DS3 and Qualifier Trials Update

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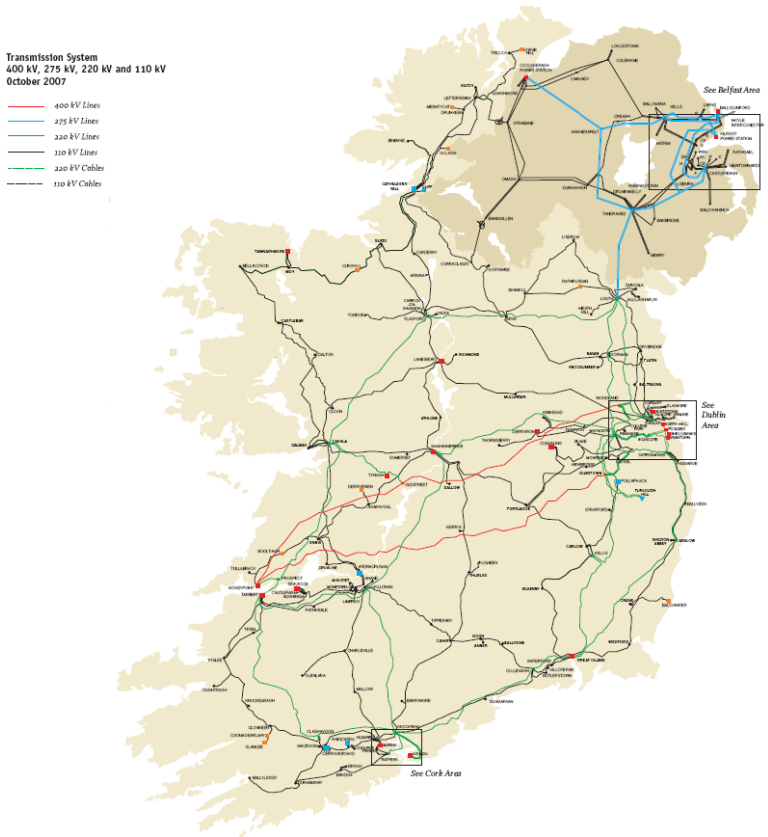
EirGrid – An All-Island Energy Company



semo
Single Electricity Market Operator

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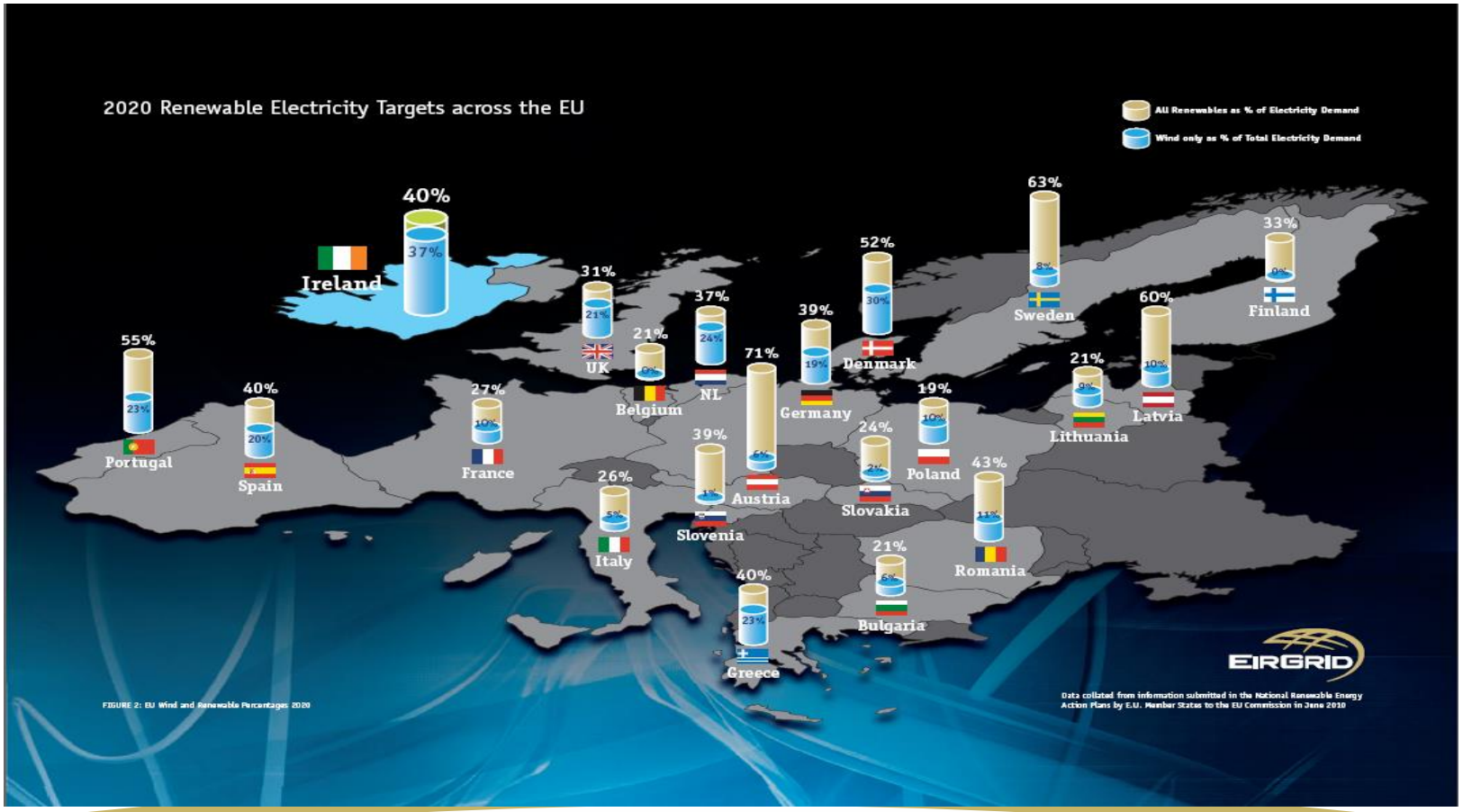
European Targets

