ACER

European Union Agency for the Cooperation of Energy Regulators

Getting the signals right: Electricity network tariff methodologies in Europe

ACER report on network tariff practices

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1. Annex 1: Summary tables of national tariff practices

Table 1: Cost allocation model applied for setting network tariffs

Country	Description of the cost allocation model
Austria	**Average cost allocation model**
Belgium	**Average cost allocation model**
Bulgaria	**Average cost allocation model**
Croatia	**Forward-looking cost model.** • Main objective: to ensure coverage of anticipated regulatory cost and regulatory income for the next regulatory period (year, *Y*+1) through network tariffs during *Y*+1. Volumes (kWh, kW, kvar) for *Y*+1 are also anticipated and used in calculation. • Main billing variables to recover network costs: energy-based (EUR/MWh, EUR/kvar), power-based (EUR/MW) and/or also lump sum charges (EUR/month) depending on the tariff model[1]. • Computation per group of network users: The unit prices for each network users group are computerised in *Y* for *Y*+1. based on the data submitted by operator in *Y* and regulator's interventions in the operator's data. • Allocation of residual costs**:** Residual regulatory cost and residual regulatory income from *Y*-1 is calculated in *Y* and used for the calculation of the unit prices for *Y*+1. Correction for inflation is used.
Cyprus	**Average cost allocation model**
Czechia	**Average cost allocation model**
Denmark	**Average cost allocation model**
Estonia	**Forward-looking cost model**. • Main objective: to account for changing costs during the application of network tariffs and ensure their coverage[2]. • Main billing variables to recover network costs: energy-based charge. • Computation per group of network users: An incremental unit price is determined from an analysis that is based on the data provided by the TSO and DSOs. The unit price of the main billing variable differs across groups of network users and based on the voltage level[3]. The difference between the allowed revenues of the network operator and the revenues obtained from the incremental unit price is not reconciled by applying any additive or multiplicative adjustment, pursuant to national law. • Allocation of residual costs: If the costs increase, the network operator has the right to submit a request for approval of new network charges that cover the increased costs.
Finland	**Average cost allocation model**
France	**Incremental cost model**. • Main objective: cost-reflectivity and geographically uniformised charges. • Main billing variables to recover network costs: energy and power-based charges.[4] • Computation per group of network users: An incremental unit price is determined from an analysis that deduces a cost function from variables, to obtain marginal costs[5] compared

[1] HR: For TSO's network charges billing variables to recover network costs are energy-based charge (EUR/kWh), power-based charge (EUR/kW) and lump sum (EUR/month). Some DSO network users (with connection capacity under 22 kW) have only two billing variables which recover network cost: energy-based charge (EUR/MWh) and lump sum (EUR/month). For DSO's network charges the unit price is distinguished for medium voltage connections and for low voltage connections and differ across groups of network users (households, non-households, public lighting, interruptible load model). Consumer's withdrawal contracted power (EUR/kW) and producer's measured power charge (EUR/kW) were 0.000 EUR/kW in 2024.

[2] EE: For example, additional costs from a new legal obligation of the network operator or costs which changed in the operation of network service (e.g. changes in the transmission tariff paid by DSOs affects the calculation of the distribution tariff).

[3] EE: TSO's network charges apply only to consumers. The unit price varies based on the voltage level (330 kV, 110 kV and 110 kV low-voltage side of a transformer). DSO's network charges apply to both consumers and producers. The unit price is distinguished for medium voltage contact points (on the undervoltage side of a 110 kV substation and 6 -35 kV on the line and 35 kV on the undervoltage side of the substation) and low voltage contact points (over 63 A and up to 63 A).

[4] FR: The main billing variable to recover network costs is a withdrawal-based charge, measured in EUR/MW and EUR/MWh. The unit price of the main billing variable does not differ across groups of network users although it differs with the volta ge level to which the user is connected. Same rules for both transmission and distribution.

[5] FR: The marginal cost methodology has been upgraded in order to adapt to the strong growth in investments forecasted in the future. The updated methodology is based on more precise grid data collected from system operators. The updated methodology consists in defining grid pockets that includes all the grid infrastructure of a voltage range connected downstream of a transformer substation. The cost of a grid pocket is partly explained by the characteristics of the users connected to it: the methodology is

Country	Description of the cost allocation model
	to the different cost drivers. Subsequently, the difference between the allowed revenues of the network operator and the revenues obtained from the incremental unit price is reconciled by applying a multiplicative adjustment to the withdrawal component, which is applied to the main billing variable at the beginning of the regulatory period. In subsequent periods the unit price is adjusted based on the evolution of the allowed revenue for each year. • Allocation of residual costs: The coefficients are adjusted proportionately to recover the charges for historical infrastructure, which deviate from the marginal cost of infrastructure development.
Germany	**Average cost allocation model**
Greece	**Average cost allocation model**
Hungary	**Average cost allocation model**
Iceland	No data
Ireland	**Average cost allocation model**
Italy	**Average cost allocation model**
Latvia	**Average cost allocation model**
Lithuania	**Average cost allocation model**
Luxembourg	**Average cost allocation model**
Malta	**Average cost allocation model**
Netherlands	**Average cost allocation model**
Norway	**Incremental cost model**. • Main objective: to contribute to efficient development and utilisation of the network. • Main billing variables to recover network costs: Allowed revenue is based on historic costs and covered by a power-based and a variable marginal cost charge[6]. • Computation per group of network users: an incremental unit price is determined from an analysis of marginal losses in each connection point. The TSO and regional DSOs charge an energy charge based on marginal losses in each node. • Allocation of residual costs: The residual cost is recovered through a fixed charge and a power charge (based on power use during the peak load hour).
Poland	**Average cost allocation model**
Portugal	**Incremental cost model**. • Main objective: to signal to network users the cost of using the network during the system peak and to reflect also the cost of the individual peak of each network user. • Main billing variables to recover network costs: For transmission, the main billing variables to recover network costs are power-based charges (peak power and contracted power)[7]. • Computation per group of network users: an incremental unit price is determined from an analysis that evaluates the long run average incremental cost (LRAIC), based mainly on historic network expansions but also based on future investment plans. This analysis is performed at the beginning of every regulatory period. The difference between the allowed revenues of the network operator and the revenues obtained from the incremental unit price is reconciled by applying a multiplicative adjustment to the main billing variables, which is applied every year according to the demand forecast and the allowed revenues. The other billing variables of the transmission tariff (active and reactive energy) are not affected by the multiplicative adjustment. For distribution, the following differences apply: the LRAIC analysis is performed separately for each voltage level in the distribution

based on the marginal cost of the number of users and the marginal cost of peak load. A model based on grid pockets enables to bring out a different cost per grid pocket. This could be used to apply different network tariffs for users connected to different grid pockets. However, since the French network tariff is geographically uniform, this difference in the cascading cost is not reflected in the tariff.

[6] NO: For transmission, the main billing variable is a fixed power-based charge (NOK/kW). The unit price of the main billing variable differs across groups of network users (e.g. large network users with power consumption over 15 MW and annual energy consumption over 100 GWh pay a lower tariff rate to the transmission network. The other tariff charge is a variable marginal cost charge. In terms of computation, per group of network users, an incremental unit price is determined from an analysis of marginal losses in each connection point. Then, the TSO and regional DSOs charge an energy charge based on marginal losses in each node. The residual cost is recovered through a fixed charge and a power charge. For distribution, tariff structure is similar as in transmission, but the fixed tariff charge differs across voltage levels (e.g.0.4 kV and 22 kV) in addition to across groups of users (e.g. industry and households).

[7] PT: The main billing variables to recover network costs are power-based charges (EUR/kW) and are denominated as peak power and contracted power. The unit price of the main billing variables differs across network user groups, since network users at VHV only pay towards the VHV assets of the transmission grid, while network users at lower voltage levels also pay for the HV assets of transmission. In addition, when applying the transmission tariff to users connected at normal low voltage (≤ 41.4 kVA), the unit price of the peak power variable is converted into a peak energy charge, as the peak power variable is not part of the tariff structure for these users.

Country	Description of the cost allocation model
	network (HV, MV, LV); for each of these three voltage levels, a separate multiplicative adjustment is applied to the main billing variables. • Allocation of residual costs: The residual cost is allocated uniformly through a multiplicative factor. This approach preserves the relative importance of the two main price signals (peak power vs contracted power).
Romania	**Average cost allocation model**
Slovakia	**Average cost allocation model**
Slovenia	**Average cost allocation model**
Spain	**Average cost allocation model**
Sweden[8]	**Forward-looking cost model**. • Main objective: to signal to network users the cost of using the network during the peak hours. • Main billing variables to recover network costs: Overall, the cost model is a combination of different cost approaches, depending on the specific tariff element. There are four components that make up the tariff: one energy charge (based on the variable costs), one power-based charge (based on forward-looking costs), and two fixed charges (one for customer related costs, and a semi-fixed component for the residual costs. • Allocation of residual costs: through a semi-fixed component.

Note: The average cost allocation model determines unit prices of the network tariff by dividing the allowed or target revenues by the forecasted quantities (such as demand). The incremental and forward-looking cost allocation models estimate the unit prices of the network tariff through an incremental or marginal approach, by estimating additional (incremental) costs due to an increase (increment) of a cost driver. 'Residual cost' is understood as the difference between allowed revenues and the revenues resulting from a tariff equal to incremental costs.

Table 2: Cost cascading applied to transmission and distribution tariffs

Country	Description of cost cascading / reason for non-application
Austria[9]	**From transmission to distribution:** The costs of the transmission system are also paid by network users connected to the distribution network.
	From transmission to transmission: The costs for the transmission network are reduced by the costs for secondary control, network losses and Network Level 3, and then the shares of the remaining costs are cascaded following the gross cascading method according to total energy volume supplied to consumers (kWh): in eastern Austria (55%), in Tyrol (40%), and in Vorarlberg (55%). The residual shares are apportioned to the withdrawing parties directly connected at transmission level in each area, reflecting their load and energy consumption. The approach for Network Level 3 is a special mechanism, as it corresponds to assets shared between transmission and distribution. The transmission costs on Network Level 3 (110-kV-lump sum for shared assets) are charged directly to the DSO (i.e. they are included in the total costs of the DSO and in the distribution tariffs).
	From distribution to distribution: The costs of the higher voltage levels are distributed to the lower voltage levels to the extent of the separate direct costs of each lower voltage level, which means that the cascaded costs are added to the direct costs of the corresponding network level. The share depends on the energy directly used by customers connected to each voltage level - there is no fixed share. Network users which are participating in renewable energy communities are exempted from the distribution cost cascading part, when they do not withdraw energy from the public network system outside the community.
Belgium	**From transmission to distribution:** The costs of the transmission system are also paid by network users connected to the distribution network.
	From transmission to transmission: 3 network levels: 380-110 kV, 70-30 kV, transformation to Medium Voltage (mostly DSOs). Different cascading keys are used for different costs categories: (1) network development costs are cascaded according to the power use of each user category; (2) network management costs are cascaded according to the energy use of each user category. Ancillary services and system integration costs are not cascaded as they cannot be differentiated according to user groups or voltage levels. It is considered that each user category equally benefits from these services, therefore each user category (3 T-voltage level, the lowest is mostly DSOs) pays the same tariff.

[8] SE: From 1 January 2027 Sweden will follow the following mix of the cost models: the energy component uses an incremental cost approach; the capacity component follows a forward-looking cost approach; the customer related charges are based on an average cost approach.

[9] AT: The electricity network has seven different levels: Level 1 (extra high voltage, 380 kV - 220 kV, incl. transformation); Level 2 (transformation extra high voltage – high voltage); Level 3 (high voltage, voltage higher than 36 kV and lower than 220 kV, in reality 110 kV); Level 4 (transformation high voltage – medium voltage); Level 5 (medium voltage); Level 6 (transformation medium voltage – low voltage); and Level 7 (low voltage, 1 kV and lower). The transmission network corresponds to Levels 1 to 3. Customers are only connected to Level 3 to 7. Level 1 and 2 are connected only the DSOs.

Country	Description of cost cascading / reason for non-application
	From distribution to distribution: Brussels: Medium/Low voltage distribution costs are precisely identified and collected, and a set of keys (e.g. Volume, EAN, meters, etc.) is defined to split the costs which are not directly related to a specific level of voltage. Keys are defined using historical data and/or technical data. Flanders: All depreciation and operational expenditures directly related to a certain voltage level are cascaded. The shares depend on the peak load per network user group. The shares differ per DSO. All costs that aren't (directly) related to a certain voltage level are not cascaded, namely: costs of system services, management costs, costs of capital, public service obligations, pension schemes and local retributions. The costs of system services at DSO-level are equally allocated to all distribution connected users (both withdrawal and injection, based upon the energy withdrawn or injected). The costs of system services at TSO-level which are paid by the DSOs, are also equally allocated to distribution connected users (only withdrawal). Wallonia: The distribution costs that are identified by voltage level are allocated to the corresponding voltage level. For the other distribution costs, a set of multiple keys is defined to split the costs which are not directly related to a specific level of voltage. The keys are based on kWh, on kW and on the depreciation cost per tension level.
Bulgaria	**From transmission to distribution:** The NRA reported its application, but no further description was provided. Partial or differentiated cost-cascading was reported, but not described
	From transmission to transmission: The NRA reported its application, but no further description was provided. Partial or differentiated cost-cascading was reported, but not described
	From distribution to distribution: No information was provided whether it applies or not.
Croatia	**From transmission to distribution:** The costs of the transmission system are distributed to all network users on all voltage levels, including distribution and transmission. Medium voltage consumers (above 230 V) can pay for some TSO costs through connection charge. Single model for TSO users were divided into two: (1) 400 kV and (2) 110 kV and 220 kV in New TSO Tariff Methodology 2022 (NN, 84/22) and in practice in 2024. Transmission costs are not distributed to the DSO's injection charge.
	From transmission to transmission: Cost can be partially attributed on three TSO voltage levels (110 kV, 220 kV, 400 kV). Network tariff is different for network user connected to 400 kV grid (this user pays less) in comparison to the users connected to other TSO network levels (network model containing 110 kV and 220 kV).
	From distribution to distribution: Part of the distribution costs incurred at higher voltage level are reflected in the distribution tariffs at the lower voltage level, therefore unit prices are lower for the MV network users (35 kV, 10 kV) in comparison to the network users connected to the LV (less than 10 kV). The distribution network includes the MV and LV levels. The price of the distribution tariff is not uniform and depends on the users' category.
Cyprus	**From transmission to distribution:** The transmission tariff applies to all loads on the Cyprus electricity network, including to distribution connected users. The transmission tariff of the only transmission voltage level (HV), in EUR/kWh, is cascaded to distribution-connected users at MV and LV. The capacity and energy component applied to an end user's metered load shall be adjusted for average annual network losses at the voltage level to which the user is connected and average annual network losses at all voltage levels above that level. An adjustment shall also be made to reflect the contribution of the customer class to coincident peak demand, as derived from the class load curve.
	From transmission to transmission: Not applicable due to single transmission level (no EHV).
	From distribution to distribution: Separate distribution tariffs apply at MV and LV. The former applies to all loads connected to the distribution network, while the latter only applies to loads connected at LV. The unit charges are corrected for losses across voltage levels.
Czechia	**From transmission to distribution**: The majority of the transmission system costs are paid only by connected DSOs, as no consumer is connected to the transmission system[10].
	From transmission to transmission: Not applied
	From distribution to distribution: Costs are partly distributed from higher voltage level to the lower voltage level. In distribution system are costs cascaded from 110 kV to usually 22 kV (from 35 kV to 1.5 kV) and subsequently to LV.
Denmark	**From transmission to distribution:** For the grid tariff there is a DKK/MWh[11] discount if the network user is connected at T-level, to reflect savings with regard to transformers towards lower voltage levels. This gives a typical discount of approximately 5-10 % for Transmission-connected consumers with regard to the grid tariff. For all other tariffs there is no differentiation.

[10] CZ: Auxiliary services of producers (or withdrawal of the generation site) pay only for losses by withdrawal charge.
[11] DK: The reduction level is 6 DKK/MWh in 2024 and 5 DKK/ MWh in 2025.

Country	Description of cost cascading / reason for non-application
	From transmission to transmission: Not applied, based on the information of the NRA.
	From distribution to distribution: Full cost cascading for all consumers and producers. Cost per network level ideally determined from actual economic registrations. Alternatively, energy flow is used as a key to allocate costs. Metering costs and admin costs (paid as a monthly subscription) are not cascaded.
Estonia	**From transmission to distribution:** The transmission cost is cascaded through a single price in EUR/MWh applied to all distribution connected users.
	From transmission to transmission: Three transmission network levels (330 kV, 110 kV and 110 kV low-voltage side of a transformer). The costs that can be directly linked to a specific voltage level are accounted for the corresponding voltage level only. Costs that cannot be linked to a specific voltage level and costs of higher voltage level to lower voltage level are applied on the basis of the electricity consumption volumes of the consumers of the corresponding voltage level[12].
	From distribution to distribution: The biggest DSO has three network levels: the undervoltage side of a 110 kV substation; 6-35 kV on the line and 35 kV on the undervoltage side of the substation; low voltage. The costs that can be directly related to a specific voltage level are counted as costs of the corresponding voltage level. Costs that cannot be linked to a specific voltage level and costs of higher voltage level to lower voltage level are applied on the basis of the connection capacity of the consumers and electricity producers of the corresponding voltage level[12].
Finland	**From transmission to distribution:** The costs not paid by transmission connected users cascade to distribution connected users. All transmission costs are allocated to all network users across all voltage levels proportionally. Distribution connected network users at different voltage levels bear the cost of losses on the network they are connected to and on upstream (higher voltage) networks.
	From transmission to transmission: Not applicable.
	From distribution to distribution: Users at a lower voltage level pay for distribution costs of its own voltage level and for distribution costs of higher voltage levels. There are 77 DSOs and it varies by DSOs which voltage levels they operate. The voltage levels are 0.4 kV, 1-70 kV and 110 kV and the DSOs define their own tariff method, so there is no uniform price.
France	**From transmission to distribution:** The user of the lower voltage level is considered in the methodology as a user of the higher voltage level. The marginal cost of the upstream level is added to the marginal cost of the lower level. The cascading of the variable cost from transmission to distribution results, in the model, in a different price (EUR/kWh) per pocket, i.e the distribution connected users get the same cascading variable cost if there are in the same distribution network pocket. At the end, since the network tariff is geographically uniformised this difference in the cascading cost is not reflected in the tariff.
	From transmission to transmission: Same logic as transmission to distribution.
	From distribution to distribution: The user of the lower voltage level is considered - in the methodology - as a user of the higher voltage level. The marginal cost of the upstream level is added to the marginal cost of the lower level.
Germany	**From transmission to distribution:** The difference between the costs allocated to the network level and the expected network charge revenues of the level (in other words the block of costs not covered at that level) is passed on to the next network level and added to the costs of that next level. There is no separate tariff element for TSO-costs passed on to DSO-connected network users. These costs become part of the DSOs allowed revenues and as such are passed on to the network users via tariffs.
	From transmission to transmission: This form of cost-cascading exists as well, as the transmission network includes more than one voltage level.
	From distribution to distribution: The difference between the costs allocated to the network level and the expected network charge revenues of the level (i.e. block of costs not covered at that level) is passed on to the next network level and added to the costs of that next level. The costs of the upstream network level are included into the allowed revenues allocated to the voltage level and subsequently they are passed on to the network users connected to that voltage level via tariffs.
Greece	**From transmission to distribution:** All transmission costs are allocated to all network users across all voltage levels proportional to demand, at system level, during system peak periods. Distribution connected network users at different voltage levels bear the cost of losses on the network they are connected to and on upstream (higher voltage) networks.
	From transmission to transmission: Not applicable as all transmission costs are recovered by HV connected transmission demand users and by demand users connected to downstream distribution networks. (No demand customers connected at EHV, whereas injection users connected at EHV or HV are not charged with use of system charges).

[12] EE: Such a principle ensures that the consumer of each voltage level pay for the costs of its own voltage level and higher voltage levels according to the electricity consumption volume (does not include the costs paid by the consumers of higher voltage level(s), but it does not pay for lower voltage levels, which it does not use.

Country	Description of cost cascading / reason for non-application
	From distribution to distribution: The distribution network comprises the MV and LV voltage levels. Costs of the MV are cascaded to LV. Cascading is achieved by a joint allocation of cascaded costs to both MV and LV user classes, in proportion to user class peak demand (capacity tariff element) or energy consumption (energy tariff element), after compensating for losses at the different voltage levels. The cost related to metering, billing and metering related customer service is not cascaded, because no 'cause and effect' relationship exists for these costs across different voltage levels.
Hungary	**From transmission to distribution:** Distribution-connected users pay explicitly a transmission tariff related to the transmission costs (via a transmission tariff element in their final electricity bill).
	From transmission to transmission: Based on benchmarking to distribution tariffs in order to decrease the difference between distribution and transmission tariffs at the same (HV) voltage level.
	From distribution to distribution: There are 5 voltage levels: HV, HV/MV, MV, MV/LV, LV. The distributed energy with a weight of 66.6% and the contracted capacity with a weight of 33.3% accounted for the cost cascading approach. The allocation is based on the usage rate (withdrawals and capacity) of each voltage levels. (But it could only be applied to the extent according to a governmental decree, that the fees payable by residential consumers shall not increase). The cost of the metering is not cascaded as metering and reading is directly connected to the meter of the network user.
Iceland	No data.
Ireland	**From transmission to distribution:** All transmission grid losses are cascaded from transmission to distribution.
	From transmission to transmission: No data.
	From distribution to distribution: Not specified.
Italy	**From transmission to distribution:** The (transmission only) network charges for EHV and HV consumers are largely power-based and to a small extent energy-based. The charging of DSO tariff payments by the TSO (amounts collected from distribution-connected network users) is also a combined power-based and energy-based tariff, with the largest part - 93% - of transmission allowed revenues coming from the power-based component. When excluding the correction coefficients which account for higher losses in LV grids, the energy-based payment of distribution-connected users is 10 times higher than the energy-based part of the payment by HV users. This corresponds to all network users virtually paying the same EUR/MWh value (if charges were virtually energy-based for everybody).
	From transmission to transmission: There is no cascading from transmission to transmission, the transmission voltage levels (380-220-150 kV) are considered as a bundle and the users connected to 380-220-150 kV grids are subject to the same network tariff (except a minimal difference in the energy component for users connected to 150 kV grids, to account for slightly higher losses).
	From distribution to distribution: The shares of distribution costs attributed to each voltage level are proportional to the shares of historical revenues obtained by DSOs applying tariffs originally built with a cost-cascading approach. As a result, on top of paying for transmission costs, due to cost-cascading from transmission to distribution, a distribution-connected MV client only pays for distribution costs in MV, while a distribution-connected LV client pays for distribution costs in MV and LV.
Latvia	**From transmission to distribution:** Initially the basic tariff, which is the tariff for the highest capacity level, is calculated, the tariff of each subsequent capacity step shall cover by the costs of the previous higher capacity level (starting from the basic) plus of its own costs level.
	From transmission to transmission: The TSO operates the grid in 330 kV and in 110 kV. There are no users at 330 kV. Network tariffs are calculated only for 110 kV users, so all costs from 330 kV are allocated to lower voltage transmission levels.
	From distribution to distribution: Initially, the basic tariff, which is the tariff for the highest voltage level, is calculated, the tariff of each subsequent voltage step shall cover the costs of the previous, higher voltage levels (starting from basic) + of its own costs level. Cost which is related to system security is allocated equally to each voltage level (according to consumption level).
Lithuania	**From transmission to distribution:** The costs of the transmission system are also paid by network users connected to the distribution network.
	From transmission to transmission: No cost cascading because costs are not collected per voltage level.
	From distribution to distribution: Cost cascading is not regulated by the NRA, it is part of the operators' distribution tariff differentiation.
Luxembourg	**From transmission to distribution:** The cascading method used includes all voltage levels for transmission (1 level) and distribution (3 levels). Allowed costs are computed for each voltage level and are aggregated for all the DSOs/TSO at national level. The cascading is made by using the average of the past four measured annual peaks at each voltage level. As

Country	Description of cost cascading / reason for non-application
	a result, distribution connected users pay a single network tariff which covers distribution and transmission costs.
	From transmission to transmission: Not applicable, as there is only one transmission level.
	From distribution to distribution: The cascading method includes all voltage levels for transmission (1 level) and distribution (3 levels). Allowed costs are computed for each voltage level and are aggregated for all the DSOs/TSO at national level. The cascading is made by using the average of the past four measured annual peaks at each voltage level. As a result, distribution connected users pay a single network tariff which covers distribution and transmission costs.
Malta	From transmission to transmission: Not applicable in lack of transmission network.
	From distribution to distribution: No cost cascading because costs are not collected per voltage level.
Netherlands	**From transmission to distribution:** The network costs at a higher voltage level are allocated to a lower voltage level in proportion to the share of the latter network in the total consumption of energy and/or power of the former network. The transmission tariffs are paid by the DSOs and consumers pay them indirectly through the DSO tariffs.
	From transmission to transmission: The transmission network: 110/150kV (high voltage) and 220/380kV (extra high voltage). The network costs at a higher voltage level are allocated to a lower voltage level in proportion to the share of the latter network in the total consumption of energy and/or power of the former network[13].
	From distribution to distribution: In general, the costs of each network level are allocated to users at lower voltage networks based on their relative share in the main cost driver of the relevant voltage level. At high and medium voltage level the cost driver is kW, at lower voltage levels the main cost driver is kWh.
Norway	**From transmission to distribution:** The network users pay for costs related to their voltage level and higher voltage levels. The cost of the transmission system is also paid by distribution network users through the DSO tariff.
	From transmission to transmission: No cost cascading.
	From distribution to distribution: The distribution network in Norway is divided into 132, 66, 22, 11, 0.4. kV voltage levels. Distribution costs are cascaded through the different voltage levels in the distribution grid. The costs are included in the allowed revenue on the lower voltage levels, and do not result in a uniform price for all customers.
Poland	**From transmission to distribution:** The transmission tariffs are paid by the DSOs and consumers pay them indirectly through the DSO tariffs.
	From transmission to transmission: No cost cascading.
	From distribution to distribution: According to Ministry Regulation, distribution rates shall be calculated by accounting for different voltage levels: HV, MV and LV. 'Small' DSOs connected to the network of a 'big' DSO buy distribution services from the "big DSO" and pay the distribution fees calculated for the voltage level.
Portugal	**From transmission to distribution:** Distribution connected users are charged with a uniform transmission tariff, adjusted for network losses across the different voltage levels in distribution. That transmission tariff is mainly composed by a power price (EUR/kW) charged during the peak period. Distribution connected users pay on average a higher transmission tariff than transmission connected users, since the latter are connected at VHV, while the former are using not only the VHV level, but also the VHV/HV transformers, which are part of the transmission assets. There is differentiated cascading of one billing variable, the contracted power (EUR/kW), which reflects the costs of peripheral network assets that are closer to the user and used by a low number of end-users (as opposed to central assets, used by a large number of users). When cascaded to lower voltage levels, the price of contracted power is converted into the price of a different billing variable (peak power), assuming a simultaneity factor. This happens because the contracted power of a user at a lower voltage level (e.g. LV) will not be using peripheral assets of the higher voltage level based on the measurement taken at the lower voltage level. For this reason, the contracted power price is converted into a peak power price based on the expected relationship between contracted power and peak power. Another differentiation performed when applying cost cascading is to correct the prices through loss factors, reflecting grid losses. For instance, when measuring network utilisation at LV, a measurement of 1 kWh or 1 kW at a LV meter, means that the network user is using the higher voltage level at a value larger than 1 kWh or 1 kW. To take this into account, prices are differentiated across voltage levels. Exemption from cost cascading: Network users participating in self-consumption, which corresponds to energy sharing of renewable energy over the public grid, is partially exempted from cost-cascading. For instance, if the generation site is connected at MV and the consumption site at LV, the withdrawal at LV does not pay network tariffs towards voltage levels above MV. In this example, there exists cost-cascading from MV to LV, but not from

[13] NL: For transmission costs in 2021, this resulted in 91.3% of the costs of the extra high voltage level being allocated to the high voltage level.

Country	Description of cost cascading / reason for non-application
	higher voltage levels to LV. The reason for this exemption is cost-reflectivity, as it is reasonable to assume that the energy shared over the public grid does not use upper voltage levels, since energy is measured in 15 minute intervals for injections and withdrawals, and inverted power flows are still a residual phenomenon.
	From transmission to transmission: No cost cascading in the absence of separate voltage levels for transmission-connected users. The T-grid is operated at VHV and HV. The distribution grid is operated at HV, MV and LV. However, all HV users are connected to the D-grid. Moreover, information from the transmission grid is collected separately for VHV and HV assets, and a D-connected user pays for all of them due to the cost-cascading, while a transmission connected user only pays for the VHV assets. (Same differentiations and exemptions apply as from transmission to distribution above).
	From distribution to distribution: The different distribution tariffs follow cost-cascading: a HV user only pays the distribution tariff for HV; a MV user pays the distribution tariffs for HV and MV; a LV user pays all distribution tariffs (i.e. for HV, MV and LV). The network charges are adjusted for network losses across the different voltage levels in distribution. The distribution tariffs are mainly composed by a power price, in EUR/kW, charged during the peak period. (Same differentiations and exemptions apply as from transmission to distribution).
Romania	**From transmission to distribution:** The TSO operates a single voltage level (EHV), while DSOs operate three voltage levels (HV, MV, LV). The transmission tariffs apply to all users, including to distribution-connected users; all users pay the transmission tariffs separate from distribution tariffs in the electricity bill.
	From transmission to transmission: No cost cascading because costs are not collected per voltage level.
	From distribution to distribution: The distribution tariffs are energy-based, calculated on the distribution costs and distributed energy related to each voltage level. These are specific tariffs (for LV, MV and HV). The distribution tariff paid by a user is calculated by summing the specific tariffs for its own connection voltage level and the higher voltage levels. The Distribution costs are allocated to each voltage level using allocation keys that are set according to the tariff methodology. As a result, the cascaded price is not uniform.
Slovakia	**From transmission to distribution:** Tariff for transmission system access (including network development costs), transmission system losses and tariff for system services (costs for providing system services and procured ancillary services) is shared by distribution-connected users as well. This is justified on the ground that these users are causing losses in transmission system and are using the balancing services.
	From transmission to transmission: No cost cascading.
	From distribution to distribution: Distribution costs are cascaded from higher to lower voltage levels.
Slovenia	**From transmission to distribution:** Until 30.9.2024: All distribution-connected users pay a transmission tariff according to the cost-cascading model. The network costs for a particular customer group based at a particular voltage level are determined as a ratio between the peak power of that customer group and the sum of all peak powers which are directly or indirectly connected into this or subordinate voltage level(s). This is a so called "gross' cost division method, which was justified for the Slovenian system due to a relatively low level of production on MV and LV at the time of introduction (93% of all production on HV level). From 1.10.2024: The remuneration allocated to each voltage level is allocated to the voltage level itself and to lower voltage levels considering both the energy balance for the energy tariff and the power balance for the power tariff. This allocation is done for each time period.
	From transmission to transmission: No cost cascading, because costs are not collected per each transmission voltage level separately
	From distribution to distribution: Until 30.9.2024: The cascade network model among different voltage levels is used for cost allocation over 3 groups of voltage levels and two intermediate voltage levels (substation and transformer level). The network usage costs for a particular customer group based at a particular voltage level are determined as a ratio between the peak power of that customer group and the sum of all peak powers which are directly or indirectly connected into this or subordinate voltage level(s). This is a so called 'gross' cost division method, which was justified for the Slovenian system due to a relatively low level of production on MV and LV at the time of introduction (up to 93 % of all production has been on HV level). From 1.10.2024: The remuneration allocated to each voltage level is allocated to the voltage level itself and to lower voltage levels considering both the energy balance for the energy tariff and the power balance for the power tariff. This allocation is done for each time period.
Spain	**From transmission to distribution:** The remuneration allocated to each voltage level is allocated to the voltage level itself and to lower voltage levels considering both the energy

Country	Description of cost cascading / reason for non-application
	balance for the energy tariff and the power balance for the power tariff. This allocation is done for each time period[14].
	From transmission to transmission: No cost cascading as the transmission network is one network level.
	From distribution to distribution: The remuneration allocated to each voltage level is allocated to the voltage level itself and to lower voltage levels considering both the energy balance for the energy tariff and the power balance for the power tariff. This allocation is done for each time period[14].
Sweden[15]	**From transmission to distribution:** Cost-cascading exists across the three different network levels: transmission (220-400 kV) operated by DSO, regional distribution (40-130 kV) operated by regional DSOs and local distribution (230-40 kV) operated by local DSOs. The cost of a higher voltage level is paid by the adjoining lower voltage level. However, within these levels it is up to the actual network company to decide how the costs are allocated. (No predefined method/shares.) Many network companies have some kind of cost-cascading where customers (e.g. 40 kV) don't pay capital costs for the lower voltage levels, but this is not a regulated principle.
	From transmission to transmission: The information on the details of this form of costs cascading was not available to the NRA.
	From distribution to distribution: Costs are cascaded at higher voltage level. However not explicitly so on lower. Lower voltage levels have the same price over large areas so any cascading would be averaged out. The distribution costs are not divided by capacity or energy (as for transmission costs), it is implicitly included, however not explicitly calculated as such. It is not certain that a lower voltage level always should contain costs from one higher. One of the biggest DSOs does not explicitly cascade the distribution costs due to complexity of the grid.

Table 3: Recovery of cost of building, upgrading, maintaining and operating the grid (CAPEX/OPEX), costs of grid losses and cost of metering via network charges

	Transmission			Distribution		
Country	CAPEX/ OPEX	Grid losses	Metering	CAPEX/ OPEX	Grid losses	Metering
Austria	X	X[16]	X[16]	X	X[16]	X[16]
Belgium	X	X	X	X	X	X
Bulgaria	X	X	X	X	X	X
Croatia	X[17]	X	X/Other[18]	X[19]	X	X/Other[18]
Cyprus	X	X	Other	X	N/A	Other
Czechia	X	X	X	X	X	X
Denmark	X	X	N/A	X	X	X
Estonia	X	X	N/A	X	X	X
Finland	X	X	X	X	X	X
France	X	X	X	X	X	X
Germany	X	X	(X)[20]	X	X	(X)[20]
Greece	X	N/A[21]	X	X	N/A[21]	X
Hungary	X	X	X	X	X	X
Iceland	X	X	N/A	X	X	X
Ireland	X	X[22]	X	X	X	X
Italy	X	N/A[23]	X	X	N/A	X
Latvia	X	X	X	X	X	X/Other
Lithuania	X	X	X	X	X	X

[14] ES: https://www.cnmc.es/sites/default/files/5691278.xlsx
[15] SE: From 1 January 2027 the following cost-cascading applies: the network operator first divides its costs between injection and withdrawal, and second it divides the costs into four components (energy, capacity, customer related, fixed). Each component is then cost cascaded down to the next grid level, and in the end, to the final customer.
[16] AT: Specific charge.
[17] HR: OPEX: Some TSO costs are recovered based on the price list for non-standard TSO services.
[18] HR: Costs for metering on the request of the network user can be paid by network user requesting the service. For example , if users ask voltage quality metering and the result is voltage quality within standard then the cost is paid by user (Article 28 of General Network Rules (NN, 100/22)), and similar for metering testing of the equipment at the interface with grid (Article 92 of General Network Rules (NN, 100/22)).
[19] HR: OPEX: Some DSO costs are recovered based on the price list for non-standard DSO services.
[20] DE: Smart metering costs (as a deregulated activity) are not part of system operator's costs.
[21] GR: Grid losses are borne by suppliers.
[22] IE: All grid losses are covered by DSOs.
[23] IT: Consumers pay (in kind, i.e. as additional energy bought in the energy market) for a 'standard' level of losses. The difference between the actual losses and the standard losses is paid (or retained) by network operators. The reason for introducing standard level of losses (and thus an implicit reward/penalty scheme for network operators) is to incentivise network operators to reduce losses in their networks.

Country	Transmission			Distribution		
	CAPEX/ OPEX	Grid losses	Metering	CAPEX/ OPEX	Grid losses	Metering
Luxembourg	X	X	X	X	X	X
Malta	-	-	-	X	X	X
Netherlands	X	X	X	X	X	X
Norway	X	X	X	X	X	X
Poland	X	X	X	X	X	X
Portugal	X	N/A[24]	X	X	N/A[24]	X[25]
Romania	X	X	X	X	X	X
Slovakia	X	X	X	X	X	X
Slovenia	X	X	X	X	X	X
Spain	X	N/A[26]	Other[27]	X	N/A[26]	Other[27]
Sweden	X	X	X	X	X	X

Note: 'X' means the cost is recovered via use-of-network charge and/or via connection charge and 'N/A' means there is no such cost of the TSO/DSO. CAPEX and OPEX costs do not account for the costs of the direct connection, but they account for the reinforcement costs in the network required by the connection. Part of the costs which are recovered by EU Funds and Congestion income is not accounted for this table. Payments to Inter-TSO compensation mechanism (ITC) - in all countries where applicable and information was provided - are recovered by use-of-network charges.

Table 4: Recovery of costs of system services purchased by the TSO for FCR, aFRR, mFRR, RR and black start

Country	FCR[28]	aFRR[29]	mFRR[30]	RR[31]	Black start capability
Austria[32]	Other	Other	Other	N/A	X
Belgium	X	X	X	N/A	X
Bulgaria	No data	No data	X	X	N/A
Croatia	N/A[33]	X	X	N/A[34]	X
Cyprus	N/A	N/A	N/A	N/A	N/A
Czechia	N/A	N/A	N/A	No data	N/A
Denmark	X	X	X	X	X
Estonia	N/A	N/A	N/A	N/A	X
Finland	No data	No data	No data	No data	No data
France	X	X	X	X	N/A
Germany	X	X	X	X	X
Greece[35]	N/A	N/A	N/A	N/A	N/A
Hungary	X	X	X	N/A	X
Iceland	X	X	X	X	X
Ireland	X	X	X	X	X
Italy	N/A[36]	No data	No data	No data	No data
Latvia	X	X	X	X	X
Lithuania	N/A	N/A	X	X	X
Luxembourg	N/A	N/A	N/A	N/A	N/A

[24] PT: Suppliers must buy the energy for their clients' consumption in addition to energy to compensate for losses which is calculated by using the 15-minute loss profiles approved and published annually by the NRA. The loss profiles are differentiated by network type (transmission and distribution) and voltage level (EHV, HV, MV, LV). In this sense, there are no tariffs for losses, since losses are purchased by suppliers on the market.

[25] PT: Metering is a regulated activity, but as required by national law, the investment cost (CAPEX) of meters (both conventional and smart meters) is not recovered through distribution tariffs. However, since 2018 DSOs are entitled to an output-based incentive for the integration of low voltage installations in smart grids, which aims to lead the DSO to deliver to consumers value added services enabled by smart grids. Under this incentive, DSOs are awarded a fixed annual amount (for a fixed number of years) per LV supply point that delivers a certain list of smart grid services to consumers that include data collected through smart metering. OPEX related to metering are part of the costs recovered via the distribution tariff.

[26] ES: Grid losses are borne by suppliers. The standard losses are established the NRA (differentiated by voltage level and period) and published.

[27] ES: Metering is a regulated activity, but the cost related to the meter is not recovered through network tariffs being paid through a regulated rental price included in the consumers' bill when the measuring equipment is owned by the system operator. This rent includes the costs of equipment investment, verification, installation and operation. In addition, system operator receives remuneration through network tariffs for taking care of the tasks of reading customers' metering equipment.'

[28] Frequency containment reserve (primary).

[29] Automatic frequency restoration reserve (secondary) (capacity or energy).

[30] Manual frequency restoration reserve (capacity or energy).

[31] Replacement reserve (tertiary) (capacity and energy).

[32] AT: The costs for FCR, aFFR and mFFR are recovered and valued with the market prices.

[33] HR: FCR is provided by incumbent BSP to the TSO for free. The regulated price for FCR is anticipated from 1 January 2025 onward. The TSO is an observer in the European project 'FCR Cooperation'.

[34] HR: Croatian TSO does not use RR.

[35] GR: Costs of reserves and congestion management are covered through the balancing market / borne by suppliers.

[36] IT: Mandatory and provided by producers for free of charge.

Country	FCR[28]	aFRR[29]	mFRR[30]	RR[31]	Black start capability
Netherlands	X	X	X	N/A	X
Norway	X	X	X	X	N/A
Poland	X	X	X	X	X
Portugal	Other	Other	Other	Other	Other
Romania	N/A	X	X	X	X
Slovakia	X	X	X	X	X
Slovenia	X	X	X	X	X
Spain	N/A	N/A	N/A	N/A	N/A
Sweden[37]	X/Other	Other	X/Other	Other[38]	X/Other[39]

Note: 'X' means the cost is recovered via use-of-network charge and 'N/A' means there is no such cost of the TSO/DSO. Part of the costs which are recovered by EU Funds and Congestion income is not accounted for this table.

Table 5: Recovery of costs of voltage control, reactive energy management, congestion management and interruptibility schemes by the TSO/DSO

Country	Transmission			Distribution	
	Voltage control and reactive energy management	Congestion management (internal and cross-border)	Payments to Interruptible loads	Congestion management and voltage control services in local markets	Payments to Interruptible loads
Austria	X	X	N/A	N/A	N/A
Belgium	X	X	X	BXL: N/A FLA: X WAL: N/A	BXL: N/A FLA: X WAL: N/A
Bulgaria	X		X	X	X
Croatia	X	X[40]	X	N/A[41]	N/A
Cyprus	N/A	N/A	Other	X	N/A
Czechia	X	X[42]	X	X	X
Denmark	X	X	X	N/A	N/A
Estonia	X	X	N/A[43]	X	N/A
Finland	No data	No data	No data	N/A	N/A[44]
France	X	X	X	X	X
Germany	X	X	X	X	X
Greece	N/A[45]	X	Other[46]	N/A	
Hungary	X	X	N/A	X	X
Iceland	X	X	X	N/A	X[47]
Ireland	X		X	N/A	N/A
Italy	No data	No data	No data	X[48]	N/A
Latvia	X	X	N/A	X	N/A
Lithuania	X	N/A (internal) Other (cross-border)	N/A	N/A	N/A
Luxembourg	N/A	N/A	N/A	N/A	N/A
Malta	N/A	N/A	N/A	N/A	N/A
Netherlands	X	X	N/A	X	X
Norway	X	X	X	X	X
Poland	X	X	X	X	N/A
Portugal	X	Other (internal) X (cross-border)	X	N/A	N/A
Romania	X	X	Other	X	N/A

[37] SE: Part of the reserves are covered through balancing fees.
[38] SE: Government-set special capacity reserve fee.
[39] SE: Contingency fee.
[40] HR: Since Croatia is included in the TSCNET, Croatia can have income from cross-border congestion management.
[41] HR: DSO does not procure system services; thus, it has no cost for system services.
[42] CZ: The income from cross-border congestion management has always exceeded the costs in Czechia so far.
[43] EE: No such scheme yet.
[44] FI: Payments to interruptible loads (interruptible consumption) are not allowed by law.
[45] GR: It is borne by suppliers.
[46] GR: Payments to Interruptible loads are covered by producers via a separate fee outside the network tariff structure. The fee is set by the Ministry, and the scheme is administered by the TSO.
[47] IS: Interruptible loads are paid for via discounts in tariff.
[48] IT: Regarding pilot projects for DSO-procured local services.

Country	Transmission			Distribution	
	Voltage control and reactive energy management	Congestion management (internal and cross-border)	Payments to Interruptible loads	Congestion management and voltage control services in local markets	Payments to Interruptible loads
Slovakia	X	X	X	NA	NA
Slovenia	X	X	X	X	X
Spain	N/A	N/A	N/A	N/A	N/A
Sweden	X	X	N/A	X	X

Note: 'X' means the cost is recovered via use-of-network charge. Part of the costs which are recovered by EU Funds and Congestion income is not accounted for this table.

Table 6: Recovery of other TSO costs

Country	Suppliers switch[49]	ENTSO-E[50]	Market operation[51]	R&D	Data-hub	TSO penalties (or rewards)
Austria	N/A	X	X	X	N/A	X
Belgium	N/A	X	X	X	X	X
Bulgaria	N/A	Other	Other	Other	Other	X
Croatia	X	X	X	X[52]	X	Other[53]
Cyprus	Other	N/A	N/A	N/A	N/A	N/A
Czechia	X	N/A	Other	X	X	N/A
Denmark	No data	X	X	X	X	X
Estonia	N/A	X	X	X	X	Other
Finland	X	X		No data	X	N/A
France	N/A	X	X	X	N/A	X
Germany	X	X	X	X	X	X
Greece	N/A	X	X	X	X	X
Hungary	X	X	X	X	N/A	X
Iceland	N/A	X	X	X	N/A	N/A
Ireland	N/A	X	N/A	X	X	X
Italy	N/A	X	N/A	X	X	Other[54]
Latvia	X	X	X	X	X	N/A
Lithuania	N/A	X	X	X	N/A	No cover
Luxembourg	X	X	X	X	X	X (part)[55]
Malta						
Netherlands	N/A	X	N/A	X	X	Other
Norway	X[56]	X	N/A	X	Other[57]	Other
Poland	X	X	X	X	X	
Portugal	N/A	X	N/A	X	N/A	X
Romania	N/A	X	N/A	X	N/A	N/A
Slovakia	X	X	X	X	X	N/A
Slovenia	X	X	X	X	X	X
Spain	N/A	N/A	N/A	X	N/A	N/A
Sweden	N/A	X	X	X	N/A	N/A

Note: 'X' means the cost is recovered via use-of-network charge. Part of the costs which are recovered by EU Funds and Congestion income is not accounted for this table.

[49] Costs of managing the switching between suppliers.
[50] TSO participation in ENTSO-E.
[51] Costs related to wholesale market operation (e.g. NEMO).
[52] HR: The recovery of the „regulatory sandbox' costs from tariff is defined in Tariff Methodology 2022 (NN, 84/22).
[53] HR: Penalties are not recovered to system operator from network users (tariffs). Reward/penalty scheme trough tariffs for the price of system operator losses will be applied for the first time for the price of electricity losses incurred in 2024 when calculating tariffs for 2026 in 2025.
[54] IT: TSO penalties are a negative input when computing TSO costs, i.e. they are deducted from the amount of costs to be recovered by network tariffs. Vice-versa, TSO rewards are computed as an increase of tariffs.
[55] LU: TSO regulated rewards (or penalties) have a sharing factor with a part to be borne by the DSO.
[56] NO: Switching between suppliers is handled by Elhub (central data hub). Elhub is fee-financed by its users (DSO, TSO, suppliers and other parties). The DSO and TSO fee is recovered via network charges.
[57] NO: Elhub users pay a fee.

Table 7: Recovery of other DSO costs

Country	Suppliers switch[58]	EU DSO Entity[59]	Local markets[60]	R&D	DSO penalties (or rewards)
Austria	X	X	N/A	X	N/A
Belgium	X	X	X	X	X
Bulgaria	Other	Other	Other	Other	X
Croatia	X	X	N/A	X[52]	Other[53]
Cyprus	Other	N/A	N/A	N/A	N/A
Czechia	X	N/A	X	X	X
Denmark	N/A	X	X	X	N/A
Estonia	N/A	X	X	X	Other[61]
Finland	X	X	N/A	X	X
France	X	X	X	X	X
Germany	X	X	N/A	X	X
Greece	N/A	X	N/A	X	X
Hungary	X	X	X		X
Iceland	No data	N/A	N/A	X	N/A
Ireland	N/A	X	X	X	X
Italy	No data	X	X	X	Other[62]
Latvia	X	X	X	X	N/A
Lithuania	N/A	Other[63]	N/A	N/A	Other[64]
Luxembourg	X	X	N/A	X	X (part)[65]
Malta	N/A	X/Other[66]	N/A	X/Other	N/A
Netherlands	N/A	X	N/A	X	N/A
Norway	X[67]	X	X	X	Other
Poland	X	X	N/A	X	
Portugal	N/A	X	N/A	X	X
Romania	X	X	N/A	X	N/A
Slovakia	X	X	N/A	X	N/A
Slovenia	X	X	X	X	X
Spain	X/Other	X	N/A	X	X
Sweden	X	X	X	C/X	X

Note: 'X' means the cost is recovered via use-of-network charge. 'N/A' means there is no such cost of the TSO/DSO (e.g. due to lack of local markets on the DSO level). Part of the costs which are recovered by EU Funds and Congestion income is not accounted for this table.

Table 8: DSO revenue pooling and reallocation or any inter-DSO compensation mechanism or revenue transfers across DSOs

Country	Application of inter-DSO revenue pooling or reallocation	Description
Austria	**Outside tariffs**	Inter-DSO compensation is applied yearly to ensure that the DSOs receive the allowed revenues: Austria has 14 network areas with unique tariffs. If there is more than one DSO in one network region, equalization payments are necessary to guarantee that the individual DSO's costs equal their individual earnings, as allowed costs should equal to the allowed revenues for the whole network area and for each DSO located inside this area[68].
Belgium	BXL: No FLA: **Within tariffs**	FLA: The DSOs are compelled to buy green and CHP certificates from the generators at a minimum price. These costs are partly

[58] Costs of managing the switching between suppliers.
[59] DSO participation in EU DSO entity.
[60] Costs related to the operation of local markets for congestion management and voltage control services.
[61] EE: DSO must cover such costs from its business profit.
[62] IT: DSO penalties are a negative input when computing DSO costs, i.e. they are deducted from the amount of costs to be recovered by network tariffs. Vice-versa, DSO rewards are computed as an increase of tariffs.
[63] LT: Cost of participation in EU.DSO costs is recovered via use-of-network charge, cost of participation in EU DSO Entity is recovered from DSO profit.
[64] LT: Penalties imposed on the operator are covered from the operator's profit.
[65] LU: DSO regulated rewards or penalties have a sharing factor with a part to be borne by the DSO.
[66] MT: Part of the DSO costs are financed through state budget.
[67] NO: Switching between suppliers is handled by Elhub (central data hub). Elhub is fee-financed by its users (DSO, TSO, suppliers and other parties). The DSO and TSO fee is recovered via network charges.
[68] AT: The cost of some DSOs will be overcompensated in the tariff value update-process, while the costs of another DSOs will be undercompensated. With the equalisation payments this under- and overcompensation of all the DSOs located in one network area will be eliminated.

Country	Application of inter-DSO revenue pooling or reallocation	Description
	WAL: N/A	reallocated between DSOs to lower tariff differences between DSOs. Reallocation based on the quality delivered by each DSO. WAL: DSOs pool and reallocate revenues coming from their transport charges which they share on kWh basis (in Belgium the TSO charges the DSOs for the consumption on the distribution network).
Bulgaria	No	
Croatia	N/A (only one DSO)	
Cyprus	N/A (only one DSO)	
Czechia	No	
Denmark	No	
Estonia	No	
Finland	No	
France	**Outside tariffs**	The tariff for the use of public electricity networks (TURPE) is identical for all electricity DSOs and is determined on the basis of the forecast level of charges borne by the main network operator covering 95% of the country (ENEDIS). As this tariff does not always consider the specific characteristics of certain service areas, the Electricity Equalization Fund (FPE) is designed to compensate for the heterogeneous operating conditions of these networks. Th mechanism aims to ensure that the tariff income covers other DSO's real charges. This amount transferred through this mechanism depends on the size of the DSO (based on its real charges or not).
Germany	Under consideration	Ongoing NRA work on determination of rules distributing the additional costs incurred in distribution networks with a particularly high level of renewable generation.[69]
Greece	**Outside tariffs**	Revenue collected from consumers connected to the Athens International Airport Distribution Network reflects use of both the airport distribution network (AIADN) and the upstream national distribution network (HEDN). The part of this revenue (collected by the AIADN Operator) that reflects use of the HEDN is transferred to the DSO of the national distribution network (HEDNO). The AIADN tariff is related to the HEDN tariff and includes a premium to account for the increased supply security (redundancy) of the AIADN.
Iceland	**Within tariffs**	Rural subsidy is paid by all users and given to users in rural DSO to reduce cost differences.
Hungary	**Outside tariffs**	The distribution tariff values are the same in the whole country. To ensure that every DSO gets the revenue covering their justified costs the there is a reallocation. The difference between the DSO revenue from the distribution tariff is paid into or received from the pool. The reallocation revenue pool is operated by the TSO.
Ireland	No	
Italy	**Outside tariffs**	Allowed revenues are defined individually for all DSOs above 25000 network users and based on a parametric approach for all DSOs below 25000 network users. Transfers across DSOs reconcile the collected tariff amounts to the allowed revenues.
Latvia	No	
Lithuania	No	
Luxembourg	**Within tariffs**	Due to common tariffs for all DSOs in the country, compensation payments between DSOs are necessary to ensure the tariff equalization. Each DSO remains responsible for their maximum

[69] DE: The NRA has published a draft determination on distributing the additional costs incurred in distribution networks with a particularly high level of renewable generation. This second consultation is in preparation for a final decision, which the NRA plans to issue by way of a determination in the third quarter of 2024. This distribution of additional costs is intended to take effect as from 1 January 2025. Background: Many electricity distribution networks are being expanded and digitalised to accommodate the feed-in and transport of regionally produced renewable energy. This causes additional costs. The level of these costs varies across the country because wind energy is mostly produced in the north and large-scale solar farms are mainly built in rural regions. All network costs are refinanced through the network tariffs by the electricity customers. Customers in those regions that would benefit from a reduction in the cost burden currently bear all the costs for integrating renewable energy. At present, the costs are not distributed equally among all network users. In large parts of north and north-east Germany, the network tariffs are noticeably higher than in other regions of the country. In some network areas, the network tariffs are up to around 15 ct/kWh, while in others, they are less than 5 ct/kWh. In some federal states, such as Bavaria and Baden-Württemberg, there are also large differences in the network tariffs payable within the state. Over the years, the situation has developed to an extent that is no longer acceptable, and it would become more acute with further growth in renewable energy. The amendments to energy industry law in December 2023 gave the NRA competence for taking the relevant decisions on network costs.

