



RESPOND



## Webinar

Andrew Howard  
Project manager

*15 September 2015*



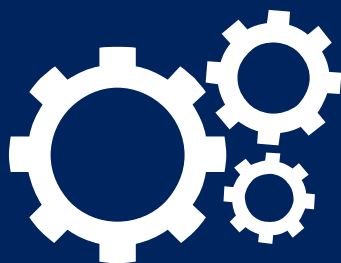


## RESPOND



Introduction

Project overview



Progress and next steps



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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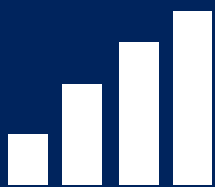
# Our smart grid development



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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**

# What is fault current/fault level?



Our network is designed to handle normal current 24/7



Protected by fuses, switches and circuit breakers in key locations



These devices detect the fault current and disconnect the fault from the rest of the network



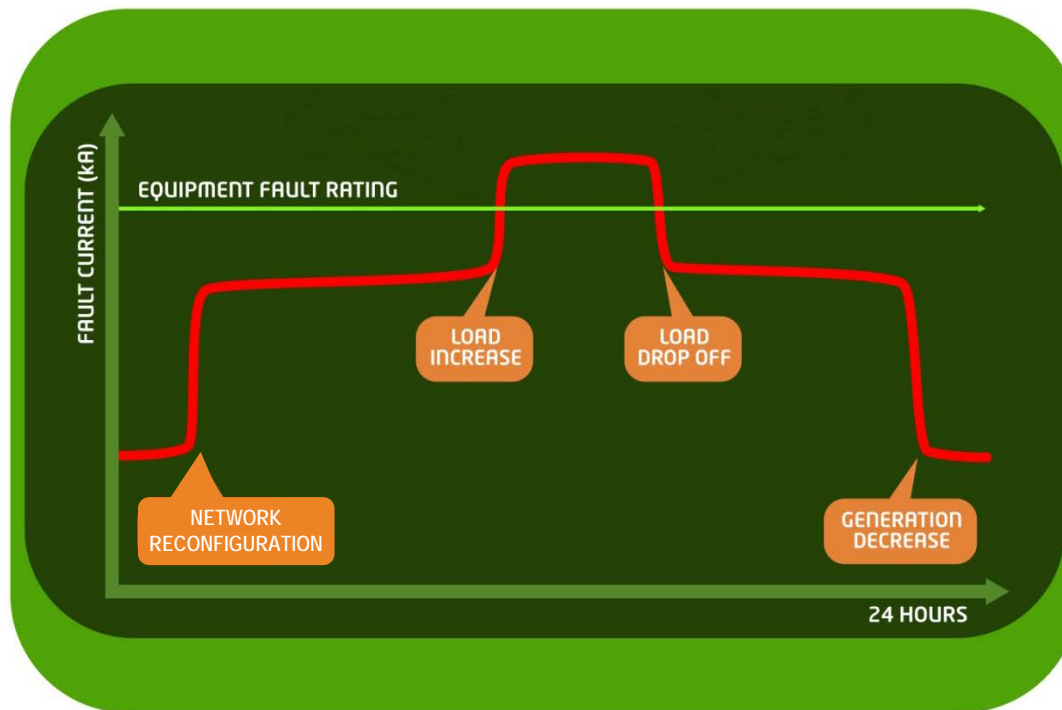
Fault current varies depending on type of fault, location, network configuration and generation sources



If unchecked fault current can damage equipment in a matter of seconds

***Fault current*** is the instantaneous surge of energy which flows under fault conditions. ***Fault level*** is the maximum potential fault current.

