ACER
European Union Agency for the Cooperation of Energy Regulators

15.7.2024

ACER RESPONSE TO
THE ENTSOG PUBLIC CONSULTATION ON GUIDANCE DOCUMENTS FOR THE TYNDP 2024

DISCLAIMER: This document presents ACER's preliminary views on the elements of the project-specific cost-benefit analyses to be performed for the TYNDP 2024, the methodology for assessing the hydrogen and natural gas systems for the TYNDP 2024 and the supply adequacy outlook to be included in the TYNDP 2024 as well as on the methodology for identifying hydrogen infrastructure gaps for the infrastructure gaps report 2024. The document does not constitute a formal opinion of ACER and is without prejudice to ACER's assessment of the draft TYNDP 2024 and the draft infrastructure gaps report 2024 which are to be submitted later in the process by ENTSOG to ACER.

1. LEGAL BACKGROUND AND PURPOSE OF THE DOCUMENT

The updated TEN-E Regulation (Regulation (EU) 2022/869) introduced under Article 13 the obligation for both ENTSOG and ENTSO-E to publish infrastructure gaps reports, to be developed within the framework of the Union-wide ten-year network development plans (hereinafter also TYNDP).

After having conducted an extensive consultation process involving all relevant stakeholders, ENTSOG and ENTSO-E shall submit their respective draft infrastructure gaps reports to the Agency and the European Commission and Member States for their opinion.

On 19th June 2024 ENTSOG published for consultation until 9th July 2024 the following draft guidance documents for the TYNDP 2024:

- Draft TYNDP 2024 Annex D1 - Implementation Guidelines
- Draft TYNDP 2024 Annex D2 - Infrastructure Gaps Identification methodology
- Draft TYNDP 2024 Annex D3 - System Assessment methodology

The purpose of ACER's preliminary feedback is to offer an early reaction on the elements of the project-specific cost-benefit analyses to be performed for the TYNDP 2024, the methodology for assessing the hydrogen and natural gas systems for the TYNDP 2024 and the supply adequacy outlook to be included in the TYNDP 2024 as well as on the methodology for identifying hydrogen infrastructure gaps for the infrastructure gaps report 2024. ACER expects ENTSOG to take into account these comments for further developments of the principles, clarifications and methodologies in these guidance documents. This document does not whatsoever replace any of the two formal Opinions which ACER shall provide to ENTSOG, the Opinion on draft infrastructure gaps report and the Opinion on draft TYNDP 2024, as

envisaged by Article 13(3) of the Regulation (EU) 2022/869 and Article 9(2) of the Regulation (EC) No 715/2009.

2. PRELIMINARY FEEDBACK

ACER welcomes the publication and consultation of dedicated implementation guidelines referring to the application of the cost-benefit analysis methodology as well as referring to the Hydrogen Infrastructure gaps identification methodology, The addition of "Implementation Guidelines and other complementary documentation was recommended in the ACER position paper on CBA consistency.

2.1. Feedback on application of the cost-benefit analysis methodology

2.1.1. Missing elements

In ACER's understanding the following information were not published neither in the TYNDP 2024 Guidelines for Project Inclusion nor in the currently consulted Implementation Guidelines:

- definitions and criteria used to define cross-border and internal infrastructures;
- definitions for the different types of TYNDP project capacities considered (e.g. yearly firm capacity, peak capacities, etc.).

ACER calls on ENTSOG to explain how the above-mentioned elements are defined in the TYNDP 2024 and how ENTSOG plans to use those in the different TYNDP simulations "cases" for gaps identification and PS-CBA.

2.1.2. Use of infrastructure level

Natural gas infrastructure level use in the Dual Hydrogen/Natural Gas Model (DGM)

As already recommended in our previous opinions and in the most recent ACER informal feedback to the TYNDP 2024 Guidelines for Projects Inclusion, the natural gas infrastructure level (as well as the hydrogen one) used for the gaps identification and for the project-specific CBAs of hydrogen projects should reflect the status, under prudent assumptions, of a reasonably expected grid for the specific assessment year, thus aiming at including only projects addressing well-identified remaining needs and which have highly probability to be commissioned. Similarly to ENTSOG proposal to use a hydrogen infrastructure level based on the European Commission PCI/PMI list, for natural gas it could be used an infrastructure level composed by all the projects identified by RePower EU plus the ones which got the FID by the time of their submission to the TYNDP 2024. Alternatively, the natural gas infrastructure level

could be composed by all projects having at least successfully completed the environmental impact assessments. This second option would also ensure further consistency with ENTSO-E TYNDP approach.

