



C₂C Customer Presentation

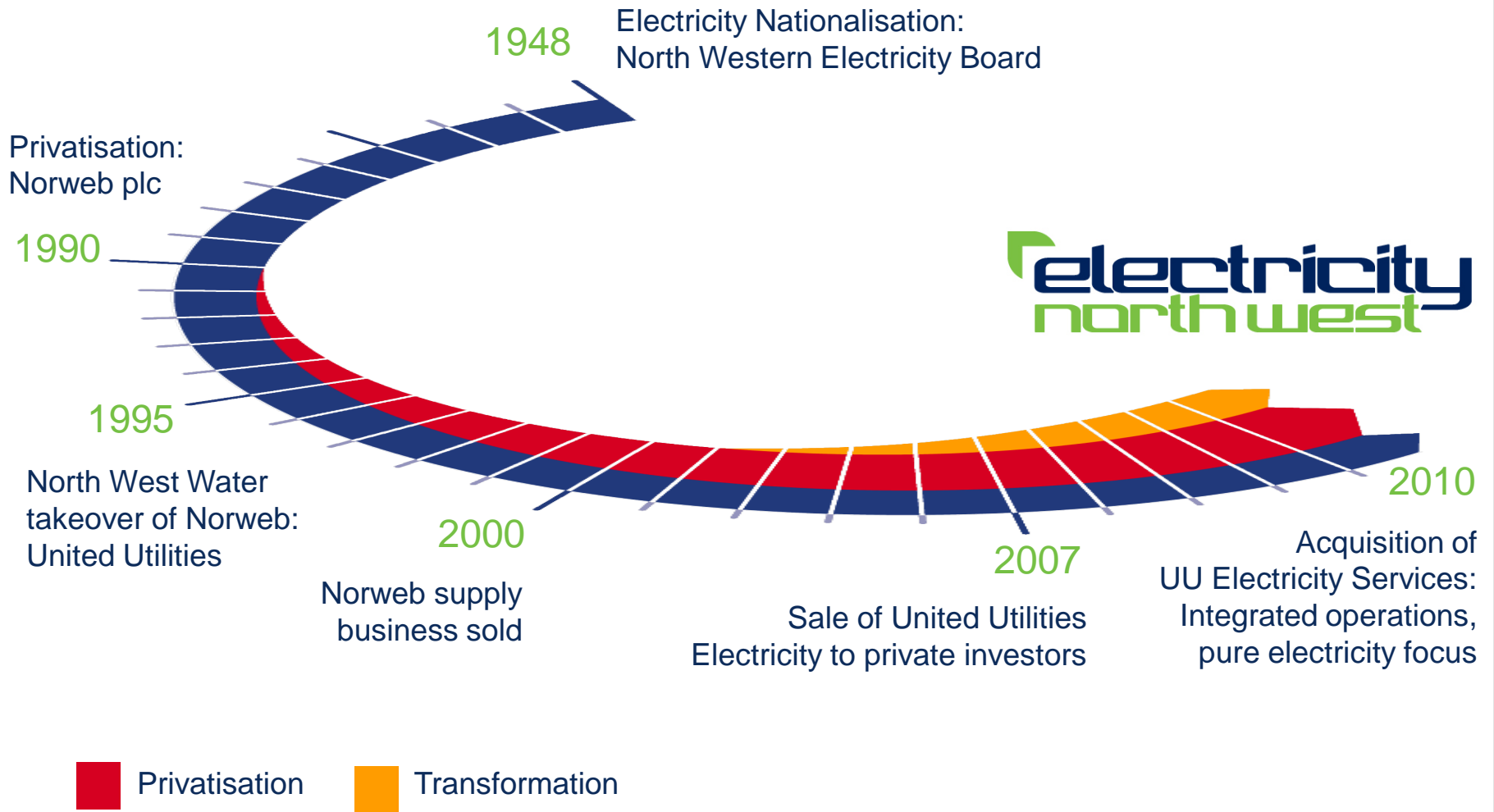
20 November 2013

Bolton Arena

Mark Crane
John Lucas



Connecting North West England



Connecting North West England

We are one of 14 Distribution Network Operators within the UK

We serve approximately 5 million people at 2.4 million domestic and industrial locations

