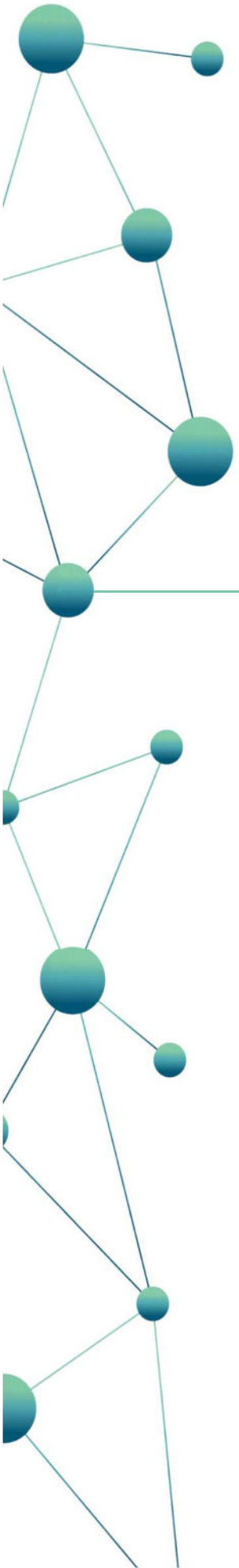


E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

Memo

The way out of the pandemic

- Lights must stay on -

July 2020

About us

E.DSO gathers 75 percent of all connected customers serving around 350 million citizens throughout Europe. In a decade, the leading Distribution System Operators for electricity (DSOs) have coordinated a group of over 40 companies, highly representative of the European industry. E.DSO members manage 7 million kilometers of lines, deliver a consolidated €27 billion a year for grid investments, pay salaries to 320,000 employees and constitutes 35 percent of the total value chain of the electricity sector.

Purpose of this Paper

The purpose of this document is to provide an overview of the actions taken by DSOs during the pandemic crisis. The paper is based on the outcomes of the regular calls which were organised between E.DSO members to share good practices. We also want to offer a reflection upon the planning and response framework adopted to ensure the continued reliability of the electricity system during (and after) the crisis. While this document focuses on the measures adopted to preserve the reliability of the DSOs, it also provides considerations and guidance relevant to the challenges ahead.

Foreword

The COVID-19 emergency confronted the world with an exceptional crisis by scale, duration, impact on people and economies. It forced shutdowns of businesses, social activities, and economies across the globe and took us from a period of prosperity to a period of unprecedented economic distress seemingly overnight. The duration and the extent of the effects on the economy are still uncertain, but preventive actions, self-isolation and quarantine were implemented in most of the countries. This disruption entailed implications for all parts of the energy value chain, not least for the DSOs in charge of managing low and medium voltage grids (and in some cases high voltage). The DSOs showed the resilience of the distribution networks, and lights were kept on. While countries were hit in different ways, and stakeholders reacted differently, DSOs kept one objective in mind: ensure electricity service for all customers. Innovation and immediate planning within DSOs and knowledge sharing proved to be the key to success. All E.DSO members swiftly implemented crisis management procedures. They further took scalable solutions adapted to the public health situation in their countries following the COVID-19 strategies adopted by their respective governments. More importantly, the active cooperation amongst DSOs, deeply helped them to share solutions and avoided some early mistakes.

Despite being traditionally perceived as safe harbors against crisis, the unique nature of COVID-19 and its consequences are creating an entirely new challenge for DSOs. In response to the challenges associated with COVID-19 pandemic and the measures taken to limit its outbreak, E.DSO created a platform of regular online roundtables among its Board members, with the aim to share knowledge and best practices on the continuity of energy operations, whilst protecting the health and safety of staff and customers. Additionally, E.DSO developed a short questionnaire about COVID-19 impacts, focusing mainly on the following topics: Projects continuity planning, workforce management, mitigation strategies, and areas of opportunity. Below we explore the details of the results.