ACER also underlines the importance of properly and transparently displaying in the TYNDP 2024 all the relevant information concerning the evolution of future availability of natural gas capacities and hydrogen capacities. Any reduction in natural gas capacities stemming from the repurposing/retrofitting of existing infrastructures to hydrogen (or to CO_2) should be properly displayed and clearly associated with the projects triggering such capacity reduction.

Hydrogen infrastructure level use in the Dual Hydrogen/Electricity Model (DHEM)

The hydrogen infrastructure level used for the gaps identification and for the project-specific CBAs of hydrogen projects should reflect the status of a reasonably expected grid for the specific assessment year, taking into account that today (almost) no cross-border hydrogen infrastructures exist. Considering the two infrastructure levels proposed by ENTSOG for the TYNDP 2024, the most conservative one based on FID projects and projects included in the most recent European Commission PCI/PMI list should be the one preferred. However, from ACER's perspective, a more conservative infrastructure approach than the ones currently proposed by ENTSOG should be preferred: i.e. comprising only FID projects and those included in the most recent European Commission PCI/PMI list but excluding all the less-advanced projects. Given the lack of maturity of less-advanced projects, this option would in fact enable a fairer assessment of the less-advanced projects (which according to TYNDP Annex A represent ca. 54% of all collected projects for the TYNP 2024) contribution, regardless of their PCI/PMI status.

2.1.3. Stakeholder engagement enhancement

- Alternative fuel approach

  ACER understands that the "alternative fuel approach" is proposed by ENTSOG to capture those situations where certain hydrogen end users (e.g. some industry sectors) might rely on alternative fuels other than hydrogen if facing hydrogen curtailment, thus also reducing the overall hydrogen curtailment measured by the TYNDP simulations. ACER believes that such approach can be meaningful if the underlying methodology and assumptions are sufficiently robust.

  Given the different sectors and characteristics, ENTSOG should have defined a (default) methodology and value in targeted consultation with main industry stakeholders to discuss the common approach (e.g. whether the disruption is foreseeable or unexpected one; etc.) as well as to get specific sectorial parameters (e.g. type of alternative fuel used, quantity available, duration; whether they can rely on alternative fuels only as an emergency measure vs all season/year; etc.). If the responses to the recent public consultation are insufficient to determine any robust assumption, ENTSOG should reach out as soon as possible the main industry stakeholders to initiate the discussion with them.

However, without a robust, widely consulted, and accepted method to evaluate the extent and the scope of such fuel switching, implementing the "alternative fuel approach" could undermine the credibility of the assessment (being an underlying assumption which affects other aspects of the TYNDP simulations). Without a robust, widely consulted, and accepted method it may be advisable to exclude this approach from the TYNDP 2024 and aim for its inclusion in the TYNDP 2026.

- Frequency of hydrogen supply disruption

  The explanation of principle “frequency of hydrogen supply disruption” should be further elaborated, in our understanding it refers to the fixed amount of hydrogen demand that would definitely switch to alternative fuels. If so, we predict is likely that in the first years of H2 market development, some consumers which have a chance, will try to rely also on alternative fuels. However, in our understanding the percentage described as an example in the IG document (i.e. 33%) applies to H2 demand and its reduction rather than a frequency and its values should be a part of a broader discussion with relevant industry and consumers representatives..

- Project Groupings

  To ensure a high level of transparency and stakeholder engagement, ACER recommends that ENTSOG also publishes and consult in the future on the draft list of proposed CBA project groups based on the consulted grouping principles. ACER believes such approach would add an extra value to the TYNDP and the subsequent work of PCI Regional Groups.

- Willingness to pay (WTP)

  In case there have not been enough inputs received in the recent public consultation, or the inputs are very contradictory, ACER calls on ENTSOG to further explore the "willingness to pay values" in a wider consultation with the industry, which would be most suitable to provide feedback on this topic and be based on more realistic values from an industry perspective.