- £9bn of Network Assets
 - 58,000km of cable
 - 96 bulk supply substations
 - 363 primary substations
 - 34,000 transforming points



UK Energy Roadmap

Source: 4th Carbon budget projection

2020 targets

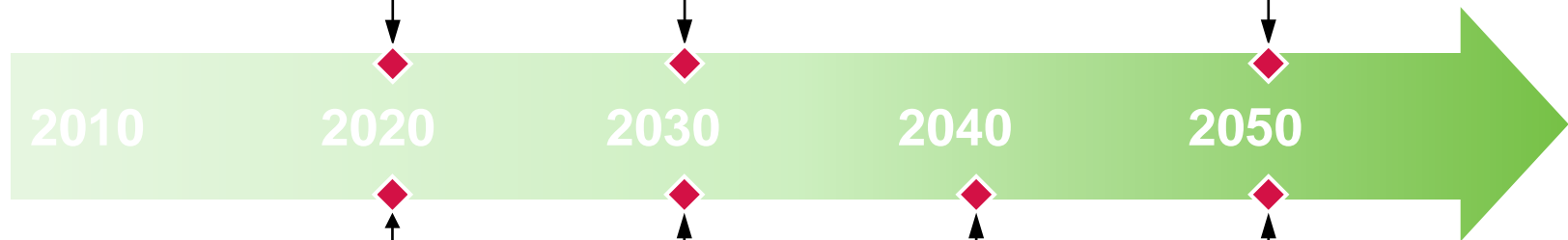
- 37% reduction in CO₂

2030 target

- 60% reduction in CO₂

2050 target

- 80% reduction in CO₂



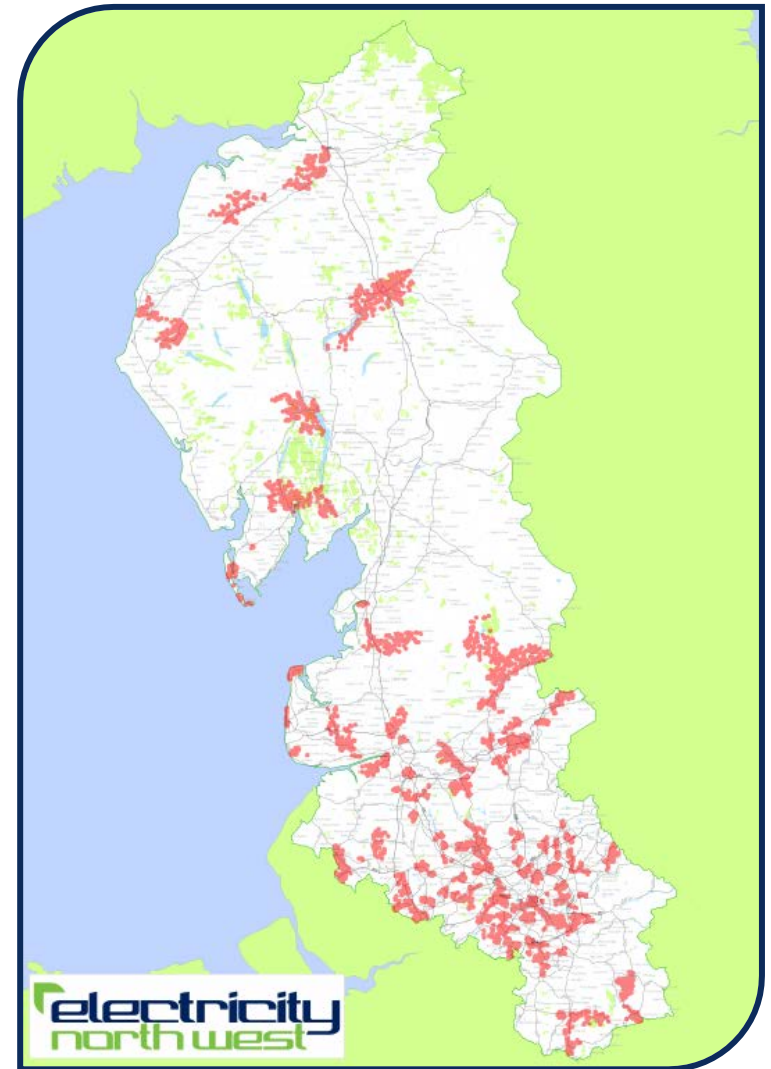
- Generation mix is radically 'overhauled'
- Transmission is a key enabler – connecting & balancing new, diverse sources of energy
- Electricity demand increases, driven by electric cars & heat pumps; gas demand declines
- Distribution network capacity significantly increases
- Carbon Capture & Storage is deployed at significant scale
- Significant technology uncertainty, 'disruptors' may emerge
- 80% reduction in CO₂ is achieved
- Consumer energy behaviour is unrecognisable from today

