CURRENT
Enabling Network Technology throughout Europe

Introduction

The TYNDP approach is safe and regulatorily sound. However, it is an incremental approach that builds on the existing grid and adds projects proposed with insufficient recognition of political agreements on EU-wide decarbonization of the energy system. There is a need for a different approach. We need to establish what is necessary for economy-wide carbon neutrality in 2050 and work back from there, planning and designing a transition to a fit for purpose grid infrastructure at a pan-European level. The optimal network needs to be defined as the reference grids for 2030, 2040 and 2050 time frames.

The TYNDP identifies the gaps between planned infrastructure and the needs of a 2030 or 2040 system that is based on national trends that are far from meeting the politically agreed climate and energy targets and ambitions.

According to the draft TYNDP 2022, "the System Needs study is not a network development plan" and "does not identify solutions". Europe should have a 30-year network development plan compatible with 55% GHG reductions before 2030 and full decarbonization before 2050.

Anticipatory investment needs to be done in the context of a full decarbonization plan. The better the plan, the better the investment decisions will be. This is a big challenge in that few of the projects needed for 2050 will have a net benefit in isolation. A significant shortcoming with the current approach is that it will not necessarily result in the most efficient pan-European system. We need to assume an optimal system for 2050 – ideally, for Europe as a whole - and work our way back. Projects that deliver the highest contribution earliest should be delivered first, while factoring in their lead times.

Scenarios

Faster scale-up of infrastructure will be needed to deliver on Net Zero in 2050
It is understandable that the scenarios do not reflect the stronger renewable energy and efficiency targets, given these have not yet cleared the legislative process. It is important that these are reflected in the TYNDP2024, together with the already agreed European Climate Law, with its 55% reduction by 2030 and full 2050 decarbonization. However, basing the conclusions of the TYNDP by applying incrementalism to an outdated National Trends version of the future is somewhat misleading.

It would make sense to have reference grids for the different time horizons. The main reference grid should be the 2050 grid required for a decarbonized Europe – not the 2020 or 2025 grid. All reference grids must comply with the overall EU carbon reduction goals agreed by the European Climate Law (Regulation (EU) 2021/1119).

If the TYNDP is based on a scenario depicting today's grids plus those additional projects that are estimated to make it through current planning processes, the result will be a small, relatively inefficient grid, that will not be in

line with a 2050 decarbonization pathway. For 2040, the TYNDP must reflect what is needed to reach European economy-wide decarbonization in 2050. For the electricity sector, that would require full decarbonization well before 2040. In addition, the infrastructure must be able to support the decarbonization through electrification of the heating, transport, and industrial sectors. The TYNDP 2022 does not currently provide such a path.

The Distributed Energy scenario (one of two scenarios, compatible with 55% GHG reduction by 2030 and full 2050 decarbonization) appears to work with a similar final electricity demand as European 1.5-degree compatible scenarios. However, this scenario is not reflected in the identification of system needs, which is based on the National Trends scenario. It is surprising that that the second decarbonization-compatible scenario - Global Ambitions - is not mentioned at all in the System Needs report, despite the extensive consultations done on this scenario and despite the fact that this most closely aligns with intentions of the European Commission with respect to regional cooperation.

Moreover, grid enhancing technologies and other technologies that are expected to mature in the coming years, such as transmission technology based on superconductors, can significantly improve the efficiency of grids, affecting both the willingness to invest in new grids and the questions of when and where to invest in what kind of grid components. The TYNDP must assume the use of such existing as well as emerging technologies within the 2050 timeframe, when it would be socioeconomic beneficial to apply them.

While the Global Ambitions has not been discussed at all in the System Needs study, without a clear explanation, the other decarbonization scenario (Distributed Energy) has been allocated only one page, which notes that solar and wind would both need to double, compared to the National Trends scenario and that natural gas imports would fall by 50%. However, none of the conclusions from the decarbonization scenario are used to identify system needs. This has very real and practical implications for European grid development. If the Scenarios are returning too few projects, they will not appear on the PCI list and will not benefit from accelerated planning and permit granting, or EU oversight, support and CEF funding. This will unnecessarily delay the needed overhaul of Europe's infrastructure development.