# Fluctuating fault level



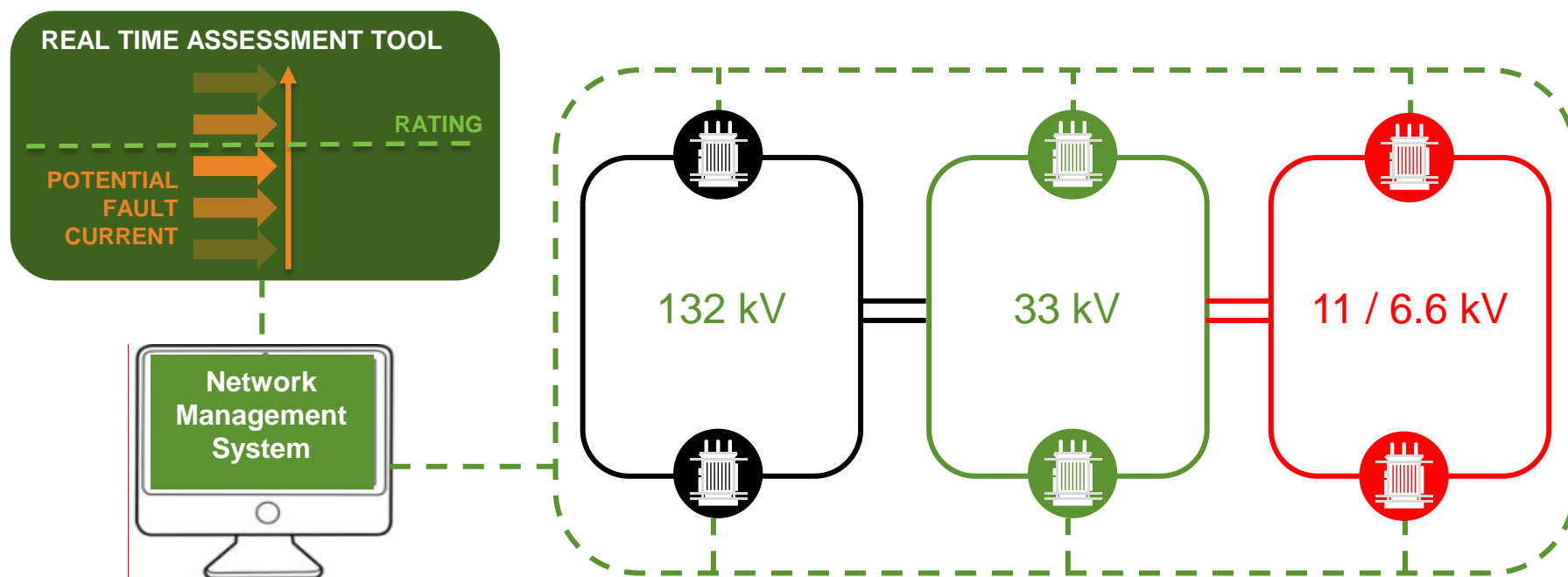
Fault level reinforcement is disruptive, lengthy and expensive which can discourage connection of new demand/generation

How can we manage these issues without expensive reinforcement ?

# Real time fault level assessment



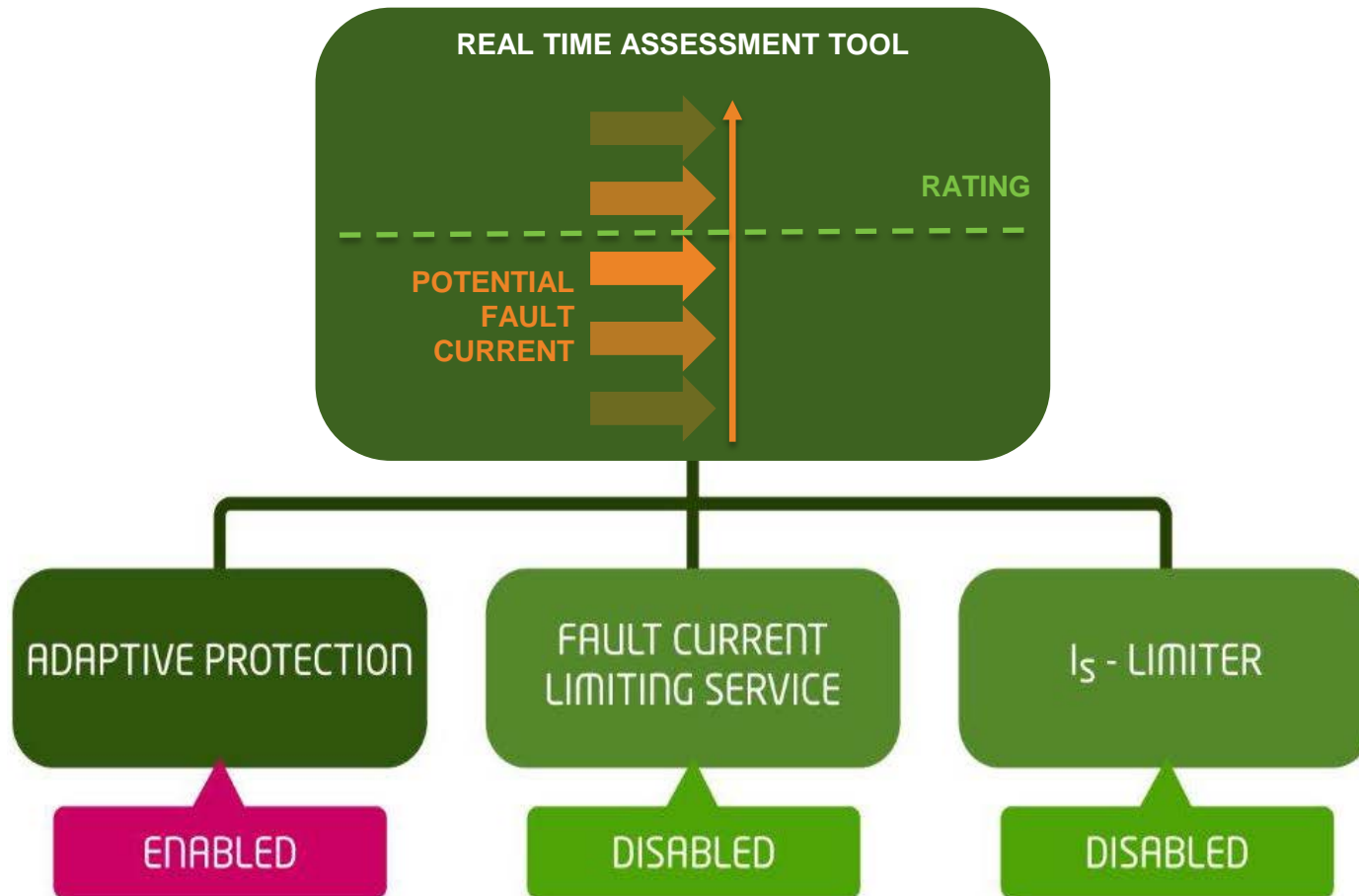
Respond is the first UK demonstration of an active fault level management solution that avoids traditional network reinforcement



