



# FENIX – Regulatory issues and recommendations

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A presentation to FENIX Stakeholder Advisory Group

Stephen Woodhouse

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# Regulatory barriers exist which may prevent the implementation of the FENIX...recommendations for change are required to overcome them

What kind of regulatory framework is needed for FENIX to be viable?

- Summary of regulatory recommendations made by previous studies of DER
- Definition of services offered by FENIX, which a regulatory regime should allow and reward
- Outline of the business model of Technical and Commercial VPPs



How do current regulatory regimes compare to this?

- Overview of how regulation is done in Europe
- Description of regulatory frameworks in GB, Spain, Netherlands and Austria
- Examination of current businesses operating as CVPPs or TVPPs in GB
- Specific barriers to FENIX, particularly in Great Britain and Spain



What changes need to be made to existing regulatory frameworks?

- Specific recommendations for changes to regulatory structure in Spain and Great Britain
- European-wide recommendations based on the lessons learnt from Spain, Great Britain, the Netherlands and Austria

**Remainder of slides focus on desirable regulatory features, interaction with another EU project (EU-DEEP) and examples of Spain and GB specific findings**

# Outline of presentation

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- ➔ 1. Desirable features of regulatory framework
- 2. Interaction with EU-DEEP
- 3. Examples of country-specific barriers and recommendations

## Regulatory framework recommendations fall into several categories...

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Area	Focus
<b>DNO/DSO incentives and requirements</b>	<ul style="list-style-type: none"><li>• Changing the environment within which distribution businesses operate</li></ul>
<b>Metering and communications</b>	<ul style="list-style-type: none"><li>• Creating enabling infrastructure</li></ul>
<b>Network access</b>	<ul style="list-style-type: none"><li>• Allowing/encouraging DER participation</li><li>• Guaranteed connection but not firm access</li><li>• Market access for DER</li><li>• Time-dependent pricing</li><li>• Access by DER</li><li>• Appropriate forms of support to encourage flexibility</li></ul>
<b>Market participation</b>	
<b>Demand side measures</b>	
<b>Ancillary services</b>	
<b>Technology support</b>	

## Desirable regulatory framework features for DER...

Area	Requirements	Detail
<b>DNO/DSO incentives and requirements</b>	<ul style="list-style-type: none"> <li>• Allowance of full recovery of DG connection costs</li> </ul>	<ul style="list-style-type: none"> <li>• removes the temptation for connection to be delayed in order to defer the costs faced by a DNO/DSO, which can occur even with a statutory requirement to offer terms of connection</li> </ul>
	<ul style="list-style-type: none"> <li>• Incentives and allowances for innovation</li> </ul>	<ul style="list-style-type: none"> <li>• innovative solutions to network problems, such as the involvement of DER can only come about through investment in research and development</li> </ul>
	<ul style="list-style-type: none"> <li>• Consistent treatment of OPEX and CAPEX</li> </ul>	<ul style="list-style-type: none"> <li>• would allow more switching between the two, an important step for fully integrating DER within the network</li> </ul>
	<ul style="list-style-type: none"> <li>• Longer term planning framework</li> </ul>	<ul style="list-style-type: none"> <li>• important for operators to have a view of what the network 'should' look like from an economically-efficient point of view in order to make informed investment decisions</li> </ul>
	<ul style="list-style-type: none"> <li>• Islanding and statutory requirements</li> </ul>	<ul style="list-style-type: none"> <li>• statutory technical requirements such as voltage and frequency limits may need to be relaxed in some situations in order to increase the reliability of network when using DER</li> </ul>

## Desirable regulatory framework features for DER...

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Area	Requirements	Detail
Network access	<ul style="list-style-type: none"><li>Guaranteed Rights to Connect</li></ul>	<ul style="list-style-type: none"><li>essential if there is to be an increase in penetration of DER</li></ul>
	<ul style="list-style-type: none"><li>Non-firm capacity connections</li></ul>	<ul style="list-style-type: none"><li>encourages the use of actively managed networks</li></ul>
	<ul style="list-style-type: none"><li>Assess DER's contribution to SoS</li></ul>	<ul style="list-style-type: none"><li>essential step in moving from a passively built distribution network to a more actively managed one</li></ul>
	<ul style="list-style-type: none"><li>True reflection of costs and benefits of DER</li></ul>	<ul style="list-style-type: none"><li>necessary for DER to have appropriate incentives to connect and operate in a manner that benefits the economy as a whole</li></ul>

