

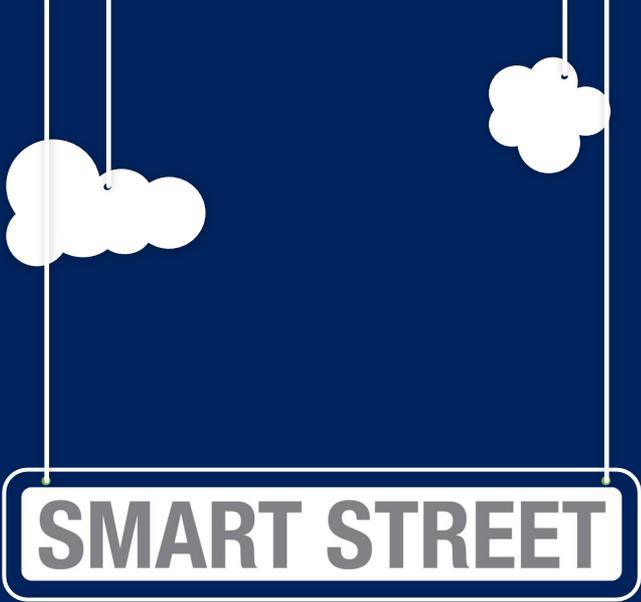


SMART STREET

Webinar

30 April 2015





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Kevin Hoban

Smart Street Project Manager



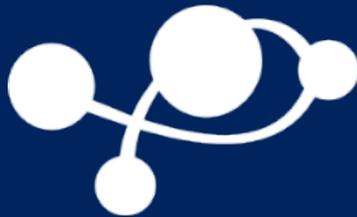


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Introduction and overview

Technical update



Trial design



Questions & answers

Webinar format



30 minutes presentation



10 minutes
questions & answers



Submit written questions online
during the webinar



Press 01 on your telephone key
pad to take part in the live Q&A at
the end of the presentation

or

Our innovation strategy



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north west

Bringing energy to your door



Our smart grid development



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Leading work on developing smart solutions



Deliver value
from existing
assets



Customer choice



Four flagship products (second tier) £36 million

C2C
Capacity to
Customers

CLASS

SMART STREET

RESPOND

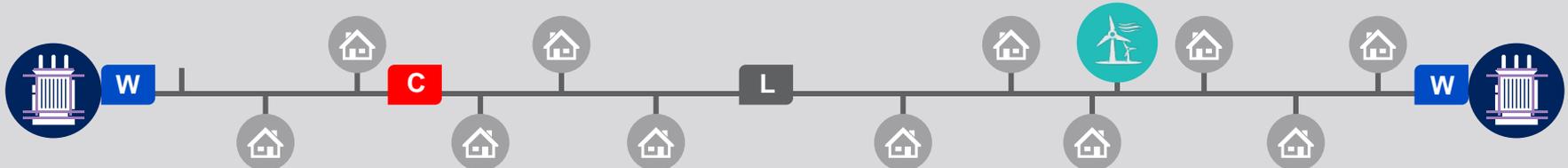
Smart Street overview



New controllable switching devices stabilise voltage

Allows us to lower voltage levels

Enables networks and appliances to work in harmony



- Low cost
- Quick fit
- Minimal disruption
- Low carbon
- Low loss
- Invisible to customers
- Faster connection of low carbon technologies