TYNDP 2024 and / or a future pan-European Network Development Plan must identify the gaps between what is presented in this TYNDP 2022 and what grid infrastructure and governance framework are needed for a decarbonized Europe.

Storage alone is not enough to deliver on Net Zero: all solutions will be needed

Compared to the TYNDP 2020, we see a great increase in the ambition for storage, but we need to make sure that this is the most cost-effective way to deliver on Net Zero in 2050. Currently, the TYNDP has to look at transmission and storage PCI projects, while Smart Grid PCIs are seen by TSOs as the place for grid enhancing technologies and these do not need to be assessed in the TYNDP to get PCI status. However, currENT believes that just because there is a Smart Grid PCI does not mean the TYNDP should not assess GETs, nor that it precludes transmission projects being 100% or partially comprised of Grid Enhancing Technologies

System Needs

The System Needs study is certainly a useful exercise. However, it is largely based on projects brought forward by developers, evaluated against a set of technical and economic criteria, assuming a scenario based on national policies and trends from long before the European Climate Law was unanimously agreed and the decision to become independent from Russian fossil fuels.

The System Needs Report is right in pointing out that "a European power system transitioning towards high RES and aiming at climate neutrality in 2050, reducing needs is not enough. It is necessary to support the transition by preparing Europe's grid for a future with higher flows of RES electricity across border." A plan for this is urgently needed.

To illustrate, the TYNDP 2022 High-Level Report correctly points out: "a clear finding from our system needs study is that one of the main benefits of addressing system needs is to reduce Europe's dependence on gas-based power generation. By connecting more consumers with more producers, grid development allows a better use of the cheapest generation", and "The higher the price of natural gas, the more beneficial it becomes to invest in Europe's cross-border electricity grid."

Yet, the System Needs report only reduces gas-based power generation by 2.3% in 2030 compared to a situation with no additional infrastructure investments. It states that gas-based power generation "would decrease by 75 TWh per year in 2040 (equivalent to 14% of the electricity generation from gas in the EU in 2021)". That effectively means that 86% of the gas generation will still be operating in 2040. As a consequence, the identified system needs are far from compatible with any political expectation of the future.

CBA Implementation Guidelines

The benefits of rapidly deployable solutions need to be further recognized in the TYNDP process

Rapidly deployable solutions enable network operators to quickly adapt to the changing needs of the grid, and maintain a high standard of security of supply in a cost effective and sustainable way. These solutions can lead to the quicker release of additional capacity on the existing network, and can often be re-deployed; giving greater long-term flexibility to network operators and increasing the robustness of grids against future uncertainties. Furthermore, solutions that provide pointed support to maintain grid stability and increase overall observability can enhance the preparedness of European power grids towards risks such as climate change and cybersecurity, thus strengthening the resilience of the network as a whole.

The CBA methodology needs to further evolve in order to meet the requirements set out in the TEN-E regulation

The CBA requirements in the TEN-E regulation (Annex V) cannot be fulfilled without examining earlier time periods. For example, energy efficiency measures do not take 10 years to implement, nor do solutions which do

not require infrastructure, often being completed in 1-2 years. This means they could be very high value projects addressing current acute issues before 2025.

To assess the costs induced for the related system over the technical life of energy efficiency measures (Paragraph 8 of Annex V) and projects that do not require infrastructure, they need to have earlier years to meet this requirement. The largest annual benefit of these projects will be in the earlier years before other works can be completed, for which it will be otherwise impossible to model the market integration, security of supply and competition (as per Paragraph 4 of Annex V).

Also being able to show changes to commissioning dates of other projects (Paragraph 2 of Annex V), will require other years to be modelled and a change they will create in the scenarios to base that evaluation on. This will by default provide some sensitivity analysis. Equally, to be able to show how the energy efficiency principle (Paragraph 5 of Annex V) is implemented in all the steps of a TYNDP, energy efficiency first solutions will need to be tested to see what can be accomplished before adding in any other additional projects not already constructed into the model.

