



Energy research Centre of the Netherlands

The case of distributed generation

Martin Scheepers
ECN Efficiency & Infrastructure



Studies on Distributed Generation and the Regulatory Framework of DSOs



- SUSTELNET
 - EU funded (FP5); coordinated by ECN; completed in 2003
 - Qualitative study; regulatory road maps
 - www.ecn.nl/en/ps/onderzoeksprogramma/energievoorziening/sustelnet/



- DG-GRID
 - EU funded (IEE); coordinated by ECN; completed in 2007
 - Quantitative study; economic impact of DG on DSOs regulated business
 - www.dg-grid.org



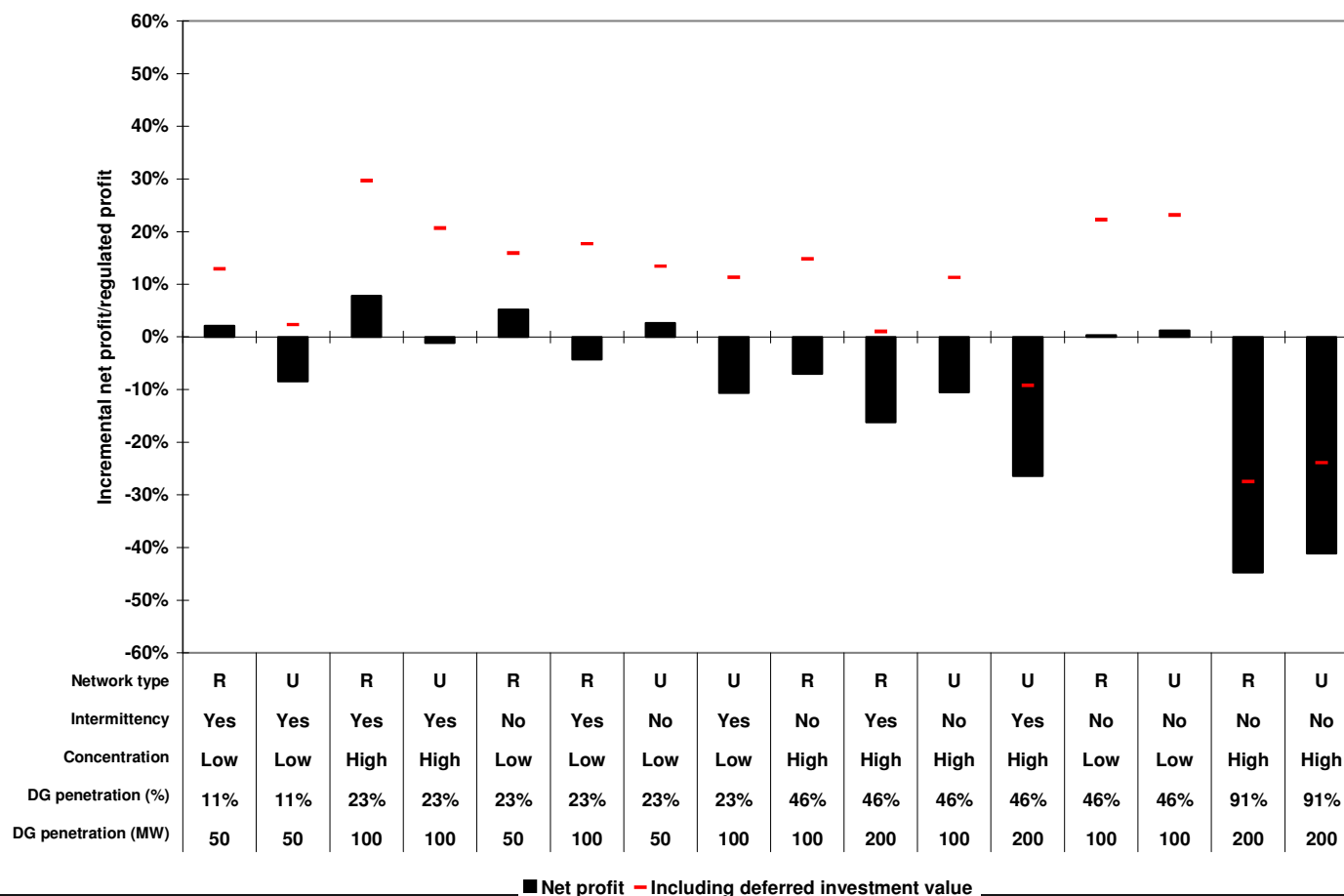
- FENIX
 - EU funded (FP6); coordinated by Iberdrola; running until September 2009
 - Virtual Power Plants (VPP); economic, contractual and regulatory issues (ECN and Pöyry)
 - www.fenix-project.org