- Ireland has ambitious targets for renewables, particularly wind



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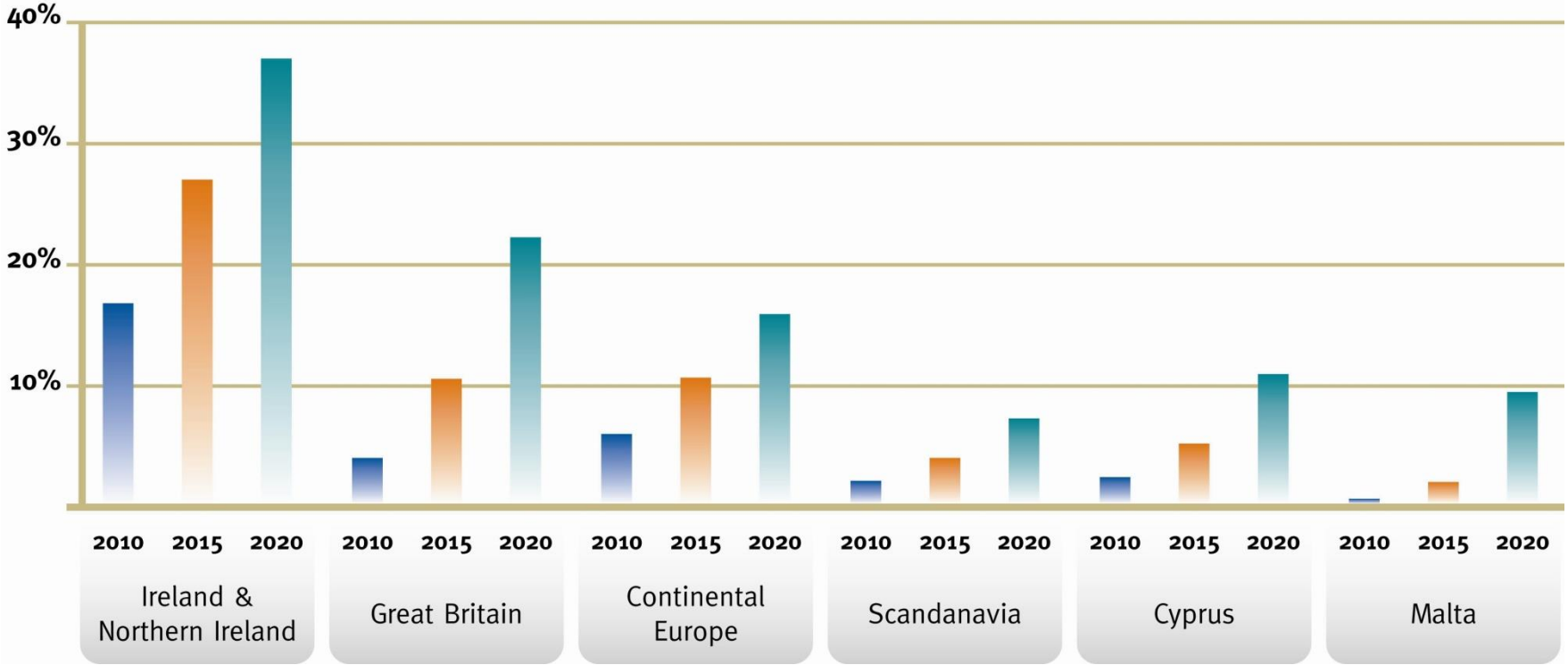
Targets for non-synchronous sources in European Systems



* Based on analysis of National Renewable Action Plans (NREAPs) as submitted by Member States

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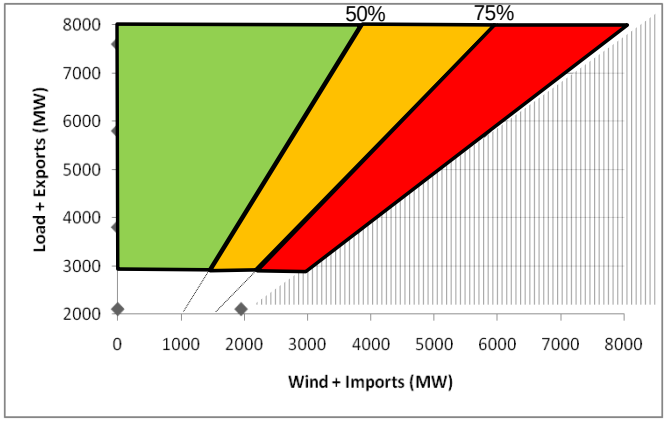
…so what are the challenges to meeting the targets?

