

# The Voice of the Networks



## Energy Networks Association

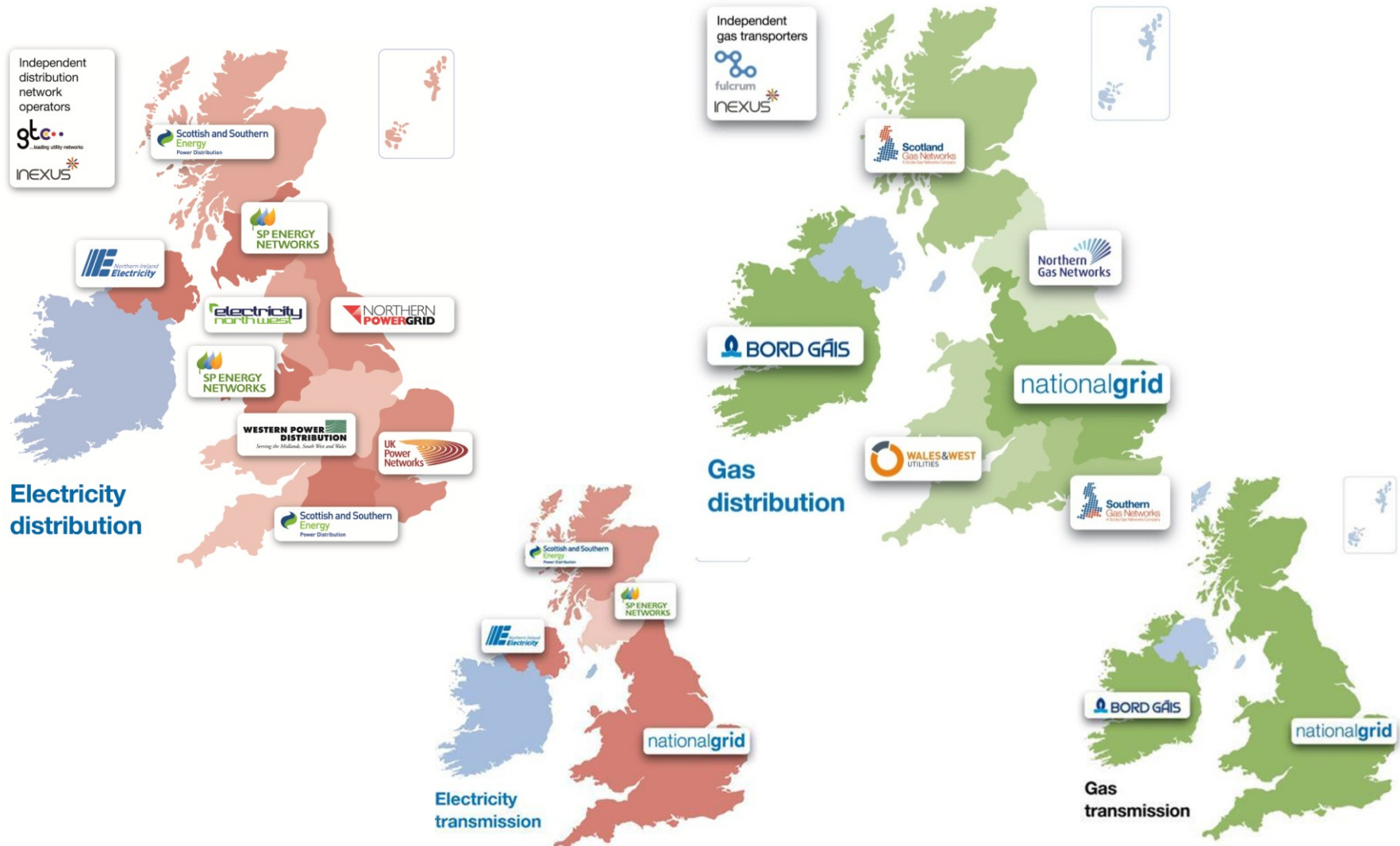
### Investments in the Distribution Networks DSO Perspective from the UK