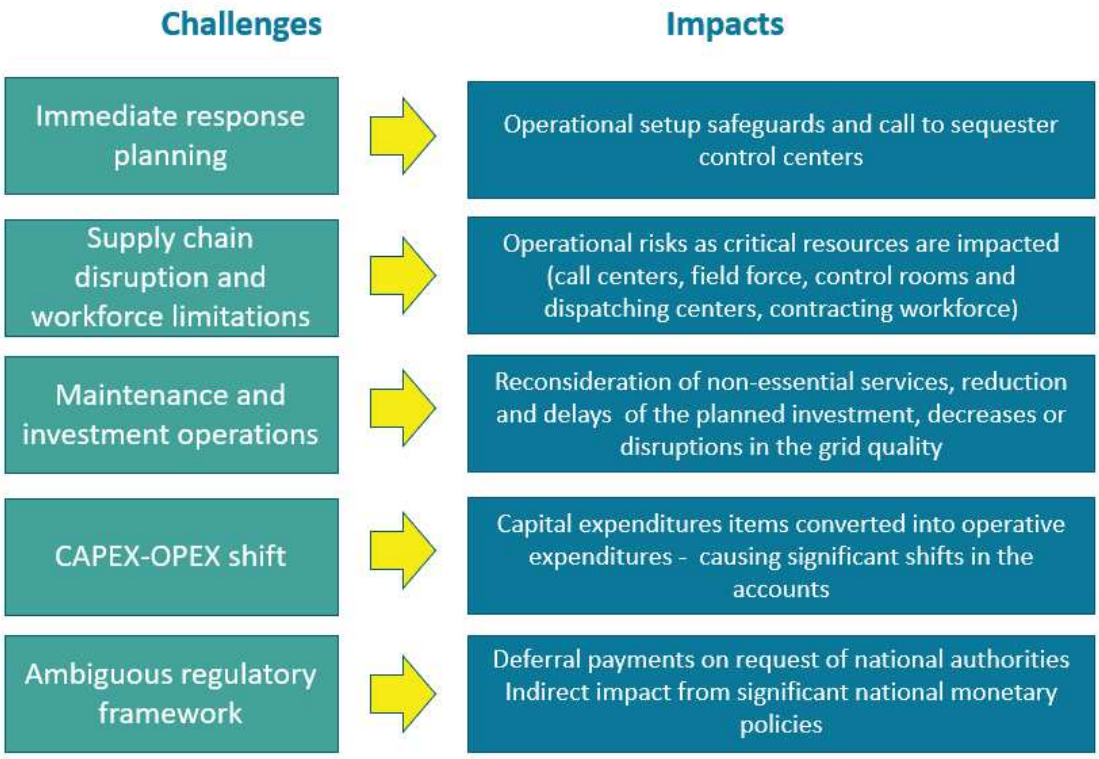
1. Dive insights

As a general observation, DSOs are well-prepared when it comes to system of crisis and managing disasters. Most of the DSOs have shown leadership in their employee communication and continuity of operations efforts in response to the pandemic.

Yet even the most cautious DSOs are entering an unexplored territory, wherein they face five key challenges (figure below) with impacts across their value chains. A mix of immediate contingency planning, cash flow management, and proactive stakeholder engagement are activated to mitigate the

consequences. The chart below illustrates the urgent challenges and risks faced by DSOs, as reported by them during the roundtables.

Figure 1.1 Challenges and risks faced by E.DSO members during the pandemic crisis



Source: E.DSO

1.1 Immediate response planning

Remarkably, the stringency of confinement measures provoked drops in consumption: 25% in Italy and 20% in France[1]. Italy experienced an 18% to 21% reduction in peak demand and energy use on a year-over-year basis in the five to seven days after its lockdown began. Apart from demand, the pandemic impacted construction, and operations activities for the electricity sector. The likelihood of deep economic downturn combined with regulatory uncertainty could delay some significant capital projects, as DSO are likely to exercise financial caution in the short term. In some cases, establishing isolated base camps and reserves of volunteers for critical infrastructure was considered as appropriate, as well as providing dedicated training aimed at updating the skills of personnel currently working in different areas to increase the pool of staff available to operate control rooms.