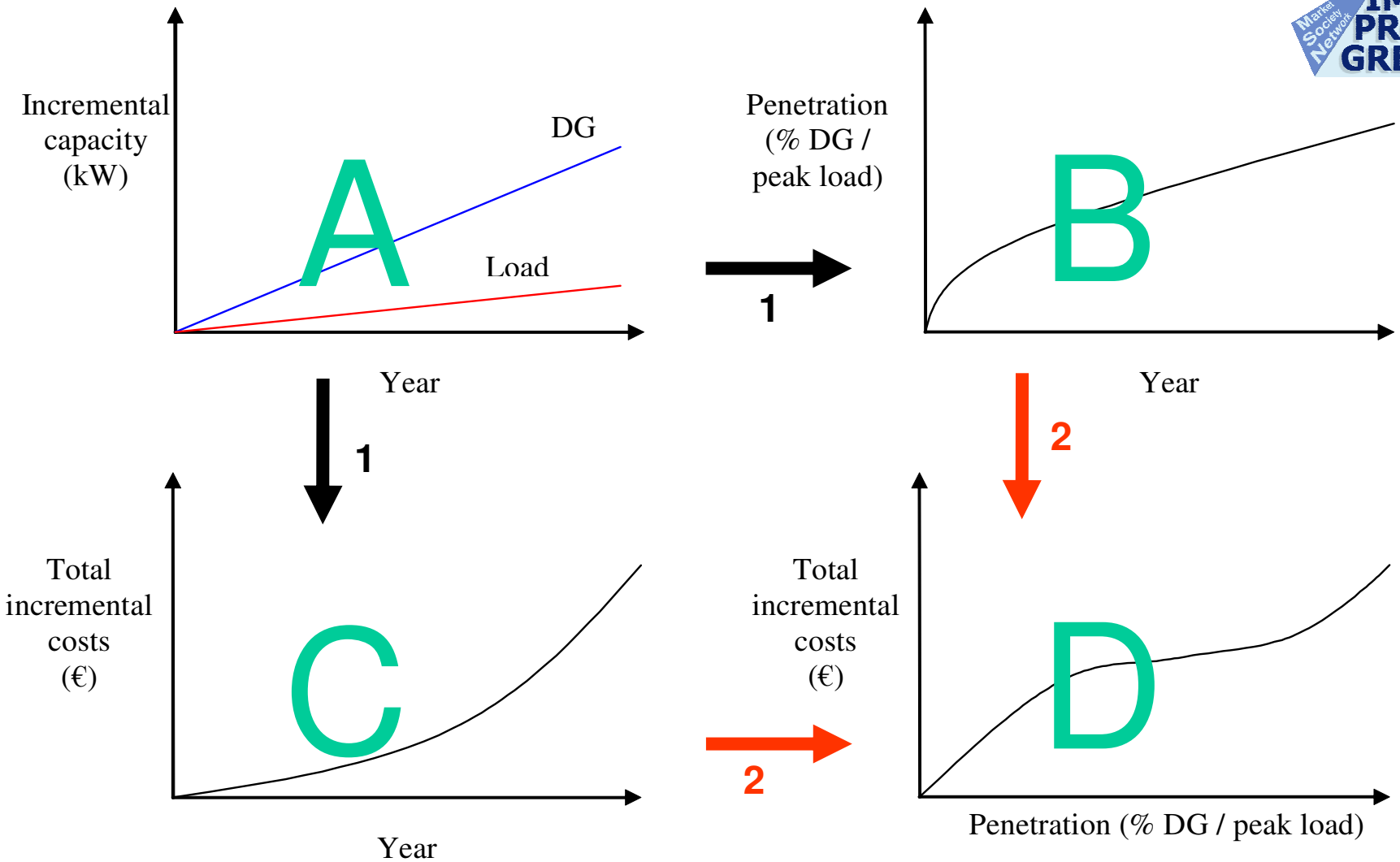
- IMPROGRES
 - EU-funded (IEE); coordinated by ECN; running until 2010
 - Quantitative study; trade-offs between regulatory framework, electricity market prices and support schemes
 - www.improgres.org

