How to Support Innovation in Network Industries: The Role of Regulators and Competition and the Case of Electricity

Michael Pollitt

Judge Business School

University of Cambridge

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Outline

- Promoting Innovation, some background
- The case of Ofgem in Great Britain
- The case of PSC in New York

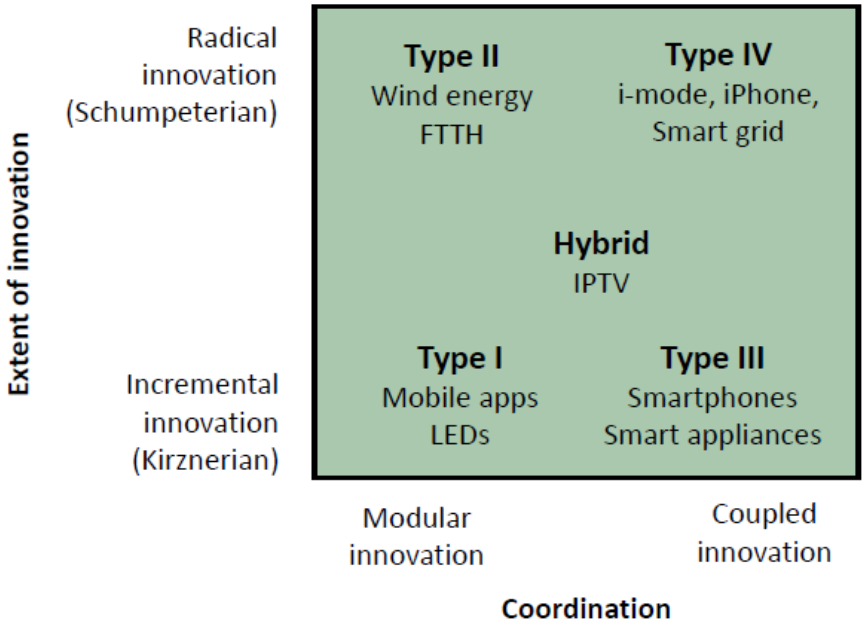
PROMOTING INNOVATION, SOME BACKGROUND

Directed Technical Change (Acemoglu et al, 2012)

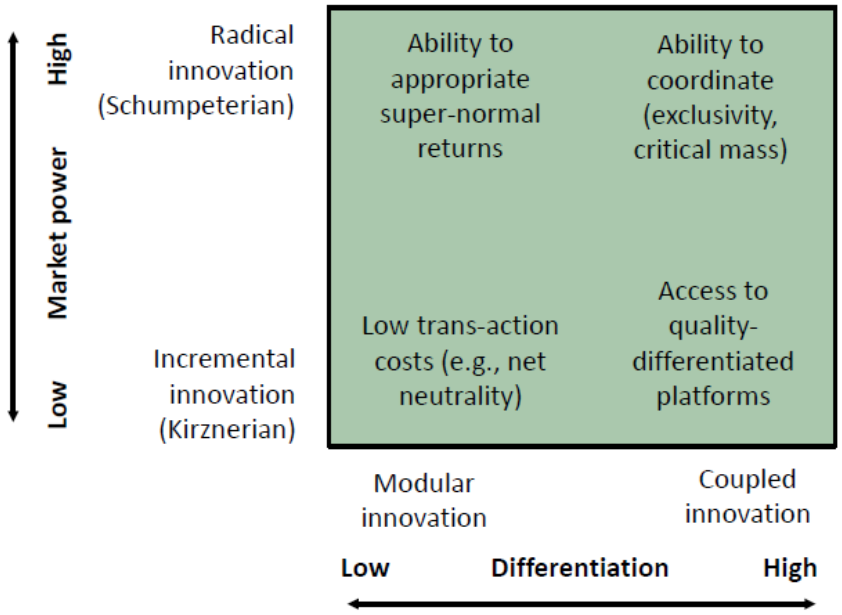
- Path dependency in technological innovation.
- Subsidising ‘clean’ inputs vs ‘dirty’ inputs may shift technical change on to a different pathway.
- This may involve shifting scientists from working on dirty technologies to clean ones.
- This may be cheaper in the long run than directly supporting existing clean technologies.

