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How can DSOs rise to the investments challenge?

Implementing Anticipatory Investments for an efficient distribution grid

Eurelectric position paper

March 2024

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We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

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Executive summary and recommendations

The timely deployment of a wider array of distributed generation sources and the electrification of demand in regions with limited or no grid capacity is unlikely to meet the European Union's climate goals without **anticipatory investments** in grid infrastructure. This is **particularly pertinent at the distribution level**, as distribution grids are currently ill-equipped to manage the integration of gigawatts (GWs) as outlined in the EU's Fit for 55 and REPowerEU objectives. While distribution networks have been instrumental in supporting the energy transition thus far, there is an urgent need for further expansion, modernisation and digitalisation to accommodate the growing influx of renewable energy sources (RES) and the electrification of final energy consumption. Moreover, in situations where the need for grid expansion is driven by electrification and decarbonisation targets, delays in implementation not only impede the energy transition but also hinder economic growth.

Despite this, existing regulatory frameworks in several European countries, including Spain, Romania, Portugal, and the Netherlands, lean towards **restricting investments in distribution networks for the future due to the influence of current grid tariffs. This approach hinders adequate network development, which is crucial for ensuring lower overall energy tariffs for consumers in the future**. With the EU's reinforced climate ambitions and stringent timelines, there is a distinct imperative to **shift from a traditional incremental approach to anticipatory grid development**.

The distribution system operators' (DSOs) objective in presenting this paper is to develop proposals for a forward-looking development of the grid, aimed at delivering **positive societal impacts**.
For the implementation of anticipatory investments, Eurelectric suggests the following definition:

> *An anticipatory investment is one that **proactively** addresses expected developments, looking **beyond immediate needs** of generation or demand, assuming with sufficient level of **certainty** that new generation and demand will materialise, notwithstanding potential low utilisation in the short term.*

Below is a list of considerations that national regulatory authorities (NRAs) will have to address when implementing anticipatory investments:

- Once transposed, the national **Network Development Plans** (NDPs) of DSOs outlined in Article 32 of the Electricity Directive (Directive (EU) 2019/944) should serve as the **primary mechanism for projecting anticipatory investments**. Ideally, these plans should establish a forward-looking perspective up to 2040, which will evolve over time. If **investment caps** are in place, their **removal** should be prioritised as a first step.

- Adequate **incentives** should be put in place for DSOs to make **anticipatory investments**. To be able to invest, DSOs need sufficient remuneration and a stable and predictable investment environment.

- Various approaches can be considered when assessing anticipatory investment needs, with **final decision to engage in the investments entrusted to the DSO**. Since most investments in new renewables and electrification will occur at the distribution level, it is crucial to ensure that the development of grid investment plans follows both a top-down and bottom-up approach to ensure alignment between decarbonisation targets and infrastructure requirements. **The following actions are recommended:**
    - Member States should **establish long-term electrification scenarios**, through roadmaps or national energy and climate plans (NECPs). Those scenarios should include **intermediate milestones** to facilitate a gradual implementation of anticipated investments. The **Governance** Regulation should undergo a review to include a specific new section mandating Member States to assess investments necessary in grids to achieve electrification and decarbonisation objectives.
    - DSOs should engage with regional and local authorities to obtain their energy transition plans, ensuring alignment with broader regional objectives.
    - DSOs can lead public consultations to gather input from stakeholders and communities on electrification priorities and infrastructure requirements.
    - DSOs can conduct individual discussions with network users and local authorities to understand specific electrification needs and tailor investment plans accordingly.

- Reciprocal coordination between transmission system operators (TSOs) and DSOs is paramount. In due course, **TSO plans should be coordinated with anticipatory investment forecasts**. As per Article 57 of Regulation (EU) 2019/943: agile and flexible updates should be made to TSO planning, allowing for the incorporation of DSO needs and the consequent anticipatory investments. This ensures the optimisation of efficiency and effectiveness of the entire electricity system. Moreover, if DSOs request provisional capacity at a certain location for distribution purpose, TSOs should respond in a timely manner with the delivery of the requested capacity.

- Taking into consideration local specificities, NRAs could also explore the possibility of **empowering DSOs to construct TSO network** in application of article 51.8 of Directive (EU) 2019/944, in cases where the TSOs are unable to accommodate the requests of DSOs into their national development plans (NDPs) in a timely manner. In such instances, in those Member States where DSOs are not allowed to own transmission assets, a

property transfer should take place according to the DSOs' related incurred costs based on rules stated by the NRA.

- The **validation methodology** for anticipatory investments involves notifying and providing information to regulatory authorities, **primarily through submission of NDPs to the NRAs**. The validation should occur *ex-ante*. **Cost recovery must always be ensured, including an adequate return on investments**.

- As the entire society benefits from enhancing the grid in a forward-looking manner, anticipatory investment costs borne by the DSOs must be **financed** in the same way as other investments, i.e., **through tariffs**. This approach aligns with the Electricity Regulation (EU) 2019/943 Article 18 and revised Electricity Market Design (EMD) Article 18, ensuring fair distribution of costs and benefits across stakeholders. In addition, **deferral strategies may be proposed** to mitigate immediate cost impacts, with **warranties** provided by NRAs to DSOs for external funding purposes.

- Where **public funds** are available, NRAs should provide **incentives** for DSOs to utilise them for anticipatory investments.

- Anticipatory investments are likely to require comprehensive review of connection charging policies **moving towards a shallow per megawatt (MW) connection fee**[1], instead of invoicing the customer for the actual incurred connection costs, which can vary based on location and condition of existing network. This approach would ensure a level playing field for customers regardless of their connection.

- The remuneration regime should be reviewed to **reduce pressure on the short-term cost reduction driver**. In the transition to output-based remuneration regarding anticipatory investments, performance indicators such as efficiently delivering capacity and/or avoiding customer supply refusals for longer than a specified duration could be used to incentivise DSOs.

- Risk assessment should be improved, with regulation **prioritising inadequate grid development risk mitigation** over concerns about potential underutilisation of assets. Accordingly, DSOs' regulated income, particularly weighted average cost of capital (WACC) established *ex-ante* and regulatory asset base (RAB), should not be adversely affected during the development of anticipatory investments. They should have the capability to recover all efficiently incurred costs, regardless of the initial level of asset utilisation. **A specific method of efficiency assessment** should be implemented for anticipatory investments where needed.

[1] Where shallow connection charges are applied, only costs for the physical connection of the generator to the nearest practical point of the existing network are borne by the generator, whereas deep connection charges mean that generators also have to pay for all necessary grid reinforcements beyond the connection point. Additionally, there are hybrid connection charges, which tend toward a shallow or deep regime and can therefore be referred to as "shallowish". See Eurelectric's November 2018 "*Charges for Producers connected to Distribution Systems*" report.

Policy actions needed

- Revising regulatory frameworks to include and define anticipatory investments

- Publishing European Commission (EC) recommendations and **ACER Guidelines for NRAs** to remove investments caps, **allow and incentivise anticipatory investments** at both distribution and transmission (**DSO and TSO**) **level** and confirm that anticipatory investments should be treated as regular investments in tariff regulation, with system operators entrusted to make the investment decision

- Appointing adequate governance organs and indicators to ensure:
    - alignment of policies and investments with national decarbonisation goals
    - alignment of different existing plans (TSO, DSO, NECPs, etc.)

