

Implementation of Article 12 Workshop 1






July 1st 2021



Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

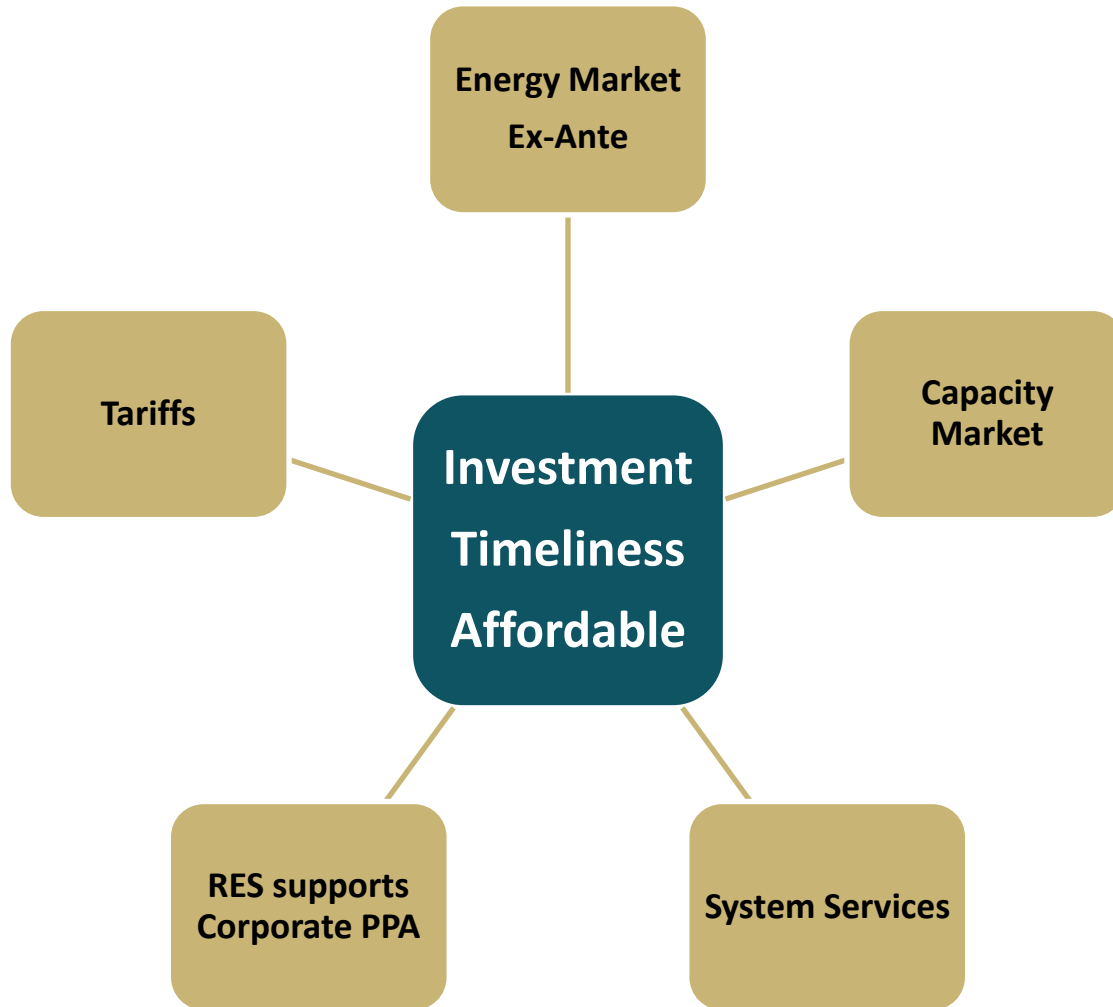
Transforming the system for the future

		2020	2030	2040
<u>Installed Wind</u>		5000 MW	15000 MW	> 20000 MW
<u>Annual RES-E</u>		~40 %	70 %	>9 %
<u>Real Time limit/SNSP</u>		70%	>95 %	>95 %
<u>Curtailment</u>		5-7 %	~0 %	~0 %
<u>Exports/Sector coupling</u>		50:50	70:30	90:10

Markets drive 3rd party Investment

- Investment
 - Clarity on risk
 - Appropriate reward
 - Credible threat of enforcement
- Timeliness
 - Market maturity
 - Need increases in line with connecting renewables
- Affordability
 - Transition cost to be able to manage 100% SNSP
 - Active participation demand side in all markets improves affordability

Markets driving necessary investment



There are many “markets” that make up the environment to drive 3rd party investment in a timely affordable manner

But are our markets delivering 70/30?

