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MEDREG WORKSHOP  
Security of supply & adequacy  
mechanisms

-ELE WG-

MEDREG Secretariat

Via Lazzaretto 3, Milano



Electricity  
Working Group  
(ELE WG)



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## ABSTRACT

As part of its action plan the MEDREG's ELE WG organized an online workshop on the security of supply and adequacy mechanisms.

This report summarizes the outcomes of the discussions during the workshop and provide the main conclusions of the events.

The full PPTs are available online on MEDREG's website: [here](#).

## ACKNOWLEDGMENTS

This report is the result of the work of the MEDREG Electricity Working Group (ELE WG), based on the presentation of the speakers of the workshop and the discussions during the event.

## DISCLAIMER

This publication was produced with financial support from the European Union. The contents are the sole responsibility of MEDREG and do not necessarily reflect the views of the European Union.

## ABOUT MEDREG

MEDREG is the Association of Mediterranean Energy Regulators, bringing together 27 regulators from 22 countries, spanning the European Union, the Balkans and the MENA region.

Mediterranean regulators work together to promote greater harmonization of the regional energy markets and legislations, seeking progressive market integration in the Euro-Mediterranean basin. Through constant cooperation and information exchange among members, MEDREG aims at fostering consumers rights, energy efficiency, infrastructure investment and development, based on secure, safe, cost-effective, and environmentally sustainable energy systems. MEDREG acts as a platform providing information exchange and assistance to its members as well as capacity development activities through webinars, training sessions and workshops. The MEDREG Secretariat is located in Milan, Italy.

MEDREG wishes to thank in particular all the experts for their work in preparing the workshop and for sharing their knowledge.

For more information, visit [www.medreg-regulators.org](http://www.medreg-regulators.org)

If you have any queries relating to this paper, please contact:

MEDREG Secretariat

E-mail: [info@medreg-regulators.org](mailto:info@medreg-regulators.org)

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SECURITY OF SUPPLY IN THE  
MEDITERRANEAN REGION

The energy sector has witness one of its most difficult years during the last decade. The energy price surge impacted the stability of the system and the end-users.

All the market participants, from governments to private investors, discussed and brainstormed to find the adequate mechanisms and measures to mitigate the negative impact of the energy crisis at the national and regional level.

At the MEDREG level, the National Regulatory Authorities (NRAs) initiated to elaborate and put in place measures to protect the consumers, with a focus on the vulnerable consumers. At a second pace, the NRAs had to develop mechanisms and actions to stabilize the energy price and ensure the security of supply.

To discuss the different perspective of the security of supply during this energy crisis, MEDREG organized an online workshop and invited its external partners to present their point of view and resolution.

## 1.1. Tools and mechanisms to limit security of supply risks/case study

The current price surge forced several governments to intervene in the functioning of the market by implementing emergency measures, mainly to ensure the following:

- Consumer protection.
- Security of supply (potential demand shedding).
- Interconnections and power exchanges played their role but at a very high price.

By doing so the several fundamentals of the EU market model are questioned especially concerning the security of supply and many countries requested the market rules to be redesigned to focus on the long term and system's resilience.

In the Mediterranean region, the security of supply has different dimension as follow:

- ⇒ **Analysis on the maturity of development of electricity systems** and specific constraints **on the basis of the following relevant indicators:**
  - Demand evolution and populations' priority needs.
  - Reserve margins and security of supply aspects.
  - Geographical location of consumers and distance from neighboring markets.
- ⇒ **Security of supply is a common issue** but from different perspectives:
  - Constraints on supply and interconnections in exceptional cases.
  - Sometimes problems with the unavailability of interconnections.
  - Palliate isolation for islands and small systems
- ⇒ **Power losses** (technical and non-technical) **and quality of supply are a central issue** in several countries that can be exacerbated by intermittent power generation
- ⇒ **Interconnection development:** need to analyze the role of interconnections according to the level of maturity of the systems

At the EU level, the regulation has set up a sophisticated framework for adequacy assessment, the principal is based on social cost of non-supplied energy. In case it's higher than the cost of an additional generation capacity then capacity mechanisms are allowed.