Country	Application of inter-DSO revenue pooling or reallocation	Description
		allowed revenue (MAR). For the tariff calculation the MARs of all the DSOs are summed and are cascaded by a usage matrix taking into account the peaks per voltage level for the whole country. Tariffs are then calculated for each voltage level using the combined client bases from all DSOs. The resulting tariffs would lead to an over or under coverage of the individual MARs for each DSO. On a national level however, over- and under-coverages level out. Inter-DSO compensations allow DSOs to recover the exact amounts corresponding to their own MAR.
Malta	N/A (only one DSO)	
Netherlands	No	DSO benchmark is used to determine DSO revenues. No pooling or reallocation is done after applying the benchmark.
Norway	N/A	
Poland		Energy transit balance between DSOs is taken into account of calculation the tariffs. The costs of energy transit services between the grids of neighbouring DSOs are an element of the tariff calculation. The balance of charges is taken into account, i.e. in the case of a DSO that is an 'exporter' of energy, the revenue it plans to obtain from neighbouring DSOs reduces the costs transferred to recipients. The amount and value of transited energy is agreed annually between the interested DSOs before the tariff process.
Portugal	**Within tariffs**	By law, tariffs shall be uniform in Portugal, including in mainland Portugal and in the autonomous regions. In mainland Portugal, NRA does not set allowed revenues for the 10 local DSOs operating LV-only grids (allowed revenues are only set for the DSO covering the entire territory). These local DSOs earn an income corresponding to the distribution tariff for the LV grid. Hence, no revenue reallocation is necessary. In the autonomous regions, as tariffs are uniform but costs are higher, the difference in costs (distribution and energy supply) is socialised through an access tariff applicable to all consumers (separate from the distribution tariff).
Romania	No	
Slovakia	No data	
Slovenia	N/A (only one DSO)	
Spain	**Outside tariffs**	There is a DSO compensation mechanism (settlement system) implemented by the NRA. There is a regulatory account for each DSO. DSOs declare their incomes to the NRA. The NRA assigns through the settlement system the system's income to each DSO based on their allowed revenues (i.e. via a matrix of collections and payments among the DSOs based on their remuneration).
Sweden	No	

Table 9: Split of transmission and distribution costs between generation (via injection charges) and load (via withdrawal charges) in 2023 (%)

Country	Transmission cost recovery via injection charges	Transmission cost recovery via withdrawal charges	Distribution cost recovery via injection charges	Distribution cost recovery via withdrawal charges
Austria[70]	**Total: 22** Capex/Opex: 0 Losses: 23 System services: 100	**Total: 78** Capex/Opex: 100 Losses: 77 System services: 0	**Total: 4.8** Capex/Opex:0 Losses: 51 System services: 100 Metering: 10.3	**Total: 95.2** Capex/Opex:100 Losses: 49 System services:0 Metering: 89.7
Belgium	**Total: 18** Capex/Opex: 0 Losses: 0 System services: 50	**Total: 72** Capex/Opex: 100 Losses: 100 System services: 50	**Total: ~1** Split per region and cost category is provided in footnote[71]	**Total: ~99%** Split per region and cost category is provided in footnote[72]

[70] AT: Due to a public funding (single event) of network losses for consumers due to high prices for electricity, the tariffs for 2023 are only partially comparable.
[71] BE: In Brussels region: Total: 0. In Flanders region: Total: 2 (Capex/Opex: 2, Losses:0, System services: 2, Metering: 0. In Wallonia region: Total: < 0.1 (Capex/Opex: <0.1%, Losses:0, System services: 0, Metering: 0).
[72] BE: In Brussels region: Total: 100. In Flanders region: Total: 98 (Capex/Opex: 98, Losses: 100, System services: 98, Metering: 100. In Wallonia region: Total: > 99.9 (Capex/Opex: > 99.9, Losses:100, System services: 100, Metering: 100).

Country	Transmission cost recovery via injection charges	Transmission cost recovery via withdrawal charges	Distribution cost recovery via injection charges	Distribution cost recovery via withdrawal charges
Bulgaria	Not available	Not available	Not available	Not available
Croatia	**0**	**100**	**0**	**100**
Cyprus	**0**	**100**	**0**	**100**
Czechia	**0**	**100**	**0**	**100**
Denmark[73]	**Total: 7** Capex/Opex/losses: 10[74] System services: 3	**Total: 93** Capex/Opex/losses: 90[74] System services: 97	**Total: 5** Capex/Opex/losses: 5 Metering: 5	**Total: 95** Capex/Opex/losses: 95 Metering: 95
Estonia	**0**	**100**	**Total: ~1** Capex/Opex: 2 Losses: 1 System services: 0.2 Metering: 1	**Total: ~99** Capex/Opex: 98 Losses: 99 System services:99.8 Metering: 99
Finland	Not available	Not available	Not available	Not available
France	**Total: 2** Capex/Opex: 0 Losses: 20 System services: 0	**Total: 98** Capex/Opex: 100 Losses: 80 System services: 100	**Close to 0**	**100**
Germany	**0**	**100**	**0**	**100**
Greece	**0**	**100**	**0**	**100**
Hungary	**0**	**100**	**0**	**100**
Iceland	**0**	**100**	**0**	**100**
Ireland[75]	**9** Capex/Opex: 25 Losses: 0 System services: 0	**91** Capex/Opex: 75 Losses: 100 System services: 100	0	100
Italy	0	**100**	**0**	**100**
Latvia[76]	**2.3**	**97.7**	**0.2**	**99.8**
Lithuania	**0**	**100**	**0**	**100**
Luxembourg	**0**	**100**	**0**	**100**
Malta	**-**	**-**	**~0**	**~100**
Netherlands	**~0**	**~100**	**~0**	**~100**
Norway[77]	**-8** (energy charge was negative in sum)	**108**	**1**	**99**
Poland	**0**	**100**	**0**	**100**
Portugal	**0**	**100**	**0**	**100**
Romania	**11** Capex/Opex:0 Losses: 24 System services: 0	**89** Capex/Opex: 100 Losses: 76 System services: 100	**0**	**100**
Slovakia	No data	No data	No data	No data
Slovenia	**0**	**100**	**0**	**100**
Spain	**0**	**100**	**0**	**100**
Sweden[78]	**38**	**62**	**Regional grid: ~16** **Local grid: ~1**	**Regional grid: ~84** **Local grid: ~99**

[73] DK: All values are approximate and preliminary. Only 2022 data is available for total charges. Total distribution charges based on DSO revenue cap for 2022, actual charges collected are lower due to delay in tariff adjustment due to exogenous cost changing, e.g. higher cost of distribution losses. Differences between revenue cap and actual revenue are collected (or disbursed) in following years. Injection charges (and producer connection charges) were introduced in 2023. Percentage and nominal split between withdrawal and injection based on 2023 tariff methodology and 2022 charge nominal amounts.
[74] DK: Due to bundling of CAPEX and OPEX costs with costs of (purchasing) transmission losses, it is not possible to split the tariff income across these two cost categories, therefore, it is possible that the share of CAPEX and OPEX recovery is biased.
[75] IE: All values are based on Transmission Use of System Tariffs from 1 October 2022 to 30 September 2023.
[76] LV: Split per cost category is not applied.
[77] NO: Split per cost category is not available.
[78] SE: Split per cost category is not available.

Table 10: Exemptions or discounts in payment for transmission and distribution costs

Country	Transmission Costs								Distribution Costs			
	Transmission-connected				Distribution-connected				Distribution-connected			
	Producers	Consumers	Storage	Prosumers	Producers	Consumers	Storage	Prosumers	Producers	Consumers	Storage	Prosumers
Austria	Some	None	Some	None	Some	None	None	None	None	All	Some	None
Belgium	None	None	Some	None	None	None	None	None	Mix[79]	Mix[80]	Mix[81]	Mix[82]
Bulgaria	None	None	None	None	None	None	None	None	All	None	None	None
Croatia[83]	All	None	Some	None	All	None	Some	Some	All	None	None	Some
Cyprus	All	None	Some	None	All	None	All	All	All	None	All	All
Czechia	All	None	None	Some	None	None	None	None	All	None	None	Some
Denmark	None	Some	None	Some	Some	Some	None	Some	Some	None	None	Some
Estonia	All	None	None	None	None	None	None	None	None	None	None	None
Finland									All	None	None	None
France	Some	Some	Some	None	All	None	None	Some	All	None	None	None
Germany	All	Some	Some	Some	All	Some	Some	Some	All	Some	Some	Some
Greece	All	Some			All	Some			All	Some		
Hungary	All	None	All	None	All	None	All	None	All			
Ireland	Some	None	Some	None	Some	None	Some	None	All	None	None	None
Iceland	All	None	None	None	None	None	None	None	All			
Italy	All		All		All		All		All		All	
Latvia	None	None	None	None	None	None	None	None	None	None	None	None
Lithuania	All	None	All	None	None	None	All	All	All	Some	Some	
Luxembourg	All	None	None	None	All	None	None	None	All	None	None	None
Malta	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None	None	None
Netherlands	All[84]	None	None	None	None	None	None	None	All[84]	None	None	None
Norway	None	Some	None	None	None	Some	None	Some	None	None	None	Some
Poland	All	Some	All		All				All		Some	Some
Portugal	All	None	Some	None	All	None	Some	Some	All			
Romania	Some	None	None	Some	Some	None	None	None	All	None	All	None
Slovakia	Some	Some	Some	Some	Some	Some	Some	Some	Some	Some	Some	Some
Slovenia[85]	All	None	All	None	All	Some	All	Some[86]	All	Some	All	Some[86]
Spain	All	None	All	None	All	None	All	None	All	None	All	None
Sweden	None	None	None	None	None	None	None	None	None	None	None	None

Notes: 'All' means that all network users in the group are exempted from the payment or receive some discount; ('All' also includes the instances where no charge applies to the network user group.) 'Some' means that only some of those network users receive some exemption or discount; 'None' means that none of those network users receives any exemption or discount. For more details on exemptions and discounts please refer to Table 28–Table 35 in this Annex.

[79] BE: BXL: All, FLA: All, WAL: None.
[80] BE: BXL: None, FLA: None, WAL: Some.
[81] BE: BXL: None, FLA: None, WAL: All.
[82] BE: BXL: None, FLA: None, WAL: Some.
[83] HR: Relating to all network users: A special case occurs during the provision of an ancillary service for voltage regulation at the request of the system operator. Reactive energy (kvar) during this period is excluded for this metering point during these intervals. The user does not pay the network tariff in the settlement for this excessive reactive energy (EUR/kvar). The increase in active power withdrawal (kW) at the request of the system operator is excluded from the network tariff settlement for the maximum peak active power (EUR/kW) for the network user. These exceptions are stipulated by the Electricity Market Law.
[84] NL: Producers pay a fraction of the costs.
[85] SI: The specified discounts correspond to the methodology in use until 30 September 2024.
[86] SI: Special compensation apply for providing system services to TSO.

Table 11: Split of transmission and distribution (use-of network) charges for injection and for withdrawal per tariff bases (%)

Country	Transmission charges				Distribution charges	
	Injection (transmission level)	Withdrawal (transmission level)	Injection (distribution level)	Withdrawal (distribution level)	Injection (distribution level)	Withdrawal (distribution level)
Austria	E: 100	No data	N/A	No data	E: ~100	P: 20.6 E: 71 L: 8.4
Belgium	E: 100	P: 70 E: 30			Not aggregated[87]	Not aggregated[88]
Bulgaria	No data	No data	No data	No data		No data
Croatia	N/A	P: 45.17 E: 41.10 L: 0.13 O[89]: 13.60	N/A	P: 24.78 E: 75.22	N/A	P: 13.04 E: 72.42 L: 12.62 O[89]: 1.93
Cyprus	N/A	E: 100	N/A	E: 100	N/A	E: 100
Czechia	N/A	No data	N/A	No data	N/A	P: 33.4 E: 66.1 L: 0.4
Denmark	E: 100	E: 100	E: 100	E: 100	E:85 L:15	E:84 L:15
Estonia[90]	N/A	E: 100[91]	N/A	E: 100	P: ~56 L: ~44	P: ~17 E: ~71 L: ~12
Finland		E: 100			Not available	Not available
France	E: 100	P: 40 E: 60		P: 40 E: 60		P: 40 E: 60
Germany	N/A	P: 66.81 E: 31.58 O: 1.61		P: 80.72 E: 18.46 O: 0.82	N/A	P: 35.26 E: 50.42 L: 10.77 O: 3.55
Greece	N/A		N/A		N/A	E: 100
Hungary	N/A	E: 100	N/A	P: 1 E: 97-98	N/A	P: 19 E: 78 L: 2 O: 1
Iceland	N/A		N/A	P:15 E: 85	N/A	P:15 E: 85
Ireland					N/A	P: 22 E: 64 L: 14
Italy	N/A		N/A		N/A	
Latvia	P: 100	P: 58 E: 42	N/A	P: 72 E: 28	N/A	P: 83 E: 17
Lithuania	0	P:39 E:61	N/A	N/A	N/A	P: 35.4 E: 60.2 L: 2 O: 2.4
Luxembourg	N/A	P: 72 E: 28 L: ~0[92]	N/A	not available	N/A	P: 18 E: 69 L: 13
Malta	N/A	N/A	N/A	N/A	N/A	N/A
Netherlands[93]	L: 100	P: ~100 L: ~0			L: 100	P: E: L:
Norway	P: 100 (the E and L terms were	P: 17 E: 33 L: 50	P: 67.5 L: 32.5	P: 4 E: 46 L: 50	No data	No data

[87] BE: BXL: N/A; FLA: E: 100; WAL: P: no data L: no data.
[88] BXL: P: 19, E:74, L:7; FLA: P: 39, E: 36, L: 23; WAL: E: no data, P: no data.
[89] HR: Excess of reactive energy (RE).
[90] EE: Share of transmission costs: transmission: 5%, distribution: 95%.
[91] EE: Until end 2023 only energy-based charges applied.
[92] LU: Some metering costs are recovered via lump sum, it is negligible.
[93] NL: Split of the transmission costs: transmission: 10.28%, distribution: 89.72%.

Country	Transmission charges				Distribution charges	
	Injection (transmission level)	Withdrawal (transmission level)	Injection (distribution level)	Withdrawal (distribution level)	Injection (distribution level)	Withdrawal (distribution level)
	negative sum)[94]		(the E term was negative sum)			
Poland	N/A	P: 35-40 E: 60-65	N/A		N/A	
Portugal	N/A	P: 79.4 E: 18.2 O: 2.5	N/A	P: 87.4 E: 12.4 O: 0.1	N/A	P: 56.6 E: 43 O: 0.3
Romania[95]	E:100	E: 100	E: 100	E: 100	N/A	E: 100
Slovakia	No data	No data	No data	No data	No data	No data
Slovenia[96]	N/A	No data	N/A	P: 62.22 E: 37.48	N/A	P: 31.3 E: 68.7
Spain	N/A	P: 75 E: 25	N/A	P: 84.6 E: 15.4	N/A	P: 84.6 E: 15.4
Sweden	100	100	N/A	N/A	P: 80 E: 16 L: 4	P: 30 E: 30 L: 40

Notes: 'P' means the share of costs recovered by power-based charges (e.g. EUR/kW or EUR/kVA), 'E' means the share of costs recovered by energy-based charges (e.g. EUR/kWh), 'L' means costs recovered by lump sum charges (e.g. EUR/y), 'O' means the share of costs recovered by other tariff-basis (e.g. reactive power), 'N/A' means not applicable.

Table 12: Split of transmission (use-of network) charges per cost categories per tariff bases (%)

Country	Total	CAPEX/OPEX	Grid losses	System services	Metering
Austria	P: 18 E: 78 L: 4	P: 28 E: 65 L: 7	E: 100	E: 100	O: 100
Belgium	P: 50 E: 50	No data	No data	No data	No data
Bulgaria	No data	E: 97.79 L: 2.31	No data	No data	No data
Croatia	P: 26.19 E: 72.86 O: 0.94 L: 0.01	No data	No data	No data	No data
Cyprus	E: 100	E: 100	E: 100	E: 100	L: 100
Czechia	P: 45 E: 55	P: 100	E: 100	E: 100	P: 100
Denmark	E: 100	E: 100		E: 100	N/A
Estonia	E: 100	E: 100	E: 100	E: 100	E: 100
Finland	No data				
France	P: 39 E: 60 L: 1	P: 40 E: 60	E: 100	E: 100	L: 100
Germany	P: ~80 E: ~20	P: ~80 E: ~20	P: ~80 E: ~20	P: ~80 E: ~20	O: 100
Greece	P: 27.6 E: 74.4	P: 27.6 E: 72.4	N/A	N/A	No data
Hungary	P: 1-2 E: 98-99	P: 1-2 E: 98-99	No data	No data	No data
Iceland	No data	No data	No data	No data	N/A
Ireland	P: 12 E: 88	No data	No data	No data	No data
Italy	P: 93 E: 7	No data	N/A	No data	No data
Latvia	P: 72 E: 28	P: 72 E: 28	E: 100	N/A	N/A

[94] NO: P: 88730, E: -121834, L: -33103.
[95] RO: Split of the transmission costs: transmission: 12% (8% injection and 4% withdrawal), distribution 88% (3% injection and 85% withdrawal).
[96] SI: The specified tariff base split corresponds to the methodology in use until 30 September 2024.

Country	Total	CAPEX/OPEX	Grid losses	System services	Metering
Lithuania	P: 39 E: 61	P: 50 E: 50	E: 100	P: 100	P: 50 E: 50
Luxembourg	No data	No data	No data	N/A	N/A
Malta	N/A	N/A	N/A	N/A	N/A
Netherlands	P: 99.96 L: 0.04	P: 99.96 L: 0.04	P: 99.96 L: 0.04	P: 99.96 L: 0.04	No data
Norway	P: 70.7 E: 29.3 L: 0	No data	No data	No data	No data
Poland	No data	P: 100	E: 100	E: 100	No data
Portugal	P: 87.2 E: 12.6 O: 0.2[97]	No data	N/A	No data	No data
Romania	E: 100	E: 100	E: 100	E: 100	N/A
Slovakia	No data				
Slovenia[96]	P: 62.4 E: 37.6	No data	No data	No data	No data
Spain	P: 75 E: 25	P: 75 E: 25	N/A	N/A	N/A
Sweden	P: 100 E: 0	P: 100	E: 100	P: 100	P: 100

Notes: 'P' means the share of costs recovered by power-based charges (e.g. kW or kVA), 'E' means the share of costs recovered by energy-based charges (e.g. EUR/kWh), 'L' means costs recovered by lump sum charges (e.g. EUR/y), 'O' means the share of costs recovered by other tariff-basis (e.g. reactive power), 'N/A' means not applicable.

Table 13: Split of distribution (use-of network) charges per cost categories per tariff bases (%)

Country	Total	CAPEX/OPEX	Losses	System services	Metering
Austria	P: 70 E: 23 L: 7	P: 65 E: 27 L: 8	E: 100	N/A	O: 100
Belgium	Not aggregated[98]	Not aggregated[99]	Not aggregated[100]	No data	Not aggregated[101]
Bulgaria	No data	No data	No data	No data	No data
Croatia	P: 13.04 E: 72.42 O: 1.93 L: 12.62	No data	No data	N/A	No data
Cyprus	E: 100	E: 100		E: 100	L: 100
Czechia	P: 33.4 E: 66.1 L: 0.4	No data	No data	No data	No data
Denmark	P: 0.5 E: 84.5 L: 15	P: 1 E: 89 L: 10	E: 100	N/A	L: 100
Estonia	P: ~18 E: ~70 L: ~12	P: ~18 E: ~70 L: ~12	P: ~18 E: ~70 L: ~12	P: ~18 E: ~70 L: ~12	P: ~18 E: ~70 L: ~12
Finland	No data	No data	No data	No data	No data
France	No data	No data	No data	No data	No data
Germany	P: ~37 E: ~52 L: ~11	P: ~37 E: ~52 L: ~11	P: ~37 E: ~52 L: ~11	P: ~37 E: ~52 L: ~11	O: 100
Greece	P: ~90 E: ~10	P: 90 E: 10	N/A	N/A	No data
Hungary	P: 19 E: 78 L: 2	No data	No data	No data	No data

[97] PT: Revenue collected through reactive energy prices that are part of the transmission tariff/distribution tariff.
[98] BE: Brussels region: P:19, E:74, L:7; Flanders region: P:39, E:38, L:23; Wallonia region: P:20–30, E:60–75, L:5-10.
[99] BE: Wallonia region: P: 20-30, E: 60-75, L: 5-0.
[100] BE: Brussels region: P: 20, E: 80; Flanders region: no data, Wallonia region: P: 20 – 30, E: 60 – 75, L: 5 – 10.
[101] BE: Brussels region: L:100; Flanders region: no data, Wallonia region: P: 20 – 30, E: 60 – 75, L: 5 – 10.

Country	Total	CAPEX/OPEX	Losses	System services	Metering
	O: 1				
Iceland	P: 15 E: 85 L: 0	P: 15 E: 85	P: 15 E: 85	P: 15 E: 85	P: 15 E: 85
Ireland	P: 22 E: 64 L: 14	P: 14 E: 64 L: 22	No data	No data	No data
Italy	No data	No data	N/A	N/A	No data
Latvia	P: 50 E: 50 L: 0	P: 93 E: 7	E: 100	n/a	No data
Lithuania	No data	Not aggregated[102]	E: 100	Other: 100	E: 100
Luxembourg	P: 18 E: 69 L: 13	P: 18 E: 69 L: 13	P: 18 E: 69 L: 13	P: 18 E: 69 L: 13	L: 100
Malta	N/A	N/A	N/A	N/A	N/A
Netherlands	P E L	P E L	P E L	P E L	No data
Norway	No data	No data	No data	No data	No data
Poland	P: 27 E: 65 L: 8	P: ~80 L: ~20	E: 100	E: 100	L: 100
Portugal	P: 56.6 E: 43 L: 0	No data	No data	No data	No data
Romania	P: 0 E: 100 L: 0	E: 100	E: 100	N/A	N/A
Slovakia	No data	No data	No data	No data	No data
Slovenia[96]	P: 31.3 E: 68.7 L: 0	N/A	N/A	N/A	N/A
Spain	P: 84.6 E: 15.4	P: 84.6 E: 15.4	N/A	N/A	N/A
Sweden	P: 31 E: 30 L: 39	P: 16 E: 32 L: 51	E: 100	L: 100	L: 100

Notes: 'P' means the share of costs recovered by power-based charges (e.g. kW or kVA), 'E' means the share of costs recovered by energy-based charges (e.g. EUR/kWh), 'L' means costs recovered by lump sum charges (e.g. EUR/y), 'O' means the share of costs recovered by other tariff-basis (e.g. reactive power), 'N/A' means not applicable.

Table 14: Transmission charges with contracted (subscribed) capacity-based element

Country	Period and unit for subscription[103]	Penalties for excess[104]	Differentiation per time-intervals[105]	Voltage level and network users[106]	Introduction / last major reform[107]
Austria					Not applied
Belgium	Annual (kVA)	Yes	No	30-380 kV	2016
Bulgaria	No data	No data	No data	No data	Applied
Croatia	Not fixed (kW)	Yes[108]	No	All	2022[109]

[102] LT: CAPEX: E: 74.07, O: 25.93; OPEX: E: 99.91, O: 0.09
[103] It shows how often users can change their subscription level (e.g. monthly) and in what unit the subscription is set.
[104] It shows whether any monetary or non-monetary penalties for exceeding the subscription level applies.
[105] It shows whether the network users can subscribe different power levels for different time-intervals under the same subscription
[106] It shows to which voltage level and network users the contracted (subscribed) capacity-based element is applied.
[107] It shows since when the contracted (subscribed) capacity-based element is applied and/or when was the last major reform.
[108] HR: Increase of subscription level. Consumer is not allowed to exceed contracted power, but no monetary penalty for it. If contracted power is exceeded, the TSO must ask the network user to request additional contracted power or to limit its withdrawal. If the problem persists TSO must install an equipment to limit the power to the contracted power (Article 36 of General Rules (NN, 100/22)).
[109] HR: Contracted capacity-based charge is included in the tariff methodology for the first time in 2022. The TSO is not obliged to propose the value to be larger than 0 EUR/kW. There are a lot of users with small power flow that do not pay for the network

Country	Period and unit for subscription[103]	Penalties for excess[104]	Differentiation per time-intervals[105]	Voltage level and network users[106]	Introduction / last major reform[107]
Cyprus					Not applied
Czechia	Monthly/annual (kW)	Yes	No	HV and MV	2000
Denmark					Considered
Estonia	Twice/year (kVA)	Yes[110]	No	All	2024[111]
Finland	Installed (connected capacity)	N/A	N/A	N/A	The injection charge consists of a fixed capacity fee per MW
France	Monthly (kW)	Yes [112]	Yes[113]	All	2021[114]
Germany					Not applied
Greece	No data	No data	No data	No data	Applied
Hungary					Not applied
Iceland					Not applied
Ireland	Any time[115] (kW)	Yes[116]	No	All	Long ago[117]
Italy	No data	No data	No data	No data	No data
Latvia	Installed (connected capacity)	N/A	N/A	N/A	
Lithuania	Once/year (kW)	Yes	No	330-110 kV and 35-6 kV	2011
Luxembourg					Not applied
Malta					N/A
Netherlands	Yearly (kW)	Yes[118]	No	Transmission withdrawal	1999
Norway					Not applied
Poland[119]	Monthly[120] (kW)	Yes (not defined)	No	All	2016
Portugal					Not applied
Romania					Considered
Slovakia	No data	No data	No data	No data	Applied
Slovenia[121]	Monthly (kW)	No[122]	No	Up to 43 kW	2001

sufficient contribution where majority of tariff structure is based on energy flow withdrawn from the grid (energy 73%, measured maximum power flow 26%).

[110] EE: Five times higher power-based transmission charge for excess.

[111] EE: This contracted capacity-based charge will be applied from 2024. In 2023, the TSO decided to change the network fee structure, as the consumption volumes of electricity from the TSO's network have decreased, but large consumption capacities are still maintained. In order to find out the actual network capacities that the users need, it was decided to introduce capacity charge. Usually, network users review their consumption capacities if they have to pay for it. As long as there is no charge for owning the capacity, it is not considered necessary to find out the actual capacities.

[112] FR: Quadratic sum of every excessive power: the penalty is the *capacity cost* $* 0{,}04 * \sqrt{\sum(\Delta P^2)}$ where ΔP is the excessive power over the contracted capacity in every 10 minutes intervals.

[113] FR: Users can have 5 different power levels: super peak hours, peak and off-peak hours during high season (winter), peak and off-peak hours during low season (summer season). Extreme peak subscribe power cannot be higher than high season peak that cannot be higher than high season off peak that cannot be higher than lower season peak that cannot be higher than low season off peak.

[114] FR: Contracted capacity-based charge has always been applied. Last major reform was in 2021.

[115] IE: Users can change their subscription level at any time once they have completed the application process with the TSO.

[116] IE: Energy based charge for excess: users are charged a Demand Network Unauthorised Usage Charge for each MWh above their contracted capacity (i.e. maximum export capacity).

[117] IE: This has always been applied without any major reforms of the methodology.

[118] NL: The subscription level can be exceeded. This results in an increase of the subscription retroactively (if the additional capacity is available).

[119] PL: There are two different approaches for setting the contractual power for access to the transmission network: one for called 'final' PoD (where end consumption is connected) and other for called 'network' PoD (which are PoD of DSOs having more than two PoDs, and these PoDs are nodes of meshed distribution network 110 kV). In final PoD contractual capacity is based on contracted power (the capacity has to be ordered in August/September of year n-1) In network PoD contractual capacity is determined on actual, historical energy flows (from July of year n-2 to June of year n-1).

[120] PL: End-users can order contractual capacity different for individual months.

[121] SI: According to the methodology in use until 30 September 2024.

[122] SI: Disconnection via main fuses in case of excess. No penalties except costs of fuse replacement.

Country	Period and unit for subscription[103]	Penalties for excess[104]	Differentiation per time-intervals[105]	Voltage level and network users[106]	Introduction / last major reform[107]
Spain	Yearly (kW)	Yes	Yes[123]	All	2021[124]
Sweden	Once/year (kW)	Yes	No	All	> 20 years

Table 15: Measured Power based transmission charges

Country	Measure / calculation[125]	Time-of-Use signal embedded[126]	Real time (or close to real time) info[127]	Voltage level and network users[128]	Introduction/ last major reform[129]
Austria	The average of the 3 highest monthly peaks (kW)	No	No data	No data	No data
Belgium	Monthly peak; yearly peak (kW)	Yes[130]	No data	30-380 kV	2012/2024[131]
Bulgaria	No data	No data	No data	No data	No data
Croatia	Individual peak (kW) during peak hours (daily tariff period); monthly peak (15 min intervals)[132]	Yes[133]	Yes[134]	All voltage levels, but not all users.[135]	2003[136]
Cyprus					Not applied
Czechia					Not applied
Denmark					Considered
Estonia					Not applied
Finland					Not applied
France					Not applied
Germany	Yearly peak (special case:	No	Yes[139]	Some[140]	For multiple decades

[123] ES: Users have the possibility to subscribe different power levels for different time-intervals with the limitation that power must increase from peak to off peak periods except for household consumers.
[124] ES: Charges with terms of power have always been applied. The last reform applies since June 2021 (Circular 3/2020).
[125] It shows how the measured power for the calculation of the charge is determined.
[126] It shows whether there is any time-differentiation of the charge.
[127] It shows whether there are some users who are able to access information regarding their power use in real time or close to real time.
[128] It shows to which voltage level and network users the measured power-based charge is applied.
[129] It shows since when the measured power-based charge element is applied and/or when was the last major reform.
[130] BE: the monthly peak tariff is not applied during summer off-peak periods and the yearly peak tariff is only applied during winter off-peak periods.
[131] BE: The power-based charge was introduced in 2012, the ToU for yearly peak tariff was introduced in 2016 and for monthly peak tariff in 2024.
[132] HR: For consumers (TSO and DSO grid): the maximum 15-minute measured power in peak hours (winter time 7:00 - 21:00, summer time 8:00 - 22:00) that was withdrawn from the grid in one month. For producers (on both TSO and grid with license for production from NRA): the maximum 15-minute measured power in all intervals in one month, but currently effectively set at zero.
[133] HR: Seasonal differentiation, but same unit price in all intervals.
[134] HR: In the interval *i* for the interval *i*-1.
[135] HR: For the consumers at distribution, only those users pay measured power-based TSO tariff who have measured power DSO tariff as well, i.e. users with contracted power higher than 22 kW, exception is for the public lightning, and for household with the ability for DSO to limit the power exchange with the grid (Crni, only eight hours of supply is guaranteed), for network user with contracted power higher than 22 kW who have agreed that DSO limits their exchange with the grid to 22 kW while preserving their full contracted power with the possibility to return to full contracted power use (Crveni) and also for network user below 22 kW asking to be in a tariff model with measured power (Article 48(6) and Article 76(1)-(2) of the General Rules (NN, 100/22)).
[136] HR: The measured power-based TSO charge was introduced in 2003, there was no major reform since then.
[139] DE: Close to real time. Users with recording performance measurements or smart meters are able to access information regarding their power use of the last 15 minutes. The power use is visible on the meters and via application or platform. TSOs/DSOs who pay for an additional service for smart meters are able to access the power use per minute.
[140] DE: All voltage levels. For network users with above 100 000 kWh/year consumption.

Country	Measure / calculation[125]	Time-of-Use signal embedded[126]	Real time (or close to real time) info[127]	Voltage level and network users[128]	Introduction/ last major reform[129]
	monthly peak)[137] (15 min intervals)[138]				
Greece	Average energy consumption during peaks[141] (15 min intervals)	Implicitly, as measured only during peaks	No data	No data	No data
Hungary					Not applied
Iceland	Maximum power (1-hour intervals)	Usually not, but there are a few exceptions	Yes		
Ireland					Not applied
Italy	No data	No data	No data	No data	No data
Latvia					Not applied
Lithuania					Not applied
Luxembourg	Yearly peak (15 min intervals)	No	Yes (visible on meter)	220kV	Long ago
Malta					N/A
Netherlands	Monthly peak (kW) (for some users weekly) (15 min intervals)[142]	Applied from 2025	Yes (depends on the meter and linked devices/service)	All transmission withdrawal	1999/2025
Norway	Individual peak (kW) during system peak hours[143]				
Poland	Historical peak between July n-2 and July n-1 used to define contractual capacity	No	No	All[144]	2008
Portugal	Historical peak over last 12 months; measured energy consumption	No	Yes	Users of VHV and for DSOs	2002[146]

[137] DE: Above 100 000 kWh/year consumption, so-called RLM meters are used. RLM stands for recording power measurement. With this type of meter, a measuring device records the power value per measuring period (15 minutes for electricity). The peak metered power offtake during the year is the basis for the calculation. Special case: Final customers with a high-power offtake during a limited period of time that contrasts with a significantly lower or zero power offtake during the remaining time are entitled to be offered a network charge based on the metered power offtake in these limited periods of time (calculation based on monthly peaks).

[138] DE: The weight of the components depends on the user's peak load that occurs simultaneously with the annual peak load of the network. For users exceeding 2500 hours of consumption, the capacity-based term is higher than the energy-based term. The opposite is true for consumers under the 2500-hour threshold. (I.e. according to the latest data from year 2015, for transmission-connected grid users exceeding 2500 hours of consumption/year: 83.4% capacity charge, 16.6% volumetric. For grid users under 2500 hours: 25.5% capacity, 74.5% volumetric).

[141] GR: For each month, calculated from the average consumption (MWh) of the eighty highest 15-minute intervals is calculated using past data from year Y-2, based on peak demand periods. This average is then multiplied by 4 to convert it into power (MW). The calculation is performed separately for HV & MV users. The annual estimated power is then derived by summing the calculated monthly values.

[142] NL: Actual maximum amount of power required within a week or month based on 15 minutes intervals. Weekly for connections that are used max 600 hours a year. Monthly for all other connections.

[143] NO: The power-based charge is determined based on each customers withdrawal during peak load of the system. For 2024, the rate is 270 NOK/kW. The basis for consumption settlement is the average power withdrawal (MWh/h) in the peak load hour over the past 5 years. The years 2019-2023 are included in the basis for the 2024 tariff. It is measured consumption at the transmission network point plus production.

[144] PL: For so called 'network' points of delivery which are PoD of DSOs having more than two PoDs, and these PoDs are nodes of meshed distribution network 110 kV.

[146] PT: Introduced as of tariff year 2002. No major reform since then.

Country	Measure / calculation[125]	Time-of-Use signal embedded[126]	Real time (or close to real time) info[127]	Voltage level and network users[128]	Introduction/ last major reform[129]
	during peaks (15 min intervals)[145]				
Romania					Considered
Slovakia	No data	No data	No data	No data	Applied
Slovenia[121]	Average of three individual during peak period[147]	No	Yes[148]	> 43 kW contracted capacity	2001
Spain	Excess power over contracted capacity (15-min intervals)[149]	Yes[150]	Yes (via platform)	All	Jun-2021
Sweden					Not applied

Table 16: Distribution charges with contracted capacity-based element

Country	Period and unit for subscription[151]	Penalties for excess[152]	Differentiation per time-intervals[153]	Voltage level and network users[154]	Introduction / last major reform[155]
Austria					Not applied
Belgium	BXL: EUR FLA: Monthly (but for min. one year)[156] (kVA)	BXL: N/A FLA: Yes[157]	BXL: N/A FLA: No	BXL: N/A FLA: >1kV	BXL: lump sum based on capacity[158] FLA: 2023 WAL: not applied
Bulgaria					Not applied
Croatia	Not defined (kW)	Yes[159]	No	All[160]	2022[161]
Cyprus					Not applied
Czechia	Monthly/annual (kW)	Yes (higher tariff for the	No	HV and MV	2000

[145] PT: The power-based charge 'contracted power' corresponds to a measured power. It corresponds to highest power reading for the last 12 months (including the current billing month) of used power, measured in 15-minute intervals. The peak power is based on measured energy during the peak period in a certain billing month. Hence, it divides the measured energy during the billing month by the total peak hours in that billing month to obtain an average power value.
[147] SI: Working days from 6:00 till 22:00.
[148] SI: with an interface for local data access.
[149] ES: Network users with meters which registers 15 minutes intervals must pay penalty each time the measured power exceeds the contracted power. Network users with meters which only registers the maximum contracted power by different time-periods must pay penalty if the measured power exceeds the contracted power at least once during the month. Different unit prices apply to different voltages. Network users with meters which registers 15 minutes intervals have also different prices by period.
[150] ES: Different unit charges by period.
[151] It shows how often users can change their subscription level (e.g. monthly) and in what unit the subscription is set.
[152] It shows whether any monetary or non-monetary penalties for exceeding the subscription level applies.
[153] It shows whether the network users can subscribe different power levels for different time-intervals under the same subscription
[154] It shows to which voltage level and network users the contracted (subscribed) capacity-based element is applied.
[155] It shows since when the contracted (subscribed) capacity-based element is applied and/or when was the last major reform.
[156] BE-FLA: monthly, but if the users increased contracted capacity, they have to wait 12 months before they can decrease again
[157] BE-FLA: The penalty equals to 1.5 * the distribution tariff for contracted capacity * the excess of the contracted capacity and must be paid for 12 months.
[158] BE-BXL: two lump sums are defined: one for installed capacity of <=13kVA and another one for >13kVA
[159] HR: Consumer is not allowed to exceed contracted power, but there is no monetary penalty for it. If contracted power is exceeded, the DSO must ask network user to request additional contracted power or to limit its withdrawal. If the problem persists DSO must install an equipment to limit the power to the contracted power (Article 36 of General Rules (NN, 100/22)).
[160] HR: Decision on the value of tariff for the DSO producers is not issued. For measured power it is applied on all TSO consumers. For the consumers on the DSO grid, only for categories that also have measured power tariff also on the DSO grid. Consumer on the DSO grid pay one price for measured power to DSO and other price for the same measured power to TSO.
All voltage levels for withdrawal. On consumers that are in the tariff model with measured power. Not to all households, not to all non-households. Rule is that contracted power higher than 22 kW, exception is for the public lightning, and for households with the ability for DSO to limit the power exchange with the grid (Crni, only eight hours of supply is guaranteed). (Article 22 of the General Rules (NN, 100/22)).
[161] HR: It is included in the New Methodology in 2022 for the first time. The DSO is not obliged to propose the value larger than 0 EUR/kW. There are a lot of passive users (small power flow between user and network) that do not pay for the network sufficient contribution. This is in a situation where majority of tariff structure is based on energy flow withdrawn from the grid (energy 73%, measured maximum power flow 26%). In this situation capital costs that exist also for these users is paid by someone else.

Country	Period and unit for subscription[151]	Penalties for excess[152]	Differentiation per time-intervals[153]	Voltage level and network users[154]	Introduction / last major reform[155]
		exceeded reserved capacity)			
Denmark					Not applied
Estonia	Any time[162] (kW and A)	Yes[163]	No	HV and MV	2017[164]
Finland					Not applied
France	Yearly (kVA for LV)	Yes (except for LV)[165]	Yes (> 36 kVA)[166]	All	
Germany					Not applied
Greece	kVA	No data	Yes (day/night)[167]	LV (<85kVA)[168]	No data
Hungary	Once/year	Yes[169]	No	HV, HV/MV, MV, MV/LV, LV (>3*80A)	2003
Iceland	No data	No data	No data	No data	No data
Ireland	Capacity charge is per kVA of MIC per annum	No data	No data	No data	Applied
Italy	No data	No data	No data	No data	No data
Latvia					Not applied
Lithuania	(kW)	Yes[170]	No	For non-household consumers of 0.4, 6 kV, 10 kV, 35 kV	2004[171]
Luxembourg					Not applied
Malta					Not applied
Netherlands	Yearly (kW)	Increase of subscription level [172]	No	> 3x80A	1999
Norway					Not applied
Poland	Depends on contract (kW)	Yes	Yes (at least one month duration)[173]	HV, MV, LV	
Portugal	Contracted power (kVA) for indefinite period (user can	No[174]	No	LV users with a power level equal or lower than 41.4 kVA.	2002[175]

[162] EE: There is no restriction. Users can change their subscription level several times per month.
[163] EE: The user can exceed the subscription level. In this case, the user must pay five times bigger usage capacity charge.
[164] EE: This contracted power-based charge is applied from 1 July 2017. In 2016, the DSO decided to change the network fee structure, because the DSO considered it is right that all network users help cover the costs of the electricity network, not just those who consume electricity from the network.
[165] FR: Quadratic sum of every excessive power. The penalty is the *capacity cost* $* 0{,}04 * \sqrt{\sum(\Delta P^2)}$ where ΔP is the excessive power over the contracted capacity in every 10 minutes intervals.
[166] FR: LV users can have 4 different power levels: peak and off-peak hours during high season (winter), peak and off peak hours during low season (summer season). MV users have a 5th period of extreme peak hours. Extreme peak subscribe power cannot be higher than high season peak that cannot be higher than high season off peak that cannot be higher than lower season peak that cannot be higher than low season off peak.
[167] GR: There may exist a meter that measures the night consumption separately.
[168] GR: consumers with conventional meters and contracted capacity less than 85kVA.
[169] HU: 3 times a year allowed exceedance, for a lower charge, and a higher charge for not allowed exceedance .
[170] LT: User who has exceeded the permitted capacity must pay three times the price of the power component of the tariff plan applied to the user's object for the exceeded part of the capacity (the difference between the actual maximum monthly capacity and the permitted capacity for use).
[171] LT: Since 2004. In subsequent years, it was extended from medium voltage to low voltage non-household consumers.
[172] NL: The subscription level can be exceeded. This results in an increase of the subscription retroactively (if the additional capacity is available).
[173] PL: Different capacity can be contracted during the tariff year for periods not shorter than one month, but it is same for day and night.
[174] PT: The power-based charge 'contracted power', when applied to users equal or lower than 41.4 kVA, corresponds to a contracted power. It corresponds to highest power available at the meter. If the simultaneous load exceeds the ex-ante contracted value, the meter trips.
[175] PT: Introduced as of tariff year 2002. No major reform since then.

Country	Period and unit for subscription[151]	Penalties for excess[152]	Differentiation per time-intervals[153]	Voltage level and network users[154]	Introduction / last major reform[155]
	change any time)				
Romania					Considered
Slovakia	No data	No data	No data	No data	Applied
Slovenia[121]	Monthly (kW)	No[176]	No	<=43 kW contracted capacity	2001
Spain	Yearly (kW)	Yes[177]	Yes (peak/off-peak)[178]	All	June 2021[179]
Sweden	Yearly (kW)	Yes[180]	No	130-6kV	1996

Table 17: Measured Power based distribution charges

Country	Measure / calculation[181]	Time-of-Use signal embedded[182]	Real time (or close to real time) info[183]	Voltage level and network users[184]	Introduction/ last major reform[185]
Austria	Monthly peak[186]	No			2001
Belgium	BXL: Monthly peak (15 min intervals) FLA: Monthly peak (15 min intervals)[187] WAL: Monthly peak (15 min intervals)	BXL: No FLA: No WAL: No	WAL: Some[188]	BXL: for medium voltage network users ≥56kVA FLA: All with smart metering WAL: ≥56 kVA	BXL: Long ago FLA: 2023 WAL: Long ago
Bulgaria	No data	No data	No data	No data	No data
Croatia	Monthly individual peak during peak hours (daily tariff period) (15-min intervals)[189]	Yes[190]	Probably	> 22 kW contracted power[191]	2003[192]
Cyprus					Not applied
Czechia					Not applied
Denmark	Avg. of top 10 hours per year	No	No	>=10 kV-60kV[193]	2023[194]

[176] SI: Disconnection via main fuses no penalties except costs of fuse replacement.
[177] ES: Users can exceed the subscription level paying some penalties. Household consumers are, in most of the cases, temporarily disconnected if they exceed the subscription level.
[178] ES: Users have the possibility to subscribe different power levels for different time intervals with the limitation that power must increase from peak to off peak periods except for household consumers.
[179] ES: Charges with terms of power have always been applied. The last reform applies since June 2021 (Circular 3/2020).
[180] SE: Users are charged an excess fee, which is slightly higher than the regular fee/kw based on the amount which they exceed the contracted amount with.
[181] It shows how the measured power for the calculation of the charge is determined.
[182] It shows whether there is any time-differentiation of the charge.
[183] It shows whether there are some users who are able to access information regarding their power use in real time or close to real time.
[184] It shows to which voltage level and network users the measured power-based charge is applied.
[185] It shows since when the measured power-based charge element is applied and/or when was the last major reform.
[186] AT: The mean of the highest measured power per month multiplied by the capacity-price. In most cases the power is measured by Smart Meters (in certain cases older technologies are used).
[187] BE-FLA: Averaging instantaneous power during quarter-hour periods and taking the maximum in every month.
[188] BE-WAL: all above 100 kVA, and a few below with the fitting meter.
[189] HR: the maximum 15-minute measured power in peak hours (winter: 7:00 - 21:00, summer: 8:00 - 22:00) in one month.
[190] HR: Seasonal, but the price (EUR/kW) is the same in all intervals.
[191] HR: All voltage levels. For some of the households and for some of the non-households. Rule is that contracted power higher than 22 kW, exception is for the public lightning, and for households with the ability for DSO to limit the power exchange with the grid (Crni, only eight hours of supply is guaranteed). (Article 22 of the General Rules (NN, 100/22)).
[192] HR: First measured power tariff charge explicitly for transmission was in 2003. There was no major reform since.
[193] DK: consumers and prosumers on 10 kV and higher. For smaller customers time differentiated tariffs are more cost reflective, since grid costs from small customers are driven by simultaneity rather than individual customer peak power demand.
[194] DK: Measured capacity charge was introduced in 2023, but not yet adopted by all DSOs.

Country	Measure / calculation[181]	Time-of-Use signal embedded[182]	Real time (or close to real time) info[183]	Voltage level and network users[184]	Introduction/ last major reform[185]
	with the highest energy consumption converted into power-based charge (kWh/h)				Planned change: From 2025, 12-month moving average instead of yearly-set charge.
Estonia	Monthly peak (hourly)	No	No	MV; LV	2017[195]
Finland	Varies across DSOs	No		MV; LV	
France					Not applied
Germany	Yearly peak (15-minute intervals)[196]	No	Yes[197]	>100,000 kWh/a[198]	Long ago
Greece	No data	No data	No data	No data	No data
Hungary					Not applied
Iceland	Maximum power (hourly)	Few instances	Yes		
Ireland	No data	No data	No data	No data	No data
Italy	No data	No data	No data	No data	No data
Latvia	No data	No data	No data	No data	Applied
Lithuania					Not applied
Luxembourg	Yearly peak (15 min interval)	No	Yes (visible on meter)	65kV, 20kV	Long ago
Malta	Yearly peak (30 min intervals)[199]	No	Yes (visible on all meters)	> 60A[200]	1977[201]
Netherlands	Monthly peak (weekly for some users) (15 min intervals)[202]	Considered	Yes[203]	> 3x80A.	1999
Norway	Average of the three highest kWh/h-values within a month.				
Poland					Not applied
Portugal	Historical peak over last 12 months; Measured energy during	No	Yes[205]	HV; MV; LV if > 41.4 kVA or public lighting	2002

[195] EE: This measured power-based charge is applied from 2 July 2017. In 2016, the DSO decided to change the network fee structure (added contracted power-based charge and lump sum) and considered that it is no longer justified to charge for the maximum measured power during the year. Measured power-based charge is applied to the maximum power measured monthly.
[196] DE: Above an annual consumption of 100,000 kWh/a, so-called RLM meters are used. RLM stands for recording power measurement. With this type of meter, a measuring device records the power value per measuring period (15 minutes for electricity). The peak metered power offtake during the year is the basis for the calculation. Special case: Final customers with a high power offtake during a limited period of time that contrasts with a significantly lower or zero power offtake during the remaining time are entitled to be offered a network charge based on the metered power offtake in these limited periods of time (calculation based on monthly peaks).
[197] DE: Users with recording performance measurements or smart meters are able to access information regarding their power use of the last 15 minutes. The power use is visible on the meters and via application or platform. TSOs/DSOs who pay for an additional service for smart meters are able to access the power use per minute.
[198] DE: All voltage levels. For network users with the annual consumption above 100000 kWh/a.
[199] MT: The methodology is defined the Electricity Supply Regulations: 'maximum demand made in any period' means twice the greatest number of units supplied during any thirty consecutive minutes during the year or, as the case may be, the quarter, as registered by the maximum demand indicator of the meter installed in such premises by the DSO.
[200] MT: All voltages for services rated more than 60Amps/phase.
[201] MT: The maximum demand charge was introduced in 1977 for industrial customers with service rating exceeding 100Amps per phase. As from 2008 the maximum demand tariff applies to all customers with a service rating exceeding 60Amps per phase. It is understood that the reason was to contribute to the financing of network reinforcement needs created by the peak demand.
[202] NL: actual maximum amount of power required within a week or month based on 15 minutes intervals. Weekly for connections that are used max 600 hours a year. Monthly for all other connections.
[203] NL: Depends on the meter and linked devices/services.
[205] PT: For the end-users to which it applies. Visible through a DSO platform.

Country	Measure / calculation[181]	Time-of-Use signal embedded[182]	Real time (or close to real time) info[183]	Voltage level and network users[184]	Introduction/ last major reform[185]
	peak hours converted into power based charges (15 min intervals)[204]				
Romania					Considered
Slovakia					Not applied
Slovenia[121]	Average of three peaks in daily tariff period[206]		Yes[207]	> 43 kW (contracted capacity)	2001
Spain	Measured excess power over contracted capacity[208] (15-min intervals)	Yes[209]	Yes (via platform)	To all except most of household consumers	Jun-2021
Sweden	Varies across DSOs, but often an average of a number of peak hours per month	Yes[210]	N/A	20-0.4 kV	2008

Table 18: Application and calculation of transmission charges for injection

Country	Transmission charges for injection	Calculation
Austria	**Application: Yes** Reason: Cost reflectivity Consultation: Yes	The charge for network losses is calculated by adding all costs for network losses and dividing by the quantities supplied and injected. The injection charges is based on the injected volumes.
Belgium	**Application: Yes** Reason: Cost reflectivity Consultation: Yes[211] Studies: Yes	Ancillary services reservation costs and part of the balancing reserves costs are recovered via injection charges. Injection tariffs equally share ancillary services costs among all network users. I.e. 50% of ancillary services reservation costs are allocated to injection, but with a cap, which is determined according to a benchmark with neighbouring (NWE) countries' injection charges.
Bulgaria	**Application: Yes** Reason: No data Consultation: Yes	No data
Croatia	**Application: No**[212] Reason: National law[213] Consultation: Yes[214]	
Cyprus	**Application: No**	

[204] PT: The power-based charge 'contracted power' corresponds to a measured power. It corresponds to highest power reading for the last 12 months (including the current billing month) of used power, measured in 15 minutes intervals. The peak power is based on measured energy during the peak period in a certain billing month. Hence, it divides the measured energy during the billing month by the total peak hours in that billing month to obtain an average power value.
[206] SI: Working days from 6:00 till 22:00.
[207] SI: With an interface for local data access.
[208] ES: It depends on the type of meter. Network users whose meter is able to measure and register every 15 minutes, pay every time the measured power exceeds the contracted power according to the formula for these type of meters. Network users whose meter only registers the maximum contracted power by different time-periods, must pay if the measured power exceeds at least once during the month. Different unit prices apply to different voltages for all consumers and network users with meters able to measure and register every 15 minutes have also different prices by period.
[209] ES: Different unit charges by period.
[210] SE: Different charge for peak periods (November – March, 06:00- 22:00 during weekdays) and for off-peak periods.
[211] BE: http://www.creg.info/pdf/Opinions/2014/Methodo/DossierAdmin/E-12-RapportConsultation-FR.pdf
[212] HR: NRA has issued Decision on network transmission tariffs at 29.02.2024 (NN, 27/24). Tariff for producers on transmission system from 01.04.2024 onward is set to 0.000 EUR/kW.
[213] HR: Article 46(16) of Electricity Market Law (NN, 111/21), remains unchanged in Electricity Market Law (NN, 111/21, 83/23).
[214] HR: Before issuing of the New TSO Tariff Methodology 2022 (NN, 84/22) containing injection charge, NRA held public consultation regarding the inclusion of the injection charge, https://www.hera.hr/hr/html/savjetovanje-2022-08.html; https://www.ho-cired.hr/images/Skupovi/domaci/prosli/Prezemtacije/Energetska_tranzicija/5_Brki%C4%87_TARIFNA_STAVKA_ZA_ENERGIJU_PREDANU_U_MRE%C5%BDU_-_korigirano.pdf

Country	Transmission charges for injection	Calculation
	Reason: Promote RES and storage	
Czechia	**Application: No** Reason: Cross-border competition[215]	
Denmark	**Application: Yes** Reason: Cost reflectivity and the phasing out of a RES subsidy scheme as of 1/1/2023 Consultation: Yes[216]	Injection rate for infrastructure has been fixed, and for system services set through a method. Producers do contribute to payments for balancing and reserve power by an energy-based injection charge. However, the charge is much lower than the system charge that apply for withdrawal.
Estonia	**Application: No** Reason: Promote RES[217]	
Finland	**Application: Yes** Reason: Cost reflectivity	G-charges consist of fixed capacity fee per MW for power plants and energy-based charge for the use of grid / input into the grid. The NRA did not have information about which cost categories each tariff basis recover.
France	**Application: Yes** Reason: Cost reflectivity Consultation: Yes[218] Study: Yes	The cost associated with electricity exports (sum of losses on the national network associated to electricity exports and of the part of Inter TSO Compensation costs associated to losses on the national network) is divided by the forecasted energy injection on voltage levels 150 kV and above. The current injection charge is 0.23 EUR/MWh.
Germany	**Application: No** Reason: Prohibited by national law	The negative injection charge is based on the general network tariffs for withdrawal. Injection to a certain network level leads to the payment of a negative injection charge according to the tariff of the upstream level. E.g. if a plant is connected to the LV level, the negative injection charge is calculated according to the network operator's tariff for the MV/LV level.
Greece	**Application: No** Reason: No major inefficiency to address[219]	
Hungary	**Application: No** Reason: Generation adequacy[220]	
Iceland	**Application: No**	
Ireland	**Application: Yes** Reason: No data	Generators' Transmission Use of System tariffs (G-TUoS) are composed of two elements: (1) capacity-based tariff element with locational signal and (2) a postage stamp tariff element. The capacity-based tariff element (based on Maximum Export Capacity) is calculated individually for each generator based on the location of its connection to the system. The locational element is calculated considering the usage of current generation on future network using a 'reverse MW mile' methodology. The Postage Stamp element applies evenly to all generators and calculated based on their Maximum Export Capacity (MEC). The G-TUoS is set to collect 25% of the approved revenue for network costs.
Italy	**Application: Phased out in 2010**	

[215] CZ: Risks of distortions in cross-border competition.
[216] DK: Public consultation involving close dialogue with the DSOs.
[217] EE: the TSO proposed not to apply them, to encourage investments in large RES projects.
[218] FR: Link to outcomes: Public consultation No.2019-011 of 23 May 2019 relating to the structure of the next tariffs, TURPE 6, for the use of the public electricity grids: https://www.cre.fr/Documents/Consultations-publiques/Structure-des-prochains-tarifs-d-utilisation-des-reseaux-publics-d-electricite-TURPE-6
Public consultation No.2020-007 of 19 March 2020 relating to the withdrawal component of the next tariffs, TURPE 6, for the use of the public electricity grids: https://www.cre.fr/Documents/Consultations-publiques/composante-de-soutirage-des-prochains-tarifs-d-utilisation-desreseaux-publics-d-electricite-turpe-6; Public consultation No.2020-015 of 1 October 2020 relating to the next tariffs for the use of the public electricity transmission grids (TURPE 6 HTB): https://www.cre.fr/Documents/Consultations-publiques/prochain-tarif-d-utilisation-des-reseaux-publics-de-transport-d-electricite-turpe-6-htb
[219] GR: It has been demonstrated that the structural inefficiencies in the transmission system (locational unbalance of supply and demand) did not impact system operation in a significant and frequent manner, to necessitate imposing an injection charge (which would enhance signals provided to generators to situate new capacity closer to demand centres).
[220] HU: The system already lacks conventional power plants, which discourages the introduction of any non-zero injection charge.

