DSM Industry Forum

Crowne Plaza Dundalk 15/11/2018

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Agenda -

Topic	Time	Speaker
Introduction and Welcome	13:00	Ian Connaughton 10 min
Setting the Scene – A Vision for DSM	13:10	Jonathan O'Sullivan – 10 min
Performance Monitoring Update • **TSO** • **Group Discussion**	13:20	Mark Gormley – 20 min All – 10 Min
DSM - Industry Discussion • **Industry Presentation** • **Group Discussion**	13:50	Paddy Finn (Electricity Exchange) – 25 min All – 35 minutes
Close – Next Steps		

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A Vision of DSM

Jonathan O'Sullivan

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Performance Monitoring

Mark Gormley, System Support

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Agenda

- Context
- Performance Monitoring stats
- Performance Monitoring discussion points
- Direction / next steps

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Context

- Large growth in aggregation between 2012 – 2018
- Historic model focused primarily on CPM revenue
- Aggregators now participating in
  - I-SEM Capacity Market
  - I-SEM Energy Markets
  - DS3 System Services
- Good performance essential for Safe Secure System Operation
- Good performance also essential for Aggregator revenue certainty
- Increased focus on performance monitoring going forward

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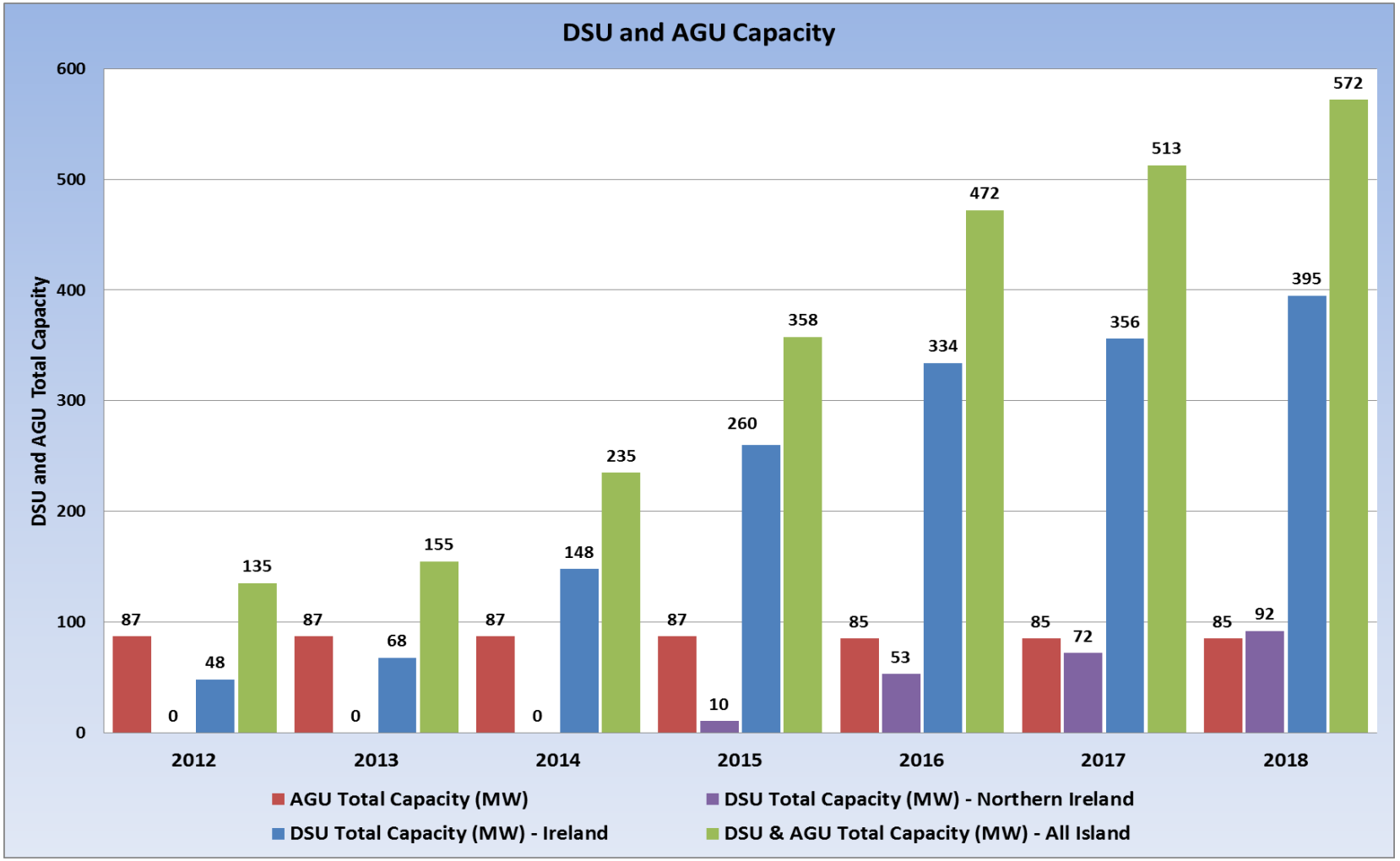
Growth in AGU and DSU capacity



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Shift change in revenue 'pots'

2016

7 Services

- **Reserve**
  - Primary (5-15 sec)
  - Secondary (15-90 sec)
  - Tertiary 1 (90-300 sec)
- **Ramping**
  - Tertiary 2 (5-15 min)
  - Replacement spinning (0.25 – 4 hour)
  - Replacement de-synch (0.25 – 4 hour)
- **Voltage**
  - Steady State Reactive Power

Ancillary Services €60,000,000

Capacity Payments €500,000,000

Energy Payments €2,000,000,000

AGU and DSU Contracted Volumes System Services Phase 1 (2018)								
	POR	SOR	TOR1	TOR2	RRD	RM1	RM3	RM8
Ireland	56	55	70	51	168	326	28	28
Northern Ireland	4	4	11	72	82	108	77	76
Total	60	58	81	123	250	434	105	103