In addition, the regulatory framework should be focus on the reliability standard to monitor the security of supply at any time. For the EU countries, the next figure details the used approach.

Figure 1. Focus on the reliability standard

### At a national level

- Sizes the electricity system.
- Informs the decisions of the public authorities to set the trajectories of development of the mix.
- Serves as a reference for RTE to calculate the margins of the power system in its POs.
- Constitutes the indicator of the quality of security of supply.

### At the European level

- Conditions the justification of the need for a capacity mechanism.
- Conditions the opening of delivery years of the capacity mechanism: if the national and European adequacy studies do not identify any difficulty in meeting the security of supply criterion for a given year, the mechanism is suspended for that year.

The energy price surge has shown how the resilience of the system is important:

- over capacities are needed in case of shocks
- Interconnections can provide security while limiting redundancies, the market design is key to make it happen
- The role of prices must be looked at carefully to avoid unsustainable costs

As for the Mediterranean region, where interconnections are limited, back-up capacity is necessary at a national level and security of supply must be addressed from a long-term perspective, anticipation and planning are crucial.

## 1.2. Gas Security of Supply in the CEER Member Countries

The natural gas has a crucial role in ensuring the security of supply in most of the Mediterranean and European countries. During the workshop, CEER presented the evolution of the regulatory framework during the energy crisis at the EU level.

By the 1<sup>st</sup> of October 2022, the level of storage filling has exceeded the targets, as fixed in the Annex 1 of Regulation (EU) 2022/1032, in most of the EU countries.

On the 24<sup>th</sup> of November, the Commission sets trajectories for filling gas storage in 2023<sup>1</sup> as follow:

- 90% gas storage target by 1 November 2023.
- Intermediate targets for the 1<sup>st</sup> of February, May, July, and September.
- Target for 1 February 2023 of a Union minimum average of 45%.

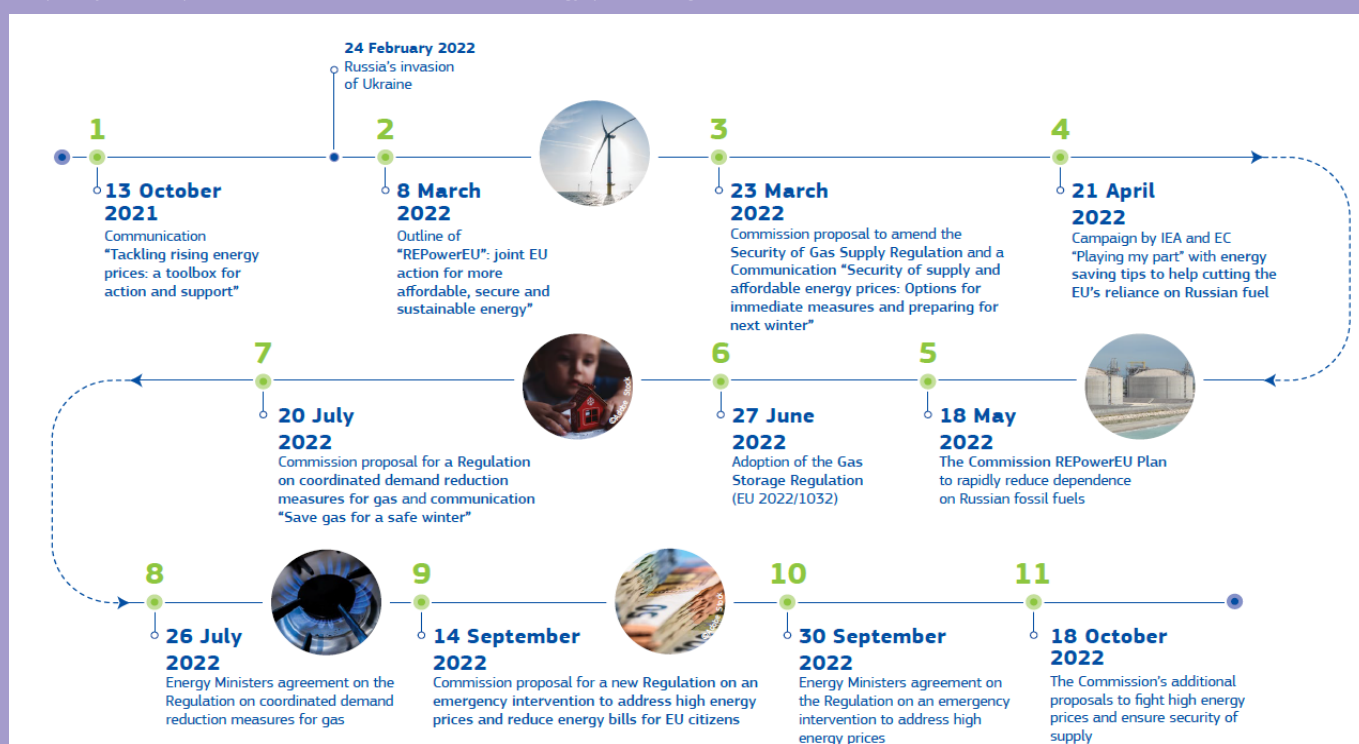
Besides to the storage filling targets, a proposal for a Council Regulation has been introduced related to “Enhancing solidarity through better coordination of gas purchases, exchanges of gas across borders and reliable price benchmarks” and it includes the following aspects:

- Transparency and joint purchasing (EU Energy Platform) (Art 3 -11)

<sup>1</sup> [https://commission.europa.eu/news/commission-sets-trajectories-filling-gas-storage-2023-2022-11-24-0\\_en](https://commission.europa.eu/news/commission-sets-trajectories-filling-gas-storage-2023-2022-11-24-0_en)

- Efficient operation of pipelines and LNG terminals (Art 12-14)
- Measures to reduce price volatility (Articles 15-17)
- Development of a new supplementary benchmark for LNG (Art 18-22)
- Gas market correction mechanism (Art 23-24)
- Security of supply (Articles 25-32)
- Setting up by COM of a **service** allowing for joint demand aggregation and gas purchasing by undertakings in the EU
- Secondary capacity booking and transparency platforms for LNG and for gas storages
- LNG facility/storage facility users, who wish to re-sell their contracted capacity on the secondary market shall be entitled to do so
- LNG facility/storage facility operators shall establish within 2 months a EU LNG Transparency Platform and a EU Storage Transparency platform
- Exempted facilities shall make public tariffs for infrastructure
- NRAs and TSOs to deal rapidly with congestion management in gas transmission networks
- More effective use of transmission capacities: TSOs offer under-utilized contracted firm capacity at interconnection points and virtual interconnection points
- Temporary intra-day volatility management mechanism for extreme price movements as of 1.01.2023; mechanism based on an upper and lower price boundary.
- Indeed, the policy makers had to adapt the regulatory framework to respond to the energy crisis since its beginning. The next figure presented the policy development at the EU level to mitigate the impact of the energy price surge.