Type	Investment	Timeliness	Affordability	70/30
Energy	More volatility and lower prices reduce investment for energy. Conventional use Energy outcomes with carbon as exit signal	Energy not driving complementary investment in a timely manner	Energy market drives value only for 30% of the volume in 2030.	Need effective energy market aligned to other markets, supports and operational practice
Capacity	Has had some success in attracting new conventional capacity. But not good for new tech. Not clear investment is the right investment?	Market discipline is poor in that money given out and capacity not being made available. Periods of scarcity estimated in 2023/24 will need careful management	Reasonably efficient if it delivered	Need to review modelling forward, new tech and market discipline if it is to get complementary investment
Supports/ Corporates	Rollout of support programmes to make RES projects investible.	RESS designed to deliver new RES in line with objectives. Need NI version soon	Approved scheme require competition. Need to look at oversupply and redispatch down costs	Use of supports needs to be monitored to ensure transition cost affordable. Alignment with markets and ops critical to avoid double payment
System Services	Rollout of new service arrangements apt for 70%	New Future arrangements needed to be effective by 2023	Need to move to volume regulation with appropriate CBA	Critical 3 rd party investment in solving technical scarcities with high RES

Agenda

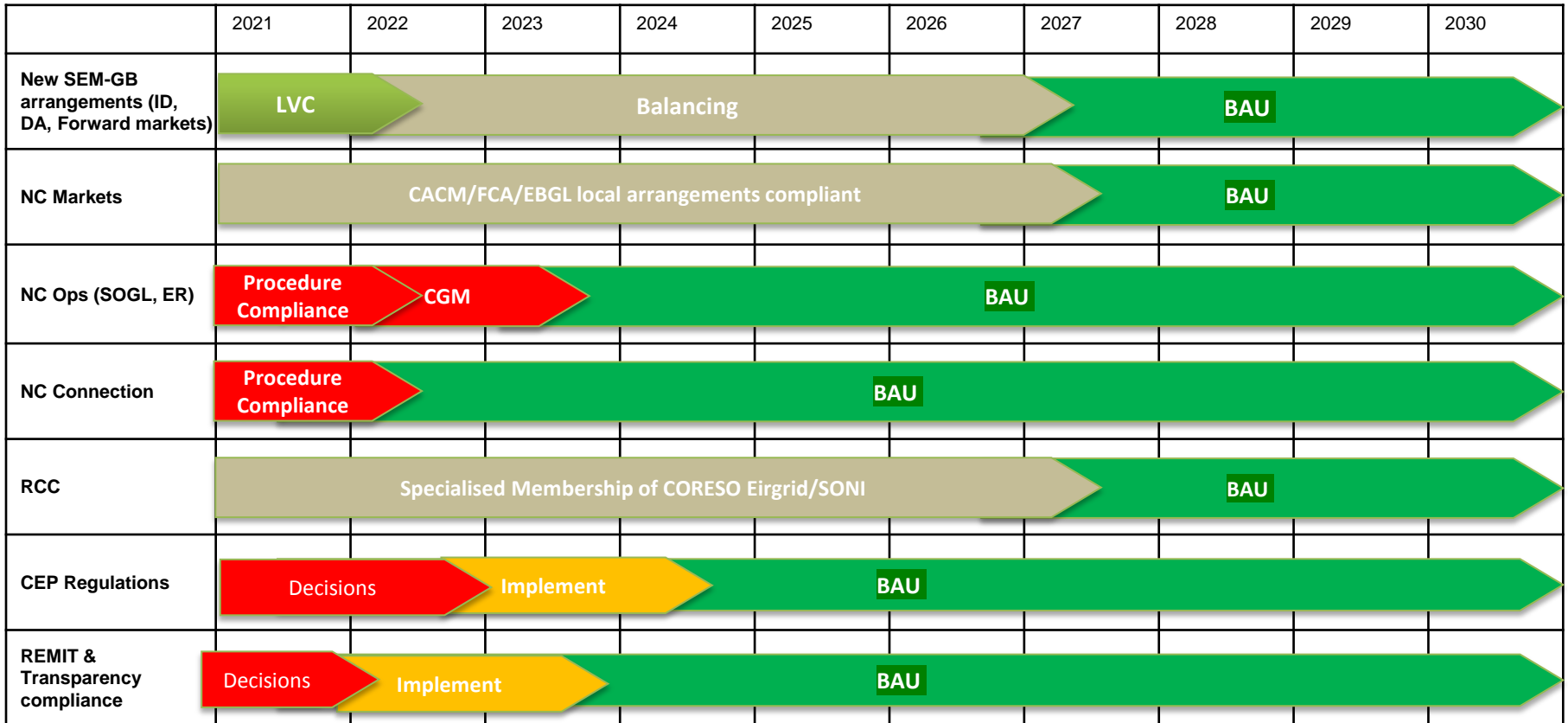
- *Introduction*
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

Agenda

- Introduction
- *Background to the Clean Energy Package*
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

Agree a plan to deliver for our partner...