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Director of Operations  
Thursday 2<sup>nd</sup> May 2013

# Agenda

- Background
  - ENA
  - Smart Grids/Networks
- Smart Networks
- Funding Mechanisms
- Standards and Policies
- Smart Demand Response
- Security/Cyber Security
- Smart Metering
- Dissemination of Learning

# Energy Networks Association



# Background

- Delivery of the UK 2050 Low Carbon Transition Plan.
- De-carbonisation of UK Electricity infrastructure.
- Networks are fully engaged and fundamental to success.
  - DECC, Ofgem and at heart of discussion.
- Without behavioural change the plan will fail.
- Customers are key to its success.
- It's not just about equipment!

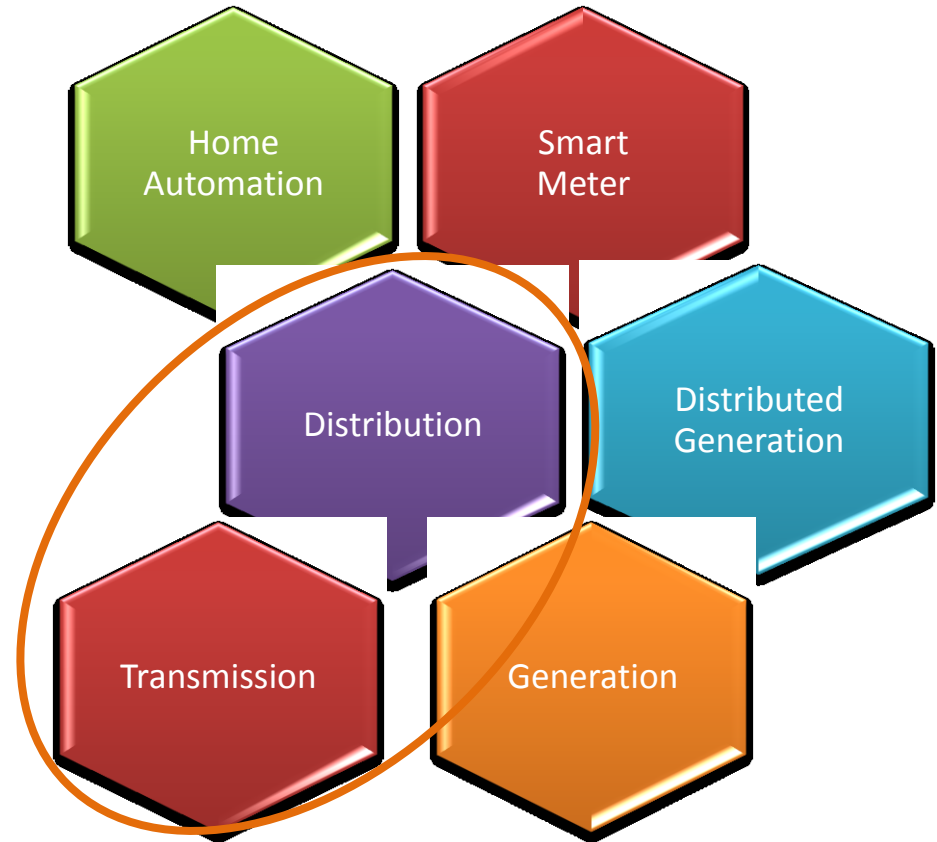


# Our world is changing

- **Current** – Stable well maintained networks, good quality of supply, ‘keeping the lights on’, well trained competent staff, largely known risks.
- **Future** – Changing networks, external impacts, new customer demands, introduction of new equipment, staff development, new and unknown risks, employee demographic.
- **Result** – The most exciting and challenging time our industry has known for decades!