Additionally, DSOs revealed that supply chain challenges appeared and threaten under-construction projects. Similarly, operations on preventive maintenance activities are being deferred due to increased personnel safety conditions and additional activities to guarantee energy supply to key customers as clinics, hospitals, or other pandemic related sites. The failure to perform the needed maintenance work could lead to performance deterioration, decreased quality of supply or even blackouts due to asset failure in the long term. Further, most initiated projects have been delayed, resulting in a substantial decrease in the procurement of goods and services.

A complete redesign of daily activities was implemented, to keep up to the challenge: Regular maintenance activities and fieldwork were restricted, with repair and restoration being arranged. Planned interruptions for regular maintenance were either suspended, deferred, or implemented with a limited duration. Mobile intervention teams were established as a back-up for field units. The redundancy of control rooms and remote control was applied, where possible.

The DSOs reported that current supplies of vital spare parts, tools and equipment are sufficient for repairs and urgent remedial maintenance as DSOs have plenty of experience with extreme weather events and manage stock systems for a more efficient use of available vital spare parts, materials, tools and equipment. Nevertheless, should the crisis continue, there is a risk to network and staff safety if supplies are not replenished in time.

DSOs worked to ensure a smooth recovery transition to pre-outbreak volumes and productivity. They guaranteed the regular shipping of equipment and components covering everyone's needs for the rest of the year through pre-buying contracts, and adopted measures to protect their contractors from the lockdown effects, especially in the countries in which social security schemes are not guaranteed.

1.2 Supply chain disruption and workforce limitations

COVID-19 notably at the beginning entailed substantial workforce implications, which are disrupting some of DSOs' short-term economic performance and operations. DSOs have implemented measures to ensure the reliability of services and workforce productivity in safe and secure conditions during the ongoing unprecedented crisis.

This increasingly challenges control rooms, operations facilities, and call centres where remote working proved to be very challenging. Uncertainty also concerns the workforce – both in ensuring their health and safety and in accommodating flexible working arrangements. All of this is creating operational risk, derailing investment plans, and causing deferral of all but the most critical projects.

DSOs are implementing organisational measures related to the safety of personnel, ensuring maintenance activities, securing supplies, etc. The security and safety of dispatch centres are guaranteed through: isolated teams in dispatch centres with back-up teams in isolation on stand-by; restricted access to dispatch centers and to stand-by units to maintain the safety and prevent the exhaustion of key personnel. **DSOs noted that employees across all functions did not face a challenge in the transition to working remotely**. For instance, in some cases employees encountered remote connectivity which largely compromised productivity. **In other cases, the remote working proved to be highly satisfactory.** E.DSO members revealed that, despite the market turmoil, DSOs remain tightly focused on core issues to maintain strong relationships with their workforce. This includes a robust, two-way communication with employees while heightened awareness of potential safety lapses as workers are distracted by concerns about the coronavirus.

Although DSOs noted the need for employees to work remotely, they acknowledged that not all employees could perform their functions off-site. In most cases, more than 50% of enterprise-level functions could be performed remotely, in contrast to only 10-25% of distribution functions being performed remotely.

1.3 Maintenance programs and investment operations

Within the different DSOs, activity levels vary from continuity of essential activities (and potentially urgent interventions), limited operational activity to a high level maintained. Actions undertaken regarding control centres range from duplicating and triplicating them, establishing back-up units to confinement measures, or preparing containment spaces. Health measures for control rooms include reinforced cleaning of control rooms. Regarding protection for employees, DSOs report strict

observations of masks, social distance procedures, the use of disinfectant products, hand disinfectants and protection shields for employees in the field.

E.DSO members informed about deferral or cancellation of activities for planned work. Some DSOs are delaying projects, resulting in a substantial decrease in the procurement of goods and services. Non-critical investments have usually been suspended. The fulfilment of investment programs is also at risk with some DSOs.

