Customer Load Active System Services (CLASS)

Webinar

Thursday 27 June 2013

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LCN Fund
Low Carbon Networks

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What we will cover today

- Objectives – why are we here?
- Electricity North West – who are we?
- The UK energy and carbon challenge
- The Customer Load Active System Services (CLASS) project
- Our partners
- Next steps
- Questions and answers

Connecting the North West

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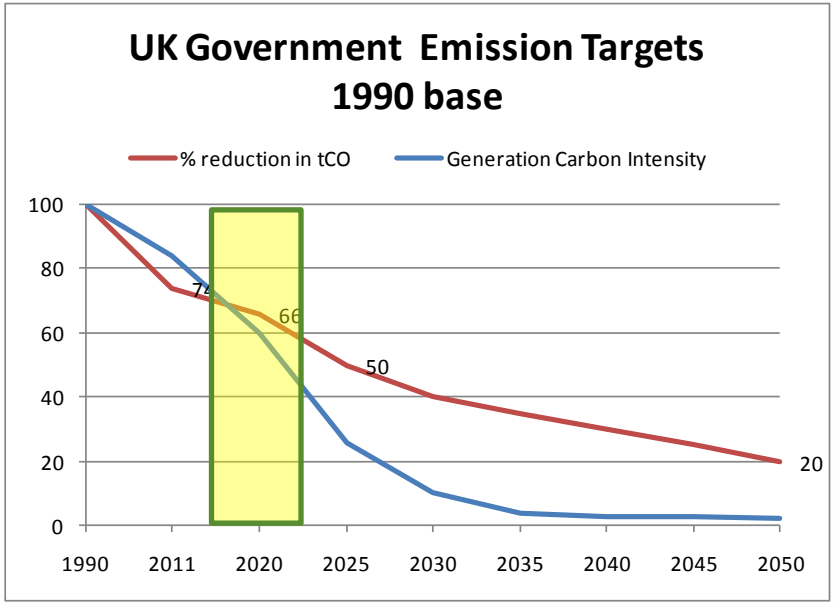
- We're not a big multinational
  - We serve the North West
  - We distribute electricity to ~ 5 million people
  - 25 terawatt hours of electricity annually

- £9bn of network assets
  - 58 000km of cable
  - 15 grid supply points
  - 96 bulk supply substations
  - 363 primary substations
  - 34 000 transforming points