What is Capacity to Customers?

[Capacity to Customers Video](#)

- The trial area is all our **132 & 33kV network** and approximately 10% of our HV network
- C₂C will touch 382,000 customers
- To find out if a location is included in our HV trial area, more details can be found on our C₂C website

www.enwl.co.uk/c2c



Design and build

- Customer engagement plan and surveys ✓
- Commercial templates and processes ✓
- Aggregator tender process ✓
- Circuit selection ✓
- P2/6 derogation and consultation ✓
- Enhanced network management software ✓
- Equipment installation and commissioning ✓

Live trials

- Trial 'go live' ✓
- Recruit trial participants
- Power quality and losses modelling
- Carbon and economic impact assessments
- Continuously engage stakeholders
- Continuously engage with customers

Closedown

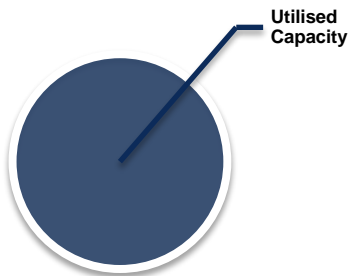
- Closedown report
- Project closedowns



**We aim to create a template for implementation
that other DNOs can learn from and use**

Capacity to Customers

Total available network capacity



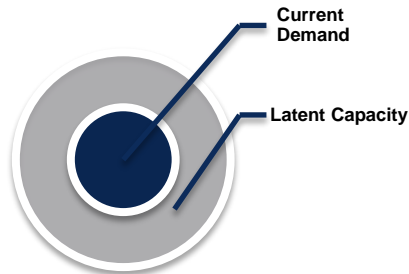
Combining proven technology and new commercial contracts

Allows ENWL to release significant network capacity back to customers

Facilitating connection of new demand and generation without reinforcement

Technical Innovation

Total available network capacity



Apply remote control equipment to the HV circuit and close the normal open point

Enhance network management software

This effectively doubles the available capacity of the circuit negating the need for traditional reinforcement

