

Moving Forward





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Market Reforms Supporting Energy Transition: Mechanisms to Integrate V-RES and Electricity Storages

SESSION IV: MARKET REFORM TO FACILITATE ENERGY TRANSITION

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Key objectives towards energy transition

Electricity consumption mix: 2030 NECP target for Italy



- Today, RES cover about 40% of the gross electricity consumption in Italy and 60% comes from fossils (mostly gas).
- Italy has set a 2030 target of achieving 65% electricity consumptions from RES (both programmable and variable (V-RES)....
-i.e.. "Inverting" the electricity mix







Mechanisms and market frameworks for investments towards the electricity sector must underpin three key objectives:







Shortcomings of traditional market design

Traditional market design features

- Short and long-term efficiency objectives, ensured by the promotion of competition
- System adequacy and security largely provided for free by conventional generation

New priorities affecting market design

 Decarbonization at the centre of energy policy developments (stemming from EU-wide target of at least 42,5% renewable energy by 2030)

Challenges arising from the integration of RES

- Non-dispatchable and distributed nature of renewable energy generation
- Inadequate investment signals from wholesale markets to handle RES peculiar cost structure



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Key objectives Alignment of investment incentives with **PRO-DECARBONIZATION** system needs, moving beyond MARKET conventional CfD models **PRO-ADEQUACY** Ensuring sufficient resource availability MARKET during tight system conditions Supporting storage capacity rollout to **PRO-SECURITY** balance RES variability and enhance MARKET system security

A 3-market forward model





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- The 3 forward market model first appeared in a work by Rocchio and Boschi in 2020
- The concept is based on the integration of forward contracting mechanisms with existing market models
- The model is built on the sequence of 3 forward markets, whose linchpin is identified in the procurement of resources functional to the security of the system







PRO-DECARBONIZATION MARKET

FERX Mechanism

to support RES rollout aligning investment incentives and system needs

PRO-ADEQUACY MARKET

Capacity Market

as a structural feature of the market to provide resources for adequacy purposes (and possible adaptation post-2028)

PRO-SECURITY MARKET

MACSE

a competitive mechanism to support investment in electricity storage through long-term payments



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Deep Dive on MACSE

- MACSE "Mercato di Approvvigionamento di Capacità di Stoccaggio Elettrico" is the Italian mechanism to support storage investment, approved by the European **Commission in December 2023**
- The mechanism will incentivize a total of 9 GW (71 GWh) of storage capacity for ten years*, with resources amounting to **17,7 bln €**
- The scheme will support the realization of storage capacity through long-term payments to cover investment and operating costs
- The first competitive procedure will consist of **two competitive auctions**: one will be dedicated to lithium-ion batteries, followed by another aimed at pumped hydro

*considering a starting point of electrochemical energy storage installed of 6,6 GWh (2023)



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Deep Dive on the FER X Mechanism

- The first part (Transitory FER X Mechanism) has been issued in February 2025 after • approval of at European Commission level and it is valid until 31st December 2025. The complete version is expected to be issued by end of the year/next year
- The FER X Mechanism is a 2-way CfD scheme for mature RES (primarily PV and ٠ Wind). The overall auctioned power in the Transitory scheme is about 18 GW (about 15 GW of which for plants with power higher than 1 MW)
- The minimum award price is 65 €/MWh for PV and 70 €/MWh for wind. The maximum is • 95 €/MWh for both technologies. Awarded price for PV will also have some corrective factors to take into account such as geographical location, removal of asbestos and whether it is a Floating PV plant
- The FER X Mechanism will include an **innovative system to optimize auction volumes** vs awarded prices and to minimize costs for the system



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Further elements on MACSE





In exchange for limiting the exposure to market risk (through the long-term payment) MACSE foresees the obligation to **make the storage asset capacity available to third-parties** in wholesale markets



This will enable the pooling and offering of storage capacity to third parties in the form of **standardized time-shifting products**. The SO will allocate physical storage resources to execute the standard time-shifting contracts, optimizing the use of available resources



These contracts can be purchased at auction from market participants through a **centralized platform** or on a **secondary market**, both instruments are managed and regulated by the Italian NEMO



The use of such instruments will allow market operators to **manage the unpredictability of RES generation**, linking this market with the prodecarbonization one



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Next steps of the mechanism

- The Ministry of Environment and Energy Security (MASE) has defined the battery storage demand requirements and is defining the pumped hydro demands requirements, with input from the System Operator (Terna)
- The 1st auction will take place on 30th September 2025.
- First auction concerning lithium-ion storage systems only, while methodology and definition of pumped hydro storage demand requirements is still ongoing at SO level