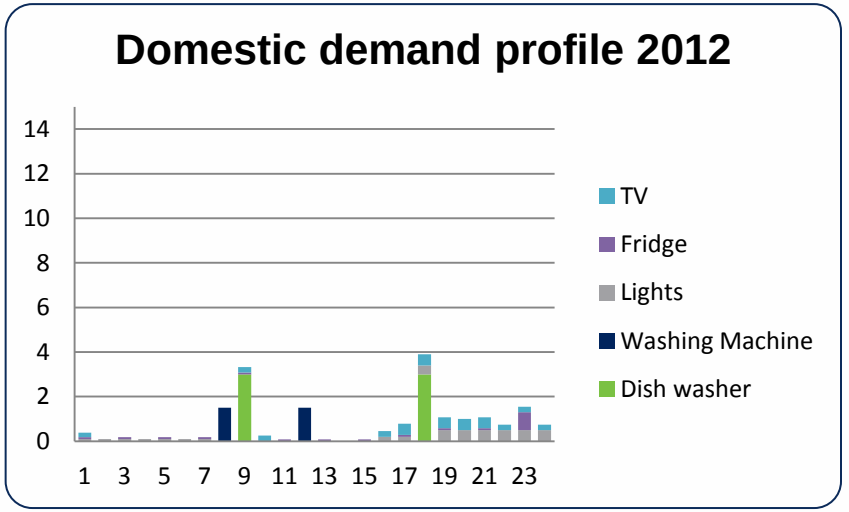
UK energy challenges

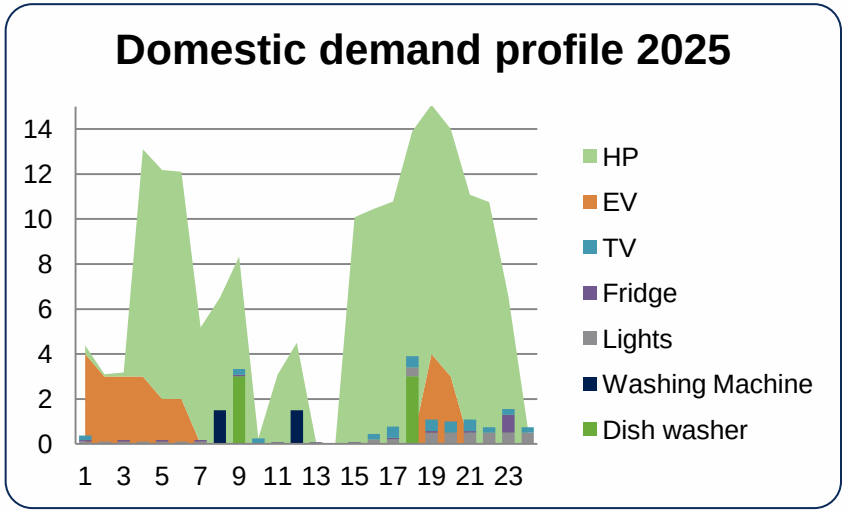
- 2013 position 1/3rd electricity, 1/3rd gas, 1/3rd oil
- 2020 34% reduction in CO_2
  - 40% from wind / PV & new nuclear
  - 5% transport 120,000 EV / hybrid
  - 26 million smart meters fitted
- 2050 80% reduction in CO_2
  - Doubling in electricity demand
- RIIO-ED1
  - Traditional reinforcement unaffordable
  - DG represents the most immediate challenge
- Challenge to identify 'smart' ways of meeting customers' future needs:
  - £30 million RD&D investment programme
  - ~ 60 ongoing projects
  - New equipment and technologies for step change in customer service



The scale of the challenge

	By 2035
Domestic demand	➢6GW even with optimal scheduling ➢Domestic ADMD 2kW – 14kW
Heating	Domestic heat pumps 350 000 fitted 8-10kW for 8 hours Additional >2 GW
Transport	31% UK12M vehicles will be EV/hybrid 720 000 domestic EVs 80 000 E-Vans 3-8kW for 8+ hours. 50kW fast chargers. Additional >2 GW Manchester >400MW
Generation	93% from renewable / carbon neutral sources 800 MW connected in last 18 months