Key activities to date

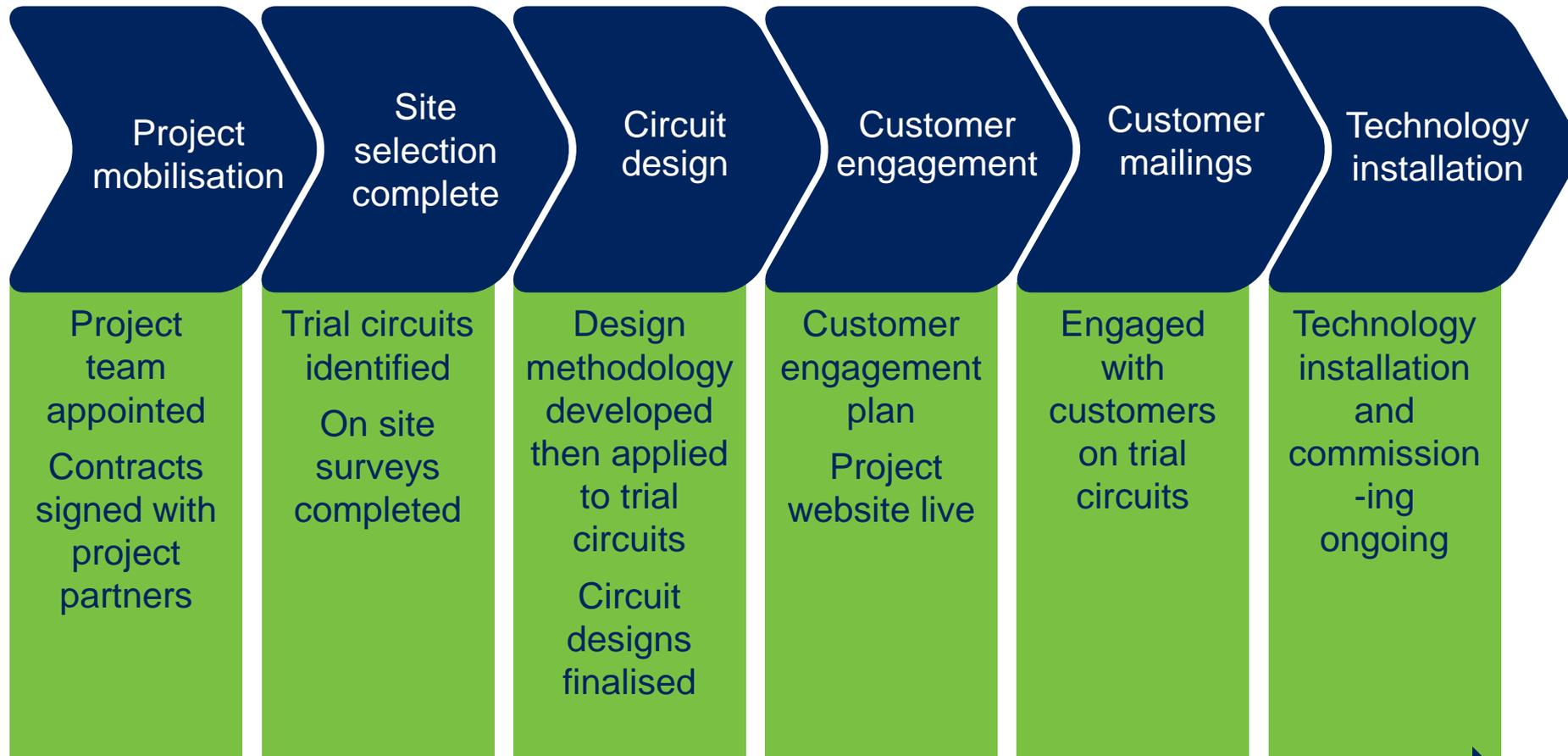


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Bringing energy to your door

Jan 2014

April 2015



Knowledge sharing and dissemination

Customer impact and objectives



Pre-trial		During/post-trial	
			
Customers have seen increased activity while equipment is installed	Occasional planned supply interruptions due to equipment installation	Reduction in fault duration during trial period	Possible change in voltage
Objective: To engage with customers and explain impact of Smart Street trial		Objective: To prove that customers will not perceive a change to their electricity supply	

Progress and next steps



Customer engagement plan submitted to Ofgem and approved

Go live of the Smart Street website and social media forums

Engaged customer panels held and lessons learned published

Customer leaflet designed and distributed to customers on trial circuits

Customers affected by new street furniture installations notified

Technology installation enquiries / complaints resolved

Successful technical installation as a result of well planned strategy and customer engagement activities