Figure 2. policy development at the EU level since the energy price surge



Source: EU Com

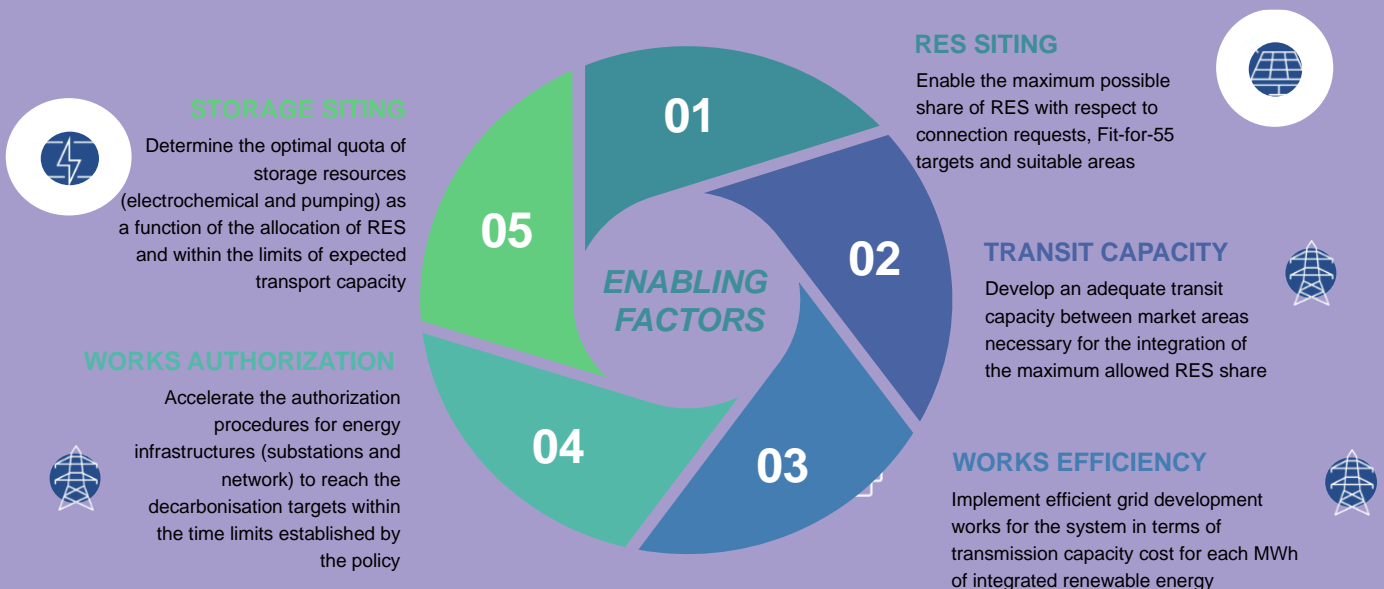
### 1.3. Role of TSOs in ensuring the security of supply

From the TSO perspective, the main factor to ensure the security of supply is the availability of the infrastructure that will allow:

- The diversification of the energy mix by increasing the share of the renewable energy sources.
- Reinforcement of the national grid and interconnections with neighbouring countries.
- Include more flexibility resources.
- Integration new technologies and storage to the system.
- Allow the capacity remuneration mechanisms.

In the case of Italy, the Italian TSO “TERNA” is implementing the EU directives related to the energy transition drivers while ensuring the security of supply by developing more cross-border interconnections, such as the future interconnection between Italy and Tunisia. The figure below describes the implementation of the EU directives by TERNA.

Figure 3. Implementation of the EU directives by TERNA



### 1.4. Role of renewable energy sources (RES) in the security of supply

The renewable energy source has an important role in the energy mix. A decade ago, its role was significant to fight against the climate changes and reduce the emissions of green gases. Today, the role renewable energy source is even more than that, its role is more crucial and became omnipresent in all the discussion in the energy sector and other sectors such as building and transport.

The RES will be the key to ensure the security of supply while maintaining the balance of the energy prices in the future. To achieve that, three steps can be identified, starting by the **electrification** of end-use sectors to maintain value and avoid curtailment of VRE, and help decarbonize other sectors. Followed by the increasing deployment of **Distributed Energy Resources (DERs)** turns the consumer into an active

