



Presentation to the Danish Ministry of Energy, Utilities and Climate

London
12 June 2018
Cambridge Economic Policy Associates



Agenda

- 1 Introductions
- 2 Evolving the regulatory model
- 3 Facilitating the energy transition
- 4 Security of supply
- 5 Open discussion

Today's presenters



Mark Cockburn
Director



Patrick Taylor
Director



Attila Hajos
Director



Ben Shafran
Managing
Consultant

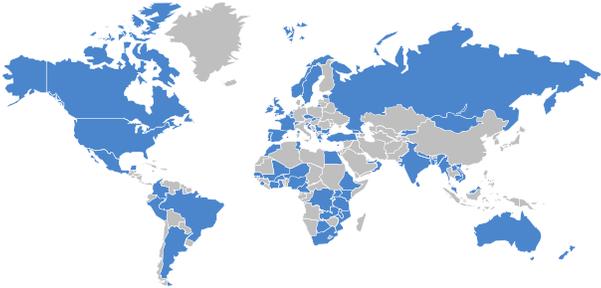


1

INTRODUCING CEPA

About CEPA

CEPA's global experience



Our sectors

- Energy
- Water
- Transport
- Communications
- International infrastructure

Our services

- Regulatory frameworks
- Price control reviews
- Market design
- Economic & financial modelling
- Evaluation & impact assessment

Page 5

About CEPA

Energy markets experience

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Supporting investment in renewable energy
- 

