



**E.DSO**  
Stakeholder  
Innovation  
Council

**The Thin Veil of  
Renewal:  
Building the Next  
Generation Grid**

Conclusions

December 2021

# Introduction

On 1 December 2021, E.DSO held its annual landmark event – **the ‘Stakeholder and Innovation Council’**. The fourth edition of the event under the headline title “The Thin Veil of Renewal: Building the next grid generation” was held as a webinar within the framework of Enlit Europe in Milan.

The Council is an exceptional event focusing **exclusively on the electricity distribution industry** and addressing the topics related to investments and future infrastructure, regulatory prospects, and customer expectations.

Since 2018 the Council has been gathering leading innovators, experts in digitalisation and smart grids, as well as experts on customer behaviour, to discuss opportunities and emerging challenges. It brings value which transcends the DSO sector and contributes to stakeholders, industry, society, and customers. **This year’s Council aimed to inspire DSOs, policymakers and regulators to ‘build back better’ after the Covid19 pandemic by adapting responsible innovation and sustainable future grids.**

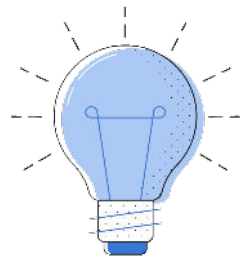
## Key Novelties

The Council was an opportunity to advance shared understanding, identify concerns and develop solutions on the future role of DSOs and investment needs for electricity grids:

- The current investment framework must change to foster the evolution of DSOs as enablers of distributed flexibility and decarbonisation.
- Green Bonds will increase their attractiveness on capital markets.
- The biggest obstacle to decarbonisation is the failure to create an effective public-private partnership to finance change.

In this year's edition, the choice of the title "[The Thin Veil of Renewal: Building the next grid generation](#)" reflects a two-fold intention: namely to address the current state of play of DSOs across Europe and anticipate the regulatory and financial new features of the DSOs of the future. The prospect of the future features mirrors the EU's ambition for a sustainable recovery oriented towards climate neutrality by 2050. **This ambition translates into a quest for DSOs to change their business model and become enablers of the future energy system which will be integrated, digitalized, decentralized and customer oriented.**

The *Renewal* aspect of the title entails the call to start thinking differently, to set aside preconceived notions of what innovation means for the energy sector, especially in a world marked by unprecedented and unanticipated interruptions. The renewal equally suggests an invitation to DSOs' resilience despite immeasurable disruptions and suspensions due to the

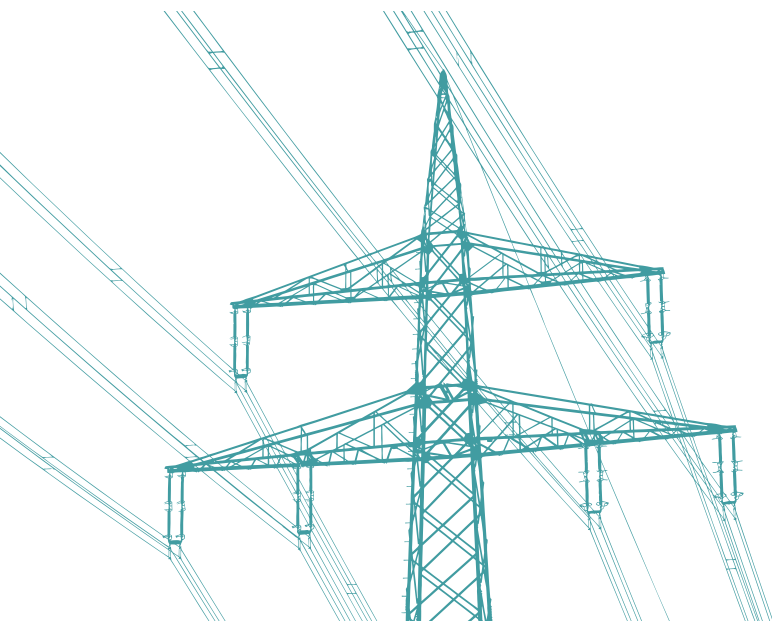


**Innovation was one of the keywords of the 2021 Council.**

The experts had the opportunity to discuss how to unlock a more resilient, green, and digital future, as well as to experience first-hand information about the future outlook. The general assumption shared during the Council was that innovation will cultivate DSOs' contribution to climate neutrality. While the past two years have been challenging for DSOs, they have shown the ability to develop and deploy leading-edge grid technologies while keeping customers and families at the core of their service. What is more, DSOs continue to contribute to the EU's sustainability goal by advancing electrification as the safest bet for a climate neutral Europe by 2020.