Country	Transmission charges for injection	Calculation
	Reason: National law[221]	
Latvia	**Application: Yes** Reason: Cost reflectivity Consultation: Yes[222] Study: Yes	In Latvia, the injection charge aims to recover part of the TSO costs (i.e. it covers multiple cost categories and not dedicated to a specific cost categories). Injection charge is set according to the ceiling set by the EU law for Latvia (i.e. 0.5 EUR/MWh). The total transmission costs recovered via injection charges is calculated by multiplying the total electricity injected directly into the T-grid (MWh) by 0.5 EUR/MWh (which is the maximal charge set in Regulation for Latvia). The injection charge is calculated by dividing the above calculated sum (in EUR) by the total installed generation capacity (MW) connected to the T-grid. The approved injection tariff is very small and do not cover all expenses which electricity producers create to the system.
Lithuania	**Application: No** Reason: General adequacy[223] Study: No[224]	
Luxembourg	**Application: N/A** Reason: No injection to transmission	
Malta	**Application: N/A** Reason: No transmission network nor TSO	
Netherlands	**Application: Only marginal**[225] Reason: Cross-border competition[226]	Grid users that only inject pay only a fixed lump sum tariff, which contributes to administrative costs, processing of metering data, the administration of the register of connections, and the billing costs.
Norway	**Application: Yes** Reason: No data Consultation: Yes Study: Yes	The injection charge includes: a G-charge for infrastructure costs (i.e. CAPEX and OPEX), a surcharge for system services costs as well as an energy-based charge to cover marginal losses. The G-charge and the surcharge for system services costs is a lump sum payment which is based on a 10-year moving historical average of production and have been designed in order to be neutral with respect to short-run production decisions and long-run capacity investment decisions. The charge for each generator is calculated each year from the average production in previous years[227] (i.e. the charge for 2023 is based on average production during the years 2012-2021). The generators cannot influence the annual cost by altering the operational decisions as the yearly amount is given at the start of the year.
Poland	**Application: No** Reason: Prohibited by national law	
Portugal	**Application: Phased out in 2022**	

[221] IT: No consultations, G-charge was removed from 1 January 2010 by regulatory decision 203/2009, taking into account a provision set by Article 33(5) of Italian law 99/2009, which was later repealed. Injection charges have been applied till the middle of the regulatory period 2008-2011. For year 2008, the tariff regulatory decision 348/2007 set a value of 0.256 EUR/MWh to be paid by producers.

[222] LV: Consultation of national system operators and network users: https://www.sprk.gov.lv/content/publiskas-konsultacijas; https://www.sprk.gov.lv/sites/default/files/editor/ED/KD_par%20elektroener%C4%A3ijas%20p%C4%81rvades%20sist%C4%93mas%20pakalpojumu%20tarifu%20apr%C4%93%C4%B7in%C4%81%C5%A1anas%20metodiku.pdf
Before introduction of the injection tariff, the NRA presented to the Estonian and Lithuanian NRAs about plans and justification, as it deemed that their market areas could be affected.

[223] LT: Lack of surplus of electricity generation in the network.

[224] LT: Initial discussions about the need for injection charge. No formal studies have been carried out yet.

[225] NL: Grid users that only inject pay only a very limited lump sum tariff that is fixed (independent from the energy/power injected). These fixed tariffs contribute to a limited set of fixed distribution costs: administrative costs, costs for facilitating switching, costs for allocation, verification and validation and the cost of maintaining the register of connections, costs of the administrative processing of metering data and the billing costs. This fee does vary between different voltage levels.

[226] NL: It is not considered as an injection charge by the national law. Substantial injection charge is not applied due to risks of distortions in cross-border competition.

[227] NO: For hydropower, the charges paid by producers can, to a large extent, be considered as fixed, depending on the amount of precipitation and inflows to the reservoirs on average during the previous years.

Country	Transmission charges for injection	Calculation
	Reason: Cross-border competition[228] Consultation: Yes[229] Study: No	
Romania	**Application: Yes** Reason: Cost reflectivity	Transmission charge for injection is determined by considering a revenue and an estimated injected electricity into both transmission grid and distribution grid. The revenue is corresponding to costs associated to injected electricity: the part of grid losses related to generated electricity and congestion costs. Generators pay through the network charge up to one third of the cost of grid losses as well as the cost of congestion.
Slovakia	**Application: Yes** Reason: Cost reflectivity[230] Consultation: Yes	Transmission costs are set independently. NRA sets fixed power-based unit price (EUR/MW) for access and energy-based (EUR/MWh) for transmitted energy. Basic for the calculation of this tariff (for access to the transmission system) is rated power of the generation equipment and their maximum possible injection capacity (MW) (methodology is published in the TSO technical documentation) and this value is then stated in the contract. The coefficient of inclusion of power generators´ reserved capacity (so called G-charge) shall be - according to the NRA's Decree - set in such a way so that the planned payments which power generators connected to the transmission grid make to the TSO for transmission network access in year t do not exceed the revenue set as multiplication of 0.5 EUR/MWh and the planned volume of power supplied to the transmission grid in year t by power generators connected to the transmission grid.
Slovenia	**Application: No** Reason: Prohibited by national law	
Spain	**Application: Phased out**[231] Reason: National law[232]	
Sweden[233]	**Application: Yes** Reason: Cost reflectivity Consultation: Yes[234]	The energy-based charge consists of two parts: marginal loss coefficient (which is computed individually for every user) and the energy price on the day-before market (per bidding zone, and per the time unit used on the market) plus an added risk premium. The split between the cost recovery of the 2 tariff basis may significantly vary much from year to year because the energy charge is connected to the electricity market price.

Table 19: Application and calculation for distribution charges for injection

Country	Distribution charges for injection	Calculation
Austria	**Application: Yes** Reason: Cost reflectivity Consultation: Yes[235]	The charge for network losses is calculated by adding all costs for network losses and dividing by the quantities supplied and injected. The injection charge is based on the injected volumes.

[228] PT: The original implementation of the injection charge in Spain was also the main reason for introducing an equivalent tariff in Portugal. Following Spain's decision to phase out injection charges, Portugal followed.
[229] PT: Most stakeholders were in favour of the phase-out, having in mind the elimination in Spain. Some raised concerns that the net effect on consumers may be negative: As producers' new bidding behaviour is not likely to have an effect on the Iberian wholesale market (i.e. not reducing the price by the amount of the eliminated injection charge), while the transmission tariff for withdrawals will increase to make up for the lost revenue.
[230] SK: Producers are also using transmission grid, therefore they are paying part of transmission tariffs.
[231] ES: The G-charge has been removed by the Circular 3/2020 and the entire cost of networks are allocated to demand. There has never been any charge related to ancillary services, system loss charges, metering charges.
[232] ES: According to Article 16.1 of Law 24/2013 tariffs must be unique throughout the national territory. Consequently, G-charges cannot be used to provide generators location signals. In addition, the G-charge was established in variable terms and eventually implemented in the price paid by consumers.
[233] SE: The split between the cost recoveries of the two tariff basis may vary much from year to year due to that the energy charge is connected to the electricity market price.
[234] SE: The final tariff methodology designed by the TSO and formulated after a remittance process with the involved actors. The actors are included in a reference group that discusses and analyses proposed changes. All changes are approved by the board of the TSO.
[235] AT: Consultation of the relevant stakeholders as part of the annual tariff setting procedure.

Country	Distribution charges for injection	Calculation
		The metering charge is applied based on the type of meter and is defined as price cap per meter per month. The charge for system services: 1.) The costs for ancillary services are determined in the 1st step. 2.) The quantities produced and injected are provided by the TSO. 3.) Calculation of the tariff: (Tariff for SDL = Costs SDL/Quantities SDL)
Belgium	**Brussels:** **Application: Never applied** Reason: few injection sites[236] **Flanders:** **Application: Yes** Consultation: Yes[237] Studies: Yes **Wallonia:** **Application: Yes** Consultation: Yes[238]	**Flanders:** Only the network costs directly related to a certain voltage level are shared between injection and withdrawal. The allocation key is based upon the share of investments directly related to injection compared to total investments. **Wallonia:** The injection tariffs are determined in a way that the costs for a producer correspond to the weighted average of the costs by the injection tariffs applicable in Flanders and Brussels regions and in transmission (by Elia), as well as in neighbouring countries (on the basis of a representative sample: France, Luxembourg, Germany, Netherlands). The weighting is based on the sum of the injection capacities installed in these countries or regions. The injection charge consists of a fixed term (EUR/year) and a capacity charge (EUR/kVA). This latter includes a tariff for flexible injection capacity, which is currently free of charge and a tariff for permanent injection capacity.
Bulgaria	**Application: No** Reason was not provided	
Croatia	**Application: No**[239] Reason: National law[240] Consultation: Yes[241]	
Cyprus	**Application: No** Reason: Incentivise greater penetration of distributed generation	
Czechia	**Application: No** Reason: Risks of distortions in cross-border competition	
Denmark	**Application: Yes** Reason: Cost reflectivity and the phasing out of a RES subsidy scheme as of 1/1/2023	Injection charge collects OPEX and purchasing losses. Injection CAPEX is collected through standard connection charges. Calculated similar to methodology for withdrawal, however the contribution from injection towards the purchasing of losses is differentiated according to the balance between injection and withdrawal within each DSO grid.
Estonia	**Application: Yes** Reason: Cost reflectivity and equity[242] Consultation: Yes[243] Study: No	The power-based injection charge component recovers part of the DSO costs without aiming a specific cost category. The lump sum includes all the costs of metering but partly also other costs (for example, the costs of administration, management and maintenance of the distribution network).

[236] BE-BXL: Due to very few injections it was deemed unnecessary by the regulator.
[237] BE-FLA: Consultation of system or network operators and concerned network users: https://www.vreg.be/nl/afgesloten-consultaties#:~:text=Consultatie%20tariefmethodologie%202021,vanaf%202022
[238] BE-WAL: Consultation of system or network operators and concerned network users organised by the DSOs: https://www.cwape.be/node/177#travaux-prparatoires
[239] HR: NRA decision for distribution injection charges is not issued currently, although it is envisaged in the New DSO Tariff Methodology 2022 (NN, 84/22).
[240] HR: Article 46(16) of Electricity Market Law (NN, 111/21) remains unchanged in Electricity Market Law (NN, 111/21, 83/23).
[241] HR: Before issuing the New TSO Tariff Methodology 2022 (NN, 84/22) containing injection charge, NRA held public consultation regarding the inclusion of the injection charge, https://www.hera.hr/hr/html/savjetovanje-2022-07.html. The value of DSO injection charge is not issued yet.
https://www.ho-cired.hr/images/Skupovi/domaci/prosli/Prezemtacije/Energetska_tranzicija/5_Brki%C4%87_TARIFNA_STAVKA_ZA_ENERGIJU_PREDANU_U_MRE%C5%BDU_-_korigirano.pdf.
[242] EE: DSOs proposed to apply them, for cost reflectivity and equity reasons.
[243] EE: The DSO provided the NRA with explanations and reasons why the application of the injection charge is fair and justified.

Country	Distribution charges for injection	Calculation
Finland	**Application:** Yes (capped)[244] Reason: Cost reflectivity	Producers usually pay for injection a fixed monthly fee (EUR/month lump sum), an energy-based fee (EUR/MWh) and a generation capacity fee (based on actual maximum capacity). The NRA does not have information about which cost categories each tariff basis aim to recover and the share of cost recovery by each of them. The distribution injection charge covers a relatively smaller share of the distribution network costs compared to the distribution withdrawal charge. For small-scale generation (max 1 MW) some tariff differentiation applies (see Table 28)
France	**Appli**cation: Only marginal[245] Reason: Opposition by stakeholders[246]	Yearly management charge, which aims to cover costs related to the management of producers by the DSO. It is the same between consumers and producers.
Germany	**Application:** Only negative[247] Reason: Promote non-variable DG. Avoided costs.[248]	The negative injection charge is based on the general network tariffs for withdrawal. Injection to a certain network level leads to the payment of a negative injection charge according to the tariff of the upstream level. E.g. if a plant is connected to the LV level, the negative injection charge is calculated according to the network operator's tariff for the MV/LV level.
Greece	**Application: No**	
Hungary	**Application: Never applied** Reason: Generation adequacy concerns	
Iceland	**Application: No**	
Ireland	**Application: Never applied**[249]	
Italy	**Application: Never applied**[250]	
Latvia	**Application: Yes** Reason: Cost-reflectivity Consultation: Yes[251] Study: Yes	In Latvia, the injection charge aims to recover part of the DSO's costs (i.e. it covers multiple cost categories and not dedicated to a specific cost categories). Injection charge is set according to the ceiling set by the EU law for Latvia (i.e. 0.5 EUR/MWh). The share of distribution costs recovered via injection charges is calculated by multiplying the total electricity injected directly into the D-grid (MWh) by 0.5 EUR/MWh. The injection charge is calculated by dividing the above calculated sum (in EUR) by the total installed generation capacity (MW) connected to the D-grid. The rest of the distribution costs are recovered by withdrawal charges
Lithuania	**Application: Never applied** Reason: Generation adequacy[252]	
Luxembourg	**Application: No** Reason: Cost reflectivity / Cross-border competition[253]	
Malta	**Application: Yes** Reason: No data	No predetermined shares. Electricity producers on 'Export only' mode pay as injection charge a fixed lump sum tariff, which contributes to metering, administrative and management costs.

[244] FI: National law sets a cap for charge for injection in DSO low voltage network.
[245] FR: Yearly management charge, which aims to cover costs related to the management of producers by the DSO. It is not considered as an injection charge by the NRA.
[246] FR: Substantial injection charge is not applied due to strong opposition by all concerned actors, but still under consideration.
[247] DE: Negative injection charge for avoided network costs.
[248] DE: This is due to the assumption that injection to a certain voltage level avoids withdrawal from the next upstream level.
[249] IE: Injection pays for their distribution connection at the time of connection to the distribution grid.
[250] IT: The payments (also by distribution-connected generators) which were phased out in 2009 only pertained to transmission charging.
[251] LV: Consultation of system or network operators and concerned network users: https://www.sprk.gov.lv/sites/default/files/editor/ED/Konsultaciju_dokumenti/Elektroenergija/2019/KD_grozijumi_elektroenergijas_metodika_22092019.pdf; Consultation of NRAs of neighbouring countries; impact assessment studies https://www.sprk.gov.lv/sites/default/files/publiskas_konsultacijas/SSO_Tarif_met_Vied_apk_30092019.pdf
[252] LT: Lack of surplus of electricity generation in the network.
[253] LU: Distribution costs in Luxembourg are driven by load; as well to keep a level playing field for producers connected in the common DE-LU market.

Country	Distribution charges for injection	Calculation
	Consultation: Yes[254]	Electricity consumers pay a withdraw charge a fixed lump sum, which contributes as well to metering, administrative and management costs. These annual lump sums are different according to consumer type and single/three phase connection.
Netherlands	**Application: Only marginal**[255] Reason: Cross-border competition[256]	Grid users that only inject pay only a fixed lump sum tariff, which contributes to administrative costs, costs for facilitating switching, costs for allocation, verification and validation and the cost of maintaining the register of connections. Due to the small size of this tariff it is not a relevant factor for producers and could not disturb a level playing field.
Norway	**Application: Yes** Reason: No data Consultation: Yes[257] Study: Yes	The injection charge includes: a G-charge for infrastructure costs (i.e. CAPEX and OPEX) as well as an energy-based charge to cover marginal losses. The G-charge and the surcharge for system services costs is a lump sum payment which is based on a 10-year moving historical average of production. The charge applied to each generator is each year calculated from the average production in previous years (the charge for 2023 is based on average production during the years 2012-2021).
Poland	**Application: No** Reason: Prohibited by national law	
Portugal	**Application: No** [258] Reason: Not provided	
Romania	**Application: No** Reason: Promote DG[259]	
Slovakia	**Application: Yes** Reason: Cost reflectivity[260]	The withdrawal charge has 3 tariff elements: an energy-based tariff element (EUR/kWh) which is paid for the volume of the withdrawn energy; an energy-based tariff element (EUR/kWh) which is paid for losses; and a power-based tariff element (EUR/kW) which is paid for the contracted (reserved) capacity and differs per voltage level. For injection there is only a power-based charge - paid for 15% of the maximal reserved capacity multiplied by power-based tariff value (different for different voltage levels). (The methodology of calculation the tariffs is set in the ÚRSO decree 18/2017.)
Slovenia	**Application: No** Reason: Prohibited by national law	
Spain	**Application: No** Reason: not provided	
Sweden	**Application: Yes** Reason: Cost reflectivity[261]	In one of the largest DSO area the injection charges differ between the two kinds of distribution networks in Sweden. For the local grid (max 10kV) it is based on yearly max power produced. Sek/kw, year without any respect to when. For the regional grid (larger than 10kV) it is based on location and subscribed power. Simplified the distance to closest TSO connection multiplied by subscribed power and price. They also pay for the injection fees from the TSO (cascading). If they are on the 130kV level they also in general are seen as increasing our losses and as such pay for produced energy to cover our costs of losses from production. In one of the largest DSO: Injection charges are calculated first. The withdrawal charges cover the rest of the costs which are not covered by injection charges. The producers which provide

[254] MT: Consultation with system operator and approval by the Parliament, since electricity tariffs in Malta are established through National legislation.
[255] NL: Small fixed lump sum fee that only covers a very limited set of distribution costs (mainly administrative costs). It is not considered as an injection charge by the national law.
[256] NL: Substantial injection charge is not applied due to risks of distortions in cross-border competition.
[257] NO: Consultations with system or network operators, concerned network users; Impact assessment studies.
[258] PT: What existed until 31 December 2021 was a transmission tariff for injection at transmission level (VHV or HV) and at distribution level (only HV and MV, not at LV).
[259] RO: not to discourage distributed generation, which is not yet sufficiently developed and has network beneficial effects.
[260] SK: Producers are also using distribution grid, therefore they are paying part of distribution tariffs.
[261] SE: Removing fees for producers would significantly increase costs for local consumers and lead to a subsidy for export which would risk the acceptance for the energy transition as well as the possibility to have industry in rural areas.

Country	Distribution charges for injection	Calculation
		generation that reduces the losses in the grid get paid an amount that is based on the energy price (SEK/kWh), since network losses are based on the energy cost. Since they reduce the cost of the grid they get reimbursed for that cost by the grid operators. Injection charges are calculated: Cost of transmission injection charge + distance to transmission grid connection*subscribed production*locational price (kr/kW*km) + subscribed production*voltage level price (kr/kW). The prices were calibrated with previous channel price model which calculated cost in relation to how much of the grid was used.

Table 20: Tariff basis, variation and differentiation of the transmission tariffs for injection

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on voltage	Variation based on location[262]	Variation based on time-of-use
Austria	Yes	No	No	No	No	No
Belgium	Yes	No	No	No[263]	No	No
Bulgaria	Yes	No	No	No data	No data	No data
Croatia[264]	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-
Czechia	-	-	-	-	-	-
Denmark	Yes	No	No	No	No	No
Estonia	-	-	-	-	-	-
Finland	Yes	Yes	No	No	No	No
France	Yes	No	No			
Germany	-	-	-	-	-	-
Greece	-	-	-	-	-	-
Hungary	-	-	-	-	-	-
Iceland	-	-	-	-	-	-
Ireland	No	Yes	No	No data	Yes	No
Italy	-	-	-	-	-	-
Latvia	No	Yes	No	No	No	No
Lithuania	No	Yes	No	No	No	No
Luxembourg	-	-	-	-	-	-
Malta	-	-	-	-	-	-
Netherlands	No	No	Yes	Yes	No	No
Norway	Yes	No	Yes		(Yes)[265]	(Yes)[266]
Poland	-	-	-	-	-	-
Portugal	-	-	-	-	-	-
Romania	Yes	No	No	No	No[267]	No
Slovakia	No	Yes	No	No	No	No
Slovenia	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden	Yes	Yes	No	No	Yes[268]	(Yes)[269]

Table 21: Tariff basis, variation and differentiation of the distribution tariffs for injection

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on voltage	Variation based on location[270]	Variation based on time-of-use
Austria	Yes[271]	No	(Yes)	Yes	Yes[272]	No

[262] Variation based on location, unrelated to the connection to a specific network operator.
[263] BE: Reservation costs of ancillary services cannot be differentiated by voltage level, so a uniform tariff value is applied to each.
[264] HR: Currently the injection charge is set at zero. If it applied, it would be a power-based charge (maximum power measured in 15 minutes intervals) only for TSO producers without variation per voltage level or location.
[265] NO: G-charge is flat. Some variation applies due to marginal loss pricing for generators.
[266] NO: G-charge is flat. Some variation applies due to marginal loss pricing for generators.
[267] RO: National law requires flat charge for injection since 2017. Before, different injection charges applied for 7 locations.
[268] SE: The injection charge differs between nodes in the transmission grid.
[269] SE: No static ToU tariff applies, but there is a time-differentiated component in the tariff, it's based on actual hourly market prices per bidding zone with an additional supplement charge to cover risks.
[270] Variation based on location, unrelated to the connection to a specific network operator. Different injection charges due to connection to different DSO area (e.g. in BE, DK, EE, FI, NL) are not accounted for this table.
[271] AT: The metering charge is applied based on the type of meter and is defined as price cap per meter per month.
[272] AT: Different tariffs are set for different network areas. Multiple DSOs can operate within a single network area.

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on voltage	Variation based on location[270]	Variation based on time-of-use
Belgium	FLA: Yes WAL: NO	FLA: No WAL: Yes	FLA: No WAL: Yes	WAL: Yes[273]	WAL: No	WAL: No
Bulgaria	-	-	-	-	-	-
Croatia[274]	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-
Czechia	-	-	-	-	-	-
Denmark	Yes	No	Yes	Yes	No	No
Estonia	No	Yes	Yes	Yes	No	No
Finland	Yes[275]	(Yes)	(Yes)	No	No	No
France	No	No	Yes	Yes	No	No
Germany	Negative	No	No	Yes	No	No
Greece	-	-	-	-	-	-
Hungary	-	-	-	-	-	-
Iceland	-	-	-	-	-	-
Ireland	-	-	-	-	-	-
Italy	-	-	-	-	-	-
Latvia	No	Yes	No	No	No	No
Lithuania	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-
Malta	No	No	Yes	No	No	No
Netherlands	No	No	Yes	Yes[276]	No	No
Norway	Yes	No	Yes		(Yes)[277]	(Yes)[278]
Poland	-	-	-	-	-	-
Portugal	-	-	-	-	-	-
Romania[279]	-	-	-	-	-	-
Slovakia[280]	No	Yes	No	Yes	No	No
Slovenia	-	-	-	-	-	-
Spain	-	-	-	-	-	-
Sweden[281]	No	Yes	No	(Yes)	(Yes)	(Yes)

Table 22: TSO costs (partially) recovered via transmission charges for injection

Country	Costs for building, upgrading, maintaining infrastructure	Costs for grid losses	Costs for system services	Costs for metering, administrative / management costs
Austria		X (E)	X (E)	
Belgium			X (E)	
Bulgaria	X (E)	X (E)	X (E)	X (E)
Croatia	-	-	-	-
Cyprus	-	-	-	-
Czechia	-	-	-	-
Denmark	X (E)		X (E)	
Estonia	-	-	-	-
Finland	No data	No data	No data	No data
France		X (E)[282]		
Germany	-	-	-	-
Greece	-	-	-	-
Hungary	-	-	-	-

[273] BE-WAL: Both the fixed term (EUR/year) and the capacity charge (EUR/kVA) vary according to the connected voltage level.
[274] HR: Currently the injection charge is effectively set at zero. If it applied, it would be a power-based charge (maximum power measured in 15 minutes intervals) only for DSO producers without variation per voltage level or location.
[275] FI: The injection charges are mainly energy-based, but individual DSOs may also have power-based and/or lump sum charge components in the injection tariff.
[276] NL: The network users that only inject pay only a very limited lump sum administrative fee. This fee does vary between different voltage levels.
[277] NO: G-charge is flat. Some variation applies due to marginal loss pricing for generators.
[278] NO: G-charge is flat. Some variation applies due to marginal loss pricing for generators.
[279] RO: injection charge applies from 2025 in producer surplus areas and covers losses due to electricity surplus to the local consumption.
[280] SK: injection charge is fixed price value, depending on maximal reserved capacity (MRC) of generator connection to the distribution system - Injection charge = 15% *MRC * distribution tariff value (different for different voltage levels).
[281] SE: variation based on voltage level, location and/or ToU applies for some DSOs.
[282] FR: The injection charge covers losses on the national network generated by electricity exports and the part of Inter TSO Compensation costs associated to losses on the national network.

Country	Costs for building, upgrading, maintaining infrastructure	Costs for grid losses	Costs for system services	Costs for metering, administrative / management costs
Iceland	-	-	-	-
Ireland	No data	No data	No data	No data
Italy	-	-	-	-
Latvia	X (P)	X (P)	X (P)	X (P)
Lithuania	-	-	-	-
Luxembourg	-	-	-	-
Malta	-	-	-	-
Netherlands				X (L)
Norway	X (L)	X (E)	X (L)	X (L)
Poland	-	-	-	-
Portugal	-	-	-	-
Romania		X (E)	X (E)	
Slovakia	X (P)			
Slovenia	-	-	-	-
Spain	-	-	-	-
Sweden	X (P)	X (E)	X	X (P)

Note: in parenthesis the respective tariff basis used for the recovery of the cost category is provided. E=energy-based, P=power-based, L=Lump sum

Table 23: DSO costs (partially) recovered via distribution charges for injection

Country	Costs for building, upgrading and maintaining infrastructure	Costs for grid losses	Costs for system services	Costs for metering, administrative / management costs[283]
Austria		X (E)	X (E)	X (L)
Belgium	FLA: X (E) WAL: -	FLA: - WAL: -	FLA: - WAL: X (P)	FLA: - WAL: X (L)
Bulgaria	-	-	-	-
Croatia	-	-	-	-
Cyprus	-	-	-	-
Czechia	-	-	-	-
Denmark	X (E)	X (E)	-	X (L)
Estonia	X (P+ L)	X (P)	X (P)	X (L+ P)
Finland	No data	No data	No data	No data
France				X (L)
Germany[284]	-	-	-	-
Greece	-	-	-	-
Hungary	-	-	-	-
Iceland	-	-	-	-
Italy	-	-	-	-
Ireland	-	-	-	-
Latvia	X (P)	X (P)	X (P)	X (P)
Lithuania	-	-	-	-
Luxembourg	-	-	-	-
Malta				X (L)
Netherlands				X (L)
Norway	X (L)	X (E)	X (L)	X (L)
Poland	-	-	-	-
Portugal	-	-	-	-
Romania	-	-	-	-
Slovakia	X (P)			
Slovenia	-	-	-	-
Spain	-	-	-	-
Sweden	X (P)	X (P)		X (P)

Note: in parenthesis the respective tariff basis used for the recovery of the cost category is provided. E=energy-based, P=power-based, L=Lump sum

[283] Including costs for warnings, disconnection from the grid, etc.
[284] DE: The 'negative injection charge' applies for any avoided network costs of the DSOs.

Table 24: Tariff basis, variation and differentiation of the transmission tariffs for withdrawal

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on Voltage	Variation based on Location[285]	Variation based on Time-of-use[286]
Austria	X	X (M)	-	X	(X)[287]	-
Belgium	X	X (M+C)	-	X	-	X
Bulgaria	X	X (C)	-	-	-	-
Croatia[288]	X	X (M+C)	X[289]	X	-	X
Cyprus	X	-	-	X	-	-
Czechia[290]	X	X (C)	-	-	-	-
Denmark	X	Considered [291]	X[292]	-	X	-
Estonia	X	X (C)[293]	-	X	-	X
Finland	X	-	-	-	-	X
France	X	X (C)	-	X	-	X
Germany	X	X (M)	-	-	-	-
Greece[294]	X	X (M)	-	-	-	(X)[295]
Hungary	X	-	-	X	-	-
Iceland	X	X (M)				No data
Ireland	X	X (C)[296]	-	-	-	X
Italy	X	X	-	X[297]	-	-
Latvia	X	X (C)	-	-	-	-
Lithuania	X	X (C)	-	-	-	-
Luxembourg	X	X (M)	-	-	-	-
Netherlands [298]	-	X (M+C)	X	X	-	X
Malta	N/A	N/A	N/A	N/A	N/A	N/A
Norway	X	X (M)	-	-	(X)[299]	(X)[300]
Poland	X	X (M+C)	-	-	-	-

[285] Variation based on location, unrelated to the connection to a specific network operator.
[286] It does not take into account differences due to mandatory/voluntary use of time-differentiated tariffs by the network users.
[287] AT: Different tariffs apply for different network areas. Multiple DSOs can operate within a single network area.
[288] HR: New Methodology from 2022 has two power-based tariffs.
1. For consumers, connected both to TSO and DSO grid: the maximum 15-minute measured power in peak hours (winter timekeeping 7:00-21:00, summer timekeeping 8:00-22:00) that was withdrawn from the grid in one month. Consumer on the TSO grid pays only to TSO, consumer on the DSO grid pays only to DSO.
2. For consumers connected to the TSO grid: the maximum power that a consumer is allowed to withdraw from the grid. It is defined in the contract for the use of the network between TSO and network user. It is a non-changing parameter for particular consumer.
3. For producers only for TSO grid: the maximum 15-minute measured power in all intervals in the month. Tariff for 'contracted power' (2.) is set to 0.000 EUR/kW. Tariff for producers (3.) is set to 0.000 EUR/kW.
[289] HR: Lump sum in Croatia is fixed value in EUR paid every month for every particular settlement point. For example, every TSO consumer pays 9.025 EUR/month regardless of the contracted capacity and electricity exchanged with the grid on particular settlement point in concerning month.
[290] CZ: Power (kW) based charge for reserve capacity, Energy (kWh) based charge for usage of network, losses, system services, lump sum charge for Market operator.
[291] DK: TSO is working on establishing power-based withdrawal transmission charges for TSO connected and DSO high (10+ kV) connected network users. There have been sent method notifications for TSO connected consumers and DSO connected consumers at voltage level 10+ kV to NRA in December 2023 and April 2024, respectively. Both methods are awaiting approval from the NRA. Regarding the methods awaiting approval, it is expected that the TSO connected users will be charged based on their contracted capacity in MW, while the DSO connected customers will be charged based on the maximum measured power in the last 12 months.
[292] DK: there is a fix amount of 180 DKK/per meter/per year, which combined with an energy-based withdrawal tariff to cover transmission costs regarding to system services, administration's costs and data handling. This charge is collected under a tariff method called system tariff. System tariff is a separated tariff from net tariff.
[293] EE: from 1 January 2024, contracted capacity-based charges apply. Until the end of 2023, only energy-based charges were in force.
[294] GR: The TSO charge for HV & MV users is 100% power-based, while for LV users it is 100% energy-based.
[295] GR: Charing based on demand during predefined system peak periods. No charge outside system peak periods.
[296] IE: Maximum import capacity (MIC)
[297] IT: Customers on HV and EHV levels pay the same power-based component, while the energy-based component is slightly lower for EHV customers. Customers at lower voltage levels pay on the basis of energy.
[298] NL: Partly based on annual contracted maximum capacity (kW) and partly on a monthly peak capacity (kW). Additional fixed lump sum fee.
[299] NO: Marginal loss tariffication applies
[300] NO: No static ToU tariffs. Marginal loss tariffication applies, marginal losses are calculated weekly and differentiated day/night/weekend for each transmission point.

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on Voltage	Variation based on Location[285]	Variation based on Time-of-use[286]
Portugal[301]	X	X (M+T)	-	X[302]	-	X (E+P)
Romania	X	Considered [303]	-	-	-	-
Slovakia	X	X	-	-	-	-
Slovenia	X	X (M+C)	-	-	-	X
Spain	X	X (M+C)[304]	-	-	-	X (E+P)
Sweden	X	X (C)	-	-	X[305]	(X)[306]

Note: 'M' means based on measured power (kW or kVA), 'C' means based on (ex-ante) contracted power (kW or kVA), 'T' means based on measured energy (kWh) which is translated into a power-based component (e.g. kWh/h=kW)

Table 25: Tariff basis, variation and differentiation of the distribution tariffs for withdrawal

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on Voltage	Variation based on Location[307]	Variation based on Time-of-use[308]
Austria	X	X (M)	X	X	(X) (network areas)[309]	X (E)
Belgium	BXL: X FLA: X WAL: X	BXL: X (M) FLA: X (M+C) WAL: X (M)	BXL: X[310]	BXL: X FLA: X WAL: X		BXL: X (E) FLA: X (E) WAL: X (E)
Bulgaria	X	X (T)		X		-
Croatia[311]	X	X (M+C)	X[312]	X		X (E+P)
Cyprus	X	-		X		-
Czechia	X	X (C)		X		X (E+P)
Denmark	X	X (M[313]+T[314])	X	X		X (E)
Estonia	X	X (M+C)	X	X		X (E)
Finland	X	X (M)	X	X		X (E+P)[315]

[301] PT: The tariff basis of the transmission tariff has the following structure, based on tariff values for year 2023: active energy (12.6%), reactive energy (0.2%) and power (87.2%).
[302] PT: Users connected at VHV pay a lower transmission tariff than users connected at lower voltage levels, as the former only pay for the VHV assets of transmission, while the latter pay also the remaining transmission assets (e.g. VHV/HV transformers).
[303] RO: Currently, the regulatory framework provides energy-based transmission tariffs. We are considering updating the methodology by applying binomial transmission tariffs.
[304] ES: Tariffs are based on time of use. Six periods are considered and there is a power-based charge for each of the periods. Additionally, there is a penalty for excess of actual power over contracted power.
[305] SE: The withdrawal charge differs between nodes in the transmission grid.
[306] SE: No static ToU tariff applies, but there is a time-differentiated component in the tariff, it's based on actual hourly market prices per bidding zone with an additional supplement charge to cover risks.
[307] Variation based on location, unrelated to the connection to a specific network operator (e.g. the network charges are set to be different to indicate at which locations the electricity is most or least needed). Distribution tariff for withdrawals are different based on the DSO area to which the user is connected to in several countries/jurisdictions including BE's Flanders and Wallonia regions, Czechia, Denmark, Estonia, Finland, Germany, Greece, Latvia, Lithuania, Netherlands, Poland, Romania, Sweden.
[308] It does not take into account differences due to mandatory/voluntary use of time-differentiated tariffs by the network users.
[309] AT: Different tariffs apply for different network areas. Multiple DSOs can operate within a single network area
[310] BLX: two lump sums are defined: one for installed capacity of <=13kVA and another one for >13kVA
[311] HR: New Methodology from 2022 has two power-based tariffs. 1. For consumers, connected both to TSO and DSO grid: the maximum 15-minute measured power in peak hours (winter timekeeping 7:00 - 21:00, summer timekeeping 8:00 - 22:00) that was withdrawn from the grid in one month. Consumer on the TSO grid pays only to TSO, consumer on the DSO grid pays only to DSO. 2. For consumers connected to the TSO grid: the maximum power that a consumer is allowed to withdraw from the grid. It is defined in the contract for the use of the network between TSO and network user. It is a non-changing parameter for particular consumer. 3. For producers only for TSO grid: the maximum 15-minute measured power in all intervals in the month. Tariff for 'contracted power' (2.) is set to 0.000 EUR/kW. Tariff for producers (3.) is set to 0.000 EUR/kW.
[312] HR: Lump sum in Croatia is fixed value in EUR paid every month for every particular settlement point.
[313] DK: Power-based distribution charges only apply for consumers on 10-60kV. For smaller customers time differentiated tariffs are more cost reflective, since grid costs from small customers are driven by simultaneity rather than individual customer peak power demand. kWh/h is used because the metering data received from customers with power-based capacity charge have a minimum resolution of 1 hr., making kWh/h the smallest metering unit universally available to DSOs.
[314] DK: The power-based component is based on hourly consumption kWh/h=kW. Current method: Power based capacity charge is based on the average energy consumption (kWh/kW) of the customer's top 10 hours with the highest energy consumption of the previous year. Planned change from the yearly-set charge to a 12-month moving average model.
[315] FI: Time elements typically apply in the energy-based withdrawal charge, but there are DSOs that apply them in the power-based withdrawal charge.

Country	Tariff basis Energy	Tariff basis Power	Tariff basis Lump sum	Variation based on Voltage	Variation based on Location[307]	Variation based on Time-of-use[308]
France	X	X (C)	X	X		X (E+P)[316]
Germany	X	X (M)	X	X		(X)[317]
Greece	X	X (M/C)		X		(X)[318]
Hungary	X	X (C)	X	X		-
Iceland	X	X (M+C)	No data	No data	No data	No data
Ireland	X	X (C)[319]	X	X		X (E)
Italy	X	X	X	X		-
Latvia[320]	X	X (C)		X		X (E)
Lithuania	X	X (C)	X	X		X (E)
Luxembourg	X	X (M)	X	X		-
Malta	X[321]	X (M)	X			X (E)
Netherlands[322]	X	X (M+C)	X	X		(X)[323]
Norway	X	X (T)	X	X		X (E)
Poland	X	X (C)	X	X		X (E)
Portugal	X[324]	X (M+C+T)[325]		X		X (E+P)
Romania	X[326]	-		X		-
Slovakia	X	X (C)		X		X
Slovenia[121]	X	X (M+C)[327]		X		X (E)
Spain	X	X (M+C) [328]		X		X (E+P)
Sweden	X	X (M+C)	X	X		X (E+P)

Note: 'M' means based on measured power (kW or kVA), 'C' means based on (ex-ante) contracted power (kW or kVA), 'T' means based on measured energy (kWh) which is translated into a power-based component (e.g. kWh/h=kW)

[316] FR: for MV users ToU tariffs embedded both in power and energy-based component; for LV users (under 36 kVA, ToU tariffs embedded only in the energy-based component

[317] DE: Applied for interruptible load.

[318] GR: See Table *42*.

[319] IE: Capacity charge is per kVA of MIC per annum.

[320] LV: The electricity supply charge is set in EUR/kWh, while the capacity maintenance charge is set in EUR/kW/year

[321] MT: Network users with a service rating not exceeding 60A per phase pay an energy-based tariff and an annual fixed service charge. The energy-based tariff is paid on consumption only and covers part of the distribution costs as well as the energy and supply costs. Prosumers do not pay any extra charges for injection. Producers that only inject but not withdraw pay only the annual fixed service charge. Users with a service rating exceeding 60A per phase pay an energy-based tariff, an annual fixed service charge and a maximum demand tariff based on the highest demand (kW or kVA) sustained for any thirty consecutive minutes during the year multiplied by two. The energy-based tariff is paid on the electricity consumed only. Prosumers do not pay any extra charges for injection. Producers that inject pay only an annual fixed service charge. This service charge covers the metering and cost-related administration of feed-in tariff account. In Malta, all producers sell to the DSO/supplier, there is no third-party access and the retail market is not open to competition.

[322] NL: network users pay withdrawal tariffs on the basis of the contracted amount of power; the actual maximum amount of power required within a week or month; energy-based charge (EUR/kWh) for the amount of energy used; and a lump sum per year.

[323] NL: See Table *42*. Table *42*

[324] PT: Each separate distribution tariff (HV, MV and LV) has the following billing variables: contracted power, peak power, active energy and reactive energy. Notwithstanding the general structure of the distribution tariffs, when applying them to small consumers connected to the LV grid (≤ 41.4 kVA), the following simplified structure applies: contracted power and active energy.

[325] PT: The criteria for the power-based charge is contracted power and peak-power, except for small consumers connected to the LV grid (denominated as Normal Low Voltage, with power levels ≤ 41.4 kVA), where peak-power is not applied.

[326] RO: The tariffs are energy-based, calculated based on the distribution costs and distributed energy related to each voltage level. These are voltage-specific tariffs (for low, medium and high voltage). The tariff paid by a user is calculated by summing the specific tariffs for its own connection voltage level and for higher voltage levels. The NRA is considering updating the methodology by applying binomial distribution tariffs.

[327] SI: different bases depending on the voltage level and capacity. For customers connected to low voltage with capacity up to 43 kW, the withdrawal charges are applied based on the rated power according to the size of fuse. For those on low voltage with capacity above 43 kW, the charges are based on the actual monthly peak power at a specified time (e.g. system peak periods between 6h and 22h only on working days). On medium and high voltage, the withdrawal charges are based on the actual monthly peak power at a specified time – a period of two continuous hours (between 6h and 22h on working days) defined as system peak periods by the DSO. The DSO is obliged to define system peak periods (hours) for each month a year in advance.

[328] ES: Tariffs are based on time of use. Six periods are considered and there is a power-based charge for each of the periods. Additionally, there is a penalty for excess of actual power over contracted power.

Table 26: TSO costs (at least partially) recovered via transmission charges for withdrawal

Country	Costs for building, upgrading and/or maintaining infrastructure	Costs for grid losses	Costs for system services	Costs for metering
Austria	Yes	Yes	Yes	Yes
Belgium	Yes	Yes[329]	Yes	Yes
Bulgaria	Yes	Yes	Yes	Yes
Croatia	Yes	Yes	Yes[330]	Yes
Cyprus	Yes	Yes	Yes	Yes
Czechia	Yes	Yes	Yes	Yes
Denmark	Yes	Yes	Yes	Yes
Estonia	Yes	Yes	Yes[331]	Yes
Finland	Yes	Yes	Yes	
France	Yes	Yes[332]	Yes	Yes
Germany	Yes	Yes	Yes	Yes
Greece	Yes	No	Yes	Yes
Hungary	Yes	Yes[333]	Yes	
Iceland	Yes	Yes	Yes	
Ireland	Yes	No[334]	Yes	
Italy	Yes	No[335]	Yes[336]	
Latvia	Yes	Yes	Yes	
Lithuania	Yes	Yes	Yes	
Luxembourg	Yes	Yes	Yes	Yes[337]
Malta	N/A	N/A	N/A	N/A
Netherlands	Yes	Yes	Yes	Partially[338]
Norway	Yes	Yes	Yes[339]	Yes
Poland	Yes	Yes	Yes	Yes
Portugal	Yes	No[340]	Yes[341]	Yes
Romania	Yes	Yes	Yes[342]	
Slovakia	Yes	Yes	Yes	
Slovenia	Yes	Yes	Yes[343]	
Spain	Yes	No[344]	No[345]	
Sweden	Yes	Yes	Yes	

[329] BE: Federal losses (HV) are compensated 'in kind' by Balance Responsible Parties. Regional losses (under 70kV network) are recovered via network tariffs.
[330] HR: FCR are provided by generators on a mandatory basis without compensation by the TSO.
[331] Frequency is held by Russian TSO for free of charge.
[332] FR: Losses generated by exportation of electricity are paid by generators connected to the 400 kV and 225 kV grid.
[333] HU: Partial recovery by setting a price of losses (based on market trends) justified by the NRA and using the factual volume of year n-2. There is an ex-post partial correction in both directions.
[334] IE: The Transmission Loss Adjustment Factors (TLAFs) are applied to generators to ensure that that the costs of transmission losses are borne by market participants who cause them. TLAFs are applied to generators' outputs so that their contribution to the market is adjusted. The value of TLAFs depends on the generator point of connection to the grid. A similar system is used in Northern Ireland.
[335] IT: Consumers pay (in kind, i.e. as additional energy bought in the energy market) for a 'standard' level of losses. The difference between the actual losses and the standard losses is paid (or retained) by network operators. The reason for introducing standard level of losses (and thus an implicit reward/penalty scheme for network operators) is to incentivise network operators to reduce losses in their networks.
[336] IT: Frequency containment reserve and reactive support is mandatory and free of charge. The costs of market-based voltage control actions by generators (to avoid voltage violations) are treated under the intra-zonal congestion charging mechanism.
[337] LU: Separate charge
[338] NL: For consumers the tariff is regulated and the meter is provided by TSO, for other network users it is not a regulated market.
[339] NO: Frequency containment reserve, frequency restoration reserve, replacement reserve, reactive support and voltage control
[340] PT: Suppliers must buy the energy for their clients' consumption in addition to energy to compensate for losses which is calculated by using the 15-minute loss profiles approved and published annually by the NRA. The loss profiles are differentiated by network type (transmission and distribution) and voltage level (EHV, HV, MV, LV). In this sense, there are no tariffs for losses, since losses are purchased by suppliers on the market.
[341] PT: FCR, FRR and RR are provided by generators on a mandatory basis without compensation by the TSO. Costs of the system operator, which is the same entity as the TSO, are recovered by a separate regulated tariff (called 'tariff for the global use of the system'), which is different from the transmission tariff.
[342] RO: FCR are provided by generators on a mandatory basis without compensation by the TSO.
[343] SI: FCR are provided by generators on a mandatory basis without compensation by the TSO.
[344] ES: Suppliers must buy the energy for their clients including losses. The standard losses are established and published by the NRA. The standard losses are differentiated by voltage level and period.
[345] ES: The costs of the ancillary services are included in the commodity price.

Table 27: DSO costs (at least partially) recovered via distribution charges for withdrawal

Country	Costs for building, upgrading, maintaining infrastructure	Costs for grid losses	Costs for system services	Costs for metering
Austria	Yes	Yes	Yes	Yes
Belgium	Brussels: Yes Flanders: Yes Wallonia: Yes	Brussels: Yes Flanders: Yes Wallonia: Yes	Brussels: Yes Flanders: Yes Wallonia: Yes	Wallonia: Yes
Bulgaria	Yes	Yes	Yes	Yes
Croatia	Yes	Yes	Yes	Yes
Cyprus	Yes	Yes	No	Yes
Czechia	Yes	Yes	Yes	Yes
Denmark	Yes	Yes	No	Yes
Estonia	Yes	Yes	No	Yes
Finland	Yes	Yes	Yes	Yes
France	Yes	Yes	No	Yes
Germany	Yes	Yes	Yes	Partially[346]
Greece	Yes	No[347]	No	Yes
Hungary	Yes	Yes	N/A[348]	Yes
Iceland	No data	No data	No data	No data
Ireland	Yes	No[349]	No	Yes
Italy	Yes	No[350]	No	Yes
Latvia	Yes	Yes	Yes	Yes
Lithuania	Yes	Yes	Yes	Yes
Luxembourg	Yes	Yes	Yes	Yes
Malta	Yes	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	Partially[351]
Norway	Yes	Yes	No	Yes
Poland	Yes	Yes	Yes	Yes
Portugal	Yes	No[352]	Yes	Yes[353]
Romania	Yes	Yes	No	Yes
Slovakia	Yes	Yes	Yes	Yes
Slovenia[121]	Yes	Yes	No	Yes
Spain	Yes	No[354]	No[355]	Yes
Sweden	Yes	Yes	Yes	Yes

Table 28: Exemption, discount or differentiation of unit tariff values or tariff basis for producers

Country	Transmission-connected producers	Distribution-connected producers
Austria	**Injection charges:** • Producers do not pay system provision charge and the system utility charge (re-evaluation ongoing) due to national law[356]	**Injection charges:** • Producers do not pay system provision charge and the system utility charge (re-evaluation ongoing) due to national law[356]

[346] DE: Smart metering is deregulated.
[347] GR: The cost of distribution losses is borne by suppliers and included in the energy component of the final electricity price .
[348] HU: DSO purchase of ancillary and flexibility services would be covered by distribution tariffs (but not taken place yet).
[349] IE: the distribution loss adjustment factors (DLAFs) apply to metered withdrawal of a network user connected to the distribution network. The DLAFs values apply to demand on the basis of which voltage level they are connected to (i.e. LV, MV and 30kV);
[350] IT: Consumers pay (in kind, i.e. as additional energy bought in the energy market) for a 'standard' level of losses. The difference between the actual losses and the standard losses is paid (or retained) by network operators. The reason for introducing standard level of losses (and thus an implicit reward/penalty scheme for network operators) is to incentivise network operators to reduce losses in their networks.
[351] NL: only for household and small non-household consumers. For large non-household consumers the metering is deregulated.
[352] PT: In Portugal, energy suppliers have to procure more energy in the market to cover grid losses. The amount of energy to compensate for grid losses is added to the metered withdrawal of the supplier's customers and calculated using the hourly losses profiles which are approved annually by the NRA. These losses profiles are differentiated by network type (transmission and distribution) and voltage level (VHV, HV, MV, LV).
[353] PT: investment cost (CAPEX) of meters (both traditional and smart meters) is not recovered through distribution tariffs. OPEX related to metering are part of the costs recovered via the distribution tariff.
[354] ES: Suppliers must buy the energy for their clients including losses. The standard losses are established and published by the NRA. The standard losses are differentiated by voltage level and period
[355] ES: The costs of the ancillary services are included in the commodity price.
[356] AT: The Austrian national electricity Act 2010 is currently being amended. According to the current proposal the system admission charge and system provision charge will be combined in a connection charge, which will be applied to both generators and consumers.

Country	Transmission-connected producers	Distribution-connected producers
	• Producers with installed capacity up to 5 MW are exempted from transmission tariffs (transmission costs) for injection. **Connection charges:** • Exemption from connection charge for RES below 20 kW pursuant to national law[357] • PHES facilities pay reduced network charge compared to other storage facilities (e.g., batteries)	• Producers with installed capacity up to 5 MW are exempted from transmission tariffs (transmission costs) for injection. **Connection charges:** • Reduced connection charge for RES pursuant to national law[358]
Belgium	• Storage facilities which are commissioned after July 2018, receive a full exemption of all network tariffs during 10 years. The transmission-connected storage facilities with a substantial capacity increase after July 2018 receive a 80% discount on all Access transmission tariffs during 5 years.	**Brussels:** No injection charge applies. **Wallonia:** **Injection charges:** • Producers which inject electricity on the LV level and whose power is less than 10 kVA are exempted[359]. **Flanders:** • Producers don't pay for transmission costs, public service obligations, surcharges.
Bulgaria	No data	No data
Croatia	Only producers with licence by the NRA would pay injection charge.[360] However, this charge is currently effectively set at 0.000 EUR/kW.	Only producers with licence by the NRA would pay injection charge.[360] However, this charge is currently effectively set at 0.000 EUR/kW.
Cyprus	No injection charge applies	No injection charge applies
Czechia	No injection charge applies	No injection charge applies
Denmark	**Injection charges:** • Some RES producers have been exempted through legislative acts, not as part of the tariff methodology. However, these exemptions are not available anymore for new producers.	**Injection charges:** • Some RES producers have been exempted through legislative acts, not as part of the tariff methodology. However, these exemptions are not available anymore for new producers. **Connection charges:** • Some RES producers are exempt from paying the transformer connection charge, if they are not located in the producer dominated area defined by the Green Power Denmark's map.
Estonia	No injection charge applies	No differentiation, exemption or discount to any producers.
Finland	No differentiation, exemption or discount to any producers regarding the use-of-network charges.	**Injection charges:** • Some DSOs do not apply injection tariffs for small power producers. • Under national law, small-scale generation (max. 1 MW) connected to the distribution network may only be allocated part of its costs to the network, and the ceiling of the energy charge for injection of small-scale generation is capped at 0.07 EUR/kWh. **Connection charges:** • Small producers are exempted from the capacity reservation charge component of the connection charge
France	**Injection charges:**	Only marginal injection charge applies

[357] AT: § 17a ElWOG
[358] AT: §54 ElWOG
[359] BE-WAL: Article 4 of the decree of the Walloon Parliament of 19 January 2017 relating to the distribution tariff methodology provides that the 'tariffs for the use of a distribution network, applicable to production units, can be differentiated according to the technology of these units and their date of commissioning. These tariffs are determined taking into account any criterion considered relevant by CWaPE, such as a comparison with neighbouring countries and in consultation with all the players, so as not to jeopardise the country's security of supply by decline in the competitiveness of the production units concerned. In the tariff proposal accompanied by the budget, the distribution network operator justifies these differentiations'.
[360] HR: Article 46(16) Electricity Market Law (NN, 111/21, 83/23).

