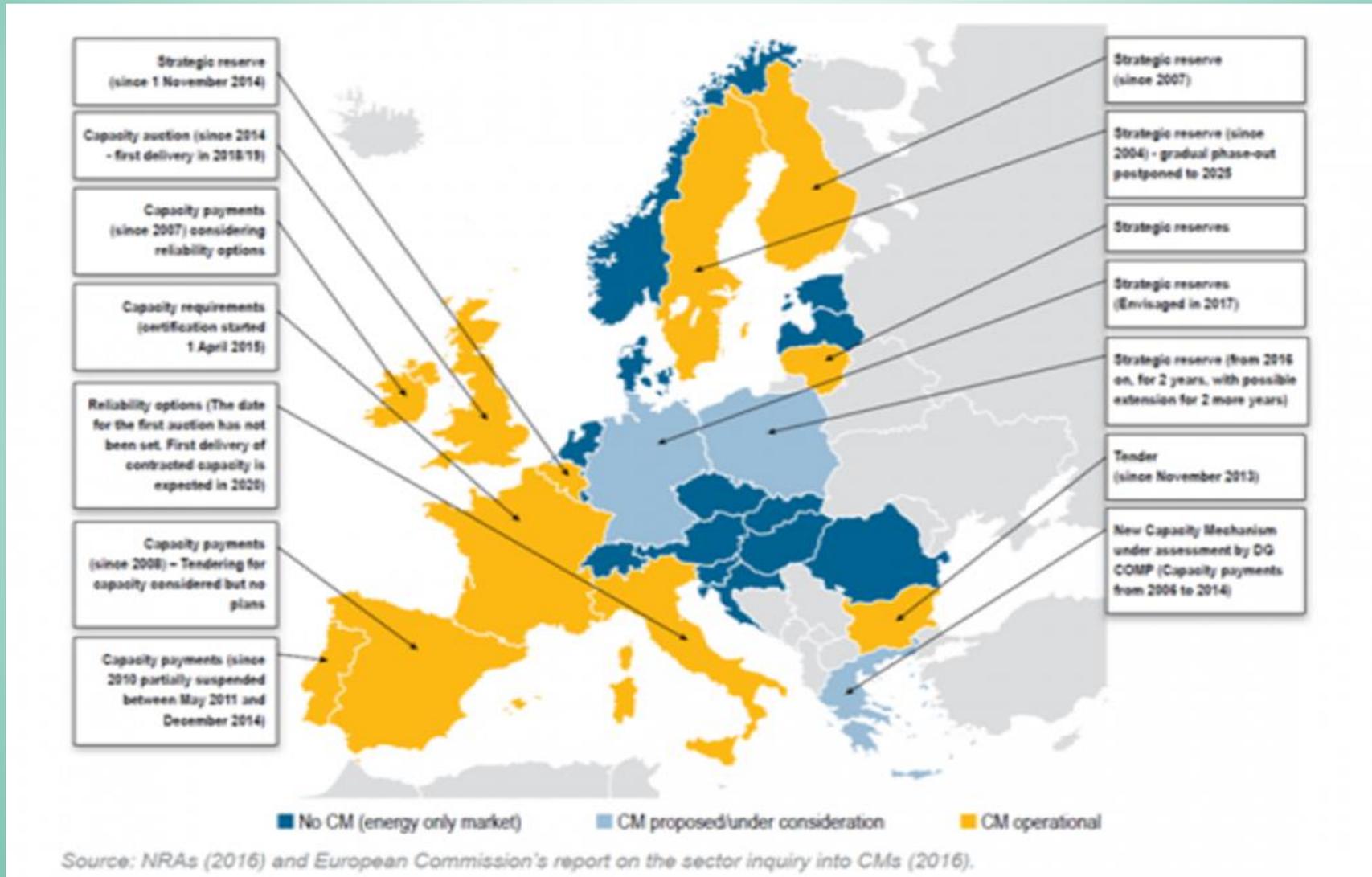


The Clean Energy Package and its Relevance for National Policies

**Nektaria Karakatsani,
RAE, Member of the Board**

15th IAEE European Conference, Vienna, 3-6 September 2017

Heterogeneous national policies: Capacity Mechanisms



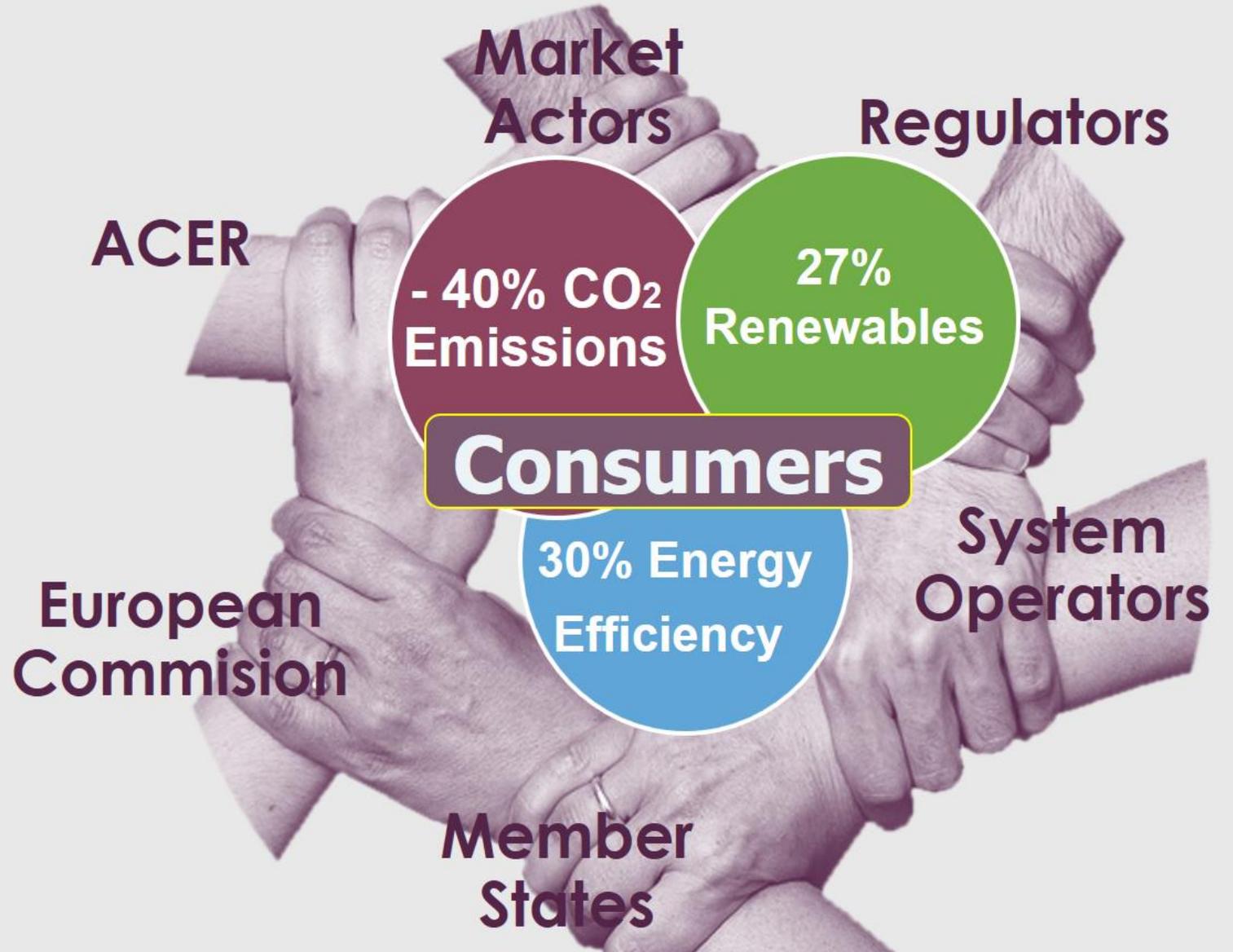
Still: Common Objectives and Challenges



**Several trajectories,
reflecting local specificities,
need to converge.**

Common Vision

Alignment
+
Coordination
+
Multi-sectoral approach



A holistic approach is being shaped

➤ A New Market Design:

Recast of the Internal Electricity Market Directive (72/2009)

Recast of the Internal Electricity Market Regulation (714/2009)

Recast of the ACER Regulation (713/2009)

➤ Climate Change Objectives:

Revised Renewables Directive 28/2009

Revised Energy Efficiency Directive 27/2012

Revised Energy Performance of Buildings Directive

➤ New Measures:

New Regulation on Risk-Preparedness

New Regulation on Governance of the Energy Union

Legislative
Proposals
for Clean
Energy
Transition

- Power sector is being redefined.
- The “3Ds”: **Digitalisation, Decarbonisation, Decentralisation.**
260 GW of RES, **>10 GW** demand-side response.

The Challenge of Adaptation

- Markets need to adapt to meet the **decarbonization challenge**, whilst safeguarding **security of supply** and ensuring **affordability**.
- New technical and business opportunities, local communities, new actors → Crucial and more active role of **DSOs**.
- Consumers can now actively interact with the markets through self-generation, demand response and storage → **Prosumers**.
- Markets **must evolve** to supply the products that consumers need.

How to stimulate competition and innovation in the short-term, while co-ordinating investments in the long term?