2020

System Services Up to €235,000,000

Capacity Payments €330,000,000

Energy Payments < €2,000,000,000

14 Services

- **Inertia / Emulated inertia response**
  - Synchronous Inertia
  - Fast Post Fault active Power recovery
  - Fast Frequency Response (<2 sec)
- **Reserve**
  - Primary (5-15 sec)
  - Secondary (15-90 sec)
  - Tertiary 1 (90-300 sec)
- **Ramping**
  - Tertiary 2 (5-15 min)
  - Replacement spinning (0.25 – 1 hour)
  - Replacement de-synch (0.25 –1 hour)
  - Ramping Margin 1 (1-3 hour)
  - Ramping Margin 3 (3-8 hour)
  - Ramping Margin 8 (8-16hour)
- **Voltage**
  - Steady State Reactive Power
  - Dynamic Reactive Response

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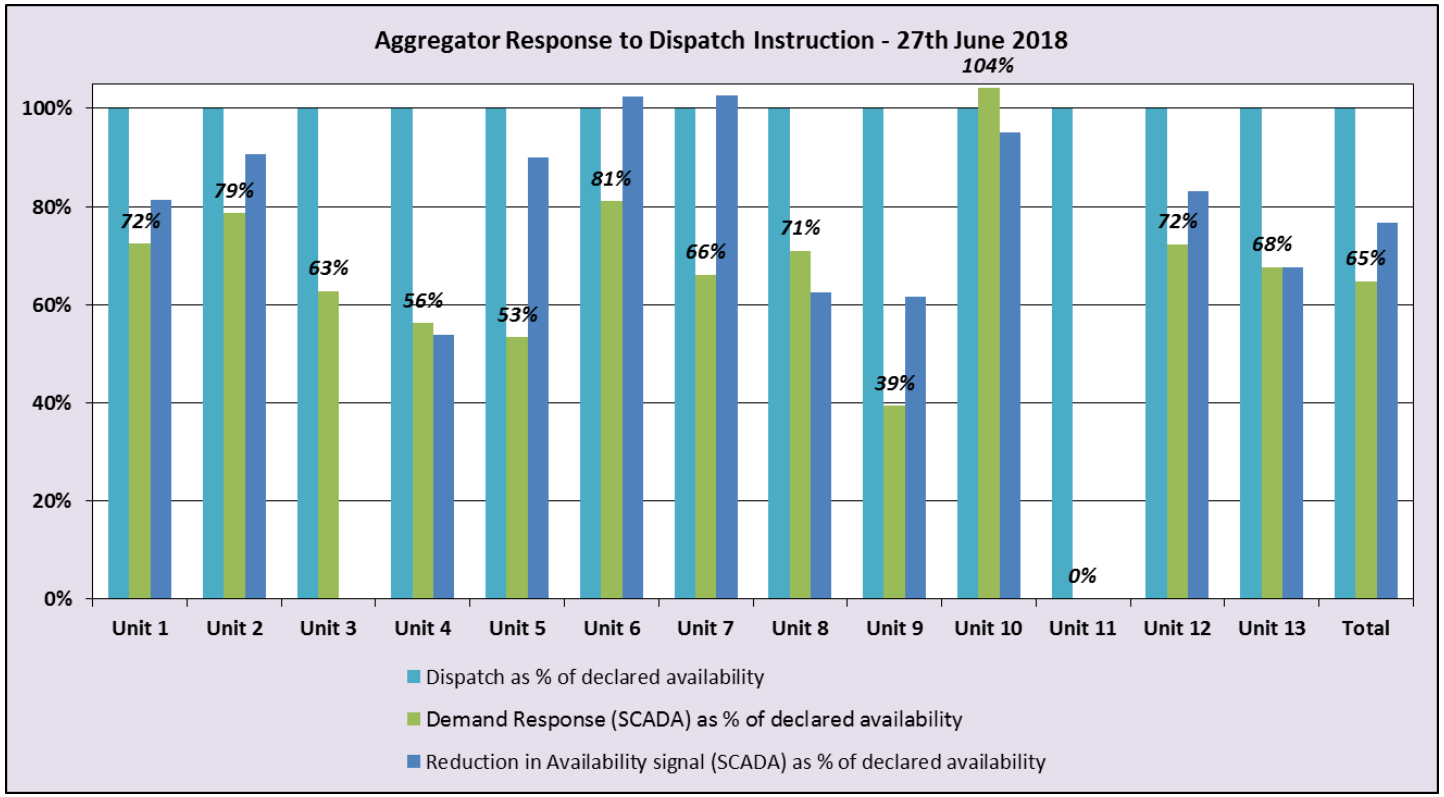
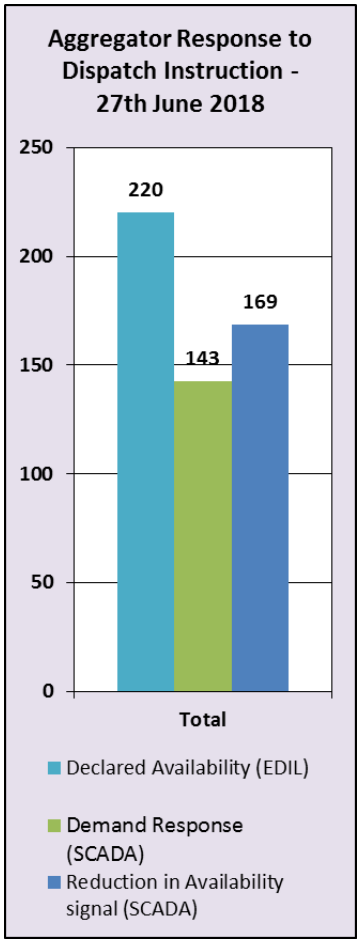
Unit Dispatch Ireland – 27th June 2018