- Enforcing TSO and DSO cooperation
  Allocating EU **funds** for **distribution and transmission network** investments in to deliver on REPowerEU and Fit for 55 targets

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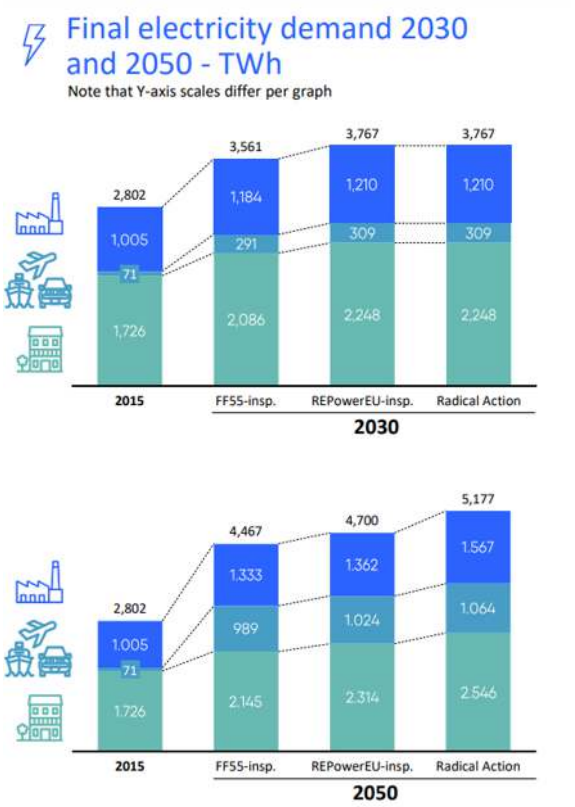
1. Introduction

The European Commission (EC) has recognised the imperative to expedite the energy transition, as outlined in their recent *European Action Plan for Grids*. This involves connecting additional Renewable Energy Sources (RES) and increased power demand on distribution system operator (DSOs) networks. The scarcity of grid capacity is already evident in several EU Member States, resulting in project connection delays for renewable initiatives and impeding the decarbonisation of vital sectors such as heating, transport and industry through electrification. Simultaneously, both generation and demand are increasingly more decentralised and granular, causing the network development to lag behind evolution of demand and generation.

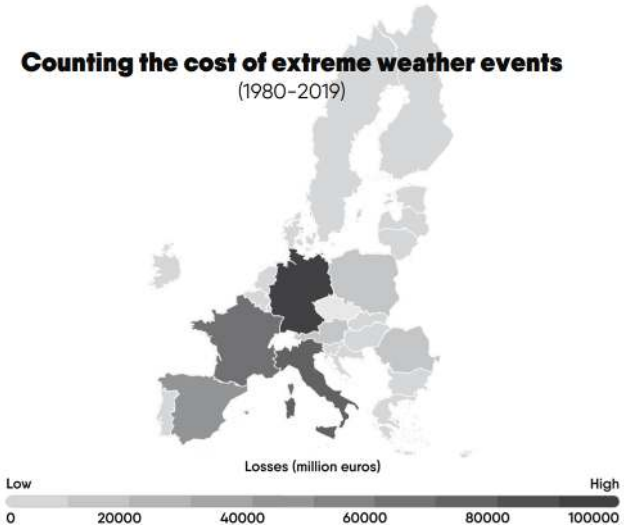


Source: Decarbonisation Speedways, Eurelectric, 2023

The International Energy Agency (IEA)[2] emphasised the seriousness of the situation, indicating that a substantial 3,000 gigawatts (GW) of renewable power projects, with 1,500 GW in advanced stages, are currently in grid connection queues worldwide. This significant figure is equivalent to five times the combined solar photovoltaic (PV) and wind capacity added in 2022. This underscores the pivotal role of grids as facilitators of the energy transition towards net-zero emissions. Thus, it is imperative to ensure that grids do not become a bottleneck in achieving this objective.

The solution frequently entails the physical expansion, reinforcement, renovation and digitalisation of networks – processes that span several years. Moreover, there is an escalating need for investments in resilience to address the current and long-term effects of climate change.

[2] Electricity Grids and Secure Energy Transitions, October 2023



Source: Eurelectric Power Barometer 2021, from The International Disaster Database

But DSOs must comply with regulatory regimes governing access, connection, network planning, and grid development that foster a reactive rather than proactive approach to grid development. Furthermore, in terms of investments, most existing regulatory systems typically acknowledge investments only when actual connection requests are already submitted, and connection contracts are granted. This implies that DSOs are unable to address future needs in an anticipatory way, resulting in DSO grid investment lagging behind connection needs, even when the recently agreed European policy targets[3] provide sufficient **certainty** regarding the **electrification required to facilitate the transition**.

In essence, most regulatory frameworks across Europe are **more inclined to prevent supposedly excessive investments rather than ensure that the grid delivers all the necessary services for society**. Consequently, DSOs are not incentivised to proactively address future challenges and opportunities, such as the integration of distributed energy resources (DERs) and RES, the uptake of electric vehicles (EVs) and heat pumps, and the emergence of energy-sharing initiatives, nor to innovate sufficiently. Depending on the national regulatory regimes, DSOs undertaking significant capacity reserves may encounter risks such as incomplete cost recognition, operating expense (OpEx) increases uncovered, capped investment and cost-efficiency penalties.

To align with the dynamic nature of the EU's energy system, regulation and regulators should move **from a traditional reactive piecemeal approach to a forward-looking one**. Establishing a supportive regulatory framework for anticipatory investments is crucial for providing appropriate incentives, ensuring investment certainty, and enabling the adequate maintenance and, when necessary, development of distribution networks in a cost-effective manner.

The EC announced that in Q1 2025, they will "propose **guidance identifying conditions under which the approval of anticipatory investments should normally be expected**, taking into consideration different **levels of development certainty of projects** and ways to address the different levels, such as via the **conditional provision of the anticipatory investments"[4].**

[3] European Commission's REPowerEU Plan and Fit for 55 package
[4] European Commission's *EU Action plan for Grids, 2023*

Through this paper, Eurelectric aims to offer insights from the power industry regarding distribution grids' needs. We will underscore the **pivotal role of anticipatory investments** in ensuring the development of infrastructure aligned with the energy future of the EU. We aim to provide a precise definition for anticipatory investments and furnish examples of **relevant projects or investments**. It is imperative that these investments find a place in the network development plans (NDPs) articulated by DSOs, outlining the specific infrastructure needs. Consequently, we will propose certain tools to address the levels of **certainty in demand and generation.**

Furthermore, investments identified in DSOs' NDPs should be mirrored in the plans of transmission system operators (TSOs) to improve coordination and efficiency. Therefore, we will emphasise the necessity to bolster cooperation between TSOs and DSOs. We will then delve into anticipatory investment financing.

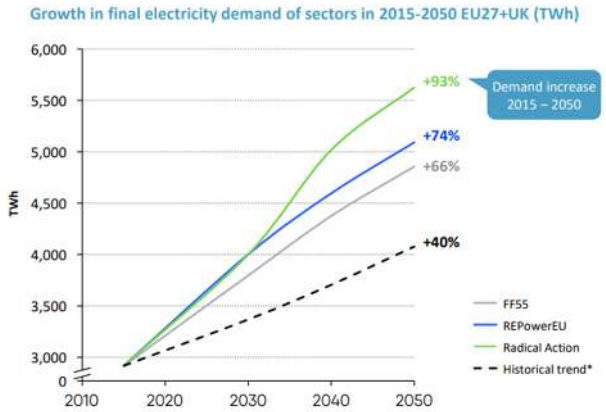
This paper ends up with country-focused sections to assess the current state of regulatory practices concerning DSO investments in the EU. Our aim is to pinpoint best practices and necessary regulatory improvements.