Electricity Markets: Challenges at EU Level

- **Impact of RES**

RES suppress SMP and displace conventional plants, while requiring **flexible** systems.
More than 20 GW of gas plants have **mothballed** in Europe.

- **Challenges for SoS:** Coal and Nuclear phase-out plans.

Storage: Crucial. Still, needs to make its business case + **barriers**.

- More ambitious **environmental targets** for 2030.

Transition to **feed-in-premium** + RES auctions: to alleviate distorting impacts.

- **More than a trillion investments** are required in infrastructure and capacity.

- **Higher overall costs**, often distributed across **stagnating demand**.

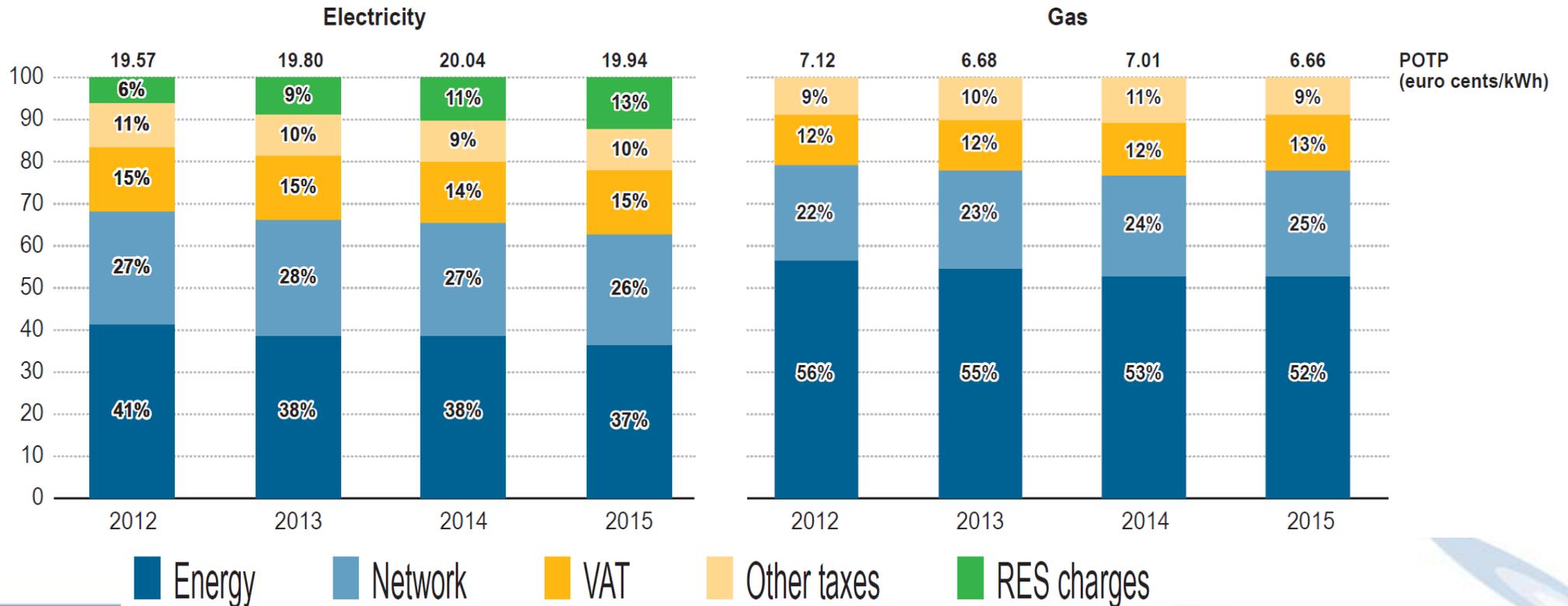
Retail prices: **irresponsive** to wholesale price drops.

Consumers' benefits and involvement need to get enhanced.

Share of non-contestable charges in energy bills keeps increasing

- ▶ RES induce **lower wholesale** prices, feeding into consumer bills.
- ▶ But, **subsidies** and other levies have **risen**, squeezing competition effects.
- ▶ **Better market functioning** is being partially offset by **governmental interventions**.

Household Energy Bill Composition, ACER/CEER MMR



Regulators' Reactions to Winter Package

Seven Fundamental Principles for a Well- functioning Energy Union

- Maintain and enhance **security of supply**.
- Promote **competition** and avoid cross-subsidies.
- Promote **cost efficiency and sectoral synergies** in delivering benefits to consumers.
- Ensure that EU legislation allows **flexibility for innovation and national / regional developments**.
- **Consistency** with 3rd Package and NCs implementation.
- Avoid **over-regulation**, so as not to stifle markets and overwhelm consumers.
- Ensure robust European **regulatory system**.

