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**REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN
PARLIAMENT**

reviewing the application of Regulation (EU) 2019/941

1. Introduction

The Risk Preparedness Regulation (EU) 2019/941 (hereafter, ‘the Regulation’), was adopted in 2019 as part of the Clean Energy Package with the aim of ensuring that all Member States are equipped with appropriate tools to prevent, prepare for, and manage electricity crisis situations in a spirit of solidarity and transparency, while respecting the requirements of a competitive internal market for electricity. The Regulation was adopted in the context of the ongoing profound transformation of the EU electricity markets, characterized by more decentralized markets with more players, a higher proportion of renewable energy and better interconnected electricity markets, which calls for more coordinated security of supply measures.

The Regulation aimed at addressing these challenges through a variety of measures, namely: (1) identification of regional and national electricity crisis scenarios, (2) assessment of risks related to the ownership of infrastructure relevant to electricity security of supply (SoS), (3) seasonal and short-term adequacy assessments, (4) risk preparedness plans, (5) regional and bilateral measures to cooperate in the prevention or management of a crisis, (6) exercises. The present report assesses the application of such measures based on the experience gained in its implementation¹ and pursuant to Article 18(4) of the Regulation, which requires the preparation of this report by 1 September 2025.

In parallel, the Commission is preparing a fitness check assessing the consistency and synergies between the Regulation and the Gas Security of Supply Regulation (EU) 2017/1938. This report, the fitness check report, as well as an upcoming impact assessment will prepare the ground for a revision of the EU energy security framework that was announced in the Affordable Action Plan² and in the European Preparedness Union Strategy³. The revision will also enhance security of electricity supply at Union level, with a particular attention to system integration and to emerging risks (e.g., climate change impacts, hybrid threats, etc.).

2. Analysis of the application of the provisions contained in the Regulation

2.1 Identification of regional and national electricity crisis scenarios

The European Network of Transmission System Operators for Electricity (ENTSO-E) has to identify every four years the most relevant regional⁴ electricity crisis scenarios in relation to system adequacy, system security and fuel security, in close cooperation with several stakeholders⁵ (Article 6). The identification follows a methodology that ENTSO-E develops and the Agency for the Cooperation of Energy Regulators (ACER) approves⁶ (Article 5). The

¹ This report has been prepared before the conclusions of the Expert Panel set up by ENTSO-E to investigate the blackout in the power systems of Spain and Portugal on 28 April 2025 are available. Consequently, such conclusions are not reflected in this report.

² COM(2025) 79 final.

³ JOIN(2025) 130 final

⁴ Under the Risk Preparedness Regulation, a region’ means a group of Member States whose transmission system operators share the same regional coordination centre.

⁵ The Electricity Coordination Group (an Expert Group composed of Member States, ACER and ENTSO-E), regional coordination centres (RCCs) and public authorities in Member States.

⁶ [ACER Decision of 6 March 2020](#)

regional scenarios are the basis for Member States to subsequently identify national electricity crisis scenarios (Article 7). Both types of scenarios are the basis for the design of sound preventive and mitigating measures.

The first regional crisis scenario assessment was performed in September 2020 by ENTSO-E. In their Risk Preparedness Plans (hereafter, ‘the Plans’) which they submitted to the Commission in 2022, Member States kept only the regional scenarios significant for them and added specific ones where relevant (e.g., *Dunkelflaute* scenario for the Netherlands). Based on the experience of the first identification of scenarios, the first set of plans and the Electricity Coordination Group’s recommendation⁷, ENTSO-E in close cooperation with ACER and the Commission, revised the methodology. This revised methodology⁸ was approved by ACER in 2024 and used for the second identification of regional electricity crisis scenarios which was concluded in September 2024. The improvements to the methodology include enhanced regional scenarios description, mandatory simulations of an increasing number of scenarios with an increased level of severity, a new top-down approach to ensure a broad regional dimension from the early stages of the identification process, and a continuous engagement with stakeholders.