Challenges

- System Stability
- Resource Variability
- Uncertainty
- New connections
- Changed power flows



Solutions

- Operating the system with up to 75% RES-E* can be achieved
- Facilitation of Renewables study identified the areas of change
- EirGrid developed the DS3 programme (**D**elivering a **S**ecure **S**ustainable **S**ystem) to meet this challenge

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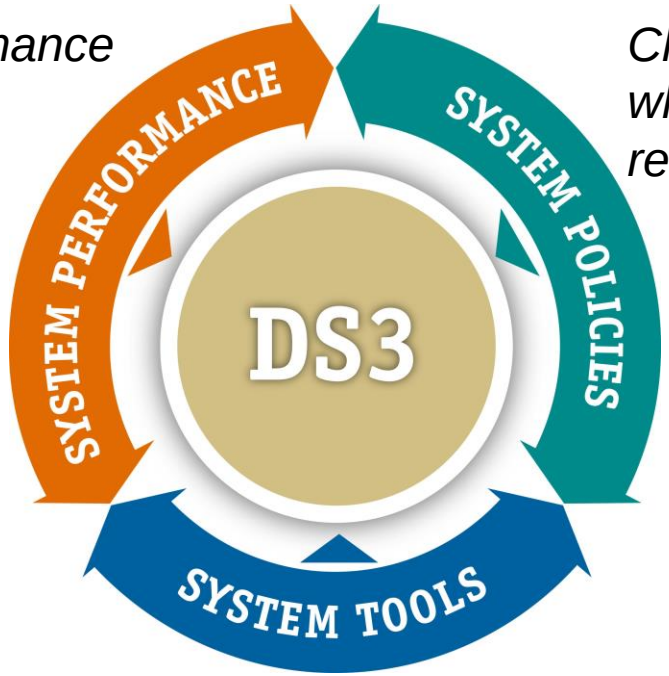
**Renewable Energy Sources - Electricity*

DS3 delivers transformational change

Change in System Performance which is incentivised by System Services



Changes in System Policies which leads to increases in renewables

System Tools enabling operational change in the Control Centre

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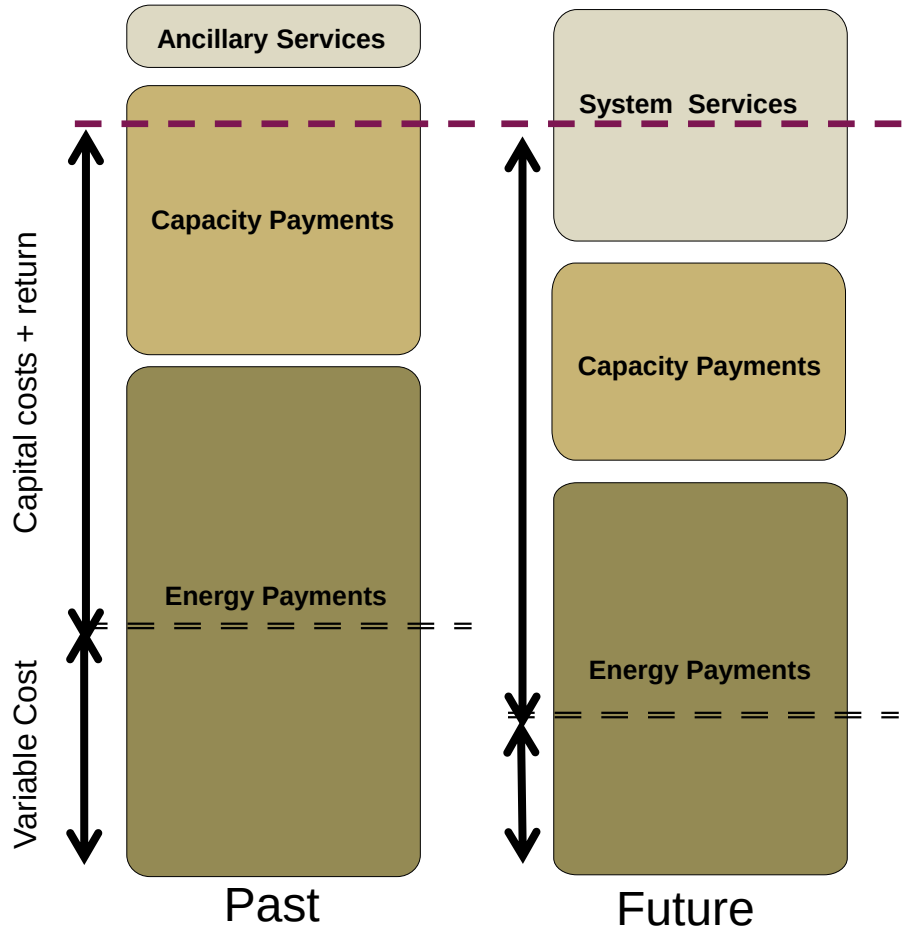
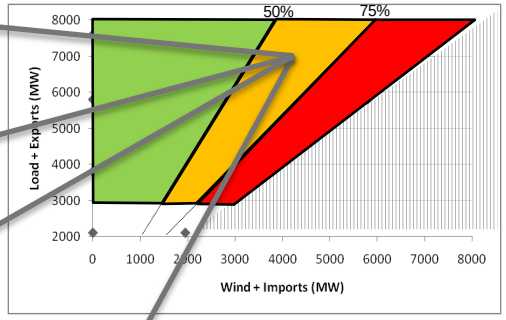
Market Solution – System Services

- ISEM project aligns with European Target Model
- Incentives for Performance through System Services
- Change in market financial mix
  - higher capital expenditure
  - lower operational costs



To achieve 75% technically.....