The importance of anticipatory investments

"The socio-economic welfare losses of delaying the network upgrades necessary to connect renewables and new demand will frequently outweigh the additional cost of investing ahead of need"[5].

Network investments are crucial for attaining both EU and national targets concerning decarbonisation, electrification and net-zero objectives. The recent predominant trends shaping the evolution of European power systems have included the need for rapid integration of renewable generation and new loads. Meanwhile, distribution grids have often been the overlooked component in this transition. In certain countries, despite nearly 70% of final energy demand in transportation, buildings and industry being reliant on fossil fuels, electrification has not even received sufficient attention.

Among the primary pathways for decarbonisation across all sectors is electrification of demand. The following forecast graph illustrates the anticipated growth in final electricity demand in the coming years, signalling a substantial increase.



Source: Decarbonisation Speedways, Eurelectric, 2023

[5] European Commission's *EU Action plan for Grids, 2023*

DSOs are gearing up to facilitate the realisation of these targets with innovative assets, standards and processes. It is imperative that they receive proper incentives considering the costs incurred efficiently in this pursuit.

Failure to rapidly connect new forms of electricity demand poses challenges to the decarbonisation of industry, household heating and cooling, electric vehicle (EV) adoption, and the advancement of electrolysers for hydrogen production. The distributed generation and decentralisation of the energy system are also adversely affected if grid projects are not built on time. **Inadequate and slower development of grid infrastructure may lead to increased grid congestion, the curtailment of renewables** and will impede timely customer connection. **Ultimately, this scenario has the potential to escalate the overall cost of the energy transition.** Delays in network expansion will not only hamper the energy transition but also hold back economic growth.

The Electricity Market Design (EMD) reform, as well as the EU Action Plan for Grids, acknowledge the significance of **anticipatory investments,** and encourages the expedited development of grids to meet the accelerated deployment of renewable generation and overall electrification of our energy system.

National regulations need to be reviewed and updated to support deploying new grids and improve the efficiency of the existing assets. In any case, it is crucial to accept a higher degree of uncertainty regarding the full immediate utilisation of such asset from its commissioning date, because "**the socio-economic welfare losses of delaying the network upgrades necessary to connect renewables and new demand will frequently outweigh the additional cost of investing ahead of need"[6]. The risk of investments becoming stranded is very low as the infrastructure will eventually be used as the energy transition progresses**. If grid infrastructure were to fall short, the associated costs would be much higher than those additional costs linked to local proactive investment[7].

[6] The EU Action Plan for Grids, European Commission, 28/11/2023

[7] *Energie door perspectief: rechtvaardig, robuust, en duurzaam naar 2050*, Expertteam Energiesysteem 2050, April 2023

2. Definition and examples

What is meant by 'anticipatory investments'?

Anticipatory Investments are identical to regular investments, with the exception that the network will be ready when it is needed by the customers. They are an efficient way of developing the network in the context of decarbonisation and mass electrification that provide enough certainty on generation and demand development.

In simple terms, **standard investments are made in response to shorter-term needs, whereas anticipatory investments are forward-looking** and aim to address future requirements. This compensates for delays caused by lengthy permitting procedures and supply chain disruptions.

In its European action plan for grids, the European Commission states that anticipatory investments should be directed towards "relevant network projects" (investments), and they should remain "proportional to the needs". According to the Commission, such investments can be relevant, for example, when investing in future-proof offshore networks that allow for future expansions of meshed offshore grids, areas with high untapped onshore PV potential such as renewable acceleration areas set in accordance with the Renewable Energy Directive (RED[8]), grid connections to ports for the provision on shore-side electricity supply, or building smart grids that support EV charging infrastructure and national or municipal heat pump rollout plans.

Eurelectric suggests the following definition of anticipatory investments:

> *An anticipatory investment is one that **proactively** addresses expected developments, looking **beyond immediate needs** of generation or demand, assuming with sufficient level of **certainty** that new generation and demand will materialise, notwithstanding potential low utilisation in the short term.*

Some clarification around the proposed definition

- Level of certainty

While anticipatory investments are meant to proactively address expected developments, it is essential to acknowledge the inherent challenge of predicting future developments with exactitude. Nowadays, every investment in the energy system is considered essential for facilitating the transition. The key distinction lies in the **timing of utilisation**, with anticipatory investments usually realising their full potential at a later stage compared to regular investments. With the latter, customers are kept waiting for grid capacity to achieve connection.

All investment plans by DSOs are based on scenarios which are coordinated with regulators, market participants, governments and other stakeholders. Therefore, the highest level of certainty is to be provided by authorities that are expected to offer guidance so that a comprehensive energy planning can happen.

[8] The Renewable Energy Directive is a key piece of European Union legislation that establishes targets for the share of energy from renewable sources in the EU member states. It sets out the framework for promoting and increasing the use of energy from renewable sources in sectors such as electricity, heating and cooling, and transportation.

- Timeframe

The current timeframe under consideration extends at least until 2030 for evaluating and initiating anticipatory investments, aligning with a vision for the 2040 infrastructure. It's important to note that **this temporal target will naturally adapt over time and shall be a rolling target.**

In any case, the regulatory framework for anticipatory investments should remain **dependable and stable.**

Examples of investments that should qualify as anticipatory

Anticipatory investments are not one-size-fits-all as they vary based on the specific needs of each region.

As a general trend, there is a noticeable increase in electrification demand in rural areas, historically known for low energy consumption. These regions are undergoing a transformation, evolving into areas with more substantial energy needs. Simultaneously, urban areas are already experiencing heightened electrification, adding complexity to networks initially designed for centralised demand patterns and not necessarily equipped for the decentralised demand levels and types associated with the ongoing energy transition.

Moreover, the electrification of industrial complexes, long-haul transportation, new intensive demands such as datacentres, electrification of district heating or new resources such as offshore wind or remote renewables-rich areas, may require dedicated grid development.
These evolutions must also be integrated into a customer-oriented approach that prioritises service quality and responsiveness.

This electrification process will not occur without anticipatory investments in grid infrastructure.

Burdensome permitting and supply chain bottlenecks are delaying electrification. Anticipatory investments are one major means to tackle this primarily by focusing on accelerating the deployment of renewables and facilitating increased electrification of demand. Moreover, in certain countries, other types of investments could also benefit from the new regulations developed for anticipatory investments if they are deemed necessary to address future needs, such as resilience against future extreme climate events or digitalisation.

Drawing inspiration from the European Commission's approach and from the abovementioned evolutions, here are a few examples that can be considered relevant and proportional network projects or investments at the EU level.

<u>For accelerating renewable energy development to reach carbon neutrality by 2050:</u>

- Reinforcing distribution networks with higher voltage levels to make them ready for upcoming RES or demand connections. For instance[9]:
    - Increasing the expansion of medium- and/or high-voltage (MV and HV, respectively) substations and upgrading associated circuit feeding capacity. This initiative aims to provide increased network capacity, catering to the connection needs of both demand and generation customers.