Re-coupling to Europe with Celtic I/C



Agenda

- Introduction
- Background to the Clean Energy Package
- *Article 12 – impact of renewable generation without priority dispatch*
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

Article 12 – *renewable generation without priority dispatch*

- Article 12 covers dispatching of generation and demand response;
- Paragraph 2 provides for priority dispatch for renewable generators and IECHP where generation capacity is less than 400kW (also demonstration projects covered);
- This applies to connections after July 4th 2019 or where significant changes have been made (separate decisions have been issued in relation to eligibility criteria);
- The generation capacity limit for renewables reduces further to 200kW from Jan 1st 2026;
- This creates a new type of generator for consideration – the non-Priority Dispatch renewable generator;
- The implementation of Article 12 needs to develop solutions for the treatment of this kind of unit in the SEM;

Article 12 – *renewable generation without priority dispatch*

- The SEM RAs have issued a proposed decision SEM-21-027 following on from their earlier consultation on these matters (SEM-20-028)
- RA consultation perceives three categories of unit arising as a result of the Article 12 changes –
 1. Dispatchable units that would have gotten priority dispatch under previous arrangements;
 2. Variable / controllable units that would have gotten priority dispatch under previous arrangements;
 3. Non-controllable/non-dispatchable units (formerly autonomous) that would have gotten priority dispatch under previous arrangements;

Article 12 – *renewable generation without priority dispatch*

- The TSOs had considered the implications more broadly and see four parameters for each generator unit;
- Is the generator renewable – yes or no?
- Is the generator dispatchable – yes or no?
- Is the generator controllable – yes or no?
- Does the generator have Priority Dispatch – yes or no?
- Applying this matrix, there are 12 potential configurations which can apply to any generator (or demand side) unit;
- In reviewing these options, there is the potential that 4 (including the category 2 units) of these are not defined in current rules or systems;
- May be worth considering all these options if further workshops;

Article 12 – *renewable generation without priority dispatch*

- Key points of the consultation paper with respect to the treatment of three categories of unit arising as a result of the Article 12 changes
- Category 1 –
 - Treated as any other conventional dispatchable generator;
 - New units of this type will register as dispatchable with PD flag = no;
 - Testing required to ensure existing units can change PD status with no issues;
- Category 3
 - No options but to continue with current treatment
- Category 2
 - Units now register as "dispatchable"

Article 12 – *renewable generation without priority dispatch*

- Treatment of Category 2 units in the Balancing Market;
 - It is expected that these units will get ex-ante positions;
 - These units will submit physical notifications (PNs), based on ex-ante market positions, to TSO as required by any other non-PD generator;
 - These units will submit commercial offer data (COD) to TSO as per any other non-PD generator;
 - They should be considered in dispatch on an economic basis like any other unit;
 - There should not any separate merit order for balancing energy for non-priority dispatch renewables;

Article 12 – *renewable generation without priority dispatch*

- Treatment of bids and offers / Submission of PNs
 - View expressed that no change required is required with respect to COD and PN submissions for Category 2 units;
 - However, it may be considered further in later workshops;
 - The current working assumption is that there will be no change;
 - The presentations today make this assumption but open to wider views and considerations;

Article 12 – *renewable generation without priority dispatch*

- Treatment of Category 2 units in respect of redispatch for constraints -
 - Constraints will be applied to all non-priority dispatch units based on a market based merit order;
 - This will be based on the bids and offers of submitted by these units;
 - As with balancing actions, only one merit order will exist for the application of constraints to all non-priority dispatch units;
 - This ensures that treatment of Category 2 units will be in line with the treatment of other non-priority dispatch dispatchable generators;

Article 12 – *renewable generation without priority dispatch*

- Treatment of Category 2 units in respect of redispatch for curtailment;
 - Curtailment will be continue to be applied on a pro-rata basis where required to all non-synchronous units;
 - Where pro-rata curtailment is applied, it will not be based on any decremental bids submitted by Category 2 units;
 - This approach may represent a significant challenge for optimisation software;
 - It means that one set of actions against one unit to be considered with two prices - one as submitted, one for curtailment;
 - It is potentially further complicated by the central dispatch nature of the SEM;
 - Are market based curtailment solutions possible?

Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- *Article 13 – compensation and its impact*
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

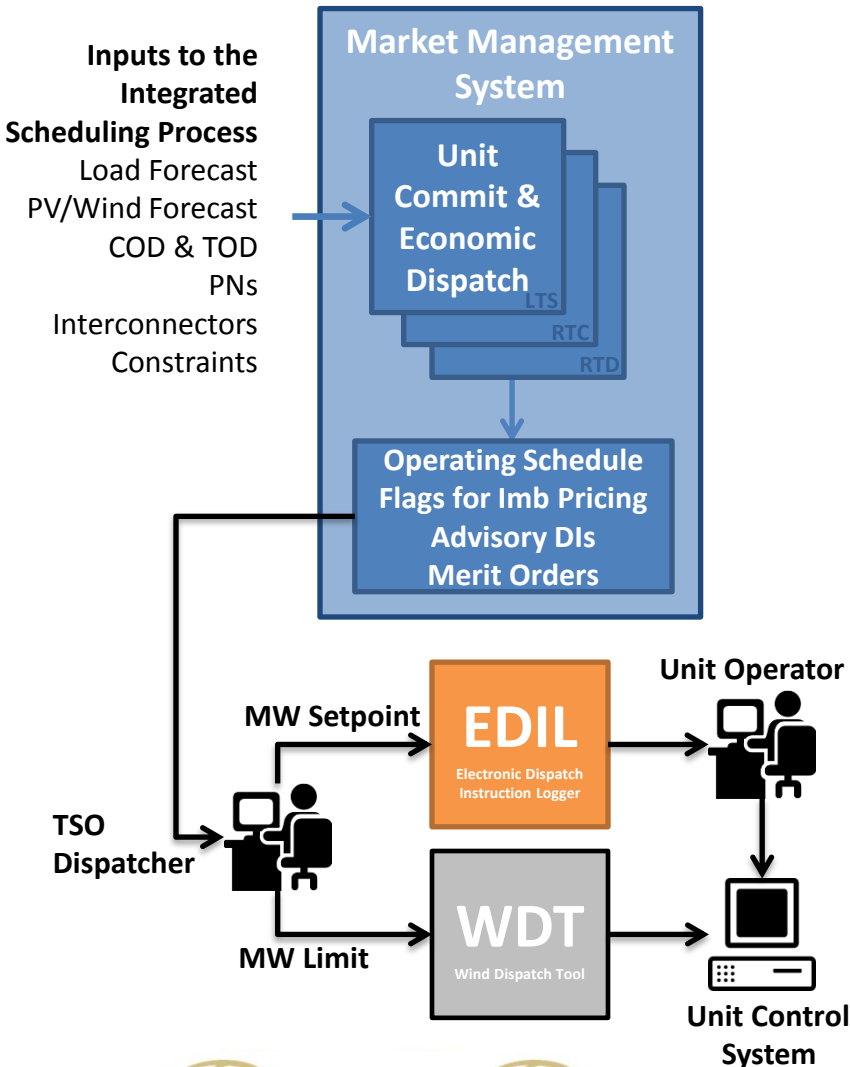
Article 13 – Impacts

- SEM-21-026 sets out a further consultation on the implementation of Article 13 of the Clean Energy Package;
- Follows on from previous consultation (SEM-20-028) from last year making new proposals in light of participant responses;
- It is expected that decisions around this will also have bearing on the implementation of Article 12;
- Levels of compensation may need to be considered in how the system is dispatched;
- For example, minimising the cost of non-market based redispatch may become a consideration;
- How actions are recorded/reported will have to be considered;

Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- *Background to current system operations/treatment of wind*
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- Next steps

Current Scheduling & Dispatch



Treatment of PV & Wind in each system

Starting point for PV/Wind schedule is TSO forecast
 Scheduling PV/Wind on aggregate
 Using pseudo prices to give effect to priority dispatch
 Network security considers Wind/PV at unit level

Online Merit Order updating every 5 minutes
 PV/Wind virtually at bottom of Merit Orders and dispatched once all other actions are exhausted