Characterising Innovation (Bauer, 2012, p.16, 17)

Typology



Enabling conditions



Institutions for rapid economic progress (Nelson, 2008)

- Distinguish ‘physical’ technology and ‘social’ technology
- Example of delivering a recipe as distinct from tools to make food.
- Old social technologies may not be appropriate and need to be replaced by new ones.
- Institutions important to enable new developments.
- The ‘fundamental uncertainty’ of innovation is why it needs to be supported.
- A mixture of private and public actions required, but public actions can be wrong ones.
- Collaborative private RD+D is possible, e.g. eFIS EV project in Milton Keynes (Miles, 2014) led by Arup and Mitsui.
- Basically rapid progress is clearly not about the amount money spent on R+D, but also about governance…

THE CASE OF THE GB Energy Regulator, OFGEM

PROMOTING COMPETITION IN ENERGY NETWORKS?

Innovation in Governance: RPI-X@20 Review

- This began in early 2008 and looked at five of the likely future responses of regulators to a greater or lesser extent.

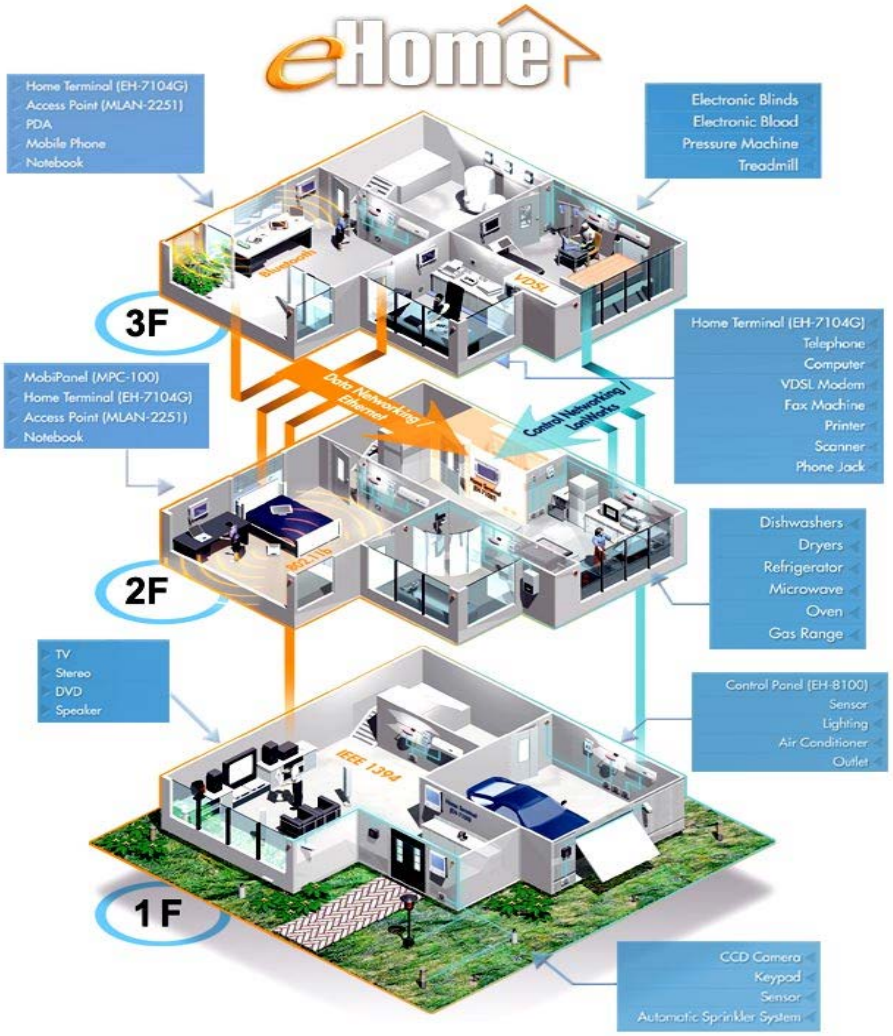
- I was particularly keen on use of negotiated settlements, extension of competition and the incentivisation of innovation.