Estimating Value of Lost Load for Member States
- 

Irish capacity market auction monitor
- 

Utility Regulator
- 

Peer review of generator cost of capital estimates
- 

Market Conduct and the efficient operation of wholesale markets
- 

Review of gas security of supply
- 

Advice on Electricity Market Reform
- 

Transitional measures for gas market reform
- 

Options for retail market regulation

Page 6

About CEPA

Energy networks experience



Review of RIIO price controls
RPI-X@20 Review



Flexibility and network pricing for future electricity systems



Assessment of interconnector applications



Advice on government policy for flexible energy systems



Electricity network charging models



Cost of capital and cost assessment for RIIO price controls



Incentives for a stand-alone electricity SO



Energy services contestability



Future regulatory options for Australia's energy sector

Page 7

About CEPA

Experience in other regulated sectors



'Delivery Partner' for PR14
Econometric benchmarking models for PR19



Expert advice on the cost of capital



Support for PR13 and PR18 – cost assessment and financial issues



Heathrow Airport capital expenditure governance



Regulatory approaches to customer engagement



Applying the 'PREMO' model to water price controls



Cost of capital and financeability



Demand elasticity of public transport in Sydney



International best practice cost of capital methodologies

Page 8



2 EVOLVING THE REGULATORY MODEL

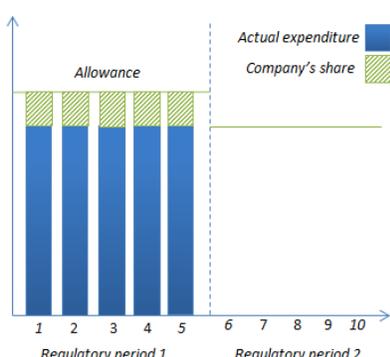
Page 9



The RIIO model

Shifting companies' focus towards customers

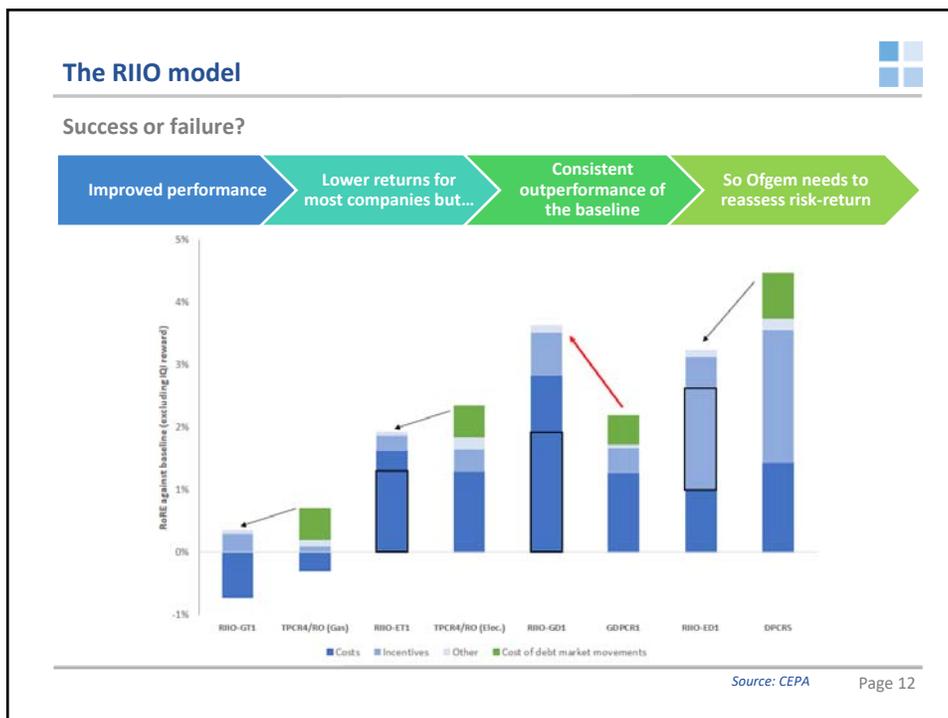
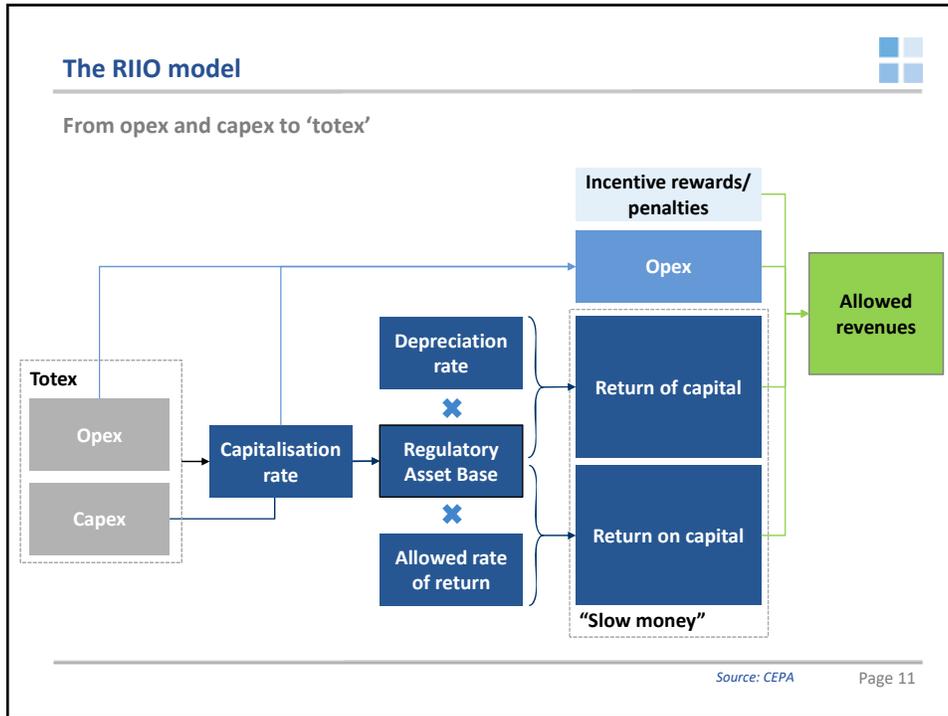
RPI-X



RIIO

Long-term value for money network services	Customers pay lowest cost for network outputs
Environmentally sustainable network services	Low carbon energy sector (connect renewable generation)
Networks meet social obligations	Safe networks services
Reliable networks services	Customers satisfied with networks services

Page 10



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3 FACILITATING THE ENERGY TRANSITION