Some Controversial Issues

- Capacity Mechanisms
- RES Priority
- Harmonisation of tariffs
- Interconnectivity Target
- Regional Operational Centers
- Regional Governance
- Aggregators
- Mandatory vs. subject to cost-benefit analysis

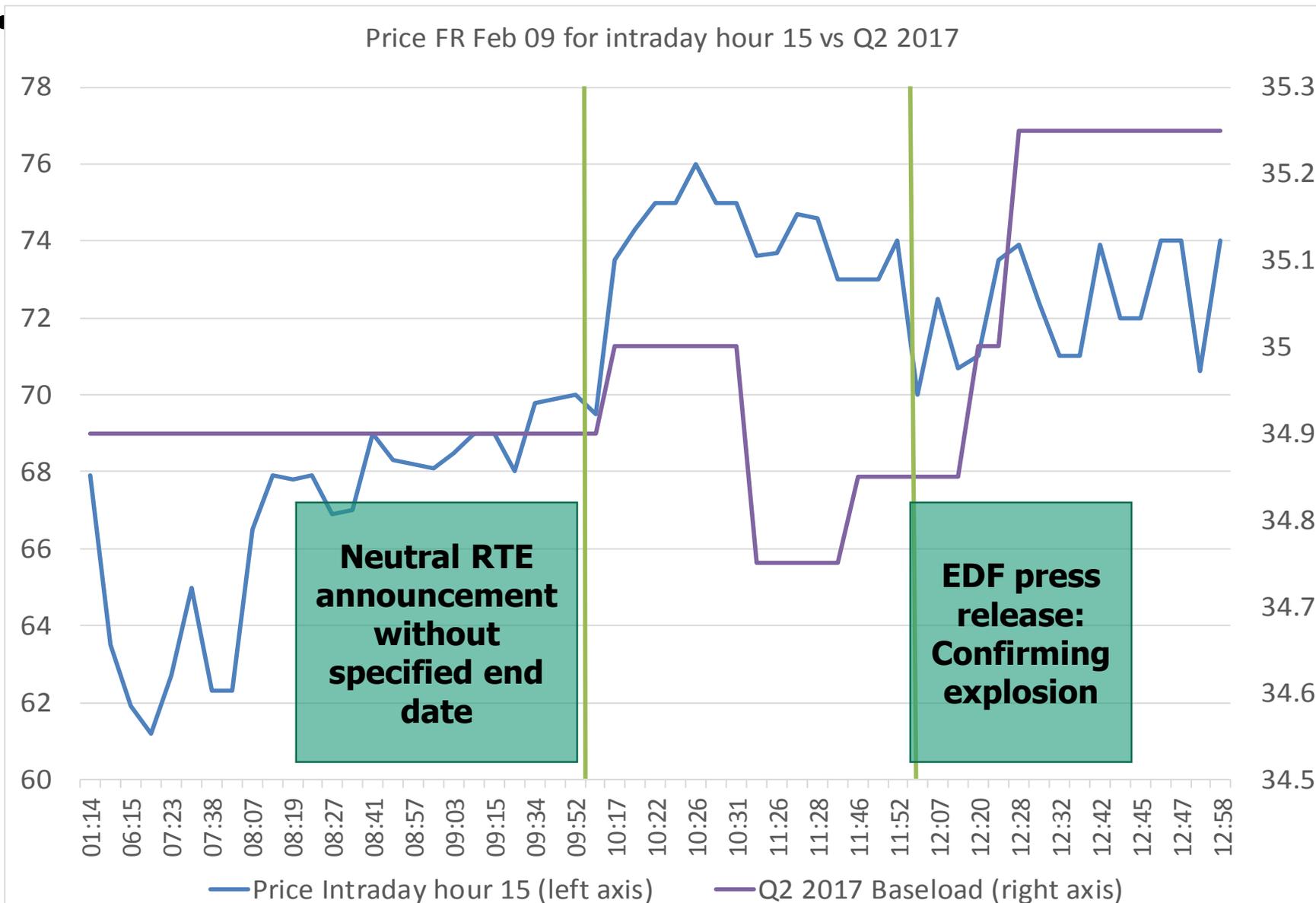
Overall: The right balance between EU, regional and national levels remains a challenge.

Regulators' Views

Efficient Price Formation - Scarcity Pricing

- Level playing field: All market participants should face the **same signals and balance responsibilities**.
- Currently, **efficient price formation in times of scarcity is not always achieved in several markets**.
- This can be due to the **existence of price caps or floors, fear of regulatory intervention** or through **political interventions**.
- Need to incorporate the concept of **Value of Lost Load (VoLL)** when assessing price limits.
- Allowing prices to reflect scarcity implies market efficiency, creates **investment signals**, has the **potential to lower costs** and to provide a more efficient use of the grid.

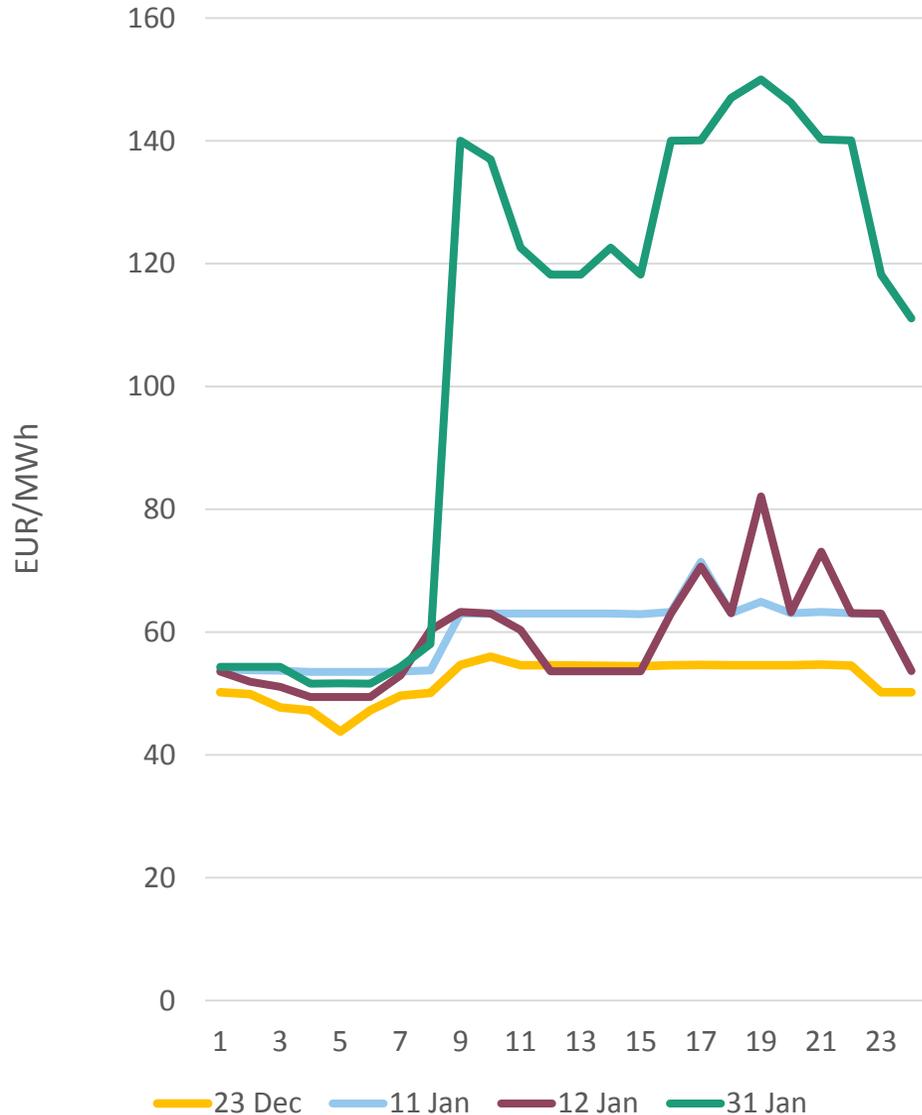
Price Reaction: France, 9.2.2017 Explosion at Nuclear Plant