Faster LCT adoption • Less disruption • Lower bills



# Real time mitigation techniques



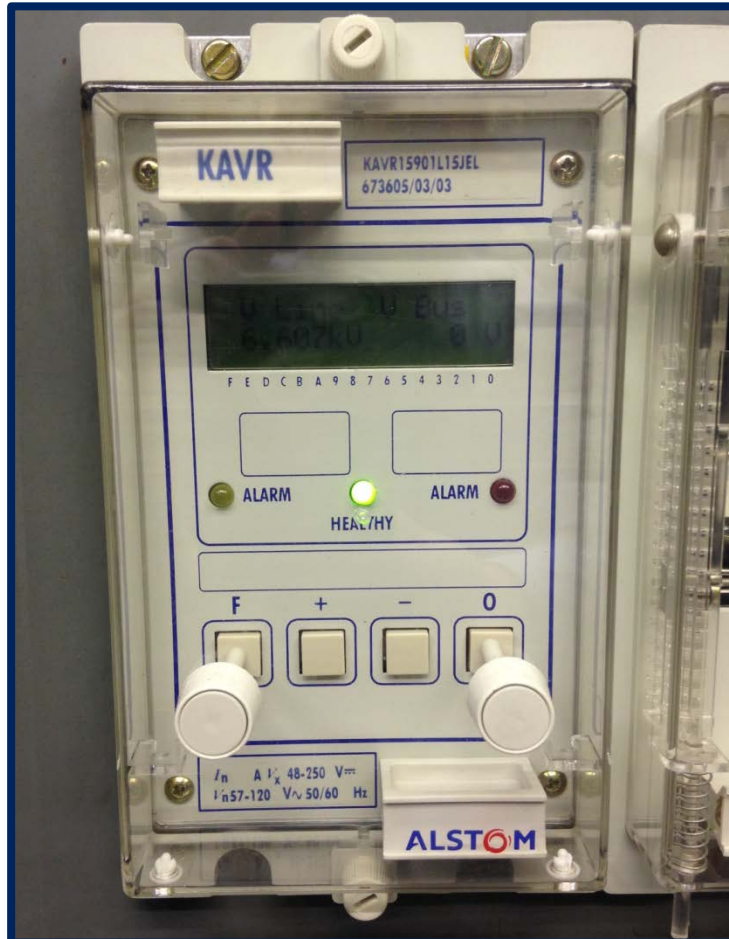
- Real time fault current assessment
- Safe network operation

# Adaptive Protection



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Network already designed to break fault current



Adaptive protection changes the order in which circuit breakers operate to safely disconnect the fault



