



# 20<sup>TH</sup> ERRA ANNUAL CONFERENCE

EN ROUTE TO SUSTAINABLE REGULATION  
UNDER NEW MARKET PARADIGMS

09-10 October, 2023  
BUDAPEST, HUNGARY



## ERRA STATUS QUO REPORT ON ENERGY TRANSITION AMONG MEMBER COUNTRIES

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ERRA

#ERRAConference2023

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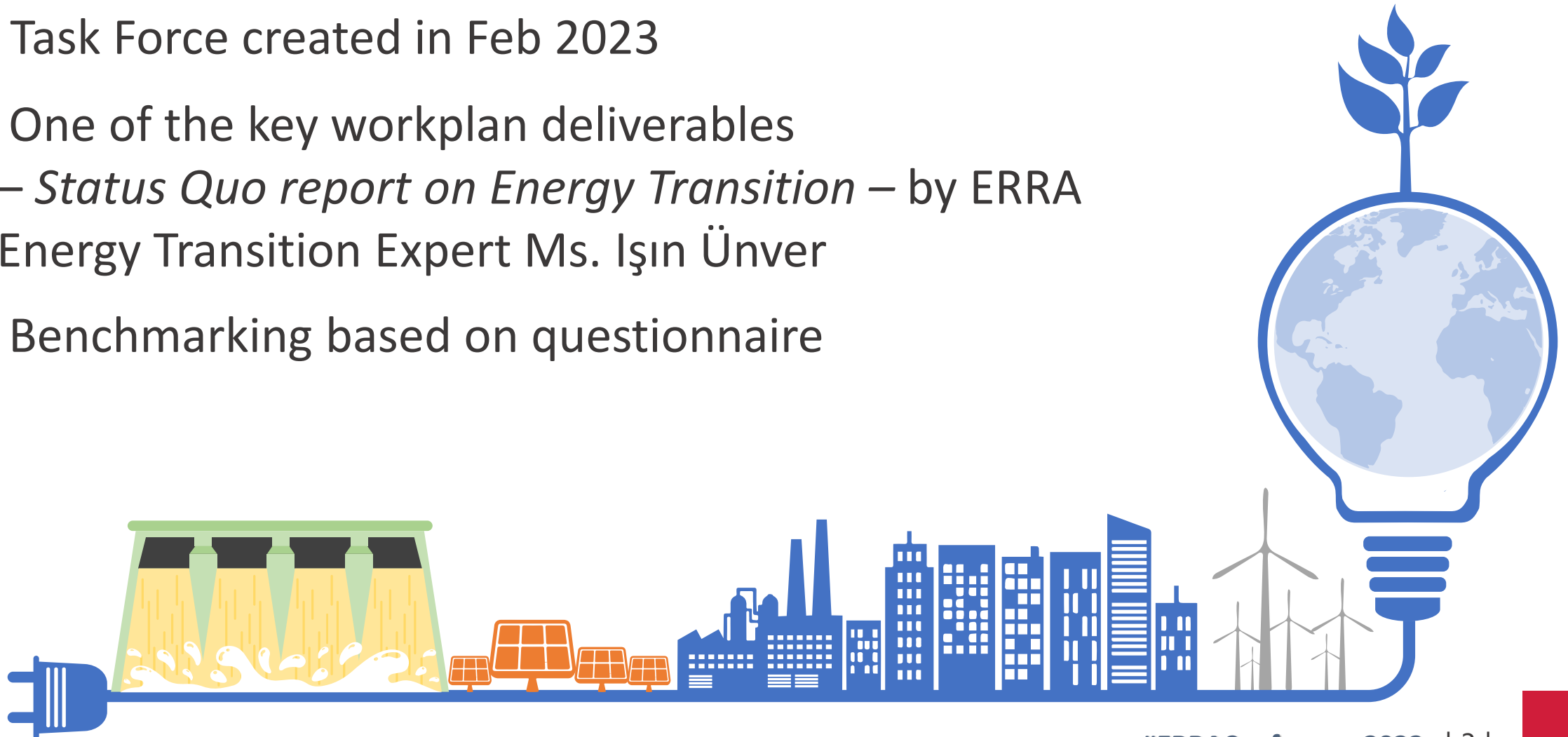
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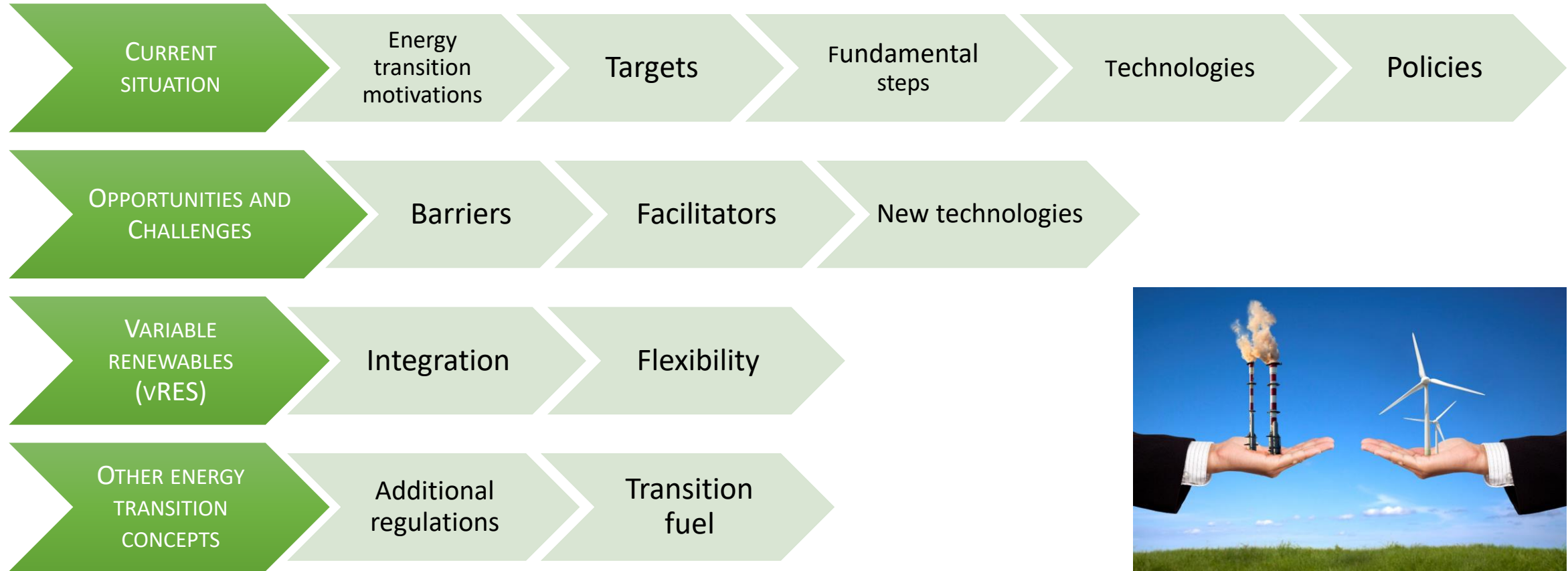
# ENERGY TRANSITION TF AND ITS KEY DELIVERABLE