- **Initial announcement:** Market participants assumed a 'normal' short-term outage -> **Impact on intraday and day-ahead markets.**

- **Confirmation of explosion,** underlining the severity of the outage -> **Stronger impact on forward products.**

Price Reaction, Greece, Energy Crisis, 19.12.2016 -13.2.2017



Electricity Market:

- ❑ Limited **scarcity pricing**: SMP \sim 50 €/MWh in phase 1, \sim 80€/MWh in phase 2.
- ❑ Limited **hedging tools**: imports and NOME.
- ❑ Strong incentive for dominant player, as net buyer, to retain **low SMP**.
- ❑ Low prices led to **escalation of exports** (up to 20 GWh).

Transition to target model in 2018 + market structure.

Gas:

- ❑ Supply contracts: no terms to **prevent overconsumption** under gas scarcity.
- ❑ Additional **balancing cost was limited**, not reflected in electricity.

Balancing platform is expected in Q4 2017.

Investment Signals and Infrastructure

- **Avoid overcapacity** by:
 - Coordinating the assessment of resource adequacy (ENTSO-E).
 - Harmonizing principles on key technical aspects (ACER).
 - Maximizing interconnectors' utilization.
- **MS to derive reliability standards. Regional risk assessments** and crisis mitigation plans.
- **Well-designed CRMs** are possible, under conditions, if justified. **New framework.**
- **Harmonization** of transmission and distribution tariff structures is **not merited.**
- A **uniform interconnectivity target** of 15% could result in perverse incentives.
- EU-wide **10-Year Network Development Plan** should be subject to regulatory approval.

Capacity Mechanisms: Issues

- Market **reforms** should come **first**.
- Recognition that **SoS concerns may still remain**.
- National and regional adequacy studies may capture additional aspects.
Are they allowed to **complement** the **pan-European assessment**?
- **Emission Standard for Generation**: 550 gr CO₂.
Beyond ETS? Subsidies to polluters?
- France: Is a **Regulation or a Directive** the right instrument?
- **Regional scope** remains crucial.
- ROCs: Supplementary or core functions? **Will TSOs become redundant**?
- Regional scale of crises - Is **XB contribution realistic**?

Renewables

- Currently, **national targets**: RES share **20%** of final energy consumption by 2020.
- A **new EU-wide target** is introduced: **27%** by 2030.
- **1 trillion €** investments will be required over 2015-2030.
Investments **dropped by 60%** compared to 2011 (costs + retroactive changes).
- **Investor confidence is crucial**
Level and conditions of support **not to be revised** in a way that negatively impacts rights and economics.
3-year national schedule, indicating budget, capacity, timing and design of each scheme.
- Support schemes: if inevitable, they should be **co-ordinated**.
Mandatory participation of RES in other Member States.

National 10-Year Energy and Climate Plan

- **Coherent strategy**: Integrating 31 existing plans, deleting 24.
- Combines reporting and planning obligations on 5 dimensions:
SoS, Climate, Energy efficiency, Energy markets, Decarbonization, R&D.
- Specific template: to be submitted by 1st January 2019, revised every 2 years, assessed by EC.
- **Content** includes: Binding **emission** reduction objectives, contributions to **RES**, indicative energy **efficiency** targets, **land use** reductions, national objectives on **diversification** and reduction of import dependency.
- If progress inadequate, one of the options is to **contribute to a financing platform for RES projects managed by the EC.**
- Framework for agreements between MS?

Regulators' Views on Renewables

- Remove priority dispatch **for existing RES, apart from new ones**, so that:
 - Cheapest plant should operate to meet demand, irrespectively of technology.
 - Pervasive outcomes are avoided, e.g. RES might refrain from updating outdated components.
- Priority is not a right with indefinite duration but **an interim measure to promote non-mature RES technologies**.
- Avoid non-market approach to re-dispatch and RES curtailment.
- Avoid net metering, to ensure that **self-generators pay their fair share of network and system costs / charges**.
- **Signals of the time value** of energy and network capacity should be **available to all**.
- Net metering reduces consumers' sensitivity, which undermines efforts to enhance flexibility.
- **Unfair cross-subsidization** by other consumers.

Consumers

- 24-hour supplier switching process by 2025 if CBA is positive.
- Keep required consumer bill information simple.
- Mandatory sector-specific certification of Comparison Tools not recommended.
- Enabling suppliers to offer dynamic tariffs - but requiring them to be provided could harm retail competition.
- Maintain a flexible approach to Smart Meter roll-out.
- Data interoperability more important for retail functioning than common data standard.

Energy Community Projects – The Case of Oxfordshire

Oxford Buses: Facts and Benefits



- **140** kW installed capacity
- **540** Solar panels
- **122 MWh** Annual generation
- **20%** of electricity needs delivered by the project

- **Savings:**
- **£5K** saved on electricity bills in the 1st year
- **ZERO** cost for the installation of the solar panels
- **£120K** in community benefit funds over the 25-year project

- **Environment:**
- **121.3** tonnes of CO2 emissions avoided since October 2013
- **3.5** carbon-free trips around the world a bus could make on the renewable energy the project has generated so far.