# What is a Smart Grid?

- Often misunderstood question.
- No real definition.
- So it's confused at the moment.
- Here's my version:

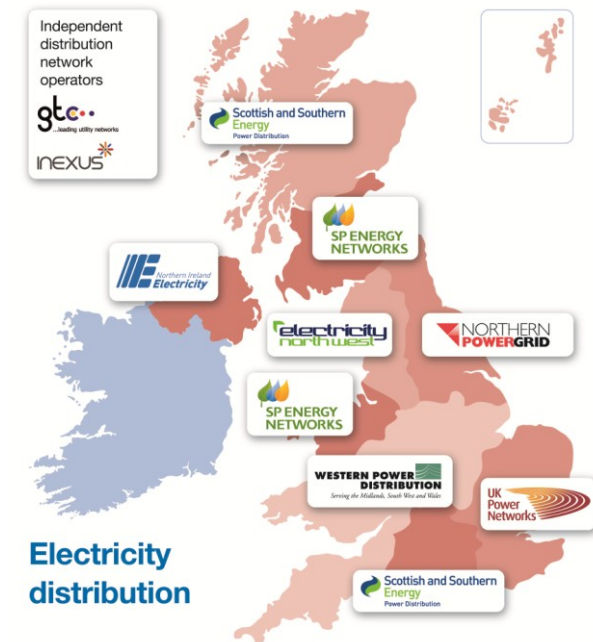


So we are talking about Smart Networks

- The UK is about to embark on the greatest house to house engagement programme seen in 40 years.
- ENA and its members play a vital role and are looking at how the UK can extract the greatest benefit from this investment.
- Energy Minister described ENA as “the hub” for co-ordination and focus on the work coming out of the Low Carbon Networks Fund (LCNF) and that “real prize of smart meters is a smarter network”.

# Smarter Networks

- New approaches to help meet 2020 and 2050 goals for energy.
- More efficient connections of renewable energy sources both micro and macro.
- A cost-effective and attractive way to meet the needs of the end user.
  - Electric Vehicles
  - Heat Pumps
  - Storage.
- Less infrastructure and visual intrusion.
- Lower cost management of intermittent generation.
  - Wind
  - Photo voltaic (PV).
- Measures that provide adaptation to climate change.
- Designs that can accommodate uncertainty and be up-scaled for rapid commercial roll-out to maximise smart grid benefits.





# Delivering Smarter Networks - Funding Mechanism

**The Low Carbon Networks (LCN) Fund aims to provide a financial catalyst for innovation on GB Electricity Networks**

- Introduced as part of the electricity distribution price control running from 1 April 2010 to 31 March 2015.
- Allows up to £500m funding for DNO projects to try new technology, operating and commercial arrangements.
- Objective is to help all DNOs understand what they need to do to provide security of supply at value for money as GB moves to a low carbon economy.

# Delivering Smarter Networks - Funding Mechanism

**The Low Carbon Networks (LCN) Fund aims to provide a financial catalyst for innovation on GB Electricity Networks**

- Allows DNO's to defer network investment via innovation over 'copper in the ground' under two tiers:
- Circa 45 projects currently live.
  - Tier 1 - designed to enable DNOs to recover a proportion of expenditure incurred on small scale projects. Total cost of projects to date: £21,148,897.
  - Tier 2 - Ofgem facilitates an annual competition for an allocation of up to £64million to help fund flagship projects. Total cost of projects to date: £ 225,478,250.
- Another 23 in pipeline for 2104
  - 8 on DSO community
  - 7 in TSO community
  - 8 in GDN community

# Smarter Networks

## The Bigger Picture

- Need to understand how smarter networks will develop.
- Understanding the future – LCNF approach across Europe.
- Infrastructure investment versus smarter world.
- Telecommunications will be vital to its development.
- Just as important is commercial agreements.
- New staff, new skills and competencies, new risks.
- Disseminating learning and sharing information.