## Desirable regulatory framework features for DER...

Area	Requirements	Detail
<b>Market participation</b>	<ul style="list-style-type: none"> <li>• Full market access for DER</li> </ul>	<ul style="list-style-type: none"> <li>• DER should be able to compete on an equal standing with centralised generation, although aggregation may be needed to permit it to do so</li> </ul>
	<ul style="list-style-type: none"> <li>• More open, liquid and transparent markets</li> </ul>	<ul style="list-style-type: none"> <li>• necessary to enable independent agents to innovate in order to integrate distributed energy resources and allow participation on a more equal basis</li> </ul>
<b>Metering and communications</b>	<ul style="list-style-type: none"> <li>• Establish technical and communication standards</li> </ul>	<ul style="list-style-type: none"> <li>• lack of technical standards is a major barrier to the uptake of more innovative metering solutions.</li> </ul>
	<ul style="list-style-type: none"> <li>• Full information flows for new and existing DER</li> </ul>	<ul style="list-style-type: none"> <li>• means that schemes would no longer be invisible to network planners and operators</li> </ul>
	<ul style="list-style-type: none"> <li>• Wider use of real-time metering</li> </ul>	<ul style="list-style-type: none"> <li>• would add value for DER by encouraging suppliers/CVPP to make full use of the DER flexibility by participating in the market and by providing services to the TSO and DSO</li> </ul>

## Desirable regulatory framework features for DER...

Area	Requirements	Detail
<b>Demand side measures</b>	• Reduction in profiling	• means that more demand and generation is more exposed to within-day price variation
	• Time-differential pricing	• providing a different cost for electricity consumed at different times would provide a currently unavailable incentive to shift demand from peak times
<b>Ancillary services</b>	• Full participation from DER	• increase the value of flexible load
	• Localised as well as national ancillary services	• allow DER to fully participate in the ongoing security and reliability of the grid at the distribution level
<b>Technology support</b>	• Optimised support mechanisms	• sufficient subsidy is available to ensure that distributed generation, both renewable and conventional, is economically and financially viable, but marginal enough (in line with the economics of the technology) to need to compete to provide the flexibility and other services necessary for active networks to become a reality
	• Targeted support for DER	• where new technologies require support in the early stages of development

## Outline of presentation

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1. Desirable features of regulatory framework
  - ➔ 2. Interaction with EU-DEEP
  3. Examples of country-specific barriers and recommendations
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## EU-DEEP conclusions overlap with FENIX recommendations ...

Area	Focus	EU-DEEP crossover
<b>DNO/DSO incentives and requirements</b>	<ul style="list-style-type: none"> <li>Changing the environment within which distribution businesses operate</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> </ul>
<b>Metering and communications</b>	<ul style="list-style-type: none"> <li>Creating enabling infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> </ul>
<b>Network access</b>	<ul style="list-style-type: none"> <li>Allowing/encouraging DER participation</li> <li>Guaranteed connection but not firm access</li> <li>Time-dependent pricing</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> </ul>
<b>Market participation</b>		<ul style="list-style-type: none"> <li>x</li> </ul>
<b>Demand side measures</b>		<ul style="list-style-type: none"> <li>✓</li> </ul>
<b>Ancillary services</b>		<ul style="list-style-type: none"> <li>x</li> </ul>
<b>Technology support</b>		<ul style="list-style-type: none"> <li>x</li> </ul>

# FENIX regulatory recommendations compatible with EU-DEEP recommendations regarding distribution charging

Informed by session with EU-DEEP representatives in February 2009...examples of overlap shown below