Our innovation strategy

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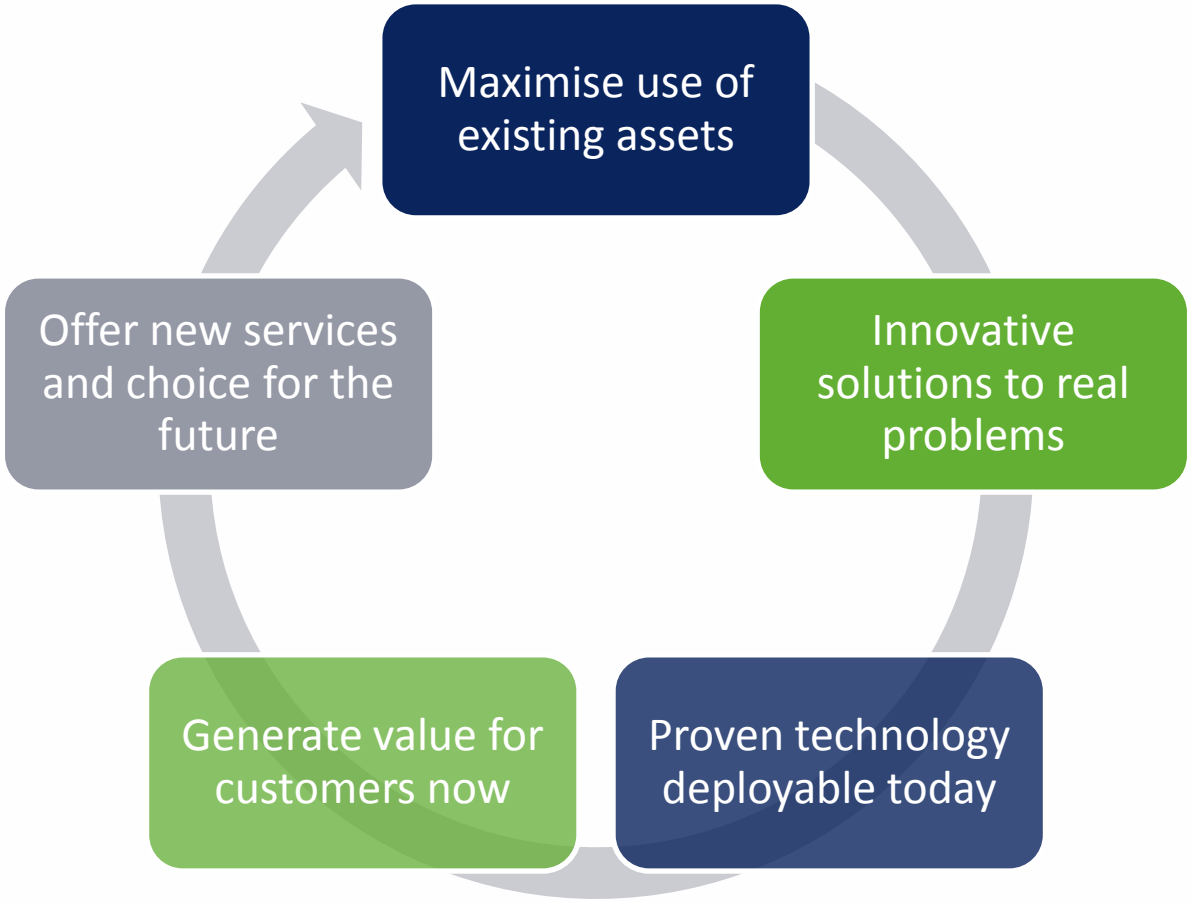

Delivering value to customers

Our smart grid development

- Electricity North West is leading work on developing smart solutions to our future challenges
- Our strategy is to deliver additional value from existing assets
- We have been awarded over £20 million of funding from the Low Carbon Network Fund (LCNF)

CLASS

Customer Load Active System Services

C2C

Capacity to Customers

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Customer Load Active System Services

"A low-cost innovative solution which manages electricity demand by controlling voltage . . .

. . . but with the same great service to customers"

We will now run a short video

What's the principle behind CLASS?

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CLASS is seeking to exploit this relationship to benefit customers

How does it work?

To give an example . . .

- It takes about 3 minutes to boil a kettle
  - A 2% **increase** in voltage and the kettle boils 8 seconds faster
  - A 2% **decrease** and it boils 8 seconds slower
- The cost to make your cup of tea is always the same!
- Would you notice the 8 seconds?

- *A problem shared is a problem halved . . .*
- Now imagine a problem shared across **20,000** homes in a town, **200,000** homes in a city or **26 million** across the UK

What problems could we solve?