- Increased Variability & Uncertainty
- Withstand higher RoCoF*
- Manage System Voltage
- Maintaining System Transient Stability



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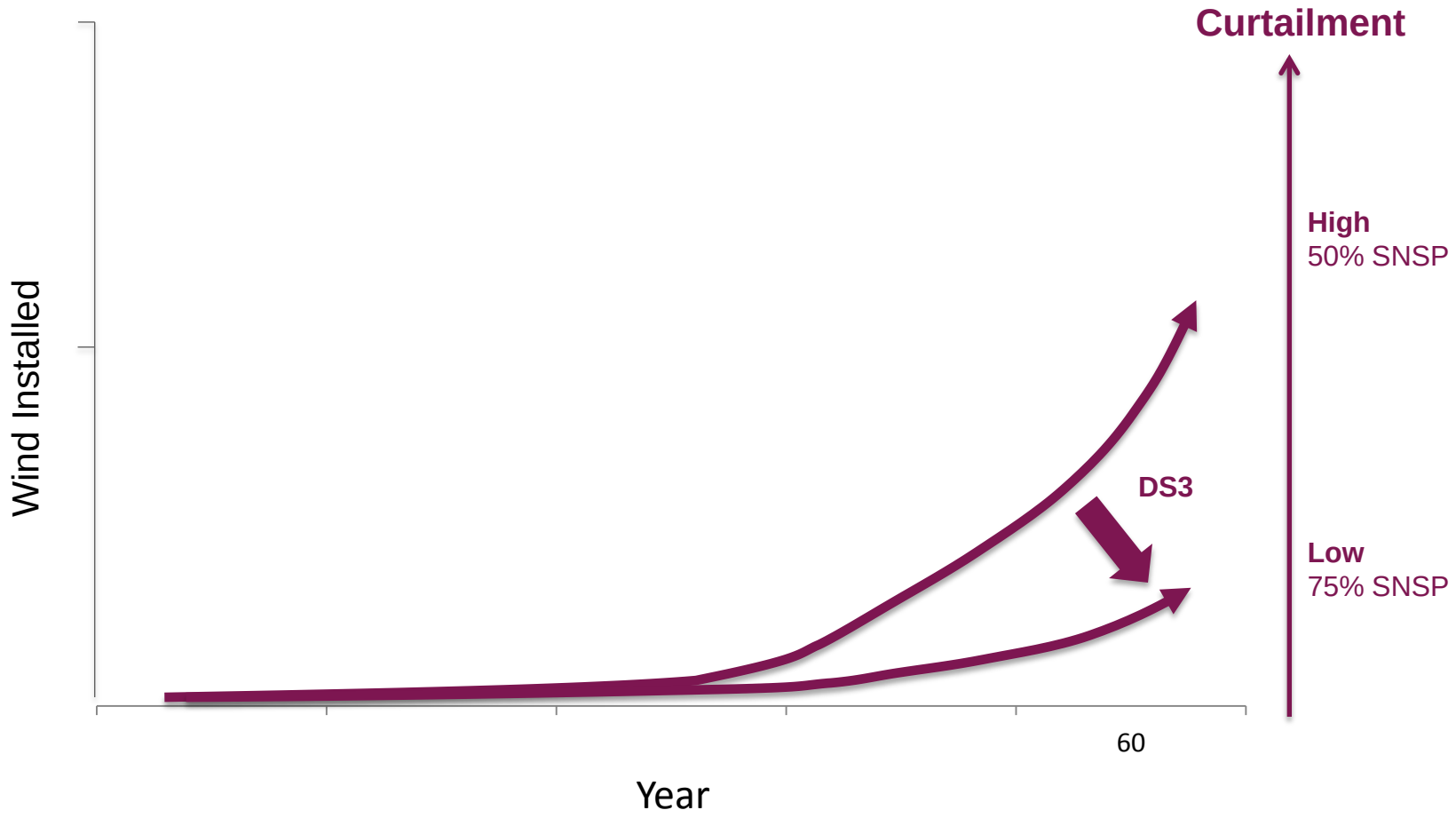
*Rate of Change of Frequency