Buildings : A Huge Challenge



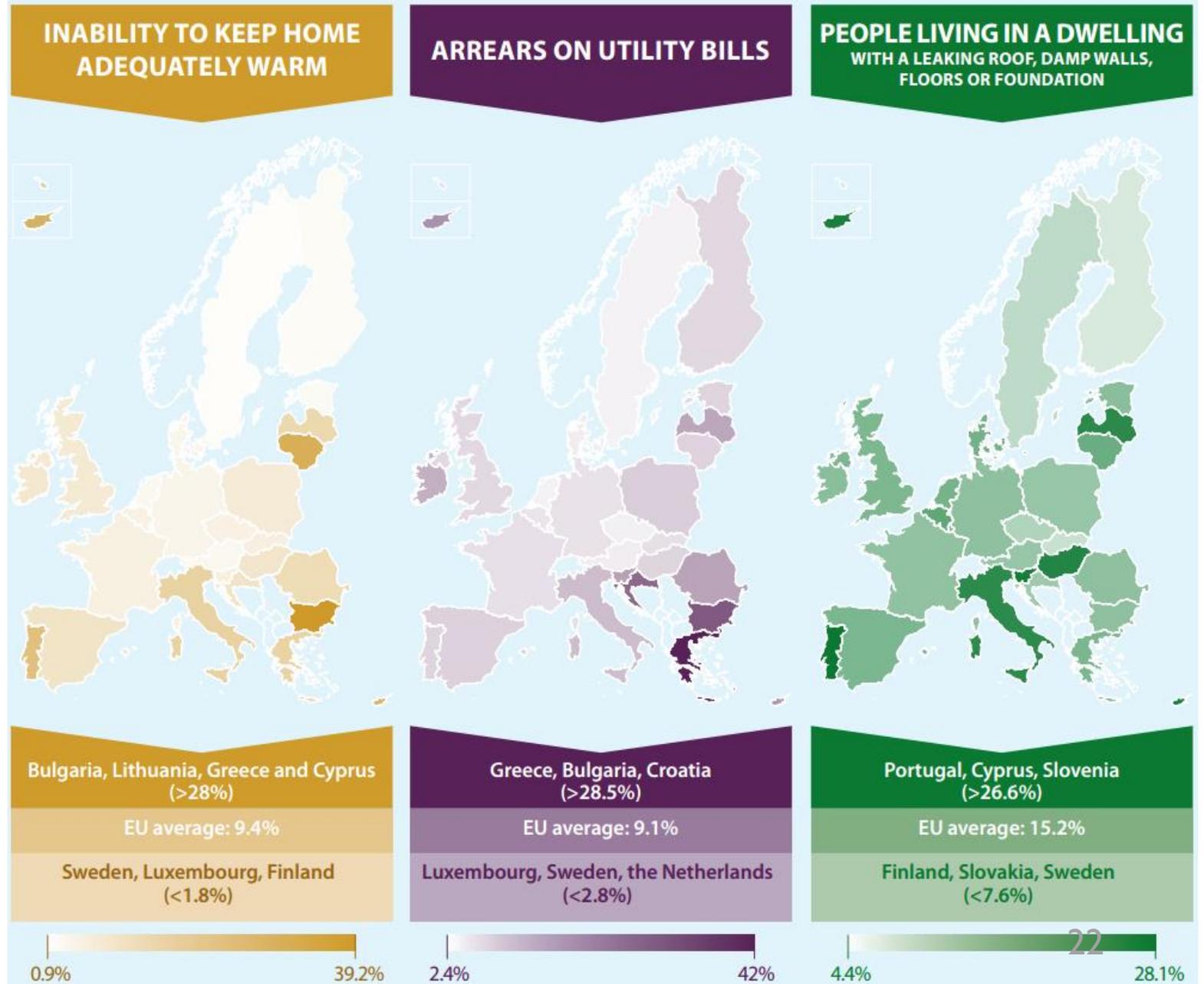
IS EUROPE READY FOR THE SMART BUILDINGS REVOLUTION?



Energy Poverty Map (Source: BPIE)

- Consistent Indicators
- Monitoring
- Best practices
- Vulnerable consumers
- Safeguards before disconnections
- Support in energy efficiency
- Priority in renovations

RAE proposed a revised framework for Social Tariffs and Public Service Obligations in Greece.



Energy Poverty

- MS: to reduce energy costs for consumers by supporting **energy efficiency investments**.
 - **Priority** to households affected by energy poverty or social housing.
 - Implement procedural safeguards before a consumer is disconnected.
 - **MS to monitor and report on energy poverty.**
 - EC to co-ordinate efforts and facilitate exchange of best practices.
 - **Energy Poverty Laboratory: Transparency and Public Engagement**
To address challenges in data quality / availability, policy transfer, dissemination of results.
 - Regulators: **Competition** yields options, cost efficiency and hence, energy savings.
 - **Regulated prices below costs are not the right instrument.**
- Instead: **Social welfare schemes that do not interfere with competition in the market.**

Integrating Wholesale Electricity Markets: Facts and Benefits

Day-ahead Markets:

- **1 B€** annual gains in social welfare
- **84%** efficient utilisation of capacity
- **1500 TWh** (~**50%** of consumption) traded on PXs

Intra-day Markets:

- **120 TWh** traded on main PXs in 2016
- **3.6%** annual volume growth over last 5 years

Balancing Markets:

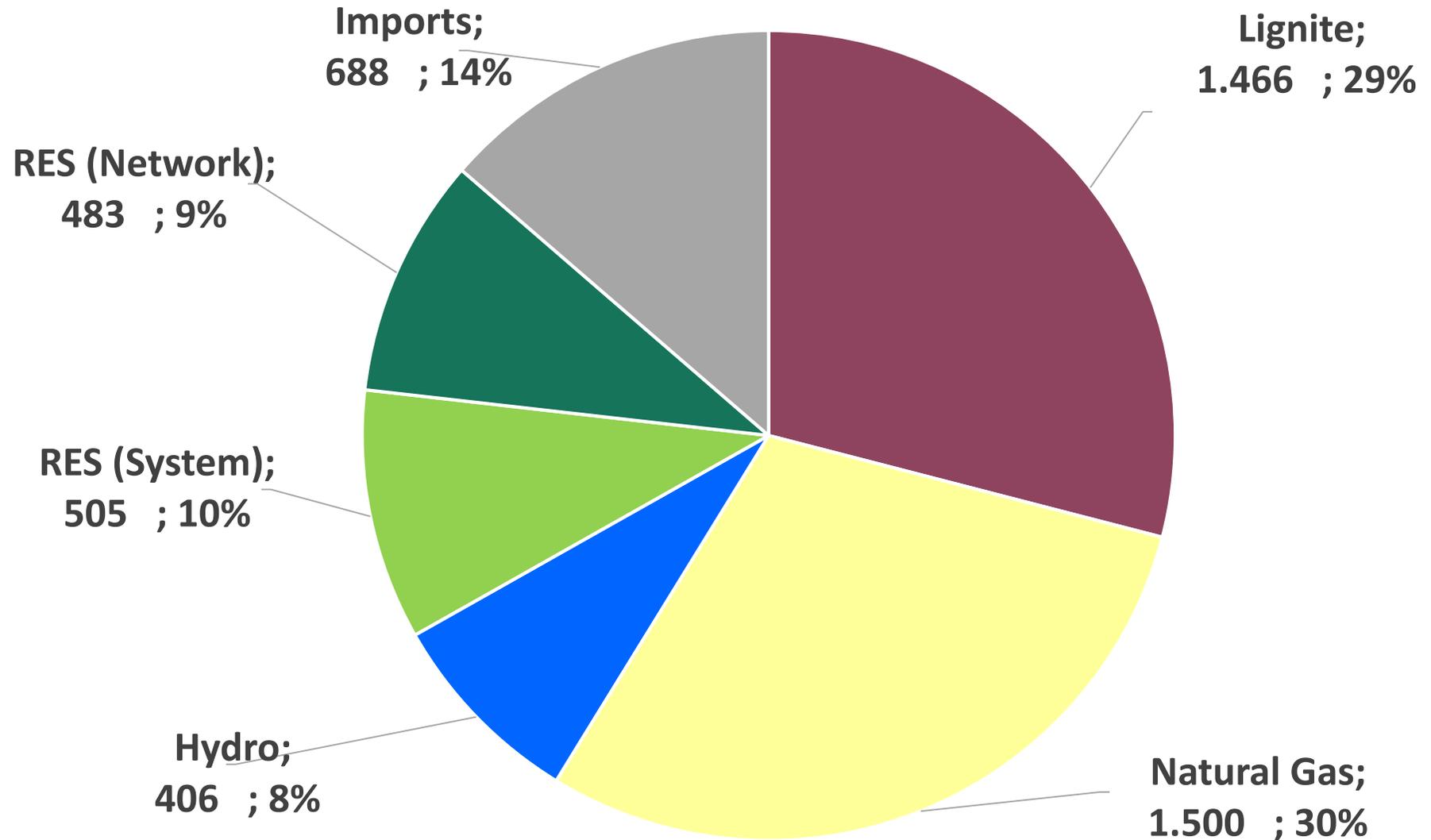
- **3 B€** further benefits expected

Derivative Markets:

- Market **trust**, Efficient **planning**
- Liquid derivatives, Efficient **hedging**