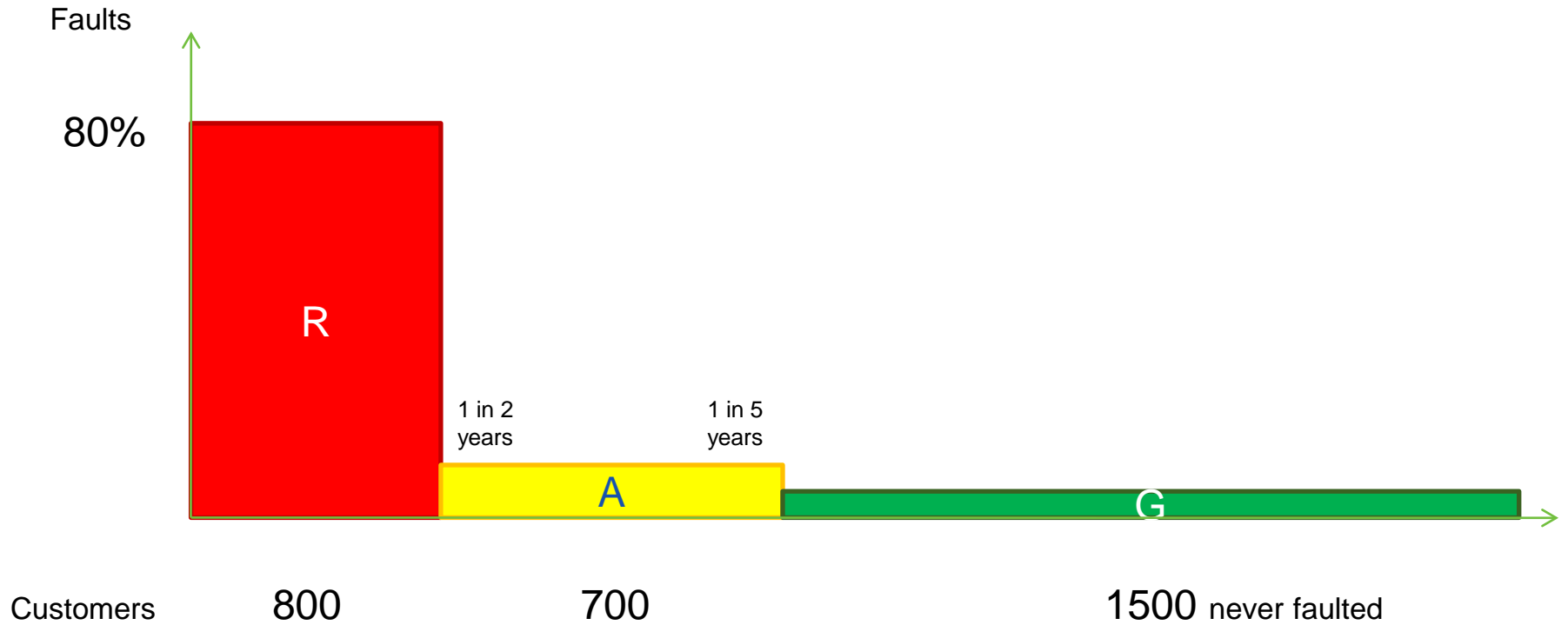
New Commercial Contracts



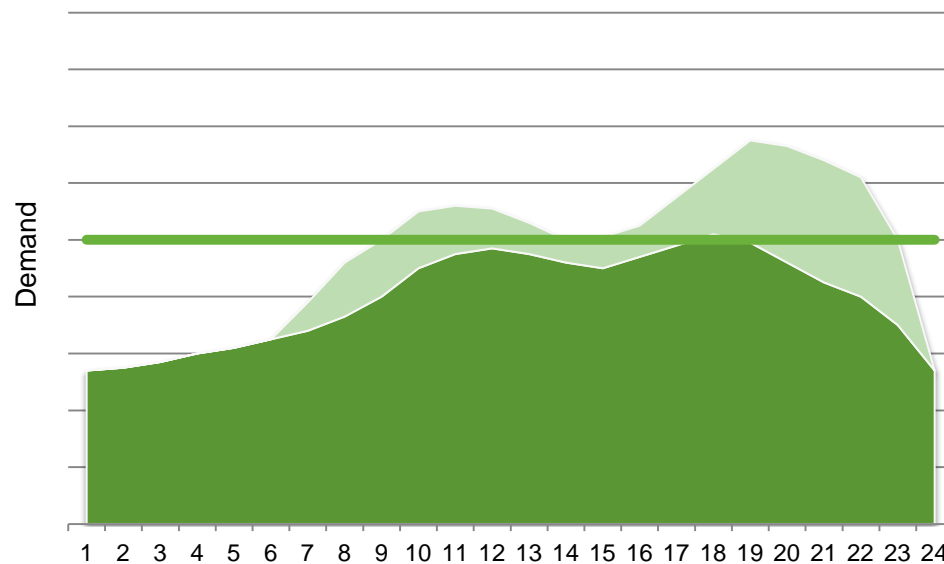
To retain customers' security of supply we will utilise innovative demand side response contracts