# Smarter Networks Security, Standards & Policies

**ENA with Ofgem, DECC and key stakeholders have been carrying out significant works in the area of network security and standards**

- Smart Metering.
- Cyber Security (Past 3 years).
- At an European Union Level via Mandate 490.
- Agreed by the EU Standards Organisation, CEN/CENELEC and ETSI.
- ENA involved in developing standards for smarter networks including;
  - Information security and telecommunications.
  - Normal network implications.
- At a UK level , work is ongoing and will continue to for the foreseeable future on;
  - Assessing System Security Standards and Design Philosophies including.
  - P2/6 - Network Security.
  - G59 (currently under review) & G83.
  - Safety.

- Integrates discussion in other Smart Grid topic areas.
- Objective is to consider how to understand and modify the management of consumer load.
- Industry workshops over the last 18 months organised between ENA and Energy UK (Formerly ERA).
- Outcomes of the debate are to be captured in discussion documents.
- Discussion is currently aimed at understanding rather than finding solutions.
- Results will be available for future discussion with DECC and Ofgem.

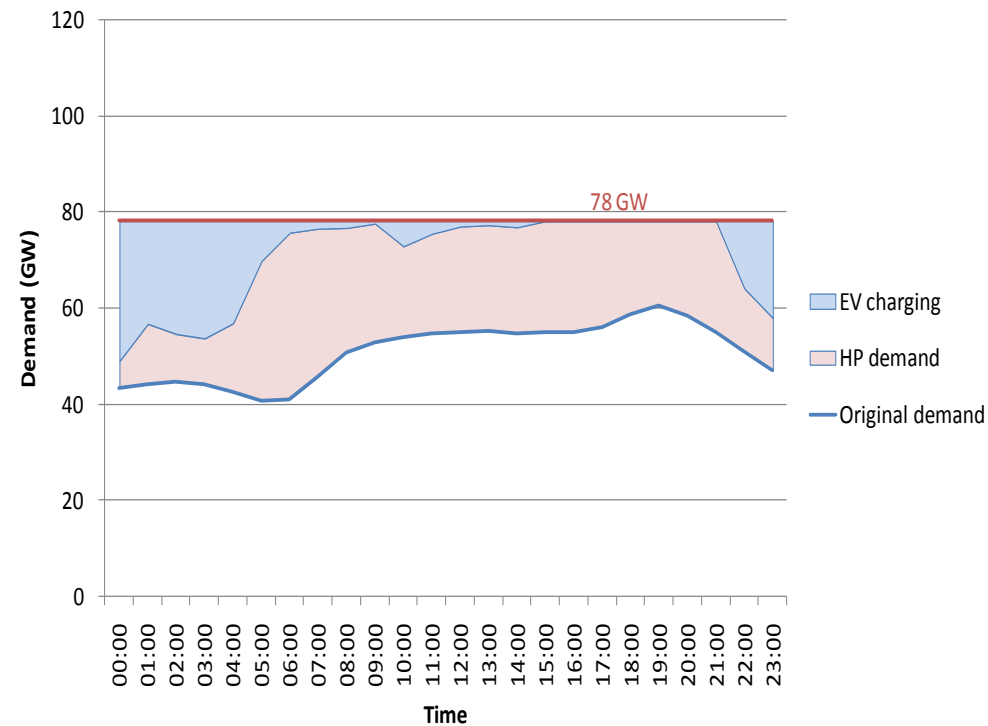
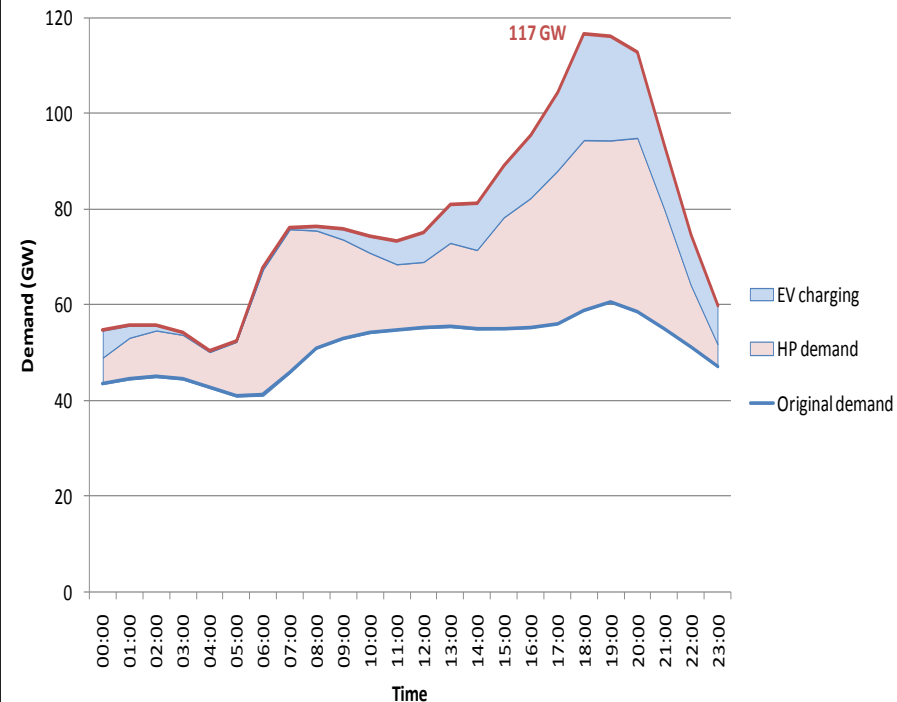
# GB Smart Demand Response