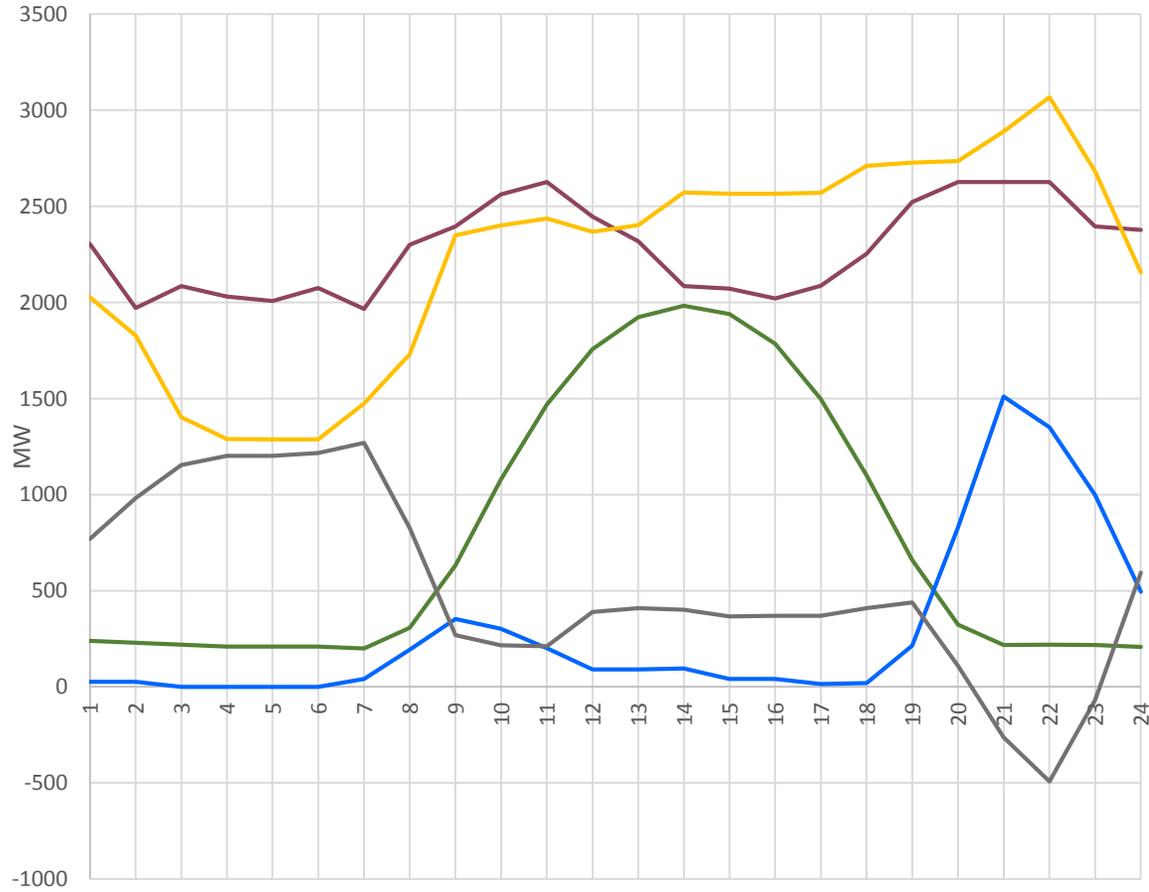
Energy Mix (GWh), July 2017

5.048 GWh

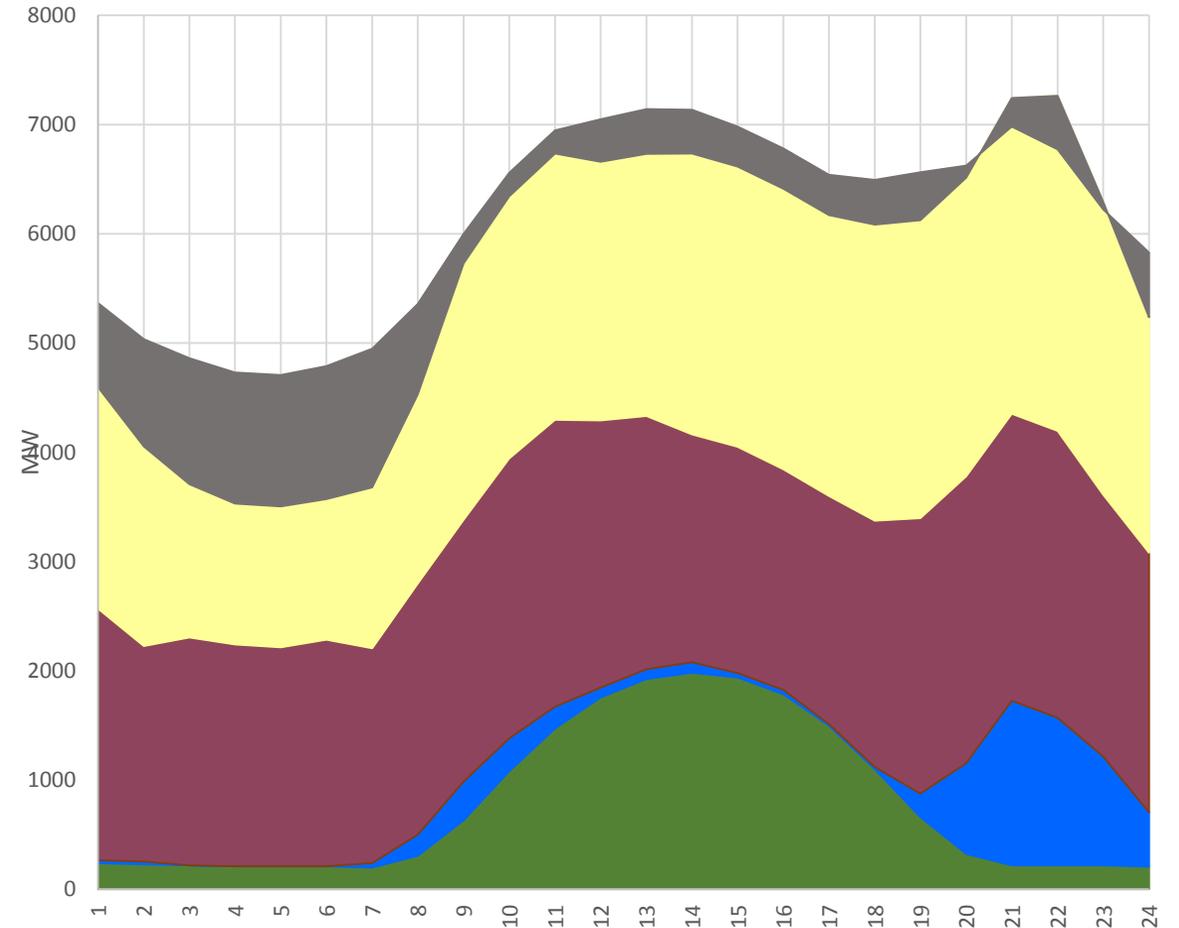


Intra-day Energy Mix - 05.09.2017

Generation mix 05-09-2017



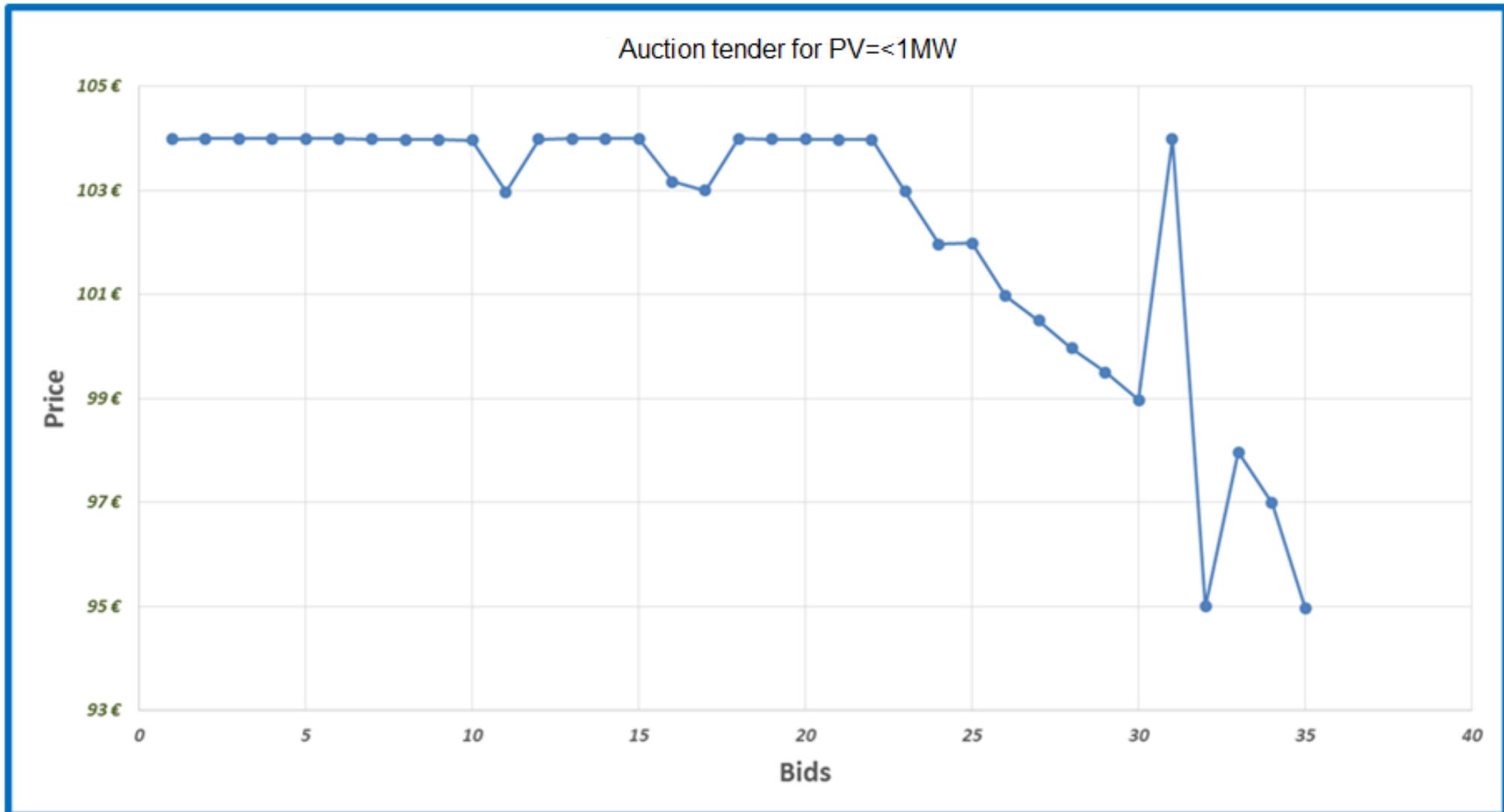
Generation mix 05-09-2017



Renewables Hydro Lignite Gas Net imports

Renewables Hydro Lignite Gas Net imports

RES: Pilot auction for PV ≤ 1 MW (Dec 2016)

