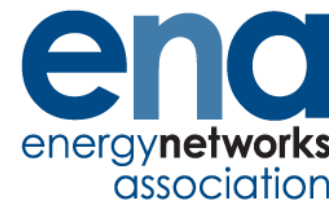


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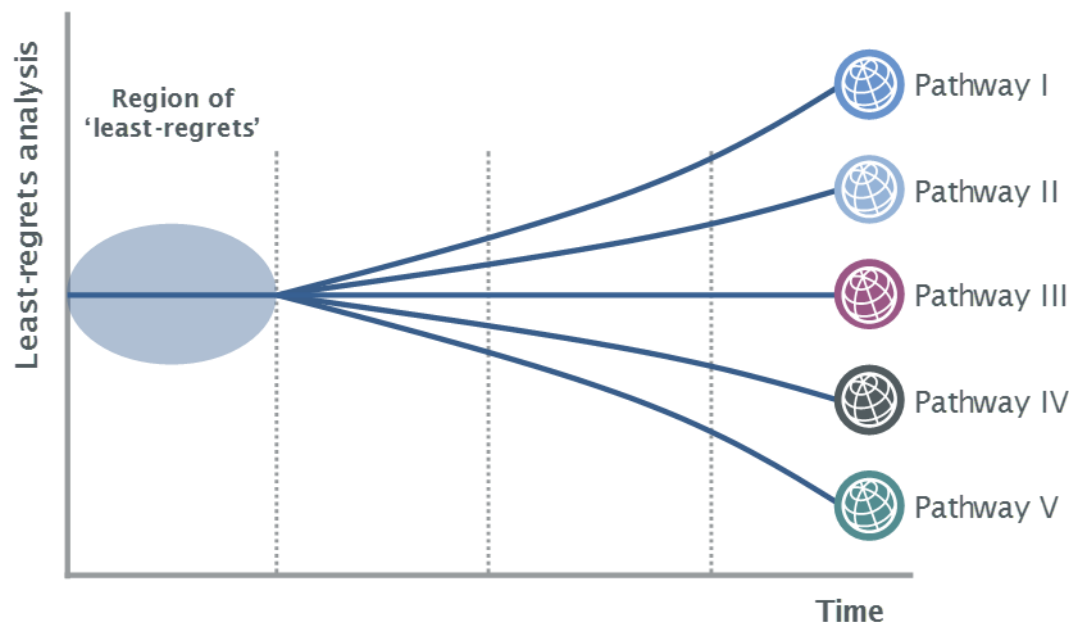
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# Least Regrets

Workstream 3 Product 3

# Least Regrets Analysis

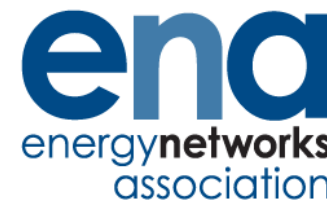
- Assessment of the five future worlds has identified areas of common functionality between the worlds
- These areas could present opportunities to implement aspects of smart grid now
- We are interested in your thoughts on this work to inform our next steps



# Defining Least Regrets - Process

- SGAM Modelling
- List of all activities common to 5 worlds
- Workshops to assess those areas already covered by ON/other industry work – see Appendix
- Highlight areas that are not being addressed and prioritise with advisory group input
- Allocate to Work Streams to assess as potential products for 2019