- VOLY / VSL cost parameter

  When considering the use of VOLY or VSL cost values for the non-GHG emissions variations indicator (B2), ACER recommends that ENTSOG consult with the EEA or a similar entity with extensive experience in this area to determine the most suitable application. Additionally, a justification for the final choice should be provided in the final IG document.

- Stressful year identification

  ENTSOG should have published and consulted in the Implementation Guidelines (IG) document the methodology that led to identify 2012 as the most stressful year and to estimate the related probability of occurrence. This methodology should be grounded in research and statistics from various reputable sources and entities specializing in

weather conditions, analysis, and historical data. ACER believes that when computing the final probability value for the chosen year used for the TYNDP assessment, it would be prudent to consider that wind and solar exhibit different patterns of variability on a year-by-year basis.

- Sensitivity analysis

  ACER has no objection to the proposed sensitivities outlined in the Implementation Guidelines (IG) document. However, it is not clear which sensitivities will actually be performed (as in the text it often says "[…] could be performed […]" and how ENTSOG intends to perform some of the proposed sensitivities (e.g. which range of SCC will be considered; avoided natural gas decommissioning cost; etc.). ENTSOG should have clearly consulted on all these elements.

  In addition to those sensitivities specified in the document, ACER also recommends incorporating a sensitivity analysis on the cost of hydrogen disruption (CoDH), which we consider a primary driver of the resulting benefits.

ACER observes that approximately 20 participants attended the recent workshop on the TYNDP 2024 guidelines. This level of participation highlights the challenge ENTSOG may face in deriving comprehensive conclusions on the elements for which stakeholder insights and concrete proposals are requested, due to the potential lack of diverse feedback from a broader stakeholder spectrum.

2.1.4. Determination of societal cost of carbon

ACER welcomes the inclusion of the societal cost of carbon (SCC) in the Implementation Guidelines document. We acknowledge the importance of incorporating a recognized and credible SCC value to accurately reflect the economic impact of greenhouse gas emissions. While we do not have a specific preference regarding the exact value to be used for the SCC, we consider the approach of adopting values from the European Investment Bank (EIB) to be reasonable and appropriate. The EIB values are well-founded and reflect a comprehensive understanding of the economic damages associated with carbon emissions, aligning with broader EU climate policies and objectives.

Furthermore, ACER believes the final results of the B1 indicator and their inclusion in the EPIs should be carried with and without SCC. Such approach would show what exactly is the incremental effect of the assumed SCC on the benefits associated with GHG emissions variations.

2.1.5. Non-GHG emissions variations indicator (B2)

ACER reiterates its view that the non-GHG emission variation benefits alone should not justify the societal viability (ENPV>0) or non-viability (ENPV<0) of a project. As this indicator measures the reduction in non-GHG emissions, while it is true that non-GHG savings would

be a benefit if the project is built, they should be marked as "additional benefits" or "additional externalities" since the benefits associated with a reduction in non-GHG emissions (especially if monetised) should not alone justify the construction (or non-construction) of a hydrogen infrastructure project. In fact, these non-GHG emissions can be in some cases reduced by other means and directly at the consumption-site-level, such as through the installation of filters or through future technology developments. Hence, ENTSOG should keep this indicator, but it should correct its scope and its description.

2.1.6. Market rents indicator (B4)

The market rents indicator (B4) proposed by ENTSOG appears to encompass both the hydrogen and electricity sectors, as well as the cross-sectorial rents arising from their interlinkage. ACER welcomes any additional consideration in the ENTSOG TYNDP 2024 of interlinkages among sectors. At the same time, and in the absence of a full interlinked CBA approach jointly performed by the ENTSOs, these benefits should be treated carefully to avoid any inconsistency with the benefits assessed by ENTSO-E CBA indicator B1 (i.e. Socioeconomic welfare). ACER recommends that ENTSOG further explains in the IG documentation why indicator B4 would also measure electricity consumer and producer surpluses when assessing hydrogen projects and it provides examples on how this would be calculated for a specific project. Additionally, in the final CBA results, the components of the B4 indicator should be presented per sector and in an aggregated form.