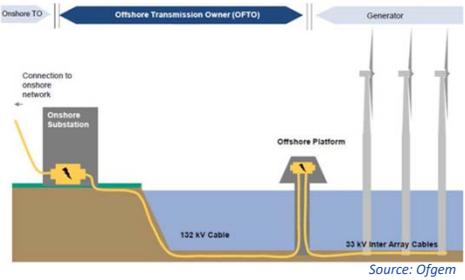
Page 13

Introducing competition into previously regulated activities ☐☐
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Competitive tendering of transmission assets



CEPA evaluation of the tenders for the first 15 projects found significant cost savings from contestability: £683m - £1,092m (2014/15 prices)



Page 14

OFTO regime



The OFTO is entitled to a stable, 20 year, inflation-linked revenue stream

Licensing policy:

- OFTOs are regulated by Ofgem through licences like other regulated energy networks in the UK (i.e. there are both standard and amended standard licence conditions). Like onshore networks, OFTOs are subject to price controls.
- The OFTO is entitled to a stable, 20 year, Retail Price Index (RPI) inflation-linked revenue stream (the Tender Revenue Stream (TRS)) in return for operating, maintaining and the decommissioning the transmission assets.
- The TRS is constant in real terms over the 20-year life of the OFTO licence – while the licence applies price controls, there are **no price reviews** as the TRS is fixed (in real terms) for 20-years at the tender process.

Building blocks of the TRS:

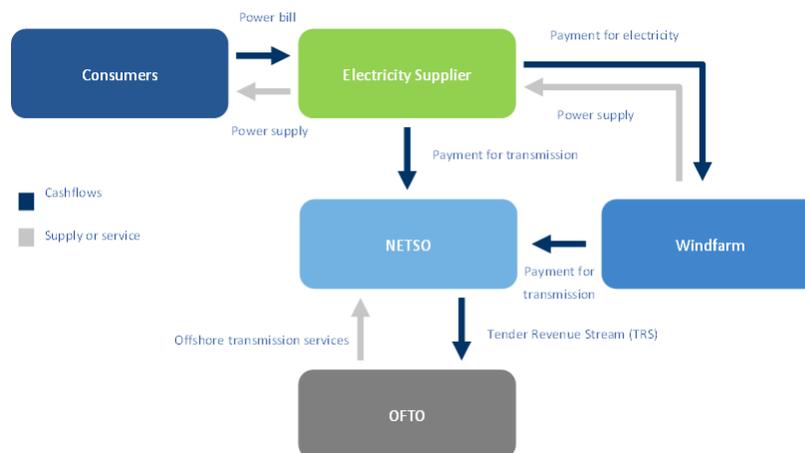
- The OFTO's 20-year TRS reflects the costs of acquiring, operating and maintaining the assets. This includes O&M costs, insurance costs, special purpose vehicle (SPV) management costs, decommissioning costs, taxes and financing costs related to the acquisition of the assets from the offshore generation developer.
- Costs such as O&M and financing are based on the successful bidders' bid, while the acquisition price reflects the assessment by Ofgem of the economic and efficient costs of developing and constructing the transmission assets incurred by the windfarm developer, the Final Transfer Value (FTV).
- The TRS that is enshrined in the OFTO's licence is adjusted before financial close, to reflect the FTV.

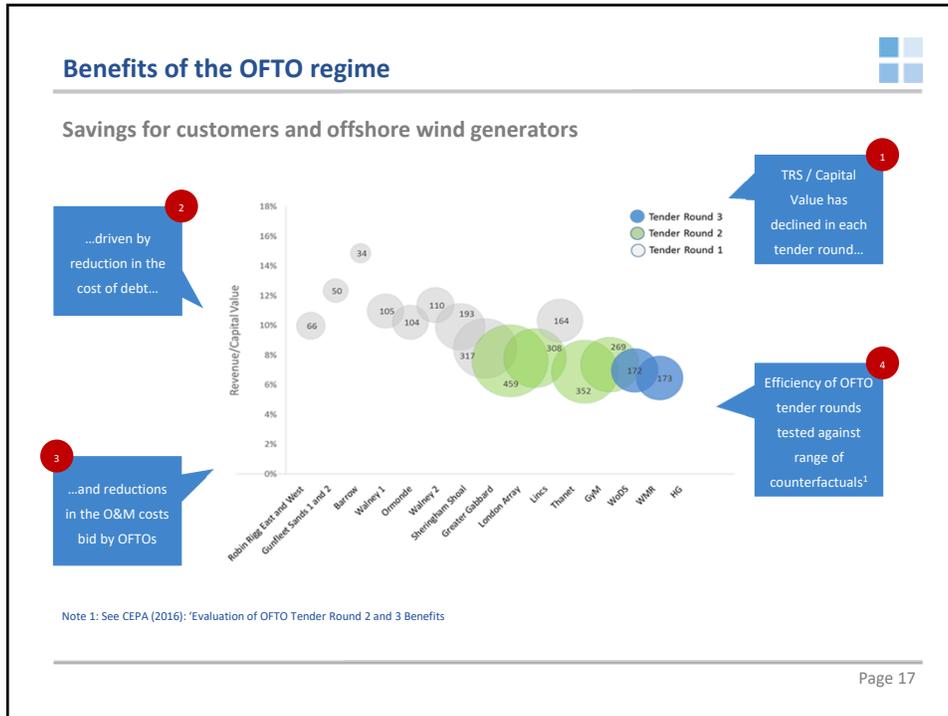
Tenders are for operational assets – i.e. post construction