With all this in mind we designed this year's Stakeholder and Innovation Council around three Ideas Labs:

- Assessment of "Connecting the Dots" study and future investments.
- Regulatory Framework and Financial Enablers
- Defining parameters and features of new DSOs role (including customers engagement)

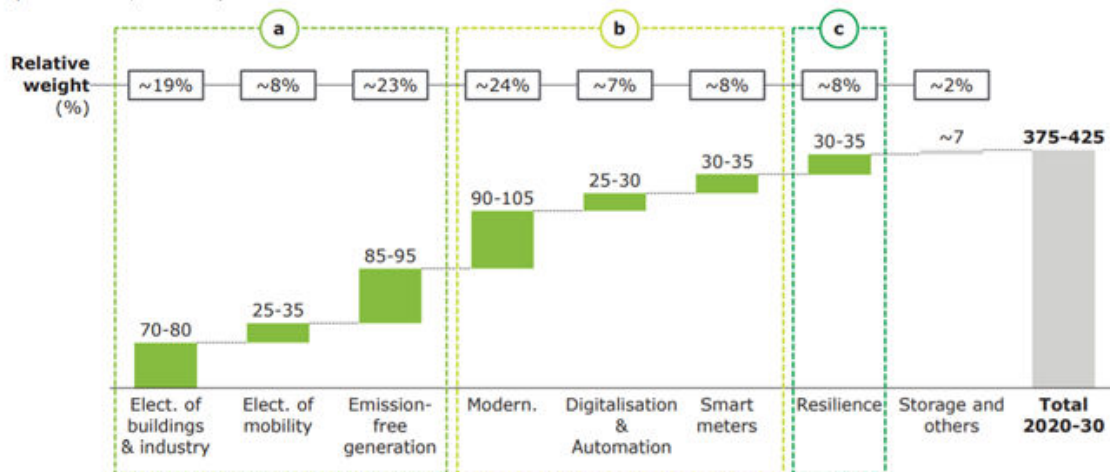


# Assessment of “Connecting the Dots” study and future investments

Earlier in 2021 E.DSO published the “Connecting the Dots” study in partnership with Deloitte and Eurelectric. It is the first study of this kind proposing an outlook of the way investment in the power distribution sector should develop if we are to achieve the objectives of the energy transition. “Connecting the Dots” encompasses the EU27 as well as the UK and identifies the policy actions that need to be taken and the main challenges DSOs will face in the quest for climate neutrality.

The study shows unequivocally that there is a need to equip the energy system for the future by boosting the momentum of **digital solutions** and increasing the **coordination between TSOs, DSOs and project promoters**. Additionally, the **resiliency of the grid** must become a cornerstone priority along with the objective to integrate **decentralised generation** and services for **demand-side participation**. All this points towards a definite need to increase investments in the capacity and resiliency of distribution grids. According to the study, these needs amount to an **investment of up to 375–425 bln EUR in 2020–2030** in order to research, innovate and deploy new technologies to guarantee the safest and most reliable network for all customers.

**EU27+UK DSO investments in power distribution grids breakdown per relevant investment drivers**  
(nominal Cbn; 2020-30)








**We consider cost-effectiveness in our scenario through load flexibility measures, e.g. smart EV charging (i.e. diversified EV charging) reducing the economic impact of electrification of mobility**

Source: DSOs and national associations; Monitor Deloitte

This investment would have **positive effects that transcend the energy system and enable local economic growth and the opening of job opportunities**. Moreover, reliance on local system integration and decentralised generation would boost the EU's **energy independence**.

The need for this investment will become ever more apparent as demand for decarbonisation increases. We can already see industries which risk consumer penalties or administrative burdens just because their supply chain relies on coal-powered electricity. These companies search for ways to decarbonise their processes and refer to DSOs as the most suitable agents. This is a great opportunity for DSOs to reaffirm their significance for the energy transition and we have already shown we can rise to the challenge. Nevertheless, the trend helps outline several risks that could arise from a possible underinvestment in the grid. It may lead to an increase in costs related to:

-  Curtailment
-  Inability to charge mobility
-  Restriction in functioning of heat pumps
-  Supply interruptions
-  Slowing down or failing the energy transition

The above leads to the conclusion that **the potential cost of underinvestment into the electricity distribution grid is greater than the alternative of oversized investment**. It is up to the regulatory system to find the optimal point and build the right environment for a resilient and secure energy transition. To rise to the challenge, the EU and Member States would need to undertake profound regulatory action including a revision or even removal of limits on investments in the distribution grids. Ex-ante investment caps that were introduced a decade ago in an environment of financial difficulties may also need to be changed to fit the climate target.

# Regulatory Framework and Financial Enablers

One of the main challenges in designing a regulatory framework that enables DSOs to contribute to the energy transition is related to harmonisation. In fact, there is no harmonised regulatory framework for investments in the distribution grid the way there is for the electricity market. The current regulation was designed in a different time and was meant to serve a different purpose – to maximise efficiency in the use of the network.



Presently there is a strong need to expand this approach by finding the instruments to regulate distribution grids in line with the objective of climate neutrality, in addition to economic efficiency.

A discrepancy between the political commitment to climate neutrality, the technological readiness of DSOs and the regulatory framework for investment risks hampers digitalisation and the deployment of smart grids. This, in turn, may slow down the energy transition and create risks for the energy system.