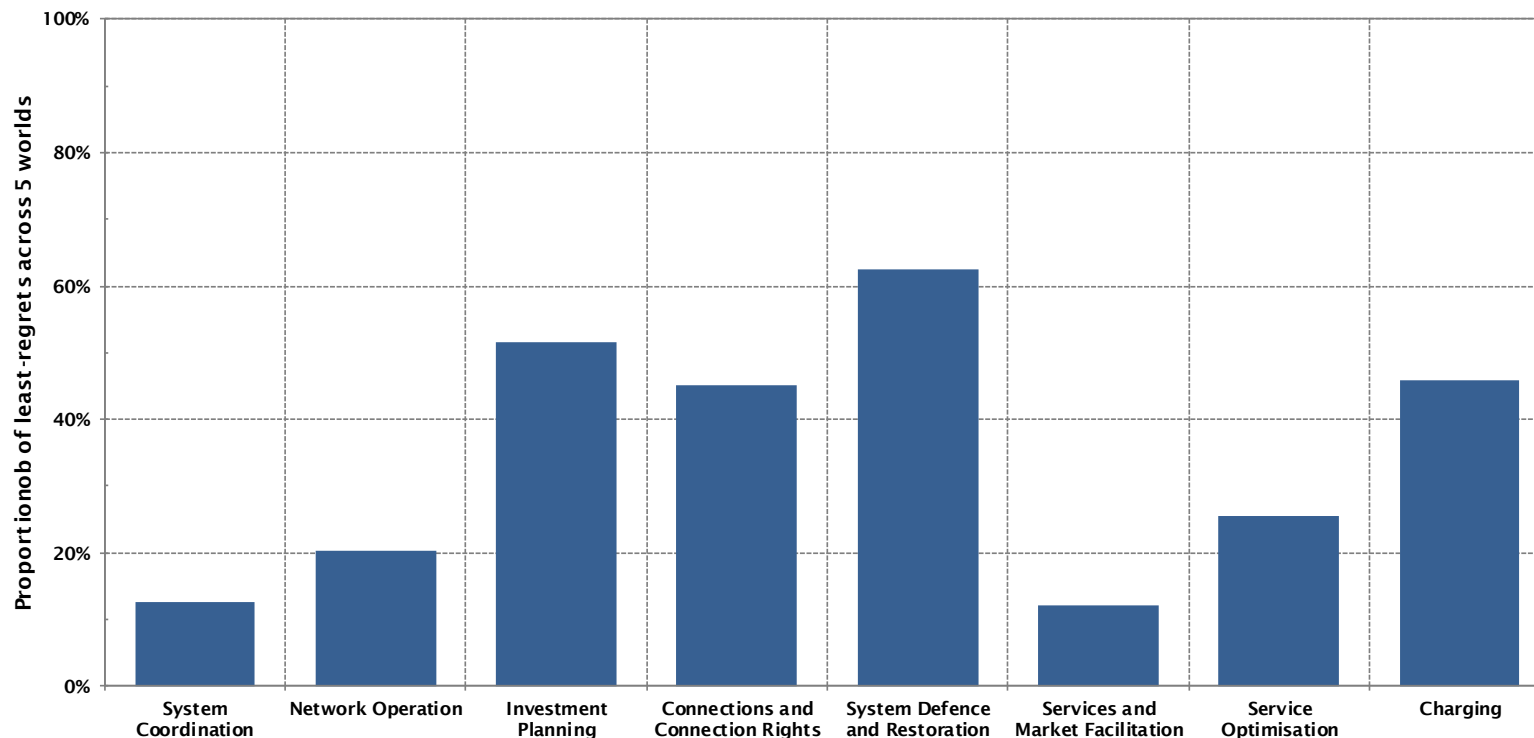
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## Least Regrets by Function

# Least Regrets by Function



Areas of no regrets tend to be aligned with achieving whole-system objectives through long-term planning establishing regulatory frameworks

# Least Regrets by Function

Function	Potential Product Areas
System Coordination	<ul style="list-style-type: none"><li>• Define guaranteed standards of performance between DSO and ESO for utilising flexibility on the distribution network</li><li>• Define the IDNO/IDSO role in the Smart Grid</li><li>• Create consistent Outage Plans across the networks</li><li>• Design a consistent and effective feedback loop for those providing services – e.g. ratings/penalties?</li></ul>
Investment Planning	<ul style="list-style-type: none"><li>• Design Contracts and Terms &amp; Conditions for procuring ancillary services (DER)</li><li>• Create a visible measure of flexibility on the networks</li><li>• Present customer information of opportunities in a consistent way – heatmaps etc.</li><li>• Should there be a design standard for generation in the same way as there is for demand? (P2) (similar to SQSS)</li></ul>

# Least Regrets by Function

Function	Potential Product Areas
Network Operation	<ul style="list-style-type: none"><li>• Unified approach to LV system monitoring and visibility of data</li><li>• Unified approach to Voltage Level monitoring</li><li>• Consistent methodology/approach for the management of constraints</li><li>• Consistent approach on the use of Dynamic Stability Mechanisms (to manage power quality) utilising ancillary services</li><li>• Publishing timely and consistent outage data</li><li>• What level of data should be visible at an operational level?</li></ul>
System Defence and Restoration	<ul style="list-style-type: none"><li>• Protocols for short-term contingency planning between DSO &amp; ESO utilising ancillary services</li><li>• Designing last-resort mechanisms (shift from market-led to control-led). What constitutes market failure?</li><li>• Designing Whole System Network Resilience and Defence Mechanisms with ancillary services</li><li>• 'Islanding' Mechanisms/'Islanded' Networks</li></ul>