Using redundancy in the network ensures no other customers go off supply

# I<sub>S</sub> limiters



Operates within  
5 milli-seconds or  
1/200<sup>th</sup> of a second



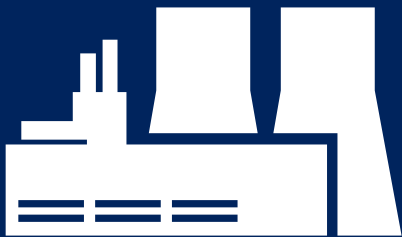
Detects rapid rise in  
current when a fault  
occurs and responds  
to break the current



Respond will prove the  
technology, review  
safety case and deploy  
at two sites

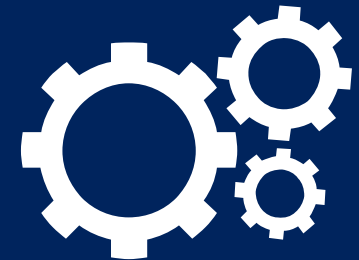


To reduce fault level we need to disconnect sources of fault current



Generator

Motor



Designed for generation of electricity

If spinning when a fault occurs, momentum of motor and magnetic field cause electricity to flow towards the fault

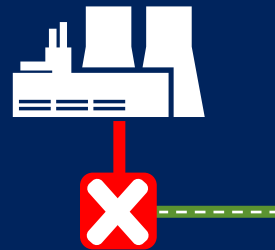
- Every source will contribute to the fault current ●
  - Larger sources will contribute more ●
- Generators will contribute more than similar rated motors ●

# Fault Current Limiting (FCL) service



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Fault current generated by customers can be disconnected using new technology