This has been the first time that a set of concrete regional scenarios has been identified on which to build the work on measures and thus **provide a degree of consistency across Member States**. This is a significant milestone that has brought together Transmission System Operators (TSOs) and national authorities to consider risk scenarios beyond national borders given the regional dimension of some risks (e.g. severe summers, which include heatwaves, forest fires, droughts) and the increased level of interconnection of the electricity system.

However, despite the already achieved improvements, there are some persisting weaknesses. First of all, the **description of the risk scenarios in most national plans was rather superficial and insufficient** to understand what their concrete impacts were. This was the case for scenarios concerning malicious attacks as well as extreme weather events and climate adaptation. For example, and in particular for cybersecurity related scenarios, the Commission requested more details on cybersecurity requirements, incident procedures and relevant actors. Second, there was **no concrete information to quantify the potential spill-over effects of a gas crisis on the electricity sector** so as to determine the need for potential (regional) preventive measures, even in the light of the dramatic changes resulting from the full-scale invasion of Ukraine by Russia. In fact, some Member States had to run ad hoc scenarios or carry out stress tests to understand the extent of the impacts of such an event. To remedy this situation, the Commission asked Member States to deepen the analysis of the scenarios to include geopolitical risks, dependence on imported fuels and on other supply chains from third countries and spillover effects from other sectors into electricity⁹, ¹⁰. Third, ENTSO-E estimated ahead of winter 2022-2023 the critical gas volumes necessary for the operation of the electricity sector during winter to support decision-making by governments. In spite of these ad hoc solutions, this has evidenced a fundamental shortcoming in a core element of the

⁷ Recommendation issued by the Electricity Coordination Group pursuant to Article 6(2) of the Regulation

⁸ [ACER Decision no 02/2024 of 8 March 2024](#)

⁹ For example, the increase in electricity demand for heating purposes in the absence of other fuels.

¹⁰ The Commission requests were part of non-binding Commission opinions delivered pursuant to Article 13(2) of the Regulation.

electricity risk preparedness logic that calls for more concrete and operational provisions, and further reflections on the impact of the dependence on imported fossil fuels.

Other issues concern the **limited consideration of preventive and mitigation actions** within the scenario simulations, which can lead to outcomes more severe than what can reasonably be expected in practice. Consequently, regional scenarios may result in more dramatic results than national ones. Also, the link to the the ENTSOG's natural gas supply and infrastructure disruption scenarios is weak, which leads to the overall conclusion that the **cross-sector consistency and coordination is limited**, in spite of the provisions in the Regulation.

On climate change adaptation, a common issue was the lack of climate vulnerability and risk considerations in the scenarios that could help design preventive measures to reduce exposure to climate-related risks. With few exceptions, a clear indication of how future grid developments will help to cope with the consequences of these risks was missing from the plans (see also section 2.4). Lastly, a **balance needs to be found on how the national dimension is incorporated into the simulations** to complement the regional analysis. Where the national dimension is limited, the impacts of some types of risks can be underestimated (e.g. wild fires), but where it is too prominent, there is a risk of too fragmented and nationally-focused assessments, which the involvement of Regional Coordination Centres (RCCs) has not solved.

2.2 Risks related to the ownership of infrastructure relevant to electricity SoS

Within four months of the identification of regional crisis scenarios, Member States have to identify and notify¹¹ the Commission and the Electricity Coordination Group (ECG) any risks related to the ownership of infrastructure relevant to security of electricity supply (Article 7(4) and recital (17)). If relevant, Member States also have to indicate any relevant preventive or mitigating measure.

Member States notified their first assessments of such risks in January 2021. These assessments largely focused on transmission infrastructure, which in many cases is either state-owned or owned by entities where the state holds a majority stake. Few Member States have identified potential ownership risks and these were deemed unlikely. Furthermore, most Member States have preventive and preparedness measures in place, such as screening mechanisms for foreign direct investments or specific procedures regulating ownership transfers. The assessment was carried out again in January 2025 with similar results.

