Utility Week Live
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DNO to DSO – delivering the future power system

Alternative models – is moving to a DSO the right approach?

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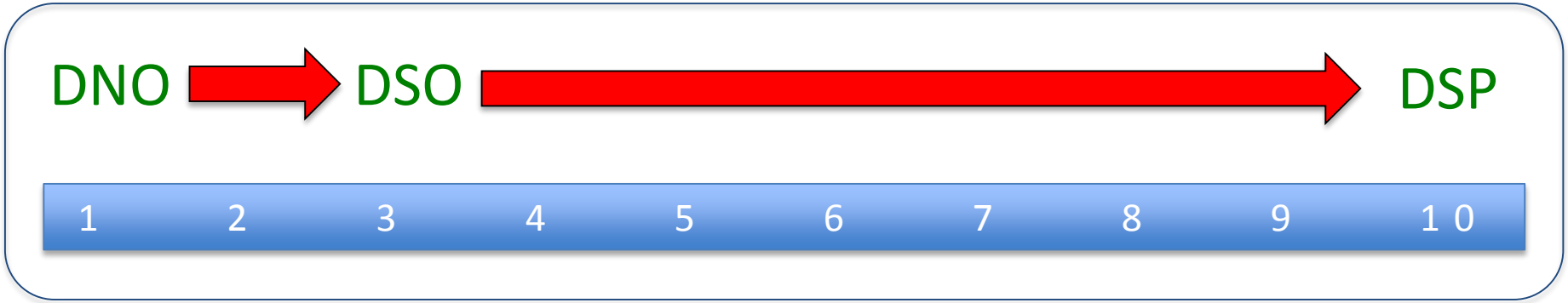
Definitions – what do we mean by DER, DSO or DSP?

- Distributed energy resources (DER), includes storage, flexibility and system resources (such as from EV vehicles), EE, demand side response, distributed supply (elec/heat), at all scales and value differs by time and place

- DSO – is this a DNO + a few system services from other actors? More or less BAU regulatory mechanism, BAU system value chain, data ownership

- Distribution service provider (DSP) – area coordinator of energy and system services; market facilitator; local market coordinator and balancer; link between public goals and regulatory outcomes. New values (and therefore new value chains) coming out of new system coordination and the new user propositions it is encouraging / trying to meet. Different regulatory mechanism incentivising desired outcomes, which reveal DER value / new area energy economics. Governance as transformational.

What is a DSO / DSP? It is the function that matters



Underlying argument for distribution service provider (DSP)

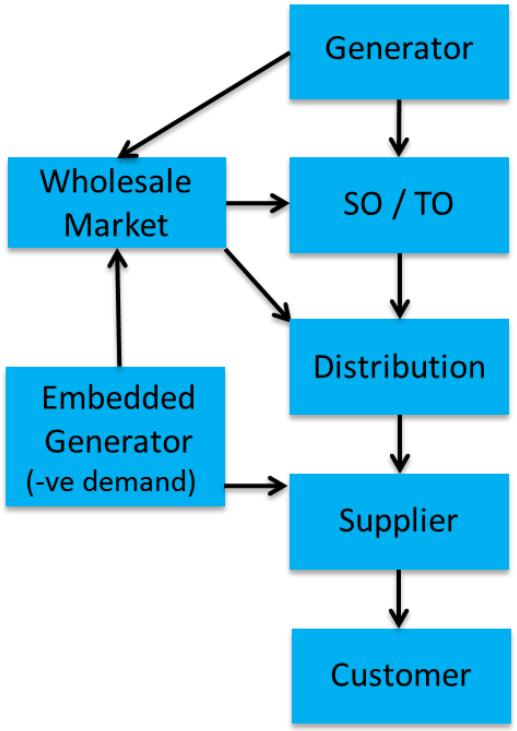
- Increasing proportions of variable power RE and DER requires a new system operation – both at T and D
- The conventional way to incorporate new resources and system operation is to upgrade / enlarge infrastructure, but this would be very expensive
- So we need to operate the system differently (ie more flexibly, using new resources). We need:
  - a ‘new’ distribution coordinator actor
  - ‘new’ governance (ie regulatory mechanism etc), given ‘new’ actor role, to reveal ‘new’ values of flexible operation using DER and to incentivise desired outcomes