EDIL facilitates Generators AGUs DSUs Batteries
 Single dispatch action = One dispatch instruction
 Typical block of energy c 40 MW single unit

Wind Dispatch Tool supports dispatch of Wind+now PV
 Single dispatch action can issue 100+ instructions
 Typical block of energy < 1 MW single unit

Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- *Possible solutions (incl. high level of potential changes to TSO systems)*
- The forward work program over the next 3 years
- Next steps

Potential Changes/Possible Solutions

What we understand as scale of the change

- Know that it is challenging for the existing systems and processes

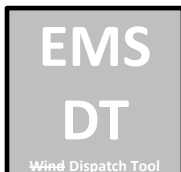
Considerations for Possible Solution



- How do we separate our forecasts of intermittent data from market participants' PNs from this new unit type? Will PN data be better or worse than our forecasts of intermittent data?
- Expect to have a single price for any single block of energy
- How many P/Q pairs might there be for each this new unit type? Merit Order likely to grow substantially and so changes may be required to keep it usable?



- How Dynamic might PNs and COD be? E.g. How active does CC need to readjust purely for price changes?
- EDIL works in integer Dis, non-integer EDIL Dis not practical
- EDIL requires 24/7 operation, not suitable for all participants
- Number of 'dispatchable PV/wind' units influences the practicality of the solution



- How might we bring commercial data (online merit order) from MMS into Energy Management System DT?
- Can the band order functionality be part of the solution?

What else needs to be considered?

- Other drivers for change: Scheduling Reserve on PV/Wind, "Prevailing Wind" issue, Classification and reporting of Constraint v Curtailment

Ongoing work

- Developing concept designs to link MMS and EMS Dispatch Tool based on latest SEMC paper and this workshop.

Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- *The forward work program over the next 3 years*
- Next steps

Article 12 – *renewable generation without priority dispatch*

➤ Timelines for implementation

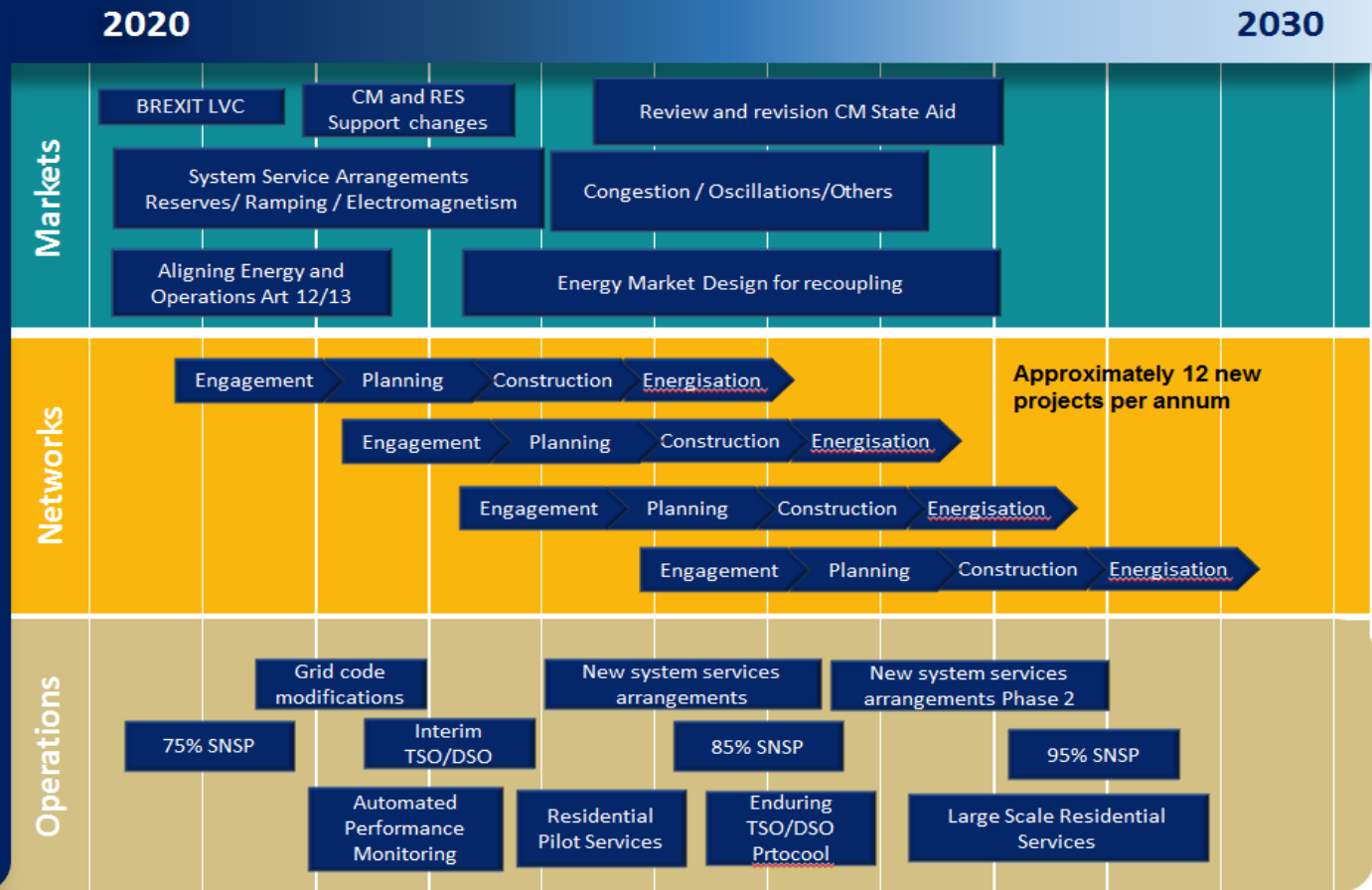
The Regulatory Authorities propose that following publication of this Proposed Decision;