Some DSOs informed that all non-essential maintenance has ceased across the distribution system. All planned disconnections of the electricity are limited. In some cases, planned disconnections are allowed only if the power supply is interrupted for a maximum of four hours and no more than 50 consumers at a time. **Non-critical activities have been adjusted**. The priorities in maintenance were urgent intervention and other prevention tasks like check-ups, revisions and elimination of defects, which was easier to perform. **Regarding critical planned investments, many E.DSO members informed that there have not been significant delays.** Some decided to stop construction sites and related works. Others, to protect their staff and customers and comply with their national regulatory framework, have suspended the smart meters roll-out for a period.

Although some DSOs encountered severe challenges to implement the investment programmes, the majority were able to maintain or even increase their planned investment.

1.4 CAPEX-OPEX shift

Due to limited mobility during confinement orders, deferrals had and are still occurring in the execution of capital projects, including IT and new construction activities. If the capital deployment is slowed, it will directly impact service and earnings, which will also affect the shareholder value.

DSOs noted that Capital expenditure (CAPEX) and Operational expenditure (OPEX) - "CAPEX-OPEX-shift" – remains generally unvaried. **However, in few cases, both CAPEX and OPEX are impacted negatively by the postponement of investments producing a decrease in consumption, which impacts the calculations of the allowed revenues.** A reduction of investment programs has caused DSOs a reduction in internal capitalized activities and therefore an increase of OPEX due to the so-called "CAPEX-OPEX-shift.

The waiving of interest and bans on disconnection will most likely increase the costs for DSOs. Consequently, their revenues will be decreased, and, if the crisis continues, their financial status will deteriorate. Unavoidably, all this would negatively impact the cash flow and short-term liquidity of DSOs.

1.5. The regulatory framework

DSOs took numerous measures to address the pandemic and ensure the business continuity through seamless recovery plans. Further, national governments adopted regulatory measures in support to DSOs efforts. The table below shows the proposed measures and engagement from governments' side.

Table 1.1. Support measures implemented in various countries due to DSOs intervention

Actions taken from DSOs	Actions taken by Member States
ČEZ Distribuce (Czech Republic) took the following measures: • Operational measures to secure power generation and distribution of energy (mandatory wearing of facemasks, mandatory body temperature measurement). • Reduction of the planned outages of electricity.	**Energy Regulatory Office (ERO),** as an administrative authority responsible for regulation in the energy sector adopted the following measures: DSOs to take into consideration the COVID-19 pandemic situation that can cause problems to customers to pay their debts. Has adopted price decision that allow business and customers to flexibly adapt the amounts of reserved electricity supplies.
EDPD (Portugal) Strategic decisions were made over planned activities, that allowed to maintain the activity of Service Providers at 80% level by focusing on installations outside the customer's house and keeping global goals, including anticipation of payment terms to more than 330 suppliers (60 days to immediately). Re-skilling of third-party workers from the (closed) stores to perform back-office and contact-centre related activities and ensure increased remote customer support activity. EDPD decided to share the results of COVID testing of the entire workforce (12k employees), in compliance with data protection rules, to promote a better and more analytical and segmented understating of the evolution of the situation. To that end EDPD has already tested more than 2/3 of their workforce.	**Regulation n° 255-A/2020** lays down extraordinary measures in the energy sector by epidemiological emergency COVID-19. These exceptional rules concern the interruption period, exceptional rules regarding the fractioned payment, moratorium on payments due from suppliers (Network operators shall adopt fractional billing of network access charges to suppliers), Further, network operators shall carry out, on a priority and binding basis, the actions that guarantee the supply of energy to priority installations (hospitals and other health facilities, public security and civil protection installations and etc.). More importantly, the Regulation provides that Distribution network operators must avoid actions involving travel and direct contact with the customer at home, reinforcing the means of distance communication with a view to communicating readings, clarifying doubts or establishing payment plans, with the exception of situations of proven urgency and with priority customers. The regulatory deadlines to which distribution network operators, suppliers of last resort and suppliers in the relationship with customers are subject are extended by half the respective regulatory deadline
E.ON (Hungary) closed their customer service points, suspended the personal reading of the smart meters and announced a disconnection moratorium until further notice. **E.ON group** generally demonstrated strength and reliability during COVID-19. It immediately activated prepared pandemic and crisis plans, and consequently brought them into operation. The most important measures included strict adherence to hygiene and distancing rules, and the isolation of particularly sensitive areas such as network maintenance. The working areas of these key personnel are separated from each other, there	**The Hungarian Energy Authority (HEA)** issued a statement to urge customers to use telephone and other online services wherever possible to stay in contact with the service providers.