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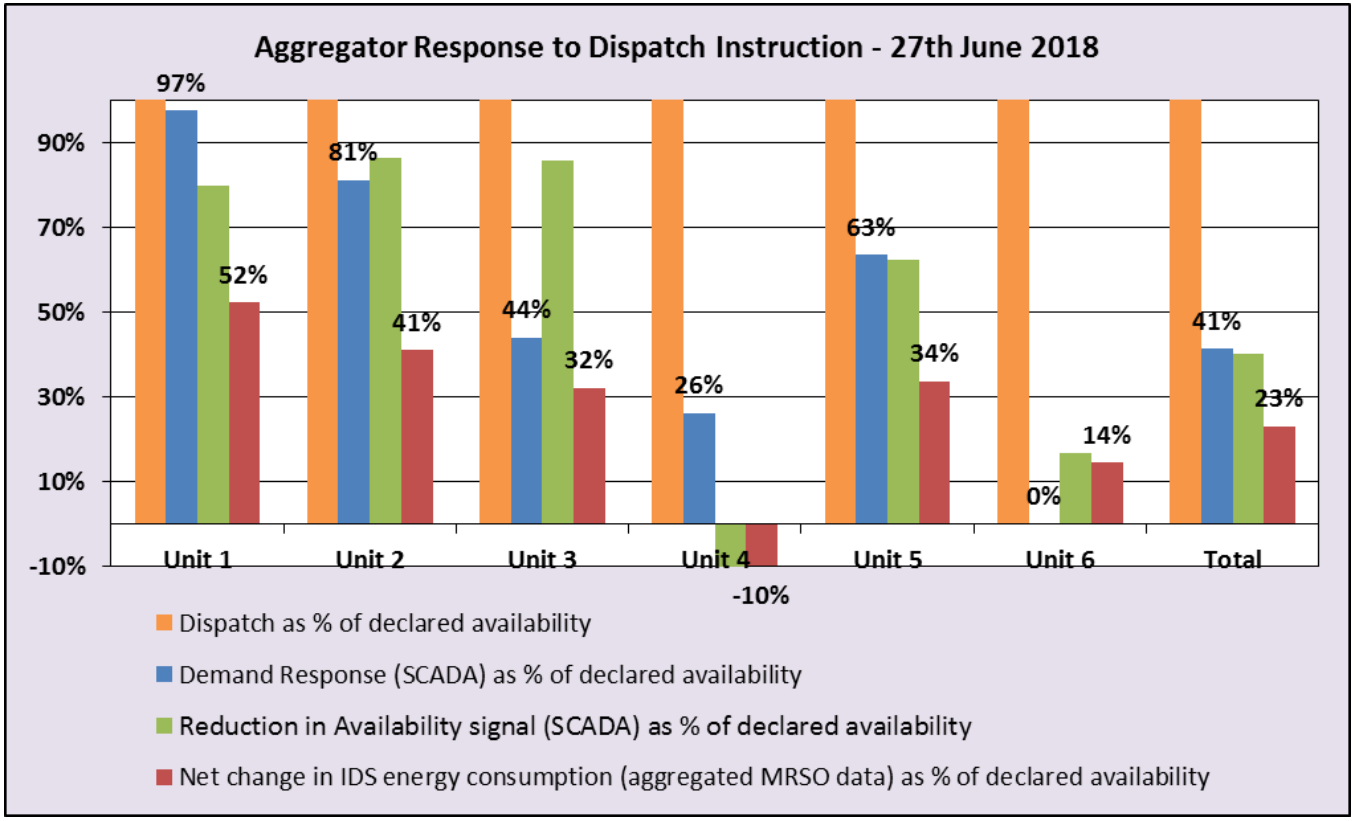
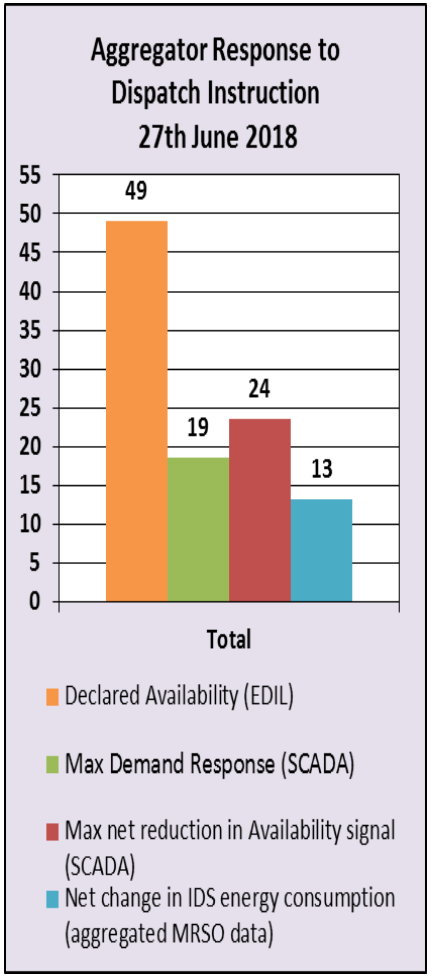
Unit dispatch N. Ireland – 27th June 2018