Country	Transmission-connected producers	Distribution-connected producers
	• Producers who are connected to lower than 150 kV voltage level are exempted from the payment of injection charges, except for metering/management.[361] **Connection charges:** • Onshore RES producers benefit from a reduction in connection charges. This reduction varies with the installed capacity. Offshore RES producers do not pay connection charges.	**Connection charges:** • RES producers benefit from a reduction in connection charges. This reduction varies with the installed capacity.
Germany	Only negative injection charge applies	Only negative injection charge applies
Greece	No injection charge applies	No injection charge applies
Hungary	No injection charge applies **Connection charge:** • Storage systems with at least 0.5 MW capacity and aFRR accreditation receive a 100% transmission use of system charge discount until 31.12.2026.	No injection charge applies **Connection charge:** • RES producers in the category of 'small-scale household power plant' are entitled to a connection charge discount (100%) compared to other producers, provided that the required injection capacity does not exceed the household's available consumption capacity (demand capacity).[362] • If a power plant using RES also installs an electricity storage facility, the part of the connection charge for the storage facility is reduced, while the power plant pays the full connection charge.
Iceland	No data	No data
Ireland	**Injection charges:** • For the capacity up to 5 MW each generator is exempted from injection charges. From 5 MW onwards there is an incremental rule; e.g. a 7 MW generator is charged for 2 MW (7-5 MW), etc.	**Injection charges:** • For the capacity up to 5 MW each generator is exempted from injection charges. From 5 MW onwards there is an incremental rule; e.g. a 7 MW generator is charged for 2 MW (7-5 MW), etc.
Italy	No injection charge applies	No injection charge applies
Latvia	No differentiation, exemption or discount to any producers.	No differentiation, exemption or discount to any producers.
Lithuania	No injection charge applies	• Distribution connected batteries under 1 MW are exempted from any network tariffs
Luxembourg	• RES self-consumers are exempted from network charges on the part of the production consumed by themselves. The exemption also applies to energy produced on the basis of RES and shared in the same building or in communities.	• RES self-consumers are exempted from network charges on the part of the production consumed by themselves. The exemption also applies to energy produced on the basis of RES and shared in the same building or in communities.
Malta	N/A	**Injection charge:** • The metering, administrative and management fee is different for RES producers compared to the two non-RES producers (large fossil fuel power plants) having a PPA with the DSO. • The metering, administrative and management fee is lower for residential

[361] FR: Reasoning: the costs covered by the injection charge (losses caused by exported electricity and losses linked to ITC) are directly imputable to producers connected at 225 and 400 kV.

[362] HU: Producers using renewable energy sources are subject to the same tariff rules as other producers, unless these renewable power plants belong to the category of 'small-scale household power plant' and meet the following criteria: their feed-in power does not exceed the available power capacity for consumption (demand capacity). The capacity limit for household -scale power plants is 50 kVA or 3X63 amperes. If the small household power plants meet all the required criteria above, they don't pay connection charge, so they have a 100% discount.

Country	Transmission-connected producers	Distribution-connected producers
		producers than for non-residential producers[363].
Netherlands	Only marginal injection charge applies	Only marginal injection charge applies
Norway	No differentiation, exemption or discount to any producers.	**Injection charges:** • Prosumers up to 100 kW of injection are exempted from the fixed ('G-charge) component of the injection charge.
Poland	No injection charge applies **Connection charges:** • RES producers below 5 MW and cogeneration below 1 MW pay 50% of connection cost (CAPEX), other producers pay 100% • Transmission-connected PHES facilities pay a reduced transmission charge based on the efficiency of the storage • The energy-based component of the transmission tariff is charged on net withdrawal	No injection charge applies **Connection charges:** • RES producers below 5 MW and cogeneration less than 1 MW pay 50% of connection costs (CAPEX); • Micro-installation has free connection; • Distribution-connected PHES facilities have no special rates • Discount for prosumers that are allowed to withdraw to 70 or 80% of the injected energy and variable distribution fees for free.
Portugal	• PHES facilities are exempted for withdrawal charges. Autonomous storage facilities (e.g., batteries) are exempted from withdrawal charges (when they participate in energy sharing over the public grid they are exempt from energy policy costs, but are still required to pay transmission and distribution tariffs).	• PHES facilities are exempted for withdrawal charges. Autonomous storage facilities (e.g., batteries) are exempted from withdrawal charges (when they participate in energy sharing over the public grid they are exempt from energy policy costs, but are still required to pay transmission and distribution tariffs).
Romania	No differentiation, exemption or discount to any producers.	**Injection charges:** • Producers whose installed capacity up to 5 MW are exempted from transmission tariff for injection[364]. • Producers pay only for transmission costs, but not for distribution costs
Slovakia	**Injection charges:** • Power-based tariff for access to the grid is not paid by ancillary services providers. • Storage facilities providing solely ancillary services to the TSO (no commercial injection or withdrawal of electricity) do not pay any transmission tariff. • Network users operating a hydroelectric power plant with a total installed capacity up to 5 MW are also fully exempted.	**Injection charges:** • Power-based tariff for access to the grid is not paid by ancillary services providers.
Slovenia		
Spain	No injection charge applies	No injection charge applies
Sweden	**Connection charges:** • Reduction of connection charges paid by offshore producers	**Injection charges:** • DSOs may apply some differentiation, exemption or discount to some producers, e.g. depending on the size of the producer, but this information is not available to the NRA, since the DSOs are free to design their own tariffs. • In one of the biggest DSO areas the injection charges are only applied to network users who have a capacity for

[363] MT: On 'export only' mode different lump sum payments depending on whether the producer is residential/domestic or non-residential as well as different lump sum payments depending on whether the connection is single phase or three phase.
[364] RO: Reason: generated electricity from distribution connected producers with installed capacity up to 5 MW is deemed to be consumed in grid and thus they do not use the transmission grid.

Country	Transmission-connected producers	Distribution-connected producers
		production larger than the capacity to consume.

Table 29: Transmission and distribution connected pumped-hydro energy storage (PHES) or non-PHES storage facilities

Country	Transmission				Distribution			
	PHES/ non-PHES[365]	Injection charge	Withdrawal charge	Connection charge	PHES/ non-PHES[365]	Injection charge	Withdrawal charge	Connection charge
Austria	PHES	E	E+P	Different	PHES	E	E+P	Same as consum.
Belgium	Both	E	E+P	Same as producer	BXL: PHES FLA: Both WAL: non-PHES	BXL: N/A FLA: E WAL: P	BXL: FLA: E+P WAL: Yes E+P	BXL: Same FLA: Same
Bulgaria	PHES	Not subject	E	No data	PHES	N/A	No data	Different
Croatia	PHES	N/A[366]	E+P+L+O[367]	Different[368]	PHES	N/A[369]	E+P+L+O)[370]	Different[371]
Cyprus[372]	None				None			
Czechia	PHES	N/A	E	Same	Single PHES	N/A	E	Same
Denmark[372]	None				Non-PHES	E	E	Same
Estonia[372]	None				None			
Finland[372]	None				PHES[373]	E+P+L	E+P+L	Same as consum.
France	Both	E	E+P	Same[374]	Non-PHES	N/A	E+P+L	Same[374]
Germany	PHES	N/A	E+P	Other	Both	Negative[375]	E+P	Other
Greece	PHES	N/A	E+P	No data	Non-PHES	N/A	E+P	Same
Hungary	Non-PHES	N/A	E[376]	Different[377]	Non-PHES	N/A	E+P+L	Different[377]

[365] Technology of standalone storage facility which is currently connected to the transmission or distribution grid of the country.
[366] HR: There was no injection charge for TSO PHES storage before 1.4.2023 and from 1.4.2024. onward it is 0.000 EUR/kW.
[367] HR: The energy storage operator at a settlement metering point with a standalone energy storage facility is not considered an „end customer' within the meaning of Electricity Market Act (NN 111/21, 83/23), except for "its own consumption" - Article 48, Paragraph 8, Electricity Market Act. NRA has not issued licence for the energy storage operators, so these articles are not applied to particular energy storage operator.
[368] HR: In the New Connection Methodology (NN, 84/22) storage pays only for individual actual cost (EUR, if needed for connection, only line to the nearest grid and adjacent transformer, individual actual cost). But decision needed for the application for that Methodology is not issued yet. In the Old Connection Methodology (NN, 51/17, 31/18, 104/20) there is no difference regarding connection cost for storage, and Old Methodology is still in force.
[369] HR: There was no injection charge for DSO PHES storage. It is envisaged in New DSO Tariff Methodology 2022 (NN, 84/22) but there is no decision yet on the value of this charge.
[370] HR: The energy storage operator at a settlement metering point with a standalone energy storage facility is not considered an „end customer" within the meaning of Electricity Market Law (NN 111/21, 83/23), except for "its own consumption" - Article 48, Paragraph 8, Electricity Market Law. NRA has not issued licence for the energy storage operators, so these articles are not applied to particular energy storage operator.
[371] HR: In the New Connection Methodology (NN, 84/22) storage pays only for individual actual cost (EUR, if needed for connection, only line to the nearest grid and adjacent transformer). But decision needed for the application for that Methodology is not issued yet. In the Old Connection Methodology (NN, 51/17, 31/18, 104/20) there is no difference regarding connection cost for storage, and Old Connection Methodology is still in force.
[372] No storage facilities are connected yet, but they would not be subject to any use-of-network network charges.
[373] EE: the connected PHES facility is non-commercial
[374] FR: The connection charge is determined based on actual costs for producers, consumers and storage facilities
[375] DE: Negative injection charge applies to storage facilities if they inject into the grid.
[376] HU: Transmission withdrawal charges apply, but there are temporary exemptions in place until the end of December 2026. Storage systems with at least 0.5 MW capacity and aFRR accreditation receive a 100% transmission charge discount until 31 December 2026.
[377] HU: Storage facilities are subject to distribution connection charges, but the rules differ from those applied to producers due to specific exemptions and reductions.

Country	Transmission				Distribution			
	PHES/ non-PHES[365]	Injection charge	Withdrawal charge	Connection charge	PHES/ non-PHES[365]	Injection charge	Withdrawal charge	Connection charge
Iceland	No data	No data	No data	No data	No data	No data	No data	No data
Ireland	Both	Not subject	E+P	Same as producer	Non-PHES	Not subject	E+P	Same as consum.
Italy[378]		N/A	Not subject	Not subject		N/A	Not subject	Not subject
Latvia	None				None			
Lithuania	Both	N/A	E+P	Same as producer	Non-PHES	N/A	E	Same as producer
Luxembourg	None				None			
Malta	N/A	N/A	N/A	N/A	Non-PHES	Not subject	E+P+L	Different [379]
Netherlands [380]	Non-PHES	Not subject	P+L	Same as consum.	non-PHES	Not subject	E+P+L	Same as consum.
Norway[381]	PHES	E	P+E	Same[382]	Both	E	P+E	Same[382]
Poland	PHES	N/A	E+P	Different	Both	N/A	E+P+L	Different
Portugal	Both	N/A	Not subject [383]	N/A	Both	N/A	Not subject[383]	N/A
Romania	Single non-PHES	E	E	Same as producer	None			
Slovakia	Both	P	E+P	Different [384]	Both	P[385]	E+P	Same as producer
Slovenia[118]	PHES	N/A	Not subject [386]	Same as consum.	Non-PHES	N/A	Not subject[386]	Same as consum.
Spain	Both	N/A	Not subject [387]	Same as producer	Both	N/A	Not subject[387]	Different
Sweden	None				Both[388]	P+L	E+L	Same[389]

Note: N/A means there is no injection charge in the country. 'Not subject' means there is an injection charge, but storage facilities do not have to pay it. 'Same' means that the connection charge regime is the same which applies to other network users. 'Different' means that the connection charge regime is different from both those applied for consumers and those applied for producers.

[378] IT: Regulatory decision 574/2014 extended the no-charging of pumped hydro to other storage facilities (pure storage). The consultation preparing decision 574 stated the reason of "equal treatment". The no-charging of pumped hydro plants was introduced by decision 348/2007, together with the no-charging of auxiliary generation services. In the consultation before the decision, it was stated that the duration of withdrawal of auxiliary services is very low (ranging from 50 to 350 hours/year), therefore justifying a different treatment.
[379] MT: If already a consumer, no extra charges. If the connection is specific to storage, same methodology and charges applicable to new consumers apply.
[380] NL: For withdrawing, storage pays the same tariff as consumers (connected at the same voltage level). For injecting, storage does not pay the lump sum administrative fee because it pays this fee as consumer and therefore the administrative costs have already been recovered.
[381] NO: The energy-based component is for marginal losses. It can be either positive or negative.
[382] NO: The connection charge is determined based on actual costs for producers, consumers and storage facilities
[383] PT: In the case of storage facilities, they are not subject to network charges for withdrawal conditional on the circumstance that they are not participating in energy sharing of self-consumption.
[384] SK: Same as consumers or producers except when delivering ancillary services there are no network tariffs
[385] SK: When storage facilities provide ancillary services they are not subject to charges. Otherwise, it is the same as for producers and consumers in case of withdrawal and injection.
[386] SI: Energy conversion was exempted from network charges by national law. With new Electricity Supply Act (valid from October 2021) this was changed (storage to pay for power withdrawal) and will be implemented in new tariff system as defined by NRA.
[387] ES: They are not subject to withdrawal charge due to shift of charges to final consumers and for the purpose of increasing security of supply.
[388] SE: It depends on DSO area.
[389] SE: The rules of setting the connection charge is the same for both storages, producers and consumers. There are no variations.

Table 30: Exemption, discount or differentiation of unit tariff values or tariff basis for (standalone) storage facilities

Country	Transmission-connected (standalone) storage facilities	Distribution connected (standalone) storage facilities
Austria	**Use-of-network charges:** • PHES storage facilities pay reduced network charges compared to consumers: PHES does not pay grid utilisation charges and network losses charges for a period of 15 years from the time they are commissioned[390]. • No grid provision fee applied for PHES (neither for producers)	**Use-of-network charges:** • PHES storage facilities pay reduced network charges compared to consumers: PHES does not pay grid utilisation charges and network losses charges for a period of 15 years from the time they are commissioned (if the capacity is more than 1 MW).
Belgium	**Use-of-network charges:** • New storage facilities, commissioned after 1 July 2018, receive a full exemption of all network tariffs (except connection charges) during the first 10 years, while former storage facilities where a substantial capacity increase (minimum 7.5%) was commissioned after 1 July 2018 receive an 80% discount on all access transmission tariffs during the first 5 years[391].	**Brussels:** • No differentiation, exemption or discount to any storage facilities. **Flanders:** • No differentiation, exemption or discount to any storage facilities. They pay the same injection charge like producers and the same withdrawal charge like consumers. **Wallonia:** **Use-of-network charges:** • From 2025, standalone storage facilities will get a 100% exemption from taxes and surcharges on DSO tariffs and a full exemption from TSO tariffs (except for reactive energy tariffs), except for its own consumption (i.e. battery losses) netted yearly. They also benefit of a full exemption from injection charges.
Bulgaria	**Use-of-network charges:** • Not subject to injection charges	No differentiation, exemption or discount to any storage facilities.
Croatia	**Use-of-network charges:** • The network tariff for the single PHES storage connected to 400 kV is set for maximum power withdrawn from the network 0.465 EUR/kW (instead of 1.858 EUR/kW) due to beneficial network impacts of the network user.[392] This provision would apply for any other network user connected to 400 kV. • Standalone storage facility is not considered an „end customer', except for 'its own consumption.[393] **Connection charges:**	**Use-of-network charges:** • Not considered an „end customer', except for 'its own consumption'.[395]

[390] AT: Reason: due to the large-scale options to act supportive for the transmission grid a separate network-charge (only for the load-based tariff component) for pumped-hydro storage is in place.
[391] BE: The objective is to promote storage development for Flex/SoS reasons. No reassessment is foreseen yet.
[392] HR: Justification is based on technical and economic criteria: https://www.hera.hr/hr/docs/2024/Odluka_2024-02-29_03.pdf. But this network charge would apply if non-storage facility would be connected to the 400 kV transmission grid, for now this is the only network user on the 400 kV.
[393] HR: The energy storage operator at a settlement metering point with a standalone energy storage facility is not considered an „end customer" within the meaning of Electricity Market Act (NN 111/21, 83/23), except for "its own consumption" - Article 48, Paragraph 8, Electricity Market Law (NN, 111/21, 83/23). NRA has not issued licence for the energy storage operators, so these articles are not applied to particular energy storage operator.
[395] HR: The energy storage operator at a settlement metering point with a standalone energy storage facility is not considered an „end customer" within the meaning of Electricity Market Act (NN 111/21, 83/23), except for "its own consumption". NRA has not issued licence for the energy storage operators, so these articles are not applied to particular energy storage operator.

Country	Transmission-connected (standalone) storage facilities	Distribution connected (standalone) storage facilities
	• Some discounts compared to consumers and producers[394]	
Cyprus	**Use-of-network charges:** • No storage facilities are connected yet. If they were connected, they would not be subject to any use-of-network network charge.[396]	**Use-of-network charges:** • No storage facilities are connected yet. If they were connected, they would not be subject to any use-of-network network charge.[396]
Czechia	**Use-of-network charges:** • Storage is not subject to power-based component and they pay only for components connected to electricity losses[397].	**Use-of-network charges:** • Storage is not subject to power-based component and they pay only for components connected to electricity losses[397].
Denmark	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.
Estonia	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.
Finland	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.	**Use of network charges** (different practices in different DSO areas): • Some DSOs offer a separate tariff for electricity storage to reflect the costs and benefits to the distribution system. • Some DSOs make no differentiation, exemption or discount to any storage facilities (neither cost off-setting of injection and withdrawal charges)
France	**Use of network charges:** • If energy storage facilities are connected to voltage where injection charges apply (>=150 kV), they pay both injection and withdrawal charges. • Some PHES are partially exempted (reduced withdrawal tariffs) upon the condition that they are withdrawing more than 10 GWh/year and having a utilisation rate of more than 44% in low hours. • Storage (including PHES) can benefit from a partial exemption if they have high withdrawal and a withdrawal profile that is flat or contracyclical. Exemption rate ranges from 50% to 81%.[398]	No differentiation, exemption or discount to any storage facilities, but a specific tariffication targeted to storages facilities is under study.
Germany	**Use-of-network charges**: • PHES whose pump capacity or turbine power increased by at least 7.5% or whose storage capacity increased by at least 5% after 04.08.2011 are fully exempted from the payment of use-of-network charges regarding the purchase of the electrical energy that is intended to be stored for the first 10 years.	**Use-of-network charges**: • PHES whose pump capacity or turbine power increased by at least 7.5% or whose storage capacity increased by at least 5% after 04.08.2011 are fully exempted from the payment of use-of-network charges regarding the purchase of the electrical energy that is intended to be stored for the first 10 years.

[394] HR: In the New Connection Methodology (NN, 84/22) for standalone storage facilities the connection charge is calculated differently for storage in comparison to producers and consumers. Connection charge for storage facilities does not include „charges for related network reinforcements", they only pay for the "charges for connection to the network" and this includes costs of meter and eventually line between metering point and the nearest grid and adjacent transformator (individual actual cost). Connection charge for consumers and producers includes „charges for related network reinforcements", and it also includes individual actual cost (meter eventually line between metering point and the nearest grid and adjacent transformator). Description of the Methodology is available in English in NRA's Annual Report for 2022, but it is not yet applied since NRA decision on the unit prices (EUR/kW) is still pending, and therefore the Old Methodology is still in force and this Old Methodology does not differentiate standalone storage in comparison to producers and consumers.
[396] CY: Cf. CERA's Regulatory Decision No. 3/2019. Reasoning: to facilitate penetration of storage facilities.
[397] CZ: Reasoning: historically, PHESs offered essential balancing services.
[398] FR: Reasoning: The exemption is decided by national law (art L.341-4-2 of the French Energy Code). Exemption rates can be reevaluated.

Country	Transmission-connected (standalone) storage facilities	Distribution connected (standalone) storage facilities
	• Non-PHES storage facilities newly constructed after 31.12.2008 and commissioned within 18 years from 04.08.2011 are fully exempted from the payment of use-of-network charges regarding the purchase of the electrical energy that is intended to be stored for the first 20 years of operation.[399]	• Non-PHES storage facilities newly constructed after 31.12.2008 and commissioned within 18 years from 04.08.2011 are fully exempted from the payment of use-of-network charges regarding the purchase of the electrical energy that is intended to be stored for the first 20 years of operation.[399] • **Negative injection charge** is applied for distribution-connected storage facilities to reward cost saving.
Greece	No differentiation, exemption or discount to any storage facilities.	No differentiation, exemption or discount to any storage facilities.
Hungary	**Use-of-network charges:** • For use-of-network charges, in general, no differentiation, exemption or discount to any storage facilities. However, there are temporary exemptions in place until 31 December 2026: Storage systems with at least 0.5 MW capacity and aFRR accreditation receive a 100% transmission charge discount until 31 December 2026. **Connection charges:** • Storage facilities are subject to connection charges under different rules compared to those applied to producers due to specific exemptions and reductions.	For use-of-network charges no differentiation, exemption or discount to any storage facilities. **Connection charges:** • Storage facilities are subject to connection charges under different rules compared to those applied to producers due to specific exemptions and reductions.
Iceland	No data	No data
Ireland	**Use-of-network charges:** • One PHES (i.e. Turlough Hill) is fully exempted. • Other commercial storage units do not pay injection charges, but are subject to withdrawal charges.	**Use-of-network charges:** • They are not charged with injection tariffs, but are subject to withdrawal tariffs under the same criteria as transmission connected storage facilities.
Italy	**Use-of-network charges:** • Storage is not subject to use-of-network charges (for pumping/charging)	**Use-of-network charges:** • Storage is not subject to use-of-network charges (for pumping/charging) **Difference in connection charges:** • Small RES/Combined heat and power (CHP) generators are charged based on a standardised formula while for the others a specific estimate by the DSO is needed.
Latvia		
Lithuania	**Use-of-network charges:** • Not subject to TSO network charges for the part of the withdrawal which is returned to the transmission network. (i.e. for pumping/charging) [as set by national law]	**Use-of-network charges:** • Batteries smaller than 1MW exempted from all network tariffs. • Batteries with over 1 MW does not pay use-of-network charges for charging the battery (i.e. they pay only for technical losses). **Connection charges:** • If the storage is only recharged from the network without injection (i.e. consumer only), it will be charged 50% connection costs. Energy storage facilities with bi-directional use shall pay 100% of the costs.

[399] DE: Reasoning: National law provision. The exemption shall be granted by approval in corresponding application of the procedural requirements according to section 19 (2) StromNEV. Section 118 para. 6 Energy Industry Act (EnWG). The exemption shall only be granted if the electrical energy for storage in an electrical, chemical, mechanical or physical electricity storage facility is withdrawn from a transmission grid and the electrical energy recovered for feed-out is fed back into the same grid with a time delay

Country	Transmission-connected (standalone) storage facilities	Distribution connected (standalone) storage facilities
Luxembourg	No differentiation, exemption or discount to any storage facilities.	No differentiation, exemption or discount to any storage facilities.
Malta	Not applicable, no transmission network	No differentiation, exemption or discount to any storage facilities.
Netherlands	Storage facilities do not pay administrative fee for injection, only for withdrawal. No differentiation, exemption or discount to any storage facilities (but the practice is under revision)[400]	Storage facilities do not pay administrative fee for injection, only for withdrawal. No differentiation, exemption or discount to any storage facilities
Norway	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.	No differentiation, exemption or discount to any storage facilities. No cost off-setting of injection and withdrawal charges.
Poland	**Use-of-network charges:** • Storage facilities are charged according to the special rules defined in the national law and pay a reduced fixed capacity charge for withdrawal compared to the consumers and an energy-based charge on net withdrawal.[401] **Connection charges:** • Storages connection fee - 50% of real costs of building the connection.	**Use-of-network charges:** • Storage facilities are charged according to the special rules defined in the national law and pay a reduced fixed capacity charge for withdrawal compared to the consumers and an energy-based charge based on net withdrawal.[401] **Connection charges:** • Storages connection fee - 50% of real costs of building the connection.
Portugal	**Use-of-network charges:** Storage facilities connected to the public grid benefit from an exemption on the use of network tariff: Pumped-hydro energy storage and other standalone storage facilities (the latter only if they are not simultaneously participating in energy sharing agreements) are exempted from transmission tariffs (network access tariff) if they inject the energy back into the grid.	**Use-of-network charges:** Storage facilities connected to the public grid benefit from an exemption on the network access tariff: Pumped-hydro energy storage and other standalone storage facilities (the latter only if they are not simultaneously participating in energy sharing agreements) are exempted from transmission and distribution tariffs (network access tariff), if they inject the energy back into the grid.
Romania	**Use-of-network charges:** • Storage facilities whose installed capacity is lower than 5 MW are exempted from transmission tariff for injection.	**Use-of-network charges:** • Storage facilities whose installed capacity is lower than 5 MW are exempted from transmission tariff for injection.
Slovakia	**Use-of-network charges:** • The storage facility, which provides solely ancillary services to TSO do not pay any injection or withdrawal charge[402]. • The storage facility used for commercial purposes (needs to be connected as local DSO) pays a transmission charge for injection or withdrawal based on the connection capacity (injection or withdrawal) which is higher. • Producers operating a hydroelectric power plant with a total installed capacity up to 5 MW are fully exempted.	**Use-of-network charges:** • The storage facility, which provides solely ancillary services does not pay any access to the grid charge.[402] • The storage facility used for commercial purposes pays a distribution charge for access to distribution system for injection or withdrawal based on the connection capacity (injection or withdrawal) which is higher. • Producers operating a hydroelectric power plant with a total installed capacity up to 5 MW are fully exempted.
Slovenia[118]	Not applicable, storage is not subject to network tariffs	Not applicable, storage is not subject to network tariffs.[403]
Spain	Not applicable, storage is not subject to network tariffs	Not applicable, storage is not subject to network tariffs
Sweden	No storage facilities are connected to the transmission grid yet.	**Use of network charges (depends on DSO areas):**

[400] NL: The NRA will investigate whether it is necessary and possible to adjust the tariff structure in such a way that it becomes more attractive for market parties to invest in energy storage.
[401] PL: Capacity charge is adjusted by a reduction factor ("K factor") proportional to the efficiency of the energy storage, which reduces the contracted capacity. The energy charge takes into account the balance of withdrawal and injection of the storage. Storages do not pay RES fee, transition fee, quality fee and capacity fee.
[402] SK: Reasoning: not to discourage the activation of ancillary services.
[403] SI: Under the current rules, storages do not pay a network charge for either withdrawal or injection. In the future (with the new rules), it is foreseen to pay a network charge for withdrawal from the network.

Country	Transmission-connected (standalone) storage facilities	Distribution connected (standalone) storage facilities
		• In some DSO areas some storage facilities are exempted from some costs (e.g. Pumped hydro is considered to have much higher duration in usage which warrants a different pricing to battery storage. Pumped hydro is handled as normal production) [404]

Table 31: Transmission and distribution tariffs for (individual) prosumers

	Transmission			Distribution		
Country	Currently connected to the T-grid	Injection charge	Withdrawal charge	Currently connected to the D-grid	Injection charge	Withdrawal charge
Austria	No	E+P	E+P	Yes	E+P	E+P
Belgium	Yes	E	E+P	Yes	FLA: E WAL: P	BXL: E+L / E+P FLA: E+P WAL: E+P
Bulgaria	Yes	E	No	Yes	E	No data
Croatia	Yes	Yes[405]	E+P+RE+L	Yes	N/A	E+P+ RE+L
Cyprus	Yes	N/A	E	Yes	N/A	E+P
Czechia	Yes	N/A	E+P	Yes	N/A	E+P
Denmark	Yes	E	E+L	Yes	E	E+P+L
Estonia	Yes	N/A	E	Yes	P+LS	E+P+L
Finland	No	E+P	E+P	Yes	E+P+LS	E+P+L
France	No	E	E+P	Yes	No	E+P+L
Germany	Yes	N/A	E+P	Yes	Negative	E+P
Greece	No	N/A	E+P	No	N/A	E+P
Hungary	No	N/A	E	Yes	N/A	E+P+L
Iceland	No data	No data	No data	No data	No data	No data
Ireland	No	P	E+P	No		E+L
Italy	No	N/A	P	No	N/A	P
Latvia	Yes	P	E+P	Yes	P	P
Lithuania	No	N/A	N/A	Yes	N/A	E
Luxembourg	No	N/A	E+P	Yes	N/A	E+P / E+LS
Malta	N/A	N/A	N/A	Yes	No	E+P+L
Netherlands	No	No	P+LS	Yes	No	E+P+L
Norway	No	E+L	E+P	Yes	E+L	E+P
Poland	No	N/A	E+P	Yes	N/A	E+P+L
Portugal	Yes	N/A	E+P	Yes	N/A	E+P
Romania	No	E	E	Yes	E	E
Slovakia	No	P	E+P	No	P	E+P
Slovenia	No	N/A	E+P	Yes	N/A	E+P
Spain	Yes	N/A	E+P	Yes	N/A	E+P
Sweden	No	E+P	E+P	Yes	Different practices[406]	E+P+L

Note: If a distribution-connected network user is indirectly charged for Transmission costs (e.g. the transmission withdrawal tariffs are paid by the distribution system operators (DSO's) and this cost is shifted further to a distribution-connected network users) it is still considered as a payment for transmission costs by a distribution-connected network user. The table does not account for energy communities.

[404] SE: In one of the largest DSOs, it is based on usage level and flexibility standalone energy storage (not pumped hydro) are considered neutral with regards to subscriptions to higher grid levels. Therefore, the cost of the higher grid level subscription has been removed resulting in a cheaper tariff, however it also comes with some demands on control from the DSO.
[405] HR: For the subject that has licence for production of electricity there is a general rule. At all metering points attributed to this subject on which this subject injects electricity to the grid he pays for injection charge {Article 25 (9) New TSO Tariff Methodology 2022, NN, 84/22 and Article 28 (9) New DSO Tariff Methodology 2022, NN, 84/22}. But if there are some exceptions in Croatian laws these will be applied.
[406] SE: No injection charge for transmission costs. In one of the largest DSO areas, they do not pay injection charge for distribution costs either.

Table 32: Discount, net-metering, cost offsetting or differentiation of unit tariff values or tariff basis for prosumers

Country	Transmission connected prosumers	Distribution connected prosumers
Austria	**Use-of-network charges:** • Prosumers up to 5 MW do not pay injection charge	**Use-of-network charges:** • Prosumers up to 5 MW do not pay injection charge.
Belgium	**Use-of-network charges:** • Transmission tariffs are charges on 15 minutes basis, this netting applies within each quarter of hour. No other differentiation, exemption or discount to any prosumer.	**Brussels:** • No differentiation, exemption or discount to any individual prosumer. **Flanders:** **Use-of-network charges:** • Prosumers with a production capacity up to 10 kW are exempted from injection charges. • Prosumers with smart meter have an energy-based (gross withdrawal) and a power-based tariff component. • Prosumers without smart meter has an energy-based (net withdrawal, netted for the billing period), lump sum and inverter power-based.[407] **Wallonia:** **Use-of-network charges:** • Prosumers pay only for distribution costs. • There is no injection tariff for prosumers which inject electricity on the LV level and whose connected power is less than 10 kVA. • The grid costs are based on gross withdrawal and there is a cap computed on the grid costs based on the net withdrawal + the prosumer tariff. • Above LV level yearly netting applies. • For network users with solar panels whose power is less than 10 kVA, a specific pricing is applied.
Bulgaria	**Use-of-network charges:** • Prosumers pay only injection charges and they do not pay withdrawal charges.	No data
Croatia	No differences for TSO prosumer in comparison to other TSO consumers. There is no 'netting' for prosumers connected to the TSO grid.	**Use-of-network charges**[408]**:** • Household consumers are in the self-supply tariff model, and they pay only for net withdrawal (based on monthly timespan). Non-household consumers pay for gross withdrawal. • Some household prosumers do not pay full network tariff on DSO grid (based on national law)[409]. There is contracted power since 1.4.2024. (price 0 EUR/kW) for TSO and maximum measured power in all intervals for DSO and TSO. • Based on national law some network users pay network tariffs based on the difference between energy withdrawn from the grid and electricity injected to the grid, if they fulfil certain prerequisites (e.g. contracted power less than 20 kW, only households, etc.). • Further, in the residential building in which inner electrical installations are not

[407] BE-FLA: Prosumers with smart meter pay the same withdrawal charges, but prosumers without smart meter pay charges based on net withdrawal (instead of gross withdrawal) and an additional inverter power-based charge.
[408] HR: Currently price for producers is 0.000 EUR/kW. If the NRA would set tariff for producers higher than 0.000 EUR/kW, only producers/prosumers without the NRA's license would be exempted as pursuant to Article 46(16) Electricity Law (NN, 111/21, 83/23) since only producers/prosumers with the NRA's license pay the tariff.
[409] HR: RES Law (NN, 138/21, 83/23) exempted some household prosumers from paying full network charge.

Country	Transmission connected prosumers	Distribution connected prosumers
		ownership of the Croatian DSO, network users on the metering points in that building if they procure special status after installation of the generator, they do not pay full network charge they would pay otherwise.
Cyprus	**Use-of-network charges:** • The tariff is based on net withdrawal: Prosumers are charges only for the excess of withdrawn energy i.e. the injected energy is deducted (net metering is based on bi-monthly settlement)	**Use-of-network charges:** • The tariff is based on net withdrawal: Prosumers are charges only for the excess of withdrawn energy i.e. the injected energy is deducted (net metering is based on bi-monthly settlement)
Czechia	**Use-of-network charges:** • Prosumers who are providers of ancillary services and do not pay reserve capacity tariffs.	**Use-of-network charges:** • Prosumers who are providers of ancillary services and do not pay reserve capacity tariffs. • Some prosumers receive a discount from reserve capacity tariffs.
Denmark	No differentiation, exemption or discount to any prosumer. No cost-offsetting.	**Use-of-network charges:** • Some prosumers exempted by law from injection charges. Predominantly (but not exclusively) small older household PV.
Estonia	No differentiation, exemption or discount to any prosumer.	**Use-of-network charges:** • Network users with a capacity of up to 63 Amperes don't have to pay the measured power-based charge, but there is no difference in costs, because all relevant costs are also included in the energy-based and contracted power-based charges and in lump sum.
Finland	No differentiation, exemption or discount to any prosumer. No cost-offsetting of injection and withdrawal charges.	**Use of network charges:** • Some DSOs do not apply injection charges for some small producers. • Net metering applies with hourly timespan for the time being (moving towards 15-minute netting).
France	No differentiation, exemption or discount to any prosumer. No cost-offsetting of injection and withdrawal charges.	No injection charge applies.
Germany	**Use-of-network charges:** • TSOs shall offer an individual network charge to final customers that withdraw electricity from the network exclusively for storage in an electricity storage facility and feed the electricity recovered back into the network. The network charge shall consist only of an annual power-based price in EUR/kW; the network operator shall apply the concurrency function for the upper usage period range and reduce the annual power-based price to the proportion of the electricity withdrawn that is not fed back into the network. In the case of concurrent behaviour benefiting the network the individual network charge for final customers shall be no less than 20% of the annual power-based price. No other differentiation, exemption or discount to any prosumer.	**Use-of-network charges:** • DSOs shall offer an individual network charge to final customers that withdraw electricity from the network exclusively for storage in an electricity storage facility and feed the electricity recovered back into the network. The network charge shall consist only of an annual power-based price in EUR/kW; the network operator shall apply the concurrency function for the upper usage period range and reduce the annual power-based price to the proportion of the electricity withdrawn that is not fed back into the network. In the case of concurrent behaviour benefiting the network the individual network charge for final customers shall be no less than 20% of the annual power-based price. • Negative injection charge
Greece	No differentiation, exemption or discount to any prosumer.	No differentiation, exemption or discount to any prosumer.
Iceland	No data	No data

Country	Transmission connected prosumers	Distribution connected prosumers
Hungary	No differentiation, exemption or discount to any prosumer.	**Use-of-network charges:** • Net metering for some network users: Only for prosumers with micro power plants (under 50 kW) is net metering available: yearly timespan under 3×80A connection capacity and monthly timespan above 3×80A connection capacity. The withdrawal charges for them are the same as for other network users.[410] **Connection charges:** • RES Prosumers in the category of 'small-scale household power plant' are entitled to a connection charge discount (100%) compared to other producers, provided that the required injection capacity does not exceed the household's available consumption capacity (demand capacity). The capacity limit for household-scale power plants is 50 kVA or 3X63 amperes.
Ireland		**Use-of-network charges:** • No injection charge for distribution costs. • Discount for prosumers depending on profile: Auto Producers (Prosumer) MEC=0 do not pay any distribution tariffs, while Auto Producers >MEC 0 do pay withdrawal charge. Charges for withdrawal for prosumers are the same as those applied to consumers with similar technical characteristics.
Italy	No differentiation, exemption or discount to any prosumer.	**Connection charges:** • Small RES/Combined heat and power (CHP) generators are charged based on a standardised formula while for the others a specific estimate by the DSO is needed.
Latvia	No prosumers are connected to the transmission grid. However, based on current rules there were no differentiation, exemption or discount to any prosumer. They would be subject to the same injection charges as producers and the same withdrawal charges as prosumers.	**Use-of-network charges:** • Cost-offsetting: if the self-consumption load is higher or equal to the production capacity, the prosumer does not have to pay the capacity fee for injection. • The calculation is based on yearly timespan.
Lithuania	No prosumers are connected to the T-network	**Use-of-network charges:** • The prosumers do not need to pay the energy component of the use-of-network charge. • No differentiation, exemption or discount to any prosumer until July 2022. Afterwards, some differentiation in the charging of household and non-household prosumers. • Household consumers can pay for the installed capacity of the power plant, the kilowatt-hours supplied to the grid and percentage billing. The same conditions apply to non-domestic prosumers. Hourly metering applied for netting and net-metering of a virtual account is recorded over a 2 year period. Net-metering applies from 1 April to 31 March of the current year for 2 years, based on hourly timespan.

[410] HU: Net metering for micro power plants under 50 kW was introduced to incentivise their penetration, when it was low. With the current more significant level of penetration, the measure is under reconsideration.

Country	Transmission connected prosumers	Distribution connected prosumers
		Connection charges: • Prosumers are subject to a 50% discount on the connection charge.
Luxembourg	**Use-of-network charges:** • Prosumers are invoiced for the energy component on the quarter hourly withdrawal from the network. • Same withdrawal charges apply as for consumers.	**Use-of-network charges:** • Prosumers are invoiced for the energy component on the quarter hourly net withdrawal from the network. • Same withdrawal charges apply as for consumers.
Malta	N/A	**Use-of-network charges:** • No injection charge applies • No other differentiation, exemption or discount to any prosumer.[411]
Netherlands	**Use-of-network charges:** • Cost offsetting: Prosumers do not pay administrative fee for injection, only for withdrawal. • No differentiation, exemption or discount to any prosumer.	**Use-of-network charges:** • Cost offsetting: Prosumers do not pay administrative fee for injection, only for withdrawal. • No differentiation, exemption or discount to any prosumer.
Norway	No differentiation, exemption or discount to any prosumer.	**Use of network charges:** • Prosumers with injected kW up to 100 kW are exempted from the fixed G-charge component of the injection charge and their network tariff is based on net withdrawal (based on hourly timespan).
Poland	**Use-of-network charges:** • Prosumers connected to the grid by 1 April 2022 are settled on the basis of the net metering system (yearly timespan), which relies on the fact that the prosumer is allowed to withdraw (without paying for transmission services) 70/80 percent of the volume of energy injected to the grid. • New prosumers connected to the grid after 1 April 2022 pay the transmission charges like other end-users. **Connection charges:** • Discount from connection charges (same as end-users)[412]	**Use-of-network charges:** • Prosumers connected to the grid by 1 April 2022 pay variable charges (which cover part of transmission costs) and quality charge for energy withdrawn from the distribution grid. The prosumer is allowed to withdraw (without paying for the distribution services) 70/80 percent of injected energy. • New prosumers connected to the grid after 1 April 2022 pay the distribution charges like other end-users. **Connection charges:** • Discount from connection charges (same as end-users)[412]
Portugal	No differentiation, exemption or discount	**Use of network charges:** • Energy-based and power-based charge paid for both transmission and distribution costs[413]. Difference among prosumers, depending on the relative position of the generation and consumption facilities.
Romania	**Use-of-network charges:**	**Use-of-network charges:**

[411] MT: Net metering is not applicable for new RES installations since 2010. For the small number of net metering cases that still exist (pre-2010) the netting time horizon is the billing period.
[412] PL: According to law connection fee is based on investment expenditures (CAPEX) for the connection. Final consumers pay connection fee amounting to 25% of CAPEX; DSOs and producers - 100% of CAPEX; RES less than 5 MW and cogeneration less than 1 MW - 50% of CAPEX; EV charging infrastructure – 6.25% of CAPEX; storage facilities 50% of CAPEX.
[413] PT: In the case of the self-consumption regime, which corresponds to energy sharing of renewable energy over the public grid, an exemption from transmission tariffs may apply, depending on the relative position of the generation and consumption facilities. This happens because with the information on generation and consumption in 15-minute intervals, one considers that the corresponding network flows only use the network assets strictly necessary to transport that energy. For instance, if the energy sharing over the public grid involves generation and consumption only connected at distribution level, then that consumption will not be subject to the transmission tariff. In addition, proximity criteria must be met, i.e. the generator and the consumption point cannot be located too far away to be exempted from the payment of transmission tariffs. Finally, the self-consumption regime involves a further analysis on possible inverted power flows, which is still ongoing. For the example from before (generator and consumption connected at distribution), if one concludes that inverted power flows exist from distribution into the transmission grid, then it will be considered that the T-grid is at least partially being used, and a fraction of the transmission tariff must be paid as well by these network users. The exact fraction to apply will result from the ongoing study, and is currently set at zero.

Country	Transmission connected prosumers	Distribution connected prosumers
	• No transmission-connected prosumers (if there were below 5 MW installed capacity they were exempted from the transmission tariff for injection)	• Prosumers whose installed capacity is lower than 5 MW are exempted from transmission tariff for injection (Note: no distribution tariff for injection is applied)
Slovakia	**Use-of-network charges / Connection charges:** • Some/all prosumers pay different withdrawal charges (e.g. different basis, discount, etc.) • Some exemptions to some tariffs and connection charges in case of prosumers ('local source')[414]. • Total exemptions from tariffs for storage when providing ancillary services.	**Use-of-network charges / Connection charges:** • Some/all prosumers pay different withdrawal charges (e.g. different basis, discount, etc.) • Some exemptions to some tariffs and connection charges in case of prosumers ('local source')[414]. • Total exemptions from tariffs for storage when providing ancillary services.
Slovenia	**Use-of-network charges:** • The tariff is based on net withdrawal for prosumers who have equal or under 43 kW connection capacity. For other network users it is based on gross withdrawal.	**Use-of-network charges:** • Prosumers or self-consuming communities with contracted capacity up to 43 kW[415] are subject to net-metering (regarding the energy-based component of the distribution tariff for withdrawal) with 1 year accounting interval[416], while prosumers with contracted power above 43 kW are subject to gross metering[417].
Spain	No differentiation, exemption or discount	No differentiation, exemption or discount
Sweden	No prosumers are connected to the transmission grid.	**Use-of-network charges:** • All prosumers pay for withdrawal. If their production is higher than consumption, they also pay injection charges). • Small prosumers are exempted from paying injection tariff (up to 63A fuse and a maximum effect of 43.5 kW) and are only subject to a withdrawal tariff. • Net metering applies for some prosumers based on 15 minutes timespan.

Note: 'No cost-offsetting' in the table means that the storage facilities and prosumers pay the same injection charge as producers and the same withdrawal charge as consumers.

Table 33: Specific tariff regimes for citizen energy communities (CEC) and renewable energy communities (REC)

Country	Currently connected to the grid (CEC/REC)	Tariff treatment
Austria	Transmission: None Distribution: Both	Participants of a renewable energy community are paying a reduced system utilisation charge since Nov. 2021. The reduced charges refer to the quantities withdrawn from the community.
Belgium	Transmission: None Distribution: Both	BXL: Discount/specific tariffs for energy communities and energy sharing[418]: In practice, from 2023 analysing the cost/advantages of energy sharing, the exemptions applicable since 2022 as part of an innovative project are prolonged as of 2025. Complementary volumes do not enjoy any discounts. Local volumes enjoy a discount based on the characteristics of

[414] SK: "Local sources" are consumers of electricity which can install generation units and send up to their maximum reserve capacities into the grid without licence. These receive some incentives such as reduced connection tariffs and connection guarantees.
[415] SI: Volumetric charge is calculated based on annual net withdrawal for network users only in so-called self-consumption scheme, which is limited to household and small commercial users up to 43 kW connection capacity.
[416] SI: Prosumer pay a network charge for the electricity withdrawal on a monthly basis, except for those who were included in the annual net metering prior to the entry into force of the requirements of EU Directive 2019/944. Net metering regime is based on the Decree on the self-supply of electricity from renewable energy sources issued by the government.
[417] SI: Reasoning: to incentivise small consumers to become active consumers and produce their own electricity.
[418] BE-BXL: Specific tariffs for energy sharing: https://brugel.brussels/publication/document/notype/2024/fr/Grille-tarifaire-2025-2027-Partage-energie.pdf. No exemption is foreseen for public service obligation tariffs. Measure and count tariff (EUR/year) is doubled for participants taking part into energy sharing. Participants of energy sharing enjoy an exemption of local taxes, but other fees/surcharges apply for locals volumes as they do for complementary volumes. Study: following a study: https://brugel.brussels/publication/document/etudes/2023/fr/ETUDE-45-COUT-AVANTAGE-PARTAGE-CONSULTATION.pdf

Country	Currently connected to the grid (CEC/REC)	Tariff treatment
		sharing.[419]. No exemption is foreseen for public service obligation tariffs. Measure and count tariff (EUR/year) is doubled for participants taking part into energy sharing. Participants of energy sharing enjoy an exemption of local taxes, but other fees/surcharges apply for locals volumes as they do for complementary volumes.[420] FLA: same treatment as individual prosumers WAL: The NRA has decided the following from 2025 until 2029 regarding customers connected to the distribution network. From 2025, final customers of all voltages located in the same building will get an 80% rebate on DSO and TSO tariffs, excluding taxes and surcharges, on shared electricity (electricity generated in the building and shared among its occupants). Any residual electricity is charged normally. Targeted non-periodical charges (i.e. especially specific metering set-up tariffs) are forbidden for these customers and for customers in energy communities. Specific tariffs for energy sharing[421]
Bulgaria	Transmission: REC Distribution: Both	Same treatment as individual prosumers.
Croatia	None	
Cyprus	None	
Czechia	None	
Denmark	Transmission: None Distribution: Both	Same treatment as individual prosumers. However, DSOs are studying citizen energy communities in terms of grid use and tariff methodology. Methodology based on cost-reflectiveness, non-discrimination, etc. apply like other tariffs.
Estonia	None	
Finland	Transmission: None Distribution: CEC	Same treatment as individual prosumers.
France	Transmission: None Distribution: CEC	Collective self-consumers (that produce for others according to a contract and a perimeter criterion) are eligible to a specific tariff for the use of the network for the self-consumed energy.
Germany	Transmission: None Distribution: None	
Greece	Transmission: REC Distribution: Both	
Hungary	None	
Iceland	No data	
Ireland	Transmission: None Distribution: CEC	Same treatment as individual prosumers.
Italy	No data	
Latvia	Transmission: None Distribution: REC	Same treatment as individual prosumers.
Lithuania	Transmission: None Distribution: Both	Same treatment as consumers
Luxembourg	Transmission: None Distribution: Both	Same treatment as individual prosumers. Energy communities have the same advantages as prosumers provided that the community is a local community. (i.e. For certain types of local communities, quarter hourly production and consumption are netted, reducing thereby the tariffs paid for withdrawal from the network.)
Malta	None	

[419] BE-BXL: from 2023 analysing the cost/advantages of energy sharing, the exemptions applicable since 2022 as part of an innovative project are prolonged as of 2025. Complementary volumes do not enjoy any discounts. Local volumes enjoy a discount based on the characteristics of sharing: same building (A - 100% reduction on EUR/kWh term), same LT substation (B - 50% reduction on EUR/kWh term), same HT substation (C), others (D). Sharing types A, B and C are exempted of transport tariff for local volumes. Specific rules apply for EUR/kVA tariffs, if applicable for HT participants. No exemption is foreseen for public service obligation tariffs. Measure and count tariff (EUR/year) is doubled for participants taking part into energy sharing. Participants of energy sharing enjoy an exemption of local taxes, but other fees/surcharges apply for locals volumes as they do for complementary volumes. Same building (A - 100% reduction on EUR/kWh term), same LT substation (B - 50% reduction on EUR/kWh term), same HT substation (C), others (D). Sharing types A, B and C are exempted of transport tariff for local volumes. Specific rules apply for EUR/kVA tariffs, if applicable for HT participants

[420] BE-BXL: Study: https://brugel.brussels/publication/document/etudes/2023/fr/ETUDE-45-COUT-AVANTAGE-PARTAGE-CONSULTATION.pdf

[421] BE-WAL: Study: https://brugel.brussels/publication/document/notype/2024/fr/Grille-tarifaire-2025-2027-Partage-energie.pdf and https://brugel.brussels/publication/document/etudes/2023/fr/ETUDE-45-COUT-AVANTAGE-PARTAGE-CONSULTATION.pdf

Country	Currently connected to the grid (CEC/REC)	Tariff treatment
Netherlands	Transmission: None Distribution: CEC	Same treatment as individual prosumers.
Norway	None	
Poland	None	
Portugal	Transmission: Both Distribution: Both	In the case of collective self-consumption regime, corresponding to energy sharing of renewable energy over the public grid, the network tariffs paid depend on the voltage level of connection of the generating unit. The higher that voltage level is, the higher the corresponding network tariff.[422] Distribution-connected prosumers, in what regards energy that is withdrawn from the public grid, but through self-consumption energy sharing agreements, where the energy is injected directly into MV or the LV distribution grid, and subject to proximity criteria, are currently fully exempted from the distribution tariff of the HV or HV+MV distribution grid, respectively, as they are not using those voltage levels (in the future, this exemption may be less than 100% if inverted power flows become frequent).
Romania	None	
Slovakia	Transmission: Both Distribution: Both	Same network charges apply
Slovenia	Transmission: None Distribution: Both	Same treatment as individual prosumers. Self-supply communities that were established before the requirements of Directive 944/2019 came into force are accounted for on an annual net consumption basis. The new charging methodology provides for charging according to the share of use of the public network for each member of the community separately.
Spain	None	
Sweden	Transmission: None Distribution: CEC	Same treatment as individual prosumers.

Table 34: Exemption, discount, differentiation of unit tariff values or tariff basis for consumers

Country	Consumers
Austria	**Distribution-connected consumers:** • Consumers do not have to pay for the system service costs, according to law. Re-evaluation is currently not planned. • Most users-groups have a power- and energy-based distribution tariff, some LV-users (especially households) have energy-based +lump sum distribution tariff
Belgium	**Distribution-connected consumers:** **Brussels:** • LV network users pay an energy-based charge and a yearly lump sum fee based on the capacity of their connection (i.e. less than or equal to 13 kVA versus greater than 13 kVA). • HV network users with peak measurement pay an energy-based charge and a power-based charge (EUR/kW) based on their actual monthly peak capacity (maximum of the last 12 months) during peak time of use: weekdays from 7 am to 10 pm. • Social tariffs (including reduced DSO charges) apply to 'vulnerable customers' / regional protected clients. **Flanders:** • Both power-based and energy-based tariffs are applied to most non-household consumers depending on the metering regime. • Social tariffs (including reduced DSO charges) apply to 'vulnerable customers' / regional protected clients. **Wallonia:** • Social tariffs (including reduced DSO charges) apply to 'vulnerable customers' / regional protected clients.
Bulgaria	**Distribution-connected consumers:** • Some consumers have energy-based, some network users have mix of energy and power-based tariffs.
Croatia	**Distribution-connected consumers:**

[422] PT: For instance, if withdrawal and injection take both place in the LV grid, and if the public grid is used, than the withdrawal charge of the network tariff does not include the cost-cascading effect from the network tariff of higher voltage levels (i.e. it only includes the distribution tariff of LV). But if injection occurs at MV and withdrawal at LV, then only the network tariffs of the voltage levels above MV will not be included (i.e. it only includes the distribution tariffs for MV and LV).

Country	Consumers
	• Different tariff bases: Difference depends on the status of the subject on the metering point: whether it is household or non-household. Household tariff models assume that electricity withdrawn from the meter is used solely for personal consumption, not for commercial or professional activities. Other metering points fall under the one of the non-household tariff models. • There is interruptible load in the form of the direct load control in the tariff model 'Crni' for households since 2008. Some consumers have possibility to be in this special network tariff model. The DSO guaranties supply during the eight (8) hours of the day. • There is special tariff model for public lighting, exclusively for public surfaces (such as roads, squares, monuments, etc.). • Tariff model depends also on the voltage level: (a) 400 kV, (b) 220 and 110 kV, (c) [35 kV, 10 kV], (d) 230 kV. • The tariff model depends also on the contracted withdrawal power. If household has more than 22 kW it is obliged to be in tariff model with measured withdrawal power tariff element. But they can transition to tariff model without measured withdrawal power tariff element when DSO is obliged to limit its withdrawal power to 22 kW. • Possibility to transition from one tariff model to another is defined in Articles 45-48 of the General Network Rules (NN, 100/22).
Cyprus	
Czechia	**Distribution-connected consumers:** • Network users (MV and HV) under certain conditions (usage up to 600 hours, usually utilised by EV charging providers) have the option to have energy-based tariff only. However, this option is taken by a fraction of the eligible network users. The rest of the users have a mix of energy- and power-based charges.
Denmark	**Both transmission and distribution connected consumers:** • Consumers can benefit from some tariff discounts, if they choose to have limited network access or have consumption over 100 GWh.
Estonia	**Distribution-connected consumers:** • Network users with a capacity of up to 63 Amperes don't have to pay the measured power-based charge, but there is no difference in costs, because all relevant costs are also included in the energy-based and contracted power-based charges and in lump sum. • Network users have the option for energy-based only, for mix of energy-based and power-based or for mix of energy-based, power-based and lump sum charges: • Households can choose also a mix of energy-based and lump sum tariff. • MV connected consumers have to pay lower variable tariffs than LV connected consumers, but higher fixed fees. • Consumers whose electricity consumption is higher have a possibility to use network services with network charges, which include lower variable fees and higher fixed fees compared to network charges, which are more suitable for lower electricity consumption consumers
Finland	**Distribution-connected consumers:** • In general, for households and small buildings, the tariff consists of an energy-based fee and a fixed basic fee, which, in some DSOs' tariff structures, depends on the size of the main fuse. • For industrial consumers, the tariff usually consists of a basic fee, power fee, reactive power fee and distribution fee.
France	**Transmission-connected consumers:** • Consumer can benefit from a partial exemption if they have high withdrawal and a withdrawal profile that is flat or contracyclical. Exemption rate ranges from 50 to 81%.[423] **Distribution-connected consumers:** • Depending on the voltage level, there are different possible combinations of power-energy component values that users will subscribe to according to their utilisation of the network.
Germany	**Transmission-connected consumers:** • Discount for Permanent loads: Tariff reduction (discounts) is applied for consumers whose individual peak load predictably differs in a considerable way from the annual peak load of the grid and users who consume for 7.000 h/a at one connection point and whose annual consumption at this connection point crosses 10 GW/h. • Different tariff bases depending on consumer's profile: The weight of the components depends on the user's peak load that occurs simultaneously with the annual peak load of the network. For users exceeding 2,500 hours of consumption, the capacity-based term is higher than the energy-based term. The opposite is true for consumers under the 2,500-hour threshold.