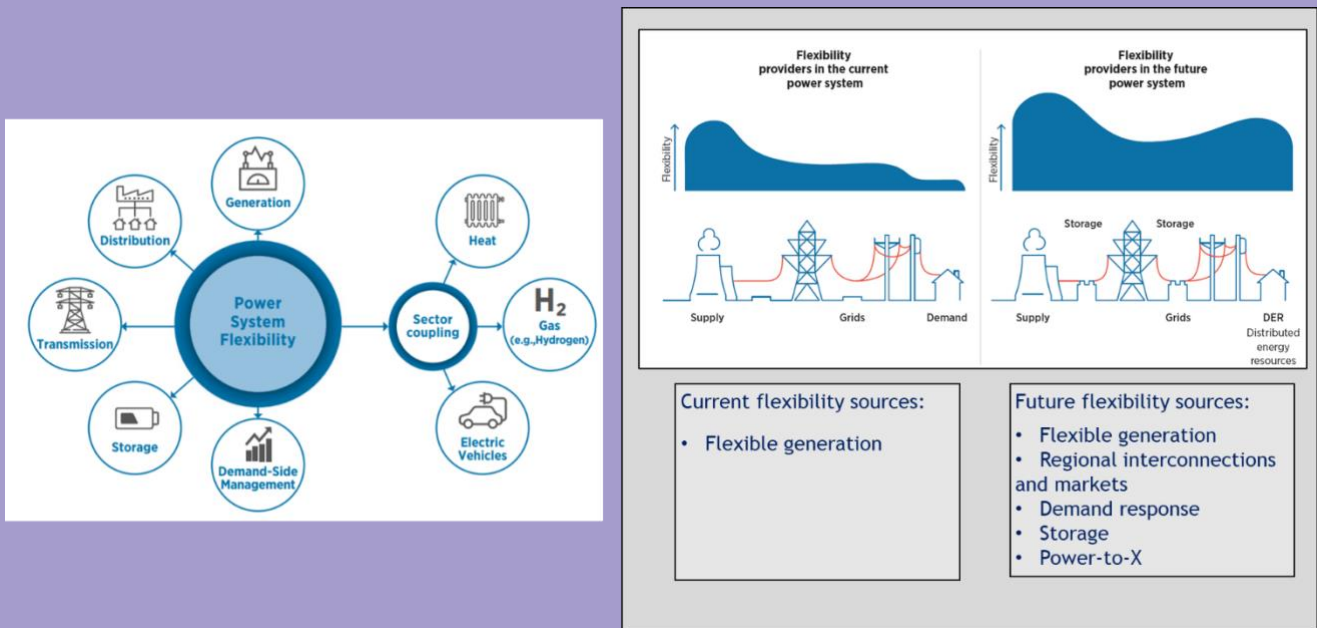


participant, fostering demand-side management and finally, the **digitalization** will enable faster response, better management of assets, connecting devices, collecting data, monitor and control.

IRENA have developed several studies in the steps and mechanisms that will enable and facilitate the integration of RES while achieving the energy transition objectives and ensure the security of supply.

Furthermore, to reach the full potential of the RES, the existing infrastructure needs to include more flexibility mechanisms and tools. According to IRENA, flexibility mechanisms are define as the capability of a power system to cope with the variability and uncertainty that VRE generation introduces into the system at different time scales, avoiding curtailment and reliably supplying demanded energy to customers. As described in the figure below:

Figure 4. Flexibility option to support the RES implementation



# 2

## ADEQUACY MECHANISMS & MONITORING

Besides to the security of supply tool, the monitoring of the adequacy mechanisms is an important role that the energy regulators acquired to ensure the balance and maintaining an adequate energy supply to the end users.

In this section, the case study of EMRA is described and a snapshot of the Med-TSO report on “periodic adequacy” is given.

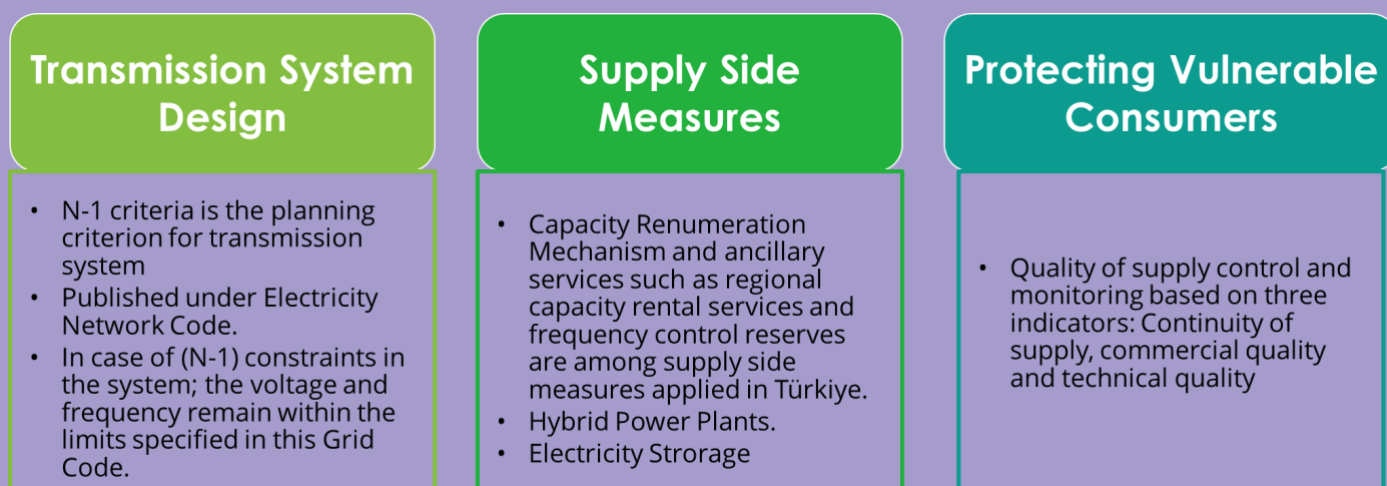
## 2.1. Tools and mechanisms to limit security of supply risks/case study