Effect of DS3 on Wind Curtailment



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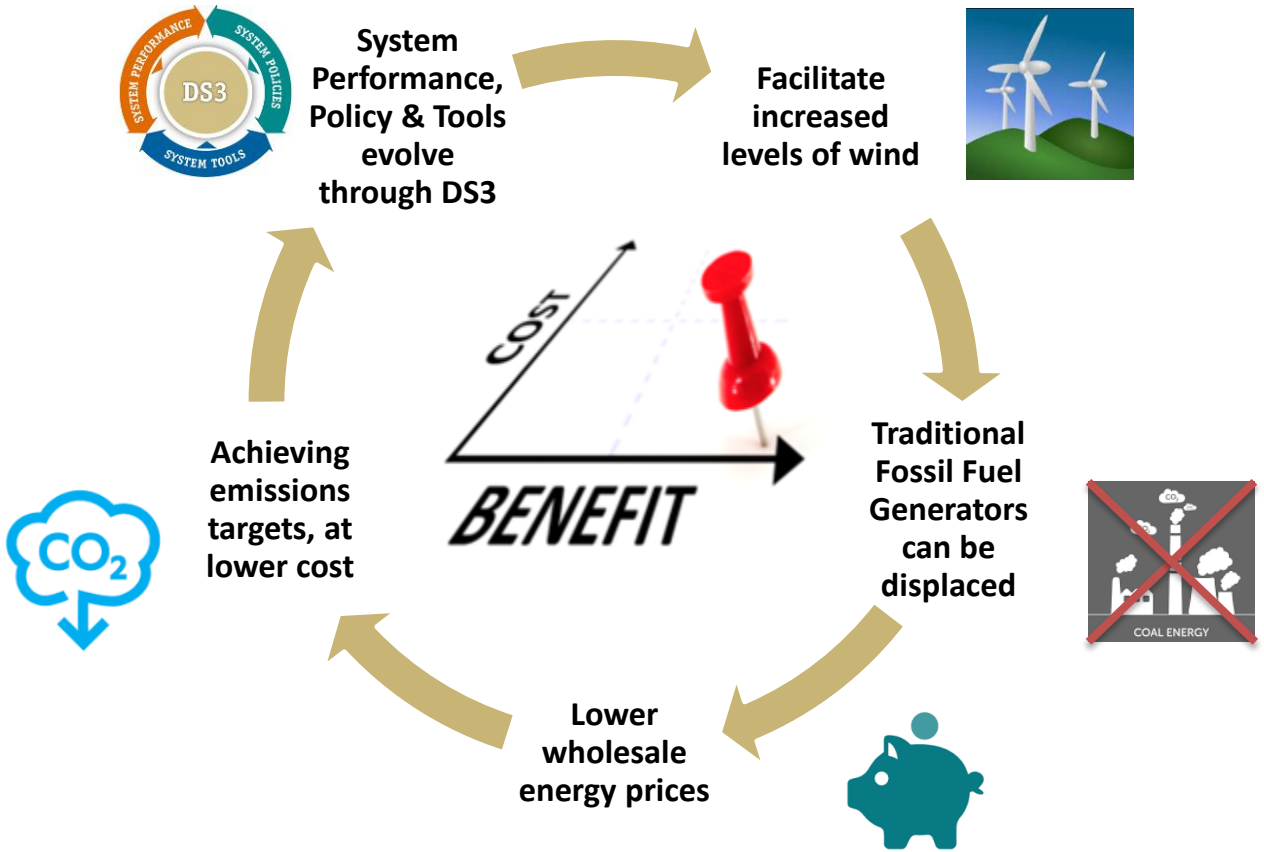
DS3 delivers benefits for consumers



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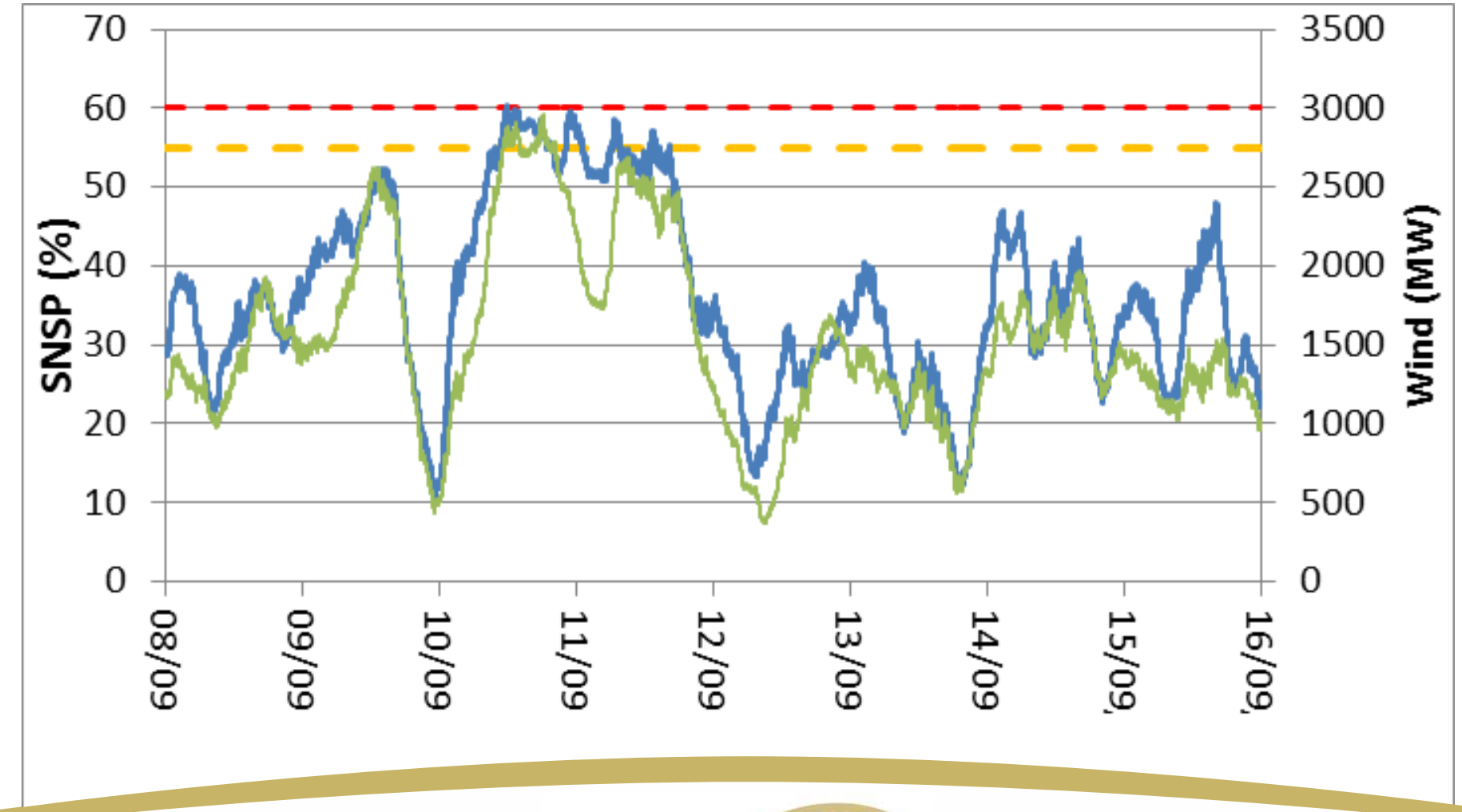
Which we are managing today….