Understanding DER value: requires an area-based coordinator to reveal value

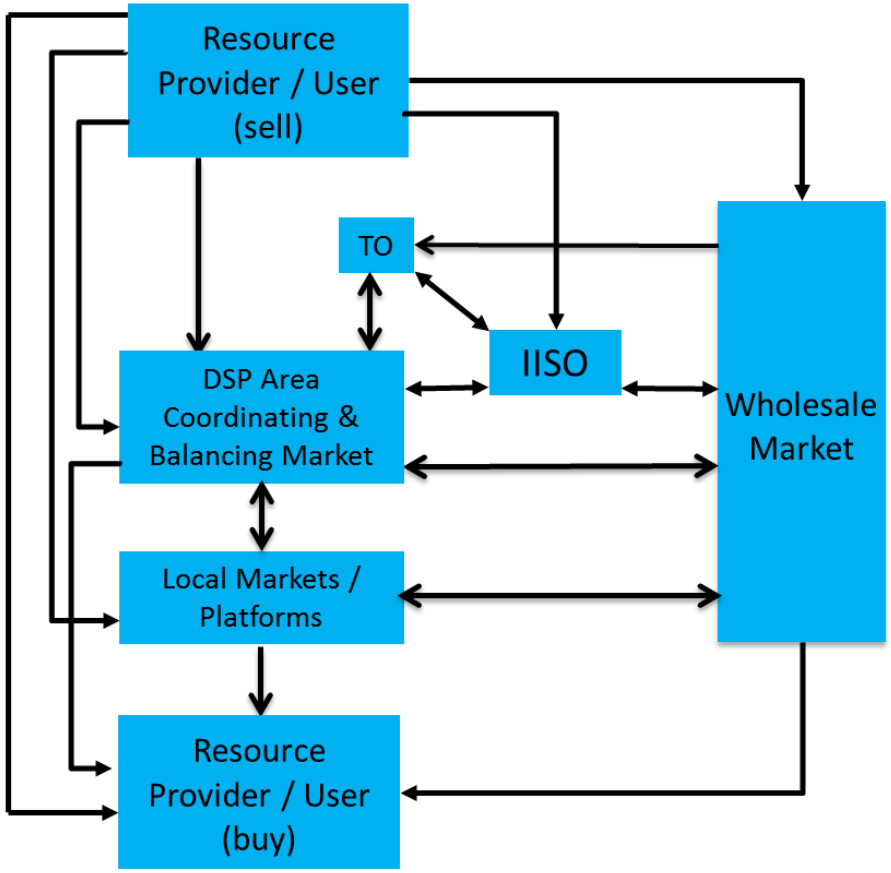
- Distribution networks and their operation are becoming more important because of decarbonisation, decentralisation of technologies and digitalisation (D3),
  - Electric vehicles / mobility
  - DSR from the domestic level
  - Smart system operation
  - Smart grid / smart meters
  - Heat decarbonisation (eg district heating, heat pumps, solar thermal)
  - EE / zero energy buildings
  - Flexibility resource and value
  - Prosumers
  - P2P
- Distribution areas are where customer involvement, decarbonisation and new energy system economics meet
- We need to understand this distributed energy resource (DER) value to whole energy system operation
- **The value from this new flexible system operation requires a D area coordinator**
  - **Area / specific values cannot be revealed via the current SO / wholesale market**

T and D System operation is changing, and governance (the traditional supplier hub model, market design, how to pay for networks etc) is no longer fit for purpose

Traditional/Supplier Hub



Flexible Choice/ System Operator Hub



Energy System Challenges and DSO / DSP Solutions

DSO	Challenges	DSP
Better than now, but not much granularity	D system co-ordination, granularity, and revealing of value for DER and data access	Area based enables this down to residential level
Better than now, but not much	Increase energy efficiency, integration between sectors, capture flexibility, value LEM, DSR	Enables this down to residential level
Certain customers	User / people focused	incentivises full user choice / place for PSO
Better than now but not much	Operation / markets to minimise infrastructure and overall costs, and sees DER as part of solution	Enables this
Some, but complex	Incentivised to meet desired outputs, including adaptability / environment - simply	Could connect government targets / goals and PBR
Some	Regulated to encourage transactions / NWA / innovation of practice / new entrants	Yes, area based + PBR and helps to reduce regulatory lag
Not really	Transparent, directive legitimate policy making	Greater coherence of decision-making, direction & less delegation from BEIS