Next steps

Brief ENW contact centre before trial go live

Further ECPs to gauge customer perception & acceptability of trials

Produce report of customer research findings

Ongoing engagement with customers during trial



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Damien Coyle

Smart Street Technology Engineer



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SIEMENS

Measures, optimises and responds

CVR and losses benefits unlocked

Oversees network and customer needs

Builds on CLASS smart voltage control



KELVATEK

World leading LV vacuum circuit breaker

Advanced measurement and protection capability

Safe LV interconnection, live monitoring and control

Improves supply reliability and restoration through fault management and detection



LV switch

Allows active network meshing and un-meshing

Advanced monitoring capabilities

Ability to control the circuit locally or remotely

KELVATEK

What customers will see – LV capacitors in street furniture

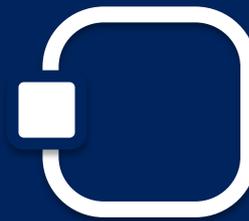


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84 LV capacitors



One on each
closed ring



Tried and tested

What customers will see - HV capacitors



3 ground mounted
HV capacitors

Located in urban areas
in GRP housings



4 pole mounted
HV capacitors

Installed similar to pole
mounted transformers

Technology overview



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84 LV capacitors
installed



40 link boxes
installed



50 end-point
controllers installed



Spectrum 5 installed
on network

**Next
steps**

7 HV capacitors
to be installed

5 OLTC
transformers to
be installed

IT integration
and
commissioning



Equipment



HV GM capacitors

Footprint larger than anticipated.

Required significant work with land owners and local authorities to agree wayleaves and planning permission



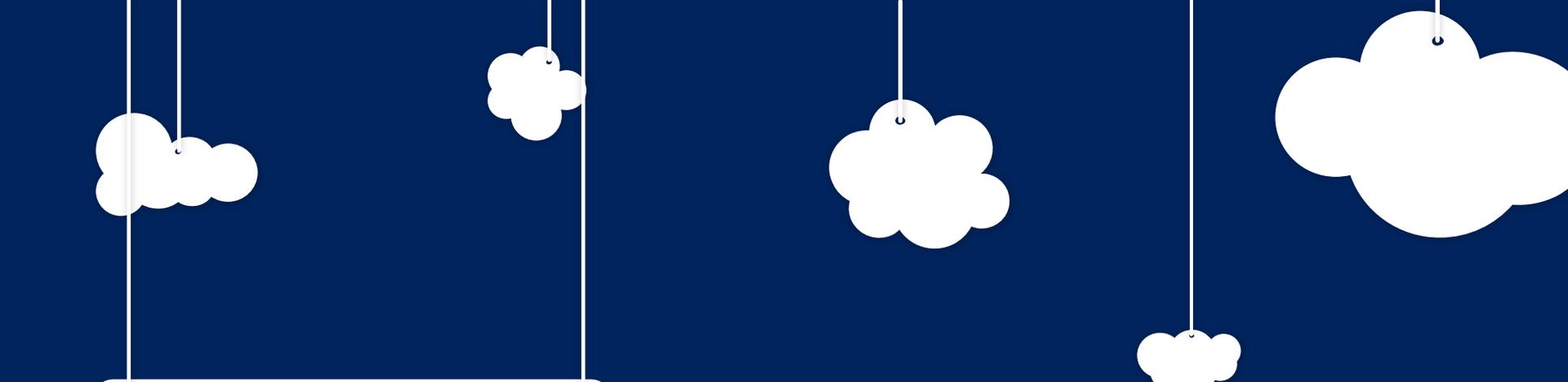
LV capacitors

A number of units had to be reduced in size to ensure footpath access was not restricted

IT



Development on interoperability between control systems and various new field devices, required engagement with all technical partners and manufacturers to identify possible issues early