## Business as usual

## Smart

Non-optimised EV and HP operation

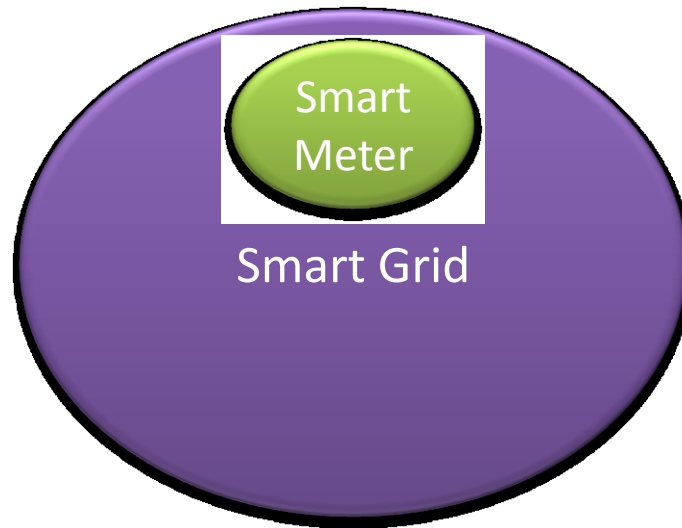
Optimised EV and HP operation



Source: ENA

- Utility Networks are critical infrastructure of fundamental importance to our society.
- In the past the utilities have focused on the security of passive assets. The Smart Grid brings an increasing need to focus on security of an active network.
- An increase in the application of ICT to utility networks has the possibility of increasing the vulnerability for disruption or misuse both malicious and non-malicious.
- This is an industry going through technology change that traditionally haven't seen ICT as a critical core of their operation.