Total hours of operation = 7754
Hours above 50% SNSP = 658 (8.5%)
Hours above 55% SNSP = 265 (3.4%)

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Critical next steps for wind integration

- *Transitioning to higher RoCoF*
- *Facilitating increased levels of exports*
- *Lowering inertia floor*
- *Lowering minimum sets requirement*

Facilitates increased RES penetration

Operational Changes enabled by Control Centre Tools & remuneration of DS3 System Services

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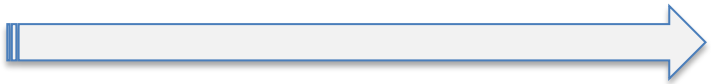
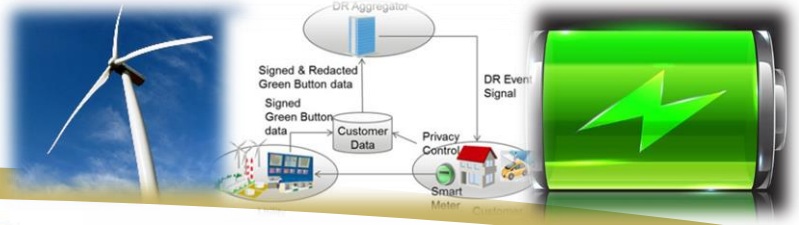
Background

Pre October 2016	October 2016	2018 & Beyond
• Harmonised Ancillary Services • 7 System Services (Existing) • Contracted via bilateral contracts • Predominantly Thermal plant	• DS3 System Services Interim Arrangements • 11 System Services (Existing + New) • Contracted via transparent procurement process • Predominantly Thermal plant with small amount of new tech.	• Regulated Tariff Arrangements • 14 System Services (Existing + New + Fast) • Open Procurement • Large penetration of New Tech along with enhanced capability of existing thermal plant





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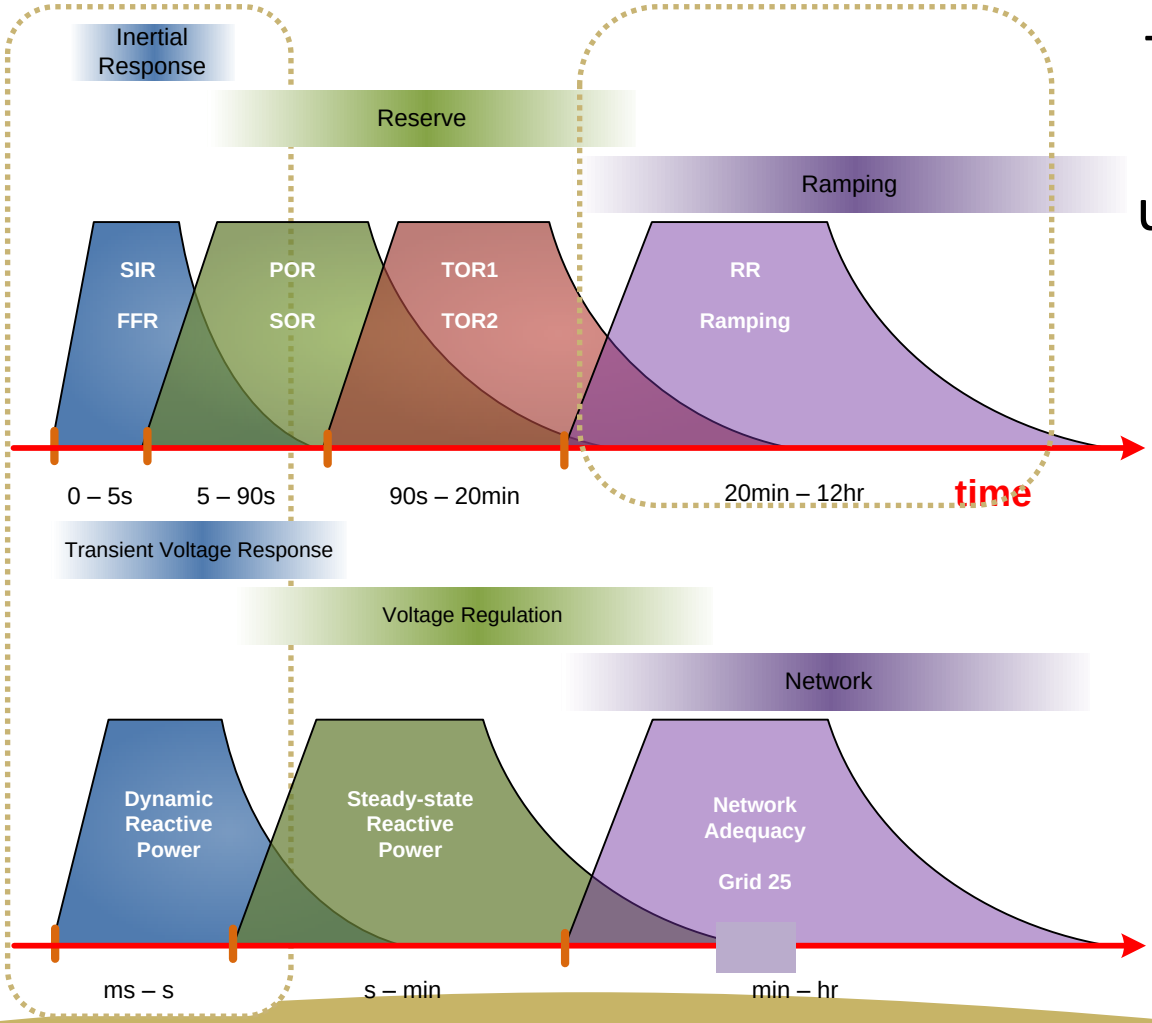
DS3 System Services