Actions taken from DSOs	Actions taken by Member States
is little to no mixing between shifts, and shift handovers are contactless. Technicians who must work on-site on the grid are equipped with special equipment to minimize the risk of infection.	
ENEL (Italy) immediately reacted to the emergency of the crisis. First, it set up a global task force and then implemented Smart Working for all the employees in Italy and then around the world. Second, it highly minimised the number of workers involved in site activities depending on the level of externalization of field operations. For instance, when remote operation was not possible, the workforce was provided with appropriate protection equipment and ad-hoc safety training. These measures were recommended also to ENEL contractors. Finally, and to ensure high level of protection to its field workers and Control Centres Operators some measures were put in place: • The reduction of filed activities to the essential ones, • Individual preventive measures: self-diagnosis, adoption of PPE, preventive quarantine even in case of suspected contamination. • Collective preventive measures; space segregation, staggered working shifts and "cellular" organization; • Attention was devoted to Control Centres reinforcing both the infrastructures and the number of operators and checking them through extremely sever stress tests;	**Decree of the President of the Council of Ministers of 22 March 2020** [2] The President of the Council of Ministers has introduced new measures, with the "Lockdown Italy" decree in force from today, including a stop to non-essential production activities. All activities aimed at ensuring the supply of essential goods such as electricity, gas, steam and air conditioning remain permitted. **Decree-Law No 18 of 17 March 2020** [3] Article 125 (1) of the Decree-Law, which extends by 6 months (up to 15 November 2020) the deadline for the completion of works for the implementation of energy efficiency and sustainable territorial development in small municipalities.
Iberdrola (Spain) demonstrated strong efforts to address COVID-19 with a dedicated service for hospitals in Spain aiming to guarantee service continuity and quality. It efficiently worked to ensure that new installations allocated to patient care have reliable power supply. Iberdrola took the action to install autonomous Generator Sets at 50 hospitals in their service area. Moreover, it made a priority of upgrading power for facilities housing field and temporary hospitals and is offering and installing back-up generators Iberdrola has also launched a 24-hour priority service line and a service exclusively for hospitals and health centres.	**Article 18 of Royal Decree 463/2020** establishes that the entities or bodies responsible for investments or the day-to-day operation of facilities, networks and systems shall take the necessary measures to ensure the provision of essential services. **Article 4 of the Royal Decree-Law 8/2020** guarantees the supply of water and energy to vulnerable consumers who are severely vulnerable or at risk of social exclusion and suspends the formula for the determination if the maximum sale price before tax of the liquefied petroleum gases

Source: E.DSO

Disclaimer: The above list of measures cannot be considered as exhaustive to the continuous ongoing measures taken by the DSOs and Member States authorities.

2 The way out of the pandemic

The emergency of COVID-19 has challenged the overall European energy strategy, but DSOs are demonstrating their solidity as central players in the electricity system evolution. The energy transition remains the ambition of the DSOs, which proved effective management under the pandemic. E.DSO believes on a broader concept of resilience considering that, DSOs must think about alternative ways of working to prevent outages.

Further, the customer's engagement remains vital in this phase. In the context of the energy transition, the relationship between DSOs and customers becomes closer, their interaction more frequent, and the need to develop broader awareness and take customers' priorities into account is compelling. This is because customers' behavior and expectations are evolving, driven by new technologies. The emergency also highlighted how needs could change because people may be working increasingly from home, implying a (partial) shift from industrial to residential consumption. Consequently, DSOs showed that they could recognise their role but also the needs and expectations of the customer while remaining flexible.

2.1 The energy transition for energy's progress

The impact of the coronavirus around the world and the resulting instability in global markets are dominating global attention. As governments respond to crises, they also keep in mind the major challenge of our time: clean energy transition. Thus, E.DSO is calling for clean energy technologies to be at the heart of the future economic recovery packages currently being drawn up by governments and National Regulatory Authorities around Europe and beyond.