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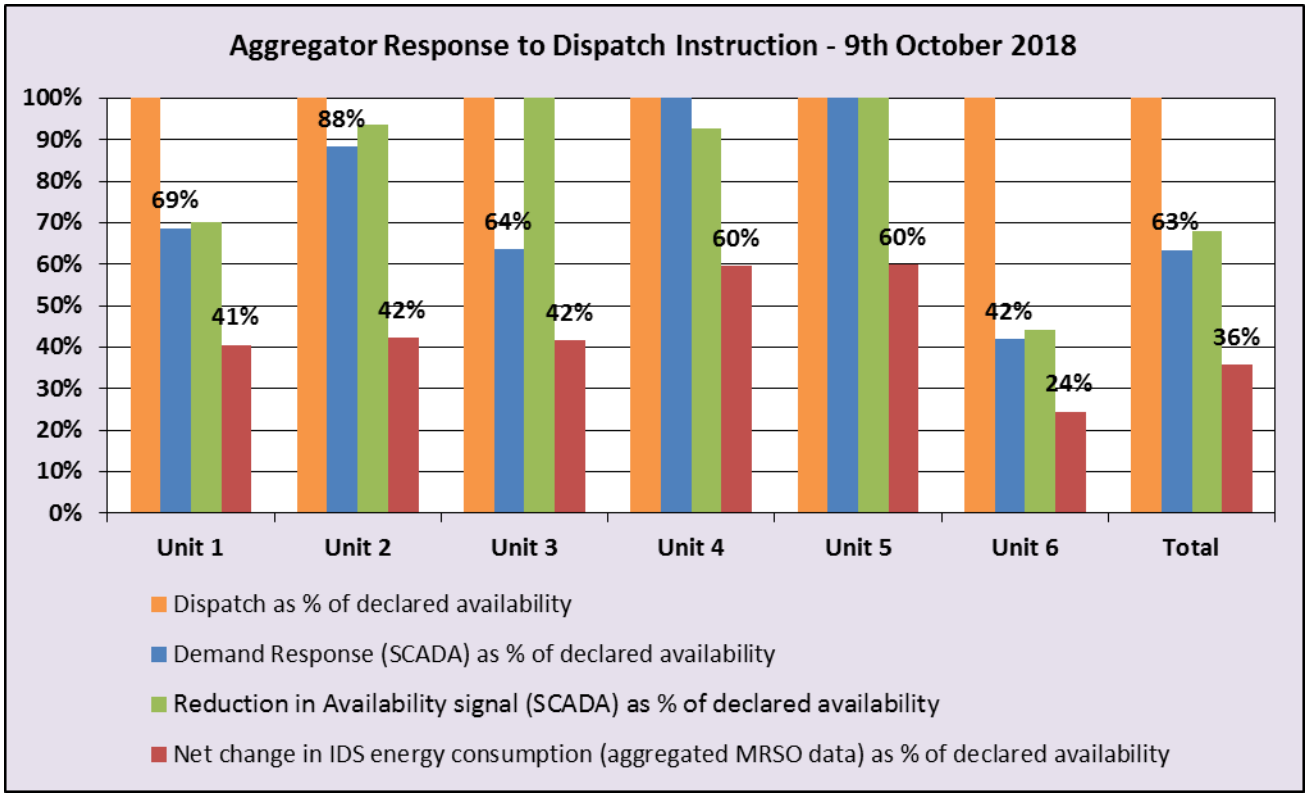
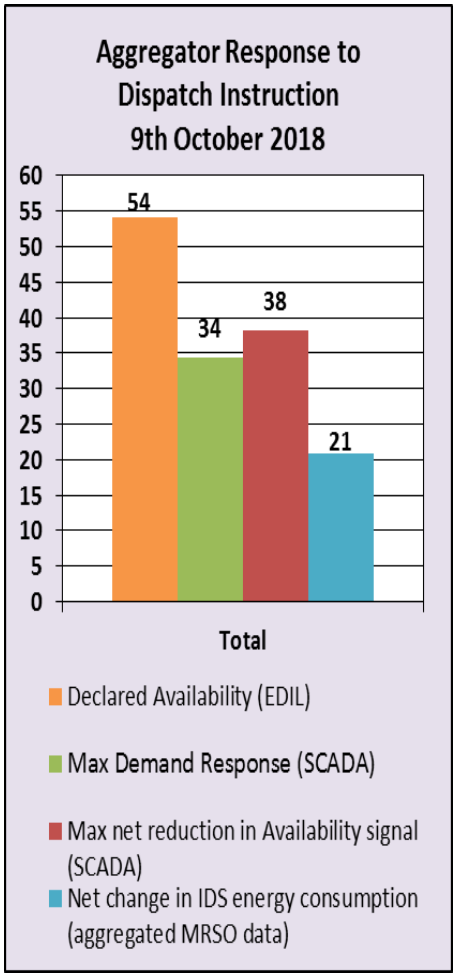
Unit Dispatch N. Ireland – 9th October 2018





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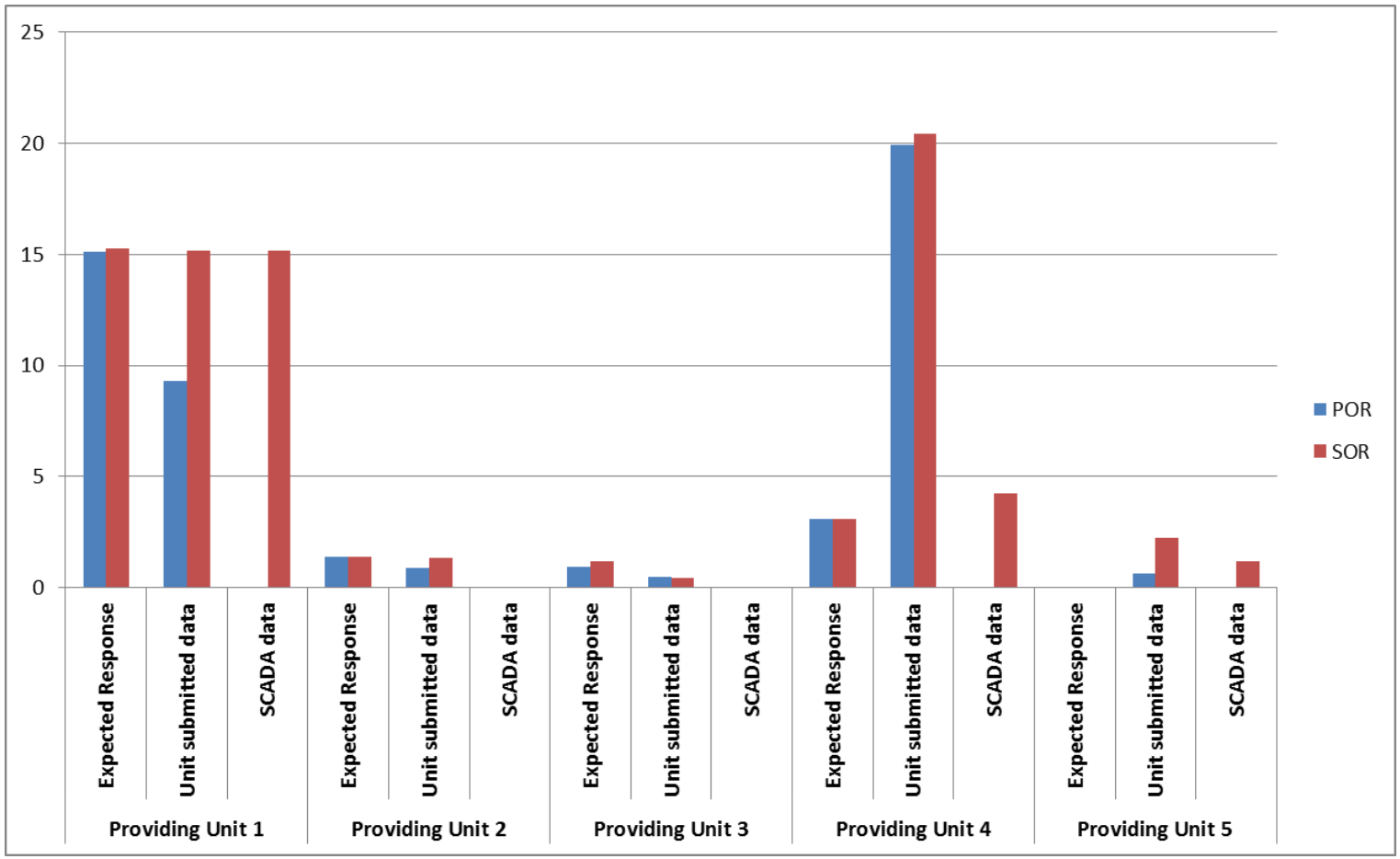
Frequency Event Performance – 12th July Frequency Event