Paraphrasing the last slide: DSP better meets energy system challenges than DSO

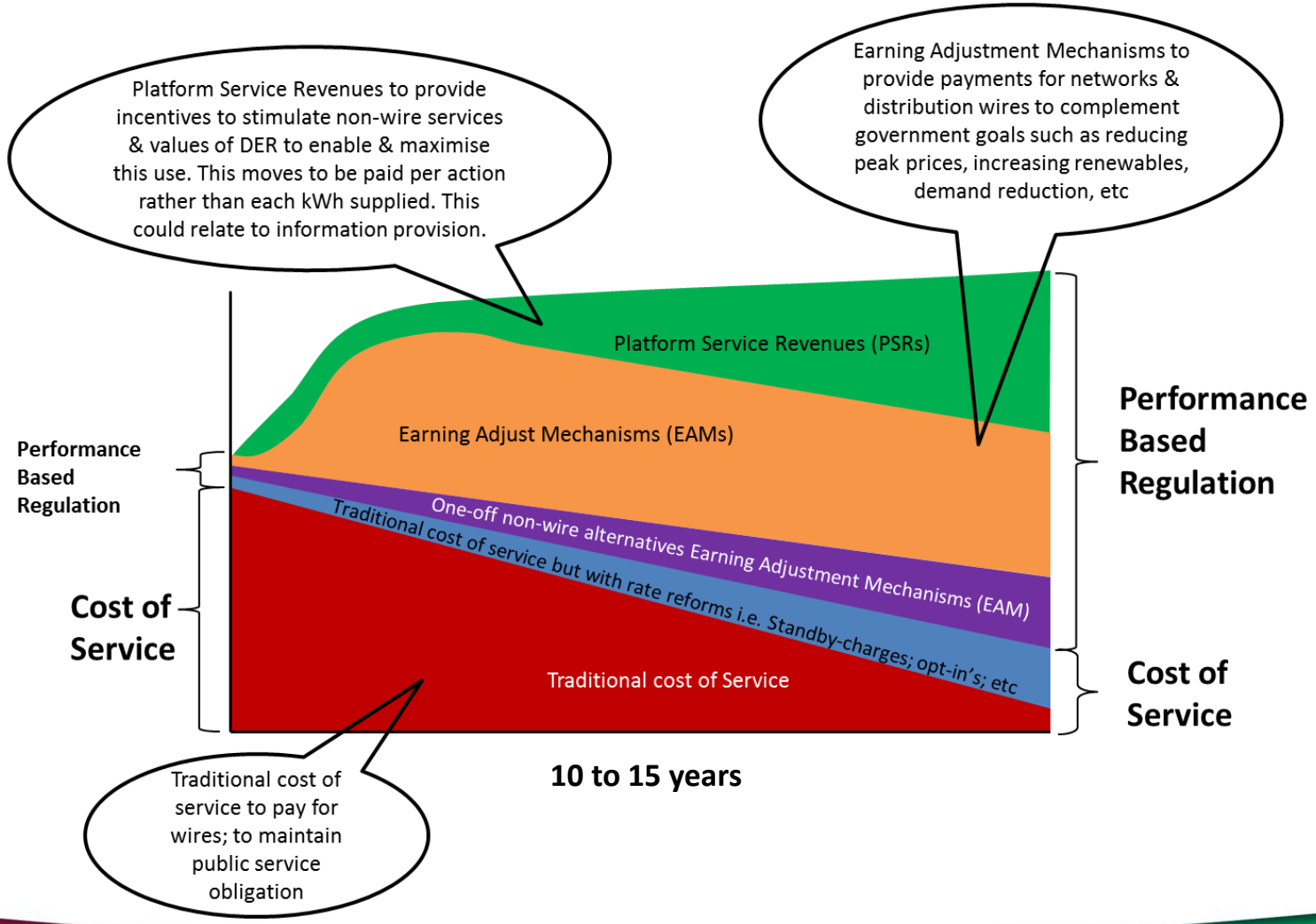
- If we are serious about meeting Committee on Climate Change carbon budgets, a DSO is just too limited
  - Soon to be ‘out of date’
- Read the NY REV 2014 Vision document
  - http://projects.exeter.ac.uk/igov/lessons-from-america-new-york-states-reforming-the-energy-vision/