The truly challenging question is whether the grids are prepared to sustain the increase of renewable energy generation or the pressure to electrify sectors such as heating and transport.

It was overall agreed that there is **need for a more forward-looking and agile regulation which serves as a genuine enablement of DSOs to carry out the clean energy transition under their own discretion**. A first step would be to solve the CAPEX bias which translates into a bias between conventional and non-conventional investments. It should equally be considered whether and how changes in tariff structures and prices signals can be used to nurture a climate-responsible customer behaviour which facilitates the integration of the energy system.

The future regulatory framework should be future-proof and encouraging sector integration. Finally, it must put an emphasis on grid resiliency as an objective of its own especially in the context of accelerated electrification.

There are good signs that make regulatory changes easier. The [#COP26](#) boosted a world-wide understanding that energy is the key to climate neutrality. Furthermore, industries and companies feel genuine pressure when they get low grades for environmental and social governance (ESG) since their supply chains rely on electricity from coal. Energy becomes more popular also through investment stories – this can already be observed in the case of green bonds. Where three years ago there was a surplus on the capital markets, today there is a lack. Green bonds have been praised also for their offering of diversification properties.<sup>1</sup>



These developments and signs build up to a change in the behaviour of private investors who begin to look for more investment prospects with an emphasis on sustainability. This is crucial because **the push for clean energy depends on an effective public-private partnership.** Resources such as [the Sustainable Europe Investment Plan](#) and [the Next Generation EU's Recovery and Resilience Plans](#) are of enormous significance but can only achieve their objectives when reinforced with a genuine market move of the private sectors towards clean energy investment. The [EU Taxonomy](#) is an important move on this positive track as it directs the interest of capital markets towards the building of a smart grid as the backbone of the energy transition.

# Defining parameters and features of a new DSOs role (including customers engagement)

First and foremost, it must be considered that a transformation of the energy system is undergoing towards decentralisation, digitalisation, and distributed flexibility. This transformation translates into an evolving role for DSOs which become responsible for the integration of flexibility services and renewable energy sources (RES) with intermittent nature. **The more flexibility services and RES become integrated at medium and low voltage levels, the flatter the traditional distinction between DSOs and TSOs becomes.** DSOs become less like network operators and more like system operators gaining responsibilities also for balancing.

The stakeholders commonly agreed that the regulatory framework must be revised to accommodate this evolution and facilitate the participation and entry of new flexibility players. To this end, **DSOs should be recognised as neutral market facilitators** performing regulated core activities and integrating renewable sources, flexibility services and active customers. It was pointed out that regulation should also acknowledge the diversity of DSOs in terms of size and resources as these imply different capabilities to foster innovation (around 2400 DSOs only in Europe).

The new regulatory framework should be designed to encourage innovations in the DSO business model and the adoption of new technologies which substitute the passive relationship DSOs have with network customers for the sake of greater interaction.



The Council was positive about the significant economic value local flexibility resources can provide and about its complementarity to investments in conventional grid reinforcements. It was agreed that for this reason, DSOs must be incentivised to optimise their network beyond the current model of 'connect and reinforce'. DSOs will remain central to the stability of the grid and need to provide a network that is designed to allow all customers to use the grid as they choose. **Data was referred to as the key enabler in this regard and would need to be leveraged to facilitate innovation.**



# Conclusion

Electrification is essential for decarbonisation and the achievement of climate neutrality. Decarbonisation was most successful in electricity – more so than in buildings or transport. In this context, we see a rising importance of DSOs for the transition towards an integrated energy system which relies on decentralisation, digitalisation, and distributed flexibility. The regulatory framework should be reformed to recognise this reality and equip DSOs with the necessary resources and competences to play their role in the energy transition.

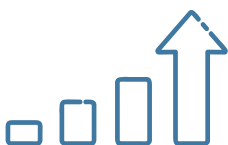
## The regulatory framework of tomorrow must:



**Recognise the need for investment into the capacity of the grid to sustain the energy transition.** This capacity refers to automation, digitalisation and resiliency of an electricity grid that will become central not only to the energy transition but to the proper functioning of the EU's economy and society. The risks of underinvesting in the grid will be far greater than the alternatives and imply costs related to curtailment, reduced e-mobility, supply interruptions or a failure to fulfil the climate targets.



**Rely on a forward-looking and agile approach to financing which serves as a genuine enablement of DSOs to carry out the clean energy transition under their own discretion.** This approach must rely on new financial instruments and contribute to effective public-private partnerships.



**Encourage the role of DSOs as neutral market facilitators who facilitate the adoption of innovative solutions, integrate renewable sources, accommodate flexibility services, and enable active customer participation.** This would lead to greater optimisation of the network as system flexibility complements grid reinforcements and stimulates local economic growth.



# E.DSO Stakeholder Innovation Council



E.DSO is a European association gathering leading electricity distribution system operators (DSOs) shaping smart grids for your future.

[www.edsoforsmartgrids.eu](http://www.edsoforsmartgrids.eu)