



Regulation to Promote Development of Distributed Energy Resources

Prepared for the EPRG-NERA Winter Seminar 2017

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8 December 2017

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The distribution grid can either be the key to energy innovation or block its growth

centrica

BUILDING A NEW ENERGY FUTURE

Cornwall Local Energy Market

February 2017 to present

The Cornwall Local Energy Market will see the development of a virtual marketplace that will provide participants with a platform to buy and sell energy and flexibility both to the grid and the wholesale energy market.

UK electricity grid holds back renewable energy, solar trade body warns

10 May 2015

“Western Power Distribution, the DNO for the Midlands, south-west England and Wales, **has closed the grid to new large renewable projects in Cornwall, Devon, Somerset and Dorset for up to six years.”**

theguardian

We must chose a regulatory model that gets incentives right.

Agenda

1. **The power system is changing.** DERs are driving large scale change by decentralizing the power system.
2. **The distributor needs to change** to support DERs, and thus the way its regulated needs to change
3. **There are three models on the table**, the DSO, DSP, and RSO.
4. **The RSO is not viable; the DSO or DSP are more promising.**

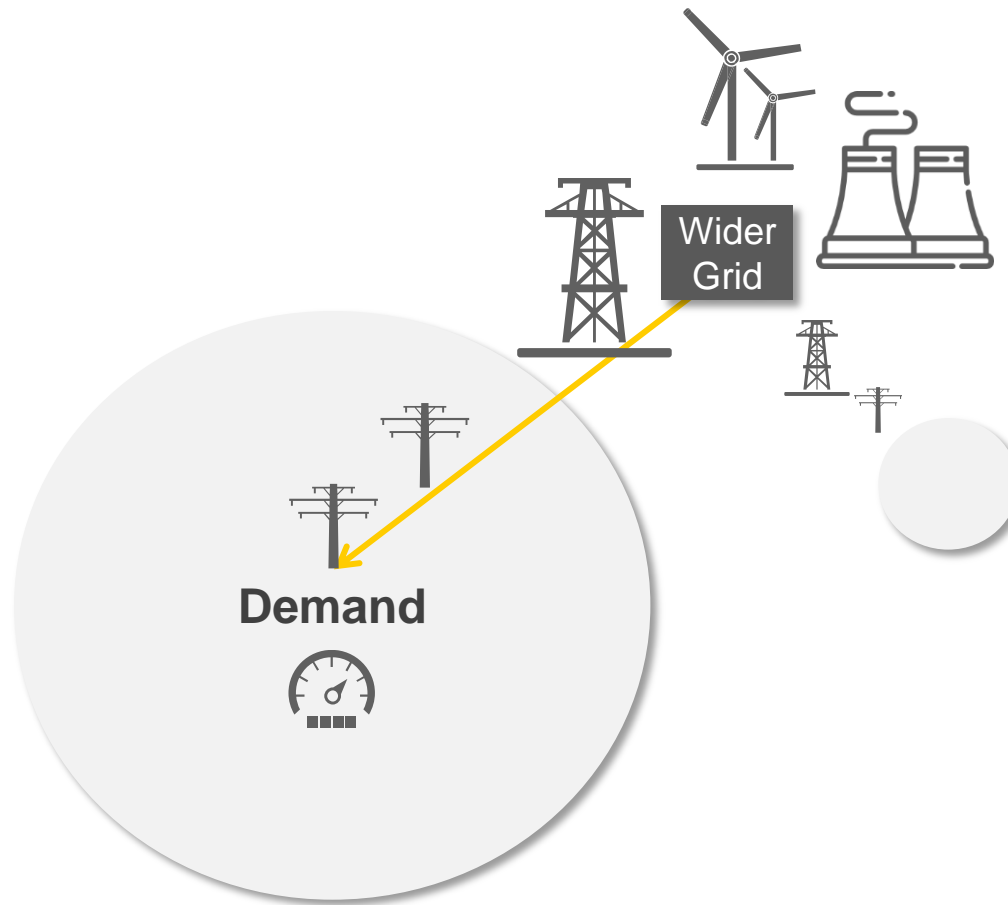
Acronym soup

- **DER:** Distributed Energy Resource
- **LEM:** Local Energy Market
- **DNO:** Distribution Network Operator
- **DSO:** Distribution System Operator
- **DSP:** Distribution Service Provider
- **RSO:** Regional System Operator