Issues of what institution becomes DSO / DSP + role of networks

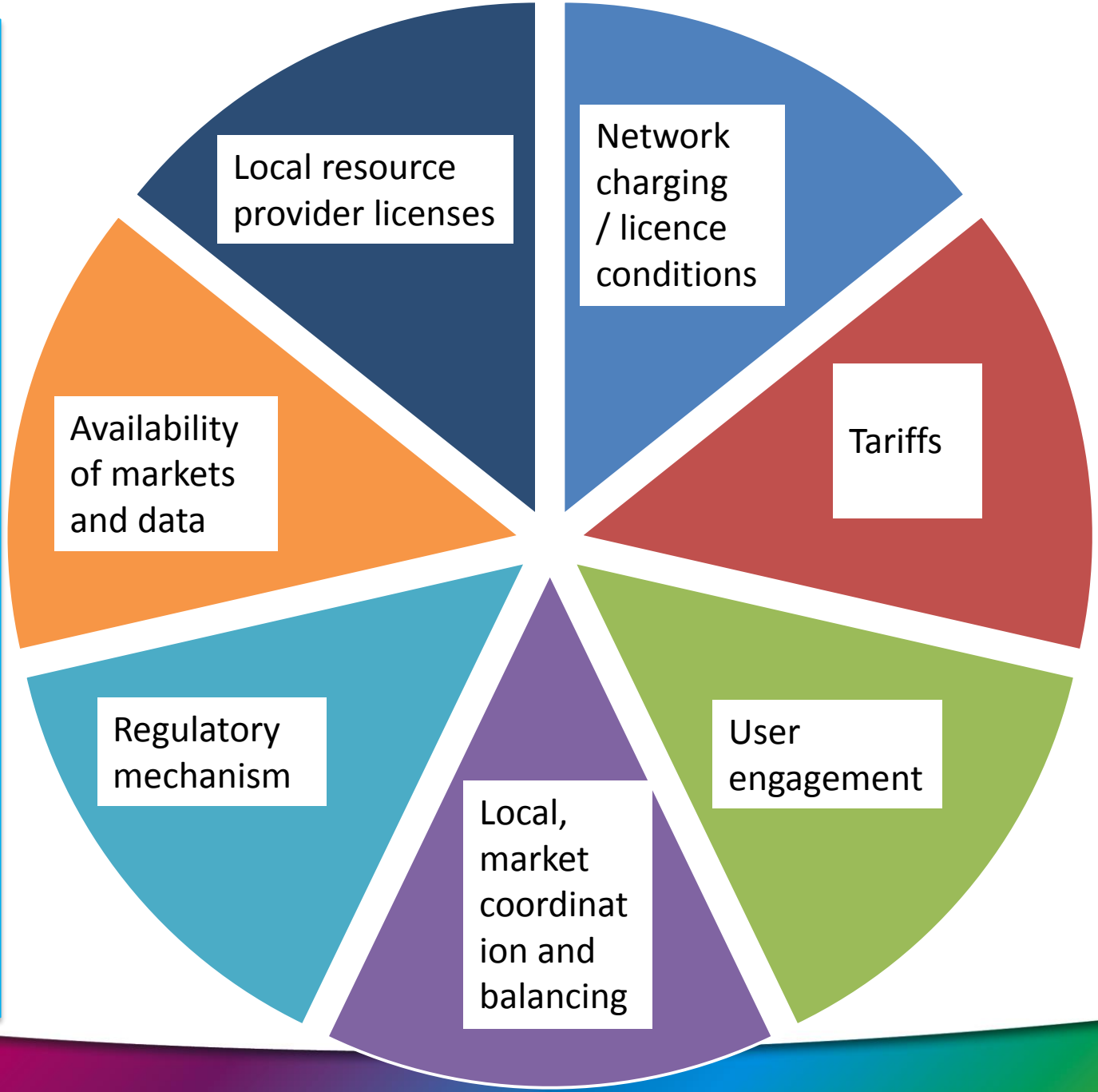
- Many possible options:
  - DNO as is, becomes a DSO
  - DNO as is, becomes a DSP
  - DNO separates wires co. from SO / DSP functions, both regulated
  - DNO ceases SO operator functions and becomes a wires company with a new platform as D area market facilitator (ie DEx in Australia), also regulated
  - Others…
- Multiple views on which option is ‘best’
  - Revolve around whether a DNO can change to being ‘active’ given appropriate incentives
- IGov open-minded but at moment a combined energy / system DNO to DSP as local market coordinator seems to answer challenges, including PSO etc

We need a regulatory mechanism which encourages DSPs and a post supplier hub value chain (to include an area-based value chain) and regulated with increasing % PBR

(below shows RORE)