This provision has resulted in a dedicated assessment of ownership risks for the first time. Nevertheless, **the focus has almost exclusively been on transmission and distribution grids. Other relevant assets, such as generation assets, were usually not considered** (with a few exceptions) even when state-owned enterprises from third countries have shares in generation assets. This also means that cross-sectoral risks, e.g. those related to the ownership of relevant infrastructure in the gas sector, were not considered. This is an area where improvement is needed.

¹¹ Most Member States (24) and Northern Ireland notified between Q4 2020 and Q1 2021. Malta and Latvia made their notification to the ECG in June 2021, following an EU Pilot. Greece made its notification to the ECG in June 2022, following a letter of formal notice.

2.3 Seasonal and short-term adequacy assessments:

ENTSO-E has to carry out seasonal adequacy assessments at Union level ahead of every winter and summer and to publish them by 1 December and 1 June respectively. While this obligation is not new¹², these assessments have to be carried out according to a new common methodology (Article 8). Such methodology has to be used for all short-term adequacy assessments, whether they are carried out at national, regional or Union level.

The methodology for short-term and seasonal adequacy assessments was approved by ACER in March 2020, upon a proposal by ENTSO-E, and has been used since by ENTSO-E for the preparation of the ‘Winter Outlook’ and ‘Summer Outlook’. These assessments have become a very relevant tool in the preparation of every season and especially in situations where risks affected several Member States simultaneously, e.g. unavailability of generation in traditionally exporting countries. Moreover, since the full-scale invasion of Ukraine by Russia, the adoption of the Winter outlooks has been advanced to November with prior discussions on observed trends and preliminary insights at the ECG also in October, to allow more time to adopt preventive measures ahead of winter.

However, there is still room for improvement, for example on the consideration of spillover effects from other sectors. The calculation of critical gas volumes (see section 2.1.) was useful, and has remained in subsequent Winter Outlooks, but it reveals a **need for further integration between gas and electricity**, in a context of increasing share of renewable electricity generation and gradual phase-out of fossil gas, and possibly other sectors in the future (e.g., hydrogen). Some Member States have further asked for the consideration of ENTSG’s winter assessment results in the winter outlook for electricity, as well as more integration and cooperation between the two ENTSGs.

Regarding the short-term adequacy assessment, all RCCs have already implemented it and have a Short-term Pan-European adequacy tool. The short-term adequacy assessment is important for situational awareness and to solve potential constraints in the week-ahead period (next seven days), thus being significant indicator of whether the electricity crisis is imminent in Member States when considering adequacy (i.e. whether the country can satisfy their country’s demand with their generation and exchanges). However, this approach does not include power flows and security analysis of the system, such as identifying weak links which can get overloaded and cause out of control cascading events (N-k). The security analysis can provide additional dimension in the security of electricity supply. Therefore, some Member States have pointed to the need to include therein transmission infrastructure, currently missing in the assessments, as in the case of a looming crisis it could provide an overview of potential congested zones that impede energy to flow to where it is needed.

2.4 Risk preparedness plans

¹² Article 106(1 and 2) of Regulation (EU) 2017/1485, tasks TSOs to contribute to the pan European winter and summer outlooks analysis by control area adequacy analysis, whereas the Article 8(3)(f) of Regulation (EC) No 714/2009 (repealed) includes among ENTSO-E tasks ‘annual summer and winter generation adequacy outlooks ‘.

Based on the regional and national electricity crisis scenarios, Member States have to adopt and update every four years national Risk-Preparedness Plans (the ‘plans’), after having consulted relevant stakeholders and national bodies. Before their adoption, Member States have to consult relevant Member States in their region, other relevant directly connected Member States and the ECG on draft versions of their plans to ensure consistency (Article 10). Articles 11 and 12 describe the mandatory content of the Plans and a template is also provided in the Annex¹³.