Governance innovation: Negotiations

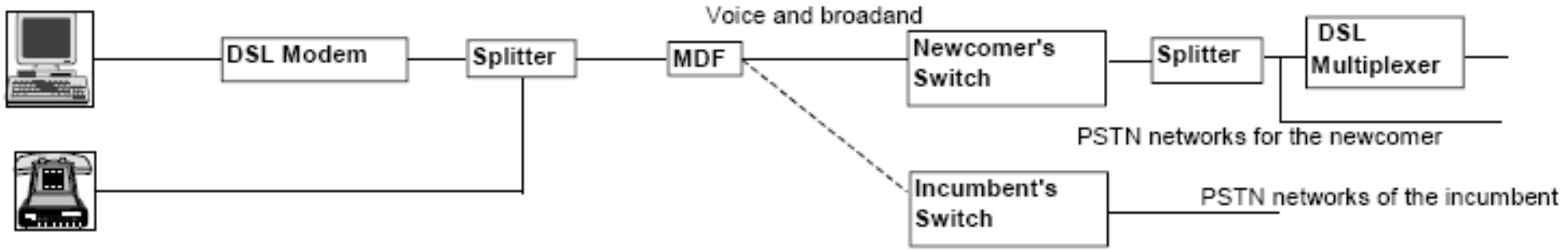
Governance Innovation: Auctions

Promoting competition across distribution networks? Access terms

Governance innovation: Innovation funding mechanisms



Governance innovation: Reorganisation of asset ownership



Promoting Innovation: Low carbon networks fund

- 2010-2015 distribution price control in Great Britain.

- ‘up to £500m to support projects sponsored by the Distribution Network Operators (DNOs) to try out new technology, operating and commercial arrangements’
- Up to 2.5% of extra revenue can be recovered from customers.
- ‘The aim of the projects is to help all DNOs understand how they can provide security of supply at value for money as Britain moves to a low carbon economy.’
- First Tier allows DNOs to recover a proportion of expenditure incurred on small scale projects.
- Second Tier annual competition evaluated by panel of experts of up to £64 million to help fund a small number of flagship projects.
- We will be monitoring the learning that emerges from these projects in order to understand its impact on the current regulatory framework.