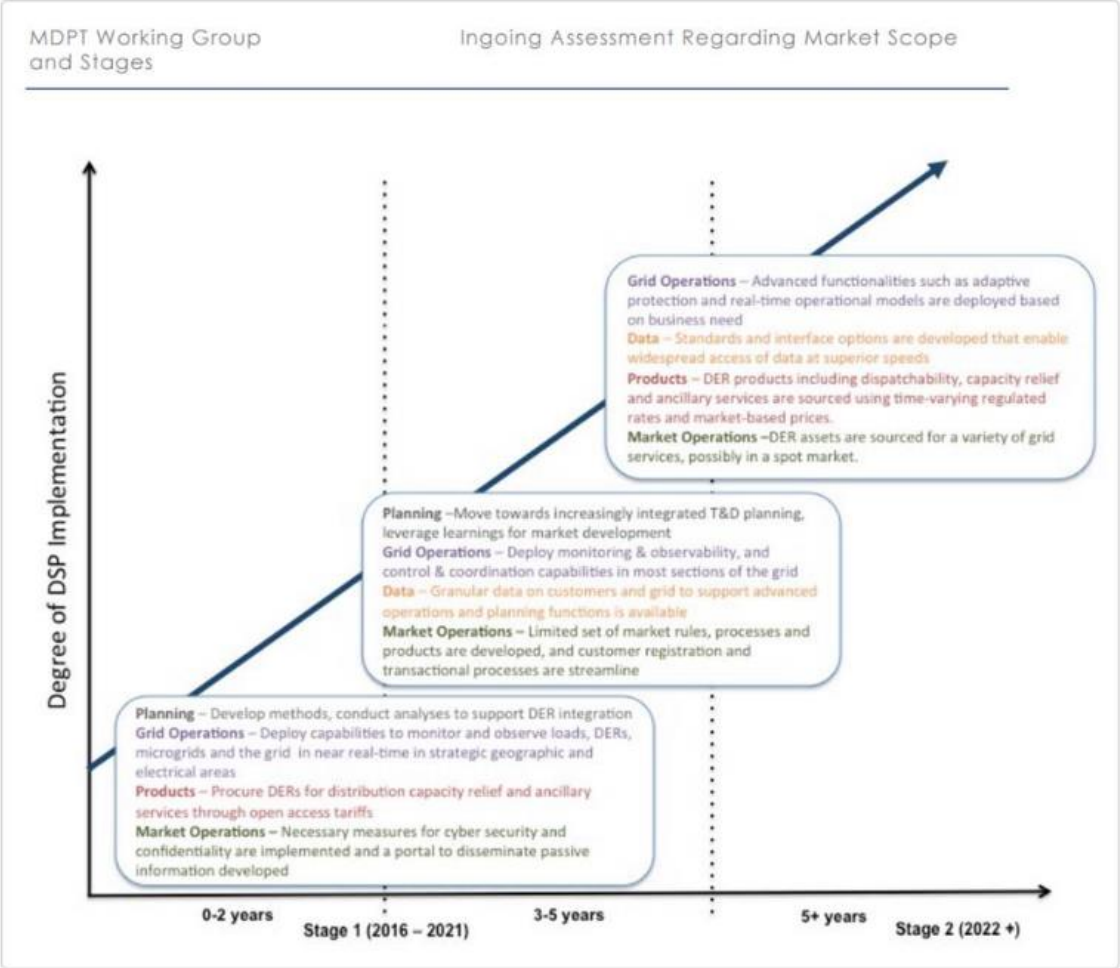


We need new governance system to fit new SO requirements and public policy goals



We need timescales for change – not too quick; not too slow, eg like NY REV /CA, and to fit CCC budget – so that changes have a good chance of working

https://www.energymarketers.com/Documents/MDPT_Report_150817_Final.pdf



Conclusions

- We need a new approach to distribution operation and regulation in GB
  - By learning lessons from elsewhere in world
  - Current DNO-DSO approach too limited
- We need transparent, distribution DER value plans
- We need to speed up change to DSPs, although expecting the process will take time and will be iterative.
- This requires a governance system which reflects the growing importance of Distribution Service Providers as a means to keep costs down as we decarbonise, whilst meeting user propositions and fitting with post supplier hub needs etc

Thankyou

For more information, please go to the IGov website

http://projects.exeter.ac.uk/igov/

Further References

- **Distribution Service Providers / Valuing DER**

Much of the IGov discussion about DSPs takes place in blogs / presentations about the New York Reforming the Energy Revolution (NY REV), which has a primer all of its own. We also see an expanded distribution function as a central part of a fit-for-purpose energy governance framework, and that also has a primer of its own (fit for purpose energy governance).