National competent authorities adopted their Plans and notified them to the Commission during 2022¹⁴, after the mandatory consultations took place. The Commission assessed the plans. While many were quite comprehensive in the description of the national framework, it issued opinions¹⁵ pointing to the **lack of compliance with the provisions from the Regulation** and requested amendments. In its request for amendments, given the circumstances following Russia’s full-scale invasion of Ukraine, the Commission asked Member States, as a matter of priority, to: i) update the plans with a pragmatic focus on the impact of a shortage of imported fossil fuels (from Russia), e.g. fuel-switching, increase in electricity demand in case of shortage of other fuels for heating, ii) run a test of the plan ahead of the winter; iii) develop the solidarity provisions (see section 2.7) and iv) deepen the assessment of the crisis scenarios (see section 2.2).

Other common requests from the Commission are related to:

- the limited **description of the national electricity crisis scenarios** (see section 2.1),
- the **definition of electricity crisis**, as it is necessary for stakeholders and other countries to predict when an emergency could be declared and, more importantly, when non-market based measures would be applied,
- the **mandatory emergency tests** (see section 2.8),
- information regarding the mandatory **stakeholder consultation** prior to the establishment of the Plan (Article 10(1) Regulation),
- **further information on some national measures**, including procedures, triggers and conditions for their application, especially for non-market-based measures to be activated in an electricity crisis (only as a last resort and in a non-distortive manner),
- **plans to develop future grids** to help to cope with the identified risks,
- the mechanisms used to **inform the public about electricity crises**,
- the mechanisms for **cooperation and coordination with Member States outside of their region** or with third countries.

¹³ The main chapters of the plans are: i) the summary of the electricity crisis scenarios, ii) roles and responsibilities of the competent authority, iii) procedures and measures to follow in electricity crisis situations, iv) the crisis coordinator, and information on v) stakeholder consultations during the preparation process of the plans and on vi) emergency tests the competent authorities are supposed to regularly organise.

¹⁴ By the 5 January 2022 deadline, only 14 Member States had submitted their Plans. 9 more notified by the end of April 2022 and the last Plan was notified in December 2022 after a series of enforcement actions were carried out by the Commission.

¹⁵ https://energy.ec.europa.eu/topics/energy-security/security-electricity-supply/risk-preparedness-plans-electricity-sector-national-competent-authorities-and-commissions-opinions_en

The plans are a cornerstone of the Regulation. They provide transparency and enable the coordination of measures across regions. In fact, ENTSO-E concluded in its Winter Outlook 2022-2023¹⁶ that cross-border cooperation and close coordination at all levels would be key during that winter to ensure that the European power system maintained its balance between supply and demand and referred specifically to the exchange on risk preparedness plans.

However, there is still room for improvement. Given that the scenarios were not described in extensive detail, it is not possible to conclude on whether all appropriate measures to address the identified risks were included in the plans and adopted. The cross-sectoral link remains also weak, and it is questionable whether a number of plans have a future looking approach, as evidenced by the limited consideration of future grid developments.

In terms of procedure, **the provisions can be considered unnecessarily heavy**, both for the adoption of plans, its assessment by the Commission and the reply to the Commission's request for amendments, which was evidenced by numerous delays in spite of enforcement actions. Moreover, while most Member States included more details in their plans following the Commission's recommendations, not all issues were addressed showing limited effectiveness of the feedback loop. The efficiency of the risk preparedness plans' administrative process is discussed more extensively in the fitness check report.

2.5 Regional and bilateral measures to cooperate in the prevention or management of a crisis

The Regulation established a new mechanism for Member States to cooperate in a spirit of solidarity to prevent or manage crises (Article 15). Where the required technical ability exists, Member States have to offer each other assistance through 'regional' or 'bilateral' ¹⁷ measures with the ultimate purpose to protect public safety and personal security. The technical, legal and financial arrangements necessary to implement such regional or bilateral measures need to be agreed in advance among Member States, including with regard to fair compensation. Subsequently, each Member State has to implement and describe in its plan the national measures that ensure actual implementation and enforcement of the solidarity measures. The Commission provided guidance¹⁸ to Member States on the key elements of fair compensation and other aspects to be included in the technical and financial arrangements between Member States for the application of the assistance mechanism.