Performance Monitoring

- System operation relies on actual performance matching expected performance

- Ensure units adhere to applicable codes and contracts
  - Grid Code requirements
  - DS3 System Service contracts
  - Capacity Market

- Areas of focus
  - Frequency event response
  - Response to dispatch instruction
  - Accuracy of SCADA
  - Accuracy of declarations
  - Accuracy of forecasting

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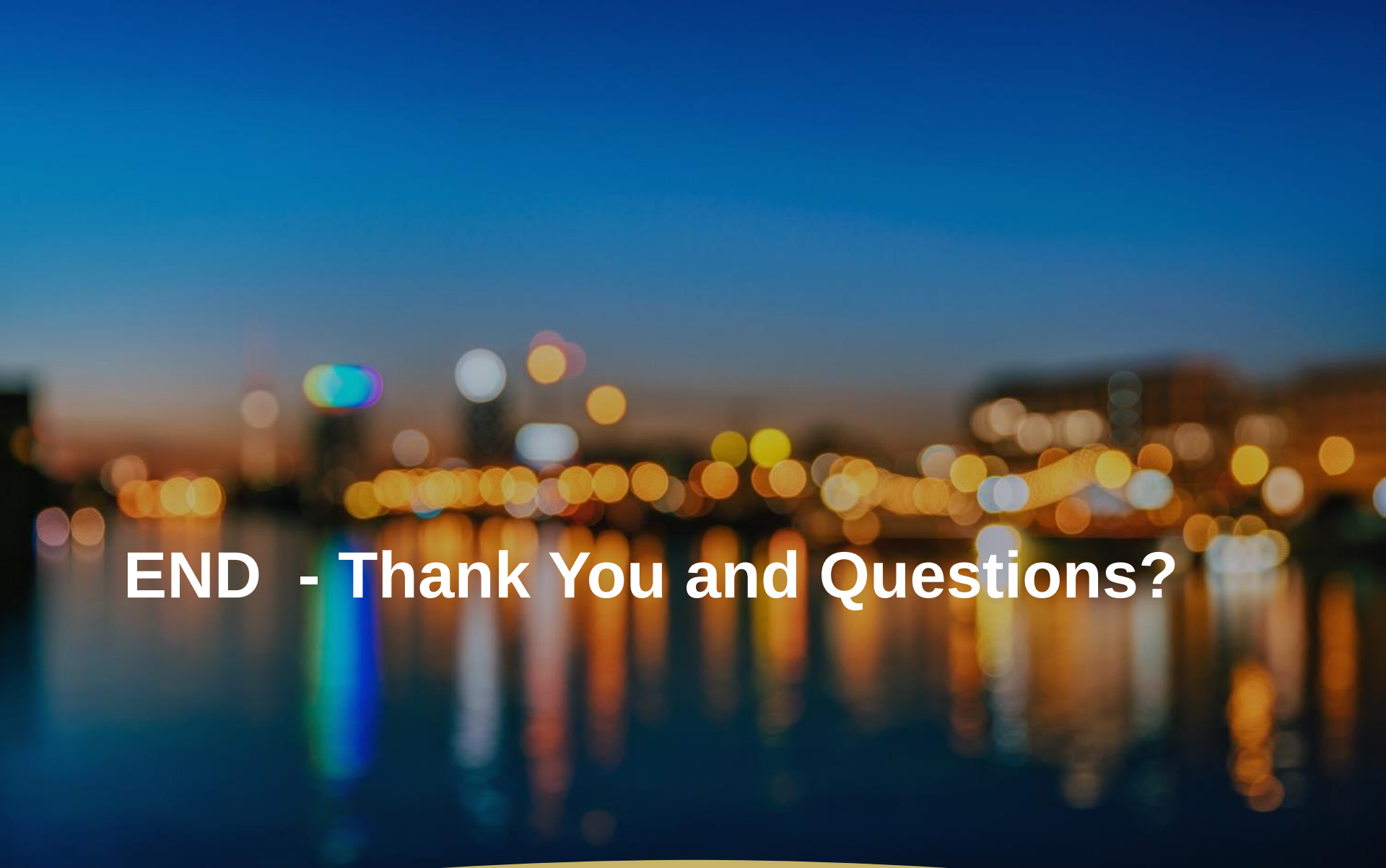

END - Thank You and Questions?