- Task Force created in Feb 2023
- One of the key workplan deliverables
  - *Status Quo report on Energy Transition* – by ERRA Energy Transition Expert Ms. Işın Ünver
- Benchmarking based on questionnaire



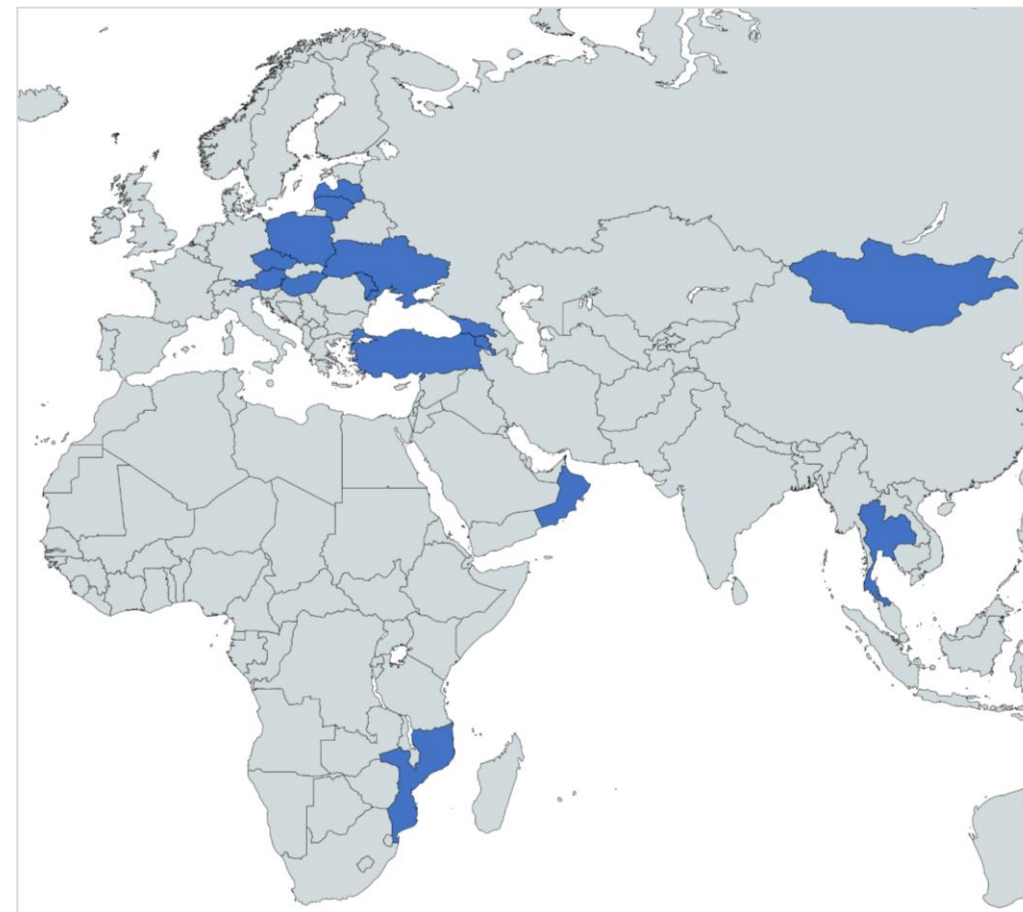
# BACKGROUND

## QUESTIONNAIRE



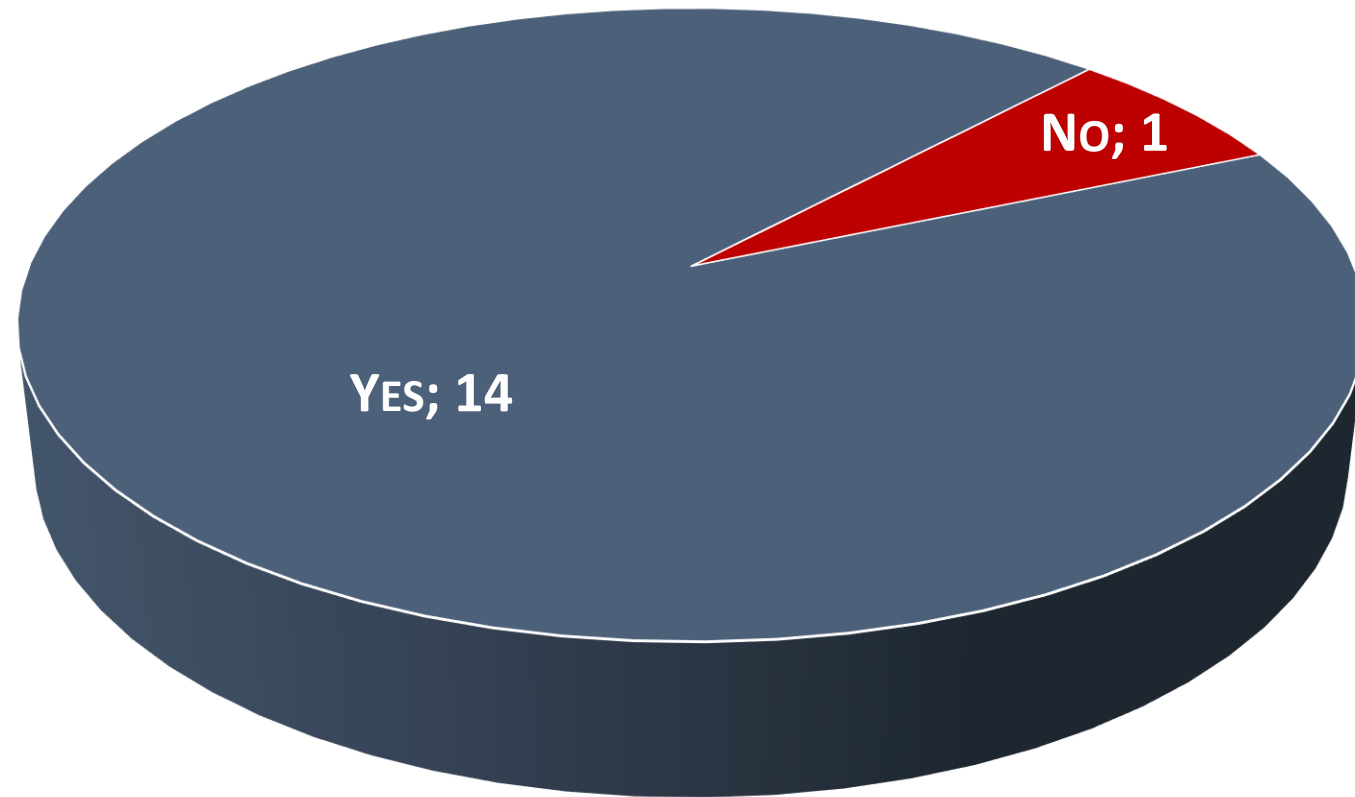
## PARTICIPATING ERRA COUNTRIES: 15

- Armenia
- Austria
- Czechia
- Georgia
- Hungary
- Latvia
- Lithuania
- Moldova
- Mongolia
- Mozambique
- Oman
- Poland
- Thailand
- Türkiye
- Ukraine