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Dan Harber

Trials & Research Engineer



Agenda



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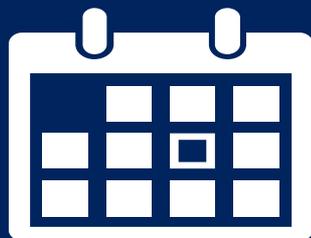
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Trial network overview



Test regimes



Proposed test schedule



Research overview

Smart Street trial overview



6 primary substations

67,500 customers

11 HV circuits – 5 closable HV rings



4 pole mounted HV capacitors

3 ground mounted HV capacitors



38 distribution substations

5 OLTC transformers

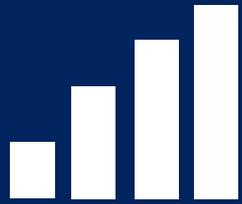


5 substation capacitors

79 LV circuit capacitors



Two years
One week on
One week off



One year's worth of
Smart Street data



To be designed to
avoid placebo affect



Five trial regimes to
test full effects

Five trial techniques

LV voltage control

LV network management
and interconnection

HV voltage control

HV network management
and interconnection

Network configuration
and voltage optimisation

Smart Street test regimes



Smart Street trial	Test regime
LV voltage control	1. On-load tap changing distribution transformer only
	2. On-load tap changing distribution transformer and capacitor(s) on LV circuits
	3. Capacitors at distribution substation only
	4. Capacitors at distribution substation and on LV circuits
	5. Capacitor(s) on LV circuits only
LV network management & interconnection	1. LV radial circuits
	2. LV interconnected circuits
HV voltage control	1. Voltage controllers at primary substation only
	2. Voltage controllers at primary substation and capacitor(s) on HV circuits
HV network management & interconnection	1. HV radial circuits
	2. HV interconnected circuits
Network configuration & voltage optimisation	1. Losses reduction
	2. Energy consumption reduction

Proposed test schedule



	TRIAL 1 - LV VOLTAGE CONTROL	TRIAL 2 – LV INTERCONNECTION	TRIAL 3 - HV VOLTAGE CONTROL	TRIAL 4 - HV INTERCONNECTION
WEEK 1	OFF	OFF	OFF	OFF
WEEK 2	OFF	OFF	OFF	OFF
WEEK 3	EQUIPMENT TESTED IN ISOLATION	ON	EQUIPMENT TESTED IN ISOLATION	ON
WEEK 4	COMBINED TESTING	ON	COMBINED TESTING	ON
WEEK 5	OFF	OFF	OFF	OFF
WEEK 6	OFF	OFF	OFF	OFF
WEEK 7	EQUIPMENT TESTED IN ISOLATION	ON	COMBINED TESTING	ON
WEEK 8	COMBINED TESTING	ON	EQUIPMENT TESTED IN ISOLATION	ON

Trial 5: The optimisation will be applied during the trial on periods where week 4 allows for full optimisation

Overview of research workstream



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WP1 will look to quantify the voltage optimisation and loss reduction techniques used in Smart Street

WP2 will look to produce the design and operation policies required to convert UK networks into optimal meshed configurations

WP3 will research the cost benefits and carbon impact related to the Smart Street solution

TNEI will provide research support and consultation for the duration of the trials

MANCHESTER
1824

 Queen's University
Belfast

TyndallManchester
Climate Change Research

 **tnei**
enterprise with energy

Next steps



April 2015

Technology
installation

Continue with
installation of
transformers
and
capacitors

Sep 2015

Start of
trials

Trials will run
for 2 years in
conjunction
with research
deliverables

Sep 2017

ECP and
customer
research

Qualitative
research with
customers on
trial circuits

Dec 2017

Project
closedown

Project
findings and
final
dissemination
event for all
stakeholders

Knowledge sharing and dissemination



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QUESTIONS & ANSWERS





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Please complete our online poll