# Least Regrets by Function

Function	Potential Product Areas
Services and Market Facilitation	<ul style="list-style-type: none"><li>• Develop consistent best practice for end to end process of procurement, activation, dispatch and settlement of D-network connected flexibility</li><li>• Consistency in exchanging real-time T &amp; D network operational data across networks</li><li>• Universal contract for flexibility providers</li><li>• Develop good practice and consistency for post-event evaluation – review service provision</li></ul>
Service Optimisation	<ul style="list-style-type: none"><li>• Contract Process</li><li>• Activation, dispatch and settlement</li><li>• Review and rate flexibility service provider</li><li>• Scope out mechanics for activation of last resort provision under market failure – notification, dispatch and reporting.</li><li>• Development and activation of emergency assistance services under market failure.</li></ul>



# Least Regrets by Function

Function	Potential Product Areas
Connections and Connection Rights	<ul style="list-style-type: none"><li>• Design a common Connection Agreement &amp; Flexibility Agreement</li><li>• Assess impact of distribution network ancillary services on agreements DSO has with ESO at boundary</li><li>• Do contracts for Transmission-connected services need to be reviewed?</li><li>• Defining firmness of connection for commercial customers as part of the connection agreement</li><li>• Should we trial secondary markets for capacity etc.?</li><li>• Should we trial a combined platform?</li></ul>
Charging	<ul style="list-style-type: none"><li>• Should a review of BSUOS (e.g. to include more forward looking signals) be included in the current charging review?</li><li>• How do you achieve increased visibility and consistency, including network impact, as part of the charging review?</li><li>• Ensuring POC Analysis and Cost Calculations are consistent.</li></ul>

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## Least Regrets Next Steps

# Least Regrets - Next Steps

- All of the outputs from Least Regrets have been considered for the 2019 PID
- Potential products assessed by Workstream leads on a range of criteria including technical feasibility, timescales, alignment with ON objectives, 3<sup>rd</sup> Party interests
- Priority Least Regrets areas from the above criteria to become products included in 2019 PID
- Least Regrets areas not being progressed, deferred or progressed by other areas of the industry to be summarised after finalisation of the 2019 PID

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## Least Regrets Appendix

# Existing Products

Function	Current ON Products	Other Working Groups
System Coordination	<b>WS1 2</b> DER Services Procurement	
	<b>WS1 3</b> Industry Framework Interaction	<ul style="list-style-type: none"> <li>• EU Network Codes SOGL/TERRE</li> </ul>
	<b>WS1 8</b> System-Wide Resources Register	<ul style="list-style-type: none"> <li>• SNAPS</li> <li>• Regional Development Plans</li> </ul>
	<b>WS1 12</b> Data Requirements	<ul style="list-style-type: none"> <li>• Power Potential</li> </ul>
	<b>WS1 13</b> Operational Data & Control Architectures	
Investment Planning	<b>WS1 1</b> Investment Processes	
	<b>WS1 2</b> DER Services Procurement	<ul style="list-style-type: none"> <li>• Individual Distribution-level Initiatives – CMZ’s etc.</li> </ul>
	<b>WS1 5</b> Whole System FES	
	<b>WS1 6</b> Regional Service Requirements	<ul style="list-style-type: none"> <li>• P2 Working Group EWTR130</li> <li>• SQSS Working Group &amp; SQSS Panel</li> </ul>
	<b>WS 1 8</b> System-Wide Resources Register	<ul style="list-style-type: none"> <li>• Regional Development Plans</li> <li>• WPD Strategic Study</li> </ul>
	<b>WS1 9</b> TSO-DSO Transmission Impacts	<ul style="list-style-type: none"> <li>• Flexibility Roadmap</li> </ul>
	<b>WS1 12</b> Data Requirements	