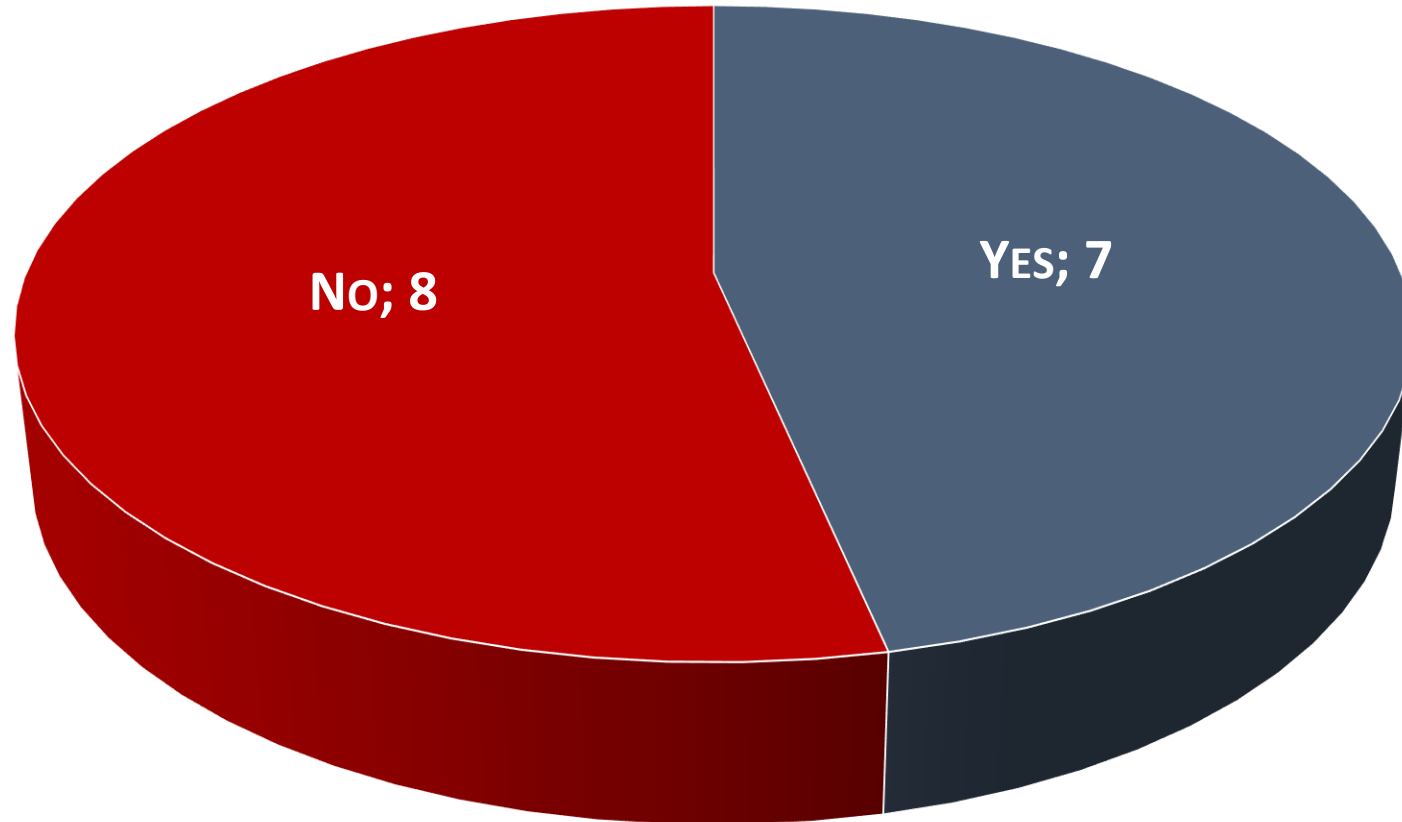
## TAKEAWAYS

# COUNTRIES ADDRESSING ENERGY TRANSITION



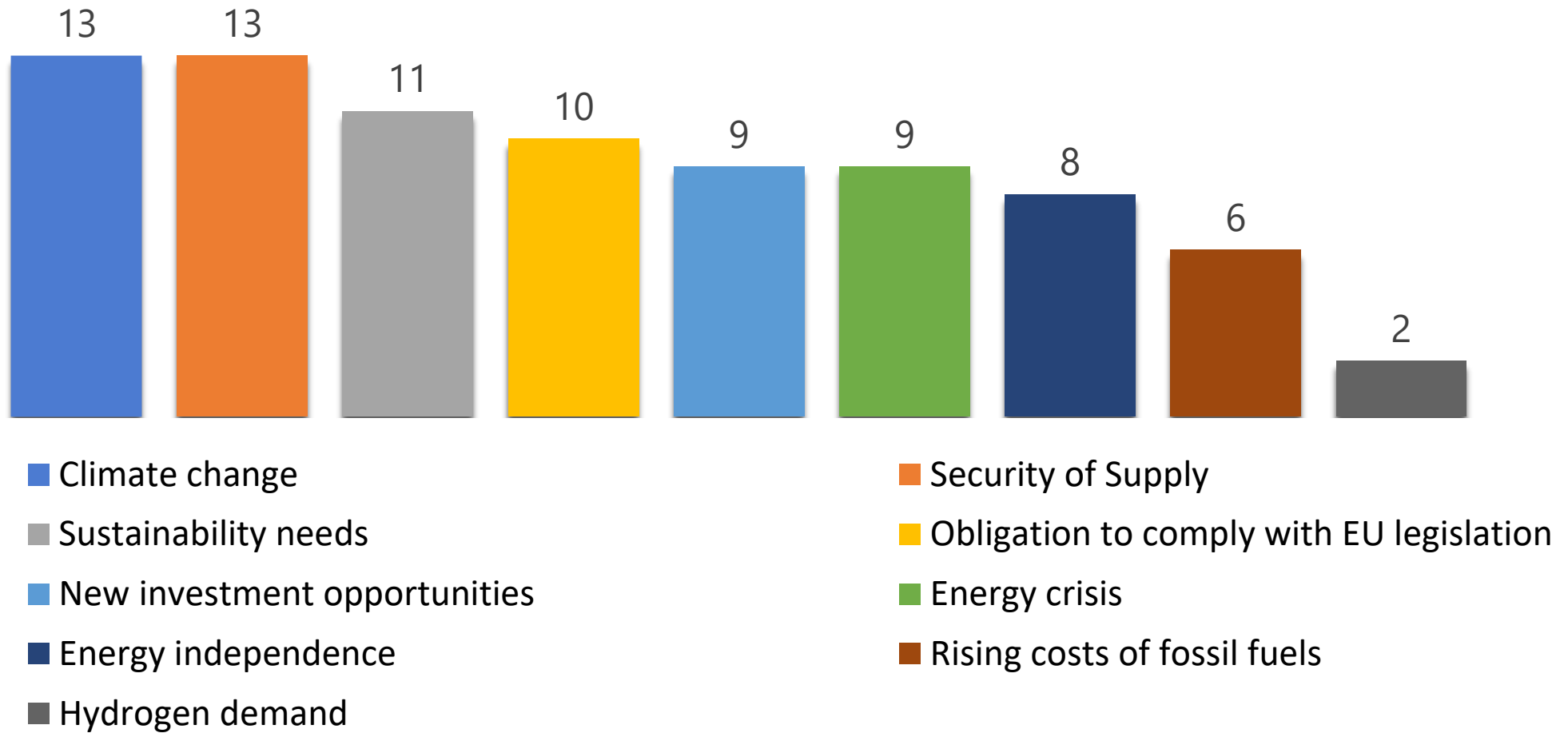
TAKEAWAYS

# DEDICATED ENERGY TRANSITION DEPT. WITHIN REGULATOR



## TAKEAWAYS

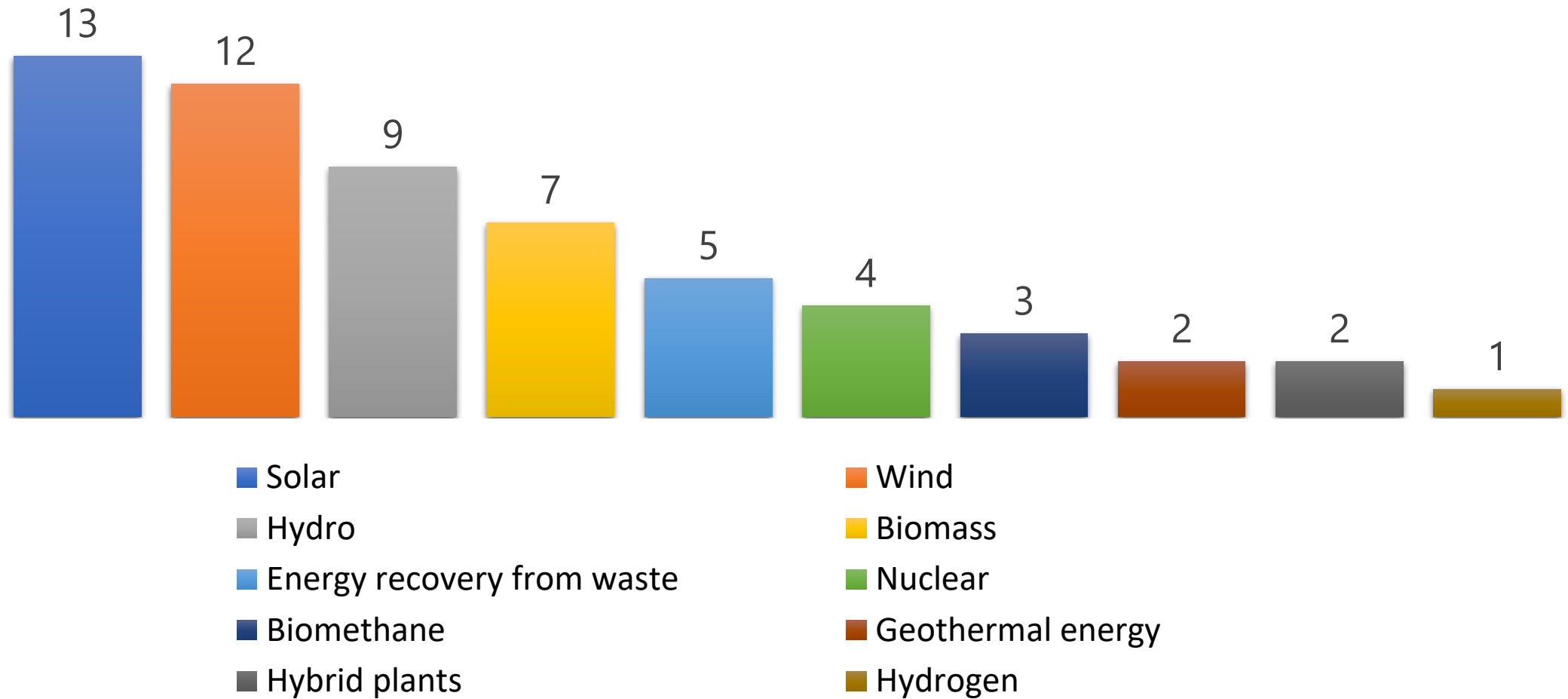