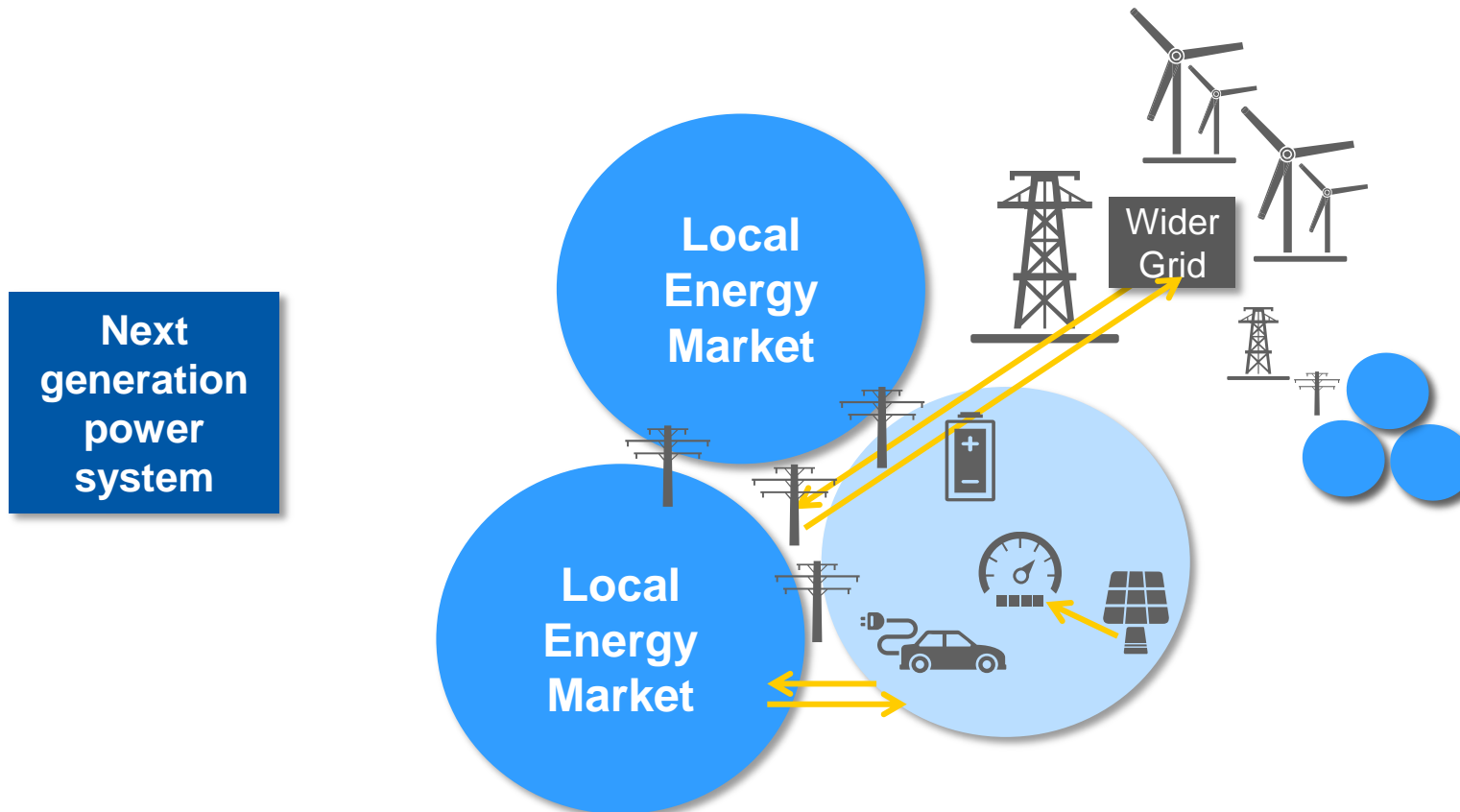


Yesterday's power system was centralized and moved in one direction

Yesterday's
power
system



Tomorrow's power system will be more complex and multi-directional



1. Renewable energy (solar PV)
2. Batteries and other demand management
3. Smart metering
4. Distribution system to connect and coordinate