OFTO regime



Payment and service arrangements for offshore transmission owners





Introducing competition into previously regulated activities

Ofgem is investigating how it can extend the scope of contestability in networks

	CATOs ¹	Competition proxy
Description	Tenders for construction, financing & operation of onshore electricity transmission projects	Ofgem sets a price control to "proxy" the expected outcomes of a competitive tender like a CATO.
Regime	<ul style="list-style-type: none"> • Competition sets price • 25 year revenue stream • Incentives • RPI linked revenues • Limited PC reopeners 	<ul style="list-style-type: none"> • Incumbent TO delivers • Regulation sets price • 25 year revenue stream • Assessment of project life allowed return
Examples	None to date	Hinkley Point Connection

Proposals for initial project current under consultation

Tx connection to Hinkley Point Nuclear Power Plant

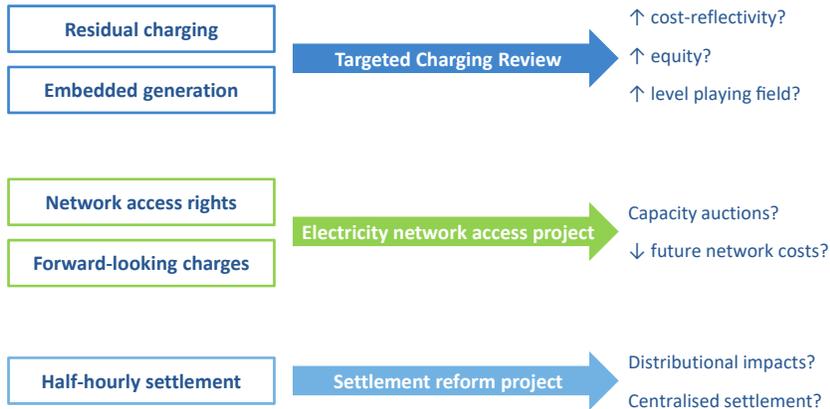
Note 1: Competitive Appointed Transmission Owner

Page 18

Network charging and flexibility



Ofgem is leading several major reviews of charging & flexibility across the GB electricity network



4 SECURITY OF SUPPLY

GB and Irish (I-SEM) experience with capacity markets



Why capacity markets were needed?

- Ambitious RES targets increased renewable generation, requiring back-up capacity and depressing wholesale electricity prices.
- In addition, uncertainty surrounding policies negatively impacted the perception of future electricity prices, resulting in 'missing money' and weak investment signals.

What was the solution?

- GB introduced capacity markets as part of package of 2013 electricity market reforms to address the 'missing money' problem.
- In the GB and I-SEM capacity markets, a required level of capacity is procured in advance (based on a reliability standard) with the price of that capacity set in a competitive forward auction. Capacity providers are paid based on their availability with penalties applied for unavailability.
- The I-SEM capacity market replaced a capacity payment mechanism where payments were administratively determined.