# KEY MOTIVATIONS FOR ENERGY TRANSITION



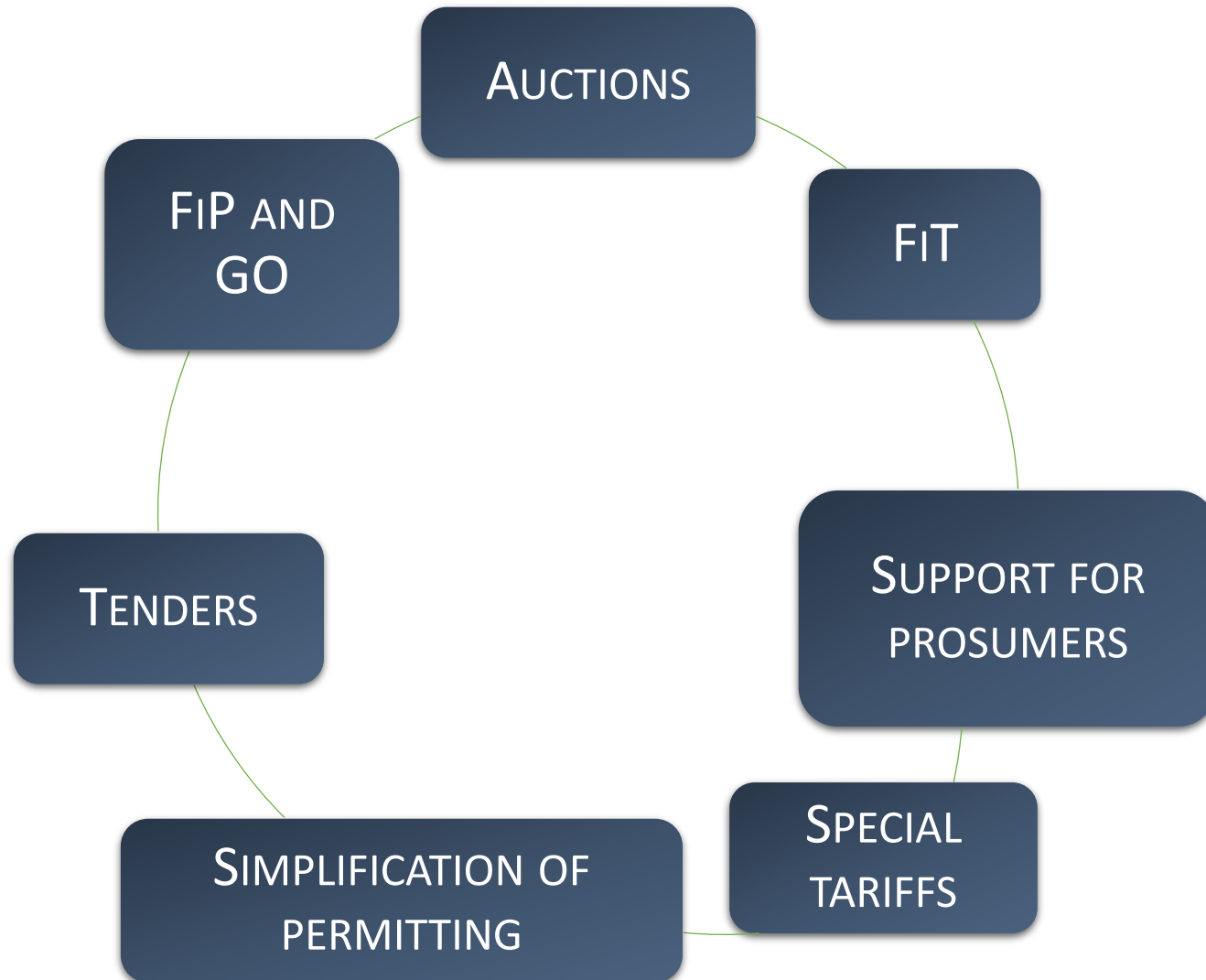
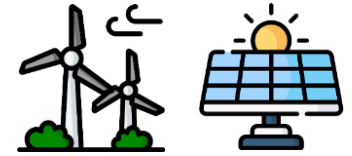


## TAKEAWAYS

# KEY TECHNOLOGIES FOR DECARBONISATION

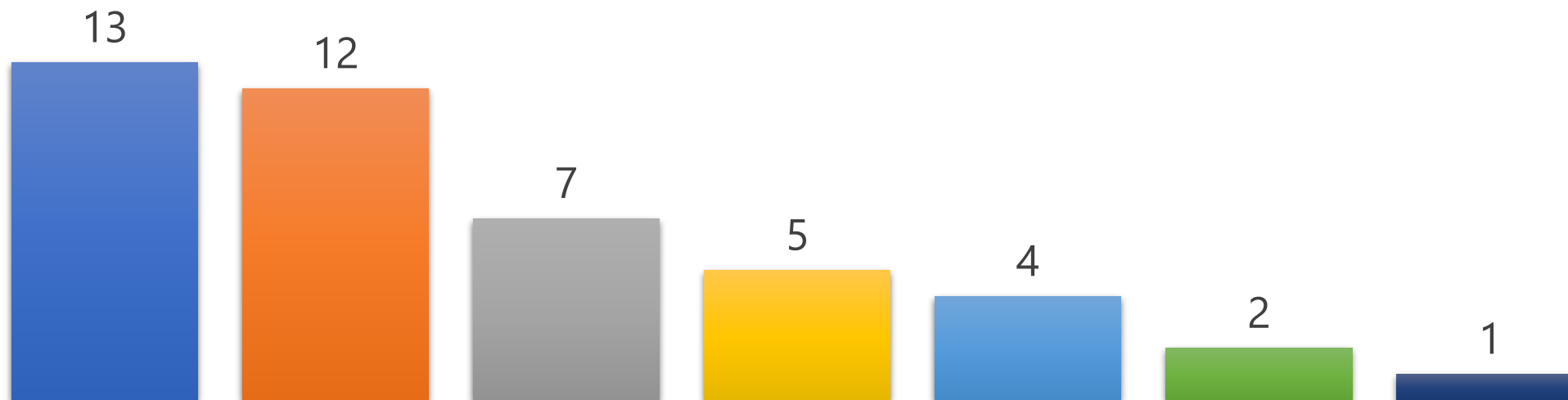