# Existing Products

Function	Current ON Products	Other Working Groups
Network Operation	<p><b>WS1 2</b> DER Services Procurement</p> <p><b>WS1 7</b> ANM Information</p> <p><b>WS1 13</b> Operational Data &amp; Control Architectures</p>	<ul style="list-style-type: none"> <li>• RfG &amp; RoCoF</li> <li>• G89 and G99</li> <li>• SMETS Data</li> <li>• LCT Group – management of LCT</li> <li>• Thermal and voltage – BAU by DNO</li> <li>• CNAIM – visibility of assets</li> <li>• NG EFR EFCC Project</li> </ul>
System Resilience	<p><b>WS1 2</b> DER Services Procurement</p> <p><b>WS1 4</b> Reliability Standards and Emergency Requirements</p> <p><b>WS1 12</b> Data Requirements</p> <p><b>WS1 13</b> Operational Data &amp; Control Architectures</p>	<ul style="list-style-type: none"> <li>• RoCoF/RfG/DCode</li> <li>• Fault Ride Through</li> <li>• NG Code Mod for Storage</li> <li>• LFDD Group</li> <li>• Emergency Planning Managers Forum</li> <li>• Emergency &amp; Restoration Code</li> <li>• Protection Approval Panel</li> <li>• NPG Microgrid Project</li> <li>• NINES (SSEN)</li> <li>• NG ‘Synthesised Inertia’</li> <li>• NG &amp; Scottish Power NIC Project on Black Start</li> </ul>

# Existing Products

Function	Current ON Products	Other Working Groups
Services – Market Facilitation	<ul style="list-style-type: none"> <li>• <b>WS1 P13</b></li> <li>• <b>WS1 P13</b> (focussed on principles of resolving conflicts b/w T&amp;D)</li> <li>• <b>WS1 P8</b> (system wide resource register)</li> </ul>	<ul style="list-style-type: none"> <li>• Existing DNO Activities – Piclo, Flexible Power, CMZ</li> <li>• Ofgem are already considering this for RIIO 2.</li> <li>• BAU (RDPs)</li> <li>• Project Entire</li> <li>• ICCP (int’l std for linking DERMS. being used by some DNOs).</li> </ul>
Services – Service Optimisation		<ul style="list-style-type: none"> <li>• CFF</li> <li>• WS1 P1 (NOA) + existing derogation process</li> </ul>

# Existing Products

Function	Current ON Products	Other Working Groups
Connections & Connection Rights	<p><b>WS1 5</b> Whole System FES</p> <p><b>WS1 7</b> ANM Information</p> <p><b>WS1 8</b> System-Wide Resources Register</p> <p><b>WS1 9</b> TSO-DSO Transmission Impacts</p> <p><b>WS1 11</b> Facilitating Connections – Action Plan</p> <p><b>WS2 2</b> Management of Capacity</p> <p><b>WS2 4</b> Information on Flexibility Services</p> <p><b>WS2 5</b> Good Practice following Connection Apps</p> <p><b>WS2 6</b> Guidance on Post Connection Changes</p> <p><b>WS2 7</b> Provision of Constraint Information</p> <p><b>WS2 2017</b> Paper on Connection Options</p> <p><b>WS4 1</b> Connection Charges for Flexible Connections</p>	<ul style="list-style-type: none"> <li>• SQSS for Transmission</li> <li>• EU Code (RfG, DCC, HVDCC) - Moving to harmonised T&amp;Cs</li> <li>• Storage – Grid Code GC96 &amp; DCode</li> <li>• BAU site specific flexibility by DNOs (firm and non-firm)</li> <li>• CUSC Mod 298 on SoW</li> <li>• CFF Access Rights &amp; CUSC 291 and 295 – Standard T&amp;Cs at Transmission</li> <li>• Ofgem Summer Consultation – Access Reform Project</li> <li>• Principle of access report from Flexible Plug and PlayTERRE Mod &amp; P344</li> <li>• MARI, FCR, FRR, RR</li> <li>• BM Access and ESO Strategy</li> <li>• Piclo</li> <li>• Power Responsive</li> <li>• Flexible Power</li> <li>• Transition, EFFS and Fusion</li> </ul>



# Existing Products

Function	Current ON Products	Other Working Groups
Charging	<b>WS4 1</b> Connection Charges for Flexible Connections <b>WS1 9</b> TSO-DSO Transmission Impacts	<ul style="list-style-type: none"><li>Ofgem Access Reform Project &amp; TCR – DUOS and TNUOS</li></ul>