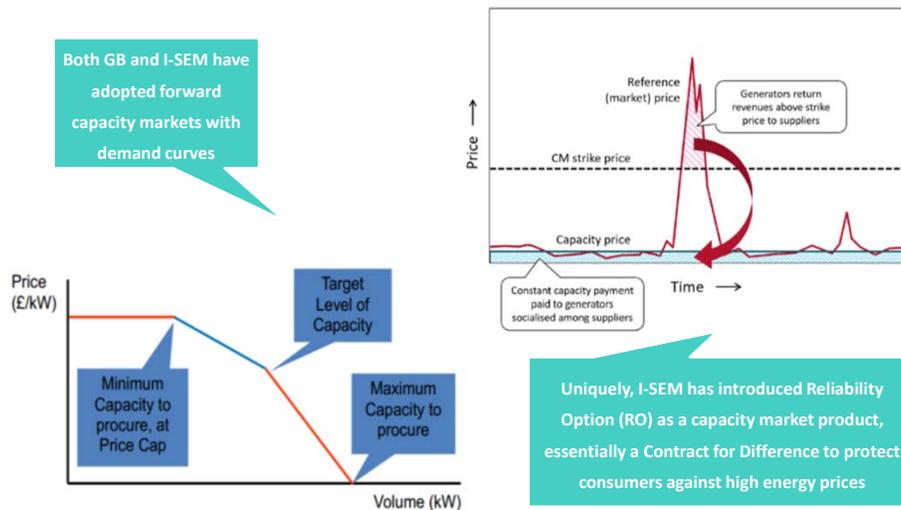
How did they perform?

- The first T-4 capacity auction in GB in 2014 cleared at a much lower price than expected (£6.95/kW-yr). In subsequent three auctions, auction-clearing prices increased (up to £22.50/kW-yr) but remain relatively low.
- Embedded benefits due to the structure of transmission and distribution charging meant that a lot of small distribution-connected diesel and OCGT generators received capacity contracts.
- In Ireland, the first capacity auction (December 2017) cleared at a price (€41.70/kW-yr) significantly below the administratively set capacity payment under the old mechanism.

Capacity market designs



Capacity market designs vary but there are common elements



Gas security of supply

GB gas system

GB perceived as having ample and diversified supply capacity (indigenous production, LNG, Norwegian and continental gas).

Gas demand forecast to stagnate or decline.

No examples of consumer interruptions to date.

Potential risks

Limited gas storage capacity and increasing reliance on imports.

Questions around whether gas will actually flow to GB in an emergency.

Actions taken

BEIS/Ofgem conduct security of supply assessments at regular intervals.

Latest assessment was conducted by CEPA, focusing on the impact of global gas supply shocks. We used detailed global gas market modelling to determine whether the GB market would be able to attract enough gas supplies.

Page 23

Interconnectors are often justified by security of supply benefits

Ofgem's cap and floor regime

Consistent with the Third Package

Developer-led approach to project selection

Incentivise efficient costs

Protect consumers from high costs

Greater predictability of returns

Source: Ofgem, CEPA

Page 24



5 OPEN DISCUSSION

Page 25



ANNEX – CEPA’S ENERGY EXPERTS

Page 26

CEPA's Energy Experts



Patrick Taylor, Director



Patrick specialises in the design and analysis of gas and electricity markets and regulation of energy networks.

He is an experienced regulatory and financial economist having worked for governments, industry regulators and utility companies across the UK and Europe.

Patrick has led multiple energy market evaluation and design studies, including for:

- Agency for Cooperation of Energy Regulators (ACER)
- Electricity and gas interconnector owners and developers
- Utilities (e.g. Centrica, EDF Energy and ESB)
- Ofgem and the energy regulatory authorities (RAs) on the island of Ireland

Patrick has also provided strategic and commercial support to some of Europe's leading utility companies and has advised regulators on regulatory regime and incentive design, pricing structures, financeability and cost of capital issues.

Patrick has managed economic consultancy teams that have advised clients across the range of price control issues, including regime and incentive design, cost of capital and financeability, financial modelling, and cost assessment and benchmarking.

Page 27

CEPA's Energy Experts



Attila Hajos, Director



Attila has extensive international experience as an economic consultant, primarily working across the energy sector with a proven track record in wholesale energy market design, analysis and modelling.