Lots of tiny changes at the right time

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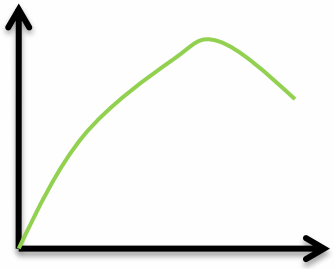
Today

High peak demand

A 2% decrease in demand at peak time:

- defers reinforcement
- allows more demand on the network at lower cost
- allows rapid connection of low carbon technology
- flexible reactive power services



Tomorrow

Response and reserve

A 2% decrease in demand:

- compensates for loss of a large power station
- allows more low carbon generation to be connected
- reduces need for reserve

And into the future

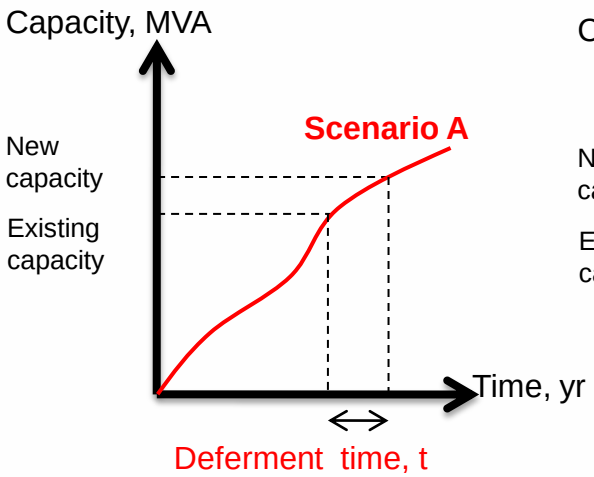
Wind following

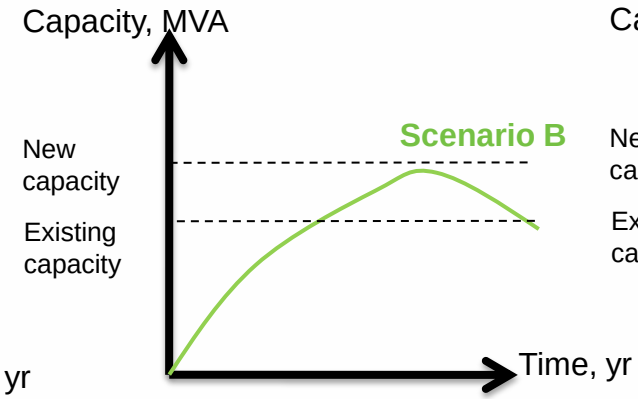
A 2% increase in demand:

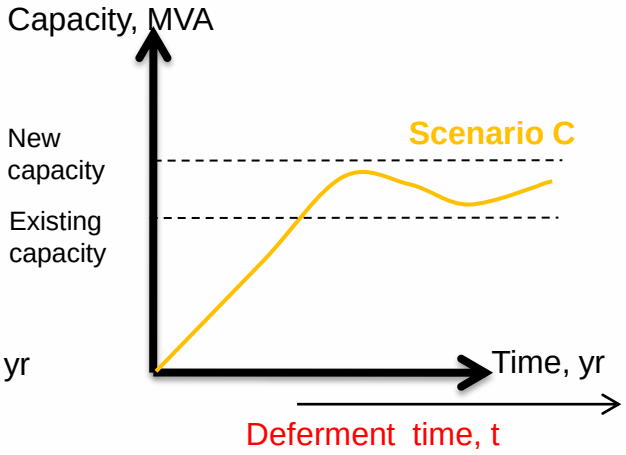
- allows several large wind farms to stay on load maximising the free wind
- lower energy costs