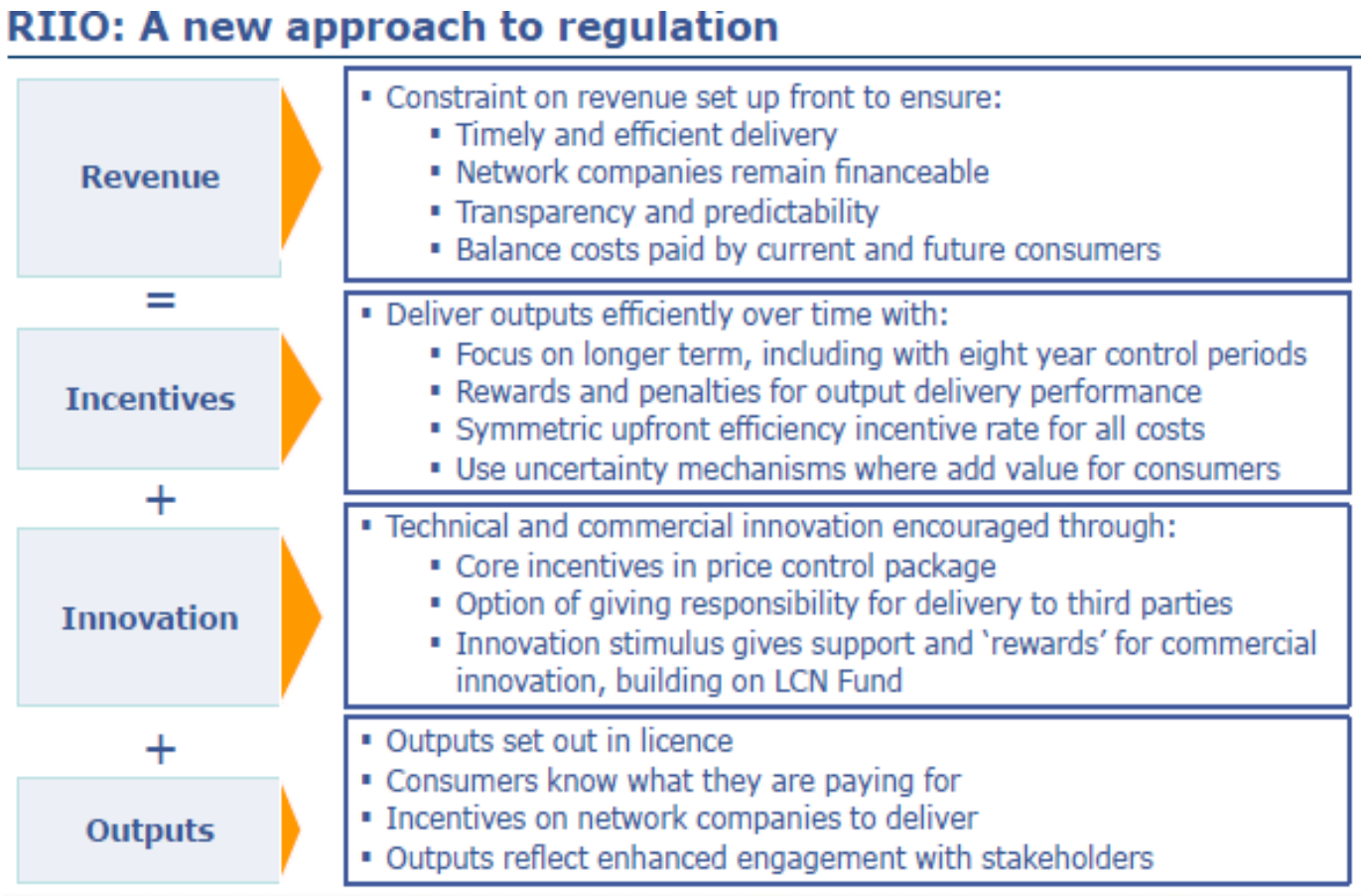
Promoting Innovation: Low carbon networks fund effects

- Setting up of ‘Future Networks’ units
- Collaborative Tier 2 projects, incl. suppliers, academics, OEMs and software solutions providers.
- For example:

Flexible Plug and Play

Project Closed End date: December 2014 **Total funding:** £9.7 million **Funding from LCNF:** £6.7 million **Funding From UK Power Networks:** £2 million **Funding from project partners:** £1 million

RIIO in Summary



Source: Ofgem City Briefing, July 2010, p.28.

THE CASE OF THE New York, Public Service Commission

PROMOTING INNOVATION IN DISTRIBUTED ENERGY RESOURCES

Promoting DSPs in New York

- New York State regulator launches Reforming the Energy Vision (REV) initiative 22 August 2014.
- The 6 state utilities are to become 'distribution system platform providers' (DSPs):

'The DSP operates an intelligent network platform that will provide safe, reliable and efficient electric services by integrating diverse resources to meet customers' and society's evolving needs. The DSP fosters broad market activity by enabling active customer and third party engagement that is aligned with the wholesale market and bulk power system.'

(State of NY Dept. of Public Service, 2014)