2.1.7. Curtailed hydrogen demand indicator (B5)

Given that the hydrogen sector and its infrastructure are still in the early stages of development, ACER reiterates its position that Security of Supply (SoS) under stressful conditions is currently not the main driver for hydrogen projects development. In any case, we recommend that the Implementation Guidelines (IG) document provides a clearer presentation of the specific differences in the parameters used for the analysis within the scope of the B5 indicator. A more detailed statistical presentation would offer greater insights into what the 2012 stressful weather year represents compared to a reference year. This should include information on which months experience significant reductions in electricity production (expressed in percentage terms), the variability of solar and wind resources, and explaining specific weather scenarios duration.

In line with its Opinion No 08/2023 – ACER Opinion on the draft CBA methodology, ACER reiterates the importance to use a dedicated cost of disruption for hydrogen value, which should differ from the one used for the natural gas. Therefore, ACER recommends ENTSOG to conduct a study on the methodology that could be used to quantify the cost of disruption of hydrogen.

In general, for any of the indicators included in the IG document, ACER calls on ENTSOG to publish an illustrative example of CBA performed on dummy projects.

2.2. Feedback on the proposed approach for the infrastructure gaps assessment

2.2.1. Quantification of capacity needs

As also stated in its Opinion No 06/2023, ACER believes that ENTSOG should revisit the proposed approach for the gaps identification as the outcome of this exercise should always be expressed in terms of quantified capacities (i.e. how much capacities should be built to lift the identified bottlenecks and where these capacities could be built). Not showing the results in terms of capacities would make the results of the infrastructure gaps assessment more ambiguous.

By comparing the resulting capacities with the collected projects, it would allow to identify competing projects (in cases where two projects have submitted capacities higher than the target capacities, these projects would be identified as – at least partially – competing) as well as those situations where not enough capacity was submitted to TYNDP by project promoters.

Without performing an expansion simulation based on cost optimisation, multiple solutions could be identified which would then be analysed and explained as part of the TYNDP 2024 infrastructure gap report. For the subsequent TYNDPS, however, the gaps assessment should aim at the identification of the optimal (cross-border) hydrogen capacities needed to meet demand and supply levels (i.e. "capacity targets"). This would also ensure further consistency with the well-established electricity TYNDP approach.

Annex I include an example of how capacities needs could be quantified and displayed in the infrastructure gap report.

2.2.2. Hydrogen market clearing price spread indicator (IGI indicator 1)

ACER acknowledges that the market clearing price indicator could potentially serve as a metric to identify infrastructure gaps. However, it is important to note that this indicator would depend on certain critical assumptions - such as supply prices - that are currently uncertain in the early stages of hydrogen market development. As also explained by ENTSOG, the application of this indicator to assess infrastructure gaps would also require the use of a subjectively defined threshold which could further weaken the quality and the credibility of the analysis.

As such, in ACER view a more simplified approach should be preferred for the TYNDP 2024, focusing only on one of the aspects mentioned by ENTSOG at e.g. page 7 of ENTSOG Annex D2. This approach could be based on measuring the capability of each country to cover their yearly hydrogen demand (implicitly as if the cost of hydrogen supply would be the same within Europe) and under normal supply and demand conditions (i.e. no stressful situations like infrastructure disruptions or peak demand). Based on this approach, a bottleneck would be

identified when there is a physical congestion preventing one or more countries to satisfy its demand.

By being centrally modelled at a pan-European level, this approach would consistently identify any infrastructure gaps that prevent a country from meeting its demand, whether directly affecting the border of the country facing demand curtailment or indirectly affecting borders between other countries.

While the approach by ACER would not capture situations where two countries, despite not experiencing demand curtailment, have different prices and could benefit from an interconnection to share the same marginal supply source, it could be argued that in the coming years, countries will gradually build infrastructure primarily focusing on meeting their expected hydrogen demands (and securing their supply), somewhat independently of price convergence among them.

2.2.3. Curtailed hydrogen demand indicator (IGI indicator 2)

ACER does not support the inclusion of IGI indicator 2 which aims at identifying infrastructure gaps by measuring the hydrogen demand curtailments under stress situations such as under a stressful year or under the unavailability of extra-European hydrogen import supply.

ACER is of the view that for hydrogen, where there is no existing market yet, nor developed network and there are no existing or soon to be commissioned extra-European import routes, the main driver justifying the development of hydrogen infrastructure projects should not be linked to security of supply needs under stressful situations.