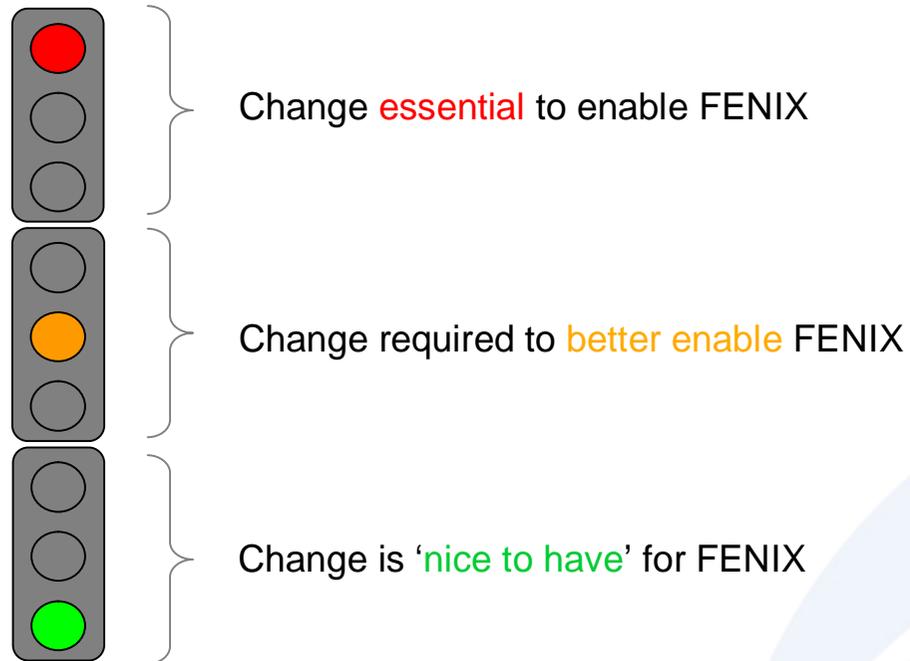
Area	Requirements	Compatibility with EU-DEEP DUoS recommendations
<b>DNO/DSO incentives and requirements</b>	<ul style="list-style-type: none"> <li>Allowance of full recovery of DG connection costs</li> </ul>	<ul style="list-style-type: none"> <li>Balance to be struck between “shallow” and “deep” connections – DG prefers shallow, DSO prefers deep</li> <li>Trend is towards “shallow” connections – in this context must ensure that DUoS charge enables recovery of network costs</li> </ul>
	<ul style="list-style-type: none"> <li>Allow DSO to benefit when active network management used to defer / avoid capex</li> </ul>	<ul style="list-style-type: none"> <li>LRMC approach to calculating Annualised Network Costs for DUoS is based on the deferral/avoidance of future capital expenditure</li> </ul>
<b>Network access</b>	<ul style="list-style-type: none"> <li>Non-firm capacity connections</li> </ul>	<ul style="list-style-type: none"> <li>May require discounted DUoS charge to reflect non-firm nature of rights</li> </ul>
	<ul style="list-style-type: none"> <li>True reflection of costs and benefits of DER</li> </ul>	<ul style="list-style-type: none"> <li>EU-DEEP approach is compatible with this</li> </ul>
<b>Metering and communications</b>	<ul style="list-style-type: none"> <li>Wider use of real-time metering</li> </ul>	<ul style="list-style-type: none"> <li>Useful for cost-reflective DUoS charging, as recommended by EU-DEEP</li> <li>Explicitly considered in ex-post approach</li> </ul>
<b>Demand side measures</b>	<ul style="list-style-type: none"> <li>Time-differential pricing</li> </ul>	<ul style="list-style-type: none"> <li>EU-DEEP approach produces time-varying DUoS tariffs</li> </ul>

# Outline of presentation

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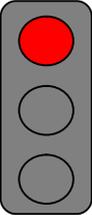
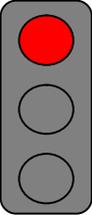
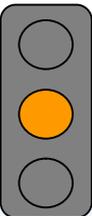
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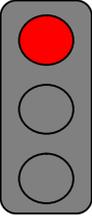
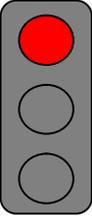
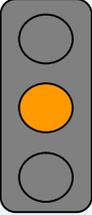
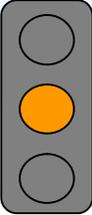
# Spain: Barriers and recommendations for distribution networks

We identified key features of distribution network design, operation and regulation in Spain, identified barriers to FENIX, and developed recommendations for change

	Key current features	Barriers to FENIX	Recommendation/solution	
<b>Regulated revenues</b>	DSO revenues are fixed, with year-on-year increases based on demand growth and RPI. Connection costs are paid by generators	Costs of new assets borne by generators, but increases in opex reduce the DSO's profit: an implicit disincentive for lean, active networks	Regulators must allow DSOs to benefit when they use active network management to defer or avoid capital expenditure	
<b>Invisibility of DG to the DSO</b>	Small generators are not required to send production data to DSO and can assume physically firm access	DER is essentially invisible to DSOs, making it impossible to control DER to manage the network. Visibility first step towards controllability	Real-time metering of distributed generation should be mandated for DG above a certain size (delegated dispatch is step towards this)	
<b>Network design</b> ----- <b>DER control</b>	DG seen as a distorting element that complicates the operation and planning of the networks. Planning methodology is conservative	Network design methodology focused on connecting, not integrating, DG. Option for DER control by DSO under commercial contracts needed	Requirement for guaranteed physically firm access not needed. DSOs must be allowed to use lean network design with controllable DER	

# GB: Barriers and recommendations for distribution networks

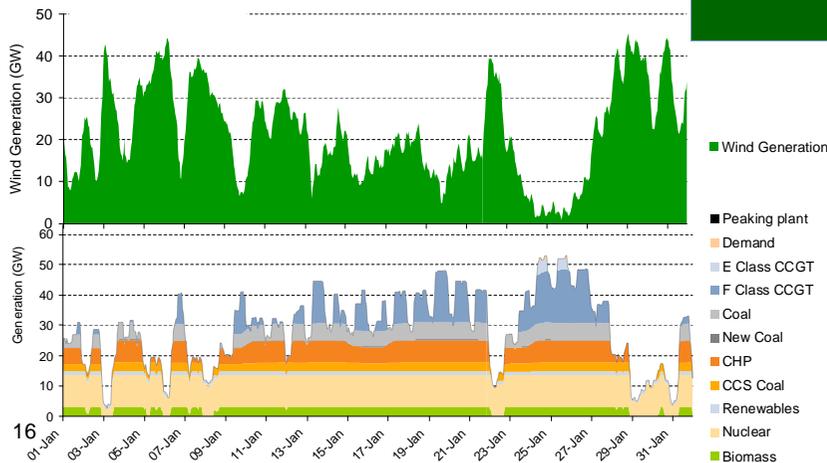
The first area where we have identified barriers to the Fenix concept and made recommendations for change is in the framework used to regulate distribution networks