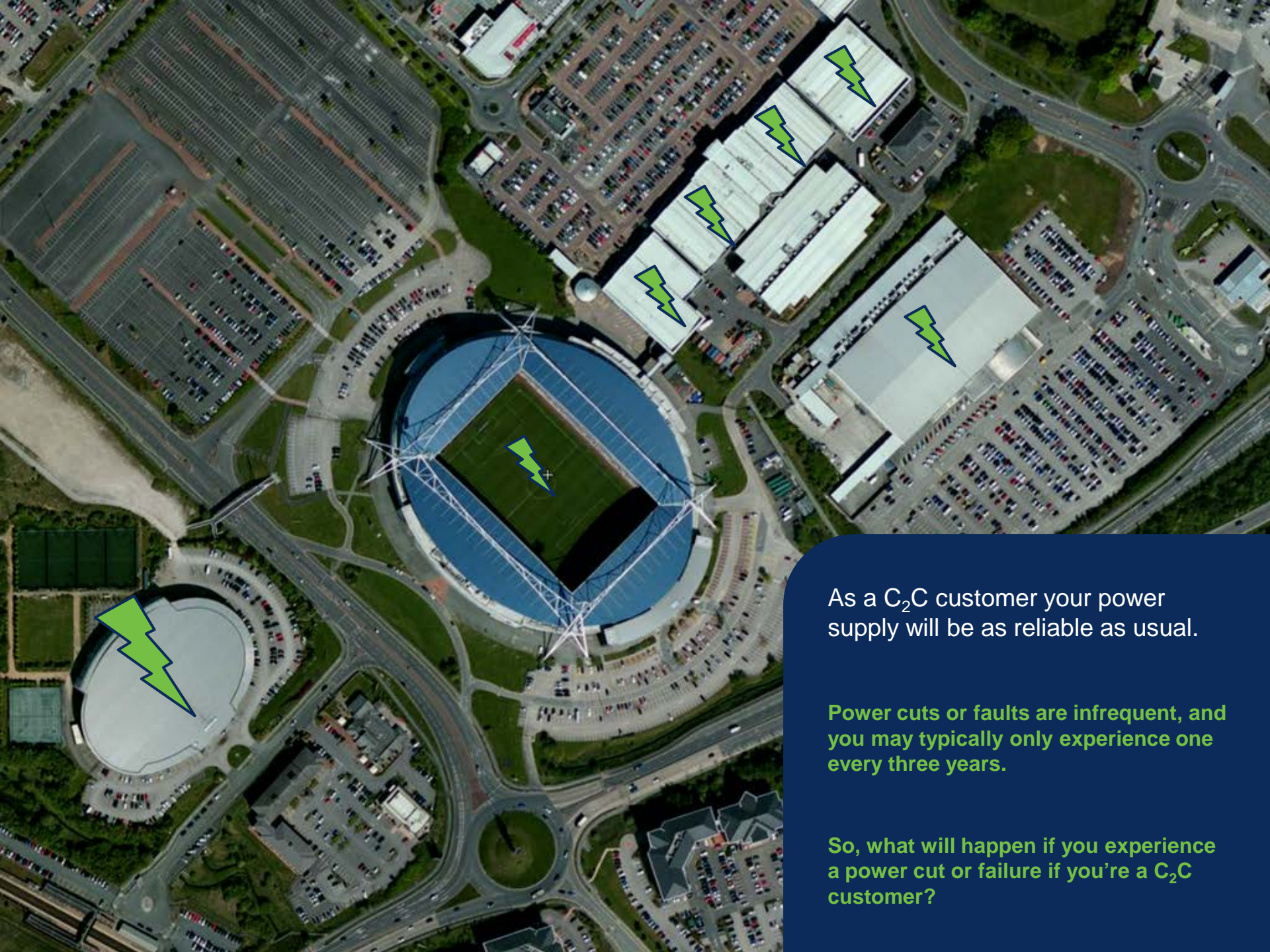
These contracts will allow ENWL to control the consumption of customers on a circuit at the time of fault

I&C Customer Categories



- The C₂C 'delayed restoration' will only occur if **your part of the network** is overloaded at the time of the fault