[423] FR: The exemption is decided by law (art L.341-4-2 of the French Energy Code). Exemption rates can be reevaluated.

Country	Consumers
	• A discount is granted to network users who considerably shift their peak load outside the network's peak load. The discount can reach a maximum of 80% of the regular tariff the user would have paid. **Distribution-connected consumers:** • Discount for high consumption: Section 19 StromNEV (Network Charges Ordinance) regulates special forms of network usage and the resulting discounts. Final costumers with a high-power offtake during a limited period of time that contrasts with a significantly lower or zero power offtake during the remaining time shall be offered billing on the basis of monthly power-based prices in addition to the annual power-based price system. • Discount for 'Atypical' network users: Where it is apparent that a final costumer's peak load contribution will predictably deviate substantially from the concurrent annual peak load, the TSO/DSO shall offer this final costumer an individual network charge that shall take due account of the network customer's particular usage pattern and shall be no less than 20% of the published network charge. • Discount for Permanent loads: An individual network charge shall also be offered if the electricity offtake from the general supply network for own consumption at an offtake point per calendar year reaches at least 7,000 hours of use per year and electricity consumption at the offtake point exceeds ten gigawatt hours per calendar year. Where the electricity offtake from the general supply network for own consumption at an offtake point is more than ten gigawatt hours per calendar year, the individual network charge referred to in sentence 2 shall be no less than 20% of the published network charge in the case of at least 7,000 hours of use per year; 15% case of at least 7,500 hours of use per year; 10% in the case of at least 8,000 hours of use per year. The agreement of individual network charges shall require the regulatory authority's approval. The application for the approval shall be submitted by the final customer. The TSOs shall reimburse downstream DSOs for lost revenue resulting from individual network charges. They shall offset these payments and their own lost revenue from individual network charges among themselves. The costs may be passed on to the final customers as a pro-rata surcharge on the network charges. • Discount for Singularly used operating resources: Where a network user uses all the operating resources that they use at a network or transformation level above the medium to low voltage transformation level exclusively themselves, a reasonable charge for these singularly used operating resources shall be set separately between the TSO/DSO and the network user. The charge shall be based on the individually allocable costs of the singularly used operating resources at the network or transformation level. The final customer shall be treated in terms of their charge as if they were directly connected to the upstream network or transformation level. • Different weight of tariff components: Mix of energy and lump sum for LV users <100,000 kWh, a mix of energy-based and power-based tariff for LV users >100,000 kWh and for non-LV users. Tariffs generally consist of a power-charge and an energy-based charge depending on the annual consumption (kW peak for power-based charge and kWh for energy-based charge). The weight of components depends on the user's peak load occurring simultaneously with the network's annual peak load. For users exceeding 2500 hours of consumption, the power-based term is larger than the energy-based term. The opposite is true for consumers under the 2500-hour threshold. At the low voltage level for consumers without power-metering, there is only an energy-based tariff unless DSOs make use of the option to additionally introduce a so-called 'base charge' (lump sum). The combined tariff consisting of an energy-based component and the base charge must be proportionate to the tariff (consisting of a energy-based and a power-based component) that would be applicable on the low voltage level in case of power metering. The vast majority of DSOs make use of this option.
Greece	**Transmission-connected consumers:** • Allocation of costs based on aggregate demand of each consumer class (HV, MV, LV) during the summer and winter peak (2 hours annually). HV/MV consumers pay fully capacity-based tariffs, LV consumers tariffs are mostly energy- based (80-100%, depending on the type of customer) • Agricultural consumers are exempt from TSO and DSO tariffs because they participate in interruptible load services. • **Tariff rebates for large consumers:** HV users with annual energy consumption and load factor above a lower limit, are entitled to rebates on the calculated transmission network charges. **Distribution-connected consumers:** • For MV network users the power-based charge is based on the actual power at specified time (e.g. system peak periods). For LV network users the power-based charge is based on contracted or rated power. • Agricultural consumers are exempt from TSO and DSO tariffs because they participate in interruptible load services.

Country	Consumers
Hungary	**Distribution-connected consumers:** • Larger users at low voltage level above 3×80A connection capacity and users connected to higher voltage levels have a mix of energy-based, power-based and lump sum charge, while other users have a mix of energy-based and lump sum charge.
Iceland	No data
Ireland	**Transmission-connected consumers:** • Based on how the consumer is connected to the grid, i.e. transmission-connected, distribution-connected with a Minimum Import Capacity (MIC) ≥ 0.5MW or distribution-connected with MIC <0.5MW the power-based charge is different. The energy charge does not vary. • Demand customers pay 50% of connection charges, while producers pay 100%. The intent of these standard connection charges is to provide a reasonable degree of certainty for parties seeking to connect to the distribution and transmission systems in Ireland, particularly the large number of new RES generators. **Distribution-connected consumers:** • Different tariff basis: some network users have only energy-based charge, some network users have a mix of energy-based and lump sum charge and some network users have a mix of energy-based, power-based and lump sum charge.
Italy	**Transmission-connected consumers:** • Customers on HV and EHV levels pay the same power-based component, while the energy-based component is slightly lower for EHV customers. Customers at lower voltage levels pay on the basis of energy. **Distribution-connected consumers:** • Different tariff basis for public lighting: For most users, the network tariff has three components: fixed, energy-based and power-based. The energy-based component is only addressing transmission; therefore, the distribution tariff can be deemed as a combination of fixed and power-based. Only energy-based charge is applied for public lightning and public charging points for electric vehicles. • Discount for vulnerable customers: Since 2008, 30% discount on consumer's estimated annual electricity bill (including all components, taxes and network tariffs as well), as far as the customer is officially recognised as vulnerable. Automatisation of the process since 2020. • ARERA decision 541/2020 introduced the possibility of a free-of-charge capacity increase for small LV clients (households and very small businesses) during night hours and Sundays to favour EV recharging during light load hours; such opportunity is targeted to consumers with private EV charging points equipped with a smart wallbox. Currently, almost 90% of such clients have a 3.3 kW contractual capacity limit, with the above decision, the capacity limit during light load hours is increased to 6 kW. Note also that power withdrawal is limited by a breaker onboard the meter which trips above the contractual limit.
Latvia	
Lithuania	**Transmission-connected consumers:** • Consumers whose electrical equipment has a permissible capacity less than 30 kW are partially exempted. **Distribution-connected consumers:** • Discounts for agricultural users: For farms of farmers, whose annual income from agricultural activities makes up more than 50 percent of the total income received, whose economic size in the tax period from January 1 to December 31 of the previous year, according to the calculations made in accordance with the procedure established by the Minister of Agriculture, is equal to 14 units of economic size or less , the same electricity prices and tariffs applied as for domestic consumers. Also for subjects of agricultural activity, whose agricultural holdings are registered in the Register of Agricultural and Rural Businesses of the Republic of Lithuania and whose annual income from agricultural activity is more than 50 percent of the total income received, the economic size of which is in the tax period of the previous year from January 1 to December 31 according to the calculations made according to the procedure established by the Minister of Agriculture, is greater than 14 units of economic size, and for recognised agricultural cooperative companies (cooperatives) receiving (receiving) electricity from low-voltage electricity networks, the power component of the relevant tariff is applied only in the months of August, September and October.
Luxembourg	**Distribution-connected consumers:** • Prior to 2025, the withdrawal charge consisted of an energy component and a lumpsum. Since 2025 the lumpsum was replaced by a power-based component consisting of a reference power-level allocated to each consumer and fees for exceeding the reference

Country	Consumers
	power level.[424] On all other voltage levels power-based distribution charges are based on measured power.
Malta	**Distribution-connected consumers:** • The registered consumer on a 'Non-Residential Premises Service' with a connection capacity rated above a 100 Amps per phase may apply to be metered and billed in kVAh tariffs instead of kWh tariffs. A specific methodology for an all-inclusive tariff covering the energy, distribution and supply costs has been determined for Shore-side Electricity ships when berthed in maritime ports in Malta. There is no specific separate tariff or methodology for the use of the distribution networks.
Netherlands	• No discount: The large industrial consumers connected to the EHV or HV transmission grid used to receive partial tariff exemption if they meet certain criteria (consumption level and profile). However, it was phased out.
Norway	**Transmission-connected consumers:** • Large network users pay a lower tariff rate to the transmission network. Large network users are individual companies with a power consumption over 15 MW and an annual energy consumption exceeding 100 GWh[425]. **Distribution-connected consumers:** • Fixed tariff charge differs industry and households.
Poland	**Transmission-connected consumers:** • Special end-users pay reduced quality fee covering the system costs. The coefficient that is used is 0.1. Special end-users are end-users who use for their own purposes in a calendar year at least 400 GWh electricity, with not less than 50% contracted capacity, for which the cost of electricity constitutes not less than 15% of the production value. • For transmission-connected network users the charge is based on the reserved contractual capacity. For the points of delivery where the distribution network is connected, the charge is based on the actual energy flows. • A capacity surcharge for capacity market costs is set by the law which awards more symmetric withdrawal profiles across peak and off-peak hours is applied[426]. • Discount from connection charges[427]: Final consumers pay connection fee amounting to 25% of CAPEX. **Distribution-connected consumers:** • A capacity surcharge for capacity market costs is set by the law which awards more symmetric withdrawal profiles across peak and off-peak hours is applied[426].
Portugal	**Distribution connected consumers:** • Discount for vulnerable customers[428].
Romania	
Slovakia	**Transmission-connected consumers:** • Some of the largest industrial consumers are partially exempted (tariff reduction). • For support of industry the NRA has implemented individual tariff settlement process.
Slovenia	**Transmission-connected consumers:** • Directly connected feeders to the grid do not pay a grid fee for withdrawal from the grid. **Distribution-connected consumers:** • Directly connected feeders to the grid do not pay a grid fee for withdrawal from the grid. • Tariff discounts for some EV-recharging stations (see Table 36).
Spain	**Distribution-connected consumers:** • Household consumers have 2 terms of contracted power to encourage EV charging in off-peak periods. • Different tariff structure options for EV-recharging stations (see Table 36)

[424] LU: https://www.myilr.lu/en/a-new-network-use-tariff/
[425] NO: Differentiation of tariffs between network customers is accepted and must be based on "objective, non-discriminatory criteria". The reason to have a reduced tariff for large consumption is that they reduce system costs. Without large consumption using electricity in the summer period, the cost of providing system services would be higher.
[426] PL: The surcharge (PLN/MWh) is based on the energy taken in peak hours. It applies to end-users with contracted capacity over 16 kW. Smaller end-users, i.e. households pay lump sum surcharge (PLN/Month). The lump sum surcharges are different for end-users with annual consumption up to 500 kWh, 500 - 1200 kWh, 1200-2800 kWh and over 2800 kWh. Capacity surcharge is multiplied by coefficient which 1 or lower than 1 depending on whether the withdrawal is similar in peak and off-peak hours or not. (E.g. for end users which withdrawal is similar in peak and off peak hours coefficient is lower than in case of bigger difference between the withdrawal in peak and off-peak hours. (i.e. 0.17 versus 0.5 / 0.83 and 1.)
[427] PL: According to law connection fee is based on investment expenditures (CAPEX) for the connection. Final consumers pay connection fee amounting to 25% of CAPEX; DSOs and producers - 100% of CAPEX; RES less than 5 MW and cogeneration less than 1 MW - 50% of CAPEX; EV charging infrastructure – 6.25% of CAPEX; storage facilities 50% of CAPEX.
[428] PT: Costs included in the transmission tariff for the global use of the system depend on the wholesale price. In case of high wholesale prices, the cost paid by network users decreases. Social discount on the energy bill (currently 33.8% of the pre-tax end-user prices). The discount is reflected in the bill through a discount in the network access tariff. Approximately 15% of domestic customers are considered vulnerable.

Country	Consumers
Sweden	**Distribution-connected consumers:** • In general, households often have a fixed charge (based on fuse size) plus energy charges. LV consumers other than households often have energy, power and fixed charge. HV consumers have energy, power and fixed components. • Specific tariff for EV-recharging stations (see Table 36)

Note: for information on differences regarding the application of time-of-use (ToU) across consumers please refer to Table 40 and Table 42. For information on treatment of P2X facilities and public EV charging stations please refer to Table 35 and Table 36 respectively.

Table 35: Tariff treatment of Power-to-Gas or other Power-to-X facilities

Country	Currently connected P2X to the transmission and/or distribution grid	Description of the tariff treatment
Austria	Transmission: None Distribution: P2X (withdrawing only)	**Use-of-network tariffs:** Power-to-gas/Power-to-X plants with a minimum capacity of 1 MW are exempt from all system utilisation charges and charges for system losses that are normally paid for by consumers. This exception is valid for a period of 15 years from their start of operations. **Connection charges:** Exemption from connection charge applies for P2G units with grid connection of <200 lfm/Mwel (set by national law).
Belgium	Transmission: None Distribution: BXL: No data FLA: No data WAL: None	
Bulgaria	None	-
Croatia	None	-
Cyprus	None	-
Czechia	None	-
Denmark	Transmission: None Distribution: P2X (withdrawing only)	No difference (i.e. same tariff setting/treatment to any P2G/P2X facilities and consumers at the same distribution voltage level). If P2X facilities include production, it is charged as a prosumer.
Estonia	None	-
Finland	Transmission: P2X (injecting and withdrawing at the same premises)	
France	Transmission: None Distribution: P2X (withdrawing only)	No difference (i.e. same tariff setting/treatment to any P2G/P2X facilities and consumers at the same distribution voltage level)
Germany	Transmission: None Distribution: P2X (withdrawing only)	**Use of network charges:** Some difference between some P2G/P2X facilities and consumers at the same distribution voltage level set by national law[429]. Facilities in which hydrogen has been produced by water electrolysis or in which gas or biogas has been produced by hydrogen produced by water electrolysis and then methanised are also exempted. Those facilities are also exempted from injection charges for the gas network. The transmission system operators shall reimburse downstream electricity distribution system operators for lost revenue resulting from exempted network charges. They shall

[429] DE: Section 118 para. 6 Energy Industry Act

		offset these payments and their own lost revenue from exempted network charges among themselves. The costs may be passed on to the final customers as a pro-rata surcharge on the network charges.
Greece	None	-
Hungary	None	-
Iceland	No data	
Ireland	None	-
Italy	None	-
Latvia	None	-
Lithuania	None	-
Luxembourg	None	-
Malta	None	-
Netherlands	None	-
Norway	None	-
Poland	None	-
Portugal	None	-
Romania	None	-
Slovakia		No difference (i.e. same tariff setting/treatment to any P2G/P2X facilities and consumers at the same transmission voltage level)
Slovenia	None	-
Spain	Transmission: P2X (some withdraw only; some both withdraw and inject) Distribution: P2X (some withdraw only; some both withdraw and inject)	**No difference** (i.e. same tariff setting/treatment to any P2G/P2X facilities and consumers at the same distribution voltage level)
Sweden	None	-

Table 36: Publicly accessible recharging points for electric vehicles (EVs) connected to the distribution grid.

Country	EV-charging points currently connected to the grid	Bi-directional charging option[430]	Tariff distinction between fast/slow charging[431]	Charging per individual charger[432]	Further description of the charge
Austria	Yes	No	No	No[433]	
Belgium	Yes	BXL: No FLA: No WAL: Yes	No	No[434]	BXL: All tariffs are the identical FLA: There is no specific tariff regime for recharging points WAL: The same as for producers and consumers
Bulgaria	Yes	Yes	No data	No data	
Croatia	Yes	No	No	No[435]	
Cyprus	Yes	Yes	No	Yes	Fixed energy-based charge
Czechia	No data to the NRA	No data to the NRA	No data to the NRA	No data to the NRA	Network users (MV and HV) under certain conditions (usage up to 600 hours, usually utilised by EV charging providers) have the option to have energy-based tariff only
Denmark	Yes	Yes	No	No[436]	Same as other consumers/prosumers. The peak

[430] "Bi-directional charging option" means that there is at least one publicly accessible recharging point for electric vehicles connected to your distribution grid with bidirectional charging option (i.e. also vehicle to grid)
[431] "Tariff distinction between fast/slow charging" means that the DSO charge (connection charge, use-of-network charge, etc.) distinguish fast from slow charging, depending on the maximum charging power of the charger or of the EV. It does not account for difference in the final bill due to application of power-based charges or because different voltage levels have different charges.
[432] Charging per individual charger means that in case of publicly accessible recharging stations, with more than one charger, the DSO charges applied individually to each charger and NOT to the aggregate to the collection of chargers (e.g. to measure the power component, in EUR/kVA or EUR/kW)?
[433] AT: Charging depends on whether the chargers are connected to the grid individually or in an aggregated form.
[434] BE-FLA: The use-of-network charges are applied to each metered connection point. So, depending on the configuration of the charging station (i.e. many DSO meters or a single DSO meter), it may change.
[435] HR: It is the same as for the any other metering point. Many recharging stations can be connected to the single metering point.
[436] DK Tariffs are based on metering at POC, like other consumers.

Country	EV-charging points currently connected to the grid	Bi-directional charging option[430]	Tariff distinction between fast/slow charging[431]	Charging per individual charger[432]	Further description of the charge
					power determines the capacity like all other consumers on +10 kV
Estonia	Yes	No	No	No[437]	Charging variables: capacity-based charge, energy-based charge and lump sum. ToU is mandatory. Load control isn't applied. No Vehicle-to-grid charges to reduce tariff payment or increase tariff payment. No exemptions, discounts or differentiations compared to other consumers connected to the same voltage level and charging their EV at home
Finland	Yes	Yes	No	No	Tariff treatment varies across the DSOs.The NRA is not aware of the exact practices
France	Yes		No	No[438]	Reduced connection charge versus other consumers
Germany	Yes	Yes	No	No[439]	
Greece	Yes	No data	No data	No data	No data
Hungary	Yes	Yes	No	No data	No ToU No vehicle-to-grid charges No exemption, discount or differentiation compared to other consumers connected to the same voltage level and charging their EV at home
Iceland	Yes	No	No	No	NOTE: there are also public EV charging points connected to the Transmission grid
Ireland	Yes	No	No[440]	No[441]	Distribution charges do not differ from distribution charges applied to other network users
Italy	Yes	No data	No data	No data	Different tariff basis for public EV charging points: operators of dedicated public points for electric vehicle recharging (i.e. points without any other loads connected) can opt for a special tariff structure, which is energy-based only, or opt for the same tariff structure for withdrawal applied to other Italian network users[442]
Latvia	Yes	Yes	No	No	Distribution charges do not differ from distribution charges applied to other network users
Lithuania	Yes	No	No	No	Distribution charges do not differ from distribution charges applied to other network users

[437] EE: If each charger has its own connection point to the distribution grid. If several chargers are connected to the network through one connection point, distribution charges are applied in aggregate to the collection of chargers.
[438] FR: Distribution charges are applied on aggregate to the collection of chargers of the station.
[439] DE: Charges applied in aggregate.
[440] IE: Depend on MIC connection points
[441] IE: Distribution charges are applied to the collection of chargers, as these are all connected to a single MPRN, and distribution charges are levelled at the MPRN level.
[442] IT: For most users, the network tariff has three components: fixed, energy-based and power-based. The energy-based component is only addressing transmission; therefore, the distribution tariff can be deemed as a combination of fixed and power-based.

Country	EV-charging points currently connected to the grid	Bi-directional charging option[430]	Tariff distinction between fast/slow charging[431]	Charging per individual charger[432]	Further description of the charge
Luxembourg	Yes	No	No	No[443]	Distribution charges do not differ from distribution charges applied to other network users
Malta	Yes	No	No	No	For dedicated electric vehicles charging points there is a Lump Sum for EV meter installation, a Fixed EV meter service charge and an Energy Based charges based on consumption time. Network users have full load control. Vehicle-to Grid charge is not applicable. In the case of the specific EV charging tariffs there is no maximum demand tariff even if the service rating is larger than 60 Amps per phase
Netherlands	Yes	No	No	No[444]	These connections typically fall in the category of small electricity consumers (up to 3x80A). These users pay a yearly fixed tariff based on the capacity of their connection (e.g. 3x35A, 3x35A, etc.)
Norway	Yes	No	No	No[445]	Charging points for EVs pay the same connection charge as any other grid user (based on actual costs) and are subject to the same tariff design as other customers
Poland	Yes	No	No	No	Discount from connection charges[446]: EV charging infrastructure pay connection fee amounting to 6.25% of CAPEX
Portugal	Yes	No data	No data	No data	different tariff structure compared to other network users: the distribution tariff is converted into an energy-only charge (EUR/kWh), different than the general structure that also includes power charges (EUR/kW or EUR/kVA): the tariff applies to EV users through their electricity mobility supplier, and not to charging points operator; A vehicle-to-grid (V2G) pilot project took place in the autonomous region of Azores. Overall, the conclusion is that V2G charging can improve the stability of the grid, can absorb excess RES during the night and

[443] LU: Measured power is considered at the point of connection, independent of the number of chargers behind that point.
[444] NL: Depending on the configuration but if the station has one connection to the grid the network charge is based on the total of the single connection and not individually per charger.
[445] NO: Network charge is applied in aggregate to each station
[446] PL: According to law connection fee is based on investment expenditures (CAPEX) for the connection. Final consumers pay connection fee amounting to 25% of CAPEX; DSOs and producers - 100% of CAPEX; RES less than 5 MW and cogeneration less than 1 MW - 50% of CAPEX; EV charging infrastructure – 6.25% of CAPEX; storage facilities 50% of CAPEX.

Country	EV-charging points currently connected to the grid	Bi-directional charging option[430]	Tariff distinction between fast/slow charging[431]	Charging per individual charger[432]	Further description of the charge
					can even generate additional income for the EV owner[447]
Romania	Yes	No data	No data	No data	No data
Slovakia	Yes	No data	No data	No data	For EV recharging points a separate tariff is provisionally introduced (regarding the system access component and the electricity distribution component)
Slovenia[118]	Yes	No	No	No[448]	Charging variables (Capacity-based / Energy-based) ToU (Mandatory) Discounts: EV charging points connected directly to the low-voltage grid pay a reduced network charge.
Spain	Yes	No	No	No	Different tariff structure options: EV can choose between two time of use tariffs, the general tariff and a specific transitional tariff with a higher weight of the energy component, although the allocated cost is the same.
Sweden	Yes	Yes	No	No[449]	Some DSOs have a specific tariff for recharging stations. These are based on flexibility of usage meaning the incentive is cost-neutral for the DSO.

Table 37: Application of charges for reactive energy

Country	Transmission charges	Distribution charges
Austria	Yes, reactive withdrawals only	No
Belgium	Yes, reactive withdrawals and injections	Brussels: reactive withdrawals only Flanders: reactive withdrawals and injections Wallonia: reactive withdrawals only
Bulgaria	Yes, reactive withdrawals and injections	No data
Croatia[450]	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Cyprus	No	No
Czechia	No	Yes, reactive withdrawals and injections
Denmark	No	No
Estonia	No	Yes, reactive withdrawals and injections
Finland	No	Yes, reactive withdrawals and injections
France	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Germany	Yes[451]	No
Greece	No	No
Hungary	No	Yes, reactive withdrawals (inductive) and injections (capacitive)
Iceland	No data	No data

[447] PT: It involved 10 EVs charging at 10 dedicated charging stations, installed at the power utility of the island, during 90 we eks and ended in December 2021. The 10 EVs injected during the 43 000 hours of operation more than 100 MWh into the grid and allowed savings of 15.2 tons of CO2 emissions. Also, each EV observed savings in the electricity bill up to 50 EUR per month, without damaging the EV battery due to V2G usage.
[448] SI: The network charge is payable per connection point of the charging station and not per individual charging point.
[449] SE: In one of the largest DSOs it varies depending on how the charging operator has built the facility and the setup. Answer from another DSO: Charges are applied on the aggregate based on the usage at the connection point,
[450] HR: Applicable to both DSO and TSO users with the same formula: Article 81 of the General Network Rules (NN, 100/22). "Excess reactive power" includes the capacitive reactive energy and inductive reactive energy in the limit of 0.95 of active energy, the formula is the same for TSO and DSO in the Article 81 General Network Rules (NN, 100/22), and the same was valid in Old General Network Rules (NN, 85/15, 49/20) in Article 44. DSO network user does not pay TSO costs through reactive power tariff charge.
[451] DE: Assets that cause demand for reactive energy beyond certain thresholds have to pay a separate charge for it.

Ireland	No data	Yes, reactive withdrawals only
Italy	Yes, reactive withdrawals only until 03/2023	Yes, reactive withdrawals only until 03/2023
Latvia	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Lithuania	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Luxembourg	No	No
Malta	N/A	No
Netherlands	No	Yes, reactive withdrawals and injections
Norway	Yes, reactive withdrawals only	Yes, reactive withdrawals only
Poland	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Portugal	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Romania	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Slovakia	No	Yes, reactive withdrawals and injections
Slovenia[452]	Yes, reactive withdrawals and injections	Yes, reactive withdrawals and injections
Spain	Yes, reactive withdrawals only	Yes, reactive withdrawals only
Sweden	No	No

Table 38: Application of charges for reactive energy at distribution level

Country	Distribution tariff (reactive withdrawals)	Distribution tariff (reactive injections)
Belgium	Brussels: Q above a percentage of P Flanders: Q above 48.4% of P Wallonia: Q above a percentage of P	Brussels: no charges for injections Flanders: Q above 48.4% of P Wallonia: no reactive injection, no charge
Bulgaria	No data	No data
Croatia[453]	Power factor below 0.95[454]	Power factor below 0.95
Czechia	Power factor below 0.95	No reactive injection allowed
Estonia	Q above 15% of P[455]	Q above 15% of P[455]
Finland	DSOs are free to decide tariff structures	DSOs are free to decide tariff structures
France	Q above a percentage of P - DSOs decide	Q above a percentage of P DSOs decide
Hungary	Q above 25% of P (LV) – Q above 30% of P (MV)	
Iceland	No data	No data
Ireland	Power factor below 0.95	No reactive injection allowed, no charges
Italy	Q above 33% of P	No reactive injection allowed, no charges until March 2023
Latvia	Power factor below 0.929	No reactive injection allowed
Lithuania	Users with >30 kW charged 0.006 EUR/kVArh	Users with >30 kW charged 0.012 EUR/kVArh
Netherlands	Power factor below 0.85[456]	No reactive injection (power factor 1)
Norway	DSOs decide the limit	No reactive injection allowed, no charges
Poland	Tg fi below tg fi0 – usually 0,4. HV.MV and in some cases LV	Market-based and linked to active energy price * mVarh
Portugal[457]	Q above 30% of P (measured outside the off-peak hours)	Measured during off-peak hours. DSO decides whether to apply the reactive charge approved by the regulator or not to apply any charge.
Romania	Power factor below 0.9	Power factor below 0.9 (capacitive)
Slovakia	Based on power factor cos fi = 0,95	No reactive injection allowed
Slovenia	9.02 EUR/Mvarh for low and medium voltage	9.02 EUR/Mvarh for low and medium voltage; 3.52 EUR/Mvhar for high voltage
Spain	Q above 33% of P	Power factor below 0.98 (capacitive), no charges
Sweden	DSOs decide	DSOs decide

Note: Q=reactive power exchanged, P=active power exchanged

[452] SI: Mandatory only for users above 43 kW.
[453] HR: The Article 34 DSO Network Code (NN, 74/18, 52/20) allows the DSO to contract with network user different power factor, but in general it should be between 0.95 and 1 in the inductive direction for consumer.
[454] HR: the national law allows the DSO to contract with network user different power factor, but in general it should be between 0.95 and 1 in the inductive direction for consumer. "Excess reactive power" includes the capacitive reactive energy and inductive reactive energy in the limit of 0.95 of active energy. DSO users do not pay the reactive power tariff for the TSO.
[455] EE: When reactive energy is withdrawn or injected, a network charge must be paid if the ratio between the amount of reactive energy withdrawal or injection and the amount of active energy consuming is greater than 15%. If this ratio is 15% or less, no fee is charged for the reactive energy.
[456] NL: The reported limits apply to consumers. For producers connected to LV network: power factor 0.9, for producers connected to MV network: power factor 0.98
[457] PT: These are the rules applicable to reactive withdrawals and injections from consumers. For producers, specific rules apply.

Table 39: Actual values of charges for reactive energy at distribution level

Country	Distribution tariff (reactive withdrawals)	Distribution tariff (reactive injections)
Belgium	Brussels: 15 EUR/Mvarh Flanders: 12.9432EUR/Mvarh Wallonia: 15 EUR/Mvarh	Brussels: no charges for injections Flanders: 15.4499 EUR/Mvarh Wallonia: no charges for injections
Bulgaria	No data	No data
Croatia	Around 20 EUR/Mvarh[458]	Around 20 EUR/Mvarh
Czechia	It is not possible to determine in EUR/Mvarh, charges for withdrawal of reactive energy is computed from maximal power withdrawn in MW and amount of withdrawn energy in MWh and from power factor	18 EUR/Mvarh
Estonia	4.1 or 5.8 EUR/Mvarh (depending on voltage)	6.5 or 7.9 EUR/Mvarh (depending on voltage)
Finland	Varies per DSO	Varies per DSO
France	Varies per DSO	Varies per DSO
Hungary	Around 10 EUR/Mvarh for low voltage Around 7 EUR/Mvarh for medium voltage	No data
Iceland	No data	No data
Ireland	No data	No charges for injections
Italy	7.92 - 10.24 EUR/Mvarh for low voltage 2.71 - 3.51 EUR/Mvarh for medium voltage	No charges for injections
Latvia	4 EUR/Mvarh	13 EUR/Mvarh
Lithuania	6 EUR/Mvarh	12 EUR/Mvarh
Netherlands	Varies per DSO	Varies per DSO
Norway	No data	No charges for injections
Poland	Market-based and linked to active energy price	Market-based and linked to active energy price
Portugal[459]	10.6-31.8-95.4 EUR/Mvarh for low voltage > 41.4 kVA 8.4-25.2-75.6 EUR/Mvarh for medium voltage	24.3 EUR/Mvarh for low voltage > 41.4 kVA 18.9 EUR/Mvarh for medium voltage
Romania	18.6 EUR/Mvarh	18.6 EUR/Mvarh
Slovakia	Varies per DSO, additional fee	Varies per DSO, additional fee
Slovenia[118]	9.02 EUR/Mvarh	9.02 EUR/Mvarh
Spain	41.554-62.332 EUR/Mvarh	No charges for injections

Table 40: Application of time-of-use signals in transmission tariffs and the temporal granularity of time-of-use transmission tariff structures

Country	Application of ToU signals in transmission tariffs	Seasonal	Day of week (working day / weekend or holiday)	Within-day (peak/ off-peak or day/ night)
Austria	No	-	-	-
Belgium	Yes[460]	Peak (1 November-31 Marc) Off-peak (1 April–30 September)	Peak (Monday–Friday) Off-peak (Weekend, holidays)	Peak (17:00-20:00) Off-peak (10:00-19:00)
Bulgaria	No	-	-	-
Croatia	Yes	Not applied	Not applied	'Winter' peak (08:00-22:00), 'Summer' peak (7:00, 21:00)

[458] HR: Price for consumers is 0.021236 EUR/kvar, but it is not separated on capacitive and inductive. Basis for network charge (kvar) is defined as |inductive|+|capacitive| - 0.33 x |active energy| if this is greater than 0, formula in Article 81 General Network Rules (NN, 100/22).

[459] PT: Charges for reactive energy withdrawals, outside the off-peak hours, are applied in a three-step approach. The reactive energy exceeding 30% of active energy, but below 40%, is charged with the lowest unit price. The reactive energy between 40% and 50%, is charged with the intermediate unit price. The reactive energy exceeding 50% is charged with the highest unit price. Any reactive injections (received by the network) during off-peak hours is charged with the same reactive energy charge. These charges (reactive withdrawals and injections) are applicable to consumers. For producers, other specific rules apply.

[460] BE: A peak tariff period has been determined based on observations of synchronic peak load occurrences. Within the peak tariff period the annual peak-load tariff is non-zero, outside the peak tariff period it is zero. Peak tariff period is between November and March, Monday to Friday (except public holidays), from 17:00 to 20:00. Since 2024, an off-peak tariff period was introduced regarding the Monthly peak tariff. Within the off-peak tariff period the monthly peak-load tariff is zero; outside it is non-zero. The off-peak tariff period is from April to September (included) during the weekends and holidays from 10:00 to 19:00.

Country	Application of ToU signals in transmission tariffs	Seasonal	Day of week (working day / weekend or holiday)	Within-day (peak/ off-peak or day/ night)
Cyprus	No[461]	Allowed, but currently not applied.	Allowed, but currently not applied.	Allowed, but currently not applied.
Czechia	No	-	-	-
Denmark	No[462]	-	-	-
Estonia	Yes	Peak (1 October-31 Marc)	Not applied	Peak (07:00-23:00)
Finland	Yes	Peak (1 December–28 February)	Not applied	Peak (07:00-21:00)
France	Yes[463]	Summer (1 April-31 October); Winter (1 November–31 March); Super-peak (1 December - 28 February)	Super peak and peak period (Monday–Friday, except holidays)	Super-peak (09:00-11:00 and 18:00-20:00) Peak (07:00-09:00, 11:00-18:00, 20:00-23:00) Off-peak (23:00 – 07:00)
Germany	No	-	-	-
Greece	(Yes)[464]	System peak periods are defined for every month of the year and they normally vary by season. Currently: October- March and April - September	For non-working days no system peak periods defined	Pre-defined system peak periods[465] Currently: Peak (17:00-22:00 or 19:00-23:00 depending on the season[466])
Hungary	No	-	-	-
Iceland	No data	No data	No data	No data
Ireland	ToU tariffs have been recently introduced	No	No	Daily peak/off-peak tariff applied to certain Transmission system connections. The peak is between 17:00 and 19:00[467].
Italy	No	-	-	-
Latvia	No	-	-	-
Lithuania	No	-	-	-
Luxembourg	No	-	-	-
Netherlands	Yes (from 2025)[468]	Three seasons: December – February (peak season); October, November, March	Weekend days and public holidays always have variation of off-peak season, weekdays have	There are five weighing factors/levels, each hour of the day is assigned a certain

[461] CY: The network charge has currently no time differentiation (i.e. the same rates apply), but the framework allows for time differentiation by seasons, day of week and peak/off-peak within a day Time periods: June - September (High Demand Season) versus October - May; weekdays versus weekends and holidays; daily peak (June - September: 16:00 - 23:00; October - May: 09:00 - 23:00)
[462] DK: The TSO has considered introduction of ToU tariffs and submitted a tariff methodology for approval to the NRA.
[463] FR: Note: Seasonal signal and peak/off-peak applied to withdrawal for users connected at 63-225 kV. There is no seasonal signal applied at 400 kV. Seasons are defined based on historical load curves. The TSO may modify seasons. The off-peak periods differ by region (south-west of France / rest of the country).
[464] GR: Transmission-connected, distribution-connected MV and distribution-connected LV customers with subscribed capacity of at least 85 kVA. For users equipped with hourly meters, transmission tariff charges are based on their demand during predefined system peak periods. There is no charge for demand outside these system peak periods. For users equipped with conventional meters, load profiles are used to derive peak period demand profile per user category (e.g. industrial, commercial, etc.) and allocate Transmission costs proportional to that peak demand. Then, the unit charge to recover allocated costs is based on the annual energy consumption of each user category. It is measured (average) demand during system peak periods. It is expressed on a per MW basis. The chargeable demand is calculated each month, as the average of the 80 highest 15-minute demand values of the customer, observed during system peak periods in the month.
[465] GR: System peak periods are proposed by the TSO and approved by the NRA. On an annual basis, the TSO assesses the need to redefine system peak periods and submits a proposal to the NRA. Assessment is based on analysis of system load in the previous 2 years. A proposal to redefine system peak periods should be based on evidence of significant shift in system peaks. The decision to redefine system peak periods is taken before 30 June of the year preceding the first year of application.
[466] GR: EET/EEST October - March: 17:00-22:00; April - September: 19:00-23:00.
[467] IE: https://cms.eirgrid.ie/sites/default/files/publications/Statement_of_Charges_2024-2025.pdf
[468] NL: ToU signals in transmission tariffs are introduced from 1 January 2025. ToU Transmission tariffs for the withdrawal of the energy from the grid apply to all Transmission-connected network users (and to DSOs).

Country	Application of ToU signals in transmission tariffs	Seasonal	Day of week (working day / weekend or holiday)	Within-day (peak/ off-peak or day/ night)
		(shoulder season); April – September (off-peak season)	variation according to the relevant season.	weighing factor. In peak and shoulder season weighing factors 1 to 4 are applied, in off-peak season and weekend days weighing factors 3 to 5 are applied.
Norway	No static ToU tariffs. Marginal loss tariffication applies.[469] (For both injection and withdrawal)	Not applied		
Poland	No	-	-	-
Portugal[470]	Yes[471]	Winter (when winter time starts) / Summer (when summer time starts) peak/half-peak/normal off-peak/super off-peak hours vary per season	Saturdays and, Sundays have different hours for half-peak/normal off-peak/super off-peak, no peak in weekend	Peak (5h in winter, 3h in summer) / Half-peak (12h in winter, 14h in summer) / normal off-peak (3 hours) / super off-peak (4h per day all days)
Romania	No	-	-	-
Slovakia	No	-	-	-
Slovenia[118]	Yes *Change in 2024: New tariff methodology with 2 seasons and 5 time blocks for both transmission and distribution network charges* Critical peak pricing applies.[472]		Peak (Monday – Friday, except holidays)	Peak (06:00-22:00)
Spain	Yes[473]	4 seasons (high, medium-high, medium and low) The definition of the seasons varies between the	Peak (Monday – Friday) Off-peak (Weekend, holidays)	6 periods for power-based charges (except for households, who have 2 periods: 08:00 to 24:00/ 00:00 to 08:00 and off-peak days)

[469] NO: No static ToU tariffs. Marginal loss tariffication applies, which aims at providing a more correct price signal in each node reflecting the changes in overall losses in the system by a marginal input/output.
Marginal percentages calculated each week differentiated day/night and weekend.
The energy charge is marginal percentage multiplied with spot price for each hour.
[470] PT: The time structure presented corresponds to the weekly time schedule, where the ToU structure differs between workings days, Saturdays and Sundays. For low voltage end-users, a daily time schedule is also available, where all days of the year follow the same structure (more information is available here, in Portuguese).
[471] PT: Note: The time signal with four periods applies to active energy (EUR/kWh).
In addition, the peak power variable, in EUR/kW/day, also reflects an additional time signal during the peak period.
[472] SI: For consumers on MV and higher, the capacity charge is determined as the average of the three highest peaks (15 minutes) in critical-time period, which is defined by TSO and different for specific DSO or CDSO (closed distribution system operator). The TSO defines and publishes critical-time periods (2 hours per working day inside of peak period) before next calendar year. If the average of three registered peaks inside critical time period is lower than 15% of the highest monthly peak outside critical time period, consumer pays for 15% of highest peak anyway.
[473] ES: Time differentiations are designed according to characterization of the demand, where it is observed there are daily 2 peaks (morning and afternoon) having hence 3 periods each day.

Country	Application of ToU signals in transmission tariffs	Seasonal	Day of week (working day / weekend or holiday)	Within-day (peak/ off-peak or day/ night)
		peninsula and the islands[474]		6 periods for energy-based charge (except for households who have 3 periods: two peaks: P1: 10:00-14:00, 18:00-22:00; P2: 8:00-10:00, 14:00-18:00, 22:00-24:00 (delayed one hour for Ceuta and Melilla); and one off-peak: 0:00 to 8:00 and off-peak days)
Sweden	No static ToU tariff applies, but a time-differentiated component in the tariff is based on actual hourly market prices per bidding zone with an additional supplement charge to cover risks.	Not applied	Not applied	Not applied

Table 41: Further details on application of ToU signal embedded in transmission tariffs

Country	Possibility of selecting from ToU options[475]	Same signal option(s) offered to all[476]	Any excluded network users[477]	Possibility of opt-out[478]	Actual share of ToU users within eligible [479]
Austria	-	-	-	-	-
Belgium	No	Yes	Yes[480]	No	100%
Bulgaria	-	-	-	-	-
Croatia[481]	No	Yes	No	No	100%
Cyprus	-	-	-	-	-
Czechia	-	-	-	-	-
Denmark	No data	No data	No data	No data	No data
Estonia	No	Yes	Yes[482]	No	
Finland	No	Yes			
France	Yes[483]	No	Yes[484]	No	

[474] ES: Peninsula: (i) High: January, February, July and December. (ii) Medium-High: March and November. (iii) Medium: June, August and September. (iv) Low: April, May and October; Canary Islands: (i) High: July, August, September and October. (ii) Medium-High: November and December. (iii) Medium: January, February and March. (iv) Low: April, May and June; Illes Balears: (i) High: June, July, August and September. (ii) Medium-High: May and October. (iii) Medium: January, February and December. (iv) Low: March, April and November. Ceuta: (i) High: January, February, August and September. (ii) Medium-High: July and October. (iii) Medium: March, November and December. (iv) Low: April, May and June. Melilla: (i) High: January, July, August and September. (ii) Medium-High: February and December. (iii) Medium: June, October and November. (iv) Low: March, April and May.
[475] At least some users are allowed to choose from different ToU signal options offered to them
[476] The same time signals are available to all network users who are subject to ToU tariffs
[477] Network users who are excluded from ToU signals. Not accounting for those who are not subject to use-of-network charges.
[478] ToU signals are mandatory for network users or network users can opt out
[479] Share of Transmission-connected network users for whom ToU network tariffs are actually applied
[480] BE: Producers are excluded from ToU (the Annual Peak tariff is applied to all 15-min net withdrawal)
[481] HR: Answers relates to the TSO connected users.
[482] EE: ToU tariffs are not available to network users connected at 330 kV.
[483] FR: Network users can choose between 3 tariff versions depending on their withdrawal pattern: short-use, medium-use or long-use. Long-use version has higher capacity-based coefficients (EUR/kW) and lower energy-based coefficients (EUR/kWh). Short-use version has higher energy-based coefficients (EUR/kWh) and lower capacity-based coefficients (EUR/kW). Seasonal signal and peak/off-peak applied to withdrawal for users connected at 63-225 kV. No seasonal signal applied at 400 kV. The ToU periods may vary across regions.
[484] FR: ToU tariffs are not applied to users connected at 400 kV. The sizing of the 400kV network is not directly linked to peak demand, but to inter-regional and international transits, which depend on local balances between generation and consumption.

Country	Possibility of selecting from ToU options[475]	Same signal option(s) offered to all[476]	Any excluded network users[477]	Possibility of opt-out[478]	Actual share of ToU users within eligible [479]
Germany	-	-	-	-	-
Greece	No	Yes	No[485]	No	100%
Hungary	-	-	-	-	-
Iceland	No data	No data	No data	No data	No data
Ireland	No data	No data	No data	No data	No data
Italy	-	-	-	-	-
Latvia	-	-	-	-	-
Lithuania	-	-	-	-	-
Luxembourg	-	-	-	-	-
Malta	-	-	-	-	-
Netherlands					
Norway	No	Yes	Yes	No	
Poland	-	-	-	-	-
Portugal	Yes[486]	No	No[487]	No	100%
Romania	-	-	-	-	-
Slovakia	-	-	-	-	-
Slovenia[118]	No[488]	No	No[489]	No	100%
Spain	No[490]	No	No[491]	No	100%
Sweden	-	-	-	-	-

Table 42: Application of time-of-use signals in distribution tariffs and temporal granularity of time-of-use distribution tariff structures

Country	Application of ToU signals in distribution tariffs	Seasonal	Day of week (working day / weekend / holiday)	Within-day (peak/ off-peak or day/ night)
Austria	Yes (some differences across network areas)[492]	Summer (1 April – 30 September) Winter (1 October – 31 March	Not applied	Day (06:00-22:00) Night (22:00-06:00)
Belgium	Brussels: Yes Flanders: Yes[493] Wallonia: Yes	Wallonia: Day / Night periods defined by the DSO may vary seasonally	Brussels: Weekend days and holidays are considered 'night' Flanders: Weekend days and holidays are considered 'night' Wallonia:	Brussels: The power-based tariff (EUR/MW) is based on actual peak (07:00 – 22:00) Day (07:00-22:00) / Night (22:00-07:00) Flanders: Exclusive night tariff for 'accumulation

[485] GR: All transmission-connected network users have capable meters to record ToU and subject to ToU charges
[486] PT: For a given voltage level, network users can select more than one ToU schedule. For instance, at VHV, HV and MV there are two different weekly schedules available, which differ in the location of the peak periods. However, the same time signal is not available to all end-users. While there is a weekly schedule available to all end-users in mainland Portugal, there is an optional weekly schedule only available to VHV, HV and MV users. Also, there is a daily schedule only available to LV users. The levels of the ToU tariffs are the same in the country. What may differ is the exact location of each time period (peak, half-peak, normal off-peak, super off-peak) across users. Distribution-connected users at LV, who also pay transmission tariffs, have access to a ToU profile with a daily schedule (i.e. distribution of time periods is the same each day). Other voltage levels (VHV, HV, MV) must follow a weekly schedule (i.e. distribution of time periods depends on the type of day: working day vs Saturday vs Sunday).
[487] PT: All Transmission-connected network users have capable meters to record ToU and are subject to ToU charges.
[488] SI: For network users up to 43 kW, the time signal is in the energy charge. For network users above to 43 kW, the time signal is also embedded in the capacity charge calculated based on monthly average of three highest peaks in peak periods.
[489] SI: All Transmission-connected network users have capable meters to record ToU and subject to ToU charges.
[490] ES: Time differentiations are designed according to characterization of the demand, where observed there are daily 2 peaks (morning and afternoon) hence 3 periods each day. The time signal is the same for all consumers except household consumers because there is no seasonal signal for them and they have a more simple tariff with less periods for capacity and energy.
[491] ES: All Transmission-connected network users have capable meters to record ToU and subject to ToU charges.
[492] AT: Time of use tariffs (day/night and seasonal) are applied in all network areas, however in some of the network areas there is no difference between the tariff applied during the different season or the time of day. This is based on the needs of the particular network area or certain commercial network users.
[493] BE-FLA: Day/Night tariffs has been phased out from January 2023. Exclusive night tariff for 'accumulation heating applies.

Country	Application of ToU signals in distribution tariffs	Seasonal	Day of week (working day / weekend / holiday)	Within-day (peak/ off-peak or day/ night)
			Weekend days and holidays are considered 'night' + exclusive night tariff for heating applications[494]	heating: the DSO offers a total charging time of 8 to 9 hours at a lower night rate. Wallonia: Day / Night (times defined by the DSO and may vary within the geographical area of the DSO);[495]
Bulgaria	No	-	-	-
Croatia	Yes	Not applied	Not applied	'Winter' peak (08:00-22:00), 'summer' peak (7:00-21:00)
Cyprus	No[496]	-	-	-
Czechia	Yes (some variations across DSOs)[497]	Choice between monthly capacity charge or yearly capacity charge (for HV and MV users)[498]	Friday 12:00 to Sunday 18:00 off-peak (LV)	Peak / off-peak periods defined by the DSO
Denmark	Yes[499]	Winter / Summer		2-3 sets of tariffs depending on the consumer category.
Estonia	Yes	Peak tariffs (optional) are only applied within the period of November – March.	On working days daily tariffs and night tariffs apply (+peak tariffs optionally under certain conditions) On weekends and holidays night-tariffs applied for 24 hours. (+peak tariffs optionally under certain conditions)	Daily tariffs: from 7:00 to 22:00 Night-tariffs: from 22:00 to 07:00 Peak tariffs: from November to March[500] on working days between 9:00 and 12:00 and 16:00 and 20:00; on weekends and holidays between 16:00 and 20:00
Finland	Yes (solutions vary across the DSOs)[501]	Winter (1 November – 31 March) / Summer (1 April – 30 October)	Not applied	Day (07:00-22:00) / Night (22:00-07:00)
France	Yes (different options, including 2 time-periods, four	Winter (1 November – 31 March) /	Not applied	DSOs can choose locally 16 peak

[494] BE-WAL: From 2026 on, weekend days and holidays will be considered as regular days.
[495] BE (WAL): From 2026 on, peak (17:00-22:00), medium peak (07:00-11:00, 22:00-01:00) and off-peak (01:00-07:00, 11:00-17:00) tariffs will be implemented as opt-in for low voltage, besides regular off-peak and peak, or normal tariffs, as follows:
[496] CY: Currently no ToU tariffs (i.e. same rates apply), but the framework allows for time differentiation by seasons and peak/off-peak within a day. Time periods: June - September (High Demand Season) versus October - May; daily peak (June - September: 16:00 - 23:00; October - May: 09:00 - 23:00).
[497] CZ: The DSO is obliged to ensure off-peak zone for given number of hours per day, differentiated by customers group. The exact hours of a day are chosen by the DSO.
[498] CZ: User can choose capacity charge (EUR/kW) on monthly basis or at yearly basis (at discount).
[499] DK: Different load periods are operated throughout the day. Load periods and tariffs vary between summer and winter. When allocating the costs over load periods, it is taken into account that part of the costs varies with the load in the electricity grid, while another part of the costs is unaffected by the load in the electricity grid. Thus, tariffs in periods with the greatest load (peak load) are high, while the tariffs are lower in periods with less load in the electricity grid. The general principle is that the electricity network's total revenue from a given network user category is unchanged regardless of whether ToU tariffs or flat tariffs are used.
[500] EE: Using the peak time tariff is an option, not an obligation on the network user.
[501] FI: DSOs decide about their respective tariff structures including ToU signals; applying different energy-based fee and monthly capacity-based fees per season and for day/night is a typical practice.

Country	Application of ToU signals in distribution tariffs	Seasonal	Day of week (working day / weekend / holiday)	Within-day (peak/ off-peak or day/ night)
	time-periods, 'mobile peak')[502]	Summer (1 April – 30 October)		hours and 8 off-peak hours
Germany	Yes (Only for interruptible devices in the LV-level)	Yes	No	Yes
Greece	Yes[503]	Capacity charge based on network use during predefined peak periods that vary by season/ month[504]		
Hungary	No	-	-	-
Iceland	No data	No data	No data	No data
Ireland	Yes[505]			Day: 08:00 – 23:00 (excl. Peak) Night 23:00 - 08:00 Peak: 17:00 – 19:00
Italy	No	-	-	-
Latvia	No (phased out in 2023)[506]	-	-	-
Lithuania	Yes (solutions vary across DSOs)[507]		Weekend hours considered as 'night'	Day (07:00-23:00) / Night (23:00-07:00) for the energy-based charge
Luxembourg	No	-	-	-
Malta	Yes[508]		For EV charging tariff: On Sundays EV charging consumption off-peak tariff applies all day	for non-residential customers with a consumption > 5000 MWh or 5500 MVAh: Day (06:00 – 22:00)

[502] FR: In medium voltage, a "mobile" peak period option is available: it is composed of a given number of "peak days" that are not set ex ante (these days are the same as the PP1 days of the capacity mechanism). Customers who have subscribed to this option only know the day before when peak period (with the highest price) will happen, depending on TSO's forecast, in order to match as best as possible with real congestions when they happen.

[503] GR: For users equipped with ToU meters, the capacity charge is based on their demand during predefined peak periods on the network. Peak periods are defined for every month of the year and they normally vary by season. There is no capacity charge for demand outside these peak periods. For users equipped with conventional meters, load profiles are used to derive peak period demand profile per user category (e.g. industrial, commercial, etc.) and allocate the power/capacity related Distribution costs in proportion to the annual average peak demand of each user category. Then, the unit capacity charge to recover allocated costs is based on subscribed demand.

[504] GR: The capacity element of the distribution tariff that applies to users equipped with ToU meters (currently all MV users and LV users with subscribed capacity of 85 kVA or above) is proportional to the monthly average demand recorded during distribution network peak demand periods. The network peak demand periods are defined for each month, by statistical analysis of hourly network load over the two previous years. An hour is nominated 'peak demand' if it fulfils the following conditions: A) Network load during this hour exceeds XX% of the highest hourly load of the month, where XX% can have a value of 85% to 95%, or B) The hour is among the N hours with the highest load of the month, where N is typically higher than 50. Results from this statistical analysis are processed further to remove inconsistencies and reduce randomness. Peak demand periods are proposed by the DSO and approved by the NRA. In principle, they are defined before the beginning of each regulatory period and they do not change in the period, unless there is evidence of significant changes in network load profile.

[505] IE: Day/Night/Peak tariffs are applied upon the choice for smaller users (DG1, 2, 5); while Day/Night tariffs are mandatory for larger users (DG6, 7, 8, 9, 10).

[506] LV: until 30 June 2023, network users could choose between two or three time periods (night/weekend period and day period or night/weekend period, day period and peak time period). Day (07:00-08:00, 10:00-17:00, 20:00-23:00) / Night (23:00-07:00) / Peak (08:00-10:00, 17:00-20:00).

[507] LT: DSOs decide on their own how to include ToU signals in their respective tariff structures; general principle - differentiation has to be based on peak loads (encourage users to shift consumption from peak to off-peak). Data in the table is only an example of an applied time-signal by one of the DSO.