Assessing infrastructure gaps against situations more linked to security of supply is premature and ENTSOG should not equate hydrogen to natural gas when performing the infrastructure gaps identification exercise. The impact of projects on specific and more stressful situations can still be assessed through project-specific cost-benefit analysis indicators. In this context, the contribution of a project to supply security could be considered an additional benefit, provided the (lower) likelihood of such stressful events has been duly considered.

2.2.4. Use of a third hydrogen infrastructure level (that contains all hydrogen projects that were accepted to the TYNDP 2024)

ACER does not support the inclusion of a third hydrogen infrastructure level as described in the public consultation question (35). The grid (or infrastructure level) used for the gaps identification should reflect the status of the reasonably expected grid for the specific assessment year.

According to the recently published TYNDP 2024, ca. 202 hydrogen-related projects were submitted, of which 110 with less-advanced maturity status). As such, a TYNDP hydrogen infrastructure level, consisting of the PCI/PMI hydrogen infrastructure level as well as all

remaining projects submitted to the TYNDP is deemed overly optimistic and it would not bring any added value since relying on project with a higher degree of uncertainty vis-a-vis their actual implementation.

In the consulted guidelines (p.11), ENTSOG explains that "*by comparing the results of different hydrogen infrastructure levels for simulations that are identical concerning all other parameters, the effect of including additional infrastructure can be identified. […]. If an infrastructure gap is indicated in the PCI/PMI hydrogen infrastructure level but is not observed in the Advanced hydrogen infrastructure level, the additional projects contained in latter infrastructure level removed it.*". Therefore, according to ACER, by comparing more conservative infrastructure levels with an overly optimistic one could result in potential "free-rider situations." In these scenarios, it would appear that all the additional projects within this infrastructure level contribute to addressing the remaining gaps not already covered by the more conservative infrastructure levels, even though some projects might not.

Additionally, based on the rules applied by ENTSOG when performing the project-specific cost-benefit analysis, the exclusion of less-advanced projects from any infrastructure level used for the infrastructure gaps identification will not exclude the possibility of assessing their benefits through the project-specific CBA step.

2.2.5. Other comments

The hydrogen infrastructure gaps identification methodology, which was consulted by ENTSOG, provides examples only on the threshold application and on the cooperation mode for indicator 2. To allow stakeholders to properly understand the implication of applying the different indicators proposed, the methodology should have instead included dedicated examples for each proposed indicator (for indicator 1, an example for each described aspects which would be captured through the indicator, should have been presented).

2.2.6. Annex I – illustrative example of a possible approach for quantification of capacity needs

The approach described below represents an example on how capacity needs could be quantified in the TYNDP 2024. In the example, the quantification is based on the idea that a bottleneck would be identified when there is a physical congestion preventing one or more countries from satisfying their demand (see section 2.2.2). The underlying concept is already mentioned by ENTSOG (i.e. "hydrogen demand curtailment", p.7 of the consulted hydrogen infrastructure gaps identification methodology).

Figure 1 represents a situation whit no cross-border infrastructure among countries. Countries B, D, E have enough supply (either domestic production or import) to cover their yearly average consumption under norma conditions, with country B and E having some surplus available which could be then exported. Countries A and B, on the opposite, they have not enough supply to cover their demand. Hence, countries A and B show a demand curtailment for a total of 50 GWh/d.