Missing markets will prevent the full development of DERs and LEMs

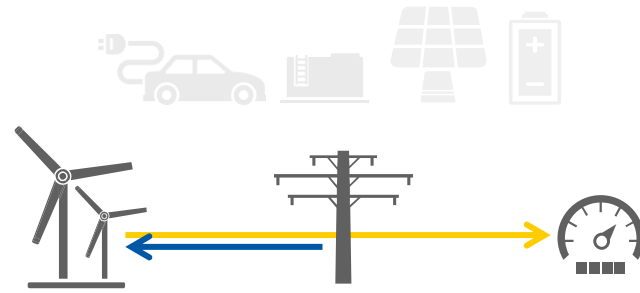
- **Necessary services:**

- **Energy**
- **Flexibility**
- **Distribution congestion alleviation**

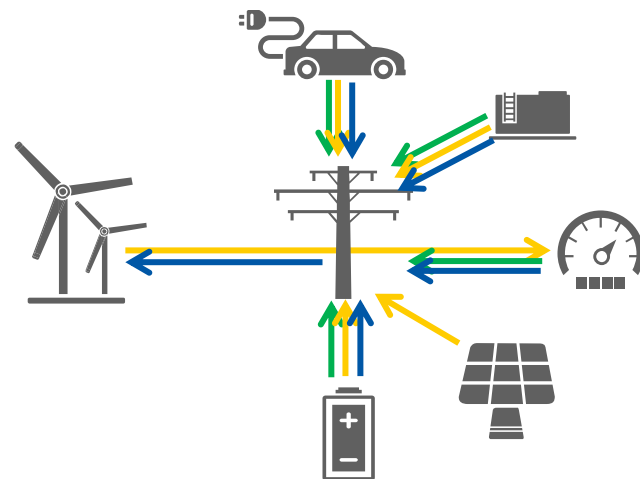
- **Nearly all are missing** from the power market institutions:

- The **wholesale energy market is not granular enough** to deliver signals at the local level.
- **DNOs are not incentivised to procure local distribution / flexibility services** or sell them on to the wider system.