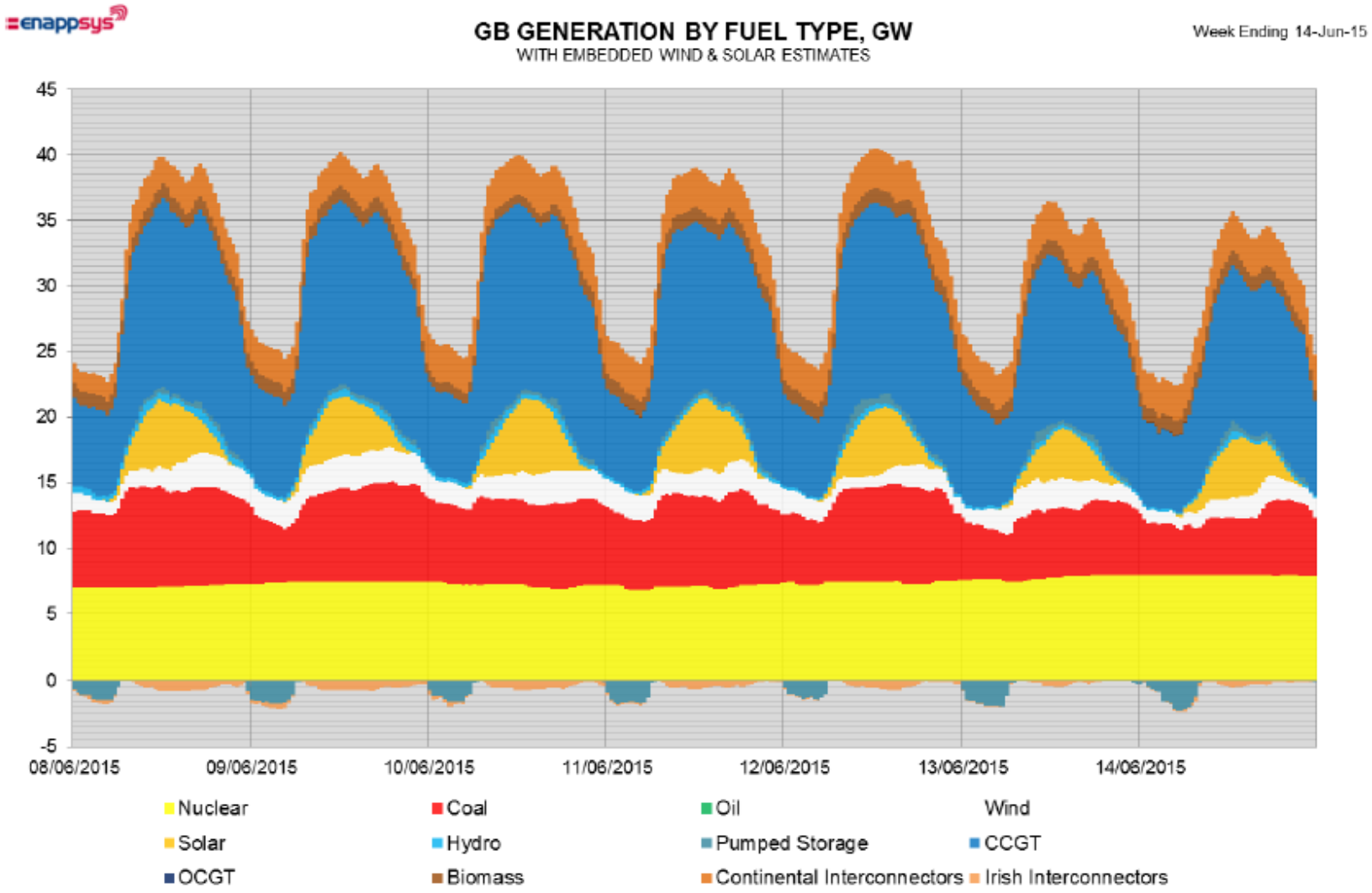
The references below are for stand- alone blogs / presentations about DSPs or Valuing of DERs. We think that the valuing of a DER resource is a central building block for an energy efficient and affordable energy system, and best undertaken via an area based co-ordinated approach. We think DSPs are the best institution to value DERs and to coordinate local areas. This primer tries to bring the 2 inter-linked issues together.

- January 2016 An early discussion of what a DSP is http://projects.exeter.ac.uk/igov/new-thinking-energy-distribution-service-providers/
- May 2016 IGov had a roundtable to discuss the concept of the DSP http://projects.exeter.ac.uk/igov/category/events/igov-events/dsp-roundtable/page/2/
- June 2016 http://projects.exeter.ac.uk/igov/presentation-distribution-service-providers/ (presentation to Inter America Bank)
- July 2016 Comparing NY REV to RIIO and arguing that the transformational nature of the NY REV was related to the DSP concept http://projects.exeter.ac.uk/igov/new-thinking-transformational-regulation-comparing-the-ny-rev-riio/
- Slidepack (last updated December 2017) http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/04/Distribution-Service-Providers-Update-Dec-2017-1.pdf
- June 2017 DSP and DER valuing in NY and CA - http://projects.exeter.ac.uk/igov/comparing-nys-with-ca-blog-5-a-ca-and-nys-similarity-mapping-der-via-a-regulated-process/
- July 2017 International experience of decentralised markets, Pixie Launch http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/07/CM-Pixie-Launch-July-2017.pdf
- 2017 http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/10/Exeter-EPG-response-to-WPD-DSO-Transition-Consultation.pdf
- Feb 2017 the difference between DSOs and DSPs http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/02/PRASEG-28-Feb-2016.pdf
- June 2017 why the distribution function is more important than the name http://projects.exeter.ac.uk/igov/comparing-nys-with-ca-blog-6-dso-or-dsp-why-it-is-the-function-rather-than-the-name-that-really-matters/
- March 2017 Reset the reset (3 blog series) looks at the DER assessment process in CA and NY: Blog 1 http://projects.exeter.ac.uk/igov/new-thikning-reset-the-reset-1-we-need-institutional-governance-reform-and-we-need-it-now/ and Blog 3: http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-3-der-walking-the-walk/