The information regarding these measures was largely missing from the Plans. In some cases (9), the Plans referred to existing arrangements for regional and bilateral cooperation and identified a number of future possible measures, but these were not agreed or adopted yet. One of the most advanced cases was the Pentilateral Energy Forum¹⁹, whose members signed a memorandum of understanding in December 2021 with a list of possible common measures

¹⁶ [ENTSO-E's Winter Outlook 2022-2023](#)

¹⁷ Regional measures are agreed within a region while bilateral measures are agreed between two countries electrically interconnected but not being in the same region. Region is defined in Article 2 of the Regulation as a group of Member States whose TSOs share the same regional coordination centre. Transitional provisions applied pending the establishment of the regional coordination centres (Article 22 of the Regulation)

¹⁸ OJ L 184, 12.6.2020, p. 79–93

¹⁹ The Pentilateral Energy Forum is a regional partnership that includes the following Member States: Belgium, the Netherlands, Luxembourg, Germany, France and Austria.

for further analysis. The Central Eastern European Member States signed a similar MoU in 2022. In other cases (15), Member States referred to existing arrangements among TSOs but in the absence of further information on the concrete measures, it was unclear whether such agreements would meet the requirements of the Regulation. The amended plans following the Commission's request for further information did not add significant information and simply pointed to ongoing negotiations with their neighbours. This is clearly an area where substantial improvement is needed.

This mechanism for bilateral and regional cooperation was designed in a way that allowed significant flexibility for Member States' implementation by setting minimum provisions and requirements. While such approach is beneficial to factor in different specific conditions, evidence²⁰ suggests that the practical implementation has been challenging as it requires prior agreement and discussion on a number of fundamental areas where Member States had very different departing points. Challenges encountered include varying definitions of electricity crises, the definition of the competent authority's scope of actions during a crisis, including in support of others, the development of financial compensation mechanisms and the establishment of communication and coordination protocols. While some efforts were undertaken by the Commission to support Member States (e.g. clarification of the definition of electricity crisis beyond the Regulation's content²¹, explanation of the link between the Regulation and the Emergency and restoration network code²², sharing of existing practices for regional cooperation and some existing measures²³), no single new bilateral or regional cooperation mechanism has been fully developed.

2.6 Exercises

The Regulation requires periodic testing of the effectiveness of the procedures in the plans for preventing electricity crises, including mechanisms on information sharing and cooperation. A calendar for biennial regional and, if applicable, national emergency tests has to be included in the plans with details on the procedures and actors involved. The lessons from these tests have to be reflected in subsequent editions of the plans.

In general, plans or their amended versions include limited information on the exercises, mostly generic information on exercise procedures and stakeholders involved. The mandatory calendar for future regional and national real time crisis simulation exercises is missing for most Member States. Only Pentalateral Energy Forum's Member States²⁴ have been rather active in the organisation of electricity crisis exercises, which has resulted in improvements of their plans (for example, the communication protocols). Moreover, only one Member State described a link between the electricity and gas sectors in the emergency tests.

²⁰ Stemming notably from two workshops organized by the Commission with Member States, in May 2023 and in June 2024.

²¹ The Regulation leaves significant margin for Member States to define as crisis as they determine what 'a significant electricity shortage' is (Article 2). In practice this varies from detailed and specific approaches including indicator values to very generic definitions leaving flexibility for Member States to declare a crisis depending on the circumstances.

²² Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration, OJ L 312, 28.11.2017, p. 54–85

²³ Second workshop organised by the Commission in June 2024.

²⁴ Belgium, Netherlands, Luxembourg, Germany, France, Austria and Switzerland.

In conclusion, and based on the information provided, **the tests of the procedures in the plans have been at best limited, even if the benefits of such tests are widely recognised by experts.** This would speak in favour of more prescriptive provisions regarding exercises and possibly a facilitating role by another actor in the case of regional exercises, based on the example of Pentalateral Energy Forum's Member States. At the same time, a number of Member States' delegates have expressed their concerns at the ECG over a high number of exercises planned in different areas and touching upon electricity, which risks creating a certain exercise fatigue and could ultimately limit the resources available for exercises as required by the Regulation. In this area, there is substantial room for improvement and for better synergies.