# Smart Metering vs Smart Grid

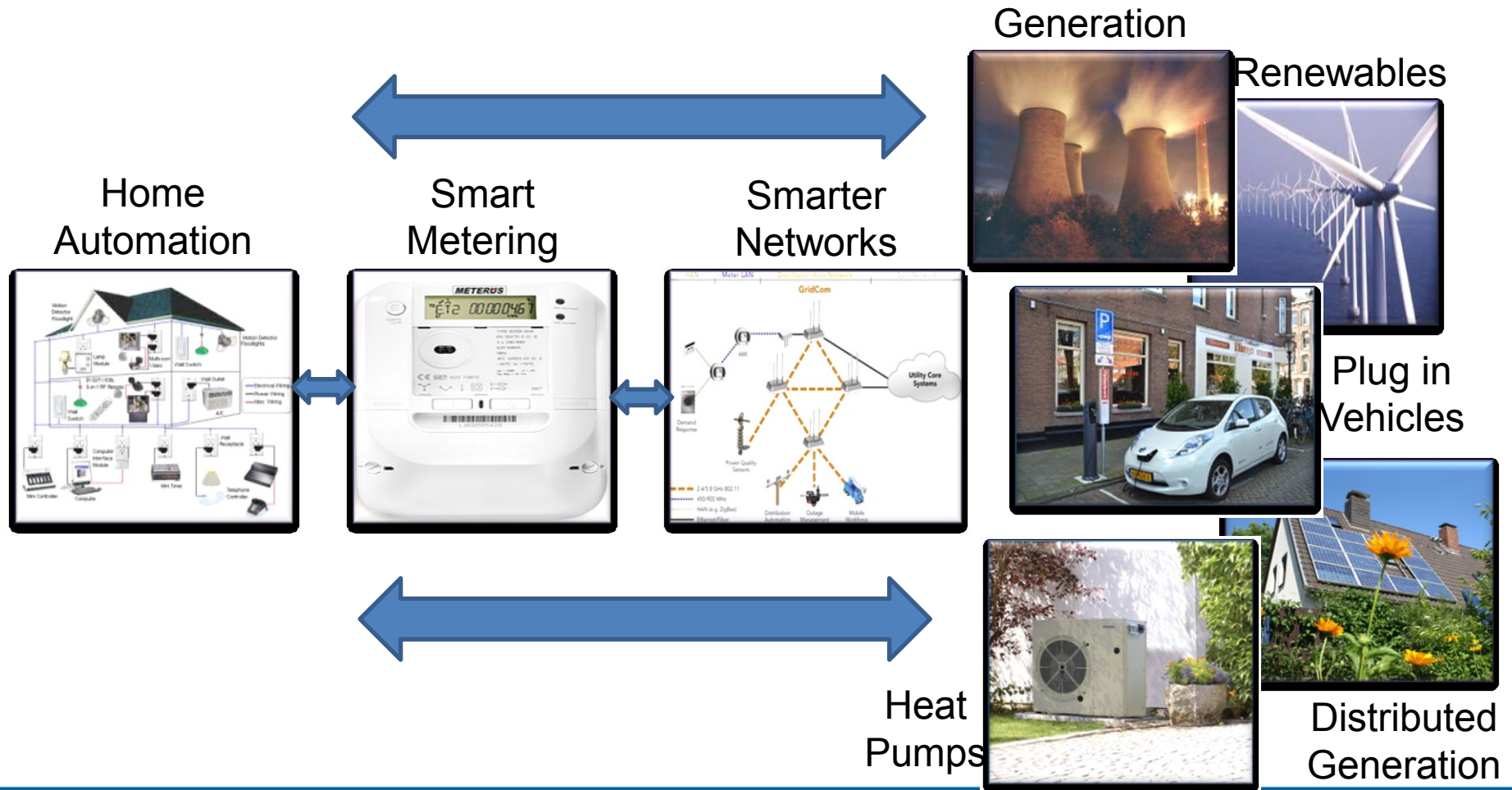


- Smart metering is an element of the smart grid.
- Smart metering cyber security focuses on data privacy and data security.
- Smart Grid is a real time control and monitoring system.
- Focus of cyber security is on security of operations – keeping the lights on.