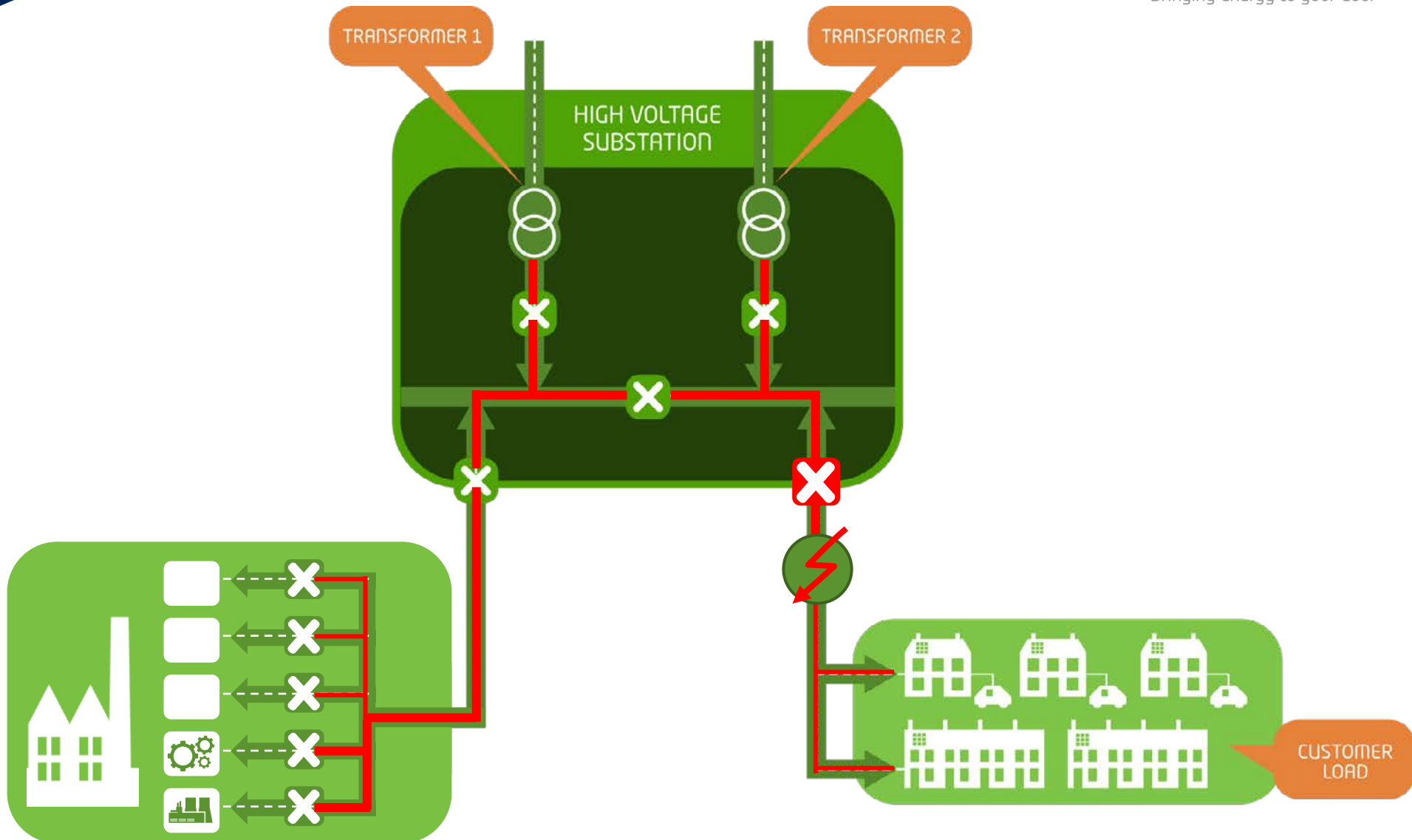


Financial benefits to customers taking part and long term to all customers



Challenge is to identify customers to take part in a trial of the FCL service

# How the FCL service works

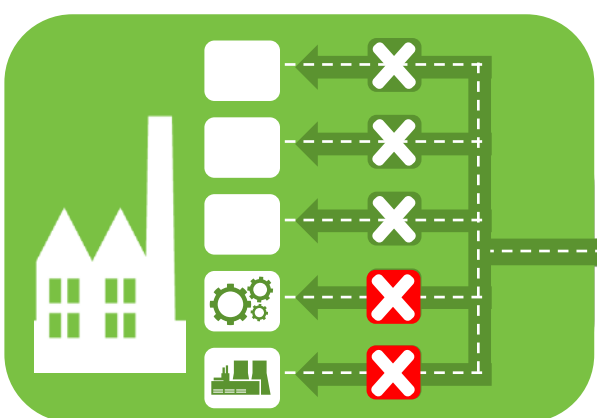
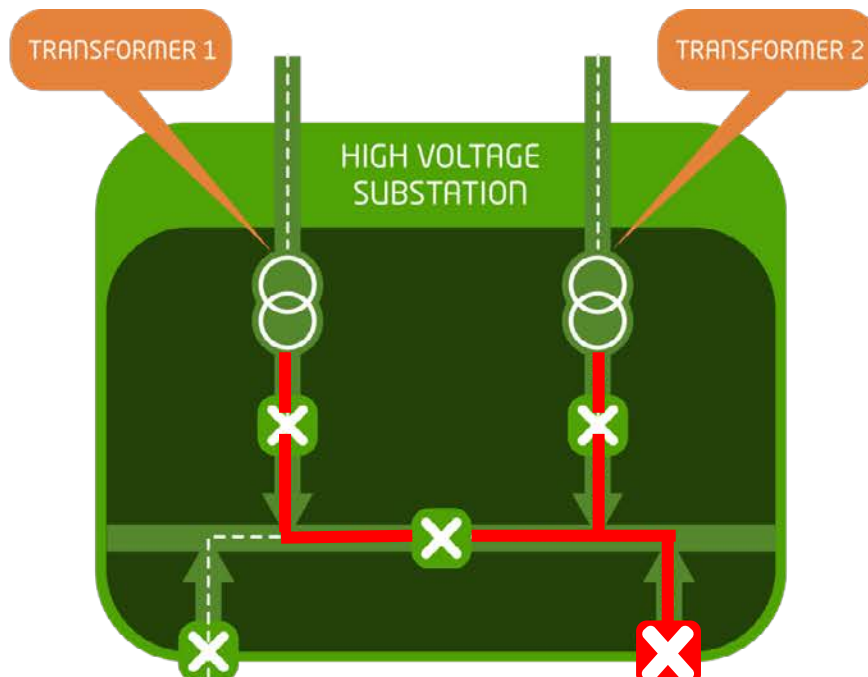