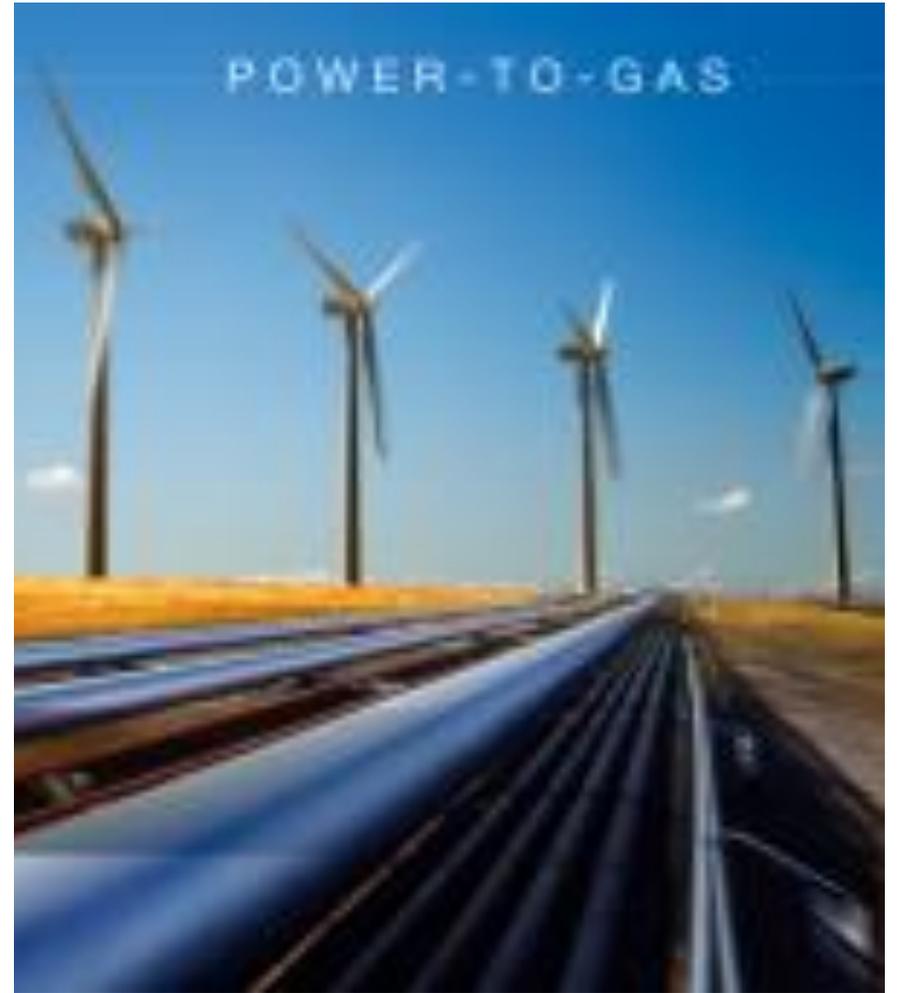


Old quotes. Relevant for the Energy Transition?

- “If you wish to create tension, simply try to change something”
- “Out of discord comes the fairest *harmony*”
- “The only constant is change”
- “Everything rests by changing”

Thank you for your attention

Future: to be invented



- Supplementary material

Remarks on Pilot Auction and New RES Framework

- **Competition** emerged in both categories (small and large projects) - **40 MW total**.
- **Significant reduction in prices** compared to reference values:
 - Category I ($\leq 1\text{MW}$): Price range: 94.97-104 €/MWh → **weighted average price: 98.78 €/ MWh**
 - Category II ($> 1\text{MW}$): Price range: 79.97-88 €/MWh → **weighted average price: 83.3 € / MWh**
- Simultaneously, the price outcomes render the **projects viable**.
- Law 4414/2016 introduced the new RES framework.
- A **new RES support mechanism**, compatible with AEEG, based on the **Sliding Feed In Premium**, was approved by DG Comp (November 2016).
- Permanent Scheme: Auction procedures specified via a Ministerial Decision, following **RAE's opinion (submitted in March 2017)**.
- **RES participation** in the market – Next **challenge**

Operating framework for aggregators, Last resort aggregator, transitional mechanism of optimal precision, management information systems and requirements for RES stations.

Energy Markets Integration: An ancient analogue ?

- Antikithira mechanism, 100 BC
- Hipparchus (?), Rhodes
- 30 gears of different size, 10 axes
- Complex calculations
- Accurate predictions

- 28 countries, heterogeneous
- 14 principles in Energy Union

✓ **Our challenge:**
**To join forces to deliver
value for the consumers**



Capacity Mechanisms

- Reference point: Mid-Term Adequacy Forecast, 10-year horizon, by ENTSO-E
- If the above study does not indicate adequacy concerns, a capacity scheme cannot be introduced.
 - For mechanisms in place, new capacity contracts will not be concluded.
 - Open to all types of resources.
 - Emission Standard for Generation: 550 gr CO₂ immediate effect for new, 5-year transition for existing
 - Auction-based, technology neutral, harmonized rules for technical issues according to methodologies proposed by ENTSO-E and approved by ACER.
 - Reliability standard: based on VOLL and CONE
 - Cross-border participation
 - XB Capacity calculated by Regional Security of Supply Coordination Centers
 - TSOs to validate eligibility and availability of resources
 - Existing mechanisms to become compliant
- Allow scarcity pricing, remove distortions, develop interconnections, storage, consult with neighbouring MS.

Key Energy Reforms: Update

- The European Commission today presented a legislative proposal for a reliable and transparent Governance of the Energy Union to help the EU meet its climate and energy policy goals until 2030 and beyond. The proposed Regulation has been developed together with initiatives on renewable energy, energy efficiency and the design of the electricity market. It will ensure policy coherence, investment certainty, improved coordination between Member States and reduced administrative burden. The proposal also builds on and integrates existing requirements for planning, reporting and monitoring in the energy and climate fields. Together with the other initiatives of the Clean Energy for all Europeans package, this will ensure EU households and businesses have access to secure, sustainable, competitive and affordable energy.
- The proposed legislation will be particularly important for achieving the EU's 2030 targets for renewable energy, energy efficiency and greenhouse gas emission reductions. It sets out the requirements for integrated national energy and climate plans and a streamlined and inclusive process to establish them. Stable national energy and climate plans up to 2030 will provide regulatory stability for investment certainty and transparency on national efforts.
- Sufficiently ambitious and coherent national plans, Commission recommendations and additional measures at EU and national level as necessary will help to ensure that the objectives of the Energy Union are met.
- By reducing and integrating a number of existing planning, reporting and monitoring obligations, the proposal will significantly reduce the administrative burden for Member States, the European Commission and other EU institutions. At the same time, Member States will have significant flexibility to take account of specific national circumstances and preferences.
- The European Commission has already presented proposals to deliver emission reductions in large industrial installations and power-plants as well as in other key sectors such as transport, buildings, agriculture and waste. It has also presented a proposal to bring the land use and forestry sector in to the EU's emission reduction efforts. Together with these proposals, the Governance Regulation will ensure that the commitments of the European Union and its Member States under the Paris Agreement on climate change are achieved, in addition to meeting the broader objectives of the Energy Union.

Key Energy Reforms: Update

- Private and corporate investment plays an important role in successfully implementing the transition from highly emitting to low or zero carbon energy production for all energy services: power, heating & cooling, as well as transport. Utility companies are struggling to develop future-proof business models, and new players are entering the energy sector. **IT companies are revolutionising the energy system, large retailers are stimulating demand and decentralised, community-based projects are gaining momentum.**
- The transition towards a decarbonised energy system requires enabling regulatory and legislative authorities to make networks and markets ready for rapid growth of new energy sources and new market players. **A range of policies are designed to attract investors and facilitate innovation.** Pressing questions arise, such as how to develop and maintain reliable regulatory frameworks that support confidence and promote bold investment in decarbonisation.
- The Paris Agreement is widely considered to be an excellent enabler for strong momentum toward green investment, because it provides a reliable framework for widely accelerated growth in the domains of renewable energy and energy efficiency. At the same time, this momentum may falter, as policy changes appear highly likely in the US. The panel will address current challenges and opportunities.

- To make the transition, the EU would need to **invest** an additional €270 billion (or on average 1.5% of its GDP annually) over the next 4 decades.