	Key current features	Barriers to Fenix	Recommendation/solution	
<b>Regulated Revenues</b>	Distribution network revenues are based on their regulated asset base	Implicit incentive to build more assets means that active network management is only used where there are administrative or cost barriers	Regulators must allow DSOs to benefit when they use active network management where this is appropriate rather than capital expenditure	
<b>Government Support</b>	Innovation Funding Initiative (IFI) has had success in promoting innovation and popular with DNOs	The focus is more on measures to connect DER to the network as opposed to integrating it into the network	Funding arrangements should focus more on promoting DER integration so that the benefits of DER can be fully exploited	
<b>Network Design</b>	Networks are often designed to maximize profit in the short term and do not take into consideration potential benefits from DG	The regulator or industry groups do not provide any longer term framework on network design	DSOs should not be required to guarantee physically firm access to all DG, and must be allowed to use lean network design methodologies	
<b>DNO Power Trading</b>	DNOs are not permitted to trade in or contract for electricity in order to support the network	DNOs must rely on constructing a network that can withstand any likely flows	Regulators must allow DNOs to reward generators for contributing to active network management	

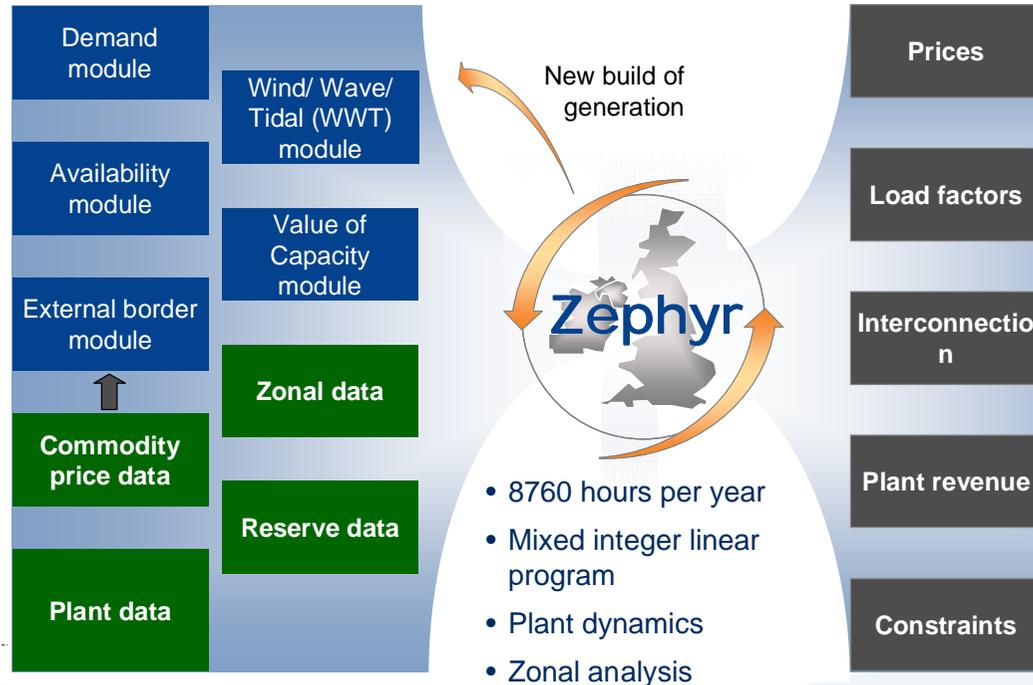
# Pöyry intermittency study may provide further insight to FENIX

## Principles

- Detailed underlying wind data
  - Hourly data for 8 years for 36 sites
- History as basis
  - Wind, availability and demand
- Mini-Monte Carlo simulation
- Value of capacity



## Platform



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**Stephen Woodhouse**

+ 44 1865 812 222 / [stephen.woodhouse@poyry.com](mailto:stephen.woodhouse@poyry.com)

Pöyry Energy Consulting  
King Charles House  
Park End Street  
Oxford, UK  
OX1 1JD

+44 (0)1865 722660  
[www.poyry.com](http://www.poyry.com)  
[www.ilexenergy.com](http://www.ilexenergy.com)