Current Model

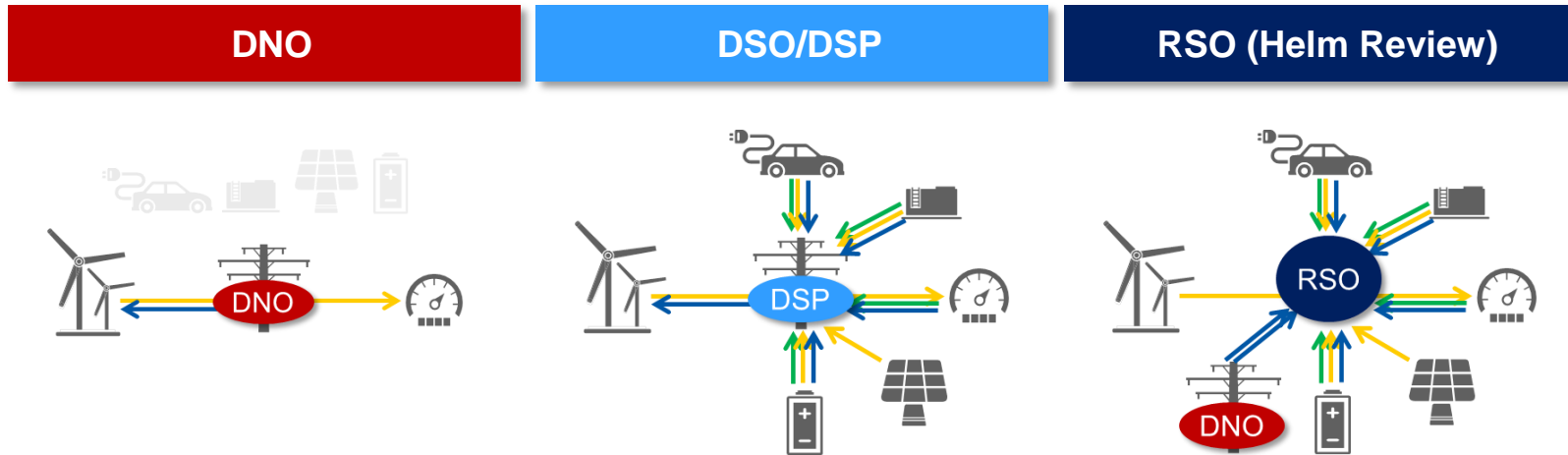


DSO/DSP



Energy → Flexibility → Distribution

There are three models proposed to improve upon the DNO

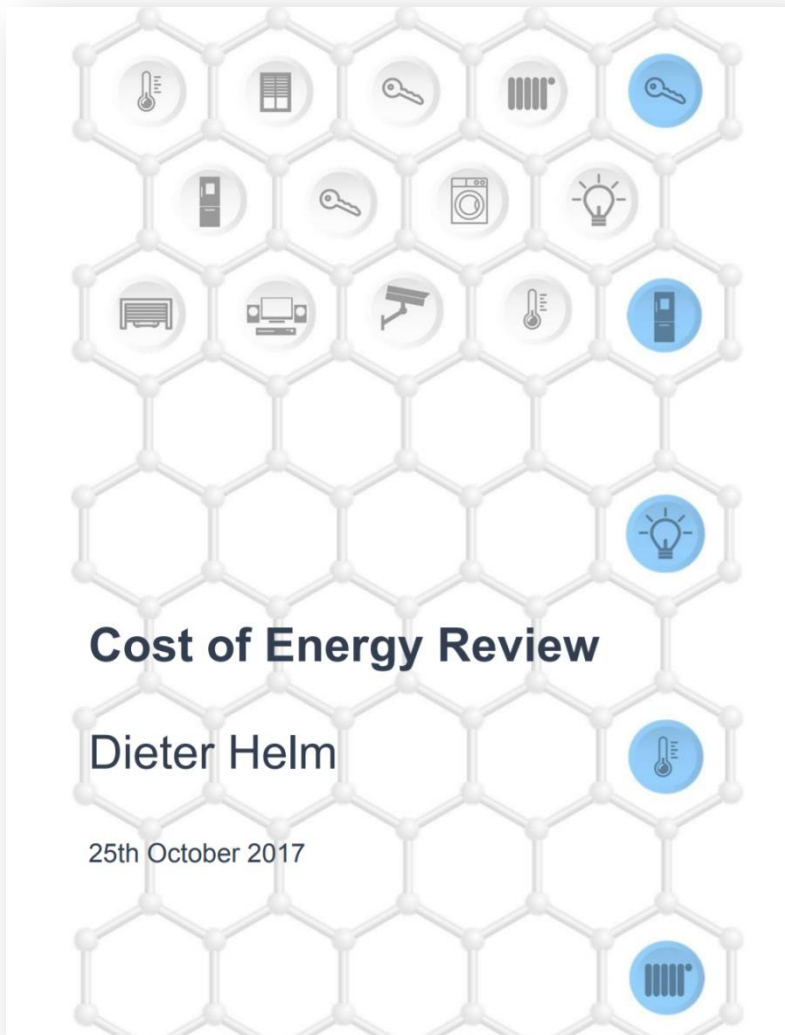


| | DNO | DSO/DSP | RSO (Helm Review) |
|--------------------------|---|--|--|
| Full Name | Distribution Network Operator | Distribution System Operator / Distribution Service Provider | Regional System Operator |
| Managing Entity | Distribution companies | Distribution companies | Newly formed RSO |
| Role of Entity | Passive. Build and maintain assets (with focus on their own). | Active. Buy or build and manage flow of data. DSP is more market-driven and can sell services on to grid. | Active. RSO sits in front of DNO and runs tenders to procure least cost services and manage flow of data |
| Compensation | Regulated return based on capital invested and operating expenses | Performance based incentives mixed with traditional regulated returns | Completely performance based |
| Goal | Reliability at low cost | Innovation and reliability at low cost | Innovation and reliability at low cost |
| Regulatory Regime | Ofgem under RIIO | Ofgem, RIIO for DSO; + other mechanisms for DSP | None |

The Helm Review proposes to create Regional System Operators

Helm argues:

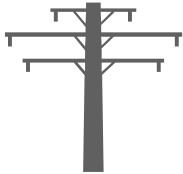
- **Past price controls have led to excess returns for DNOs.**
- **Future price controls will become nearly impossible:**
 - Hard to predict costs over 8 year periods
 - New technologies blur lines between T/D/G/S
- **Develop new publicly owned National and Regional System Operators (NSO/RSOs)**
 - NG SO at a lower voltage.
 - Remit is security of supply and demand forecasting
 - Tender for capacity and flexibility
- **Ofgem becomes redundant**



Helm's remedies are not justified and are unlikely to work in practice

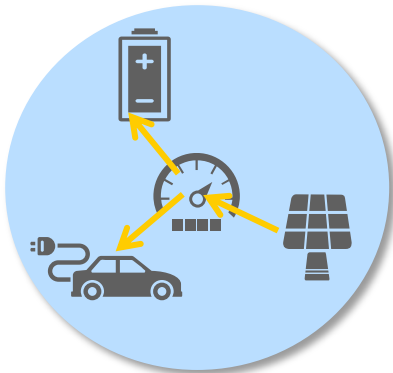
1. Does not evaluate or consider **other regulatory models**
2. It ignores the likely **market power of incumbent DNOs** in RSO tenders, which would need to be mitigated through some kind of regulation (by Ofgem or another regulator)
3. It reaches **contradictory conclusions** by bemoaning government intervention in generation but asking for more of it in distribution

We must strike the right balance to support the growth of DERs and LEMs



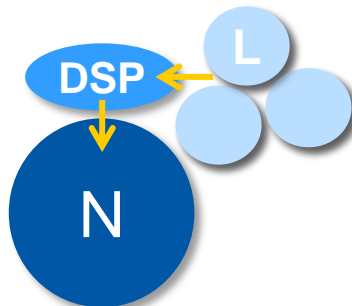
■ On **regulation**

- Concerns around cost forecasting can be addressed using shorter regulatory periods, possibly without fixed ex ante allowances for major investments
- Considering requiring DNOs to market test their investments with tenders



■ On **markets**

- More layers of central planning will not solve problem
- Incentivize those closest to the problem to solve it
- Some services might not be tender-able



■ Other **reforms**

- Efficient network pricing is probably required
- It will be important to integrate national and local markets



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