In Türkiye, the Ministry of energy is responsible of ensuring the security of supply and the regulator is responsible for monitoring the realization of the licensed generation facilities and notifies the Ministry of the new licensed generation capacity to be in operation in the next 5 years. On the other hand, the TSO is responsible for the preparation of the generation capacity projection report, short-term supply and demand projection report and the 20-year long term Electricity Power Generation Development Plan.

The supplier companies are obliged to notify the EMRA of their estimated electrical energy peak power demands, the amount of electrical energy they need, the contracts they have made for the supply of this amount, and their additional energy or capacity needs for the next five years.

The regulator ensures the monitoring of the system through the main segments of the electricity systems as shown in the figure below:

Figure 5. EMRA's Safeguarding the Security of Supply



In addition, EMRA developed a data collection systems and regulation that defines the procedures and principles regarding the collection of data needed by the Authority in the process of monitoring, analysing and reporting market activities in order to achieve the objectives in the relevant legislation in the energy market.

Based on the energy market notification, EMRA audit the market following the following steps:

1. Predefine/Predetermine Data type, content, format, timing etc. in the regulation- i.e. binding document (Quality Regulation By Law etc.)
2. Ensure establishing systems on site to «measure» correctly (data gathering) (smart meters)

3. Ensure transfer of data «safely» both to DSO and to Regulator
4. Establish monitoring systems (E.g. EBIS)
5. Establish data analysis tools for remote auditing
6. Establish system to reach raw data of the DSO (if possible) (E.g. EDVARS)

The case study has shown that the reception of robust, accurate, real, and complete data from system operators is essential to enable the Authority effectively to carry out its role as regulator. In addition, the DSOs are the key actors having relevant data to monitor the SoS.

Furthermore, to minimize the information asymmetry utilize appropriate information technologies to reach accurate, real, and complete data and to prevent manipulation on the data, try to establish systems that enables recording and transferring data automatically to the Regulator and/or establish systems to reach the raw data.

## 2.2. Med-TSO report on “Periodic Adequacy Report”

Med-TSO has been working on the security of supply and adequacy mechanisms during the last years and have developed a periodic report that monitors the adequacy in the Mediterranean region. The methodology used is based on the latest development of the EU regulations and decisions put additional responsibilities on European TSOs in the process of assessing and controlling system adequacy. With the aim to follow the same development, Med-TSO decided to carry out similar investigations related to power system’s adequacy for the non-EU Med-TSO members.