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Industry Perspective Slides

Paddy Finn

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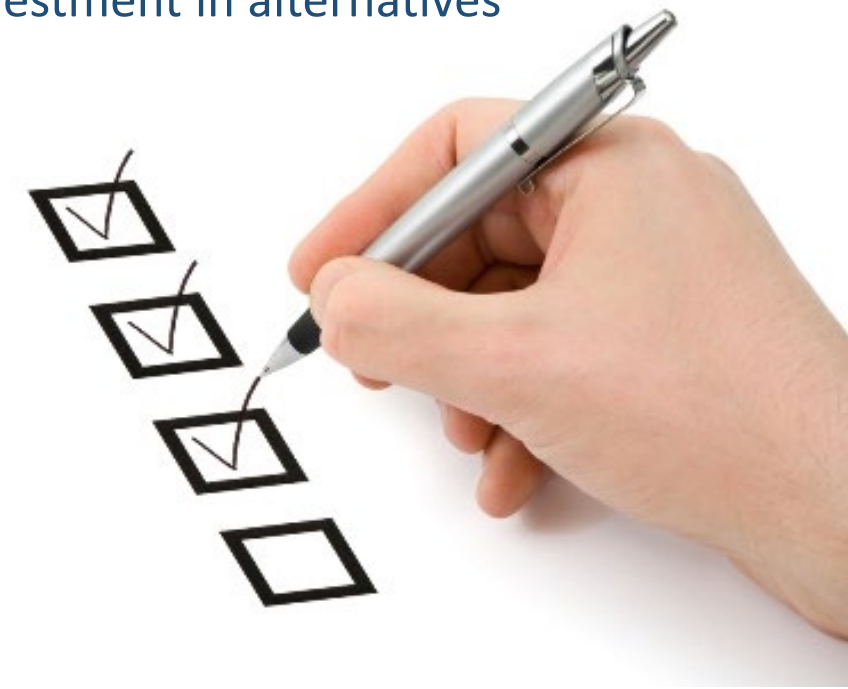
EirGrid DSU Forum – DRAI perspective
15th November, 2018

Summary

1. Introduction:
   - Benefit of DSUs
   - DSU Performance
   - Trend of DSU Marginalisation
2. Issues:
   - Joint Market Registration
   - Single VTOD, Single EDIL Instruction
   - Static Reserve Characteristic
   - RO Exposure when not Dispatched
   - DSO/DNO Instruction Sets
3. Going Forward

Benefits of DSUs

- DSUs provide a cost effective system balancing solution:
  - Utilise existing assets
    - Sunk costs and sunk carbon
  - Returning value back to the customer, reducing the need for investment in alternatives
    - Batteries, peaking plants, etc
  - Demand flexibility enabling more responsive grid
    - Facilitating generation from variable renewable energy sources
  - Inherent DS3 system services capability
  - Technology exists and is market ready
    - Don’t need to wait for smart meters;

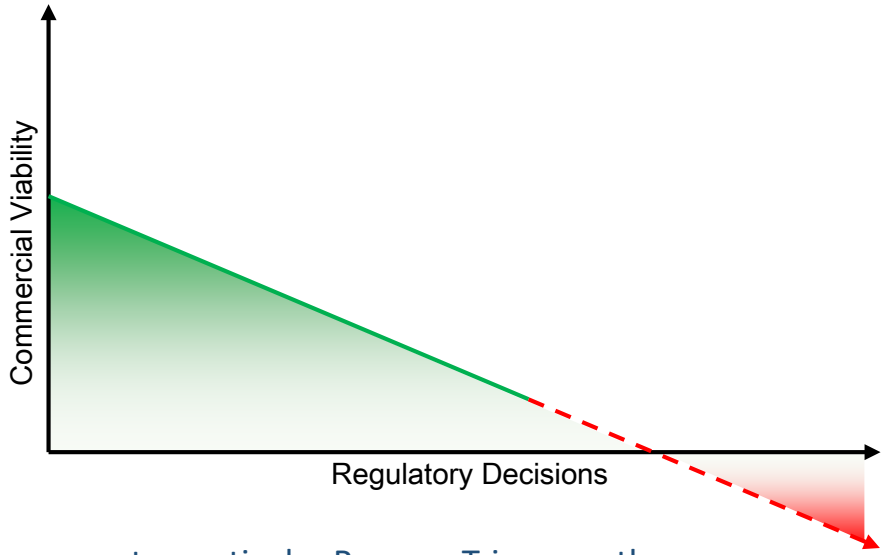


DSU Performance

- Result from NI dispatch test on 27th June is not representative of the collective performance of DRAI members
  - 38% delivery of declared availability driven by non-performance of a few and not poor performance by all
- DRAI members are committed to delivery of services through prudent operating practice as per Grid Code requirements;
  - Support initiatives from RAs to restrict and penalise activity that has disregard for the code
  - Members invest considerably in ICT to enable automated high speed response to system frequency events and TSO instructions;

Trend of DSU Marginalisation

- The industry has observed a trend of decisions against which we have to battle for fair and equitable terms
  - T1 and T4 capacity auctions are applying increasingly punitive industry-wide de-rating factors on DSUs rather than unit-specific de-rating factors or elected DECTOLs.
  - Long-run DSUs appear to inline for inequitable treatment in the market.
  - Initial exclusion from volume uncapped market,
  - Current proposals for volume capped market directly conflict with the characteristics of demand response,
  - DSUs are not allowed to benefit from DS3 hysteresis scalar despite their ability to deliver on the strict definition of the requirement:
    - "FFR Hysteresis Control" means the capability of a Providing Unit to deliver a response at a particular Reserve Trigger as the frequency falls and not to retract its initial provided response as the frequency recovers through the Reserve Trigger;
  - . . . . . .