Impact DG on regulated profit DSOs

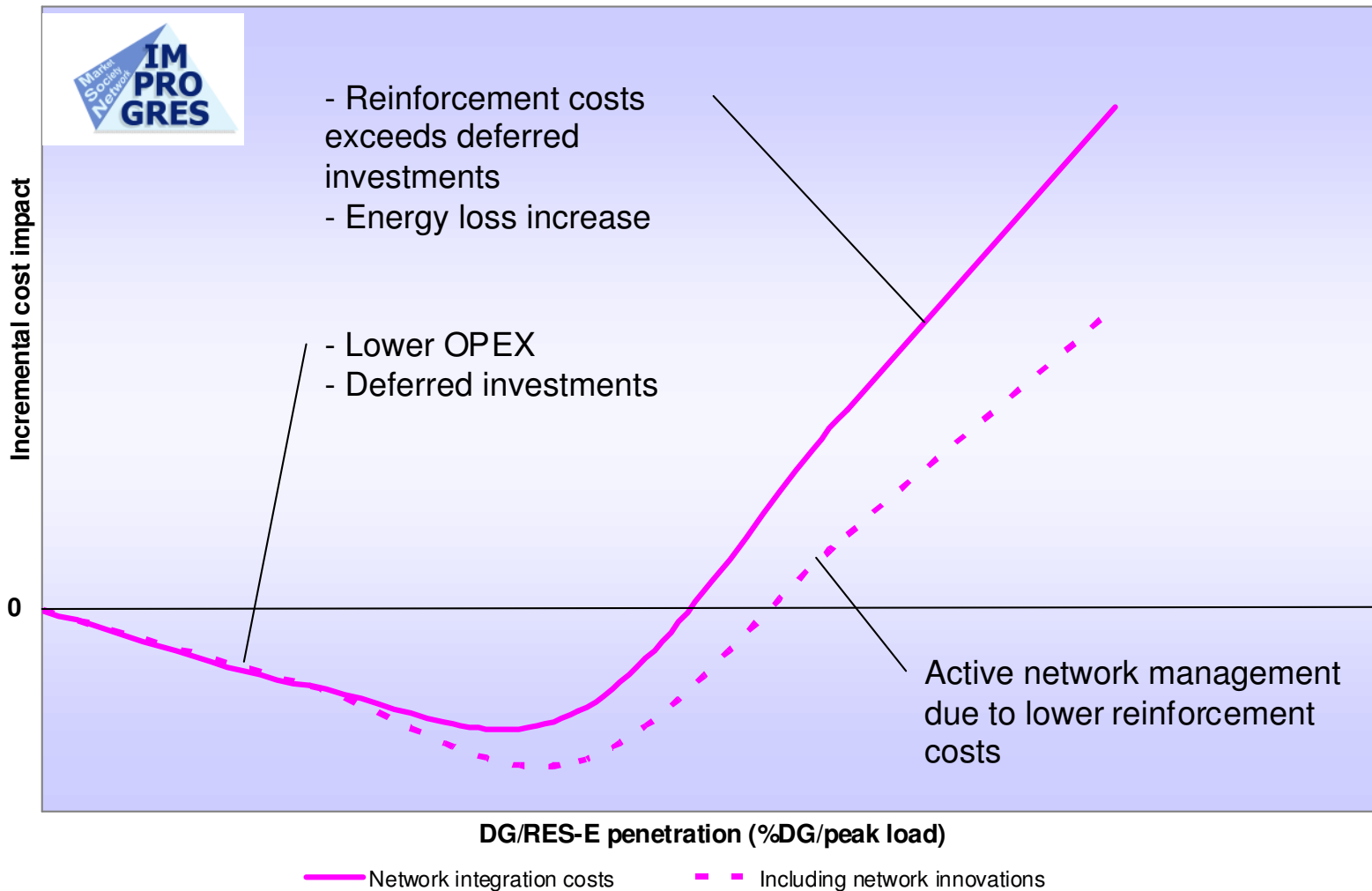
UK network, Revenue cap regulation & passive network management including deferred investment potential (-)



Incremental network investment costs



Incremental costs impact



Recommendations: DG – DSO interactions

- **Connection charges**
 - **Create level playing field** for DG integration.
 - Use simple rules mainly recognizing **shallow costs**, i.e. direct costs of connection.
- **DG participation in network operations**
 - **DG is 'visible'** for DSOs, e.g. by real time metering.
 - DG operators pay or receive **Use of System** charges from DSO, **differentiated by location and time**. This will enable DSOs to manage power loads on the network.
 - **DG support mechanisms are compatible** with electricity market prices and flexible network use of system tariffs. They should reflect the social value of electricity injected in the system.
 - **DG providing Ancillary Services** (voltage support, reactive power, etc) to DSOs.

Recommendations: DSO – Regulator interactions

- **Network investment planning**
 - **DG recognized as cost driver** for network investments.
 - Recognition that DG can improve network reliability and is an **alternative to network investment**.
 - Networks don't have to serve all (uncontrolled) peak loads at all times. **Active network management**, i.e. temporarily controlling DG (and loads), can defer or avoid network investments.
- **Incentives to integrate DG**
 - To support transition to future electricity networks, **DSO profit from integration DG and applying active network management**, e.g. allowed to keep (part of) efficiency gains received.
 - Networks need to innovated to improve network performance with active participation of DG. **DSOs receive innovation incentives**.

Thank you!

- For further contacts:
 - Martin Scheepers, ECN, scheepers@ecn.nl
 - For the IMPROGRES project:
Frans Nieuwenhout, ECN, nieuwenhout@ecn.nl
 - For the FENIX project:
Stephen Woodhouse, Pöyry, stephen.woodhouse@poyry.com