Promoting DSPs in New York

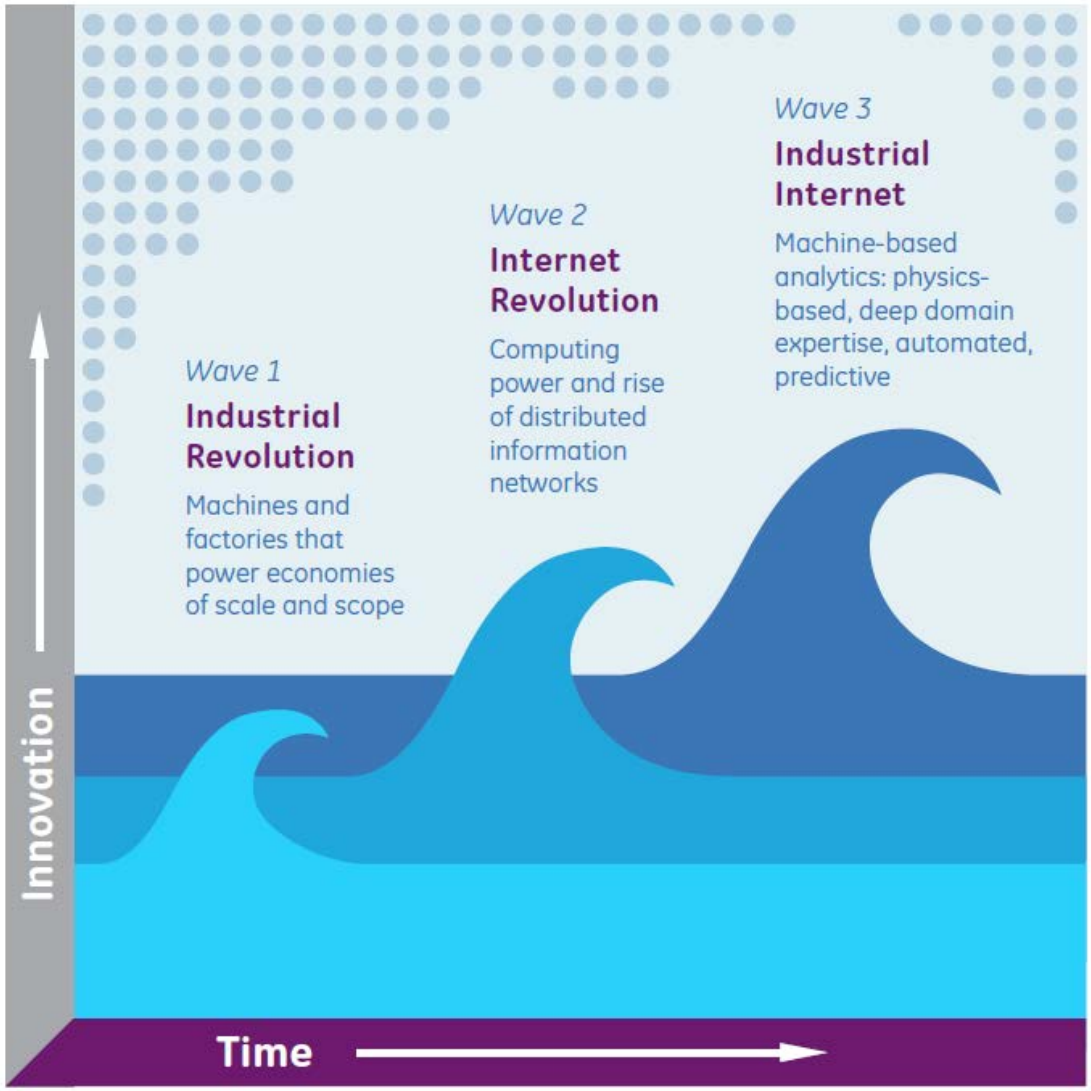
- What the project hopes to achieve:
  - Identification of projects which will use distributed energy resources to reduce costs.
  - Use of DSM projects to serve needs of distribution system.
  - Support development of distributed energy resources (DERs), such as via ESCos.
  - DSP should be widely available, even though provided by incumbent monopolies.
  - Creation of level playing field for new entrants.

Source: Jeff St.John, posted 12 Sept, 2014 http://theenergycollective.com/jeffstjohn/494781/5-key-proposals-new-yorks-grid-transformation

THE FUTURE?

The internet of things in Energy?

Figure 2. Rise of the Industrial Internet



Source: Evans and Annunziata (2012, p.7)

Concluding thoughts

- Innovation can be stimulated by competition and explicit incentives.
- The future of energy is very uncertain and hence experimentation is likely to be valuable.
- Innovation in what?
  - In governance and payment arrangements in energy? (e.g. SO, LMPs, connection charging)
  - In the use of information from smart grids and smart meters? (e.g. in pricing, control)
  - In policy making in the face of rising complexity (e.g. in customer engagement, cost benefit assessment)

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