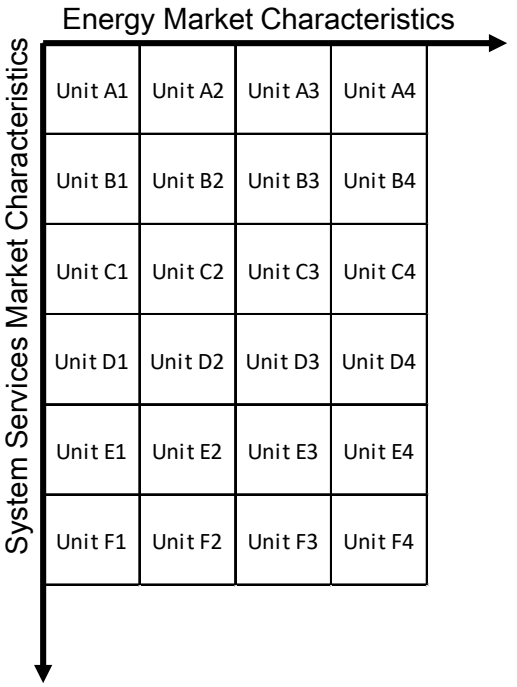


Joint market registration

- The capacity market and system services markets are technically and commercially very different

- Registration process currently includes the following conflicting parameters:
  - Energy & Capacity Market
    - IDSs need to be grouped by VTOD, de-rating factors, and location
  - DS3 Market
    - IDSs need to be grouped by similar speed of service response and service groupings

Optimised permutations would require unwieldy number of units



Joint market registration

- Required Change:

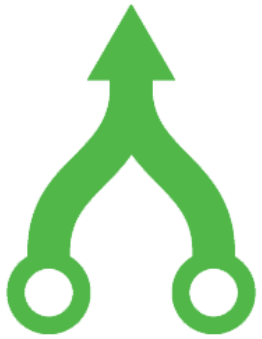
  Separation of Energy/Capacity and DS3 System Services registration

  - IDSs can participate in different units for Energy/Capacity market and DS3 System Services market

- Interim Solution:

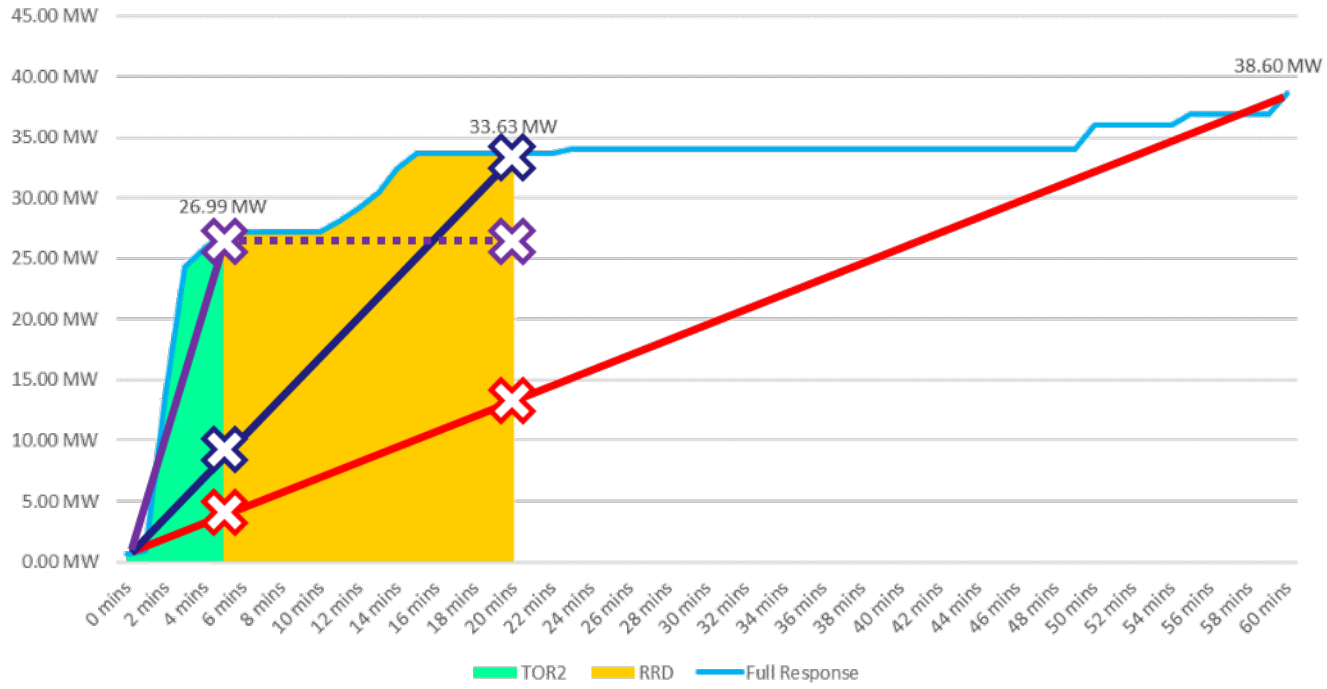
  Allow group commitment to Reliability Option

  - Underlying units have a shared responsibility to deliver on combined capacity obligation
  - IDSs can then be moved between units to optimise DS3 System Services characteristics