# Smart Grid v Smart Metering Overview

SMART GRID



# GB Smart Meter Programme

- Mandated roll out programme
- Supplier led delivery
- Largest project ever undertaken within our industry
- Approximately 53 million electricity and gas meters to be changed
- 30 million homes to be visited
- Estimated two million Network Operator reactive interventions to deal with service termination issues.
- Mass roll out to start in the third quarter of 2015
- Anticipated programme completion by end of 2020
- Consumers will be able to see their near real time energy consumption data on their In-Home Display and to download more detailed historic data from their home network.
- Consumers will be able to share data with third parties (such as switching sites) should they choose to.
- Part of a larger project to ultimately provide a smart grid across the GB and enable a low carbon future.

# Learning Dissemination ENA Conference

- 2 conferences have now been held.
- First LCNF Conference was in Gateshead, July 2011.
- Last year's conference took place at the Millennium Centre, Cardiff 24th – 26th October.
- This year's conference will take place at the Hilton Metropole, Brighton, 13<sup>th</sup> – 14<sup>th</sup> November.
- ENA aim to make the LCNF Conference “the” smart network event for those who have to make it a reality.

# The ENA Smarter Networks Portal



**Ofgem and ENA members requested ENA to develop a GB Smarter Networks Portal (SNP). The SNP will act as a repository for innovative projects, initially focussing on the LCN Fund Tier 1 and Tier 2, IFI and moving into RIIO, with the stated aims of providing:**

- An overview of the technical and commercial coverage of current smart grid projects in GB
- Identification of activity areas and gaps
- Informing the joint ENA/ERA (CUE) demand response work
- An understanding of likely sources of Cost/Benefit data
- Information of relevance to the next round of LCN Fund bids
- Information of relevance to the next round of Price Controls
- Assistance to ENA, its members and other interested parties in tracking progress of projects
- A tool to enable/ promote the sharing of information and learning

**Official ENA Launch Event 25<sup>th</sup> June 2013 at Hilton Doubletree, Westminster**

# Smarter Networks Portal

## ENA 'Smarter Networks' Portal

Tweet 0 Like 0 Share 2



Low Voltage Networks



Low Voltage Monitoring



Low Carbon Generation



Low Voltage Networks Heat Pumps



Low Voltage Networks Electric Vehicles



System Operations: Comms & IT



Energy Storage & Demand Response



High Voltage Technology

## Low Carbon Networks (LCN) Fund

Ofgem announced the Low Carbon Networks Fund in August 2009 to help drive innovation and new technology to deliver the networks of the future. It is one of the most significant and important investments in network innovation in Europe.

It will provide up to £500 million over five years, encouraging and enabling the transition to a low carbon energy sector. £64 million funding is available each year in the competitive element of the fund and a further £80 million is available over the five years to help fund smaller scale projects. A further £100 million is available over the five years as a discretionary award to reward projects which bring particular value in helping the networks adapt to climate change while providing security of supply and value for money to consumers.

LCN Fund projects are broken down into Tier 1, covering smaller scale projects that deliver initial learning to benefit the operation of the grid, and Tier 2 which is for larger scale projects in specific areas. The Tier 2 projects are decided on through an Ofgem bidding process each year for a share of the £64m.

[Read More](#)

## Latest News

**MAY 22, 2013** "New Smart Technology Enables More Distributed Generation"

Project: Flexible Plug and Play

**MAY 20, 2013** "Low Carbon Networks Fund Ofgem Update"

Project: Low Carbon Networks (LCN) Fund

**MAY 20, 2013** "Network Innovation Competition Ofgem Update"

Project: Network Innovation Allowance & Network Innovation Competition

**MAY 09, 2013** "Low Carbon Networks (LCN) Fund 2013 Initial Screening Process (ISP) Update"

<http://www.smarternetworks.org/>

- The next few decades will see significant change.
- We are working on what the future will look like.
- Major investment and infrastructure development.
- New risks will be identified and need to be resolved.
- New standards and policies will emerge.
- Skills and training will be crucial.
- Need to build and maintain strong relationships too
  - Commercial Arrangements

It will be the most exciting and challenging period our industry has known for a very long time.

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