Further References: NY REV

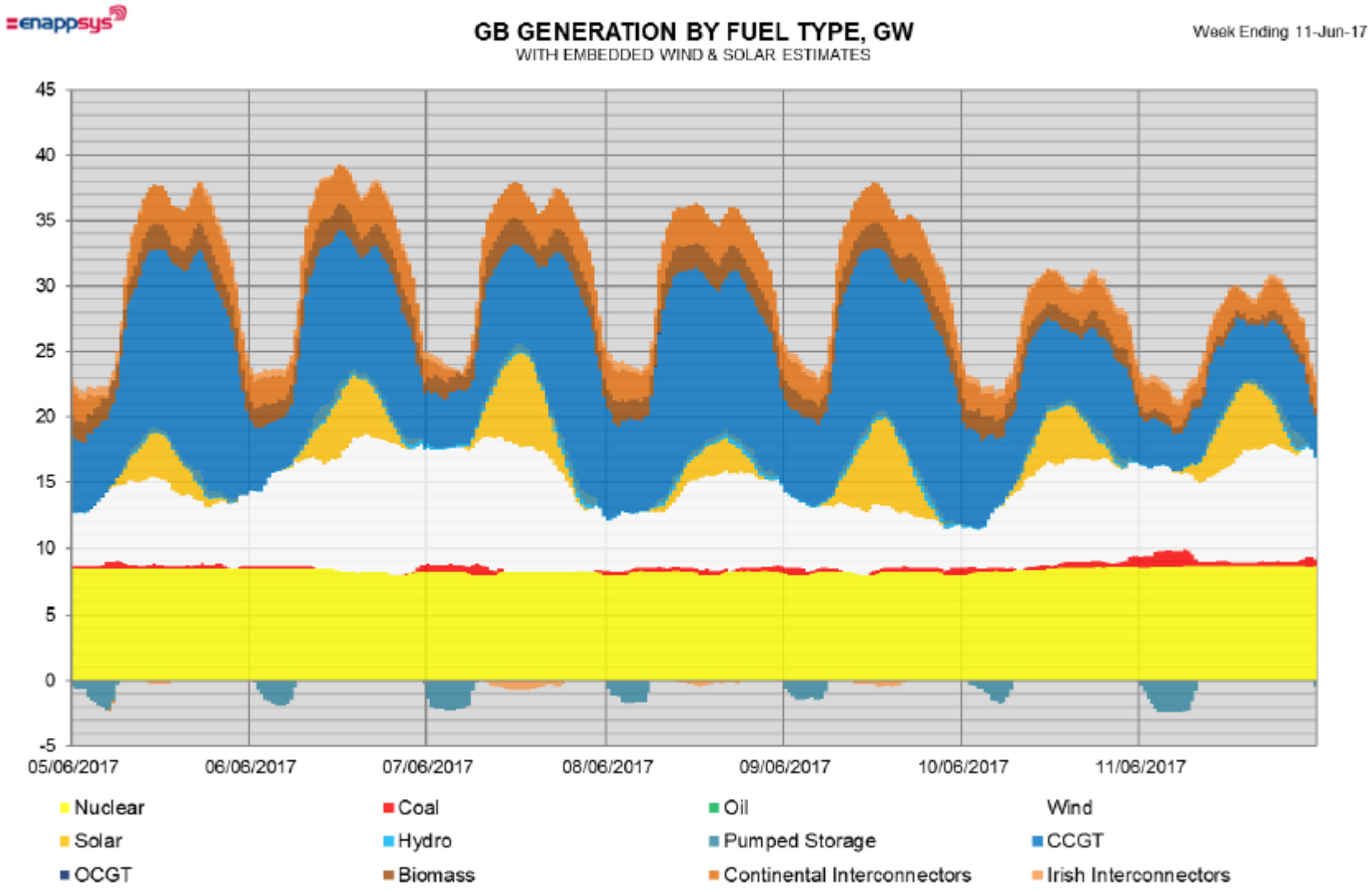
- Blog 1 (2014) http://projects.exeter.ac.uk/igov/lessons-from-america-new-york-states-reforming-the-energy-vision/
- Blog 2 (2015) http://projects.exeter.ac.uk/igov/new-thinking-reforming-the-energy-vision-an-update/
- Blog 3 (2016) http://projects.exeter.ac.uk/igov/us-regulatory-reform-ny-utility-transformation/
- The Rate Making Order 2016 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BD6EC8F0B-6141-4A82-A857-B79CF0A71BF0%7D (also linked in Blog 3)
- Notes on Rate Making Order by CM http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/06/NOTES-NY-REV-ORDER-19-May-2016.pdf
- Blog 4 (2017) http://projects.exeter.ac.uk/igov/comparing-ny-with-ca-blog-2-catching-up-with-the-ny-rev/
- Blog 4 is part of a 6 part series on New York versus California regulation http://projects.exeter.ac.uk/igov/comparing-nys-and-ca-blog-1-series-overview/
- Reset the reset (3 blog series) http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-1-we-need-institutional-governance-reform-and-we-need-it-now/ and Blog 3 of Reset the Reset looks at the DER assessment process in CA and NY http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-3-der-walking-the-walk/
- August 2016 Comparing the NY REV and RIIO http://projects.exeter.ac.uk/igov/new-thinking-transformational-regulation-comparing-the-ny-rev-riio/
- A central ‘new’ institutional part of the NY REV is the coordinating and market facilitating role of the Distribution utility (which are combined distribution and supply in GB terms). IGov has another primer on Distribution Service Providers, so please look at that one. We have a DSP slide pack which we update from time to time. Many of our figures change and this is the place where you can usually get the most up-to-date figure (or nearly up to date). http://projects.exeter.ac.uk/igov/new-thinking-distribution-service-providers/
- A March 2018 Review of Australia and NY REV issues, looks at DER assessment and regulating NY REV utilities http://projects.exeter.ac.uk/igov/wp-content/uploads/2018/03/Brown-Bag-Lunch-BEIS-22-March-2018.pdf