Single VTOD, Single EDIL Instruction

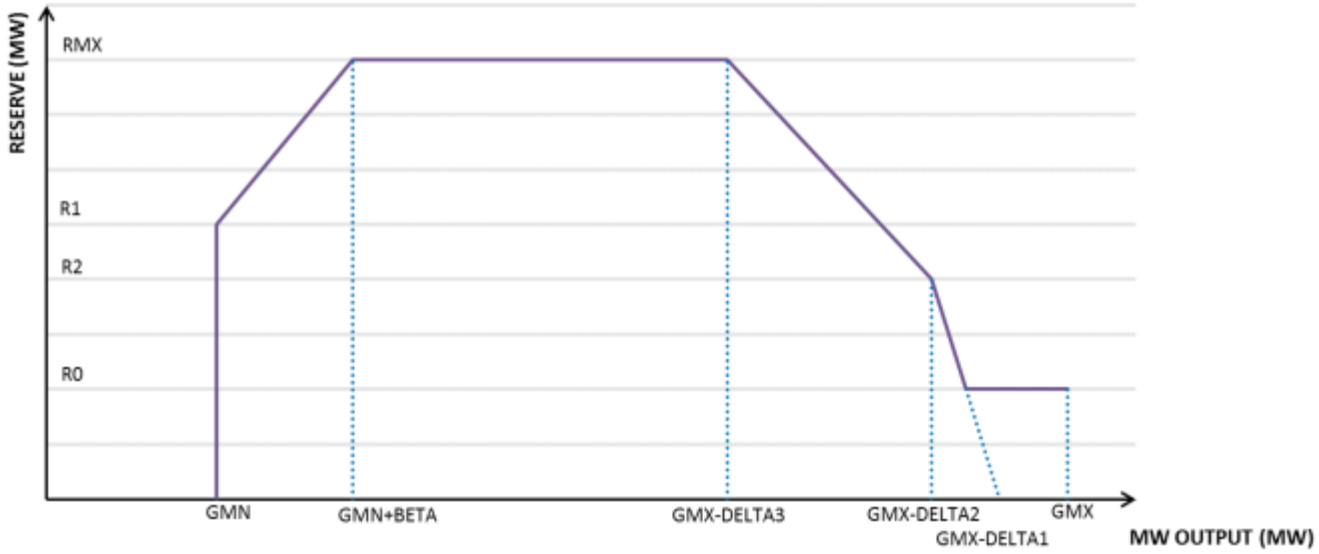
- Issue:
  - Single-step VTOD cannot capture individual ramp-rates for TOR2, RRD, and max declared availability
    - Setting VTOD based on unit capacity assumes that TOR2 = 8.3% of unit capacity and RRD = 33.3% of unit capacity
    - Setting VTOD based on TOR2 or RRD ramp rates assumes MDMW can be achieved faster than is possible
  - Multi-step VTOD cannot capture variable nature of DSU ramp rates based on mix of available IDSs
    - Varying availability changes points of inflection in multi-step curve
- Solution:
  - TOR2, RRD, MDMW specific EDIL instructions
    - Assume 5 minute ramp for declared TOR2
    - Assume 20 minute ramp for declared RRD
    - Assume VTOD ramp for MDMW



Static Reserve Characteristic

- Issue:
  - Static Reserve Characteristic in Schedule 9 of the DS3 System Services Contract is designed to characterise conventional generators and is only accurate for DSUs when all IDSs are available for their full tested capacity
  - This fails to account for the inherently dynamic nature of a DSU's availability

- Action:
  - TSO must acknowledge that the static Reserve Characteristic is not appropriate for DSUs and agree not to require adherence to these values for the purposes of performance monitoring.
  - Alternative method of declaration of availability and ramp rates for each DS3 System Service should be investigated



RO Exposure when not Dispatched

- Issue:
  - DSUs, along with other units types, have been exposed to difference payments during scarcity events when not dispatched despite being in merit
  - Affected units are available and delivering on the spirit of their obligations to the CRM but are not afforded any opportunity to mitigate this risk
  - Market power is being handed to units operating in constrained areas

- Solution:
  1. Units scheduled for non-energy actions should be prevented from setting subsequent energy prices
  2. During a scarcity event, a unit should only be exposed to difference payments when they have a declared availability of 0 MW or, where their declared availability > 0 MW, for their:

     (load following adjusted RO volume **minus** their declared availability)
     +
     (their under-delivery on their declared availability)

DSO/DNO Instruction Sets

- Issue:
  - Letter dated 5th October 2018: The CRU and UREGNI overturned a previous decision that set out that instruction sets resulting from DSO/DNO congestion should not have a negative financial impact on DSUs
    - This decision was subsequent to the T-1 capacity auction and wholly undermined the assumptions that underpinned DSUs' RO commitments
  - IDSs subject to instruction sets cannot contribute to a DSU's ability to deliver on its RO
  - Instruction sets have historically been issued with 1 working days notice making it technically impossible to replace lost capacity, even if it were commercially possible
  - IDSs can become subject to an instruction set at any time, removing any certainty of cost-recovery post-installation and removing any certainty of customer income
    - It is no longer possible to provide current or prospective clients with any reasonable level of commercial certainty
    - This promotes the systematic objection to planning permission for renewable energy installations local to IDSs
  - All risk has been transferred to DSUs while the DNO and DSO are the only parties who can manage the risk
    - The DNO and DSO have done little to reduce this risk and are not incentivised to do so

- Action:
  - Suggest action: DRAI seek TSO support to emphasise the need to remove instruction sets / incentivise DNO/DSO to prioritise issue

Summary of Issues

1. Joint Market Registration
   - Separate unit IDS registration for Energy/Capacity Market and DS3 System Services Market
2. Single VTOD, Single EDIL Instruction
   - Individual EDIL instructions should be issued depending on response required
3. Static Reserve Characteristic
   - TSO asked to acknowledge unsuitability of static reserve characteristic for DSUs
4. RO Exposure when not Dispatched
   - Units should not be fully exposed to difference payments when available and in merit but not dispatched
5. DSO/DNO Instruction Sets
   - TSO must impress unviability of current situation on RAs and seek an alternative agreement

Going forward

- DSUs are an important system balancing tool -- TSO can utilise demand response in support of renewable energy targets
- Under SI No. 426 of 2014 CRU is required to promote demand response and work in close cooperation with demand service providers
- DRAI are committed to developing the market for DSU, however, DSU marginalisation is undermining the viability of the industry

Market development

- Demand response in Ireland has potential to grow significantly -- DSU sector experienced considerable growth in the current capacity year (based on more favourable market conditions);
- DRAI want to work with RAs to develop the market and support achievement of national renewables targets;

DRAI request

- RAs establish a dedicated DSU industry forum to facilitate discussion of technical issues;
- RAs assign responsibility for DSU market development – dedicated DSU resource;