[9] Electricity distribution networks capacity pathways consultation report, ESB Networks (Ireland)

    - Transitioning voltage levels e.g. from 10 kilovolts (kV) to 20kV, and 38kV to 110kV, resulting in an augmented capacity. This adjustment enables the connection of more customers and enhances standby capacity.

- Purchasing sites in advance for future substations and, where greenfield site acquisition proves difficult, converting existing electrical assets to higher capacity assets. In this solution, conversion needs to happen before the substations are heavily loaded to enable/allow outages and offloading, and such conversion is also subject to the available site area. The inclusion of technical design preparation, connection, as well as ground and architectural works in a manner that allows for easy extension of the substation's capacity is also paramount.

- Adopting advanced renewable hubs and adjusting associated charging policies where relevant, particularly in areas with significant renewable potential. This approach can also be applied to combinations of renewable and demand hubs.

To enable electrification potential across all sectors, particularly in industry and transport, considering also the 2040 targets[10]:

- Reinforcing the grid in areas where emerging demand such as charging infrastructure, datacentres and electrolysers is soon to materialise with a high degree of certainty, even though the specific connection locations and timing may still be uncertain.

- Expanding the grid to facilitate the connection of new demand in places where the demand is already located and easily quantifiable, such as in green ports and on industrial sites. This ensures that the grids serving these sites are well-prepared for upcoming electrification.

- Taking into consideration local specificities, exploring the possibility of empowering DSOs to construct TSO networks in application of article 51.8 of Directive (EU) 2019/944, in cases where the TSOs were unable to timely incorporate the requests of DSOs into their NDPs. In such instances, in those Member States where DSOs are not allowed to own transmission assets, a property transfer should take place according to the DSOs' related incurred costs based on rules stated by the NRA.

Any other investments with a potential delay between commissioning and full utilisation of the infrastructure, and thus may experience low utilisation in the short term, may also be considered anticipatory by some Member States:

- Allowing for enhancements to the grid's resilience in preparation for the increasingly extreme climate events, such as structural reinforcement of existing distribution lines (e.g., increasing mechanical strength of conductors, cross-arms, and insulators for aerial cables) or in certain circumstances, undergrounding of distribution lines to mitigate risks and improve grid resilience against extreme weather conditions. Special attention should be given to areas particularly sensitive to climate impacts with high demand.

- National barriers should be removed regarding assimilation of investments in Operational and Information Technology (OT, IT) related to grid digitalisation into investments in physical network reinforcement/extension from a regulatory perspective.

[10] Impact assessment report on "Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society", European Commission, February 2024

These examples should be considered **relevant** and **proportionate** network projects, provided they can support a future need in alignment with national climate plans and national roadmaps, or are adequately justified in the distribution NDP.

3. Ensuring the relevance of anticipatory investments through network development plans.

Why and how to incorporate anticipatory investments in the NDPs?

An agile way of forecasting the anticipatory investments should be proposed, necessitating adaptability from both DSOs and regulators in response to the ever-changing energy landscape. NDPs (Art. 32.3, Electricity Directive) are the most appropriate tool to that purpose.

NDPs serve as the roadmap for DSOs to define grid development needs and directions, as outlined in Article 32.3 of the Electricity Directive. Consequently, they stand out as the optimal means for determining investments that are proportional to the requirements and significance of network projects. This Article 32 is expected to emerge as the primary **tool for legitimising anticipatory investments**.

However, to achieve the necessary advanced expansion of grids and stimulate the required anticipatory investments, it is crucial to deviate from the typical way of developing distribution network plans. These plans traditionally define **shorter-term investment needs** based on expected changes in demand and supply requirements. This regulatory timeframe for distribution plans of two to three years in most countries **may prove insufficient** to establish an efficient framework as well as strategically integrating anticipatory investments into the NDPs. Anticipatory investments involve planning for at least a 2030 horizon and developing the network with 2040 capacity in mind when looking from a 2024 point of view. This approach is guided by a "building once for the future" mindset that allows for lower costs than incremental investments.

Depending on the NRA and the national approach to NDP development, anticipatory investments could be subject to different regulatory treatments. Consequently, while they may be integrated along regular investments usually outlined in the NDP, the first step might involve the **removal of any existing budgetary cap constraints** where a cap is applicable. Additionally, in cases where regulatory treatment necessitates it, anticipatory investments might be featured in a dedicated chapter within the NDP. This dedicated chapter serves to provide regulators with improved visibility into these investments and their ongoing developments.

Tools to forecast anticipatory investments: building upon the certainty of projects

The accuracy of the assessment of capacity needs depends on the degree of engagement from stakeholders.

It is recommended that DSOs be fully entrusted with the decision of making anticipatory investments based on this information collection and on the consultation with authorities.

To build their NDPs with the incorporation of forward-looking investments, DSOs can use the following tools to identify generation and demand projects with established levels of certainty. One major approach to assess anticipatory investment needs is by **establishing long-term electrification scenarios** in the form of roadmaps, potentially based on the national energy and climate plans (NECPs), which are subject to public consultation.

Currently, a widely observed good practice is for DSOs to engage with regional and local authorities to obtain their own energy transition plans (for instance, municipalities' plans for electrifying transportation) and develop the infrastructure in a collaborative way.

While local and national plans are prominent tools, the identification of such need not exclusively originate from this level. In fact, these needs may arise from various sources, including public consultations, individual discussions with network users or suggestions from regional or local authorities. For instance, if a DSO acknowledges that a specific industry has planned to undergo electrification and decarbonisation, the DSO should be able to proactively upgrade the network in that area by including such reinforcement in the NDP. This action can be driven by the specific needs of the local community or industry, potentially aligning simultaneously with the plans of local governments, and of TSOs, which also highlights the need for more flexible and agile NDPs.

In all instances, the accuracy of the assessment of needs depends on the degree of engagement from stakeholders.

In summary, establishing **comprehensive and inclusive energy planning** is a crucial element. To that end, Governments can actively **reduce uncertainty** in their planning processes by providing clarity on policies that influence the 'what, where, and when' aspects of societal developments. Then, in due course, expansion and reinforcement network plans, along with resilience and climate adaptation measures, should be coordinated with other pertinent structural documents such as the ten-year network development plans (TYNDPs). The objective is to achieve decarbonisation and climate targets in a harmonised manner across both distribution and transmission systems.

Regardless of the information gathering method chosen, it is recommended that **the final decision on the investment plan be entrusted to the DSOs**. The expertise of DSOs positions them well to reach the optimal decision based on the information collected. This approach ensures that the decision-making process is well-informed and considers the intricacies of the energy landscape.

Obtaining validation of the anticipatory investments through the NDPs

Regulators and governments should be involved in the anticipatory investments plans of DSOs through **notification and information procedures, mainly via the NDPs**. Introducing streamlined validation processes and defining the scope of expected investments ahead of each regulatory period will promote investment continuity and expedite grid development.

Each country should propose a regulatory framework that optimises the implementation of anticipatory investments. Depending on the applicable regulatory regime, the anticipatory investments' validation should be *ex-ante* or have a clear official procedure. This procedure could align with **methodologies similar to the Member States' validation process for regular investments**[11], while accounting for the differences in treatment required in some cases.

[11] Report on distribution tariff methodologies in Europe, ACER, February 2021

4. Fostering improved collaboration between TSOs & DSOs for optimised network development

TSO planning should comprehensively address all DSO needs, including anticipatory investments.