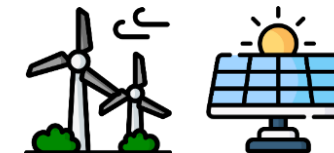


# RENEWABLE ENERGY DEPLOYMENT



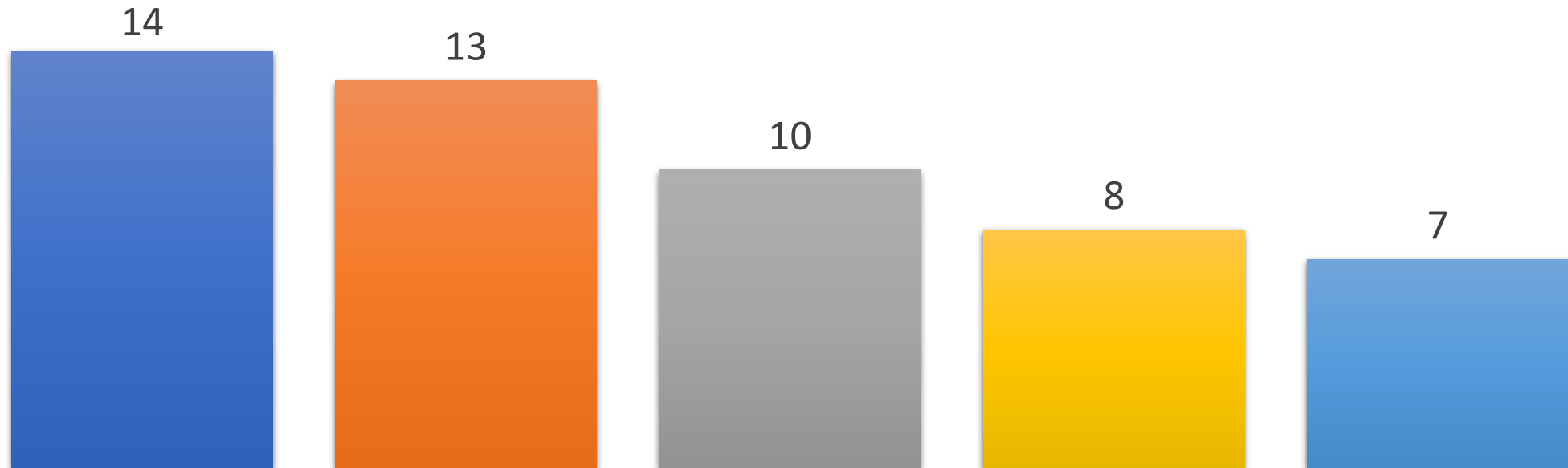
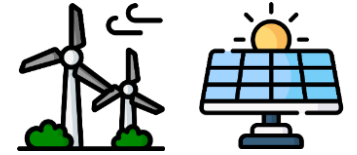
Countries are continuously updating their renewable energy acts and RES support systems.