Millions of indiscernible changes can have a huge and valuable effect

Valuing optionality

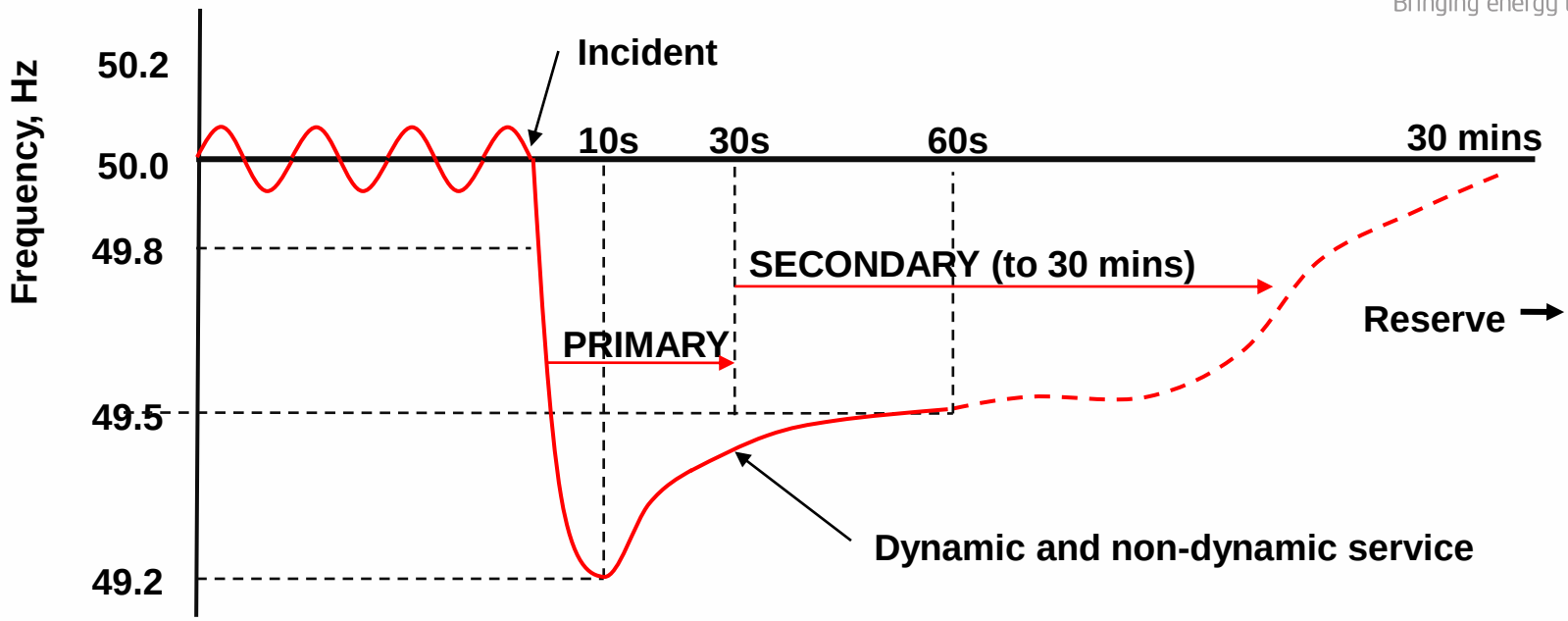


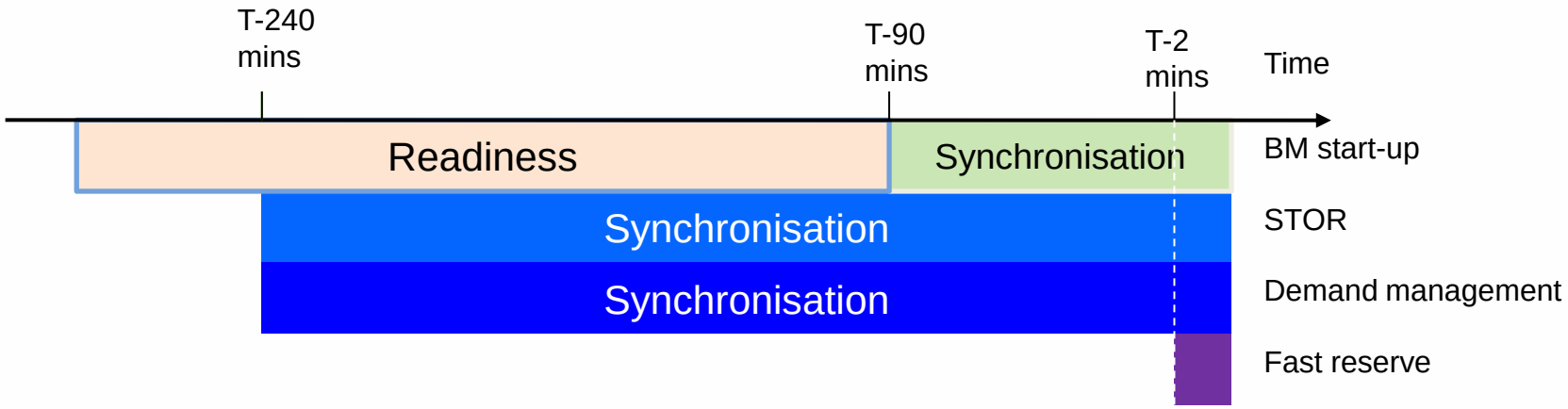




- CLASS solution delivers optionality, managing uncertainty
- New DG and energy efficiency measures impact demand
- Benefits can be permanent:
  - Central Manchester is a scenario B project
  - Wigan is a scenario C project
- Benefits are repeatable at each primary substation
- RIIO-ED1 will see many sites move to B or C

Reserve and response





How will CLASS work?

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- We will install smart voltage control in major substations linked to our control centre
  - Allows voltage to be adjusted when required
  - Automatically stabilises network frequency
  - Keeps voltages at safe levels

SIEMENS

+

- Advanced network management system
  - Links our regional control centre to National Grid control centre
  - Allows accurate voltage measurement and availability
  - Allows demand and voltage control

GE Energy

MANCHESTER 1824
The University of Manchester

nationalgrid

Harnessing world class technology in an innovative solution

Customer engagement is key

- We are confident that customers will not notice any changes and will continue to receive the same great service
- To assess this, we will undertake robust customer engagement throughout the project so that are able to demonstrate that customers do not notice a difference
- We will communicate the principles of CLASS in ‘plain English’
- We will develop a stakeholder engagement plan using multiple channels
- We will conduct a wide range of surveys during the trials to assess customer views on the effects of CLASS

High-level project plan

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Technology Build

Trials, Customer Surveys & Analysis

Closure

Learning & knowledge sharing