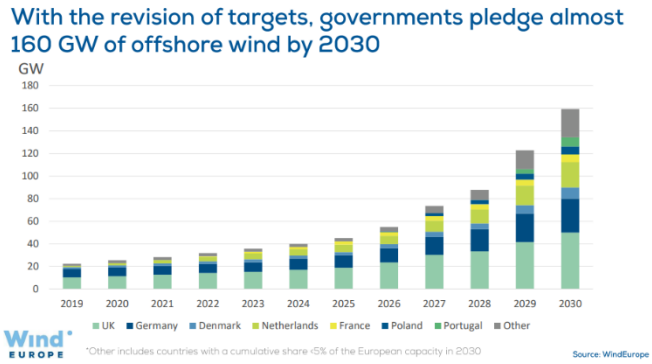
The cost of delays needs to be adequately reflected in the TYNDP process

The 'cost of delay' must be reflected in the assessment of TYNDP projects, and flexible solutions must be fairly valued. currENT advocates for optimizing the use of existing grids and reinforcement of grids as the first steps in grid development. While new grids are essential to meet certain long-term system needs, building new grids requires large amounts of capital investment, affects nature and typically takes many years to consent and develop. Public opposition and administrative hurdles to onshore developments make the implementation of approved projects challenging even with the vastly improved mechanism that now exists under the TYNDP and PCI processes today.

There is often a scope to better utilize available capacity on the existing grid by using flexible grid enhancing solutions. This can deliver earlier benefits to consumers while new infrastructure is 'in permitting' or under construction (e.g., by reducing constraint costs), continue to benefit or improve new infrastructure and can defer or eliminate some of the network needs. The value of reducing carbon emissions in the near-term and making progress towards a high-RES grid now is far greater than reducing the same carbon emissions in 10 years' time. This 'cost of delay' associated with large infrastructure projects must be taken into account when considering which project should be taken forward to meet an identified system need.

Draft Implementation Guidelines & Hybrid Interconnectors:

The draft Implementation Guidelines state that "a massive uptake in offshore RES (predominantly offshore wind technology) is expected now and in the upcoming decades, aiming at above 60 GW offshore wind + 1 GW ocean energy by 2030 and 300 GW offshore wind and 40 GW ocean energy by 2050 in European waters, following the EC's offshore RES strategy."



Again, these projections seem far from market expectations. According to WindEurope, European governments have pledged to almost 160 GW of offshore wind by 2030 – 100 GW higher than assumed in the TYNDP.

ENTSO-E is correct to point out that the additional guidance for hybrid projects, beyond compliance with the 3rd CBA guideline, should "ensure consistency with the targeted wind capacity levels defined in the TYNDP scenarios and related reference grid as well as the targeted Offshore Wind Farms (OWFs) capacity in the expected future strategic Offshore Development Plans (ODP) at sea basin level".

These are due to be published by the involved MS in January 2023 for 2030, 2040 and 2050 in accordance with the revised TEN-E regulation.

We welcome that the Draft Implementation Guidelines include the notion of hybrid interconnectors and proposals on CBA options 1 and 2. However, introducing truly meshed DC overlay grids (within same market and / or between bidding zones) in the implementation guidelines, is very important moving forward.

Governance models

The CBA options addressed in the Implementation Guidelines must be seen in the context of future changes to the governance model of the pan-European offshore grids, i.e., an Independent System Operator (ISO), an ISO per sea basin, or competitive models.

It is understood that ENTSO-E is preparing a position paper on roles and responsibilities in offshore network development. It would reportedly identify 5 potential models and assess them in function of different criteria such as complexity, number of stakeholders/contractors, experience etc. The models would include:

1. Onshore TSOs does everything
2. One offshore TSO per sea basin (owned by neighbouring onshore TSO)
3. Competitive model – light: third party only building the asset
4. Competitive model – no Independent System Operator (ISO): third party building, owning and maintaining the asset
5. ISO not owning the asset but doing the network planning, building and operating and maintaining the asset,

currENT welcomes such a debate and suggest that future TYNDPs include a section on governance. We need a technically competent body, that does not own assets, to oversee the deployment of a pan-European grid, identify technology gaps and choices to bring us all the way to decarbonisation. If the endgame is a European grid, capable of supporting a decarbonised economy, then recognising this sooner will save money and enable us to get there quicker than otherwise would be the case, assuming rationality prevails. The TYNDP has a vital role to play in this. With such an approach we can model the energy system across all sectors and come up with a fit for purpose post carbon system that consumers can afford and rely upon.