Distribution networks play a pivotal role in the energy transition by connecting the highest share of renewable capacity[12]. They must also adapt to the increasing trend of self-consumption, energy sharing, and the electrification of various demands. Achieving these goals, while ensuring the security and quality of the supply to final consumers, can be guaranteed through effective coordination with TSOs.

There remains a need for improved collaboration, despite the provision in Article 57 of Regulation (EU) 2019/943, which emphasises strong cooperation and exchange of necessary information and data between both system operators regarding generation and demand. This cooperation should strive to **achieve maximum efficiency from both economic and environmental perspectives,** aiming to minimise unnecessary redundancies. **TSO planning should comprehensively address all DSO needs**, encompassing factors such as demand growth—particularly from decarbonisation processes—inclusion of additional renewable distributed generation or self-consumption, incorporation of new large customers and the integration of enhanced quality of service and resilience demanded by network users. Furthermore, TSO planning updates should be agile and flexible, **allowing for the incorporation of anticipatory investments made by DSOs**.

Taking into consideration local specificities, NRAs could also explore the possibility of empowering DSOs to construct TSO networks in cases where the TSOs are unable to incorporate the requests of DSOs into their NDPs in a timely manner. In such instances, in those Member States where DSOs are not allowed to own transmission assets, a property transfer should take place according to the DSOs' related incurred costs based on rules stated by the NRA.

5. Financing the anticipatory investment: cost & risk sharing

The financing of the anticipatory investments involves two aspects. Namely, the financing instruments based on the DSO regulated income, and how the costs are passed through to network users or by public funds.

Financing instrument and impact on DSO remuneration

DSOs should be incentivised to proceed with anticipatory investments as these are made for the benefits of society.

DSOs' annual economic results should not be negatively impacted by the engagement in anticipatory investments as these are made in the interest of society. DSOs should generally be incentivised to develop the grid in a forward-looking manner.

[12] According to Eurelectric's Connecting the dots study, January 2021, 70% of RES share will be connected directly at distribution level

The general idea is that anticipatory investments should be **treated like any other DSO expense** and do not require a dedicated financing instrument. Member States have the discretion to decide whether public or private sources like banks will support such investments, based on their specific needs and circumstances. As such, anticipatory investments should be financed through distribution tariffs, applicable funds (Recovery and Resilience Facility, Modernisation, Cohesion), or other sources.

In any scenario, DSOs should generally be incentivised to develop the grid in a forward-looking manner, as these investments are made in the interest of the society. Therefore, in instances where, due to circumstances beyond the responsibility of the DSO, the asset subject to the investment is not fully utilised, connections are not ultimately realised or expected efficiency is not achieved, Member States must ensure that DSOs can **fully recover all efficiently incurred costs**. This means, **utilisation of the assets should not be included in the definition of efficiency; only investments' execution efficiency should be considered instead.** As such, the weighted average cost of capital (WACC) established *ex-ante* and regulatory asset base (RAB) should not be adversely affected.

More generally, ensuring the **proper remuneration of anticipatory investments** is vital for the efficient development of grids. Therefore, it is essential to review the remuneration regime to **shift focus away from short-term cost reduction**. Additionally, there is a **need for improved risk assessment**, with regulation **prioritising inadequate grid development risk mitigation** rather than solely focusing on the potential risk of underutilised assets.

To normalise anticipatory investments, the forecasted investment of DSOs should incorporate anticipatory investments **in the same manner as regular network investments are included in the regulatory price control process**. This approach could be complemented by a revised strategy for DSO remuneration, assigning equal importance to operational expenditure (OpEx) and capital expenditure (CapEx), and potentially transitioning to an 'output-based'[13] remuneration model applicable to anticipatory investments. Such performance-based incentives could imply efficiently delivering capacity and/or minimising customer supply refusals beyond a specified duration. In such case, these criteria should be tailored to the characteristics of the specific area and its grid capacities. This recommendation aligns with Electricity Regulation 2019/943 and revised EMD.

Investing in operational improvements can also contribute to increasing hosting capacity in the short term by leveraging flexible connection agreements[14], which are another means to increase hosting capacity in the long term.

[13] Output-based remuneration should not be confused with remuneration based on metrics of power or energy delivered. Outputs refer to a set of economic or operational goals set by the regulator that the grid operator is expected to achieve.
[14] Power system of the future – Keys to delivery capacity on the distribution grid, Eurelectric, 2023

Tariff regimes: impact on customers

The socialisation of costs is considered the fairest approach, as the lack of timely momentum to invest and build infrastructure for future certain needs could impose a substantial burden on society. Europe risks falling behind in achieving its energy transition goals, and delaying investments would inevitably lead to additional societal costs.

Allowing DSOs to systematically plan one step beyond the expected, with future demand and generation responding to certainty levels, can accelerate infrastructure development and **reduce the risk of emerging network congestions**. This forward-looking approach mitigates the necessity for future same-site investments, thereby avoiding associated challenges such as the time-consuming process of obtaining permits. The risk of a certain level of transitory overinvestment during the first years should therefore be accepted until generation and demand fully materialise. Such an approach would require an **adjustment of existing remuneration arrangements** when they are based on asset utilisation. Given the enormous societal and associated investment challenges, relaxation should be considered in those Member States where the degree of utilisation of new assets is taken into account in the remuneration process. Given the reality of the energy transition, a certain headroom when estimating the applicable efficiency measure is indeed desirable. The physical capacity of the network and financial resources show an important parallel; namely that some overcapacity is less harmful than a lack of capacity. It is therefore important that the regulator provides DSOs with sufficient margin to quickly strengthen their electricity networks through **appropriate revenue recovery within the tariff mechanism**[15].

Furthermore, if electricity consumption grows at the rate anticipated by the Commission, the impact of anticipatory investments on customers' distribution network tariffs will be mitigated by spreading it across a larger customer base. However, if society decarbonises at a slower pace, the potential increase in tariffs resulting from anticipatory investments may become a secondary concern compared to the failure to meet climate goals.

Incorporating anticipatory investments into the tariff ensures a fair reflection of the actual costs incurred, contributing to the reliability and efficiency of the grid and ultimately resulting in financial advantages for customers over time. In cases where anticipatory investments are very significant, deferral strategies may be proposed to mitigate immediate cost impacts, with private investors typically providing funding.

Additionally, anticipatory investments might require a comprehensive review of existing connection charging policies. These investments should not send disadvantageous signals to customers, particularly in countries where they bear the cost of grid reinforcement. Nor should they result in areas without anticipatory investments being marginalised due to higher connection costs. **Transitioning to a shallow per megawatt (MW) connection fee**, rather than billing based on actual connection costs incurred, offers a potential solution. This approach would not only promote electrification but also ensure a fair playing field for customers, **minimising disparities** in connection costs between areas with and without anticipatory investments.

[15] *Energie door perspectief: rechtvaardig, robuust, en duurzaam naar 2050*, Expertteam Energiesysteem 2050, April 2023

6. COUNTRY FOCUS: EXISTING LEGISLATIVE & REGULATORY LANDSCAPES

The objective is to display existing regulatory models touching upon anticipatory investments. Overall, Eurelectric would like to highlight the following main outcome based on these country focuses:
DSOs are currently not incentivised to initiate forward-looking network investments, which could facilitate or expedite renewable connections. Anticipatory investments are rare among the European examples investigated below, and in several cases, they are forbidden or even penalised.

