Stimulating innovation in the electricity supply industry

David Newbery
*University of Cambridge*

European Energy Forum 2015, London
5th October 2015
• Liberalisation and the collapse of R&D
• EU response: SET Plan
  – 2015 relaunched as Energy Union R&I strategy
• Allocating SET funds, past and future
  – Who pays?
• How to fund R&I
• Ofgem Network Innovation Competitions as model
Learning justifies **Renewables Directive**

Supporting R&D

- **Renewables Directive** stimulated RES deployment
- Not all low-C technology is ready for deployment
  - Excessive deployment, insufficient R&D?
- R&D collapsed at end of 1980s
  - Liberalisation and pessimism over nuclear economics?
- R&D is a public/club good
  => need collective action to increase low-C R&D
  => Need to share IPR benefits contrary to MS interests
  => **Strategic Energy Technology (SET) Plan**

**SET plan to leverage MS’s R&D, steer choices**
Ensure adequate size and diversity of portfolio
Breakdown of 2012 support by type of intervention

Tiny share of R&D compared to production and demand support

Ecofys 2014
SET Support schemes

• **2007 SET** R&D non-nuclear ≈ €2.4bn (Nuclear €0.94)
  – 70:30 private:public; 80:20 MS:EC

• SET plan to 2020 total €70 bn or double 2007 rate
  – Grid: €2bn; fuel cells + H₂: €5bn; Wind: €6bn;
  – **nuclear fission** €7bn; **bio-energy** €9bn;
  – smart cities €11 bn; CCS €13 bn; **Solar:** €16bn;

• Joint programming to amplify MS R&D
  – CCS as an example, disappointing to date

• **2015:** Energy Union Package 25 Feb COM(2015) 80:
  – A new strategy for Research and Innovation (R&I) *(including updated SET Plan)* … should accelerate energy system transformation
Role of EU funding

• Encourage R&D in **under-researched areas**
• **rebalance** EU R&D portfolio
• support **high-risk high-cost long-term R&D**
  - particularly where too costly/risky for one country
• **cross-border collaboration** to **disseminate skills**
• encourage **open access**/reduce restrictive IPR
• create **credible commitments** by joint agreement
• **amplify under-resourced MS R&D**
Who should finance SET-Plan?

R&D intensity 2008

Sources: COM(2009) 519, Eurostat
• **Renewables Directive** solved club good problem
  – allocate MS targets, MSs solve what & how
  – but: hard to trade RES, learning benefits vary widely

• Post 2020: no MS RES targets

• **Possible solution**: MS targets % GDP for R&I
  – decide value of learning benefit of each RES technology
  – counts towards target expenditure, balance => EC
  – R&D and demos allocated by EC competition

*Ofgem’s innovation competitions as model*
LCN Fund structure

IFI: Allowance focused on R&D

£20m p.a.

Increasing value

Increasing oversight

LCN Fund

First Tier: Allowance for trialling new technologies and commercial arrangements to better prepare for low carbon economy.

£16m p.a.

Second Tier: DNOs compete for central fund. Allows trialling new technologies and commercial arrangements to better prepare for low carbon economy.

£64m p.a.

PLUS £100m discretionary reward

Increasing number of projects
Criteria

• Accelerates development of low-carbon future
  – has direct impact on operation of DN
• DNOs co-fund (>10%) for commitment
  – involves other partners and external funds
• Involves risk, generates new knowledge
  => disseminate all findings
• Project is robust, ready, relevant and timely
• has potential to deliver customer benefits

*replaced by Network Innovation Competitions*
Conclusions

• LCNF/NIC: DNO’s proved very responsive
  – incentives and competition matter
• Wide range of partners involved
  – encourages learning, transfer of IT from other sectors
  – innovative ways of overcoming local inertia
• Universities involved in data analysis
  – ensures wide dissemination and independence
• EU R&I could adopt this model
  – requires funding and competitive allocation
Acronyms

DNO Distribution Network Operator
LCNF Low Carbon Network Fund
NIC Network Innovation Competition
MS Member State
R&I Research and Innovation
R&D Research and Development
RES Renewable Energy Supply
SET Strategic Energy Technology