[508] MT: ToU available for customers > 5GWh and time-differentiated all-inclusive retail charge for EV charging points. ToU tariffs for 2 specific consumers' categories: - for non-residential consumers with a consumption > 5000 MWh or 5500 MVAh and EV charging points. - for non-residential customers with a consumption > 5000 MWh or 5500 MVAh, A day premium of EUR0.0015 and a night discount of EUR0.0262 over the applicable non-residential tariff is applied. For EV charging tariff: For residential and domestic EV charging points outside off-peak tariffs are the general electricity tariffs. EV off-peak tariffs and tariffs for non-residential EV charging points are specific tariffs. EV charging tariffs cover energy component and part of distribution and supply costs.

Country	Application of ToU signals in distribution tariffs	Seasonal	Day of week (working day / weekend / holiday)	Within-day (peak/ off-peak or day/ night)
				Night (22:00 – 06:00) For EV charging tariff: Outside off-peak (06:00-12:00 and 16:00-24:00) / off-peak (24:00-06:00 and 12:00-16:00) for EV charging points
Netherlands	Yes (but very limited application)[509]	Not applied	Weekend hours are considered as low tariff period	Normal tariff period: 07:00 - 23:00 Low tariff period: 23:00 – 07:00
Norway	Yes (most DSOs)[510]	Usually Summer/winter, but it is up to each DSO to determine based on actual flows.	Not applied	Up to each DSO to determine.
Poland	Yes[511]	Summer (1 April – 30 September) / Winter (1 October – 31 March) peak hours vary per season	Weekends and statutory holidays treated as night period	Peak (07:00-13:00, 16:00-21:00 in winter, 19:00-22:00 in summer) / off-peak (remaining hours)
Portugal[512]	Yes[513]	Winter / Summer peak/half-peak/normal off-peak/super off-peak hours vary per season	Saturdays and, Sundays have different hours for half-peak/normal off-peak/super off-peak, no peak in weekend	Peak (5h in winter, 3h in summer) / Half-peak (12h in winter, 14h in summer) / normal off-peak (3 hours) / super off-peak (4h per day all days)
Romania	No			
Slovakia	Yes		Weekends considered as off-peak	Peak /off-peak band; off-peak has to be offered 8 hours or 20 hours)
Slovenia[118]	Yes *Change in 2024: New tariff methodology with 2 seasons and 5 time blocks for both transmission and distribution network charges*		Weekends and holidays considered as off-peak	Peak (06:00-22:00) / off-peak (22:00-06:00)

[509] NL: Network users that are connected to LV, non-households and connection is larger than 3x80A, but not large enough to get MV connection. This category of users is very limited in numbers. The tariff structure for this category is as follows: a. Fixed network charge (EUR / year) b. kW contracted (EUR/kW/year) c. kWh normal (EUR/kWh) for 07:00 to 23:00 on weekdays, d. kWh low (EUR/kWh) for the remaining hours. The kWh low and normal tariffs vary between DSOs due to different efficiency performance (benchmarking).

[510] NO: Before July 2022 it was mandatory to provide seasonal differentiation of the DSO-tariff. From July 2022 it is not mandatory, but most of the DSO differentiate the energy component between day and night.

[511] PL: Typically, there are 3 zones during the day (morning peak, afternoon peak and off-peak) and 2 periods (peak/off peak and day/night). The charges can be also differentiated for summer and winter. Night period additionally includes all hours of Saturdays and Sundays and statutory holidays.

[512] PT: The time structure presented corresponds to the weekly time schedule, where the ToU structure differs between workings days, Saturdays and Sundays. For low voltage end-users, a daily time schedule is also available, where all days of the year follow the same structure (more information is available here, in Portuguese).

[513] PT: The time signal with four periods applies to active energy (EUR/kWh). In addition, the peak power variable, in EUR/kW/day, also reflects an additional time signal during the peak period.

Country	Application of ToU signals in distribution tariffs	Seasonal	Day of week (working day / weekend / holiday)	Within-day (peak/ off-peak or day/ night)
	Critical peak pricing applies[514]			
Spain	Yes[515] Regarding ToU tariffs 6 periods are considered for power-based withdrawal charge except for households were there are 2 periods, 6 periods are considered for energy-based withdrawal charge except for households were there are 3 periods.	4 seasons (high, medium high, medium, low) Definition of seasons varies between peninsula and the islands[516]	Weekends are different from working days	6 periods for power-based charges (households have 2 periods) 6 periods for energy-based charge (households have 3 periods - 2 peak and 1 off-peak)
Sweden	Yes[517] (some DSOs apply for both injection, and withdrawal)	Optional seasonal (summer and winter)		Optional peak/off-peak

Table 43: Details on application of ToU signal embedded in distribution tariffs

Country	Possibility of selecting from ToU options[518]	Same signal option(s) are offered to all[519]	Any excluded network users[520]	Possibility of opt-out[521]	Actual share of ToU users within eligible [522]
Austria	No	No[523]	No	No[524]	Not available to the NRA.
Belgium	Brussels: No Flanders: No Wallonia: No	Brussels: Yes Flanders: Yes Wallonia: No[525]	Brussels: No Flanders: No Wallonia:	Brussels: For some users[526] Flanders: No data Wallonia:	Brussels: 10-25% Flanders: No data Wallonia:

[514] SI: For consumers on MV and higher, the capacity charge is determined as the average of the three highest peaks (15 minutes) in critical-time period, which is defined by TSO and different for specific DSO or CDSO (closed distribution system operator). The TSO defines and publishes critical-time periods (2 hours per working day inside of peak period) before next calendar year. If the average of three registered peaks inside critical time period is lower than 15% of the highest monthly peak outside critical time period, consumer pays for 15% of highest peak anyway.
[515] ES: Time differentiations are designed according to characterization of the demand, where it is observed in there are daily 2 peaks (morning and afternoon) having hence 3 periods each day.
[516] ES: Peninsula: (i) High: January, February, July and December. (ii) Medium-High: March and November. (iii) Medium: June, August and September. (iv) Low: April, May and October. Canary Islands: (i) High: July, August, September and October. (ii) Medium-High: November and December. (iii) Medium: January, February and March. (iv) Low: April, May and June. Illes Balears: (i) High: June, July, August and September. (ii) Medium-High: May and October. (iii) Medium: January, February and December. (iv) Low: March, April and November. Ceuta: (i) High: January, February, August and September. (ii) Medium-High: July and October. (iii) Medium: March, November and December. (iv) Low: April, May and June. Melilla: (i) High: January, July, August and September. (ii) Medium-High: February and December. (iii) Medium: June, October and November. (iv) Low: March, April and May.
[517] SE: optional seasonal and peak pricing energy for fuse, small and large customers. Practices differ across DSOs. DSOs decide on their own about their respective tariff structures; table values are typical ToU signals which are applied. ToU is applied to different elements on different tariffs as such the time signal varies between 2 energy counters and peak load during peak time.
[518] At least some users are allowed to choose from different ToU signal options offered to them
[519] The same time signals are available to all network users who are subject to ToU tariffs
[520] Network users who are excluded from ToU signals. Not accounting for those who are not subject to use-of-network charges.
[521] ToU signals are mandatory for network users or network users can opt out.
[522] Share of distribution-connected network users for whom ToU network tariffs are actually applied.
[523] AT: Some (but not all) of the 14 network areas use variation based on season (summer/winter tariff) and/or time of day (high/low tariff). The tariff possibilities are: summer high tariff, summer low tariff, winter high tariff, winter low tariff. In case of different summer/winter tariffs, the winter tariff is higher.
[524] AT: ToU is mandatory if it is applicable in the particular network area.
[525] BE-WAL: the ToU signals vary based on the DSO's choice and location of the network user.
[526] BE-BXL: ToU tariffs are optional to all network users with HI/LO meters, as they can still choose to switch to Total Hours (sum up the HI and LO registers)

Country	Possibility of selecting from ToU options[518]	Same signal option(s) are offered to all[519]	Any excluded network users[520]	Possibility of opt-out[521]	Actual share of ToU users within eligible [522]
			Info not available to the regulator	For LV users[527]	Info not available to the regulator
Bulgaria	-	-	-	-	-
Croatia	Yes[528]	Yes	'Public lighting'[529]	Yes[529]	70% with ToU (2023)
Cyprus	-	-	-	-	-
Czechia	Yes[530]	No	Yes[531]	Yes (for all)	50-75%
Denmark	No	Yes		No	95% of the consumers
Estonia	Yes[532]	No	No[533]	Yes (households, i.e. 97% of network users or 35% of consumption)[534]	> 90%
Finland	No data[535]	No	DSO's choice / the info is not available to NRA	DSO's choice / the info is not available to NRA	DSO's choice / the info is not available to NRA
France	Yes[536]	No	No[537]	Yes (all)	> 95%
Germany	Yes	Yes	Only interruptible devices	No	Introduced from April 1st 2025
Greece	No	Yes	LV (<85 kVA)[538]	No	<10%
Hungary	-	-	-	-	-
Iceland	No data	No data	No data	No data	No data

[527] BE-WAL: Option for LV network users who can opt for a standard meter and a single price or can opt for a dual meter for with a different price for day and night consumption) and mandatory to other network users. The information on the share of mandatory versus optional ToU charges for distribution-connected network users is not available to the regulator.
[528] HR: Consumer can request from the DSO to change the tariff model in general, including transition from non-ToU tariff model to ToU tariff model, and otherwise. The request is defined in general in Article 48(2) of the General Network Rules (NN, 100/22), and transition from one model to another is in general prescribed in articles 45-48. New meter can be prerequisite for model change. Costs for the new meter with more functionalities is borne by network user if network user requests new meter, Article 90. Network user with contracted power above 22 kW must have model with measurement of the withdrawn power and ToU. But exception from that rule is possible. Network user can request model transition without measurement of withdrawn power, and also without ToU, and in that case DSO installs device that limits the withdrawal measured power to 22 kW. Contracted power is not reduced in that case. This is defined in the Article 48(6) of the General Network Rules (NN, 100/22).
[529] HR: Public lighting is excluded from ToU as a specific single-tariff model used exclusively for lighting of public places, public roads and similar purposes. Using the time of use tariff is limited by the installed meter. Consumer and/or supplier can ask DSO to install meter that would allow consumer to be included in the time of use tariff scheme.
[530] CZ: User can choose from more than one ToU tariff. The DSO is obliged to ensure off-peak period for given number of hours per day, differentiated by customers group. The exact hours of a day are chosen by the DSO. DSOs offer slightly different conditions. Location is also taken into account by the DSO while setting the peak/off-peak hours.
[531] CZ: Network users who do not match the conditions for using the ToU tariff are excluded.
[532] EE: It is possible for network users to choose a ToU tariffs with peak-time tariffs instead of the ToU tariffs without peak-time tariffs which is differentiated day/night and weekdays/weekends.
[533] EE: According to national law all network users must have smart meters and none of them are excluded from ToU.
[534] EE: ToU is optional for household users and mandatory for other users. The share of mandatory versus optional ToU charges for distribution-connected network users is about 3% mandatory (representing 65% of consumption) and 97% optional (representing 35% of consumption).
[535] FI: User can choose from typically two different tariff options with different ToU signals typically for time-of-day and time-of-day and year. The DSO sets the time intervals in these options.
[536] FR: Network users can choose between different tariff versions depending on their withdrawal pattern: short-use, medium-use or long-use. Long-use version has higher capacity-based coefficients (EUR/kW) and lower energy-based coefficients (EUR/kWh). Short-use version has higher energy-based coefficients (EUR/kWh) and lower capacity-based coefficients (EUR/kW). In medium voltage, a "mobile" peak period option is also available to the customers. Time of use signals vary based on DSO's choice and based on location.
[537] FR: No user is excluded (network users can all opt to have smart meters which allows ToU tariffs)
[538] DE: Users excluded from ToU: low voltage customers with subscribed capacity less than 85 kVA, because these users are currently not equipped with ToU meters.

Country	Possibility of selecting from ToU options[518]	Same signal option(s) are offered to all[519]	Any excluded network users[520]	Possibility of opt-out[521]	Actual share of ToU users within eligible [522]
Ireland	No	Yes	No[539]	Yes (for smaller users)[540]	10%-25%
Italy	-	-	-	-	-
Latvia	-	-	-	-	-
Lithuania	No	No (DSO choice)	No[541]	Yes (for all)	<10%
Luxembourg	-	-	-	-	-
Malta	No	No	Yes[542]	Yes (for all)	The info is not available to the NRA
Netherlands					Marginal[543]
Norway	No	No (DSO choice, location)[544]	Yes[545]	Yes (households)	>90%
Poland	Yes	No[546]	No	Yes (for some)[547]	10-25%
Portugal	Yes	No[548]	Yes[549]	Yes (LV contracted power of =< 20.7 kVA, 90% of users)[550]	10-25%
Romania	-	-	-	-	-
Slovakia	No	Yes	Yes[551]	Yes (for all)	10-25%
Slovenia[118]	No	No[552]	No[553]	Yes (=<43 kW)	50-75%
Spain	No	No[554]	No	No	>90%

[539] IE: No user is excluded. Customers who have analog single read meters have no capability to record ToU. However, these customers can request a smart meter to avail of ToU tariffs. The National Smart Metering Programme will replace all meters with smart meters by the end of 2024.
[540] IE: All network users can avail of ToU tariffs. For small users (DG1, 2, 5) it is available as an option. For larger users (DG6 – 10), it is mandatory. The information on the share of mandatory versus optional ToU charges for distribution-connected network users is not available to the NRA.
[541] LT: No user is excluded. Any user can request from operator for the ToU capable meter and ToU distribution tariffs.
[542] MT: ToU tariffs are provided for 2 specific consumers' categories: non-residential consumers with a consumption > 5000 MWh or 5500 MVAh and EV charging points. The ToU tariffs for these 2 specific consumers' categories are different. EV charging points that do not have a ToU capable meter are excluded from ToU.
[543] NL: Network users that are connected to LV, non-households and connection is larger than 3x80A, but not large enough to get MV connection. This category of users is very limited in numbers.
[544] NO: Time signals (seasonal) depend on the DSO's choice and depend on the location
[545] NO: A few customers (households) have exemption from meters capable to record ToU. 1) due to cost of changing meter relative to consumption volume, 2) due to personal/medical conditions (e.g. related to radiation).
[546] PL: Different ToU tariff options can be selected by the network users. ToU signals vary among the network user groups and based on DSO's choice.
[547] PL: ToU is mandatory for HV network users when the DSO has only a tariff group with 3 time bands and no group with the single time band as HV end-users must choose a tariff group that is offered. ToU is mandatory for less than 10% of the eligible users and optional for others.
[548] PT: Network users can select among different ToU schedules. For instance, users at HV and MV can select from two different ToU schedules with a weekly schedule. Users at LV can select between a weekly schedule and a daily schedule. The structure of the ToU periods is different between voltage levels. At HV, MV and a part of LV, a ToU structure with 4 periods is mandatory. For the remaining part of LV a ToU with 3, 2 or 1 periods applies.
[549] PT: Users not equipped with ToU meters are excluded
[550] PT: ToU is mandatory for below 10% of distribution-connected network users. It is mandatory for HV customers, MV customers and LV customers with contracted power above 41.4 kVA, with a ToU structure of 4 periods. It is mandatory for LV customers with contracted power up to 41.4 kVA and above 20.7 kVA, with a ToU structure of 3 periods. ToU is optional for LV customers with contracted power up to 20.7 kVA. It is optional for these customers because these are less informed and in the past did in general not have access to meters capable of ToU structures.
[551] SK: Network users who do not fall under the specifications of particular ToU tariffs, as set in the Slovak NRA Decree 18/2017, are excluded from ToU.
[552] SI: For network users up to 43 kW, the time signal is in the energy charge, while for network users above to 43 kW, the time signal is also embedded in the capacity charge calculated based on monthly average of three highest peaks in peak periods.
[553] SI: Any user can request ToU tariffs. In the new methodology (since october 2024) ToU tariffs can be implemented with both type of meters (smart / no smart).
[554] ES: Time differentiations are designed according to characterization of the demand, where it is observed in there are daily 2 peaks (morning and afternoon) having hence 3 periods each day. ToU tariffs also vary based on network user groups.

Country	Possibility of selecting from ToU options[518]	Same signal option(s) are offered to all[519]	Any excluded network users[520]	Possibility of opt-out[521]	Actual share of ToU users within eligible [522]
Sweden	Yes	No (DSO's choice)[555]	The information is not available to the NRA	Yes (DSO's choice)	The information is not available to the NRA

Table 44: TSO and DSO tariff treatment (e.g. exemption, discount, different charges) for network users participating in wholesale, balancing or local markets (e.g. via demand response, offering system operation services)

Country	Tariff treatment for participation in whole and balancing markets	Tariff treatment for participation in local markets for system operation services
Austria	No specific tariff exemption, discount or differentiation	Implementation of local markets is ongoing
Belgium	No specific tariff exemption, discount or differentiation	Brussels: Implementation of local markets is ongoing[556] Flanders: Providers of flexibility or ancillary services are exempted from power-based charges during activation or control tests[557] Wallonia: Implementation of local markets is ongoing
Bulgaria		No data
Croatia	Bonus for system services if system service is activated by TSO. Bonus relates to the network tariff settlement both for the DSO network user providing TSO services and TSO network user[558]	No implementation of local markets for system operation services yet. DSO does not procure and does not pay for these services[559]
Cyprus	The competitive wholesale market of Cyprus is not fully operational yet.	No implementation of local markets for system operation services yet. The Cypriot electricity market is still under transitional arrangements
Czechia	No specific tariff exemption, discount or differentiation	Implementation ongoing for wider application of flexibility[560]
Denmark	No data	Implementation of local markets is ongoing [561]
Estonia	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet

[555] SE: DSOs decide on their own about their respective tariff structures; Some DSOs allow network users to choose between different ToU tariffs and apply/ or offer different signals to different network users.
[556] BE-BXL: On 21 February 2024, BRUGEL approved a new version of the technical regulations for the management of the electricity distribution network in the Brussels Capital Region (decision 259). This regulation provides a framework for the process of setting up a market for local congestion management. This framework is not yet complete. Article 2.28 provides a frame within which the DSO may purchase flexibility services for local congestion management, after transparent and participatory consultation with the TSO and the players concerned. Paragraph 4 provides that the DSO must sub mit the specifications relating to local congestion management and auxiliary services (other than frequency control) to BRUGEL for approval by 1 January 2026 at the latest. Article 2.29 provides that when the DSO considers that the acquisition of the services referred to in article 2.28 cannot be carried out under the right conditions (not cost-effective, risking serious market distortions or greater congestion), it must submit a reasoned request for exemption before 1 January 2025. If approved by BRUGEL, this derogation is valid for 3 years.
[557] BE-FLA: Flexibility can already be offered in the form of FCR (MV and LV), aFRR (MV and LV) and mFRR (MV). Non-frequency ancillary services and commercial flexibility products are currently being developed, and market tests are being planned.
[558] HR: There is a bonus when any network user provides ancillary service to Croatian TSO, and bonus is for voltage control regarding excessive reactive energy and for the metered maximum power, both only in case when service is activated on the TSO request. If this would not be applied, network user would pay more for network charges during the provision of the system services. This is defined in Article 83 of the General Network Rules (NN, 100/22) issued by NRA.
[559] HR: This is under consideration. DSO must issue rules for ancillary services on the distribution grid based on Article 52 of the Electricity Market Law (NN, 111/21, 83/23). These rules are not issued yet. These services could be only for DSO grid. TSO has 100% national market for one mFRR product and for the first time in 2024 partly for aFRR. Some DSO network users provide balancing services to TSO.
[560] CZ: There is no separate flexibility market in CZ, but current tariff methodology allows certain measures: In LV DSOs can block certain devices in peak hours. The remote control tool of DSO to block certain devices in peak hours - these devices are then powered later in off-peak hours. In MV/HV: the network users might be clustered as ancillary service providers or they might offer flexibility pro their supplier to lower down imbalance of the supplier. It will be implemented in new tariff methodolog y later and more thoroughly.
[561] DK: Currently, there are match-making events and pilot projects between aggregators and DSO's. Furthermore, an aggregator model that defines legal rules in the market is in the making by the authorities.

Country	Tariff treatment for participation in whole and balancing markets	Tariff treatment for participation in local markets for system operation services
Finland	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet[562]
France	No data	Local markets for system operation services exist, but no specific tariff exemption, discount or differentiation[563]
Germany	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet
Greece	No data	No implementation of local markets for system operation services yet
Hungary	No specific tariff exemption, discount or differentiation	Implementation of local markets is ongoing[564]
Iceland	No data	No data
Ireland	No specific tariff exemption, discount or differentiation	Implementation of local markets is ongoing[565]
Italy	No data	Local markets exist (pilot)[566]
Latvia	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet
Lithuania	No specific tariff exemption, discount or differentiation	Implementation of local markets is ongoing[567]
Luxembourg	No specific tariff exemption, discount or differentiation	Local markets for system operation services exist (pilot), but no specific tariff exemption, discount or differentiation)[568]
Malta	N/A	No implementation of local markets for system operation services yet
Netherlands	No specific tariff exemption, discount or differentiation	Local markets for system operation services exist, but no specific tariff exemption, discount or differentiation)[569]
Norway	No data	No data
Poland	No specific tariff exemption, discount or differentiation	Implementation of local markets is ongoing[570]
Portugal	The increased consumption from participation of Demand Response in	Local markets for system operation services exist (pilot project FIRMe, since 2024), but

[562] FI: Energy Authority is currently revising and developing regulatory methods for the upcoming regulatory periods (2024-2027 & 2031) and explore a possibility of a separate incentive for counting flexibility in the regulatory framework. No concrete proposal at this point yet.
[563] FR: Local flexibility has appeared very recently on the DSO network. Enedis has published a regional call for tender in 2020 with 2 awarded parties that are providing flexibility. The costs incurred are included in the tariffs.
[564] HU: DSOs shall submit an annual report to the NRA about the status of flexibility market. The NRA may grant an exemption if it finds that the market procurement is not yet sufficiently developed. The flexibility products are currently being developed through intensive committee work and the last annual report was due by end of March 2022.
[565] IE: The DSO issued a consultation on a Flexibility Market Plan and has commenced a number of Pilot programmes to develop flexibility services at a distribution level. The first Pilot programme is expected to commence in October 2022. The DSO has additional flexibility schemes going live every 3-6 months after the initial go-live this autumn and every year the DSO will consult on and publish an updated multiyear rollout plan, enabling NRA adapt their rollout as appropriate (building on learnings, leveraging opportunities that arise etc.)
[566] IT: By regulatory order 352/2021, ARERA started the process of pilot projects for "local ancillary services", which term largely corresponds to flexibility. Costs for distribution infrastructure and communication are covered by distribution tariffs unless they are financed via grants or other contributions. Costs of the flexibility services are provisionally recovered by existing tariff components and regulatory accounts, with a view to define a stand-alone component and a stand-alone account when these costs will be material enough.
[567] LT: Based on the amendments of national law, DSO shall set the rules for procurement of flexibility until the end of 2022. Therefore, cost regarding this procurement is not yet included in the distribution tariffs.
[568] LU: DSOs are conducting several flexibility pilot projects. Costs for these projects are covered by network tariffs. With Luxembourg being part of the German/Luxembourgish market, the NRA together with the relevant authorities is evaluating on how to integrate the FFR FCR and flexibility markets.
[569] NL: Costs associated to procurement of flexibility services are included in distribution tariffs. DSOs are allowed to procure local flexibility in cases where congestion is either expected or has already materialised. This is part of the procedure for congestion management at the DSO level as laid down in the Network Code. This type of flexibility can be procured through the existing GOPACS platform or via bilateral contracts.
[570] PL: Currently in Poland, the process of building the Central Energy Market Information System (CSIRE) is underway (expected to be launched in 2025) and the process of mass implementation of AMI meters. The schedule provides for the installation of remote reading meters at energy consumption points representing at least 80 percent by the end of 2028.
The costs of the above implementations and other costs of implementing intelligent metering systems are included in TSO and DSO's tariffs. At the same time, the legislative process is underway and new regulations are created for incentives to distribution system operators for the most cost-efficient operation and development of their networks including through the procurement of flexibility services. Regardless of the above, there are pilot projects on the possibility of a wide implementation of flexibility services.

Country	Tariff treatment for participation in whole and balancing markets	Tariff treatment for participation in local markets for system operation services
	balancing market is not subject to network tariff[571]	no specific tariff exemption, discount or differentiation[572]
Romania	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet
Slovakia	No data	Implementation of local markets is ongoing[573]
Slovenia	Exception to network charging at intervals during the provision of system services.	Implementation of local markets is ongoing[574]
Spain	No specific tariff exemption, discount or differentiation	No implementation of local markets for system operation services yet[575]
Sweden	No specific tariff exemption, discount or differentiation	Local markets for system operation services exist[576], but no specific tariff exemption, discount or differentiation

Table 45: Transmission tariff methodology setting process

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values
Austria	NRA	Only specific stakeholders[577]	No defined period	1 year
Belgium	NRA	Public consultation	4 years[578]	1 year (set ex ante for each of the 4 years)[579]
Bulgaria	NRA	Public consultation	1 year	1 year
Croatia	NRA	Public consultation[580]	No defined period	1 year[581]
Cyprus	NRA	Public consultation	5 years	6 months
Czechia	NRA	Public consultation	(5 years)[582]	1 year[583]
Denmark	TSO (subject to NRA approval)	Public consultation[584]	No defined period	1 year[585]
Estonia	NRA	Public consultation	No defined period[586]	No defined period

[571] PT: Article 2 of ERSE Directive n.º 20/2023, of 26 December.
[572] PT: Although there is no specific provision for the recovery of flexibility procurement costs through distribution tariffs, the new TOTEX methodology applied since 2022 aims to implicitly incentivise the procurement of flexibility by the distribution system operators.
[573] SK: Legislative work is ongoing: For the time being SK has not implemented the flexibility markets at distribution level as the NRA is waiting for update of the primary legislation and then discuss the way how to implement it as well as in secondary legislation.
[574] SI: Legislative work is ongoing: In the current methodology costs of procurement of services is not implemented yet as eligible cost of DSO. Implementation of article 18(8) of Regulation is subject of new methodology applicable from 2023. Article 18(8) of the Regulation is partly implemented in the methodology in the context of the pilot schemes, where these flexibility costs are taken into account by the DSO as eligible costs of the DSO's activities.
[575] ES: Currently, it is in the process of analysis. The NRA has implemented in various regulations the possibility for agents to propose pilot projects to contribute to flexibility, digitization and efficiency.
[576] SE: There are some flexibility markets in Stockholm (Sthlmflex) and on other places (CoordiNet). The costs for flexibility is considered a part of the allowed revenue and are thus paid by the customers.
[577] AT: According to the national law, the Federal Economic Chamber, Federal Chamber of Agriculture, Federal Chamber of Labour, Austrian Trade Union Federation have to be consulted.
[578] BE: The tariff methodology can be revised during the regulatory period.
[579] BE: Tariff values are set (ex-ante) for the whole regulatory period, but the values differ each year.
[580] HR: Consultation before issuing methodologies and consultation with Consumer protection organization before decisions on the values of tariffs is legally required.
[581] HR: Tariff is determined in the second half of the year G for the year G+1. If there is no need to change the tariff then the tariff remains unchanged. NRA can change tariffs in regular dates, and exceptionally any time of the year on TSO/DSO request if there is large difference between income and costs. Difference between income and costs with incentives from the previous year (Y-1) in the current year (Y) for the setting tariffs in the next year (Y+1), is corrected by inflation. Intention is that in current year (Y) tariffs are set for the next year (Y+1) in order to cover forecasted costs and transpose correction from the previous year (Y-1).
[582] CZ: 5 years length of the tariff methodology is binding only for setting of allowed revenues and it is not binding for methodology which is used for calculating tariffs based on the allowed revenues.
[583] CZ: Tariff values are updated annually on the basis of a pre-defined methodology.
[584] DK: NRA conducts the public consultation. The TSO might also conduct a consultation prior to sending the methodology to the NRA for approval.
[585] DK: Tariff values are updated annually by the TSO on the basis of a pre-defined methodology.
[586] EE: The typical duration of the period is 3-4 years.

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values
Finland	TSO (without NRA approval)[587]	Public consultation [588]	8 years (4 year sub-periods)	1 year (with the possibility of revision within the year)[589]
France	NRA	Public consultation	4 years	1 year[590]
Germany	Ministry of economic affairs (legislative process for jurisdiction shift to the NRA is ongoing) [591]	Only specific stakeholders[592]	No defined period[593]	1 year[594]
Greece	NRA	Public consultation	4 years[595]	1 year[596]
Hungary	NRA	Only specific stakeholders[597]	4 years	1 year[598].
Iceland	No data	No data	No data	Multiple times a year[599]
Ireland	NRA	Public consultation	5 years	1 year[600]
Italy	NRA	Public consultation	8 years[601] (with mid-term update)	1 year[602]
Latvia	NRA	Public consultation	No defined period[603]	1 year (with the possibility of extension)[604]
Lithuania	NRA	Public consultation	5 years	1 year[605]
Luxembourg	NRA	Public consultation	4 years	1 year[606]

[587] FI: There is no ex-ante approval of tariffs or prices of network services by the NRA nor any other authorities. The NRA confirms ex-ante the revenue cap and connection charges. The NRA shall also approve ex-ante the terms and conditions of transmission and connection services before the network operators apply them. In addition, the NRA supervises the compliance between methodology and the Finnish Electricity Act. In situation of discordance, the NRA could decide on injunction.
[588] FI: The public consultation is not formally (legally) required and carried out by the TSO.
[589] FI: Tariff values are updated annually by the TSO on the basis of a pre-defined methodology. Within a year, the TSO can update the tariff values when needed, but there is an 8% cap set by national law for tariff increases.
[590] FR: Tariff values are updated annually on the basis of a pre-defined methodology. For OPEX, excluding system purchases (losses, congestion, frequency response services), only inflation is updated. For system purchases and capital charges real expenditure are taken into account.
[591] DE: The implementation of the ECJ ruling (C-718/18) is currently in progress. Jurisdiction change is part of it.
[592] DE: There are no formal requirements for consultation when adopting the ordinance for the tariff methodology. However, it is set after consultation of the relevant energy industry associations.
[593] DE: The length of the regulatory period for setting allowed revenues is 5 years.
[594] DE: Tariff values are updated annually on the basis of a pre-defined methodology. Link to the current method of tariff value updates: https://www.gesetze-im-internet.de/stromnev/
[595] GR: The regulatory period for setting allowed revenue is 4 years. Tariff methodology is independent from this cycle and can be revised within a regulatory period.
[596] GR: Tariff values are updated annually on the basis of a pre-defined methodology. he value update method accounts only for inflation and the required revenue settled for the year.
[597] HU: The tariff methodology is set after consultation of the relevant stakeholders as required by the Hungarian Electricity Act.
[598] HU: Tariff values are updated annually on the basis of a pre-defined methodology. The update takes into account inflation, pass-through cost, investments etc.)
[599] IS: Tariff updates, typically 1-2 times per year. Transmission loss tariffs updated quarterly
[600] IE: Tariff values are updated annually on the basis of a pre-defined methodology. Adjusted for inflation, k-factor (T-2) and updated forecasts.
[601] IT: Since 2016 it is 8 years, two sub-periods 4 years each. However, the WACC period is different (6 years with two sub-periods)
[602] IT: Tariff values are updated annually on the basis of a pre-defined methodology.
[603] LV: Methodology does not specify the regulatory period. TSO or system users can submit a request for changes in tariff calculating methodology. NRA evaluate submitted requests and make amendments if it is necessary.
[604] LV: Tariff values are set for one year. If the TSO doesn't submit new tariff proposal and the NRA doesn't oblige the TSO to do so, the same tariffs apply for next year. The tariffs are determined for period of 2-5 years (regulatory period), where information (regulatory account) is submitted every tariff period (tariff period can be set from 1 to 5 years) on the difference between the actual (forecasted) and planned revenues during the tariff period and information (calculation) about uncontrolled expenses. When a certain threshold of deviations occurs, the tariffs may be changed from the next tariff period.
[605] LT: Tariff values are updated annually on the basis of a pre-defined methodology. Prices can be adjusted twice a year, when there are significant changes in one or more factors on the basis of which the prices was calculated (significant changes in the scale of services, inflation, taxes, other objective factors).
[606] LU: Tariff values are updated annually on the basis of a pre-defined methodology. Yearly update and review of costs.

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values
Netherlands	NRA	Public consultation [607]	3-5 years	1 year[608]
Norway	NRA	Public consultation	No defined period[609]	1 year[610]
Poland	NRA	Only specific stakeholders[611]	1 year[612]	1 year (with the possibility of revision within the year)[613]
Portugal	NRA	Public consultation + targeted consultation of the tariff council	4 years	1 year[614]
Romania	NRA	Public consultation	5 years	1 year[615]
Slovakia	NRA	Public consultation	5 years	1 year[616]
Slovenia	NRA	Public consultation	No defined period	1 year (set ex ante for each year of the regulatory period with the possibility of revision)[617].
Spain	NRA	Public consultation ahead of tariff methodology setting	6 years	1 year
Sweden	TSO (without NRA approval)[618]	Public consultation	No defined period	1 year[619]

Table 46: Distribution tariff methodology setting process

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values[620]
Austria	NRA	Public consultation by the NRA	No defined period	1 year[621]
Belgium	Regional regulator	Public consultation by the regional regulators	Brussels: 5 years Flanders: 4 years Wallonia: 5 years	Brussels: No update during tariff period,

[607] NL: When preparing a change to the national tariff code, the TSO has to consult with stakeholders. The decision on the tariff methodology is taken by the NRA after consultation of the relevant stakeholders in the context of the Dutch administrative law. The yearly tariff decision is not subject to formal consultation, but there is an informal consultation of the proposal by the TSO.
[608] NL: Tariff values are updated annually on the basis of a pre-defined methodology. Annual changes in the allowed revenues due to inflation as well as updated expenditures. The main part of the update of expenditures results from an update of the ongoing investments of the TSO which result in updated and corrected capital and operational costs.
[609] NO: The general rules for the allowed transmission revenues (and their recovery via tariffs) shall be periodically reviewed. Each period must last a minimum of 5 years. Smaller changes in the regulation and changes in the tariff methodology do not follow the same periodical system and may be amended at any time. Any changes in the rules and regulations will be subject to a public consultation.
[610] NO: Tariff values are updated annually on the basis of a pre-defined methodology.
[611] PL: The NRA consults the TSO before and during the tariff approval process (not necessarily every tariff year).
[612] PL: Tariff is approved for 1 year. Some assumptions (e.g. on RoC) are made for 5 years period.
[613] PL: update of all expenditures.
[614] PT: Tariff values are updated annually on the basis of a pre-defined methodology. The method includes the determination of the allowed revenues (reconciling with past over- or under-recovery) and the forecasted demand for the next tariff year.
[615] RO: Tariff values are updated annually on the basis of a pre-defined methodology. The transmission tariffs for year t+1 are updated considering: forecasted costs, inflation, forecasted quantity (injected and withdrawn) and corrections of year t-1. For system services, the frequency is also annual (similar to transmission tariffs), but there is the possibility to update it after the first quarter or first semester (this update is only for prices, if these are too high or too low compared to the prices approved).
[616] SK: Tariff values are updated annually on the basis of a pre-defined methodology.
[617] SI: Tariffs are (ex-ante) pre-defined for each year of the regulatory period separately. There is a possibility to revise the tariff values with updated expenditures. In case where the volatility of the planned energy quantities (inputs) would result in a more than 10% increase of the tariffs.
[618] SE: The tariff methodology has been independently developed by the Swedish TSO. The methodology undergoes an evaluation each year. The NRA defines only the revenue cap. The regulation regarding transmission and distribution tariff methodology is being reviewed by the Swedish NRA, with the purpose of introducing secondary legislation on network tariffs in Sweden in 2020. Sweden has previously only had a general tariff regulation (in the Swedish Electricity act and Electricity Regulation). From 2019, the NRA has the right to introduce more detailed regulation on tariffs on both TSO and DSO level.
[619] SE: Tariff values are updated annually on the basis of a pre-defined methodology and updated expenditures.
[620] i.e. period of applicability of the same tariff values
[621] AT: For inflation, Capex expenditures, regulatory account, different parameters in regard to the current regulatory framework.

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values[620]
				with some exceptions[622] Flanders: 1 year[623] Wallonia: 1 year[624]
Bulgaria	NRA	Public consultation by the NRA	Between 2-5 years	1 year
Croatia	NRA	Public consultation by the NRA[625]	No defined period	1 year[626]
Cyprus	NRA	Public consultation by the NRA	5 years	6 months
Czechia	NRA	Public consultation by the NRA	5 years (but smaller amendments are possible in each year) [627]	1 year
Denmark	DSO (subject to NRA approval)	Public consultation by the NRA	No defined period[628]	No defined period[629]
Estonia	NRA	Public consultation by the NRA	No defined period: the tariff methodology is amended upon DSO's proposal if the NRA agrees with it or if it is provided by law.	No defined period[630]
Finland	DSO (without NRA approval)[631]	No consultation	No defined period (each DSO decides separately when to update its tariff methodology)	No defined period: each DSO decided separately when to update its tariff values[632]
France	NRA	Public consultation by the NRA	4 years	1 year[633]

[622] BE-BXL: for public service obligation and other small tariffs components (part of the distribution tariffs) yearly update (based on year-2 actual values for public service obligation)
[623] BE-FLA: in accordance with allowed revenue
[624] BE-WAL: Tariffs may be adjusted (each year) within the regulatory period, but the adjustment is not automatic and must be approved by the regulator. Tariffs are approved for the next regulatory period of 5 years
[625] Consultation before issuing methodologies and consultation with Consumer protection organization before decisions on the values of tariffs is legally required.
[626] HR: Tariff is determined in the second half of the year G for the year G+1. If there is no need to change the tariff then the tariff remains unchanged. The NRA can change tariffs in regular dates, and exceptionally any time of the year on TSO/DSO request if there is large difference between income and costs. Difference between income and costs with incentives from the previous year (Y-1) in the current year (Y) for the setting tariffs in the next year (Y+1), is corrected by inflation. Intention is that in current year (Y) tariffs are set for the next year (Y+1) in order to cover forecasted costs and transpose correction from the previous year (Y-1).
[627] CZ: 5 years length of the tariff methodology is binding only for setting of allowed revenues and it is not binding for methodology which is used for calculating tariffs based on the allowed revenues.
[628] DK: The method can in some cases be time-limited, but there is no general rule. (E.g. NRA is able to grant permission to the DSO to differentiate prices on the basis of geographical delimitation. In these cases, the methods will typically be time-limited to 2 years.)
[629] DK No specific frequency. distribution tariffs are regulated by limits on electricity distribution companies' total income. distribution tariffs are set according to those limits. Tariff-adjustments in upwards direction requires four-months notice.
[630] EE: The same tariff values are applied until a DSO submit an application for new tariff values approval and NRA approves it Each DSO submits such application individually and the NRA approves them separately. No defined period. Tariff values change if the DSO applies for it and the NRA approves tariff changes. The typical duration of the period is 3-4 years. Usually, when the DSO deems it necessary to change the network charges, all circumstances affecting the network charges (volumes, costs for grid losses, costs for building, upgrading and/or maintaining infrastructure, labour costs etc) are taken into account, not just inflation.
[631] FI: There is no ex-ante approval of tariffs or prices of network services by the NRA nor any other authorities. The NRA confirms ex-ante the revenue cap and connection charges. The NRA shall also approve ex-ante the terms and conditions of distribution and connection services before the network operators apply them. In addition, the NRA supervises the compliance between methodology and the Finnish electricity act. In situation of discordance, the NRA could decide on injunction.
[632] FI: The annual tariff price increase is capped at 8 % by law for electricity DSOs. Some aspects of the regulatory framework for allowed revenue are updated annually, once every two, or four years. These updates include updates to for example the WACC parameters.
[633] FR: The tariff level is changed every year based on inflation, a predefined trajectory and an additional adjustment factor to account for variability in costs and revenues, and incentives regulation.

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values[620]
Germany	Ministry[634]	Consultation of regulators, network operators and industry associations by the Ministry	No defined period	1 year[635]
Greece	Formerly the NRA, from 2022: DSO (subject to NRA approval)[636]	Public consultation by the NRA	No defined period	1 year[637]
Hungary	NRA	Consultation TSO and DSO	4 years	1 year[638]
Iceland				1-2 times a year
Ireland	DSO (subject to NRA approval)	Public consultation by the NRA	No defined period	1 year[639]
Italy	NRA	Public consultation by the NRA	8 years (two 4-years sub-periods)	1 year
Latvia	NRA	Public consultation by the NRA	No defined period	1 year[640]
Lithuania	NRA	Public consultation by the NRA	No defined period: the tariff methodology is amended as deemed necessary by the NRA	1 year[641]
Luxembourg	NRA	Public consultation by the NRA	4 years	1 year (updated expenditures)
Malta	DSO (subject to NRA approval)[642]	No consultation	No defined period	No defined period[643]
Netherlands	NRA	Public consultation[644]	3, 4 or 5 years[645]	1 year[646]
Norway	NRA	Public consultation by NRA. Ex ante information from DSO to customers	No defined period + annual income cap decisions by NRA	1 year (updated based on each company's allowed revenue, which is set annually.)
Poland	NRA	Consultation of DSOs and DSOs association	No defined period	1 year
Portugal	NRA	Public consultation + targeted consultation of the tariff council	4 years	1 year[647]

[634] DE: Methodology is set in an ordinance by the Ministry of Economic Affairs.
[635] DE: Link to the current method of tariff value updates: https://www.gesetze-im-internet.de/stromnev/
[636] GR: The tariff methodology applied in year 2020 and previous years was set by the NRA. The respective tariffs were calculated also by the NRA, based on DSO forecasts for connected consumer capacity and demand for power and energy. From year 2022, the DSO proposes the tariff methodology for approval by the NRA, based on principles included in the Distribution Network Code, and calculates the tariff annually, based on the approved tariff methodology. NRA approves both the tariff methodology and the tariffs calculated annually by the DSO.
[637] GR: The value update method accounts only for inflation and the required revenue settled for the year
[638] HU: Method: inflation, investments-depreciation, planed and realised revenue, quality of service correction.
[639] IE: Adjusted for inflation, k-factor (T-2) and updated forecasts.
[640] LV: Non-controllable costs, revenue deviation and changes in inflation forecasts are taken into account.
[641] LT: Prices can be adjusted twice a year, when there are significant changes in one or more factors on the basis of which the prices was calculated (significant changes in the scale of services, inflation, taxes, other objective factors).
[642] MT: The DSO is required to submit the retail tariffs, which cover also the distribution costs, for the approval of the NRA. The DSO forms part of a vertically integrated company, which is also the sole supplier of electricity in Malta. The DSO is required to keep unbundled accounts at internal management accounts level only. As such there is no specific separate tariff for the use of the distribution network. The costs of the distribution network are in part covered by a maximum demand tariff, an annual fixed charge, kWh tariffs that covers also energy and the supply and connection charges. All tariffs are regulated.
[643] MT: The latest tariff approval was in 2014, i.e. the same tariffs are currently applied without any update.
[644] NL Same process as for the transmission tariff methodology (see footnote 607)
[645] NL: The national law limits the regulatory period to be 3, 4 or 5 years. The NRA decides for each regulatory cycle which length it considers appropriate.
[646] NL: The tariff values are updated yearly to account for inflation, changes in productivity and possible ex-post corrections.
[647] PT: The method includes the determination of the allowed revenues (reconciling with past over- or under-recovery) and the forecasted demand for the next tariff year.

Country	Responsible party to set the tariff methodology	Consultations ahead of tariff methodology setting	Length of the tariff methodology period (frequency to amend it)	Frequency of updating the tariff values[620]
Romania	NRA	Public consultation by the NRA	5 years	1 year[648]
Slovakia	NRA	Public consultation by the NRA	5 years	5 years (but in practice typically 1 year)
Slovenia	NRA	Public consultation by the NRA	No defined period[649]	1 year (updated expenditures)
Spain	NRA	Public consultation by the NRA	6 years[650]	1 year (updated expenditures)
Sweden	DSO (without NRA approval)	No consultation	No defined period: each DSO decides separately when to update its tariff methodology	No defined period: each DSO decides separately when to update its tariff values[651]

Table 47: Transmission tariff transparency

Country	Detailed tariff methodology	Cost categories recovered by tariffs	The amounts recovered by each tariff element (at least when the tariff is set)	Each year, the tariff values for each network user group
Austria	NOT publicly available	NOT publicly available	NOT publicly available	Publicly available
Belgium	Publicly available	Publicly available	Only overall T-costs[652]	Publicly available
Bulgaria	Publicly available	Publicly available	Publicly available	Publicly available
Croatia	Publicly available	Publicly available[653]	Publicly available[654]	Publicly available
Cyprus	Publicly available	Publicly available	Only overall T-costs	Publicly available
Czechia	Publicly available	Publicly available	NOT publicly available	Publicly available
Denmark	Publicly available	Publicly available	Only overall T-costs	Publicly available
Estonia	Publicly available	Publicly available	NOT publicly available	Publicly available
Finland	NOT publicly available[655]	Publicly available	Publicly available	Publicly available
France	Publicly available	Publicly available	Publicly available	Publicly available
Germany	Publicly available	Publicly available	Only overall T-costs	Publicly available
Greece	Publicly available	Publicly available	Publicly available	Publicly available
Hungary	Publicly available	Publicly available	Only overall T-costs	Publicly available
Ireland	Publicly available	Publicly available	Publicly available	Publicly available
Iceland	No data	No data	No data	No data

[648] RO: The distribution tariffs for year t+1 are updated considering: the costs, the inflation and the quantity of electricity (withdrawal) for year t+1 and corrections of year t-1.
[649] SI: Last revision of the distribution tariff methodology was on 16.11.2022. The latest regulatory period is set for years 2024-2028.
[650] ES: For this first regulatory period (2020-2025) if it is deemed necessary it can be amended at the middle of the regulatory period (for the fourth tariff year). WACC-period is also 2020-2025.
[651] SE: in some DSO areas: updates are made for several reasons but mainly for expected changes in allowed revenue which includes investments, inflation and changes in regulatory framework as well as for changes in costs from higher grid levels (e.g. TSO pricing). Tariffs are also changed to better reflect the costs of operating the grid and adjusting to changes in terms and conditions for customers
[652] BE: Only annual TOTEX budget is publicly available. Detailed costs figures are considered confidential.
[653] HR: Costs structure included in tariff calculation is available in New TSO Tariff Methodology 2022 (NN, 84/22). Sometimes the values of tariff costs are published, for some costs regularly in NRA Annual Reports (e.q., ancillary services, balancing services, electricity losses, imbalance settlement). TSO publishes financial reports with additional details (https://www.hops.hr/godisnji-izvjestaji).
[654] HR: From 2019 onwards NRA publishes weighted average values for all tariff elements and tariff models, available in English (https://www.hera.hr/en/html/annual_reports.html) and in Croatian (https://www.hera.hr/hr/html/god_izv.html). For example, figures 4.2.12, 4.2.19, 4.2.9 and 4.2.10 in NRA Annual Report for 2022.
[655] FI: The Finnish TSO is not obligated to publish tariff methodology, but TSO has published "Grid service pricing structure" - design for different network user.

Country	Detailed tariff methodology	Cost categories recovered by tariffs	The amounts recovered by each tariff element (at least when the tariff is set)	Each year, the tariff values for each network user group
Italy	Publicly available	Publicly available	Partly publicly available[656]	Publicly available
Latvia	Publicly available	Publicly available	Only overall T-costs	Publicly available
Lithuania	Publicly available	Publicly available	Publicly available	Publicly available
Luxembourg	Publicly available	Publicly available	Only overall T-costs	Publicly available
Malta	N/A	N/A	N/A	N/A
Netherlands	Publicly available	Publicly available	Publicly available	Publicly available
Norway	Publicly available	Publicly available	Publicly available	Publicly available
Poland	NOT publicly available	Publicly available	NOT publicly available	Publicly available
Portugal	Publicly available	Publicly available	Publicly available	Publicly available
Romania	Publicly available	Publicly available	NOT publicly available	Publicly available
Slovakia	Publicly available	Publicly available	NOT publicly available	Publicly available
Slovenia	Publicly available	Publicly available	Only overall T-costs	Publicly available
Spain	Publicly available	Publicly available	Only overall T-costs	Publicly available
Sweden	Publicly available	Publicly available	Publicly available	Publicly available

Note: 'only overall T-costs' means that only total aggregated sum of the transmission costs covered by the tariffs (i.e. no disaggregated cost amounts by each tariff element).

Table 48: Distribution tariff transparency

Country	Detailed tariff methodology	Cost categories recovered by tariffs	The cost amounts recovered by each tariff element (at least when the tariff is set)	Each year, the tariff values for each network user group
Austria	Publicly available (+EN)	NOT publicly available	NOT publicly available	Publicly available
Belgium	Publicly available	Publicly available	Brussels: Total distribution cost covered by the distribution tariffs is publicly available (but no details for each tariff). Flanders: Publicly available Wallonia: Total distribution cost covered by the distribution tariffs is publicly available.	Publicly available
Bulgaria	Publicly available	Publicly available	NOT publicly available	Publicly available
Croatia	Publicly available	Publicly available[657]	Publicly available[658]	Publicly available
Cyprus	Publicly available (+EN)	Publicly available	Only overall (aggregated) D-costs.	Publicly available
Czechia	Publicly available	Publicly available	NOT publicly available	Publicly available

[656] IT: The cost values are not systematically published every year. Still, they are usually published before the beginning of the regulatory period (in consultation documents regarding tariff setting) or occasionally in some NRA reporting.
[657] HR: Costs structure included in tariff calculation is available in the DSO Tariff Methodology 2022 (NN, 84/22). Sometimes the values of tariff costs are published, for some costs regularly in NRA Annual Reports (e.q., electricity losses). DSO publishes annual reports with additional details, https://www.hep.hr/ods/o-nama/publikacije-229/godisnja-izvjesca-230/230
[658] HR: From 2019 onwards, NRA publishes weighted average values for all tariff elements and tariff models, available in English (https://www.hera.hr/en/html/annual_reports.html) and in Croatian (https://www.hera.hr/hr/html/god_izv.html). For example, figures 4.2.12, 4.2.19, 4.2.9 and 4.2.10 in Annual Report for 2022.

Country	Detailed tariff methodology	Cost categories recovered by tariffs	The cost amounts recovered by each tariff element (at least when the tariff is set)	Each year, the tariff values for each network user group
Denmark	Publicly available	Publicly available	Only overall (aggregated) D-costs.	Publicly available
Estonia	Publicly available [659]	Publicly available	NOT publicly available	Publicly available
Finland	NOT publicly available	NOT publicly available	NOT publicly available	Publicly available
France	Publicly available	Publicly available	Publicly available	Publicly available
Germany	Publicly available	Publicly available	Only overall D-costs[660]	Publicly available
Greece	Publicly available	Publicly available	Only overall D-costs	Publicly available
Hungary	Publicly available	NOT publicly available	Publicly available	Publicly available
Iceland	No data	No data	No data	No data
Ireland	Publicly available	NOT publicly available	Total distribution cost covered by the distribution tariffs is publicly available.	Publicly available
Italy	Publicly available	Publicly available	Overall D-costs, disaggregated with different segmentation compared to the tariff elements[661].	Publicly available
Latvia	Publicly available	NOT publicly available	Only overall D-costs is published, but disaggregated information is made available upon individual requests.	Publicly available
Lithuania	Publicly available	Publicly available	NOT publicly available	Publicly available
Luxembourg	Publicly available	NOT publicly available	Only overall D-costs.	Publicly available
Malta	NOT publicly available	NOT publicly available	NOT publicly available	NOT publicly available
Netherlands	Publicly available	Publicly available	NOT publicly available	Publicly available
Norway	Publicly available	Publicly available	Only overall D-costs.	Publicly available
Poland	Publicly available	Publicly available	NOT publicly available	Publicly available
Portugal	Publicly available	Publicly available	Only overall D-costs, disaggregated with different segmentation compared to the tariff elements.[662]	Publicly available
Romania	Publicly available	NOT publicly available	Overall costs, disaggregated with different segmentation compared to the tariff elements[663].	Publicly available

[659] EE: Standard terms and conditions for applying distribution tariffs (only in Estonian) are also published.
[660] DE: Allowed revenues consist of different cost categories. However, the charges are not aiming at remunerating specific costs. Rather both the power and energy charge follow a TOTEX approach.
[661] IT: The total sum collected by distribution tariffs is published every year. In addition, some aspects which do not correspond to specific elements (the remuneration on capital, the amortization and the operational expenditures) are published separately at least at the end/beginning of regulatory periods.
[662] PT: the NRA publishes in detail the tariffs and the underlying demand forecast, for each tariff element. If a user multiplies, the tariff by the demand forecast for that tariff element (e.g. contracted capacity), the corresponding amount is obtained.
[663] RO: Distribution costs approved for the fourth regulatory period, aggregated by the type of cost and for all the 5 years is publicly available.

Country	Detailed tariff methodology	Cost categories recovered by tariffs	The cost amounts recovered by each tariff element (at least when the tariff is set)	Each year, the tariff values for each network user group
Slovakia	Publicly available	NOT publicly available	NOT publicly available	Publicly available
Slovenia[118]	Publicly available	NOT publicly available	NOT publicly available	Publicly available
Spain	Publicly available	Publicly available	Publicly available[664]	Publicly available
Sweden	NOT publicly available	NOT publicly available	NOT publicly available	Publicly available

Note: 'only overall costs' means that only total aggregated sum of the distribution costs covered by the tariffs (i.e. no disaggregated cost amounts by each tariff element.