Country: SPAIN	
How are the investments considered in the regulated revenue?	New investments and subtracting depreciation are added to the RAB which is updated yearly. Assets under construction are not included in the RAB. When assets end their regulatory lifetime, they are taken out of the RAB, and stop receiving revenues for investment. Assets commissioned in year "n" start receiving revenues in year "n+2".
Do you have investments in an anticipated form in your country?	There is no such definition in our regulation.
What is the definition at your country's level?	N/A
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	So far, there are no plans to implement anticipatory investments.
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	N/A
Is the investment general (i.e. for any DSO expense) or is it framed in one specific regulation (e.g. the regulation for EV charging stations)?	N/A
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	N/A
What are the consequences of these investments on tariffs?	N/A.
Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	Yes. In the case of Spain there is a yearly investment cap that applies to grid companies forbidding any investment that exceeds a predefined percentage of the previous year GDP. Investment plans that exceed the allocated cap will be rejected, and if the actual investment executed exceeds the allocated cap, the DSO is penalised with a lower investment limit for

	the following years plus a reduction in the final remuneration of the exceeded year. Furthermore, the regulator frequently experiences delays in notifying the approval of submitted investment plans, to the extent that investments are carried out before the DSO receives confirmation of approval. Additionally, there is a complete absence of rules governing the execution of investment inspections by the regulator, resulting in arbitrary decisions for which no appeals can be made, except through the courts of justice. Moreover, in Spain, the limited capacity poses a challenge for new users seeking grid connections. When new users apply for a connection in an area with insufficient capacity, they are given the option to either pay for the necessary grid reinforcement or to be connected to another area with available capacity at no additional cost. However, disputes often arise in these situations, as network users contest the reports indicating capacity unavailability. Relocating connections is not typically viewed as the preferred solution. Consequently, many network users are compelled to finance the required reinforcement, which often takes years to complete. If DSOs and TSOs anticipated such investments, capacity could be expanded, thereby reducing delays in network customer connections and their associated financing burdens.
Examples of anticipatory investments that you would like to provide as guidance	Currently most problems are found in the lack of capacity to connect new demand such as EV chargers, Data Centers and Electrolysers.
Develop a regulatory approach for anticipatory investments in the concerned Member State	BEST REGULATORY APPROACH FOR SPAIN Main barriers to overcome: - Spain keeps an investment cap on electricity grid companies. This is detrimental to any additional investment. Currently, the allowance barely allows for asset renovation. DSOs can currently not accommodate any anticipatory investments related with the energy transition, unless they are paid for by the order giving customer.

	- There is a complete lack of rules for the execution of investment inspections by the regulator leading to arbitrary decisions for which appeals other than the court of justice are hardly useful. - Customers need to individually endorse and pay every single reinforcement for accessing the distribution grid unless it is considered part of the network development plan that caters for the organic demand growth. General surveys for gathering the information needed to decide on anticipatory investments will not yield credible results unless it is ad hoc for HV connections. An easier approach for LV and MV would be to extend the current shallow standard connection charge that applies in Low Voltage to all voltage levels. This would provide a level playing field for customers that will not see extreme differences in the cost of connection in places with anticipatory investment done and other places without it. With this approach, the customer would have to pay only a fraction of the investment cost but still receiving the economic signal to guide investment decisions to optimal locations and uses. DSOs in Spain have already a large enough backlog of connection requests that enable them to know with a high level of certainty where the anticipatory investments should be built. This shallow connection charge will have an additional benefit in the case of Spain, as currently many demand customers withhold their connection requests to avoid being the first to show up because connecting to a node where other customers have already requested and have paid for reinforcements results in a cheaper connection. Future regulation will also have to solve the coordination between TSO and DSO. An optimal approach for anticipatory

	investments would be to allow the DSO to build the needed transmission infrastructure itself for a subsequent transfer to the TSO at audited or valid standard costs. Currently the TSO has very poor levels of planning completion due to insufficient throughput while the DSOs could easily take over that job. Eventually, if the investment limit is to be kept by the Government, those investments duly qualified as anticipatory, should not affect investments made under the limit constrain. The Government would still keep track of expenditure as the information on anticipatory investments approvals will be readily available. Also, anticipatory investments will not fit within the current investment limit because in the next few years large quantities of assets built in the 1980's will have to be replaced, thus consuming most of the investment limit.

Country: ROMANIA	
How are the investments considered in the regulated revenue?	1. RAB is calculated at the beginning of regulatory period (RP). The assets of the base year of the RP are used as the initial RAB. For each year of the RP, the RAB value increases with investments in new assets and decreases with depreciation and the value of assets that exit before complete depreciation. 2.The new investments of the next RP are included *ex-ante* in RAB after the *ex-ante* approval by NRA of the investment plans, resulting an *ex-ante* value of CAPEX for the next RP. 3.Assets under construction are not included in RAB. All the investment costs are included in RAB at the time of commissioning. 4. There is differentiation in the treatment of different project categories in terms of incentives, for example: For interconnection projects there are incentives provided (surplus to WACC) due to higher risks according to European legislation. For investments in electricity network there is a surplus to WACC vs. other types of investments (buildings, hardware, and administrative software)
Do you have investments in an anticipated form in your country?	No. Investment in distribution networks with duration of over 3 years has a special regime. Very strict requirements regarding cost-benefit analysis (CBA). The regulator may take out of RAB the investment if after 2 years it does not fulfil 80% of the KPIs from the CBA
What is the definition at your country's level?	No definition at this stage.
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	N/A
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	N/A
Is the investment general (i.e. for any DSO expense) or is it framed in one specific	N/A

regulation (e.g. the regulation for EV charging stations)?	
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	N/A
What are the consequences of these investments on tariffs?	The main component of Regulated Revenue/ tariffs is return on assets. No special treatment for anticipatory investments – not defined, yet.
What were the missed opportunities in the EMD's reform for the definition and future implementation of "anticipatory investments" (art 18)?	More attention should be given to investment in resilience improvement and acceleration of digitalisation
Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	yes
Examples of anticipatory investments that you would like to provide as guidance	Acceleration of digitalisation, investment in networks resilience
Develop a "best regulatory approach for the member state"	Romania has a generous allocation for network development from the Modernisation Fund. Such allocations may exceed the CAPEX programme of DSOs constituted from collection of rid usage payments from customers. Assets resulting from utilisation of such grants are not part of the DSO remuneration base. The DSO needs to be incentivised to spend resources on absorbing such funds. Flexibility in CAPEX allocation and recognition is needed. A rule that 85% of the CAPEX should be spent on physical network expansion has to be revisited. Multi-annual projects have a special treatment but should not exceed 3 years duration. The implementation of longer duration projects should be covered by the specific regulation.