# MAIN INCENTIVES FOR RES



- RES deployment support schemes (e.g., FiT, FiP, auctions)
- Supporting prosumers and decentralized generation
- Increased investment in energy infrastructure to improve grid resilience
- Facilitate getting financial loans for establishment of power plants using clean energy
- Tax incentives
- Plans to change existing gas networks with renewable gases
- Phase-out of fossil fuel subsidies

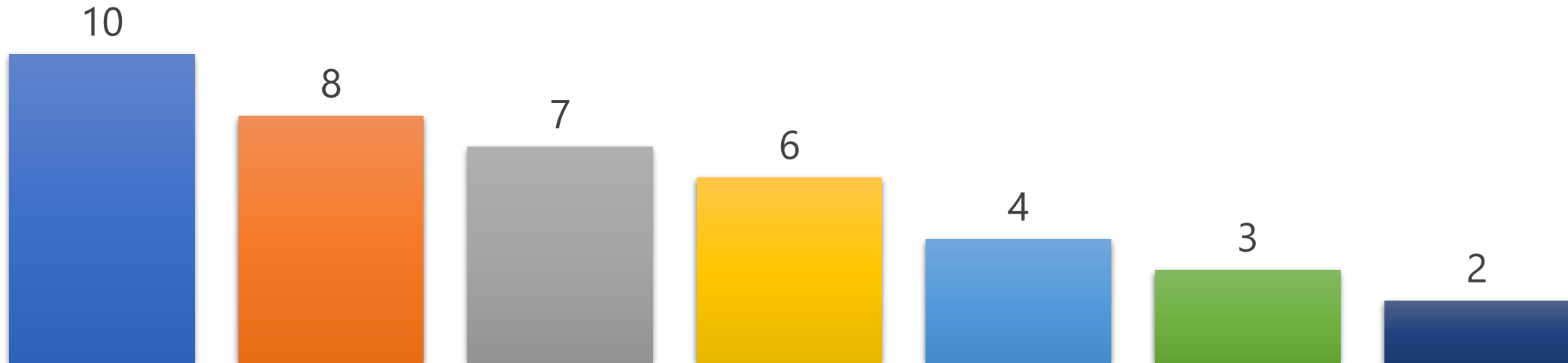
# MEASURES TO INTEGRATE LARGE VRES



- Energy storage
- Transmission (TSO) and distribution (DSO) grid investments
- Interconnections with other countries
- Roll out of smart grids
- Functional organised markets