Table 49: Data availability to the NRA on cost categories per different voltage levels

Country	Transmission				Distribution			
	CAPEX/ OPEX	Losses	System services	Metering	CAPEX/ OPEX	Losses	System services	Metering
Austria	Yes	Yes	Separate	No	Yes	Separate	No	No
Belgium	Yes	Yes	Separate	Separate	Yes	BXL:Yes FLA: Separate WAL: Separate	BXL: No FLA:Yes WAL: No	Yes
Bulgaria	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Croatia	Yes	Separate	Separate	Separate[665]	Separate	Separate	Separate	Separate[665]
Cyprus	Separate	Separate	Separate	Separate	Yes	Yes	Yes	Yes
Czechia	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Denmark					No	No	N/A[666]	No
Estonia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Finland	Separate	Separate	No	No	No	No	No	No
France	Separate	Separate	Separate	Separate		Separate		Separate
Germany	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Greece	No	No	No	No	No	No	No	No
Hungary	Separate	Separate	Separate	No	Separate	Separate	Separate	Separate
Iceland	Separate	Separate	Separate	Yes	Separate	Separate	Yes	Yes
Ireland	Separate	No	Separate	Separate	No	Separate	No	Separate
Italy								
Latvia	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Lithuania	Separate	Separate	Separate	No	Yes	No	Yes[667]	No
Luxembourg	Yes	Yes	Yes	Separate	Yes	Separate	Yes	Separate
Malta	N/A	N/A	N/A	N/A	Separate	Separate	Separate	No
Netherlands	Yes	Yes	Yes	No	No	Separate	No	Separate
Norway	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Poland	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate
Portugal	Separate	No	Separate	No	Separate	No	No	Yes
Romania	Separate	Separate	Separate	Per voltage level	No	Per voltage level	No	Per voltage level
Slovakia	Per voltage level	Per voltage level	Per voltage level	Per voltage level	Separate	Separate	Separate	Separate
Slovenia[118]	Yes	Separate	Separate	No	Separate	No	Separate	No
Spain	Separate	No	No	No	No	No	No	No

[664] ES: Allowed revenues for each DSO are published every year, with details of allowed revenues for Investment, O&M, and incentives (https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-13101). Details on the cost amounts recovered in the tariff elements are provided in the tariff model for year 2021 (available in Excel format).
[665] HR: New TSO Tariff Methodology 2022 (NN, 84/22) envisages separation of this costs (Table 1, row 2.1.3) but TSO does not fulfil this row within Excels he submits to NRA.
[666] DK: System services are handled by the TSO, therefore no DSO cost.
[667] LT: Costs for (purchasing) system services - the DSO does not order these services, the services are ordered by the TSO. Therefore, these costs are not covered through distribution service tariffs. They participate in the calculation of the final tariffs of the transition service, which include the costs of transmission, distribution and system services. Metering costs are included in the total OPEX and are not shown separately in regulatory reports of regulated activity.

Country	Transmission				Distribution			
	CAPEX/ OPEX	Losses	System services	Metering	CAPEX/ OPEX	Losses	System services	Metering
Sweden	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate

Notes: 'Yes' means that the information is available to the NRA in separation from other cost categories and per each differentiated transmission/distribution voltage levels; 'Separate' means the information is available to the NRA in separation from other cost categories but not separation per voltage level; 'Per voltage level' means the information is available to the NRA for multiple transmission/distribution voltage levels, but not in separation from other cost categories. Metering is considered as a separate tariff or tariff element, if it is bundled only with administrative costs (but separate from CAPEX/OPEX, losses, system services).

Table 50: Cost categories entering the tariff structure as a separate (dedicated) tariff or tariff element

Country	Transmission				Distribution			
	CAPEX/ OPEX	Losses	System services	Metering	CAPEX/ OPEX	Losses	System services	Metering
Austria	Yes[668]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Belgium[669]	Yes	No	Yes	No	No	No	No	BXL:Yes FLA:Yes WAL:No
Bulgaria	No	No	No	No	No	No	No	No
Croatia[670]	No	No	No	No	No	No	No	No
Cyprus	No	No	No	Yes	No	No	No	Yes
Czechia	No	No	Yes	No	No	No	No	No
Denmark[671]	No	No	No[672]	No[673]	No	No	N/A	Yes[674]
Estonia[675]	No	No	No	No	No	No	No	No
Finland	No	No	No	No	No	No	No	No
France[676]	No	No	No	Yes	No	No	No	Yes
Germany[677]	No	No	No	Yes	No	No	No	Yes[678]
Greece	No	N/A		No				
Hungary	Yes	Yes	Yes	No	Yes	Yes	N/A	Yes
Iceland	Yes	Yes	No	Yes	No	No	No	Yes
Ireland	No	No	No	No	No	Yes		No
Italy								
Latvia	No	No	No	No	No	No	No	No
Lithuania[679]	No	No	Yes	No	No	No	Yes	No
Luxembourg[680]	No	No	No	Yes	No	No	No	Yes
Malta	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes

[668] AT: The connection charge does not include 100% of TOTEX, as there are 2 additional tariff elements which can cover those coast categories (system admission charge and system provision charge).
[669] BE-BXL: there are two main tariffs categories: "Network use" and "metering and counting". "Network use" is the main category, regrouping costs related to, among other, losses, system services (if any) and opex/capex costs related to the RAB.
[670] HR: The tariff for *withdrawal contracted power* and for injection charge is determined separately with no methodologically defined direct link between these charges and some costs. After this, anticipated income from these network charges is forecasted. The anticipated total regulated costs for *Y*+1 with residual cost from *Y*-1, is subtracted with anticipated regulated income from two network charges (*withdrawal contracted power* and *injection charge*). Croatia uses values of the *default attribution coefficients* inscribed in the tariff methodologies to distribute this remaining cost to other network charges. TSO, DSO and NRA can deviate from *default attribution coefficients*.
[671] DK: Distribution: Producers: All CAPEX collected through standard connection charges. Injection charge is combination of OPEX and purchasing losses. Consumers: CAPEX collected through both standard connection charges and use-of-network charges, which also collect OPEX and purchasing losses. Metering incl. meter CAPEX is collected as a separate tariff per meter.
[672] DK: The costs of system services is bundled with administrative costs of transmission operator in a separate tariff structure called system tariff.
[673] DK: TSO-operator (Energinet) processes both customer master data and metering data in the so-called DataHub to facilitate a correct settlement basis between the actors in the electricity market. These cost is bundled with TSO's electricity associated administrative costs in a tariff structure called system tariff.
[674] DK: costs of metering is bundled with administrative costs.
[675] EE: All cost categories are bundled together.
[676] FR: distribution: Infrastructure costs, losses and system services are calculated separately but are all part of the withdrawal component of the tariff. Metering costs are recovered through a metering component.
[677] DE: Distribution: All costs are bundled together with the exception of conventional metering costs. These are entering the tariff structure as a separate tariff element.
[678] DE: In Germany, smart metering is deregulated
[679] LT: Distribution: Costs for (purchasing) system services are ordered by the TSO. Therefore, these costs are not covered through distribution service tariffs. The final tariffs of the transition service, include the costs of transmission, distribution and system services. Metering costs are included in the total OPEX and are not shown separately.
[680] LU: Distribution: Metering costs are accounted for separately and are paid for by a dedicated tariff element in the tariff structure. All the other costs are bundled

Country	Transmission				Distribution			
	CAPEX/ OPEX	Losses	System services	Metering	CAPEX/ OPEX	Losses	System services	Metering
Netherlands	No	No	No	N/A[681]	No	No	No	Yes[682]
Norway	No	No	No	No[683]	No	No	No	No
Poland	Yes	Yes	Yes	No	No	No	No	No
Portugal	No[684]	N/A	N/A[685]	No	No	N/A	N/A	No
Romania[686]	No	No	Yes	No	No	No	N/A	No
Slovakia	No	Yes[687]	Yes	Yes	Yes	Yes	Yes	Yes
Slovenia	No	No	No	No	No	No	No	No
Spain	Yes				Yes			
Sweden[688]	No	Yes	No	No	For some	For some	For some	For some

Note: 'Yes' means that the cost category enters the tariff structure as a separate (dedicated) tariff or tariff element; 'No' means that the cost category enters the tariff structure bundled with at least one other cost category; 'N/A' means that the cost category does not apply (e.g. the DSO does not purchase system services) Metering is considered as a separate tariff or tariff element, if it is bundled only with administrative costs (but separate from CAPEX/OPEX, losses, system services).

Table 51: Annual amount of the transmission and distribution use of network charges (for 2022 and 2023) [EUR]

Country	Transmission		Distribution	
	2022	2023	2022	2023
Austria	No data	No data	2 092 495 208	2 288 265 730
Belgium[689]	736 066 679	597 013 256	2 163 861 329[690]	2 279 235 735[691]
Bulgaria[692]	335 526 000	259 257 000	788 665 000	558 481 000
Croatia[693]	193 310 159	194 925 028	454 032 919	447 180 552
Cyprus	33 000 000	33 000 000	89 634 000	89 634 000
Czechia[694]	614 042 152	652 968 714	2 976 341 587	2 516 327 456
Denmark[695]	527 258 799	553 521 166	~1100 000 000	
Estonia	86 385 000	87 425 000	~257 500 000	~308 500 000
Finland[696]	Not available	Not available	Not available	Not available
France	4 128 000 000	4 035 000 000	4 064 000 000	5 825 000 000
Germany	5 320 464 680	5 308 007 993	21 152 717 876	23 912 555 801
Greece	268 079 560	312 858 419	797 887 000	981 774 885
Hungary[697]	650 000 000	1 110 000 000	929 000 000	1 535 000 000
Iceland[698]	127 803 502	125 277 273	174 696 560	195 842 638
Ireland	646170000	1050030000	1 037 660 000	1 181 718 000
Italy	No data	No data	No data	No data
Latvia	120 099 700	107 790 900	339 719 161.7	348 355 576.5
Lithuania	159 597 739	103 253 265	297 827 420	221 452 633

[681] NL: Metering services are provided and invoiced by a metering company (deregulated).
[682] NL: Metering services for small electricity consumers (connection up to 3x80A) are provided by DSO's. The tariff is calculated separately, however invoiced in one all-in tariff. For larger consumers (from 3x80A onwards) metering services are not the responsibility of DSO's but provided by other parties (i.e. deregulated)
[683] NO: For consumers the tariff is regulated and the meter is provided by the DSO, for other network users it is not a regulated market
[684] PT: Distribution tariff is designed primarily around two tariff elements (contracted power and peak power) that are meant to reflect the long run average incremental cost in terms of CAPEX and OPEX. Hence, in principle, these two tariff elements represent a «separate tariff element» to indicate the network costs. However, in the tariff-setting exercise, these two tariff elements are scaled (upwards or downwards) to recover the overall allowed revenues of the TSO, including not only CAPEX and OPEX, but also other cost items, such as metering.
[685] PT: FCR, FRR and RR are provided by generators on a mandatory basis without compensation by the TSO. Costs of the system operator, which is the same entity as the TSO, are recovered by a separate regulated tariff (called "tariff for the global use of the system"), which is different from the transmission tariff.
[686] PL: Distribution: Costs for purchasing system services are in the system services tariff, applied by the TSO. Metering cost are included in OPEX/CAPEX.
[687] SK: Paid by consumers.
[688] SE: distribution: The energy fee includes cost of losses and a part of CAPEX and OPEX cost. Metering costs are bundled in the monthly fee with costs for data collection and invoicing and system fees at least of one of the largest DSOs.
[689] BE: Total transmission charges include taxes and congestion rents (very high in 2022-2023) and do not include remuneration.
[690] BE: BXL: 146 861 329, FLA: 1 200 000 000, WAL: 817 000 000
[691] BE: BXL: 154 235 735, FLA: 1 300 000 000, WAL: 825 000 000
[692] BG: Exchange rate: 1.95583 EUR/LEV
[693] HR: Exchange rate: 7.5345 HRK/EUR
[694] CZ: Exchange rate 2022: 24.565 CZK/EUR; 2023: 24.007 CZK/EUR
[695] DK: Exchange rate: 7.45 DKK/EUR
[696] FI: All revenue for TSO/DSO is lumped together
[697] HU: Exchange rate: 2022: 390 HUF/EUR, 2023: 385 EUR/HUF
[698] IS: Exchange rate: 2022:142.33 ISK/EUR, 2023: 149.14 ISK/EUR

Country	Transmission 2022	Transmission 2023	Distribution 2022	Distribution 2023
Luxembourg [699]	42 862 616	144 971 949	191 298 878	234 089 134
Malta	N/A	N/A	No separate charge	No separate charge
Netherlands	849 490 766	1 292 493 641	3 257 485 351	4 480 622 856
Norway[700]	425 000 000	Not available yet	2 939 000 000	Not available yet
Poland[701]	~936 170212	No data	~4 780 000 000	No data
Portugal	293540316	312287241	1066250876	1075189891
Romania[702]	284 000 000	312 000 000	1 302 000 000	1 497 000 000
Slovakia	355 231 889	620 681 468	866 000 000	1 037 000 000
Slovenia	96 367 124	96 367 124	276 616 042	276 616 042
Spain	1 413 259 703	1 318 944 842	5 255 587 217	5 053 864 933
Sweden[703]	2 182 362 843	Not collected yet	4 922 926 373	Not collected yet

Table 52: Amount of transmission and distribution cost categories (EUR)

Country	Transmission CAPEX/ OPEX	Transmission Losses	Transmission System services	Transmission Metering	Distribution CAPEX/ OPEX	Distribution Losses	Distribution System services	Distribution Metering
Austria					2 275 654 587.05	355 973 354.25	No data	158 767 320
Belgium					BXL: 136 208 345 FLA: 1 250 000 000 WAL: no data	BXL: 7 313 348 FLA: (included in CAPEX/ OPEX) WAL: no data	BXL: 0 FLA: (included in CAPEX/ OPEX) WAL: No data	BXL: 10 714 042 FLA: 50 000 000 WAL: no data
Bulgaria	157 415 000	116 826 000	33 094 000					
Croatia[704]	105 152 775	53 064 021	48 082 104[705]	N/A	407 585 926	83 239 199	0	954 039
Cyprus	33 000 000		31 716 000	3 719 000	89 634 000		31 716 000	3 719 000
Czechia[706]	290 614 155	103 406 344	257 789 476	1 158 739	825 556 204	1 372 563 306	257 238 762	60 969 184
Denmark[707]	297 208 124.21	N/A	256 313 041.97	N/A	750 000 000	270 000 000	NA	80 000 000
Estonia	56 708 932	20 416 798	10 162 391	136 845	~125 000 000	~81 000 000	~91 000 000	12 000 000
Finland					Not available	151 000 000	Not available	Not available
France	4 171 000 000	1 219 000 000	586 000 000	25 000 000	Not available			
Germany[708]	5 864 699 697*	405 527 980*	2 988 533.219	2 682 471	20 325 523 811	686 983 698	103 392 413	506 377 238
Greece	303 293 390							
Hungary	336 000 000	179 000 000	605 000 000					

[699] LU: Data provided are maximum allowed revenues.
[700] NO: Exchange rate: 11 NOK/EUR
[701] PL: Exchange rate: 2023: 0.23 EUR/PZL
[702] RO: Exchange rate for 2022 is 4.93 LEI/EUR and for 2023 is 4.95 LEI/EUR
[703] SE: Exchange rate for 2022: 10.2 SEK/EUR
[704] HR: Values for Croatia are for 2023.
[705] HR: It does not include energy for balancing.
[706] CZ: Exchange rate 24.007 CZK/EUR.
[707] DK: All values are approximate and preliminary. Only 2022 data available for total charges. Total distribution charges based on DSO revenue cap for 2022, actual charges collected are lower due to delay in tariff adjustment due to exogenous cost changing, e.g. higher cost of distribution losses. Differences between revenue cap and actual revenue are collected (or disbursed) in following years. Injection charges (and producer connection charges) were introduced in 2023. Percentage and nominal split between withdrawal and injection based on 2023 tariff methodology and 2022 charge nominal amounts.
[708] DE: Actual costs for 2021.

Country	Transmission				Distribution			
	CAPEX/ OPEX	Losses	System services	Metering	CAPEX/ OPEX	Losses	System services	Metering
Iceland	129 818 641	18 633 499						
Ireland	328 483 175	0	615 397 234	0	978 137 000	0	0	0
Italy								
Latvia	78 269 600	29 521 300	N/A	N/A	309 837 581	38 517 996	n/a	n/a
Lithuania	50 092 198	38 245 370	98 120 777	199 528	359 632 687709	15 636 182	25 132 410	428 041
Luxembourg	27 180 190	8 848 106	108 943 653	negligible	164 767 294	42 932 992	93 500	26 295 348
Malta	N/A	N/A	N/A	N/A				
Netherlands	1 015 544 044		276 949 597					
Norway								
Poland[710]					1 485 659 574	2 613 957 446	279 765 957	62 382 979
Portugal[711]	312287241				1075189 891			
Romania								
Slovakia								
Slovenia								
Spain	1 318 944 842				5 053 864 933			
Sweden					1 090 000 000	830 000 000	6 500 000	18 500 000

Note: For most countries the figures refer to 2023, but not for all. The different reference years are provided in footnote.

Table 53: Annual volumes of injection into and withdrawal from the transmission grid and split of transmission use of network charges between transmission and distribution (for 2023)

Country	Transmission connected users				DSO connection points				
	Withdrawal (TWh)	Injection (TWh)	Contribution to system peak (MW)	Share of transmission charges (%)	Withdrawal (TWh)	Injection (TWh)	Contribution to system peak (MW)	Share of transmission charges (%)	NRA info on volumes per voltage level [712]
Austria	49.59	13.32	2189.3	29.5	15.25	5.79	5373.2	70.5	Yes
Belgium	17.9	52.5	2160	37	37.5	0.02	5077	63	Yes
Bulgaria									Yes
Croatia	1.258	14.26	228	6.69	15.12 [713]	1.768	3049	93.31	No
Cyprus	0.3	1.6			4.2	9.3			N/A
Czechia	1.547229	48.906 013	1124		37.673 705	0.329 488	6782		N/A
Denmark	1.39	13.88		6	33.01	18.60		94	
Estonia	0.43	3.84	122.3	5	6.48	0.23	1328	95	Yes

[709] LT: CAPEX: maintenance of the electricity network EUR 96 586 744; expansion of the electricity network EUR 221 079 584; OPEX: EUR 41 966 359

[710] PL: Exchange rate used is 4.70 PLN/EUR.

[711] PT: The breakdown by cost categories does not apply in 2023 as it is in the middle of the regulatory period and these activities are regulated with a TOTEX approach. In PT costs of losses and system services are not a TSO or DSO cost. In the case of transmission, metering costs are bundled with other costs. In the case of distribution, metering costs are not included in tariffs (see footnote 827).

[712] Is the information on annual electricity withdrawal/injection by transmission-connected users per different transmission voltage level available to the NRA?

[713] HR: Not all DSO connection withdrawal points are equipped with hourly (quoter hourly) meter and not all points are equipped with remotely readable meter. So, there is time-volume discrepancy of the data (e.g. meter is not read between two intervals 1th of January and 31th of January) and also some meters are not read for the whole period (e.g. reader was not able to reach the meter in January Y+1 for meter read for December Y due to the absence of network user at home when meter state is assumed and used for settlement). This value in table represents sold electricity on the DSO grid to consumers.

Country	Transmission connected users				DSO connection points				
	Withdrawal (TWh)	Injection (TWh)	Contribution to system peak (MW)	Share of transmission charges (%)	Withdrawal (TWh)	Injection (TWh)	Contribution to system peak (MW)	Share of transmission charges (%)	NRA info on volumes per voltage level [712]
Finland									N/A
France	78	360		15	311	18		85	Yes
Germany	22.5 (2022)	496.2		~10				~90	Yes
Greece									Yes
Hungary	1.1		120-130	1-2	42		6280	98-99	Yes
Iceland	15.6	0	1865		3.8	0	644		Yes
Ireland	24.63	24.959							No
Italy									
Latvia	0.446	5.329	1161	7	5.578	0.095		93	Yes
Lithuania									No
Luxembourg	0.1	0	220	2.7	4.8	0	841	97.3	N/A
Malta	N/A	N/A	N/A	N/A					
Netherlands				12				88	No
Norway	17	81			55	32		77	No
Poland	3		27326		92		27326		Yes
Portugal	2.4	42.8		2.2	47.3	15		97.8	N/A
Romania	1.6	33.5		11	48.8	17.7		89	No
Slovakia									
Slovenia	0.472	12.96		0.15	10.6	1.14		99.85	Yes
Spain	16.8	158.5	39035	20.7	204.8	108.6	795347	79.3	N/A
Sweden	115.4	111.1							Yes

Note: 'N/A' means Not applicable, as there is no differentiation of transmission levels

Table 54: Annual volumes of injection into and withdrawal from the distribution grid by distribution connected users (for 2023)

Country	Withdrawal (TWh) at distribution	Injection (TWh) at distribution	NRA info on injection/withdrawal volumes per distribution voltage level [714]
Austria	62.53	26.10	Yes
Belgium	BXL: 3.823274 FLA: 32 WAL: 13.9 (2022)	BXL: n/a FLA: 6 WAL: 2.9 (2022)	Yes
Bulgaria	No data	No data	Yes
Croatia	15.12 [715]	1.768 [716]	Only for withdrawal
Cyprus	4.2	9.3	Yes
Czechia	58.263	22.924	Yes
Denmark	~32.9 (2022)	17.6 (2022)	Yes
Estonia	6.75	0.85	No
Finland	56	22	No
France	No data	No data	No data
Germany	409.3 (2022) [717]	Not available [718]	Yes
Greece	36.9	8.3	Yes

[714] Is the information on annual electricity withdrawal/injection by distribution-connected users per applied different distribution voltage level categories (e.g. MV, LV or higher granularity) available to the NRA?
[715] HR: Not all DSO connection withdrawal points are equipped with hourly (quoter hourly) meter and not all points are equipped with remotely readable meter. So, there is time-volume discrepancy of the data (e.q. meter is not read between two intervals 1th of January and 31th of January) and also some meters are not read for the whole period (e.q. reader was not able to reach the meter in January Y+1 for meter read for December Y due to the absence of network user at home when meter state is assumed and used for settlement). This value in table represents sold electricity on the DSO grid to consumers.
[716] HR: Injection to the grid from producers.
[717] DE: https://www.bundesnetzagentur.de/EN/Areas/Energy/DataCollection_Monitoring/start.html
[718] DE: Total net generation (excl. electricity not fed into general supply networks), no differentiation between: TSO and DSO: 496.2 (TWh), p. 54 et. seq. Link: https://www.bundesnetzagentur.de/EN/Areas/Energy/DataCollection_Monitoring/start.html

Country	Withdrawal (TWh) at distribution	Injection (TWh) at distribution	NRA info on injection/withdrawal volumes per distribution voltage level[714]
Hungary	37.4[719]	7.6[720]	Yes
Iceland	No data	No data	No data
Ireland	23.7	6.85	Yes
Italy	No data	No data	No data
Latvia	6.23	1.34	Yes
Lithuania	9.727	1.468	Yes
Luxembourg	4.6	No data	Yes[721]
Malta	2.642	2.190[722]	No
Netherlands	N/A	N/A	N/A
Norway	No data	No data	No data
Poland	151.34	No data	Yes
Portugal	47.3	15	Yes
Romania	43.4	21.5	Yes
Slovakia	No data	No data	No data
Slovenia	11.38	1.24	Yes
Spain	204.8	108.6	Yes
Sweden	88.9[723]	17.7[724]	Yes

Table 55: Connection charges at transmission level

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location [725]
Austria	Shallow	Individual actual cost (EUR)	Yes (discount for small RES, PHES, P2G)	N/A	N/A
Belgium	Shallow	Mainly lump sum per connection (EUR) based on length, voltage level, type (primary/secondary). Some costs (studies) are individually estimated	No exemption, discount or difference	Yes	No
Bulgaria	Shallow	Individual actual cost	Difference between RES versus non-RES producer[726]	N/A	N/A
Croatia	Deep[727]	Individual actual cost, network reinforcement	Producer, consumer, storage[727]	No	Yes[727]

[719] HU: without withdrawal within net metering
[720] HU: without injection within net metering
[721] LU: For the cascading purpose, the point of start are import/export load curves to which national production is added. Therefore, the injection at 220 kV level is considered and no injection values reported by voltage level. For withdrawal: 0 .4 kV: 1.6 TWh 20kV: 1.9 TWh 65 kV: 1.1 TWh
[722] MT: injection includes main local fossil fuel generators
[723] SE: TWh (only withdrawal from local DSOs, not regional grid)
[724] SE: TWh (only injection to local DSOs, not regional grid)
[725] SE: Variation based on location, unrelated to the connection to a specific DSO (e.g. the network charges are set to be different to indicate at which locations the electricity is most or least needed, not because for different DSOs different charges or tariff values apply)
[726] BG: The difference was not explained by the NRA
[727] HR: In 2024 Old Connection Methodology from 2020 is still applied (NN, 51/17, 31/18, 104/20). New Connection Methodology is issued in 2022 (NN, 84/22). Prerequisite for the application of the New Connection Methodology is NRA decision on the values of the unit prices (EUR/kW) which is still pending. The same document (New Connection Methodology) is applied for both TSO and DSO connection requests.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location [725]
		cost, requested contracted power, unit price (EUR/kW), type (producer, consumer), methodology in force[727]			
Cyprus	Shallow	Individual actual cost[728]	No exemption, discount or difference	N/A	N/A
Czechia	Shallow	Individual actual cost; contracted power (EUR/MW)	No	Yes	Yes (Network users connected to urban versus rural areas[729])
Denmark[730]	Shallow / semi-deep	Individual actual cost	Difference between onshore RES producers versus offshore RES producers; Difference between larger and smaller producers. Difference between consumers and producers[731]	N/A	Yes

Old Methodology. Producer connecting to the TSO grid pays full connection costs to the nearest grid (individual actual costs) and a share in the grid reinforcements costs directly incurred by producer's connection, including 400 kV voltage level. Consumer connecting to TSO grid pays unit connection price (EUR/kW) if this price multiplied with contracted power and with 1.2 is less than cost this consumer incurs to TSO for connection to the nearest grid (individual actual cost) and network reinforcement (including 400 kV), otherwise consumer pays real cost (individual actual costs and share in network reinforcement cost). In some cases, a cost sharing is possible. Unit connection charge for consumer (EUR/kW) is different in Zagreb and in the rest of Croatia, based on the Government Decision (NN, 52/06). More information in English can be found on pages 62-63 in NRA Annual Report 2020, https://www.hera.hr/en/docs/HERA_Annual_Report_2020.pdf.
New Methodology. For connection to the TSO grid, network reinforcement cost is not calculated on the case-by-case basis as in Old Connection Methodology. Instead, it is anticipated. Based on the anticipated network reinforcement cost and anticipated demand for connection, along with the non-connection related benefit of the grid reinforcement, unit price for TSO network reinforcement cost is determined (EUR/kW). Calculation for the TSO user for network reinforcement is simple in this case and known before the request for connection. In all cases line to the nearest grid and adjacent transformer is paid and it is paid in addition to the network reinforcement cost. Storage pays only for individual actual costs. If a network user has contracted power in one direction, they receive contracted power in the opposite direction up to the amount contracted in the initial direction for free (0 EUR/kW). If they request additional power beyond this, then they pay for the power beyond based on the unit prices (EUR/kW). Unit connection charges (EUR/kW) can differ on a regional basis, for example, charges may vary between Dubrovnik and Zagreb. More information: 'Transmission and distribution network connection charges', p. 87-88, https://www.hera.hr/en/docs/HERA_Annual_Report_2022.pdf.

[728] CY: In accordance with the Transmission and Distribution Rules (TDR), the TSO is responsible for the processing of applications for connection to the T/D-network of producers with a requested connection capacity greater than 8 MW, or customers with a requested connection capacity greater than 12 MVA. In all other cases, applications are processed by the DSO. The applicant is charged based on the necessary equipment and the circuits required exclusively for the connection of his installations.

[729] CZ: In remote areas, users pay actual connection costs, while in urban areas, users pay unit charge per connected capacity.

[730] DK: Transmission-connected users pay station charge, while distribution-connected users pay transformer charge. distribution-connected users that are located in consumption dominated areas or where there is no clear dominance are exempted from the payment of transmission charge. Furthermore, the station charge varies across voltage levels: 132/150 kV, 220 kV, and 400 kV. As the transformer charge is only paid by the users located in the production dominated areas, this charge is geographically differentiated. The connection charge for the close network is also geographically differentiated, where the charge is higher for production dominated areas and lower for consumption dominated areas.

[731] DK: Transmission-connected consumers pay shallow charge: the actual costs associated with connection, while they contribute to the costs of reinforcement and maintenance of the grid via an energy-based withdrawal tariff. Transmission-connected producers pay a semi-deep connection charge. The semi-deep connection charge contains an average cost of

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location [725]
Estonia	Deep	Individual actual cost (EUR)	No exemption, discount or difference	N/A	N/A
Finland	Shallow	Standard lump sum fee (EUR) per connection (different in case of connection to power line versus connection to substation); Individual actual cost (EUR) (in case of new substation is requested)	No exemption, discount or difference	Yes	No
France	Shallow	Individual actual cost (EUR)	Yes (discount for RES, offshore RES)	N/A	Yes
Germany[732]	Shallow and deep	Individual actual cost (EUR)	No differentiation		
Greece	Shallow	Individual actual cost (EUR)	No exemption, discount or difference	N/A	Yes
Hungary	Deep	Individual actual cost	Yes (discount for RES)	N/A	-
Iceland	No data	No data	No data	No data	No data
Ireland	Shallow	Individual actual cost (EUR)	Yes (discount for demand customers)	Costs may vary on voltage level	
Italy	Shallow	Individual actual cost (EUR)	Yes (caps/discounts for some EHV and connected network users)[733]	N/A	-
Latvia	Deep	Individual actual cost (EUR)[734]	No exemption, discount or difference	N/A	-
Lithuania	Deep	Individual actual cost (EUR)	No exemption, discount or difference[735]	N/A	N/A
Luxembourg	Shallow	Individual actual cost (EUR)	No exemption, discount or difference	N/A	N/A
Malta	N/A	N/A	N/A	N/A	N/A

connection in the station, which is a fix amount per connection. Further it contains an average cost per MW for the costs of reinforcement of the nearby grid, which is geographical differentiated and should be paid upfront before the connection. The charge for the nearby grid applies on all producers with a capacity over 50 kW. Further producers pay an injection charge for recovering the costs of the transmission network, which is an energy based and geographical differentiated tariff. Transmission Injection charges apply on both T-and connected producers unless they exempted by law.

[732] DE: Connection charge methodology is not regulated; connection charges are set by TSOs and have to be non-discriminatory.

[733] IT: No conceptual difference, but the supplementary costs for network upgrades could be larger for offshore RES. EHV and HV producers are required to pay standard costs borne for connecting them, calculated by the TSO depending on the necessary minimal equipment (which is defined on a case-by-case basis after individual connection requests). EHV and HV RES and high-efficiency cogeneration benefit from caps / discounts. EHV and HV consumers are required to pay 50% of the costs borne for connecting them (which are defined on a case-by-case basis after individual connection requests)

[734] LV: The costs are determined in an open tender.

[735] LT: All users connected to the T-grid pay 100% of the actual connection costs.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location [725]
Netherlands	Shallow	Individual actual cost (EUR)–two components[736]	No exemption, discount or difference	N/A	N/A
Norway	Deep	Individual actual cost (EUR) distributed on basis of customers connected capacity relative to total new available capacity	No exemption, discount or difference	N/A	N/A
Poland	Shallow	Individual actual cost (CAPEX)-rule is set by national law	Yes (discounts for small RES and cogeneration, storage facilities, EV charging facilities)	N/A	N/A
Portugal	Deep	Individual actual cost (EUR)[737]; capacity (EUR/MW)	Difference between consumers versus producers[738]	No	No
Romania	Shallow and Deep	Individual actual cost; contracted power (EUR/MW)[739]	Yes (Shallow charge for consumers and deep charge for producers)	No	No
Slovakia	Super-shallow Shallow	Individual actual costs (resp. TSO costs caused by the connections)	No exemption, discount or difference	No	No
Slovenia	Mix of shallow and deep	Individual actual cost (EUR); contracted power (EUR/MW)[740]	No exemption, discount or difference	Yes	No
Spain	Deep	Individual actual cost (EUR); contracted power (EUR/MW)	No exemption, discount or difference	Yes	No

[736] NL: The connection tariff comprises two components: 1. the initial connection tariff, which covers the costs of creating the grid connection. It varies as all connections to the high-voltage grid are tailor made. 2. the periodic connection tariff, which covers the costs of maintaining and, if necessary, replacing the connection. Parties with multiple connections receive a separate invoice for each one. The periodic connection tariff is a fixed amount that is updated once a year.
[737] PT: Although the transmission network covers 3 voltage levels (150, 220 and 400 kV), the charges applicable to connection to this network do not depend on the voltage level. It is worth mentioning that the charge for the reinforcement of the existing network is charged regardless of whether the new connection motivates this reinforcement or not. To that extent, it constitutes a contribution to the investment necessary to replace the capacity taken by the connection and the respective charge internalises the expected benefits of the connection (depending on whether it is a consumption or production facility).
[738] PT: The charge for network reinforcement varies depending on whether the facilities are consumption or production.
[739] RO: The charge paid for connection infrastructure reflects the actual cost. Similarly, a grid reinforcement component is based on the actual cost but is limited by a cap approved by the NRA multiplied by installed capacity. As for testing and commissio ning, users are charged based on the installed capacity.
[740] SI: The calculation of network connection charges is based on the average influence of the newly connected/increased load (kW) on the necessary extensions and reinforcements in the grid.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location [725]
Sweden	Deep	Individual actual cost	No exemption, discount or difference	N/A[741]	N/A[742]

Note: Where the connection charge is calculated based on actual costs (i.e. individually estimated), the variation based on the voltage level and the location is implicit (i.e. different voltage level or location may result in different actual costs), thus in the table such cases are labelled as 'N/A' (Not applicable).

Table 56: Connection charges at distribution level

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
Austria	Shallow	Individual actual cost (EUR); capacity[744] (EUR/kW)	Discount for RES	Yes	Yes (network areas)[745]
Belgium	Brussels: Deep Flanders: Deep Wallonia: Deep	Brussels: Individual actual cost (EUR); Lump sum (EUR); contracted capacity (EUR/kVA) Flanders: Individual actual cost (EUR); lump sum (EUR); distance (EUR/m); contracted capacity[746] Wallonia: Individual actual cost (EUR); distance (EUR/m); contracted capacity[747]	No exemption, discount or difference	Brussels: Yes Flanders: Yes Wallonia: Yes	Brussels: No Flanders: No Wallonia: (Difference between network users connecting to rural and urban areas)[748]

[741] SE: Since the connection charge is calculated individually for the network users, the connection charge varies because of different costs, including due to different voltage level (i.e. variation by voltage level is implicit).
[742] SE: Since the connection charge is based on actual costs (i.e. individually estimated), the variation based on the voltage level and the location is implicit (i.e. different voltage level or location may result in different actual costs.)
[743] Variation based on location, unrelated to the connection to a specific DSO (e.g. the network charges are set to be different to indicate at which locations the electricity is most or least needed, not because for different DSOs different charges or tariff values apply)
[744] AT: The system admission charge is based on the actual costs. Connection charge for RES producers is calculated based on a flat fee per kW. The system provision charge levied in case of a connection is calculated per capacity (EUR/kW).
[745] AT: There are no locational signals incorporated in the connection charges, but there are different connection charges for the individual network areas in AT. The costs of each network area are covered separately by the specific local connection charge of each network area.
[746] BE-FLA: In most cases, the connection charge consists of a standard lump sum per connection (EUR). Additional unit charges per capacity (EUR/kVA), per distance (EUR/m) or per connection are possible. In some cases, the individual estimated actual costs are charged.
[747] BE-WAL: Cost may be charged on the basis of a package or unit cost per service, unit charge per capacity, cost per km.
[748] BE-WAL: D-consumers (LV) in urban areas are exempted from reinforcement and extension charges, whereas those outside pay actual costs. The reasoning behind is that urban networks should be designed to accommodate all user needs and to de-incentivise urban sprawl.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
Bulgaria	Shallow	Distance; contracted power	No exemption, discount or difference	No	No
Croatia[749]	Deep	Individual actual cost, network reinforcement cost, requested contracted power, type (producer, consumer, storage), distance from the transformer, voltage level, methodology in force	Producer, storage, consumer	Yes	Yes
Cyprus	Shallow	EUR/kVA[750]	Different charges for residential and industrial consumers[751]	Yes	Yes[752]
Czechia	Shallow	Individual actual cost; contracted power		Yes[753]	Yes (difference between network users connecting to rural and urban areas[754])
Denmark	Shallow and deep	Lump sum (the average cost for	Yes (deep for producers,	Yes	Yes

[749] HR: In 2024 Old Connection Methodology from 2020 is still applied (NN, 51/17, 31/18, 104/20). New Connection Methodology is issued in 2022 (NN, 84/22). Prerequisite for the application of the New Connection Methodology is NRA decision on the values of the unit prices (EUR/kW). The same document (Methodology) is applied for both TSO and DSO connection requests.
Old Methodology. Connection charges for some consumers is based on the anticipated fixed connection charge unit price (EUR/kW) that includes costs to the nearest grid (individual actual cost) and network reinforcement cost, but only if they are within the 400-meter diameter from the nearest MV/LV station and if their contracted power is up to 22 kW (MV – medium voltage, LV – low voltage). Other consumers can pay more than the same fixed connection charge unit price (EUR/kW) if they incur more costs to the DSO on the low voltage grid. For consumers, there is a fixed connection unit price (EUR/kW) depending on the region: for Zagreb (1,700 kn/kW, 7.53450 HRK/EUR) and for the rest of Croatia (1,350 kn/kW), based on the Government Decision (NN, 52/06). Connection cost for consumer connecting to the medium voltage level can include a share in the cost for the HV/MV station and the 110 kV TSO line, depending on the share of the requesting contracted power ($P_{contracted}$) in the rated power of the network reinforcement infrastructure {e.g. $P_{contracted} / (0.8 \cdot P_{HV/MV})$, $P_{HV/MV}$ is rated infrastructure power}. Producers pay full connection costs to the nearest grid and a share in the grid reinforcements costs directly incurred by their connection. In some cases, a cost sharing is possible. More information in English can be found on pages 62-63 in NRA Annual Report 2020, https://www.hera.hr/en/docs/HERA_Annual_Report_2020.pdf.
New Methodology. DSO user connecting to the MV (above 230 V) pays to TSO network reinforcement price for the higher voltage levels (EUR/kW) and to DSO for the medium voltage level (EUR/kW), and doesn't pay costs to the nearest grid. So, connection cost to the MV is not calculated on the case-by-case basis as in Old Connection Methodology, it is based of anticipated price known before connection request. Storage connecting to the MV and also on lower voltages levels pays only costs to the nearest grid. Network user distant from the existing grid in the area outside the state planned construction area pays to DSO at least for the incurred connection cost to the nearest grid (T_{PRNN}) and for the incurred reinforcement costs for low and medium voltage level (T_{STUM}), or unit connection charge (C_{NN1}, EUR/kW) if multiplied with power (P, kW) gives higher value ($P \cdot C_{NN1} > T_{PRNN} + T_{STUM}$), and „cost sharing" is possible in this case. Other users connecting to the LV pay for both connection cost to the nearest grid and for the purpose of network reinforcement on the 0.4 kV regardless of the incurred costs to operator, but only trough unit price valid for all users connecting to the grid (EUR/kW), and this unit price includes connection cost to the nearest grid. Unit connection charges (EUR/kW) can differ on a regional basis, for example, charges may vary between Dubrovnik and Zagreb. More information: https://www.hera.hr/en/docs/HERA_Annual_Report_2022.pdf (p. 87-88)
[750] CY: If network extension/reinforcement is required a share of the cost is allocated to the DSO and the rest to the applicant based on several criteria (network characteristics, load, line etc.) described in the NRA's Regulatory Decision 03/2013.
[751] CY: e.g. the costs are separated based on the "Load Entitlement" (kVA), voltage level and network topology, if extension/reinforcement is required.
[752] CY: There is no locational specific variation but the further away from the distribution network, the higher is the charge.
[753] CZ: On each level, the connection charges match the average historic costs on the voltage level
[754] CZ: In remote areas, users pay actual connection costs, while in urban areas, users pay unit charge per connected capacity.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
		a given voltage level)	semi-deep for consumers)		(only for producers)[755]
Estonia	Shallow and deep	Individual actual cost (EUR); contracted power (EUR/MW)	No exemption, discount or difference	Yes	No
Finland	Shallow and deep	Individual actual cost (EUR) or lump sum[756] contracted power (EUR/MW)	Consumers versus Producers/Storage facilities; Small producers versus Other producers[757]	Yes	Yes[758]
France	Shallow	Individual actual cost (EUR) or lump sum; distance (EUR/m) contracted power (EUR/MW)	Yes (for RES and EV charging points)[759]	Yes	Yes[760]
Germany	Shallow and deep	No particular basis defined[761]	No exemption, discount or difference	Yes[762]	
Greece	Shallow and deep	Individual actual cost (EUR); lump sum; distance (EUR/m);	Few differences: producers	Yes	Yes[764]

[755] DK: Geographical differentiation is currently only implemented for producers. The law is currently under revision so that the geographical differentiation will also be possible for consumers.
[756] FI: In case of low voltage connections near substations, charge is calculated based on the average shallow costs and capacity charge. For the rest of the connections, connecting users pay actual shallow costs and capacity charge.
[757] FI: Costs are charged differently between production and consumption in relation to the capacity reservation charge. Concerning production, the average benefits relating to connecting production to the network must be considered. In the case of small production, a capacity fee is not charged.
[758] FI: Connection pricing is based on three different principles: zone pricing, area pricing, and case by case pricing. Zonal pricing is used at a distance of at least 600 m (and at least 3x63 A connections) from existing substations. Area pricing is used outside of zone pricing. Case by case pricing is used if there are no conditions for area pricing (often a single higher-capacity subscription that is not covered by zonal pricing due to its high power and distance). Zonal pricing is based on the average actual construction costs of the connections in the zones. Area pricing is based on the construction cost of the planned area divided by all potential connections in the area. Case-by-case pricing is based on the construction costs required for an individual connection. All connection charges shall also include an average capacity reservation fee (EUR/kVA) to cover the average cost of strengthening the network. The cost of strengthening the network may not be charged on a case-by-case basis. The principles for determining the capacity reservation fee are determined by the regulator. The capacity reservation fee is voltage level specific and must be determined separately for production and consumption connections. For the production the capacity reservation fee is usually a smaller than for the consumption connections because DSO must take into account in its pricing the potential benefits to the capacity that production facilities may cause in relation to consumption connections. DSO is not allowed to use capacity reservation fee for production that connection power is at most 2 MVA. The costs of network development are not allowed to include in the connection pricing. Network reinforcement consists of rebuilding the network (=network development) and increasing power transmission capacity. The capacity reservation fee is defined to include only calculated average costs that have an effect on the increase in transmission capacity.
[759] FR: Connection costs are reduced for RES and EV charging infrastructures. The costs are recovered via the network tariff.
[760] FR: A part of renewable energy connection fees is mutualised throughout regional schemes.
[761] DE: There is no particular regulation of connection charges. According to paragraph 17 of the Energy Act, the technical and economic conditions for connections have to be appropriate, transparent and non-discriminatory. These conditions apply to connection charges, too.
[762] DE: Each DSO sets its own connection charges and indicates variations. However, the low voltage level, there is a specific rule regarding deep connection charges (NAV). The NAV stipulates that an appropriate deep connection charge for the partial remuneration of the building or reinforcement of the network can be charged. The charge is calculated according to the relation between the capacity of the specific connection and the capacity of the grid. Deep connection charges must, however, not be charged for capacities not exceeding 30 kW.
[764] GR: Unit charges for consumers' connection may differ between geographic locations (e.g. due to differences in network specifications, like coastal areas).

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
		contracted power (EUR/MW)	versus consumers[763]		
Hungary	Shallow and deep	Individual actual cost; distance; contracted power	Yes (discount for RES and difference between LV/MV vs HV consumers)[765]	Yes	No
Iceland					
Ireland	Shallow	Various basis for setting the charge[766]	Difference between RES and non-RES producers; Difference based on size/type of the connection	Yes	
Italy	Shallow	Distance (EUR/m); contracted power (EUR/MW)	Consumers vs other network users[767]; small RES/CHP generators and other generators	Yes	No
Latvia	Shallow and deep	Individual actual cost (EUR); nominal current	Smaller network users vs other network users[768]	Yes	No
Lithuania	Shallow and deep	Lump sum (EUR); distance (EUR/m); contracted power (EUR/MW)	Prosumers versus other network users[769]	Yes	Yes[770]

[763] GR: Connection charges for both consumers and producers are essentially based on "deep connection cost" principle, with a few differences. For producers' connection charges are based on actual (realised) cost of network expansion and reinforcement required. Consumers' connection charges are calculated by means of a) unit costs related to the required network expansion and reinforcement works, as well as to the cost of existing network infrastructure and b) parameters related to the capacity of the required connection.

[765] HU: Consumers connecting to high voltage network pay the 70% of the total costs of connection. Consumers connecting to low or medium voltage network have to pay capacity based (HUF/kW) and distance based (HUF/m) tariff elements for the connection.

[766] IE: Connection Charges vary by voltage size and incentivise customers to right size their connection and connect to the most appropriate voltage level. LV/MV: The network user pays a capital contribution towards 50% of the shallow connection. HV: The network user pays a capacity-based charge towards deep reinforcement. Standard Charge based on MIC including a 50% capital allowance Standard Charge based on a per metre charge for new network – cable /OHL. Non-standard based on 50% of actual costs. Charges are based on the Least Cost Technically Acceptable (LCTA) connection method and all enhancements over LCTA are charged at 100%

[767] IT: Connection charges for active users are differentiated between small RES/CHP generators and others; small RES/CHP generators are charged based on a standardised formula while for the others a specific estimate by the DSO is needed. Connection charges for passive users are always based on a standardised formula, different from the one for active users.

[768] LV: DSO shall cover 50% of the connection charge if the nominal current of the input protection appliance of the connection does not exceed 100A and a connection voltage does not exceed 400V. In other cases, the network user pays the entire connection charge (deep).

[769] LT: Connection charges vary between prosumers who produce and consume in the same place (charged 50% connection costs) and prosumers who produce in one place and consume in another (charged 100% connection costs). Vulnerable users pay 20% of the connection costs. In the case of storage - if the storage will only be recharged from the network and not returned to the network, will be charged 50% connection costs. Energy storage facilities shall pay 100% of the costs, if the energy is subsequently returned to the electricity networks.

[770] LT: It takes into consideration geographical location impact on costs of connection.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
Luxembourg	Shallow	Individual actual cost (EUR) or lump sum (EUR); contracted power (EUR/MW)	No exemption, discount or difference	Yes	Yes
Malta	Shallow and deep	Individual actual cost (EUR); lump sum (EUR); contracted power (EUR/MW)	Yes (difference between smaller network users versus other network users)[771]	No	No
Netherlands	Shallow	Individual actual cost (EUR) or lump sum (EUR); distance (EUR/m)[772] capacity (EUR/MW)	No exemption, discount or difference	No	No
Norway	Deep	Individual actual cost[773]	No exemption, discount or difference	Yes	Yes
Poland[774]	Shallow	Individual actual cost	Producers vs storage vs consumers; RES versus cogeneration; EV charging infrastructure vs other consumers[775]	Yes	No[776], but difference for first connection
Portugal	Deep	Individual actual cost (EUR); distance (EUR/m); contracted power (EUR/MW) [777]	Producers versus consumers[778]	Yes	No
Romania	Shallow and deep	Individual actual cost; lump sum	Producers pay network reinforcement	Yes	No

[771] MT: Up to 60 Amps, connections charged a lump sum. Over 60 Amps, connections extended from an existing substation based on the actual cost and capacity.
[772] NL: One-time connection combines a fixed cost and an additional cost per meter cable length when the connection is more than 25 m; a periodic connection charge covers the cost of capital of the assets involved - it combines a fixed cost and an additional cost per meter cable length when the connection is more than 25 m.
[773] NO: Individual charge. Customers pay a share of actual investment costs of the connection based on capacity demand.
[774] PL: For the first connection charge is calculated on 25% of investments expenditures. For the reserve connection, a connection charge covers all investments expenditures
[775] PL: There are five connecting groups in DSO: from II (110 kV), III (MV), IV (LV, more than 40 kW), V (LV, less than 40 kW), VI temporary. Groups II-III pay a charge equal to 25% of CAPEX (investments expenditures used for realisation of the connection); RES less than 5 MW and cogeneration less than 1 MW: 50% of CAPEX; Micro-installation - 0% of CAPEX (free connection); EV charging infrastructure - 6.25% of CAPEX. Batteries 50% of CAPEX. Groups IV, V and VI pay charges from tariff multiplied by connection capacity.
[776] PL: There are differences between DSOs, but not within the area of the DSO.
[777] PT: Depending on the voltage level and on the requested power, the requester bears the entire connection cost or a portion of the total cost. The charge for network reinforcement depends on the voltage level as well as the power required. The charge for connection services is a function of the voltage level, the power required, the length of the connection elements, the type of connection (aerial or underground).
[778] PT: The charge for network reinforcement varies depending on whether the facilities are consumption or production.

Country	Connection charge category applied ('depth' of the charge)	Basis for setting connection charge	Exemptions, discounts or other differentiation between network users	Variation based on voltage level	Difference based on geographic location[743]
			component (deep charge) versus consumers pay a shallow connection charge		
Slovakia	Shallow and deep	Individual actual cost (EUR); contracted power (EUR/MW)	Discount for storage facilities providing ancillary services	Yes	
Slovenia	Shallow	Contracted power (EUR/kW)[779]	Producers versus consumers; different unit charges for households versus non-households[780]	Yes	No
Spain	Deep	lump sum (EUR); contracted power (EUR/kW)	No exemption, discount or difference[781]	Yes	No
Sweden	Deep	Individual actual cost	No exemption, discount or difference	Implicit[782]	Implicit[782]

Note: Where the connection charge is calculated based on actual costs (i.e. individually estimated), the variation based on the voltage level and the location is implicit (i.e. different voltage level or location may result in different actual costs), thus in the table such cases are labelled as 'N/A' (Not applicable).

Table 57: Cost sharing problem of grid connection

Country	Treatment of the problem of extending the network to serve one particular network user, leading to high connection costs for that user, which ultimately will reduce the connection costs to connect further users in the future
Croatia	In 2024 Old Connection Methodology from 2020 (NN, 51/17, 31/18, 104/20) is still applied. Old Connection Methodology is issued in 2022 (NN, 84/22). Prerequisite for the application of the New Connection Methodology is NRA decision on the values of the unit prices (EUR/kW) which is still pending. Old Methodology. Cost sharing exists for: A. users related to the new transformer 10(20)/0.4 kV regarding medium voltage (MV) grid reinforcement {Article 20(4)}, B. TSO producer related to the new reinforcement of the transmission grid {Article 32(3) and 35.a(2)} and C. TSO consumer and/or DSO producer and/or DSO producer related to the new 110/35 kV or 110/10(20) kV {Article 36(2)}. In all cases there is five-year time counting depending on the case: from the permit to use new infrastructure or counting from the connection to the grid. For the consumer distant from the transformer (MV/LV) more than 400 meters in diameter, and if for that user reconstruction of the low voltage grid is needed - than this user pays 50% of this cost and the other 50% is paid by DSO. If before this user's connection to the grid new users appear, then, there is cost sharing between new users and the user that signed the first contract.

[779] SI: New user is obliged to pay for average cost for connection while costs for connection from public grid to premises of the user depends on the individual case and its implementation/construction, which are covered by customers.
[780] SI: Specific connection charges in (EUR/kW) are calculated for different types of customers depending on the voltage level at which the costumer is connected: HV - consumption at 110 kV, MV - consumption at 35, 20 and 10 kV, LV - commercial above 43 kW, LV - commercial up to 43 kW, LV – household.
[781] ES: Distribution-connected producers pay for their connection and all the necessary reinforcements. For distribution-connected consumers, a difference is made depending on the nature of the network expansion, which is either paid for by the DSO or the network user. In the latter case, for consumers who connect to LV up to 100 kW or to HV up to 250 kW, at urban area, the DSO is remunerated at ex ante set values, depending on the power and voltage level.
[782] SE: Since the connection charge is calculated individually for the network users, the connection charge varies because of different costs, including due to different voltage level (i.e. variation by voltage level is implicit).

Country	Treatment of the problem of extending the network to serve one particular network user, leading to high connection costs for that user, which ultimately will reduce the connection costs to connect further users in the future
	New Methodology. Cost sharing is possible in case when low voltage infrastructure construction is needed outside the state planned construction area. Cost sharing in this case can appear if new consumers appear before the infrastructure is constructed {Article 20(8)}. No other cost sharing exists.
Denmark	Connection charges for all consumers and all producers are standard charges based on average grid costs. Therefore, the first and subsequent connections in a new area pay the same connection charge, which covers average investment costs. DSOs build the public grid. Customers establish their own cable to the POC, which is chosen by the DSO.
France	Specific treatment for RES production (S3RENR) where network reinforcements are shared with users in the future.
Greece	To ensure fair charges and address the 'free-rider' problem, a mechanism is in place to reimburse network users that have paid for the full actual cost of network expansion and/or reinforcement (mainly producers and some specific consumer connection cases), in case that other users are connected in the future making use of the extended/reinforced network (up to 5 years later)
Hungary	Consumers connecting to the high voltage network: The costs of works needed to make the required connection capacity available for a single network user are split into two different categories. The two categories are direct connection cost and indirect connection cost. Direct cost category includes all the costs of the investments by the TSO that result network devices that will be used by one single network user (e.g. a direct wire). The direct cost is paid by 100% by the network user. Indirect cost category includes all the costs of the investments that result network devices that will be used by several network users. The direct cost is paid only partially by a single network user. That method assures that connection costs for further networks users in the future will not be reduced.
Ireland	The Connection Charging Methodology includes a mechanism to refund customers who pay for deep connections, where customers connect in the future. The size of the refund depends on the size of the new customer(s).
Latvia	If, when evaluating the installation of a new connection, the system operator establishes that it is economically justified to install an electrical installation with additional capacity exceeding the permitted load requested by the network user, new system user pays in proportion to his requested capacity and the system operator shall cover all other costs related to the installation of additional capacity.
Lithuania	In the case the customer is connected to the D-network and its connection requires T or D network reconstruction in order to strengthen the network, then it is assessed whether there are potential users who would connect the equipment to the enhanced network for a period of five years. If so, the network development / reconstruction cost divided (formula: installation cost / infrastructure capacity (kW)) and each subsequent connected user pays for the network reinforcement previously carried out, depending on the installed capacity, thus contributing proportionately to the cost recovery. The criteria for the assessment of a potential user are defined in the Methodology for the Connection of Electrical Equipment to the Electricity Networks approved by the NERC.
Norway	Costs are reduced by 50% before connection charge is calculated.
Portugal	The charge for the reinforcement of the existing network (deep connection charge) results from the consideration of the set of expected benefits of the new connection, given the unit investment cost of the network operator. It is actually a contribution and takes into account, for example, the expected payment of tariffs for the use of networks, the improvement in the quality of service, the reduction of technical losses or the impact on price formation in the market (in the case of production facilities).
Romania	There are areas where consumption is higher than generation and other areas where generation exceeded the consumption. In the first situation, there is no need for reinforcements in the existing D-grid to connect new generators, so this measure (deep connection charge for producers) offers a locational signal to new producers and could reduce the quantity of electricity transmitted over long distances and the associated costs (mainly losses).
Slovenia	New user is obliged to pay for average cost for connection while costs for connection from public grid to premises of the user depends on the individual case and its implementation/construction, which are covered by customers.
Spain	In generation, the producer pays for his connection and all the reinforcements that are necessary. In the case of consumers, a difference is made between the natural extension of the network (growth in demand that emerges naturally in the networks) and the new network extensions: In the former case, the infrastructures must be carried out and paid for by the DSO. In the second case, they must pay for the development of the networks that are necessary, as well as the reinforcement at the same voltage level to which it is connected. In the latter case, for consumers who connect in LV and with a power of up to 100 kW or in HV with a power of

Country	Treatment of the problem of extending the network to serve one particular network user, leading to high connection costs for that user, which ultimately will reduce the connection costs to connect further users in the future
	250 kW, on urbanised land, the DSO is remunerated at values set ex ante, common for the entire territory, depending on the power and voltage level.
Sweden	If there are more connections probable in the area the customer only pays a relevant share of the connection. If there are none the connection can only serve that customer and that customer will have to pay it all. They have in rare occasions bought back unused connection capacity in order to connect more customers (Note: the practice was provided for one of the largest DSOs).