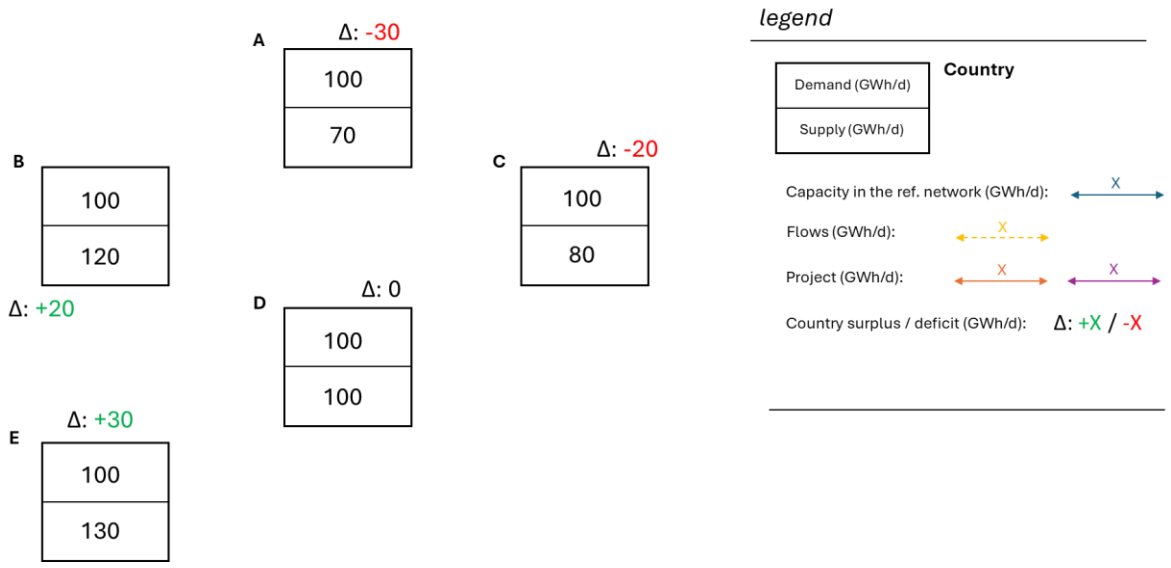


Figure 1 – situation with no cross-border infrastructures

Figure 2, represents now a situation where the infrastructure level is included in the assessment. In this example, the considered infrastructure level is composed by three bidirectional cross-border capacities between countries A-B, A-C and E-D. Thanks to the infrastructure assumed available as part of the infrastructure level, country B can share its extra supply with countries A and C (up to 20 GWh/d, the dashed lines), leaving a remain infrastructure need of 30 GWh/d. For simplicity, the example assumes that countries A and C equally share the hydrogen surplus from country B.

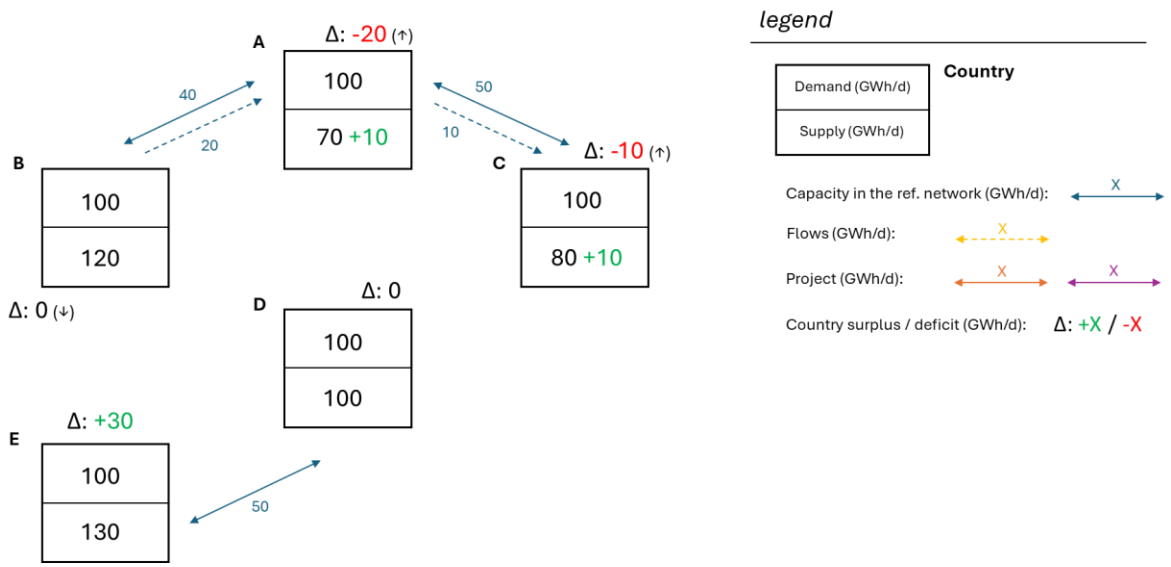
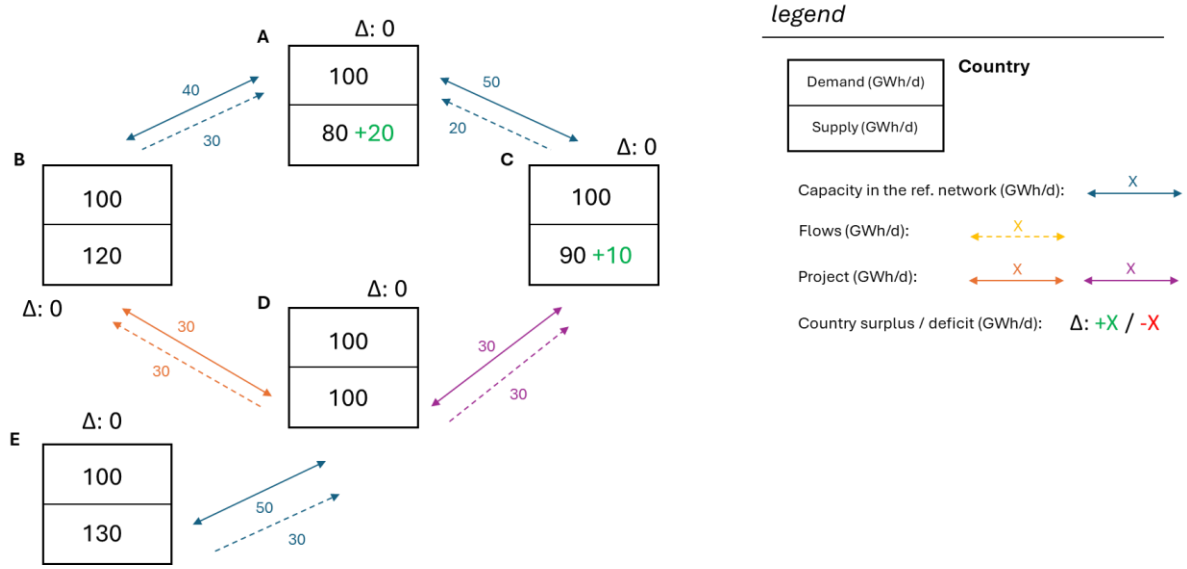