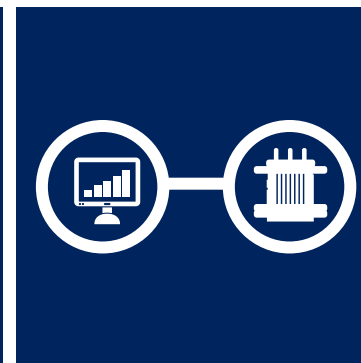
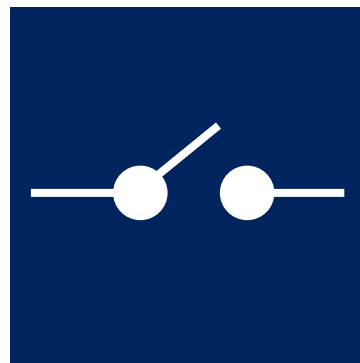
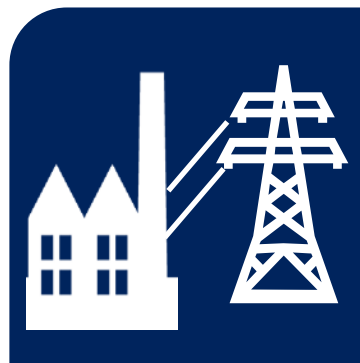
# How the FCL service works



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Do customers have equipment that can contribute to fault current?

Are customers willing for equipment to be disconnected if required?

What commercial arrangements need to be in place?

What technical arrangements need to be in place?

Is there a long-term benefit to all GB customers?  
What is the scale of the benefit?



# Customer engagement



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Survey with I&C  
demand and  
generation  
customers



Engaged  
customer panel  
will help  
structure the  
survey



Develop our  
commercial  
contract for FCL  
services to trial  
during the  
project



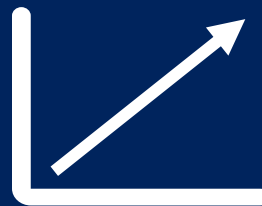
Monitor network  
performance  
and our  
customers'  
experience

To take part in the survey, please register your interest at  
[www.enwl.co.uk/respond-survey](http://www.enwl.co.uk/respond-survey)

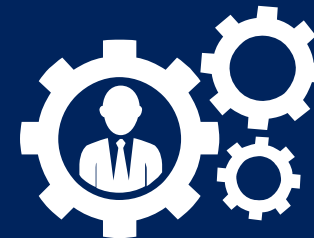
# Respond project hypotheses



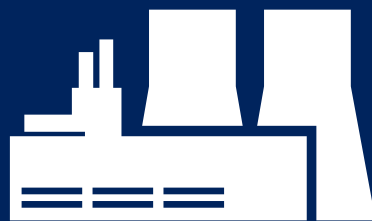
Faster and cheaper to apply than traditional reinforcement



Will deliver a buy order of fault level mitigation solutions based on a cost benefit analysis



Facilitates active management of fault current, using retrofit technologies and commercial services



Enables a market for the provision of an FCL service



Uses existing assets with no detriment to asset health



Reduces bills to customers through reduced network reinforcement costs

# Respond project summary



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£ 5.539  
million

**Build**  
Now to  
April 2016

**Trial**  
May 2016 to  
April 2018

**Decommission  
& closedown**  
October 2018

Fault  
Level  
Assessment  
Tool



Adaptive protection  
(5 HV, 2 EHV sites)



Fault Current Limiting  
(FCL) service



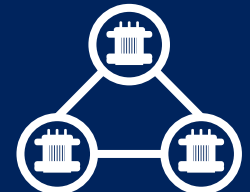
I<sub>s</sub> limiters (2 HV full  
install, 3 HV and 2 EHV  
sensing equipment)

Delivers same capacity but up to 18 x faster

Up to 80% cheaper

Could save GB £2.3 billion by 2050

# Progress to date



Customer engagement plan and data privacy statement submitted to Ofgem and approved

Go live of the Respond website and social media forums

Project publicised through partner organisations and in the media

Customers registered for engaged customer panel and survey

Orders placed for major items

Installation sites confirmed

# Next steps



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Sep 2015

October 2015

now – May 2016

May 2016

Engaged  
customer  
panel

Preparation of  
customer  
survey  
materials and  
convening first  
expert panel

Customer  
survey

Survey of  
customers to  
assess  
appetite to  
provide a Fault  
Current  
Limiting service

Installation

Installation and  
commissioning  
of Fault Level  
Assessment  
Tool and fault  
mitigation  
equipment

Start of  
trials

Site selection  
and  
installation

Knowledge sharing and dissemination

# Questions and answers



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Submit written questions



Press 01 on your telephone key  
pad to submit your question  
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or

# Questions & answers



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**Andy Howard**  
Project  
Manager



**Paul Turner**  
Delivery  
Manager



**Steve Stott**  
Project  
Engineer



**Kate Quigley**  
Customer  
Delivery  
Manager



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## Webinar

*Please complete our online poll*