Table 58: Transfer or split of some of the connection charge revenues between DSOs

Country	Transfer or split of some of the connection charge revenues between DSOs
Austria	No
Belgium	No
Bulgaria	No
Croatia	No (only one DSO)
Cyprus	No
Czechia	No
Denmark	Yes: If different DSO's own different voltage levels in a given area, there are two models in use: 1) No split, but if the lower level DSO feeds in more max-load to the overlying grid, the underlying grid has to pay extra for that right 2) A split based on which DSO owns which of the essential grid assets.
Estonia	No
Finland	No
France	Yes: the cost-based connection charge is paid to the network operator whose network the network user will directly connect to. The network operator is obliged to transfer the share of the connection charge that is covering the costs of other network operator's investment.
Germany	No
Greece	No
Hungary	Yes: the cost-based connection charge is paid to the network operator whose network the network user will directly connect to. The network operator is obliged to transfer the share of the connection charge that is covering the costs of other network operator's investment.
Iceland	No data
Ireland	No
Italy	No
Latvia	No
Lithuania	No
Luxembourg	Other: Since there is a national tariff equalization between DSOs, this is implicitly done. Compensations between DSOs at regular intervals during the year, ensure that every DSO reaches his maximum allowed revenue.
Malta	N/A (In Malta there is only one DSO)
The Netherlands	No
Norway	Other: Each DSO calculates connection charges for their own investments. The connection charges associated with the same connection are bundled, and charged the relevant customer. The connection charge is split between the DSOs, based on the costs they are responsible for.
Poland	No
Portugal	No
Romania	No
Slovakia	No
Slovenia	No
Spain	No
Sweden	No

Table 59: Non-TSO and non-DSO costs collected by the system operators

Country	Non-TSO cost collected by TSO	Non-DSO cost collected by DSO
Austria	• RES: Pass through costs which are not part of any charges, separate item in the bill.	• RES[783]: Pass through costs which are not part of any charges, separate item in the bill.

[783] AT: Supporting schemes for renewables: OEMAG sets the levy. It is paid for by the network customer. A fee for the usage of public grounds: The levy is stated in the law. It is also paid for by the network customer as well as the energy customer, if the network in which the customer is located has an obligation to pay this levy.

Country	Non-TSO cost collected by TSO	Non-DSO cost collected by DSO
Belgium	• RES, Co-gen and Energy efficiency: Recovered via a surcharge (EUR/MWh) separated from TSO charges. • Adequacy: Part of the TSO charges according to the national law.	Brussels: • Energy efficiency, Social and Other[784]: Separate tariff lines within DSO charges, but not separated in the final bill. Flanders: • RES, Co-gen, Energy efficiency, Adequacy; Social, DSR, Other:[785] Separated from network charges Wallonia: • RES, Co-gen, Social, Other:[786] Separated from network charges
Bulgaria	N/A	• RES; • Adequacy: Separated from network charges
Croatia	N/A[787]	N/A[787]
Cyprus	• RES, Co-gen and Energy efficiency: EUR/kWh surcharge, separate in the bill from TSO charges[788]	• RES; Co-gen; Energy efficiency; EUR/kWh surcharge, separate in the bill from TSO charges[789] • Social: EUR/kWh surcharge, separate in the bill from TSO charges[790]
Czechia	N/A	N/A
Denmark	N/A	• NRA fee: Recovered by a charge, but not separated from DSO costs in the bill[791]
Estonia	• RES and Co-gen: Separate surcharge in the bill, i.e. separated from TSO costs[792]	• RES and Co-gen: Separate surcharge in the bill, i.e. separated from DSO costs[792]
Finland	• Adequacy: Separate[793] • Electricity tax	• Electricity tax:[794] • NRA fee: Not separated from DSO costs
France	N/A	N/A
Germany	• RES and Co-gen: Two separate levies separated in the bill from TSO costs[795] • Adequacy[796]	• RES and Co-gen: Two separate levies separated in the bill from TSO costs[796]

[784] BE: A part of public street lighting, DSO tax on the profit, costs of supporting energy transition, costs related to temporary supply of power in the public space (e.g. during fair).
[785] BE-FLA taxes (different than VAT), local retributions, public service obligations, cost of public lights are recovered as a separate tariff element of the distribution tariff. The NRA sets the charge which applies to all distribution-connected consumers.
[786] BE-WAL: Local municipality taxes (EUR/kWh), taxes paid by the DSO (contribution ISOC) (EUR/kWh), public service obligations/public lights.
[787] HR: RES and Co-gen: Single levy (EUR/kWh) set by the Government (not part of the tariff structure) and separate item in the bill from TSO charges. But this levy is not collected by TSO and/or DSO but from suppliers by Market Operator. The single charge is used for financing feed-in system lead by Croatian Market Operator (HROTE). There is the possibility that supplier issues single bill for both DSO and TSO tariff when money collection goes through supplier. Separated bill is also possible. Social: There is the solidarity contribution on the household bill for the endangered consumer. Government decision (NN, 95/15, 31/22, 28/24).
[788] CY: There is a charge related to RES and Energy Efficiency measures that is recovered through the bill as a separate charge from all consumer categories and is set by the Ministry of Energy.
[789] CY: There is a charge related to RES and Energy Efficiency measures that is recovered through the bill as a separate charge from all consumer categories and is set by the Ministry of Energy.
[790] CY: Public Service Obligation (EUR/kWh) - is a separate charge in the electricity bill that is not subject to VAT and imposed so that the EAC can recover the expenses incurred due to the additional costs that aroused by the application of special (red uced) tariffs for vulnerable consumers
[791] DK: Activities in the NRA are financed by fees determined by the authorities. The DSOs pay fees to the NRA to cover cost related to DSO activities e.g. calculation of DSO revenue caps, benchmarking analysis, and approval of tariffs. Cost of NRA fees bundled with other costs in the distribution charges. NRA budget determined as part of state budget. The DSOs pay fees to the Danish Energy Agency that covers costs e.g. related to designating the DSO´s to operate for a period of time.
[792] EE: The renewable energy charge (includes Cogen) is calculated by the TSO using principles which are set in national la. The charge is paid by the electricity consumers.
[793] FI: Costs of measures for ensuring adequacy: the power reserve system is financed by separate payments for electricity consumption based on the utilisation of the electricity system and the grid, which the grid operator designated for system li ability is entitled to collect from the users of transmission services. Network users also pay electricity tax.
[794] FI: The excise duty on electricity is set by the Government and is graded into a lower and a higher category. The lower duty is levied on separately metered electricity used in industrial manufacturing, data centers and professional greenhouse cultiv ation. Small-scale generation (below 100 MVA) is exempt from the duty. A part of the excise duty covers the costs of operations of the National Emergency Supply Agency.
[795] DE: EEG-Umlage (renewables). Part of the electricity bill of consumers and collected by the grid operators.
[796] DE: The TSO network costs include costs for the so-called capacity reserve (§13e EnWG). This reserve can be activated in case of severe imbalances between supply and demand on the electricity market that endanger the functioning of the electricity system

Country	Non-TSO cost collected by TSO	Non-DSO cost collected by DSO
Greece	• RES: Uplift charges are collected from Suppliers[797] • Co-gen: Covered by a separate charge • Adequacy and fossil fuel: Related costs are covered through wholesale market uplift charges.	No data
Hungary	• RES: Supporting schemes for renewables are financed through levies set by the Government, which are not part of the tariff structure, but included in the electricity bill. TSO is administering.	N/A
Iceland	N/A	N/A
Ireland	• Adequacy and DSR: Non-separate from TSO costs in the final bill	• DSR: Non-separate from DSO costs in the final bill
Italy	• RES and Co-gen[798] • Adequacy, stranded costs[799]	• Various policy costs[800]: Separated from the DSO costs in the final bill.
Latvia	• Past RES [801]	• Fossil fuels
Lithuania	• RES[802]	N/A
Luxembourg	• RES; Co-gen: Separate from TSO cost in the final bill[803], some of them are collected by TSOs, some by suppliers	• RES; Co-gen: Separate from DSO costs in the final bill[804]
Malta	N/A	N/A
Netherlands	N/A[805]	N/A[806]
Norway	• Adequacy: Non-separate	• RES; Energy efficiency: Separate surcharge in the final bill.[807]
Poland	• RES; Co-gen; Adequacy; Other: Separate surcharge for each[808]	• RES; Co-gen; Adequacy; Other: Separate surcharge for each[808]
Portugal[809]	• RES, Co-gen, energy efficiency, adequacy: Separate surcharge • Social: Non-separate from TSO costs	• RES; Co-gen, energy efficiency; Separate surcharge • Social: Non-separate from DSO costs

[797] GR: Through the RES levy (ETMEAR), auctioning of CO2 emission allowances and wholesale market uplift charges.
[798] IT: A3-SOS is the tariff element to cover the costs for supporting renewable sources and CIP 6/92 cogeneration.
[799] IT: Costs of measures for ensuring adequacy, stranded costs of phased-out power plants are also recovered by charges.
[800] IT: There is a number of policy costs which are paid by electricity consumers. In addition, TV tax is separately recovered via the electricity bills. However, they are not part of regulated network tariffs.
[801] LV: Support schemes for RES, cogeneration and fossil fuels are not applicable since 2013. However, some of those power plants which were granted till 2013 with such a support (for 10-20 years) receive payments (the last one until 2037) from the obligatory mandatory component (OMC) set by the regulatory ever year, separately from the transmission tariff.
[802] LT: Costs of supporting schemes for renewables are the public service obligation. The public services obligation price is part of the final price of electricity, which is paid by the consumer.
[803] LU: Supporting schemes: dedicated tax is collected by TSO/DSOs via suppliers. Feed-in tariffs are paid by TSO/DSOs to their respective producers. Costs and money transfers related to this scheme are separately accounted for and are declared to the NRA. Hence these costs/amounts do not enter network tariffs.
[804] LU: The costs of EV-recharging points accessible to the public operated by the DSO was recovered in the past as part of the distribution tariff, without distinguishing such tariff element. However, it has been excluded from the distribution tariffs in the meantime.
[805] NL: Energy tax and public service obligations are included in the electricity bill, but these are collected by the energy supplier and not the TSO.
[806] NL: Sustainability surcharge is included in the electricity bill, but it is collected by the energy supplier, not the DSO.
[807] NO: The surcharge ("Energifondet") is 0.01 NOK/kWh for households. Other network users are charged a fixed yearly rate of 800 NOK per metering
[808] PL: Costs of supporting schemes for renewables are recovered by a RES charge, which is set annually by the NRA. Costs of supporting schemes for cogeneration of heat and power are recovered by a cogeneration charge, which is set annually by the relevant Ministry. Transition fee - cost of termination of long-term energy contracts prior to their expiration; Stranded costs of phased-out power plants are recovered by a transition charge calculated by the NRA. Capacity fee - costs of capacity market.
[809] PT: Supporting schemes for renewables and cogeneration of heat and power are recovered in a separate tariff, which is included in the network access tariff. Hence, the network access tariff includes these non-DSO costs, as well as the transmission tariff, the distribution tariff and a tariff for costs of the system operator. Past employee downsizing costs are recovered as part of the distribution tariff, without distinguishing such tariff element. In addition, the low voltage distribution tariff includes concession rents paid by the DSO to municipalities and an incentive for the integration of LV installations into smart grids. Other costs (e.g. support schemes for renewables/cogeneration/fossil fuel, capacity mechanisms, cost for efficiency programs, rent of areas utilised by hydro plants, budget of the energy NRA, additional costs from the autonomous regions of Azores and Madeira) are recovered through a separate charge, called "global use of the system tariff". Each bill needs to identify the part of the network access tariff related to the non-TSO/DSO costs.

Country	Non-TSO cost collected by TSO	Non-DSO cost collected by DSO
Romania	• Co-gen: Separate from TSO costs in the final bill[810]	N/A
Slovakia	• RES, Co-gen, Fossil fuels[811]	N/A
Slovenia	• RES; Co-gen; Energy efficiency; Other: Separate from TSO costs in the final bill [812]	• RES; Co-gen; Energy efficiency; Other: Separate from TSO costs in the final bill
Spain	• RES; Co-gen; Stranded generation: Separate from TSO costs in final bil	• RES; Co-gen; Stranded generation; Social: Separate charge[813]
Sweden	• Adequacy: Separate charge[814]	• Energy tax[815]

Note: 'RES' means costs of supporting schemes for renewables; 'Co-gen' means costs of supporting schemes for cogeneration of heat and power; 'Fossil fuels' means costs of supporting schemes for fossil fuels; 'Energy efficiency' means costs of support schemes for energy efficiency; 'Adequacy' means costs of measures for ensuring adequacy (e.g. strategic reserve power plants, support for 'peakers', other relevant capacity remuneration mechanism); 'Stranded generation' means stranded costs of phased-out power plants; 'Social' means costs of social measures (e.g. pensions contributions, rural areas, emergency social support measures to mitigate the price increase in recent years); 'DSR' means costs of support schemes for demand response (others than costs of local/flexibility markets)

Table 60: Tariff setting related incentives for assets behind the meter and dedicated metering

Country	Tariff setting related incentives (other than "ToU') to the consumers to own a storage, EV-charging, heat-pump or other electric appliances	Existence of dedicated metering or submeter for consumption of a certain appliance separately from other consumption
Austria	No	Transmission: Yes[816] Distribution: No
Belgium	Yes[817]	No
Bulgaria	N/A	N/A
Croatia	No	Yes[818]
Cyprus	Yes	Yes (separate billing)
Czechia	No	No
Denmark	Transmission: No Distribution: Yes[819]	Transmission: No Distribution: Yes, on request
Estonia	No	Yes[820]
Finland	Transmission: N/A Distribution: No	Transmission: N/A Distribution: Yes
France	No	Yes (e.g. EV)
Germany	Yes[821]	Transmission: No Distribution: Yes[822]
Greece	No data	No data
Hungary	Transmission: Yes[823] Distribution: No	Transmission: No Distribution: Yes
Iceland	No data	No data
Ireland	No (just ToU)	Probably for DTS-T
Italy	No data	No data
Latvia	No	No

[810] RO: The fee for supporting scheme for cogeneration is approved by the NRA annually. It is paid by end-users through their suppliers for consumption.
[811] SK: Costs of supporting schemes for renewables; Costs of supporting schemes for cogeneration of heat and power: Costs of supporting schemes for fossil fuels; Cost for such support schemes are recovered by system operation tariff.
[812] SI: Costs of supporting schemes for RES and cogeneration of heat and power is part of a supplement charge set by Government and levied on each network user who is subject to transmission tariff. Costs are collected by TSO only for T connected users. Other: contribution for Market operator activities
[813] ES: RES support, stranded power generation costs for electricity production in Spanish non-peninsular territories. Costs collected by DSOs by separated charge.
[814] SE: For costs of measures ensuring adequacy a separate power reserve charge is applied which is paid by BRPs.
[815] SE: Energy tax is paid by end consumers and collected by the DSO.
[816] AT: Depending on the contract with the TSO there are dedicated metering devices
[817] BE: Quarter hourly netting is an incentive to storage and prosumers.
[818] HR: There are some network users which object is connected to both DSO and TSO grid. There are separated metering points to each network. For producers there are submeters for different production units.
[819] DK: Power-based capacity charges for large consumers and prosumers.
[820] EE: Network users allowed to choose different suppliers for different measurement points.
[821] DE: The pricing of the annual peak load could incentivise consumers to use storage to shave their peak load.
[822] DE: It applies a separate metering system to measure the consumption of appliances like heat-pumps or EV-charger due to a general ruling of the NRA. Operators of heat-pumps or EV-chargers can choose a consumption depending. Smart metering costs are not part of DSO costs. Smart metering is a deregulated activity in Germany.
[823] HU: Consumers with storage are exempted from transmission fee till 2026 if they have aFRR accreditation.

Country	Tariff setting related incentives (other than "ToU') to the consumers to own a storage, EV-charging, heat-pump or other electric appliances	Existence of dedicated metering or submeter for consumption of a certain appliance separately from other consumption
Lithuania	No	Yes[824]
Luxembourg	Yes[825]	No
Malta	No	Yes[826]
Netherlands	No	No
Norway	No	No
Poland	Storages	No
Portugal[827]	No	Yes[828]
Romania	No	No
Slovakia	No data	No data
Slovenia	No	No
Spain	No	No
Sweden	No	No

[824] LT: Currently only separate objects/items in the whole park are with technical meters. They are used for imbalance settlement of separation of factual generation/consumption between several corporate entities which generation assets are connected to the same transformer.
[825] LU: Implicit incentives for storage are the better management of measured peak on voltage levels above the low voltage level. No other incentives are in place.
[826] MT: a separate meter is required to generating facilities of Prosumers and to residential EV charging points to benefit from specific tariffs.
[827] PT: Costs of metering (conventional and smart meters): investment cost (CAPEX) of meters is not recovered through distribution tariffs. OPEX related to metering are part of the costs recovered via the distribution tariff. Metering is a regulated activity, but as required by law, the investment cost of meters (both conventional and smart meters) is not recovered through distribution tariffs. However, since 2018 DSOs are entitled to an output-based incentive for the integration of low voltage installations in smart grids, which aims to lead the DSO to deliver to consumers value added services enabled by smart grids. Under this incentive, DSOs are awarded a fixed annual amount (for a fixed number of years) per LV supply point that delivers a certain list of smart grid services to consumers that include data collected through smart metering.
[828] PT: There are two practices that may fall under this question. For electric mobility, which has its own regulated entity for managing financial and informational data flow, the power/energy measurements at public EV chargers are subtracted from the overall power/energy measurement, to obtain two separate load diagrams (electric mobility vs rest). For collective self-consumption (i.e. energy sharing), the injection of renewable energy is allocated via allocation keys to specific end-users, with the injected energy being subtracted from the overall power/energy measurement, with the remaining load diagram being charged with the regular network tariffs.

2. Annex 2: Links to national tariff methodologies and tariff values

Table 61: Links to transmission tariff methodologies and transmission tariff values

Country	On-going transmission tariff methodology period	Link to the latest transmission tariff methodology	Link(s) to the current transmission tariff values / online calculator
Austria	No certain time period is defined for the methodology; latest revision in 2012 (change of law)	N/A[829]	https://www.ris.bka.gv.at/GeltendeFassung.wxeAbfrage=Bundesnormen&Gesetzesnummer=20010107&FassungVom=2024-01-01
Belgium	January 2024- December 2027	https://www.creg.be/sites/default/files/assets/Publications/Others/Z1109-11FR.pdf	https://www.creg.be/sites/default/files/assets/Tarifs/Elia/TarifsTransport-2024-2027%20FR.pdf
Bulgaria		https://www.dker.bg/uploads/normative_docs/naredbi/Naredba_1_15052024.pdf	https://www.dker.bg/uploads/reshenia/2021/res-c27-2021.pdf
Croatia	In September 2024 TSO has submitted request to NRA to increase consumer's network tariff for 12% and to determine the injection charge (0.125 EUR/kW) starting from 1 January 2025. With this injection charge price TSO anticipates 5.3 MEUR of income from TSO producers. HERA issued decision to increase network charges for 12% starting from 1th of January 2025 but without injection charge, reasoning is here, https://www.hera.hr/hr/docs/2024/Odluka_2024-12-09_04.pdf	https://www.hera.hr/hr/docs/SPKP/NN-2022-07-20-1284.pdf[830]	NRA decision on tariff values: https://narodne-novine.nn.hr/clanci/sluzbeni/2024_12_145_2403.html Link to amounts recovered by each tariff element: https://www.hera.hr/en/docs/HERA_Annual_Report_2022.pdf (p.79, p.83) Certified tariff calculators: https://www.hrote.hr/?id=1717 Market operator's tariff calculator https://www.hrote.hr/alat-za-usporedbu Another certified tariff calculator: https://ustedi.hr/
Cyprus	Regulatory period for reviewing the tariff methodology is every 5 years. Latest revision was in 2022	https://www.cera.org.cy/Templates/00001/data/nomothesia/ethniki/rythmistikes_apofaseis/2022_05.pdf	https://tsoc.org.cy/electrical-system/use-of-system-charges/
Czechia	2021-2025	https://www.eru.cz/en/-/zasady-cenove-regulace-pro-regulacni-obdobi-2021-2025-pro-odvetvielektroenergetiky-plynarenstvi-pro-cinnosti-operatora-trhu-v-elektroenergetice-a-ply	https://www.eru.cz/cs/-/cenove-rozhodnuti-c-8-2021

[829] AT: The tariff setting methodology is only provided in the explanatory notes concerning the actual system ordinance. The changes between the years are explained here: https://www.e-control.at/bereich-recht/verordnungen-zu-strom/-/asset_publisher/tiRyh5zzUOU7/content/systemnutzungsentgelte-verordnung-sne-v-1?_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7_assetEntryId=10262340&_com. The cost setting methodology is available here: https://www.e-control.at/documents/1785851/0/Regulierungssystematik_Strom-TSO_FINAL+%281%29.pdf/9a0b09ba-aaf8-8760-b156-6bd33854aa75?t=1563368399034#:~:text=Die%20Regulierungssystematik%20stellt%20fest%2C%20dass,%C2%A7%2050%20ElWOG%202010%20ber%C3%BCcksi

[830] HR: The overview in Croatian of the New Connection Methodology (NN, 84/22) is publish in 16 TH HRO CIGRE Symposium in Cavtat (Croatia) in November 2024, "Metodologija za određivanje iznosa tarifnih stavki za prijenos električne energije iz 202 2.", T2-08.

Country	On-going transmission tariff methodology period	Link to the latest transmission tariff methodology	Link(s) to the current transmission tariff values / online calculator
Denmark	No certain time period is defined for the methodology; The transmission tariff methodology has been set in 2005. The TSO is working on a tariff reform. There have been major changes for injection charges in 2023. New methodologies for the withdrawal charges are expected.	The latest DUR decision approving a transmission tariff methodology: https://afg.forsyningstilsynet.dk/h/42c520c9-70bc-4643-93f3-3f63bb755d28/693aa5ff46b047bc8dc0e8b97516be02?showExact=true	https://energinet.dk/El/Elmarkedet/Tariffer/Aktuelle-tariffer https://energinet.dk/regler/el/tariffer/
Estonia	No certain time period is defined for the methodology; latest revision in 2023.	https://www.konkurentsiamet.ee/media/321/download (in Estonian)	https://www.konkurentsiamet.ee/media/633/download
Finland	2024-2031 (2 sub-periods 2024-2027 and 2028-2031)	Not publicly available: the Finnish TSO is not obligated to publish tariff methodology TSO has published 'Grid service pricing structure' - design for different network users: https://www.fingrid.fi/globalassets/dokumentit/fi/palvelut/kayttovarma-sahkonsiirto/fingrid_kantaverkkopalvelun_hinnoittelurakenne_en_f.jpg	https://www.fingrid.fi/en/grid/grid-connection-agreement-phases/main-grid-contract-and-service-fees/#service-fees
France	Jul 2021- Jul 2025 (TURPE 6 period)	https://www.cre.fr/Documents/Deliberations/Decision/tarif-d-utilisation-des-reseaux-publics-de-transport-d-electricite-turpe-6-htb (in French) https://www.cre.fr/en/Documents/Deliberations/Decision/tariffs-for-the-use-of-public-transmission-electricity-grids-turpe-6-htb (in English)	https://www.cre.fr/en/Documents/Deliberations/Decision/tariffs-for-the-use-of-public-transmission-electricity-grids-turpe-6-htb (Section 5.2.2, from p.93)
Germany	No certain time period is defined for the methodology; The ordinance setting the methodology has come into force in 2005 and has since been amended several time, latest amendment was in 2021 resulted in minor changes	https://www.gesetze-im-internet.de/stromnev/	The tariffs of the 4 German TSOs are harmonised: https://www.netztransparenz.de/de-de/%C3%9Cber-uns/Netzentgelte
Greece	No certain time period is defined for the methodology; latest revision in 2023 by NRA decision.	https://www.rae.gr/wp-content/uploads/2024/02/%CE%B1%CF%80%CE%BF%CF%86%CE%B1%CF%83%CE%B7-E-21-2023.pdf	https://www.rae.gr/wp-content/uploads/2022/08/643_2022.pdf
Hungary	Apr 2021- Dec 2024	https://www.mekh.hu/download/c/90/51000/MU_II_m%C3%B3dos%C3%ADt%C3%A1s_20230626.pdf	http://www.mekh.hu/download/2/ae/e0000/rendszerhasznalati_dijak_2021_aprilistol.xlsx
Iceland			
Ireland	2021-2025 (Last amendments in 2022)	https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU20152-TSO-and-TAO-Transmission-Revenue-2021-20252.pdf	https://cms-prd.eirgrid.dept.ie/eirgrid-statement-charges-2023-2024

Country	On-going transmission tariff methodology period	Link to the latest transmission tariff methodology	Link(s) to the current transmission tariff values / online calculator
		(Appendix 3)	
Italy	January 2016- December 2023; (semi-period January 2020 – December 2023)	https://www.arera.it/allegati/docs/19/568-19TIT.pdf (especially articles 7, 25 and 26 and Annex tables) https://www.arera.it/it/docs/19/568-19.htm	https://www.arera.it/it/elettricita/trasmissione.htm; https://www.arera.it/allegati/docs/19/568-19tabTIT_ti.xlsx (tables 1 and 5)
Latvia	No certain time period is defined for the methodology; The methodology was approved in August 2022 (last amendments in November 2023)	https://likumi.lv/ta/id/335096-elektroenergijas-parvades-sistemas-pakalpojumu-tarifu-aprekinasanas-metodika (in Latvian)	Existing transmission tariff rates are set for two and a half years (Jul 2023–Dec 2025): https://www.sprk.gov.lv/sites/default/files/editor/ED/Elektroenergija/Tarifi/Par%20AS%20Augstsprieguma%20t%C4%ABkls%20p%C4%81rvades%20tarifiem.pdf From 1 January 2024 https://www.sprk.gov.lv/sites/default/files/2023-12/Publikacija_Augstsprieguma_tikls_30112023.pdf
Lithuania	January 2022 – January 2026 (reviewed biennially)	https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/049c46b09dcb11e48d7bacdf30d64d66/ueYGduhurK?jfwid=-1ac9ufnnuk	https://www.vert.lt/en/Pages/price-ceilings-of-electricity-transportation-services-and-public-energy-price-ceilings.aspx
Luxembourg	January 2021- December 2024	https://legilux.public.lu/eli/etat/leg/rilr/2020/05/26/a561/jo (only in French)	https://assets.ilr.lu/energie/Documents/ILRLU-1685561960-948.pdf
Malta	N/A	N/A	N/A
Netherlands	No certain time period is defined for the methodology[831]; The latest revision was in February 2022 (only minor changes were made in the national tariff code)	https://wetten.overheid.nl/BWBR0037951/2022-02-09 (only in Dutch)	Tariff values (2024): https://www.acm.nl/system/files/documents/tarievenbesluit-tennet-2024.pdf (p. 20-21) and https://www.acm.nl/system/files/documents/rekenmodule-tarievenbesluit-tennet-2024.xlsx (both only in Dutch)
Norway	No certain time period is defined for the methodology, latest revision was on 1 January 2019	https://www.statnett.no/for-aktorer-i-kraftbransjen/tariff/tariffer-i-sentralnettet/	https://www.statnett.no/globalassets/for-aktorer-i-kraftsystemet/tariff/tariff-booklet-2022.pdf
Poland	No certain time period is defined for the methodology (Current tariff values apply between January – December 2022)	DSOs connected to TSO grid: https://www.ure.gov.pl/pl/biznes/taryfy-zalozenia/zalozenia-dla-kalkulacj/9961,Informacja-w-sprawie-kalkulacji-taryf-OSD-na-2022-r.html Smaller DSOs: https://www.ure.gov.pl/pl/biznes/taryfy-zalozenia/zalozenia-	https://bip.ure.gov.pl/bip/taryfy-i-inne-decyzje-b/energia-elektryczna/4367,Taryfy-opublikowane-w-2023-r.html

[831] NL: The national tariff code describes the tariff structure. This tariff code is a regulation that can be amended. Generally, an amendment is proposed by the TSO after which the NRA decides. There is an annual tariff decision through which tariffs are set for the next calendar year. In the tariff decision allowed revenues are calculated (on the basis of a methodology which remains the same throughout the regulatory period). Then tariffs are determined by applying tariff structure described in the national tariff code. For the tariff decision, the TSO proposes the tariffs and the NRA then decides on the tariffs.

Country	On-going transmission tariff methodology period	Link to the latest transmission tariff methodology	Link(s) to the current transmission tariff values / online calculator
		dlkalkulac/7833,Informacja-dla-przedsiebiorstw-energetycznych-posiadajacych-koncesje-na-dystrybu.html	
Portugal	January 2022- December 2025 (4 years)	https://www.erse.pt/media/s3mdkbcx/estrutura-tarif%C3%A1ria-se-2022.pdf (p. 30ff)	Tariff values for year 2025: Website: https://www.erse.pt/en/activities/market-regulation/tariffs-and-prices-electricity/#tariffs-and-regulated-prices Publication in Official Journal https://www.erse.pt/media/oiwgcxk5/diretiva-2_2025-tarifas-2025.pdf (only in Portuguese) Excel: https://www.erse.pt/media/ipboeq4k/s_tarifas_net.xlsx (only in Portuguese)
Romania	January 2020- December 2024 The current tariff methodology was set by the NRA in 2019. (latest amendment in 2023) The system services are subject to the ANRE Order no. 116/2022 (system methodology).	https://www.anre.ro/ro/energie-electrica/legislatie/metodologii-tarife/transport-si-servicii-de-sistem	Current transmission tariffs are approved by ANRE Order no. 109/2023. The system services tariff value is approved by ANRE Order no. 116/2023 and 15/2024; https://portal.anre.ro/PublicLists/Ordin
Slovakia	Current tariff methodology was set in 2017 by the NRA New regulation period will start from 1 January 2023.	https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2017/18/20211215.html (Decree No. 18/2017, only in Slovakian)	Values of tariff for the system services (TSS) in Slovak NRA Decision 0097/2022/E Values of tariff for the access to the transmission system and for the transmitted energy values in Slovak NRA Decision 0078/2022/E Values of tariff for losses during energy transmission in transmission system in Slovak NRA Decision 0078/2022/E Maximal prices for the balancing services (capacity and energy) per particular types of balancing service that can be paid by Slovak TSO to balancing services providers in Slovak NRA Decision 0092/2022/E.
Slovenia	There is no defined period, (Last revision on 16 November 2022) The latest regulatory period is set for years 2024-2028.	http://www.pisrs.si/Pis.web/pregledPredpisa?id=AKT_1050	transmission tariff values:https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2023-01-3431?sop=2023-01-3431 Online calculator - for end price comparison: http://primerjalnik.agen-rs.si/index.php?/kalkulatorelektrika/kalkulator/action/Izbir

Country	On-going transmission tariff methodology period	Link to the latest transmission tariff methodology	Link(s) to the current transmission tariff values / online calculator
			aOdjemalca/Podstran/PrimerjavaPonudb - for network charges: http://primerjalnik.agen-rs.si/index.php?/kalkulatorelektrika/kalkulator/action/VnosPodatkovAnalizaCuo/Podstran/AnalizaCenZaUporaboOmrezja
Spain	Six years from January 2020 to December 2025	Legal text https://www.boe.es/buscar/act.php?id=BOE-A-2020-1066 Impact assessment https://www.cnmc.es/sites/default/files/2808025_42.pdf Tariff model https://www.cnmc.es/sites/default/files/2808026_42.xlsx	https://www.boe.es/diario_boe/txt.php?id=BOE-A-2023-26251 https://www.cnmc.es/sites/default/files/5050864.xlsx
Sweden	No certain time period is defined for the methodology; latest revision was in 2021	www.svk.se/tariff	https://www.svk.se/siteassets/4.aktorsportalen/systemdrift-o-elmarknad/transmissionsnatstariff/aktuella-prislistor/prislista-2022_transmissionsnatet.pdf

Table 62: Links to distribution tariff methodologies and distribution tariff values

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
Austria[832]	No certain time period is defined for the methodology	https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20010107&FassungVom=2024-01-01	Tariff values (January 2024 – December 2024): https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20010107&FassungVom=2024-01-01
Belgium	Brussels: January 2020- December 2024 Flanders: January 2020- December 2024 Wallonia: January 2019- December 2023	Brussels: https://www.brugel.brussels/themes/tarifs-de-distribution-12/methodologie-tarifaire-2020-2024-320 Flanders: https://www.vreg.be/nl/tariefmethodologie-2021-2024 Wallonia: https://www.cwape.be/sites/default/files/cwape-documents/2021.09.02-M%C3%A9thodologie%20tarifaire%202019-2023%20-	Brussels: https://www.brugel.brussels/themes/tarifs-de-distribution-12/tarifs-de-distribution-2020-2024-46 https://www.sibelga.be/fr/raccordements-compteurs/tarifs/tarifs-utilisation-du-reseau/simulateur-couts-de-distribution-electricite Flanders: https://www.vreg.be/nl/periodieke-nettarieven-elektriciteit-

[832] AT: further information: https://www.e-control.at/en/bereich-recht/verordnungen-zu-strom/-/asset_publisher/tiRyh5zzUOU7/content/systemnutzungsentgelte-verordnung-sne-v-1?_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7_assetEntryId=10262340&_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7_redirect=https%3A%2F%2Fwww.e-control.at%2Fbereich-recht%2Fverordnungen-zu-strom%3Fp_p_id%3Dcom_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview%26_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7_cur%3D0%26p_r_p_resetCur%3Dfalse%26_com_liferay_asset_publisher_web_portlet_AssetPublisherPortlet_INSTANCE_tiRyh5zzUOU7_assetEntryId%3D10262340

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
		%20modifications%20-%20consolidation%20officieuse.pdf https://www.cwape.be/node/177#mthodologie-tarifaire	en-aardgas-2024 https://simulatornieuwenettarieven.vreg.be/ https://vtest.vreg.be/ Wallonia: https://www.cwape.be/node/176#grilles-tarifaires
Bulgaria		https://www.dker.bg/uploads/normative_docs/naredbi/Naredba_1_15052024.pdf	
Croatia	In September 2024 DSO has submitted request to NRA to increase consumer's network tariff for 12% starting from 1 January 2025. DSO did not request inclusion of the injection charge. But, DSO calculated maximum allowed value of injection charge (0.141 EUR/kW). If this value would be applied DSO income would be 0.7 MEUR of income from DSO producers. HERA has issued Decision in December 2024 where network charges are increased for 12% without injection charge.	2022 methodology (not valid yet): https://www.hera.hr/hr/docs/SPKP/NN-2022-07-20-1283.pdf	NRA decision on tariff values: https://narodne-novine.nn.hr/clanci/sluzbeni/2024_12_145_2404.html Link to amounts recovered by each tariff element: https://www.hera.hr/en/docs/HERA_Annual_Report_2022.pdf (p.79, p.83) Certified tariff calculators: https://www.hrote.hr/?id=1717 Market operator's tariff calculator https://www.hrote.hr/alat-za-usporedbu Another certified tariff calculator: https://ustedi.hr/
Cyprus	Regulatory period for reviewing the tariff methodology is every 5 years. Latest revision was in 2022 (smaller amendments).	https://www.cera.org.cy/Templates/00001/data/nomothesia/ethniki/rythmistikes_apofaseis/2022_05.pdf	Tariff calculator: https://www.cera.org.cy/Templates/00001/data/hlektrismos/cost_of_use.pdf
Czechia	Ongoing tariff methodology period (2021-2025):	https://www.eru.cz/en/-/zasady-cenove-regulace-pro-regulacni-obdobi-2021-2025-pro-odvetvi-elektroenergetiky-plynarenstvi-pro-cinnosti-operatora-trhu-v-elektroenergetice-a-ply	low voltage: https://www.eru.cz/cs/-/cenove-rozhodnuti-c-9-2021 medium and high voltage: https://www.eru.cz/cs/-/cenove-rozhodnuti-c-8-2021
Denmark	No certain time period is defined for the methodology	https://greenpowerdenmark.dk/files/media/document/Anmeldelse-af-model-for-producentbetaling.pdf	Link to 2021 tariffs (in Danish): Energi Data Service | Datasets | Datahub Price List (Danish) Explanation of tariff model 3.0: Dansk Energis tariferingsmodel 3.0
Estonia	No certain time period is defined for the methodology; latest revision was in 2023 (i.e. 5 years after the second latest)	https://www.konkurentsiamet.ee/media/321/download (in Estonian)	https://www.konkurentsiamet.ee/media/627/download

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
Finland	No certain time period is defined for the methodology (each DSO decides separately when to update its tariff methodology). Ongoing tariff methodology period is 2024-2031. Current regulatory period is set for 2024-2027.	DSOs are not required to publish their tariff methodologies, but they can do on a voluntary basis. None of the distribution tariff methodologies is currently published.	DSOs are obliged by law to publish tariff values. They provide this information on their websites
France	Jul 2021- Jul 2025 (TURPE 6 period)	https://www.cre.fr/content/download/23338/file/210121_2021-13_TURPE_6_HTA-BT.pdf	https://calculatrice.cre.fr/
Germany	No certain time period is defined for the methodology (The ordinance setting the methodology has come into force in 2005 and has since been amended several time, latest amendment was in 2023 Ongoing regulatory period: 2024-2028	https://www.gesetze-im-internet.de/stromnev/	There are over 800 DSOs in Germany who publish their respective tariffs sheets. There is no online calculator. The links to the tariff sheet of some of the biggest DSOs: Westnetz: https://www.westnetz.de/de/ueber-westnetz/unser-netz/netzentgelte-strom.html Stromnetz Berlin: https://www.stromnetz.berlin/files/globalassets/dokumente/entgelte/zugang/Entgelte-01-01-2024/NNE-B-2024.pdf NetzeBW: https://assets.ctfassets.net/xytfb1vrn7of/6Wb8sYU8x0Fw6benikLxGo/66537b6b8070d5503b1165d2aad21b02/netzentgelte-strom-2024.pdf
Greece	No certain time period is defined for the methodology; latest revision was in 2021 (RAE decision 707/16.9.2021). The tariffs determined according to the new methodology will be effective from 1 January 2023[833]	https://www.rae.gr/wp-content/uploads/2021/12/A707A_2021-%CE%95%CE%93%CE%A7.%CE%A7%CE%A7%CE%94-%CE%A6%CE%95%CE%9A-B5427_-22.11.21.pdf	https://www.rae.gr/wp-content/uploads/2024/02/FEK-2024-Tefxos-B-00738-downloaded-01_02_2024.pdf
Hungary	Ongoing tariff methodology period (April 2021 – December 2024, latest amendment in June 2023):	https://www.mekh.hu/download/c/90/51000/MU_II_m%C3%B3dos%C3%ADt%C3%A1s_20230626.pdf	http://www.mekh.hu/download/2/ae/e0000/rendszerhasznalati_dijak_2021_aprilistol.xlsx
Iceland	No data	No data	No data
Ireland	Tariff review is ongoing.	Tariff review is ongoing.	Tariff review is ongoing.
Italy	2016-2023, divided into two 4-years sub-periods (2016-2019, 2020-2023)	https://www.arera.it/allegati/docs/19/568-19TIT.pdf#page=27 (Annex A to Decision 568/2019/R/eel, articles 8-13, 16, 21-26)	https://www.arera.it/it/elettricita//distr.htm

[833] GR: The NRA indicated that the determination of DSO required revenue for 2021 and 2022 was delayed. For this reason, distribution tariffs that were determined according to the previous methodology and were based on recovery of 2020 DSO required revenue, continue to apply also in 2021 and 2022. It is expected that the new methodology will be applied to determine distribution tariffs for recovery of DSO 2023 required revenue.

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
Latvia	No certain time period is defined for the methodology; the methodology was approved in Dec 2011, the last amendments in June 2021, effective from July 2022. Existing distribution tariff rates are set for five years (January 2020–December 2024)	https://likumi.lv/doc.php?id=241677&from=off (only in Latvian)	https://www.sprk.gov.lv/sites/default/files/editor/ED/Elektroenergija/Tarifi/AS_Sadales_tikls_tarifi_01012020.pdf (tariff values from p.12) https://sadalestikls.lv/lv/tarifu-kalkulators (in Latvian)
Lithuania	January 2022– January 2026, reviewed biennially	https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/049c46b09dcb11e48d7bacdf30d64d66/ueYGduhurK?jfwid=-1ac9ufnnuk	https://www.vert.lt/en/Pages/price-ceilings-of-electricity-transportation-services-and-public-energy-price-ceilings.aspx
Luxembourg	January 2021- December 2024	https://legilux.public.lu/eli/etat/leg/rilr/2020/05/26/a561/jo (only in French)	https://assets.ilr.lu/energie/Documents/ILRLU-1685561960-948.pdf
Malta	No certain time period is defined for the methodology, the methodology applies since 2008	The tariff methodology is not published. Some tariff related information is available here: https://www.rews.org.mt/#/en/rewsfa/27	The DSO forms part of a vertically integrated company which is also the sole supplier of electricity in Malta. Articles 6, 35, 43 and 4 of Directive (EU) 2019/944 do not apply to Malta (Article 4 has a time-limited derogation until 5 July 2027). The DSO is required to keep unbundled accounts at internal management accounts level only. As such there is no specific separate tariff for the use of the distribution network. The costs of the distribution network are in part covered by a maximum demand tariff, an annual fixed charge, kWh tariffs that covers also energy and the supply and connection charges. All tariffs are regulated. Link to tariffs: https://www.rews.org.mt/#/en/a/13-regulated-electricity-tariffs
Netherlands	January 2022- December 2026	https://www.acm.nl/nl/publicaties/methodebesluit-regionaal-netbeheer-elektriciteit-2022-2026	Calculation of the allowed revenues for 2022: https://www.acm.nl/nl/publicaties/berekening-totale-inkomsten-2022-regionaal-netbeheer-elektriciteit Tariff values for 2022 for each DSO: https://www.acm.nl/nl/publicaties/tarievenbesluit-coteq-elektriciteit-2022 https://www.acm.nl/nl/publicaties/tarievenbesluit-enexis-elektriciteit-2022 https://www.acm.nl/nl/publica

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
			ties/tarievenbesluit-liander-elektriciteit-2022 https://www.acm.nl/nl/publicaties/tarievenbesluit-rendo-elektriciteit-2022 https://www.acm.nl/nl/publicaties/tarievenbesluit-stedin-elektriciteit-2022 https://www.acm.nl/nl/publicaties/tarievenbesluit-westland-elektriciteit-2022
Norway	No certain time period is defined for the methodology, the latest revision was in June 2021, effective from July 2022	https://lovdata.no/dokument/SF/forskrift/1999-03-11-302	https://www.nve.no/reguleringsmyndigheten/publikasjoner-og-data/statistikk/nettleiestatistikk/
Poland	No certain time period is defined for the methodology Current tariff values apply between January–December 2024	DSO connected to TSO grid: https://www.ure.gov.pl/pl/biznes/taryfy-zalozenia/zalozenia-dla-kalkulacj/11748,Informacja-w-sprawie-kalkulacji-taryf-OSD-na-2024-r.html smaller DOSs https://www.ure.gov.pl/pl/biznes/taryfy-zalozenia/zalozenia-dlkalkulac/7833,Informacja-dla-przedsiebiorstw-energetycznych-posiadajacych-koncesje-na-dystrybu.html	https://bip.ure.gov.pl/bip/taryfy-i-inne-decyzje-b/energia-elektryczna/4367,Taryfy-opublikowane-w-2023-r.html
Portugal	January 2022- December 2025	https://www.erse.pt/media/s3mdkbcx/estrutura-tarif%C3%A1ria-se-2022.pdf (p.46ff) (only in Portuguese)	Tariff values for year 2025: Website: https://www.erse.pt/en/activities/market-regulation/tariffs-and-prices-electricity/#tariffs-and-regulated-prices Publication in Official Journal: https://www.erse.pt/media/oiwgcxk5/diretiva-2_2025-tarifas-2025.pdf (only in Portuguese) Excel: https://www.erse.pt/media/ipboeq4k/s_tarifas_net.xlsx (only in Portuguese)
Romania	January 2019- December 2023 The tariff methodology was set by ANRE Order no. 169/2018. Last amendment in 2023.	https://www.anre.ro/ro/energie-electrica/legislatie/metodologii-tarife/distributie-energie-electrica (only in Romanian)	Tariff values are approved by ANRE Order no. 110, 111, 112, 113, 114 and 115/2023 https://portal.anre.ro/PublicLists/Ordin
Slovakia	2017- 2022 The tariff methodology is set by Decree No. 18/2017	https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2017/18/20211215.html (in Slovakian)	DSOs are obliged to publish their applied tariff values.

Country	On-going distribution tariff methodology period	Link to the latest distribution tariff methodology	Link(s) to the current distribution tariff values / online calculator
Slovenia	There is no defined period. Last revision on 1 June 2022. The latest regulatory period is set for years 2024-2028.	http://www.pisrs.si/Pis.web/pregledPredpisa?id=AKT_1050	Transmission tariff values: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2021-01-4132?sop=2021-01-4132 On line calculator: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2023-01-3431?sop=2023-01-3431
Spain	January 2020- December 2025	Decision setting the tariff methodology: https://www.boe.es/buscar/act.php?id=BOE-A-2020-1066 Impact assessment: https://www.cnmc.es/sites/default/files/2808025_42.pdf Tariff model: https://www.cnmc.es/sites/default/files/2808026_42.xlsx	https://www.boe.es/diario_boe/txt.php?id=BOE-A-2023-26251 https://www.cnmc.es/sites/default/files/5050864.xlsx
Sweden	No certain time period is defined for the methodology	Each DSO sets its own tariff methodology. DSOs are not obliged to publish their tariff methodology.	DSOs are obliged to publish their tariff values. They provide this information on their websites.

3. Annex 3: G-charge monitoring

The legal ranges of annual average transmission charges paid by producers is set by Annex B of the Commission Regulation[834]. The transmission charges by generators under the scope of the Regulation (i.e. 'G-charge') excludes connection charges, charges related to ancillary services and specific system loss charge.

Application of G-charges is identified for eight countries (DK, FI, IE, LV, NO, RO, SK, SE) for this Report. In the other countries which have reported injection charges at transmission: they cover only costs related to system losses and/or ancillary services (AT, BE, FR) or such charges are marginal lump sum fees (NL, MT) for administrative and/or metering costs, well under the ceilings for G-charges.

The annual average G-charge is calculated by dividing the annual total transmission tariff charges paid by producers by the annual total energy injected by producers into the transmission system. In this regard, ACER notes that, in most of the concerned countries (including DK, FI, IE, RO, SE), the calculation of annual total transmission tariff charges paid by producers includes both the relevant payments by producers connected at transmission level as well as those connected at the distribution level, while in the other countries, transmission costs are not paid by the distribution-connected network users or the calculation was not specified.

ACER finds that based on NRAs report, as shown in Table 63-Table 65, in none of the countries, except in Ireland, the ceiling set by the EU law has been exceeded since the last ACER review. For Ireland, the NRA informed ACER that the breach occurred as based on the current calculation for Generators' Transmission Use of System tariffs (G-TUoS) methodology, i.e. 25% of allowed revenue for network costs is divided by the total measured energy injected annually by producers to the transmission system. The NRA has been engaging with the TSO on this issue since 2023. In December 2024, the TSO has published a consultation aimed at addressing the breach and potential future breaches, where any difference between the amount calculated using the methodology above and the regulated cap would be refunded to generators. This consultation closed recently, and the NRA is still awaiting its outcome.

Table 63: Value for annual total transmission G-charges paid by the producers [MEUR]

Country	Value for annual total transmission G-Charges paid by the producers [MEUR]										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Denmark	12.18	11.71	14.21	10.04	10.9	11.1	10.68	10.42	12.01	13.52	30.94
Finland	30.08	29.7	33.91	44.28	53.53	56.33	No data	No data	No data	No data	No data
Ireland	52.1	60.18	60.0	60.81	58.47	61.94	69.54	75.71	76.66	73.17	86.77
Latvia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.461	2.52	2.36
Norway[835]	57.14	71.05	No data	69.37	No data	No data	82.9	80.3	No data	88.7	No data
Portugal	23.8	24.62	23.97	27.8	25.24	28.06	24.45	24.76	23.29	No data	No data
Romania	117.87	131.89	70.73	20.92	11.43	13.6	12.93	13.25	13.87	23	38
Slovakia	N/A	7.84	7.96	7.83	7.77	7.91	8.8	8.9	9.4	No data	No data
Spain	137.49	128.99	131.45	132.5	131.2	130.5	129.2	N/A	N/A	No data	No data
Sweden[836]	86.02	85.76	90.49	75	90.58	No data	No data	99.6	101.6	121.2	55

Table 64: Total measured energy injected annually by the producers to the transmission system [TWh]

Country	Total measured energy injected annually by the producers to the transmission system [TWh]										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Denmark	30.29	29.04	35.34	28.86	27.62	27.04	26.70	25.89	29.74	33.56	32.49
Finland	42.97	36.4	37.67	63.23	58.04	60.27	No data	No data	No data	No data	No data
Ireland	25.62	25.78	No data	28.3	29.53	29.3	29.48	30.74	30.12	32	30.76
Latvia									4.599	3.98	5.33

[834] Decision of the EEA joint Committee No 7/2011 sets a legal range of the annual average transmission charges paid by producers also in Norway.
[835] NO: 9.7 NOK/EUR exchange rate was used for years 2019 and 2020.
[836] SE: 10.6 SEK/EUR exchange rate was used for years 2020 and 2021.

Country	Total measured energy injected annually by the producers to the transmission system [TWh]										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Norway	57.17	60.68	No data	63.04	No data	No data	29.5	67.2	No data	81	No data
Portugal	47.3	49.51	48.08	55.82	54.43	56.2	48.7	49.3	46.6	No data	No data
Romania	52.4	57.29	57.79	56.97	56.15	56.94	52.37	49.63	52.79	49	51
Slovakia		15.68	15.92	15.74	16.14	15.94	17.5	17.8	18.8	No data	No data
Spain	270.53	257.98	262.91	265.01	262.4	261	258.4			No data	No data
Sweden	105.3	116.6	117.8	118.05	122.34	124.4	No data	120	121	121.2	122.6

Table 65: Annual average transmission G-charges paid by producers [EUR/MWh]

Country	Annual average transmission G-charges paid by producers [EUR/MWh]											Limit[837]
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Denmark	0.4	0.4	0.4	0.38	0.4	0.4	0.4	0.4	0.4	0.4	0.95	1.2
Finland	0.7	0.85	0.9	0.7	0.92	0.93	No data	No data	No data	No data	No data	1.2
Ireland	2.03	2.33	0	2.15	1.98	2.11	2.4	2.5	2.5	2.29	2.82	2.5
Latvia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.535	0.632	0.442	0.5
Norway[838]	1.00	1.17	1.04	1.1	1.1	1.1	1.1	1.16	1.2	1.3	1.2	1.2
Portugal	0.5	0.5	0.5	0.5	0.46	0.5	0.5	0.5	0.5	No data	No data	0.5
Romania[839]	2.25	1.97	1.22	0.37	0.2	0.24	0.25	0.27	0.26	0.46	0.73	2
Slovakia	N/A	0.5	0.5	0.4974	0.48	0.5	0.5	0.5	0.5	No data	No data	0.5
Spain	0.5	0.5	0.5	0.5	0.5	0.5	0.5	N/A	N/A	No data	No data	0.5
Sweden	0.83	0.65	0.77	0.63	0.74	No data	No data	0.83	0.84	0.53	0.45	1.2

[837] 'Limit' means the upper value of the range set by point 3 of Annex Part B of Commission Regulation (EU) 838/2010 and by the Decision of the EEA joint Committee No 7/2011.
[838] NO: the values in the table refer only to the G-charge, they do not include the additional mark-up for system operation (i.e. 0.2 EUR/MWh in years 2017-2019, 0.05 EUR/MWh in 2020 and 0.17 EUR/MWh in 2021, calculating with 10 NOK/EUR exchange rate).
[839] RO: The value for the annual average transmission G-charges paid by producers is determined by dividing the total revenue collected from the transmission and distribution-connected producers to the total measured electricity injected into both T-grid and D-grid.

4. List of Tables