3. Conclusions

The implementation of the Regulation has enabled the EU to make relevant progress in its security of electricity supply. It has provided the first-ever EU-wide common and uniform framework for electricity risk preparedness, and Member States have developed risk preparedness plans, grounded on regional and national electricity crisis scenarios, according to unified methodologies and a common template.

However, this report also highlights some areas for significant improvement. This includes the need for more in-depth analysis of regional and national electricity crisis scenarios to support policy making (preventive and emergency measures), the development of more effective regional and bilateral measures to cooperate in the prevention or management of a crisis, and the use of exercises and emergency tests to ensure the effectiveness of national plans. This report also identifies a lack of system integration approach in relation to security of supply and system resilience, which creates some weaknesses in the current framework.

In addition, the Commission will look at the outcome and recommendations of the Expert Panel set up in accordance with EU law to investigate the blackout in the power systems of Spain and Portugal on 28 April 2025. These will provide further insights to be considered in the revision of the energy security framework with the ultimate goal to ensure that the EU's energy security architecture is robust, resilient, and able to shield European citizens and businesses from the challenges of the future.

The energy system has also been deeply impacted by several events since the entry into force of the Regulation, such as the full-scale invasion of Ukraine by Russia and increased risks on critical energy infrastructure. In reaction to these events, the EU accelerated its work on new legislation to protect critical infrastructure from physical and cyber-attacks²⁵, carried out stress tests to critical energy infrastructure²⁶ and also strengthened cooperation with other actors such as NATO²⁷. Most recently, the EU intensified efforts²⁸ to enhance the security of its undersea cable infrastructure in response, among others, to growing threats to submarine

²⁵ Directive (EU) 2022/2557 on the resilience of critical entities (CER), OJ L 333, 27.12.2022, p. 164. Directive (EU) 2022/2555 on measures for a high common level of cybersecurity across the Union (NIS2), OJ L 333, 27.12.2022, p. 80.

²⁶ See Point 6 of the Council Recommendation of 8 December 2022 on a Union-wide coordinated approach to strengthen the resilience of critical infrastructure, OJ C 20, 20.1.2023, p. 1.

²⁷ See the [EU-NATO Task Force on the resilience of critical infrastructure](#)

²⁸ COM/2025/440 final/2.

power cables²⁹ posed by the illicit activities of the Russian shadow fleet. These late developments have only been factored in the current energy architecture to a limited extent and in the form of recommendations to Member States contained in the Commission opinions on the Plans e.g. to implement the results of the stress tests or to increase cooperation between authorities responsible for security of supply and cyber security actors.

Similarly, the Commission could only recommend Member States to include climate change considerations, such as climate vulnerability and risks, in their plans. The European Commission has now published its first-ever European Climate Risk Assessment³⁰, which concluded that the energy sector is projected to experience the strongest rise in economic annual damage to critical infrastructure, in comparison to transport, industry, and social sectors and recommended the strengthening of climate risk planning in the electricity sector³¹. In addition, the Commission has presented the European Preparedness Union Strategy³² to boost the EU's ability to anticipate, prevent, and respond to the unprecedented threats the European Union is facing – from geopolitical tensions and conflicts, cybersecurity and information manipulation risks, to climate change and increasing risks of natural hazards. This strategy foresees the development of EU comprehensive risks and threats assessments.

Furthermore, the European energy system continues undergoing a profound transformation driven by the need to decarbonise and electrify the economy, whose effects are already tangible. The framework needs to prepare for such changes in order to preserve security of supply in the Union.

In the light of all the above, a **revision of the existing framework** appears essential to ensure it is fit for purpose to address new challenges. The findings of this report and the fitness check will inform the Commission's future policy initiatives to enhance security of electricity supply at Union level.

²⁹ JOIN (2025) 9 final.

³⁰ [European Climate Risk Assessment](#)

³¹ COM(2024) 91 final.

³² JOIN/2025/130 final.