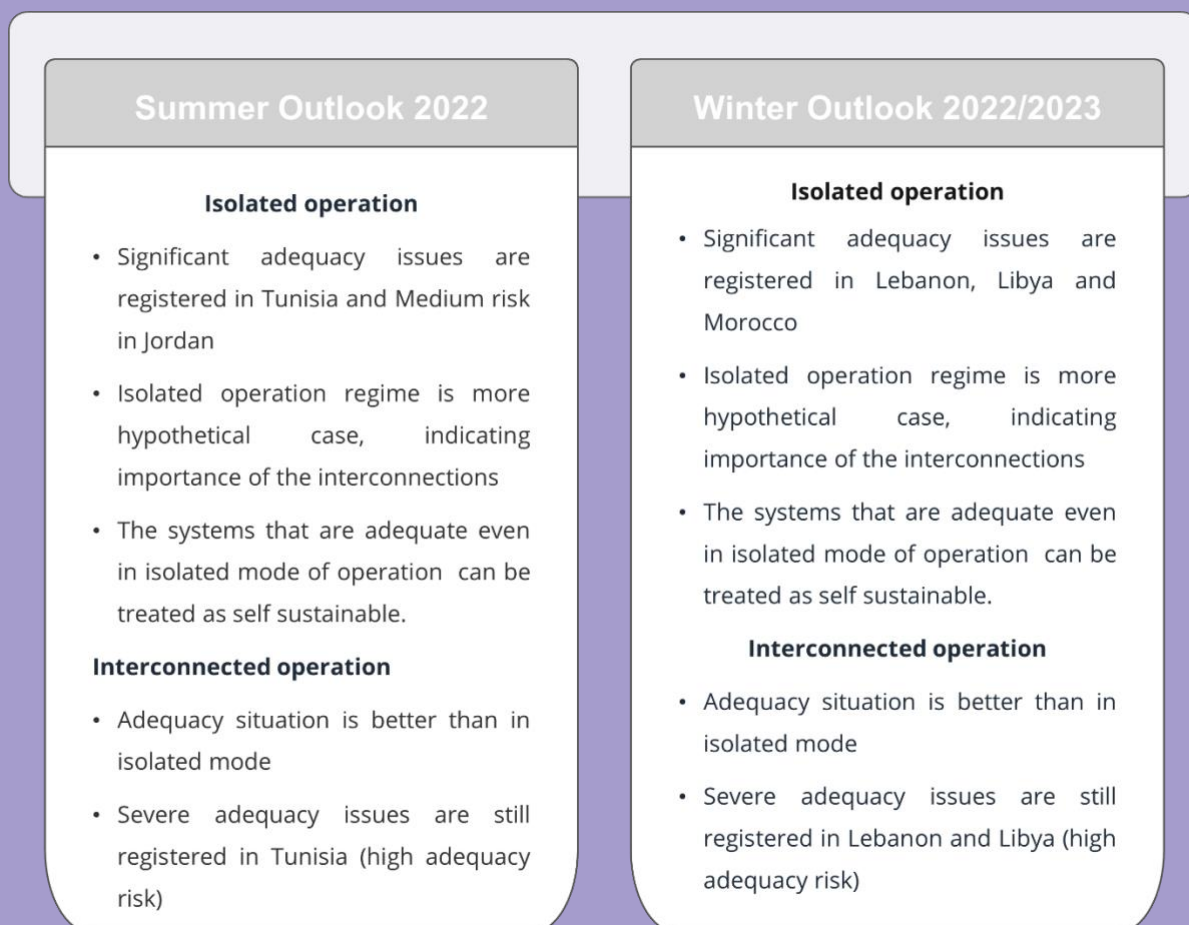
The most recent report includes the results of the Summer Outlook 2022 and Winter Outlook 2022/2023 (both published online). Furthermore, the mid-term Adequacy Forecast 2025 & 2027, will be published soon, followed by the early Summer Outlook 2023.

The assessment was based on whether the country have enough capacity to cover power demand even under severe/extreme conditions? And how the interconnection could reduce shortage situations? The used indicators are related to:

he P95/P50 loss of load duration (**P95/P50 LOLD**), P95/P50 Energy Not Serve (**P95/P50 ENS**), **Loss of Load Expectation (LOLE)**, **Expected Energy Not Served (EENS)**, **Relative EENS**, **Dump Energy** and **the Capacity Margin**.

The main results for the the Summer Outlook 2022 and Winter Outlook 2022/2023 are shown in the figure below:

Figure 6. Main results for the Summer Outlook 2022 and Winter Outlook 2022/2023





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**MEDREG – Association of Mediterranean Energy Regulators**  
Via Fieno 3, 20123 Milan, Italy –Tel: +39 3402938023  
[info@medreg-regulators.org](mailto:info@medreg-regulators.org) [www.medreg-regulators.org](http://www.medreg-regulators.org)