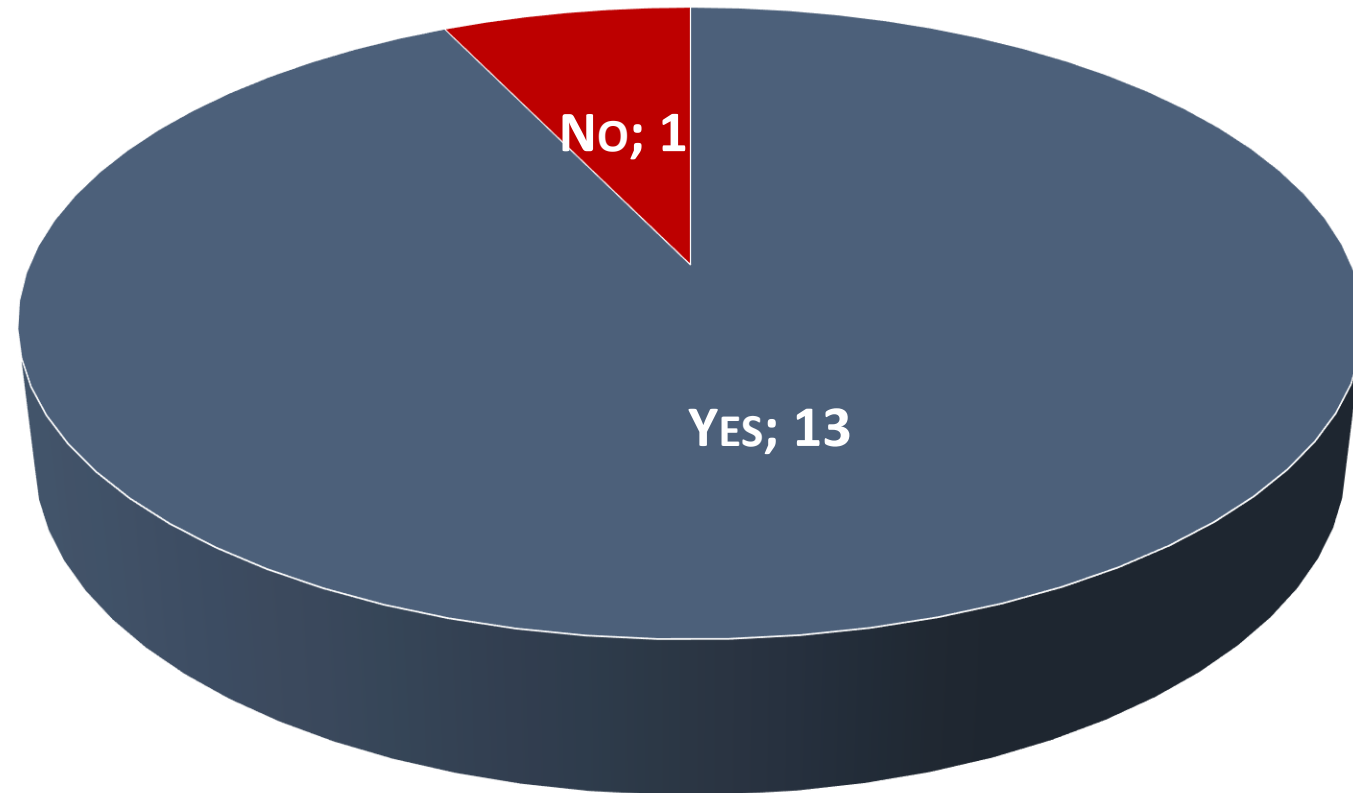
## TAKEAWAYS

# CHALLENGES FOR THE ENERGY TRANSITION

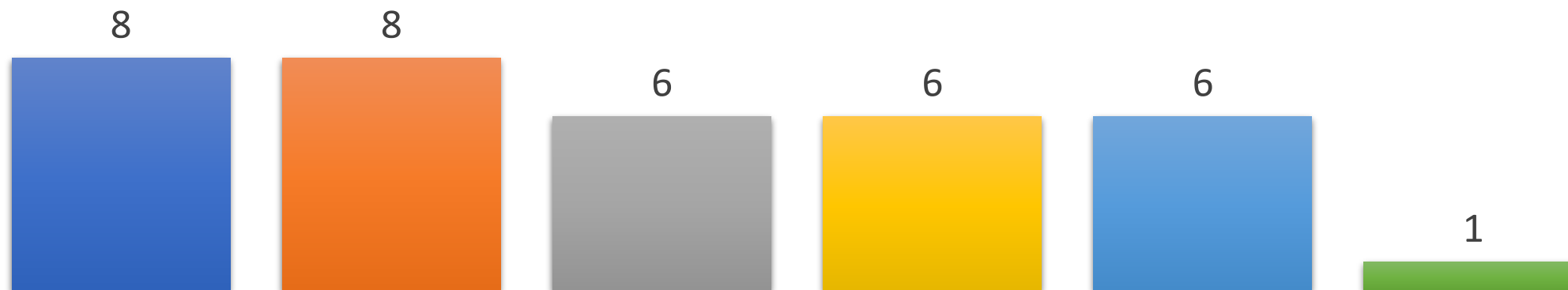


- Grid resilience/system balancing
- High costs of renewable energy investment
- Electricity pricing
- Lack of finance
- Social resistance
- Inadequate human and institutional capacity
- Lack of education and/or specialised programmes involving business stakeholders

# GRID DEVELOPMENT REGULATIONS



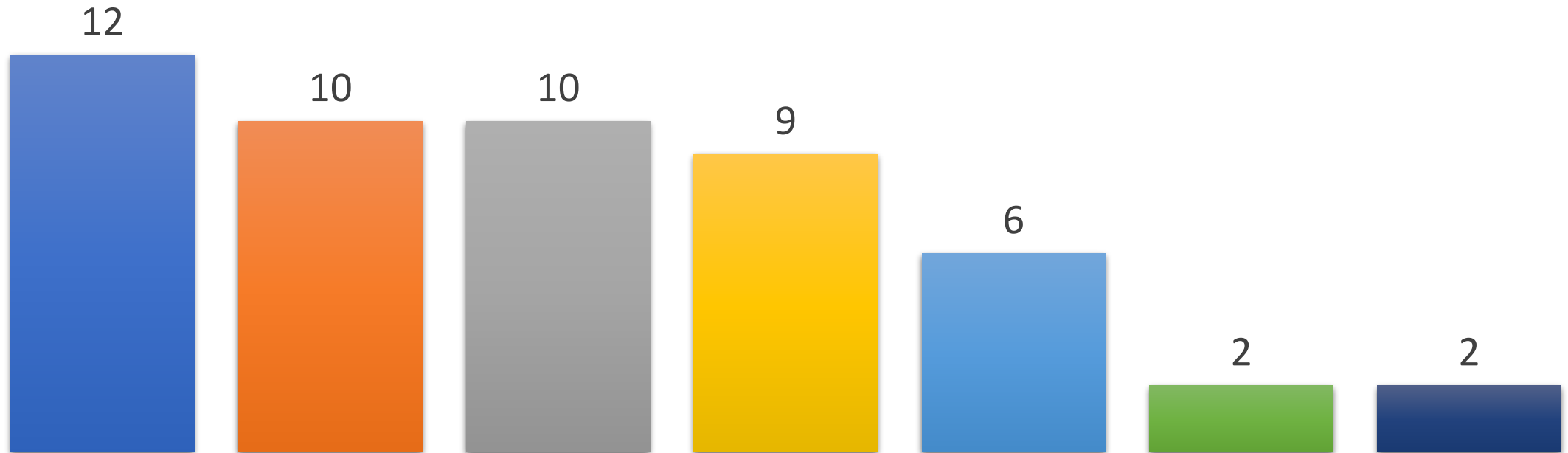
# MEASURES FOR FLEXIBILITY



- Adequacy of power system in case of unavailability of renewable generation (Unexpected)
- Adequacy of power system in case of seasonal unavailability of renewable generation like electricity generation from hydroelectric plants during summer (Expected)
- Balancing short term variable generation from wind and PVs
- Efficient operation of day ahead markets to manage changes in net load
- Quality of the primary frequency response and frequency stability
- Other

## TAKEAWAYS

# ADAPTATIONS AND NEW TECHNOLOGIES USED



- Energy efficiency measures
- Energy storage systems
- Smart grids
- Electrification
- Hydrogen
- Power-to-X
- Other



# ENERGY EFFICIENCY



LAWS &  
STRATEGIC  
PLANS

ENERGY  
EFFICIENCY  
TARGETS

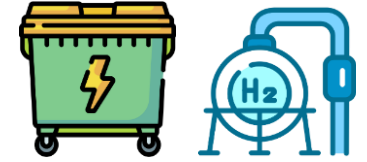
NEW PROJECTS  
& CONSUMER  
AWARENESS  
CAMPAIGN

e.g. Austria, Hungary,  
Lithuania, Moldova, Mongolia,  
Mozambique, Poland, Ukraine

e.g. Austria, Czechia, Hungary,  
Latvia, Lithuania, Mongolia,  
Mozambique, Oman, Poland,  
Thailand, Türkiye, Ukraine

e.g. Lithuania, Thailand

# OTHER CLEAN ENERGY TECHNOLOGIES



Examples of declared interest in other clean energy technologies.