Jan 2013	• Project start-up
	• Site selection
	• Installation of equipment and hardware
	• Build and test data link with National Grid
Mar 2014	• Design trials and tests regime
Apr 2014	• Commence live trials
	• Undertake customer surveys
	• Publish network modelling and analysis report
	• Publish asset health analysis report
	• Publish carbon analysis report
	• Publish customer impacts report
Aug 2015	• Publish NETS SQSS change proposals
Aug 2015	• Closedown report and closure
	• Initiate long-term monitoring study with National Grid
Sep 2015	

CLASS project partners

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Technical build	Trials & research	Customer engagement
SIEMENS PB PARSONS BRINCKERHOFF nationalgrid GE	MANCHESTER 1824 Tyndall Centre for Climate Change Research Chiltern Power nationalgrid	Impact Research
Learning & dissemination		

A wealth of experience

CLASS project team

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Steve Cox
CLASS Project Director

CLASS Project Steering Group

Craig McNicol
Future Networks Delivery Manager

Herb Castillo
CLASS Project Manager

Paul Turner
Future Network Technology Lead

Kate Quigley
Future Networks Customer Lead

Customer Load Active System Services

Technical innovation

World class technology

Financial and Carbon savings for customers

New understanding of a fundamental relationship

Existing assets, innovative thinking & tiny changes at just the right time

Reinforcement deferral, response balancing & voltage control

Carbon savings & lower customer bills

V & D data underpins network management now and into the future

CLASS will deliver savings to customers and across the supply chain

Want to know more?

futurenetworks@enwl.co.uk

www.enwl.co.uk/class

- Webinar podcast
- Q&A update from this session

0800 195 4141

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