To ensure system security



To manage forecast uncertainty

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DS3 Qualification Trials Process

DS3 Programme: Achieve 75% SNSP with curtailment <5% per annum by 2020

New System Scarcities

DS3 System Services: Develop the market mechanisms to incentivise an enhanced portfolio of ancillary service provision, from both new and existing technologies

New Services

New Technologies

New Capabilities

More Distributed

DS3 Qualification Trials: Provides the mechanism for managing this transition in a prudent and controlled manner, ensuring the TSO can rely on services being procured and the end consumer gets value for said services

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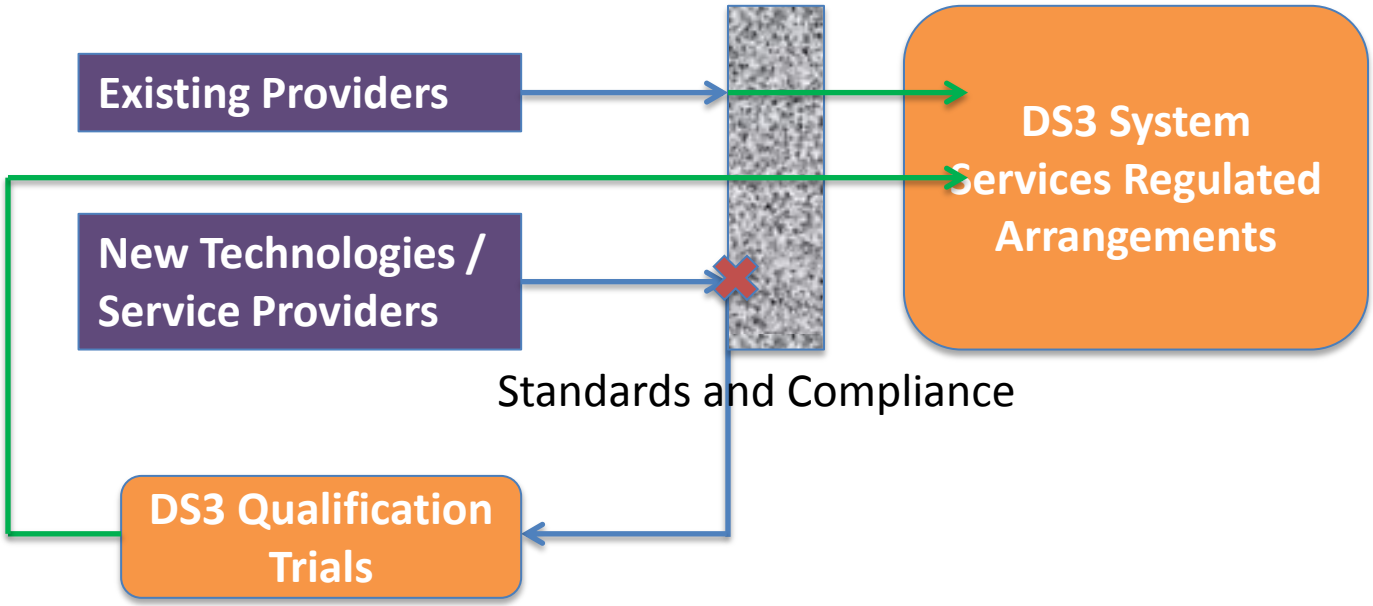
Where does the QTP fit in to System Services?



- It is envisioned the trials will run annually up to 2020. Timelines and format of future trials currently being developed