## HYDROGEN

- e.g. Czechia, Hungary, Türkiye, Mongolia

## HYDRO

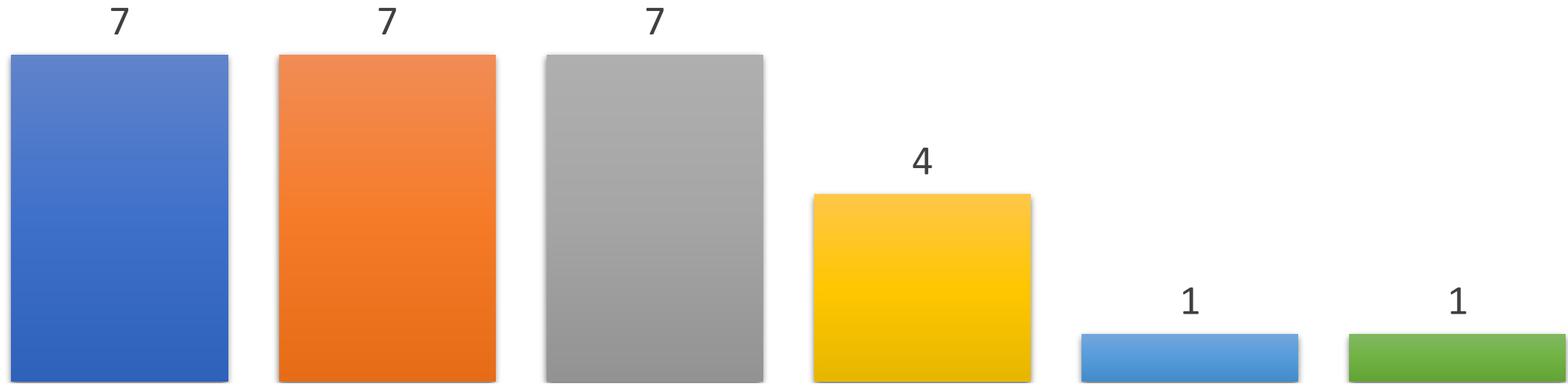
- e.g. Latvia, Thailand

## WASTE-TO-ENERGY

- e.g. Oman

## TAKEAWAYS

# REGULATIONS ON NEW CONCEPTS OF ENERGY TRANSITION



■ Regulation regarding energy storage

■ Supporting tariff for prosumers

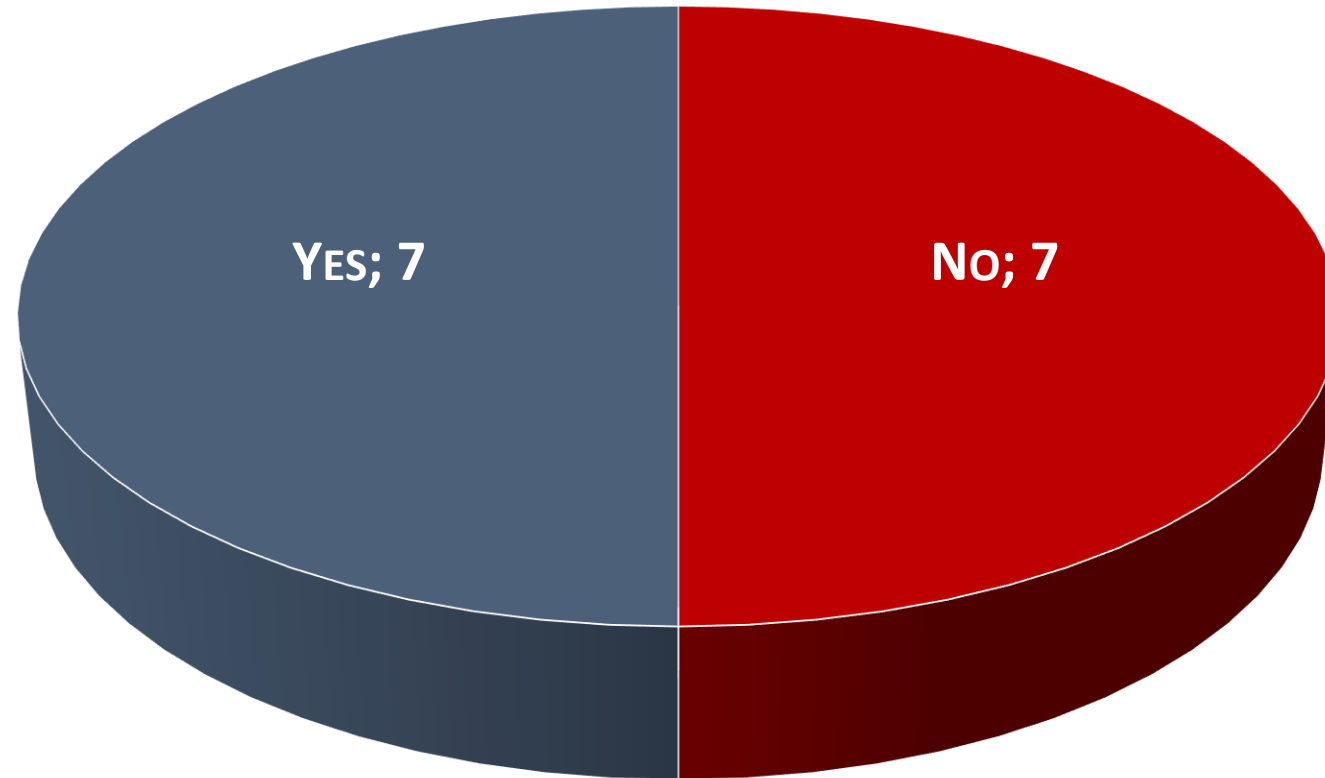
■ Regulation for EV charging points

■ Regulation enabling smart grids

■ Regulation on hydrogen

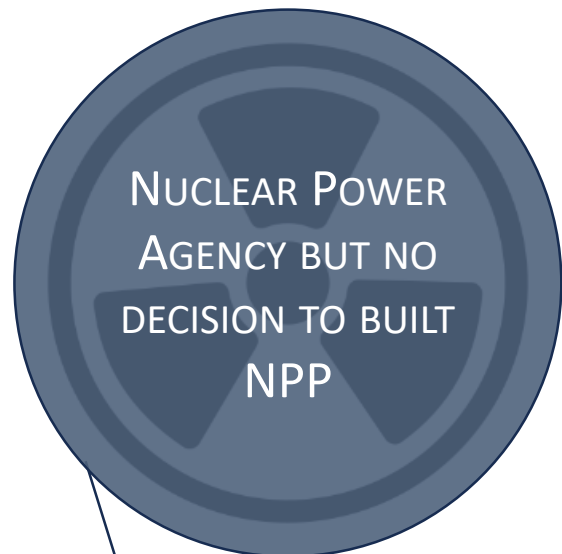
■ Other

# EXISTENCE OF PILOT PROGRAM/REGULATORY SANDBOX



# TAKEAWAYS

## NUCLEAR POWER



Mozambique



Poland  
Türkiye

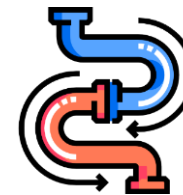


Armenia  
Czechia  
Hungary



Lithuania

# TRANSITION FUEL



Declared transition fuels differ per country as per context and availability.

NATURAL GAS	CNG	COAL	HYDROGEN & METHANE	GREEN HYDROGEN	HYDRO
<ul style="list-style-type: none"><li>•Czechia</li><li>•Hungary</li><li>•Lithuania</li><li>•Mozambique</li><li>•Ukraine</li></ul>	<ul style="list-style-type: none"><li>• Latvia</li></ul>	<ul style="list-style-type: none"><li>• Poland</li></ul>	<ul style="list-style-type: none"><li>• Mongolia</li></ul>	<ul style="list-style-type: none"><li>• Oman</li><li>• Türkiye</li></ul>	<ul style="list-style-type: none"><li>• Georgia</li></ul>

# EARLY CONCLUSIONS

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- ⇒ ERRA Member countries differ in their advancement in energy sector's green transition. Many however, have already been implementing specific means and advanced incentive systems to boost their transition's dynamics.
- ⇒ Challenges such as improvement of grid resilience remain.
- ⇒ New technologies are cautiously explored, but energy-crisis-driven affordability concerns make fossil fuels' phase-out increasingly difficult.

## NEXT STEPS

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- Finalisation of the report will be conducted in collaboration with a partner organization
- The paper will be published in November 2023







ENERGY REGULATORS  
REGIONAL ASSOCIATION



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