Generation summer 2015



Source: National Grid

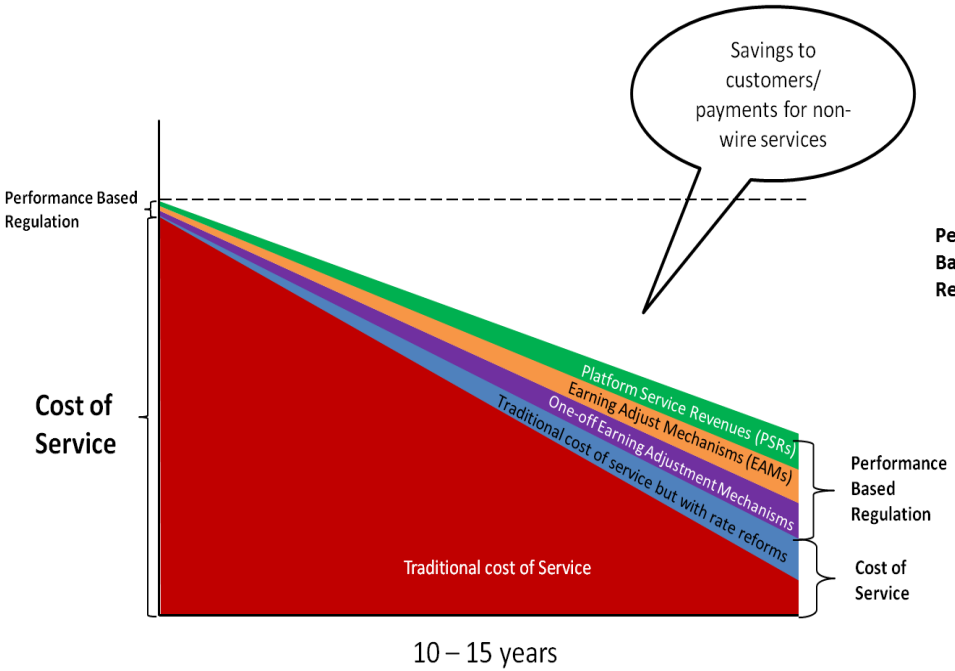
Generation summer 2017



Source: National Grid

There are longer term issues related to the role of networks / how to pay for them in an energy efficient world (which we need for decarbonisation)(total revenue not RORE)

Super-energy efficient world



A non-energy efficient world