Country: FRANCE	
How are the investments considered in the regulated revenue?	DSO previsional investment programmes are elaborated at local level (département) with representatives of the State (préfets), and are examined by a committee (Comité du système de distribution publique de l'électricité). The distribution tariff is called the "TURPE" (tariff for the use of public distribution networks) and covers the expenses. It is decided by French Energy regulator (CRE) after public consultations of stakeholders, as well as close exchanges with DSOs. It is cost-reflective, set for 4 years, with a possibility for small adjustments. The tariff is adjusted every year, mostly to take into account inflation, but also the adjustment account for expenses/income ("Compte de Régulation des Charges et Produits", CRCP), a system for recovering expenses and income which are difficult to predict and cannot be controlled. It is limited to ±2%.
Do you have investments in an anticipated form in your country?	Not defined as such, but this is an example from our preliminary work on network development plan: the S3REnR (*schemas régionaux de racccordement au réseau des énergies renouvelables).* It is regional renewable energy master plan.
What is the definition at your country's level?	N/A
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	Since law and regulation in 2010 and 2012 respectively introduced the S3REnR principles, the French regions have developed and implemented plans to connect around 10 GW of renewable generation. It has been revised and improved regularly over time and is still the topic of discussion of working groups supervised by the ministries.
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	The S3REnR is set according to an overall connection capacity set by the regional prefect, in accordance with article L. 321-7 of the French Energy Code. It only relate to RES generation and connection to the grid
Is the investment general (i.e. for any DSO expense) or is it framed in one specific	This capacity is defined based on the multi-annual energy plan (PPE), the regional

regulation (e.g. the regulation for EV charging stations)?	spatial planning and sustainable development scheme (SRADDET) drawn up by the region, and the expected growth in connection requests.
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	Not specified timeframe but the S3REnR is based on plan for a decade. The purpose of the S3REnR is to specify the investments required for the structural part of the electricity networks and their financing, in order to accommodate the connections needs for renewable energy generation expected over the next ten years in each French administrative region. Accordingly, network capacities are dedicated to renewable energy generation. This plan is drawn up by RTE, the transmission system operator, in agreement with the distribution system operators, including Enedis, as required by law. These plans aim to ensure that the network can accommodate the growth of renewable energy over the next decade, in accordance with the State's, Region's, and potential new renewable energy production facilities' guidelines, while considering environmental concerns.
What are the consequences of these investments on tariffs?	Not on tariffs directly but the impact is on the project holders. They get to share the costs of grid connections they would normally bear on their own if the deployment of renewable energy was not anticipated in the region. *Principle of shared investment.* The S3REnR allows assets costs to be shared between producers and local authorities, with costs being fiscalised. Producers contribute to the development of new assets through their unit share of the S3REnR plan. This allows sharing of costs between all regional players (producers), both by providing medium-term visibility of the cost and by promoting parity of access to the network for part of connection cost
What were the missed opportunities in the EMD's reform for the definition and future implementation of "anticipatory investments" (art. 18)?	/

Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	/
Examples of anticipatory investments that you would like to provide as guidance	/
Develop a "best regulatory approach for the Member State"	/

Country: PORTUGAL	
How are the investments considered in the regulated revenue?	There is a TOTEX model, which allows the recovery of capital costs related to investments prior to the Regulatory Period (RP). When defining the TOTEX for a new RP, the NRA considers a projection of the Regulatory Asset Base (RAB), building on the real RAB the company shows prior to the new RP and on the most recently approved NDP. Actually, for the subsequent RP new investments are taken *ex-ante* into RAB following the Government approval of a 5-year NDP by the Government, following an NRA assessment of the plan and NRA recommendations to the DSO regarding investment values (typically based on considerations about tariff impacts), resulting in a RAB projection considered for the upcoming RP.
Do you have investments in an anticipated form in your country?	There isn't any definition regarding anticipatory investments
What is the definition at your country's level?	N/A
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	N/A
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	N/A
Is the investment general (i.e. for any DSO expense) or is it framed in one specific regulation (e.g. the regulation for EV charging stations)?	N/A
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	N/A
What are the consequences of these investments on tariffs?	Regulated revenue comes from tariffs charged to the system when they are approved by the NRA via NDP. As long as these investments are included in an approved NDP, they'll be included in RAB and, thus, reflected in network tariffs. Investments beyond the ones approved in the NDP are taken at DSO risk during the RP.
What were the missed opportunities in the EMD's reform for the definition and future implementation of "anticipatory investments" (art. 18)?	

Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	Yes
Examples of anticipatory investments that you would like to provide as guidance	Creation of capacity to connect new decentralised generation and to supply new types of loads, such as EV chargers, datacenters and electrolysers.
Develop the best regulatory approach for the Member State	When assessing an NDP, the NRA should not only focus only on the impact of the proposed investment on network tariffs, but rather on the whole system in a broader perspective. Actually, NRA should take into consideration if an increase in network tariffs due to anticipatory investment in network capacity may be largely compensated by a reduction in energy prices, coming from its contribution to a larger penetration of renewable energy sources. Following the same principle, an increase in network tariffs due to anticipatory investment in local network reinforcements also may be compensated by a reduction of primary energy consumption, as it contributes to a faster replacement of fossil fuel transportation with EV.

Country: NETHERLANDS	
How are the investments considered in the regulated revenue?	The DSOs are allowed to charge a regulated tariff, which is determined through a yardstick method by the regulator. The revenue generated through this tariff aims to cover the TOTEX costs that the DSOs incur while performing their tasks, such as operating costs, and depreciation costs. The DSOs are also allowed to charge a reasonable return margin (WACC). No distinction is made between regular investments and anticipatory investments. With the current regulatory method in the Netherlands, there is no consideration given to the future plans of DSOs. Instead, the regulator estimates future investments based on extrapolating values realized in the past and its scalability through the tariff. The idea is that increased investment would generate increased volume and therefore increased revenue. Anticipatory investments explicitly do not follow this pattern. Increasing investments lead to higher expenditures for DSOs, consequently raising their capital requirements. Anticipatory investments are in the Netherlands processed too late in the tariff, given the current methodology. The regulator in the Netherlands is currently reconsidering its regulatory method and the position of (anticipatory) investments for the period after 2026, although which direction this will go has not yet been determined.
Do you have investments in an anticipated form in your country?	Dutch DSOs are required to submit an investment plan every two years, which outlines the investments that they plan to make in the electricity and gas networks in the Netherlands, for the upcoming ten years. These plans are based on scenarios that are developed jointly by the System Operators. The scenarios take into account the expected developments in the Dutch society, such as the energy transition, and the impact that these developments will have on the electricity and gas networks. However, this practice is currently not

	encouraged in the Dutch regulatory method.
What is the definition at your country's level?	N/A
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	N/A
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	N/A
Is the investment general (i.e. for any DSO expense) or is it framed in one specific regulation (e.g. the regulation for EV charging stations)?	N/A
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	N/A
What are the consequences of these investments on tariffs?	N/A
What were the missed opportunities in the EMD's reform for the definition and future implementation of "anticipatory investments" (art. 18)?	Adding a clear definition of anticipatory investments
Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	The current output measurement for the DSOs is not neutral when it comes to investments because the degree of utilization of the network is also taken into account. As a result, DSOs have an incentive to postpone investments until (1) there is certainty that the investment is needed and (2) there is immediately a high degree of utilization.
Examples of ai that you would like to provide as guidance	We do not have specific examples in the Netherlands, but we do have general considerations that emphasize the importance of anticipatory investments (see below).
Miscellaneous	
Develop the best regulatory approach for the member state	The societal costs associated with the risk of temporary "overinvestment" are currently lower than the societal costs of insufficient network capacity. Therefore, it is crucial to provide System Operators in the Netherlands with the flexibility systematically plan and invest based on the expected demand in 2050. This approach can accelerate infrastructure development and limit the risk of delaying network congestion in the future. Such an approach advocates deviating from the current

	utilization efficiency in the regulatory methodology. Given the enormous societal challenge and associated investment challenge, a compensation lower than the efficient costs is socially considerably more harmful than a compensation that is (slightly) higher than the efficient costs. A certain safety margin in estimating the efficient costs is therefore desirable. In a sense, the physical capacity of the network and the financial resources show an important parallel, namely that some overcapacity is less harmful than a lack of capacity. It is therefore important that the Regulator gives System operators sufficient room to quickly strengthen their electricity networks through tariff regulation. Moreover, the investment plans of the System Operators are based on widely supported scenarios, are largely driven by national, provincial, and municipal plans, involve extensive consultation with stakeholders, and are reviewed by the ACM. This ensures that the right investments are made and that they are well-founded.