Figure 2 – situation with a hydrogen infrastructure level (i.e. with cross-border infrastructures)

Figure 3, shows the possible ways how the remaining gaps could be addressed. To fully mitigate the needs of countries A and B, additional 30 GWh/d is required. Without an "optimal" approach that would indicate the least-cost solution, several ways to mitigate the gap could be identified in the infrastructure gap report: e.g. by increasing capacity to enable the route E>D>C>A (line purple) or by increasing capacity to enable the route E>D>B>A>C (line orange) or through a LH2 import terminal (not shown in Figure 3). Any project submitted to TYNDP addressing this need would be considered – at least partially – competing.



2.3. Feedback on the proposed approach for assessing the hydrogen and natural gas system needs

In line with the feedback provided related to the cost-benefit methodology application about the limited value of assessing hydrogen infrastructure under stressful security of supply (SoS) situations for the TYNDP 2024, ACER has a general recommendation that the System Assessment proposed by ENTSOG focuses solely on natural gas aspects. This would allow ENTSOG to fulfil its task of delivering a non-binding Community-wide ten-year network development plan for natural gas, as outlined in Regulation (EC) 715/2009 (Article 8) and the forthcoming Gas and Hydrogen regulation. The time and resources saved by not performing hydrogen simulations for the "system assessment" could be re-allocated to extend the scope of the hydrogen infrastructure gaps to all three scenarios (instead of NT+ only) and to all time horizons.

Furthermore, ACER recommends that ENTSOG includes in the Supply Adequacy Outlook chapter of the final System Assessment document a more detailed methodology underlying the adequacy assessment that ENTSOG intends to use. It is essential that stakeholders are consulted on this methodology and given the opportunity to provide their comments before the final document is published. Key items to be included should encompass the main assumptions underlying the central scenario, such as demand and supply estimates and hypotheses regarding storage.

3. NEXT STEPS

In line with the TEN-E Regulation 2022/869, ACER will issue an Opinion on the ENTSOG's Infrastructure Gaps Identification (IGI) as well as on its draft TYNDP 2024 at a later stage. ACER emphasizes the importance of receiving all relevant materials promptly to ensure they align seamlessly with the 2025 Projects of Common Interest (PCI) selection process.