1. At least one workshop is held by the TSOs and SEMO with interested stakeholders to discuss design requirements for a solution.
2. Within three months of the SEM Committee's Final Decision, a paper is prepared by the TSOs and SEMO setting out the detail of interim and enduring implementation proposals and associated timelines, considering feedback received through workshops with stakeholders.
3. This submission will then be subject to final SEM Committee approval.
4. Any required updates to the TSOs ruleset published in SEM-13-011 are submitted to the SEM Committee for consultation.

Shaping Our Electricity Future

Guiding Principles

- 70% electricity from renewable sources
- Customer centric - transparent engagement
- Economically meet the Renewable Ambition and maintain power system reliability
- Collaborative support from government, and regulators is a key success factor
- Maximize the use of the existing grid
- New infrastructure investment is needed
- New clean conventional generation is needed
- TSO and DSO collaboration is a key success factor
- 40-50 network reinforcements is the assumed feasible capability
- Network planning considers grid development beyond 2030 to 2050



Energy Market

Descriptor	Start	End	Resourcing
BREXIT – LVC	Oct 2021 ?	1 Jan 2023 ?	Medium
BREXIT – Balancing Platform	Keep the same until reintegration with EU		
Article 12 – Dispatching RES to market	Oct 2021	Oct 2023	Medium
Article 13 – Non Market Compensation	Oct 2021	Oct 2023	Small
General Non compliance tidy up	Oct 2021	Oct 2023	Medium
Reintegration Market – Self / Central - Ex post ex ante imbalance setting	Jan 2023	Dec 2026	Large

Future Arrangements

Descriptor	Start	End	Resourcing
HLD Design of Future Arrangements	2020	Dec 2021	Small
Detailed Design of Daily Auction	Jun 2021	June 2022	Large
Vendor Selection and Build	Sep 2022	Apr 2024	Large
Modification for Energy Consumption SEM Market	Jun 2021	Jun 2023	Small
Fixed Term Contracts	Jun 2021	Dec 2022	Medium

Capacity Market

Descriptor	Start	End	Resourcing
Short term Security of Supply	June 2021	June 2024	Medium
CRM Improvements for medium term	September 2021	September 2022	Small
Review of need and design of CRM for State Aid approval	Jan 2023	Jan 2025	Medium
Implementation of new CRM for Reintegration	Jan 2024	Jan 2027	Large

Forward Work Programme

- Based on the synergies identified so far two programmes emerge to advance work towards Implementation
- Will be integrated into the Business Planning Process

Market Scheduling & Dispatch

Article 12

Article 13

Common Grid Model

Synchronous Condensers / Energy Payment in Market

Wind Dispatch Tool improvements

FFR

ESPS

System Services Future Arrangements

System Services Auction Platform and Settlement System

- **Control Centre Tools will continue into 2022**

Agenda

- Introduction
- Background to the Clean Energy Package
- Article 12 – impact of renewable generation without priority dispatch
- Article 13 – compensation and its impact
- Background to current system operations/treatment of wind
- Possible solutions (incl. high level of potential changes to TSO systems)
- The forward work program over the next 3 years
- *Next steps*