

Smart Grid Considerations and Barriers

Perspective from ESBN Smart Networks Ellen Diskin, 12.09.12



ESB Networks strategy





ESBN Smart Networks Experience



Projects

- Wind voltage & reactive power management
- Network voltage optimisation and CVR
- EV integration
- Smart metering data analysis
- 4G communications

Partners and collaboration

- Electric Power Research Institute (EPRI)
- Irish universities (UCD ERC, DIT...)
- Industrial partners: IBM, Intel, Alstom...
- Other bodies: SEAI, Smart Grid Ireland





What are key considerations?



Innovation vs. maturity – where should the balance lie?

Fast changing legal and regulatory environment

Capital Formation: Funding & project delivery





Innovation vs. maturity



- Challenges in renewables integration require innovation
- Many new technological solutions, but products & standards still developing
 - Distribution management systems
 - > IEC61850
- Dual responsibility
 - leverage benefits of innovation
 - Deliver cost effective system





Innovation vs Maturity: Key considerations







Legal and regulatory development



New requirements

DSO interaction with
wind generation
Operation & control of
storage
Distribution level

ancillary services



Frameworks must promote

- innovation
- transparency & commercial opportunities

Networks

Consultation vital so that effective solutions are not precluded!

in our Right Dollars

Capital formulation



- Funding required upfront, benefit realised over longer period
- Availability of funding at a sustainable rate
- Investment justification challenges
 - Technological uncertainty
 - ICT life cycle
 - Participation of network users
- funding uncertainty results in
 - Discontinuity between delivery of interdependent systems
 - Interoperability impacts
 - a SINGLE delay impacting on MULTIPLE systems
 - risk of premature redundancy





Solutions



Commitment to R&D

- Test the technology
- Test its interaction with other systems
- Explore what benefits are seen
- Explore what improvements could be made
- Future proofing: investment in *facilitating infrastructure* (comms, monitoring, control) so developing technologies can be integrated once mature
- engagement & collaboration nationally & internationally based on shared priorities investment









ESBN approach





Network control & monitoring

Robust communications

RD&D, collaboration

Loss reduction Continuity improvements Voltage management Reactive power management 75% renewable integration



ESB Networks Integrated Future Smart Networks Model







ESBN example solutions



- Strategy internal identification of developing needs
- Smart networks **RD&D** into potential resources
 - Wind farm Volt / VAr control
 - Optimal network sectionalisation
 - Conservation voltage reduction
 - Data management
 - Network and comms technologies

future proofing infrastructure

- >1900 down-line MV automation devices installed
- > 2,500km fibre & ongoing extension
- > >100 microwave links & upgrade underway
- > >500 polling radio sites
- IP Operational Network Migration







Questions, discussion?