Country: IRELAND	
How are the investments considered in the regulated revenue?	Ireland has a price review every 5 years. Investments are approved and then there is a look back afterwards.
Do you have investments in an anticipated form in your country?	For the renewable hubs pilot – yes – otherwise no.
What is the definition at your country's level?	N/A
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	N/A
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	N/A
Is the investment general (i.e. for any DSO expense) or is it framed in one specific regulation (e.g. the regulation for EV charging stations)?	N/A
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	N/A
What are the consequences of these investments on tariffs?	N/A: Renewable hubs are a pilot: Renewable Hubs decision: CRU202353_Renewable_Hubs_Pilot_Consultation.PDF (divio-media.com) As part of the pilot a per MVA methodology is being used for connection charges.
What were the missed opportunities in the EMD's reform for the definition and future implementation of "anticipatory investments" (art. 18)?	
Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	
Examples of anticipatory investments that you would like to provide as guidance	ESB Networks Capacity Pathways Consultation: https://www.esbnetworks.ie/docs/default-source/publications/electricity-distribution-network-capacity-pathways-consultation-report---accessible-version.pdf?sfvrsn=9ffe47ff_9
Miscellaneous	

Develop the best regulatory approach for the Member State	Ireland is preparing for a 5 year price review this year and will be in detailed discussion with the NRA.

Country: ITALY	
How are the investments considered in the regulated revenue?	Italy revised its remuneration model, from a RAB based approach for capex towards a TOTEX approach (ROSS). Transitory period starting in 2024 (ROSS-base). Full implementation starting from 2026 (ROSS-integrale). ROSS-base 2024-2025: total expenditure, which includes capital and operational expenditure, is split between "Slow Money" (remunerated through WACC and depreciation) and "Fast Money" (recognized in the year). The split between Slow and Fast money is based on a conventional capitalization rate set *ex-ante* by the NRA, taking into account historical and forecasted capex and opex provided by the DSO. Ongoing investments do not receive depreciation whereas they receive WACC remuneration. ROSS-integrale (from 2026): it will rely on DSO Business plan to be approved *ex-ante* by the NRA. ROSS-integrale could be based on CBA methodology.
Do you have investments in an anticipated form in your country?	No distinction in current Italian regulation applies between regular and anticipatory investments.
What is the definition at your country's level?	None
If so, what sort of legislation is it and at which stage of implementation is it? (law, regional decree, sandbox, implemented for XXX years)	Not applicable in the Italian Regulation
What are the conditions to use these investments? For instance, is it limited to one sort of spending or technologies (EV, batteries, RES,...)?	Not applicable in the Italian Regulation
Is the investment general (i.e. for any DSO expense) or is it framed in one specific regulation (e.g. the regulation for EV charging stations)?	Not applicable in the Italian Regulation
Is there a timeframe applying to these "anticipatory investments"? (e.g.: they can be budgeted for projects realised maximum within the upcoming 2 years, etc.)	Not applicable in the Italian Regulation
What are the consequences of these investments on tariffs?	Not applicable in the Italian Regulation
What were the missed opportunities in the EMD's reform for the definition and future	Not applicable in the Italian Regulation

implementation of “anticipatory investments” (art 18)?	
Is the regulation more focused on blocking excessive investments rather than on allowing forward looking approach?	Not applicable in the Italian Regulation
Examples of ai that you would like to provide as guidance	• Network reinforcement investments expected for a longer period (i.e. 5-10 years ahead), including hosting capacity for distributed generation and reinforcements for electrification. Those investments, as for future scenarios, should be consistent across TSOs and DSOs • Climate Resilience • Acceleration of digitalisation • Connection of renewables/prosumers
Miscellaneous	• The strengthening and development of networks is essential to guarantee the expected growth levels in renewables and EV, as well as the electrification of consumption, according to EU targets. Anticipatory investments should be rewarded accordingly. • Regulation must be reviewed and updated to support not only the creation of new networks but also the improvement of the use of current resources, in a more flexible and efficient way.
Develop the best regulatory approach for the Member State	See above

ANNEX – REFERENCES

IMPLEMENTING THE REVISED EMD AND THE GRIDS ACTION PLAN (GAP)

- The Grids Action Plan aims to propose guiding principles identifying conditions under which anticipatory investments in grid projects should be granted.

"The electricity market design reform proposal made by the Commission clearly indicates that anticipatory investments should be used for the ***relevant network projects****. At the same time,* ***its usage should remain proportional to the needs****.*

Anticipatory investments can be ***relevant for example for investing*** *in future-proof offshore networks that allow for future expansions of meshed offshore grids; for areas with high untapped onshore PV potential such as* ***renewable acceleration areas set in accordance with RED****; for grid connections to ports for the provision on shore-side electricity supply, or for building smart grids that support EV infrastructure charging national plans or municipal plans for heat pump rollout.*

Complementing the work on anticipatory investments being conducted by the Copenhagen Forum, the Commission, with support from ACER, ENTSO-E and EU DSO Entity and in consultation with relevant stakeholders on both electricity supply and demand side, will by Q1-2025 propose ***guidance identifying conditions under which the approval of anticipatory investments should normally be expected****, taking into consideration different* ***levels of development certainty of projects*** *and ways to address the different levels, such as via the* ***conditional provision of the anticipatory investments****."*

- Revised EMD, Art. 18§2

*"****Tariff methodologies shall reflect*** *the fixed costs of transmission system operators and distribution system operators and shall consider both capital and operational expenditure to provide appropriate incentives to transmission system operators and distribution system operators over both the short and long run, including* ***anticipatory investments****, in order to increase efficiencies ▌ including energy efficiency****;*** *(...)"*

- Revised EMD, Art. 18§8

"Transmission and ***distribution tariff methodologies shall provide incentives to*** *transmission and* ***distribution system operators*** *for the most cost-efficient operation and development of their networks including through the procurement of services****. For that purpose, regulatory authorities shall recognise relevant costs as eligible, including costs related to anticipatory investments****, shall include those costs in transmission and distribution tariffs,* ***and shall, where appropriate, introduce performance targets in order to provide incentives*** *to transmission and distribution system operators* ***to increase overall system efficiency in their networks****, including through energy efficiency, the use of flexibility services and the development of smart grids and intelligent metering systems."*

- Revised EMD, Art. 18§9

"(...) ***methods to ensure transparency in the setting and structure of tariffs, including anticipatory investments determined after consultation to relevant stakeholders****, consistent with relevant Union and national energy objectives and taking into account the acceleration areas as established in accordance with the Directive (EU) 2018/2001 on the promotion of renewable energy sources;"*

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

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