Attila has assisted Ofgem, DECC, European agencies and National Regulatory Authorities with a range of issues, including:

- security of supply
- the potential harmonisation of transmission tariffs,
- measuring the impact of gas network codes,
- renewable energy,
- assessing potential reforms to electricity market governance,
- developing a market power mitigation strategy.

Attila is currently project manager for CEPA's mandate as the capacity auction monitor for the I-SEM, and is also currently part of CEPA's team providing consultancy services to the CRU on the economics and benefits of interconnection.

Page 28

CEPA's Energy Experts



Ben Shafran, Managing Consultant



Ben Shafran is an experienced manager and energy policy specialist. His experience includes key roles in major regulatory projects in the energy sector in the UK.

Ben developed and implemented regulatory approaches that set the benchmark for innovation and transparency, while balancing the interests of consumers and investors. These include:

- Ofgem's RIIO (Revenue = Incentives + Innovation + Outputs) regulatory regime
- the UK's cap-and-floor regime for interconnectors

Ben re-joined CEPA in 2017 as a Managing Consultant after working as a Policy Director at the AEMC, where he managed projects that covered a wide range of energy policy issues including:

- network charges
- distributed energy resources
- price signals for reliable supply

Ben is a former Ofgem employee where he managed the work on cost of capital, financeability and risk/reward for the first set of RIIO price controls.

Page 29

CEPA's Energy Experts



David Newbury, Vice-Chairman



Professor David Newbury is CEPA's Vice-Chairman and a world-leading economist in the field of regulating network utilities.

He has unrivalled experience advising a range of clients on a range of issues in the energy sector including privatization, mergers and competition, and nuclear generation.

David is a Research Fellow in the Control and Power Research Group at Imperial College London and Emeritus Professor of Applied Economics at the University of Cambridge.

David is currently:

- Research Director of the Electricity Policy Research Group at the University of Cambridge.
- Research Fellow in the Department of Electrical and Electronic Engineering at Imperial College, London.
- Panel member of Ofgem's Low Carbon Network Fund
- Gas and Electricity Innovation and the Competitions Deputy Independent Member of the Ireland Single Electricity Market Committee
- On the panel of Technical Experts for DECC's delivery of Electricity Market Reform.

David was the 2013 President of the International Association for Energy Economics and has been an economic adviser to Ofgem.

Page 30

CEPA's Energy Experts



Ian Alexander, Senior Advisor



Ian specialises in regulatory economics and industry reform. He is a regulatory economist with over 20 years experience in developing regulatory regimes, supporting regulators and companies in price reviews and options for private sector participation.

Ian is an expert in regulatory regime design, evaluation and implementation; financial aspects of regulation (cost of capital, asset valuation, barriers to investment); and incentive design.

Ian has worked extensively with Ofgem, the UK Gas and Electricity regulator, on both traditional and innovative regulatory issues. This has included:

- extensive support with successive price control schemes
- assisting the development of the new OFTO, interconnector and CATO regimes to introduce competition
- incentivizing renewable energy investment

Ian has experience working in the regulated European gas and electricity markets, as well as in assisting regulators in both developed and developing markets across the world, such as Australia, Oman and Peru.

Ian has also worked with companies and consequently has an appreciation of the requirements of a range of stakeholders in energy markets.

Page 31

CEPA's Energy Experts



Lewis Heather, Managing Consultant



Lewis has expertise performing economic analysis and designing policy across the electricity and gas market supply chains both within Great Britain (GB) and internationally.

Prior to joining CEPA, Lewis worked for Ofgem (the GB energy regulator) where he led several areas of policy and regulation within the wholesale, networks and retail sectors.

Lewis' has expertise performing economic analysis and designing policy across the electricity and gas market supply chains.

He has led projects both in the UK and in the EU, covering a range of topics such as:

- consumer decision making
- policy evaluation and trialing
- security of supply
- incentive design

Lewis managed the development of multi-million pound incentive schemes for the electricity and gas system operators, developing in depth knowledge of the features of the electricity market and system balancing.

Lewis was recently part of the CEPA team responsible for monitoring the implementation of the I-SEM capacity auction.

Page 32

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