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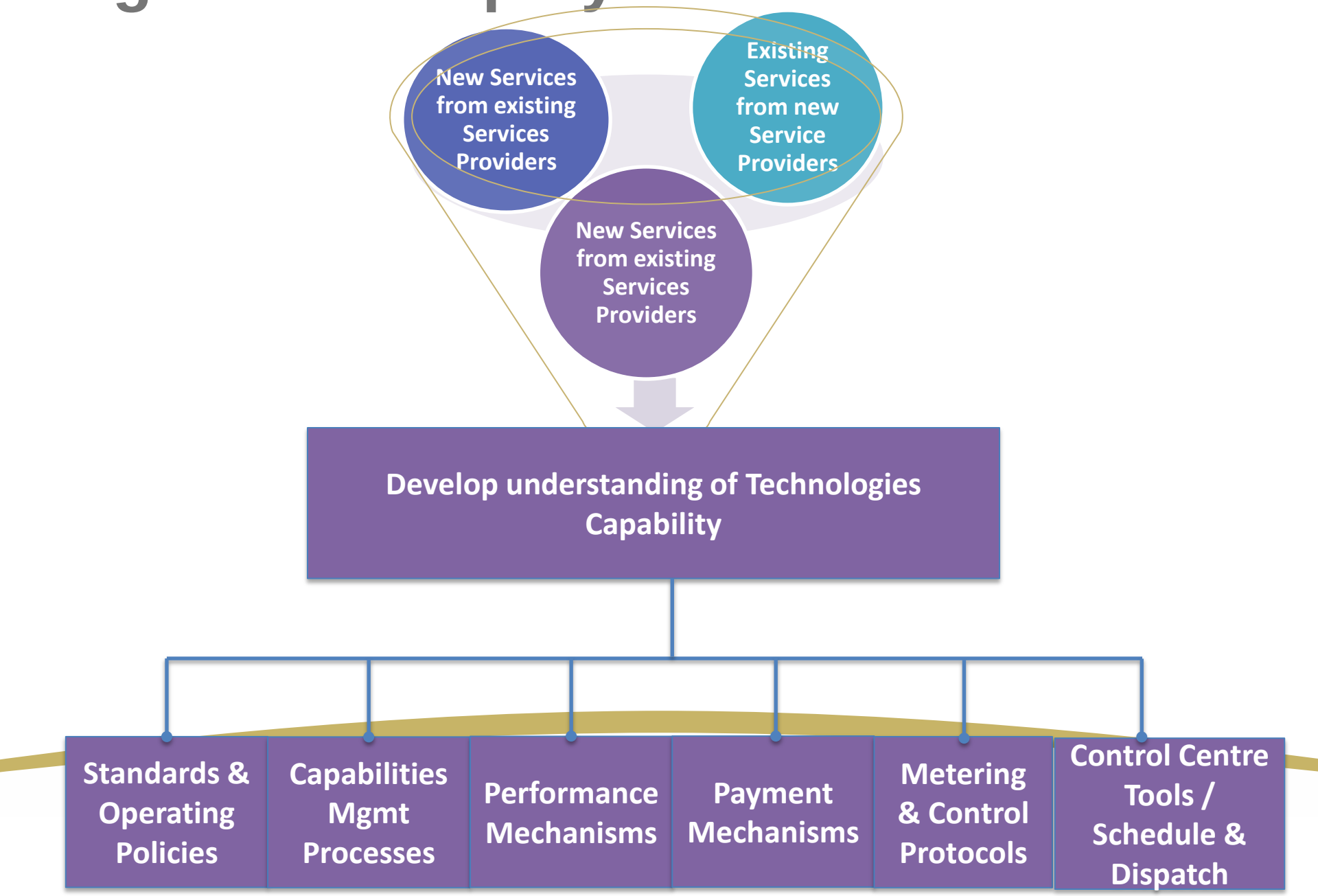
Large Scale Deployment of New Services



Qualification Trial Process 2017

Provenability

Services to be proven	*Technology*	*Max Volume*
POR, ~~RM3~~	Wind	40MW
POR	DSM	20MW
POR, ~~RM3~~	Other Technologies	40MW

Measurability

Services to be measured	*Technology*
FFR	Conventional Generators, Wind, DSM, Other Technologies
DRR, FPFAPR	Conventional Generators, Wind, ~~Other Technologies~~

Min/ Max Size: 1MW, 5MW per PU
'Other technologies minimum size: 100kW
Payment in line with tariff (Availability Based)

One-off payment per Providing Unit
FFR: at least 2 Conv, 1 DSM, 1 Wind, 2 Other Tech
DRR/ FPFAPR: 3 (1 from each)

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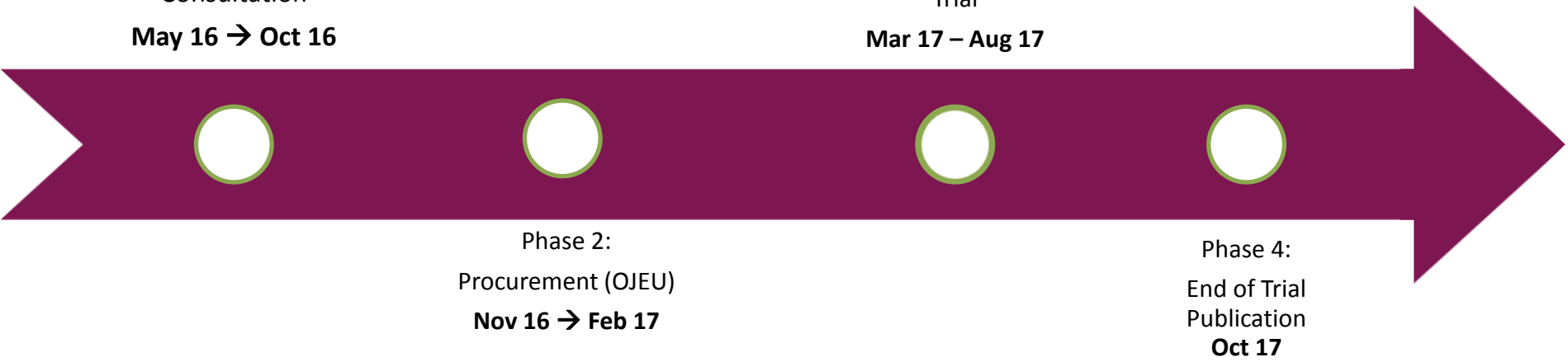
QTP Year 1 Timeline



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Key Concepts

- Successful participation in the trial by a Service Provider “proves” the technology class for Industry as a whole
- Trials are run via Open Procurement process (OJEU) & service providers paid to partake
- Trials run at small scale with maximum caps on volume which will be procured
- Upon successful completion of a trial, Technology Class gets added to “Proven List of Technologies” which gets published in line with main procurement process

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Key Learnings from Year 1

- Greater input / coordination with DNOs will be required
- Need a mechanism for New Technologies to connect in order to participate
- Running Procurement process took significant time and resources
- Time between End of Procurement / Contract signing / Trial Commencement extremely narrow (ideally would install additional signals as required / device recorders etc)
- Timing of trials aligned with Main Procurement Timelines, however, certain trials would be best run in different timelines (e.g. Wind in Winter)

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