Massive investments in the deployment and integration of clean technologies could certainly stimulate economies by creating new jobs or boosting economic activity while advancing the energy transition. E.DSO also aligns itself with the ambitions of the European Commission (DG ENER), that urges clean energy to be the driving motivation for the future. E.DSO fully agree that the energy transition will indeed be a significant part of the EU's COVID-19 response.

We further support the integrated approach to prevent and manage risks as part of "day after COVID-19" actions, through the adoption of an Energy System Integration Strategy, and a related strategy on hydrogen. Leading DSOs are ready to use the crisis to redefine their role as enablers of the energy transition while also enabling a green economic recovery. E.DSO is confident that DSOs will play a key role in the energy transition as most decentralized flexible resources are connected to their networks. They will enable transactions between market actors and use flexibility resources in coordination with Transmission System Operators (TSOs). Therefore, it is important to take the flexibility debate out of the theory box, to enrich the discussion and explore as many points of view as possible.

2.2 Developing flexible grids

E.DSO is already getting a sight of how future electricity structures might look like. Due to confinement measures taken around the world, there has been a 15% decline in electricity demand in most advanced economies. At the same time, average renewable generation as a percentage of the power mix has been very high in the past few months. Unforeseen changes in electricity demand with an increased deployment of intermittent renewable generation make it necessary to implement new solutions of managing these changes and ensuring secure system operation. One way to do so is through improving grid flexibility.

At the same time, the COVID-19 lockdown spanning most of the planet has underlined how much we all depend on a secure of electricity system. The unexpected decrease of industrial load followed by a significant increase in residential load -consequence of confinements- highlights the importance of having enough capacity in the grid to cope with these changes while being able to serve all customer's energy needs. The lessons learnt from the pandemic together with the expected increase in connected renewable resources are operational challenges that DSOs are ready to address to ensure the security of electricity supply,

3 The day after tomorrow – pandemic proof?

Even if the "day-after world" is full of unknowns, E.DSO members are already working to figure it out accurately. Through their association, collectively or individually. E.DSO looks towards innovative and when needed, disruptive strategies in enhanced operations management and resilience techniques. Improving the integrated approach to prevent and manage risks will be, certainly, part of this "day after" actions, and probably E.DSO will have to propose not only technical aspects but also policy and regulatory dimensions.

Key elements we consider are primarily stakeholder engagement and a set of prescriptions, notably risk prevention (actions and procedures to reduce the likelihood of any adverse impact event and/or minimising its collateral effects); readiness, response planning, execution and communication; interaction with the citizens; recovery followed by ex-post event analysis to implement improvement actions for the future.

E.DSO members consider that the EU energy policy comes at a crucial moment, as the European Commission envisages the investment priorities for the recovery and the future EU budget. E.DSO mirrors the Commission's commitment to a green recovery, which is at the centre of Next Generation EU proposal for a €750 billion recovery plan [4]. The Green Deal will undoubtedly have an important role to play, mainly on potential areas such as energy system integration, demand-side response, smart grids, and other emerging flexibility solutions.

More importantly, DSOs are keen to cooperate with other grid operators and new participants and exchange data. Digitalisation is a *conditio sine qua non*, but alone will not provide enough safeguards to DSOs' survival in an ever-moving market.

Cybersecurity also becomes essential, as teleworking, and remote operations will increase. The Commission Recommendation on cybersecurity in the energy sector [5] identifies more energy-specific measures needed for implementing relevant cybersecurity preparedness in the energy sector. In this respect, the future Network Code on cybersecurity will be an essential contribution.

E.DSO considers that there is a high need to foster a culture of cyber resilience, protecting the critical assets and services while striking a balance between agility, efficiency, and profitability. The framework, we are considering moving forward, will to be an integral part of the energy transformation the European Commission has shown. E.DSO believe that the DSO's role is to be an integrated solutions provider of cutting edge and advanced solutions to purse the innovation ambitions.

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

www.edsoforsmartgrids.eu