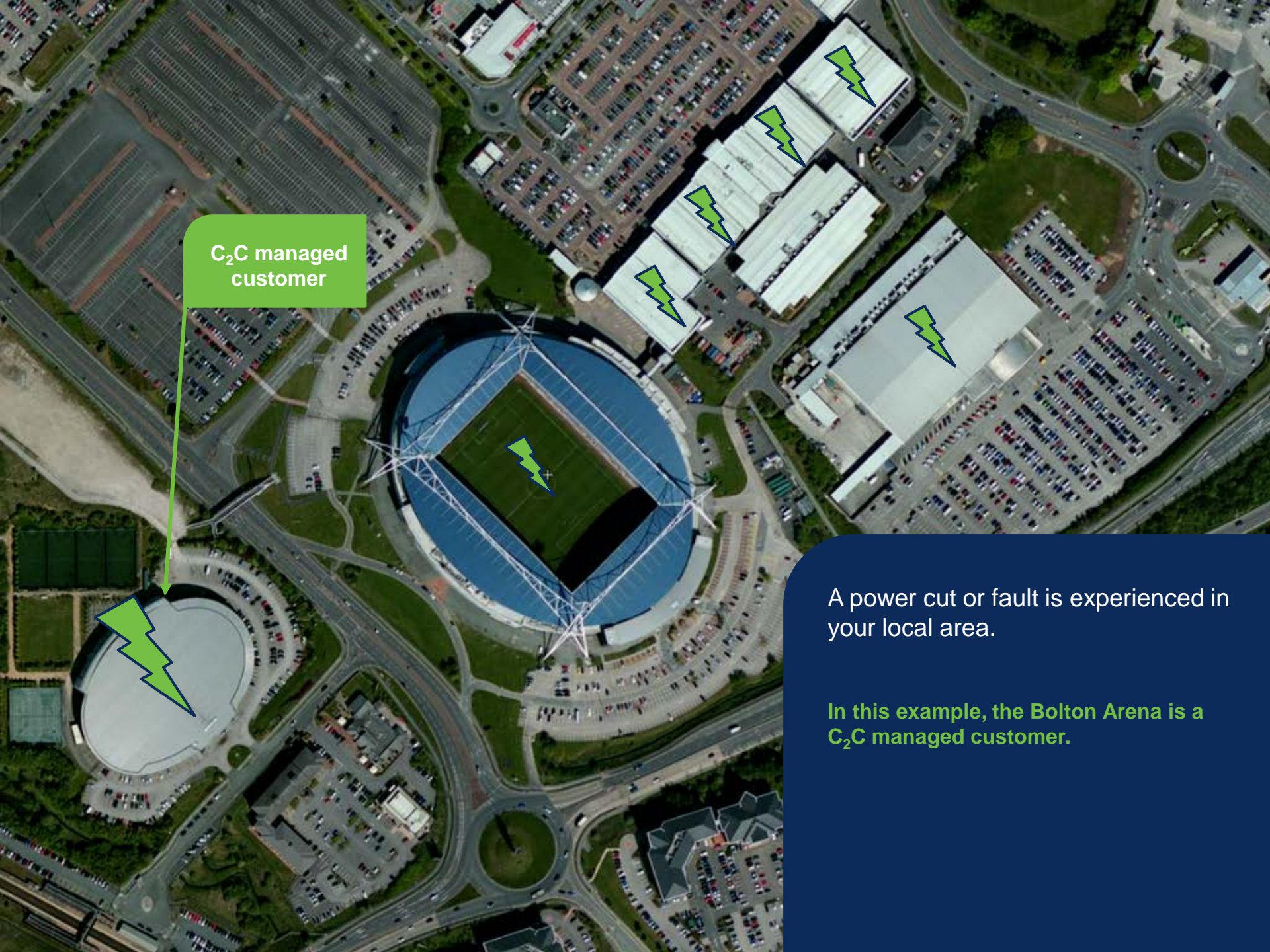




As a C₂C customer your power supply will be as reliable as usual.

Power cuts or faults are infrequent, and you may typically only experience one every three years.

So, what will happen if you experience a power cut or failure if you're a C₂C customer?



C₂C managed customer

A power cut or fault is experienced in your local area.

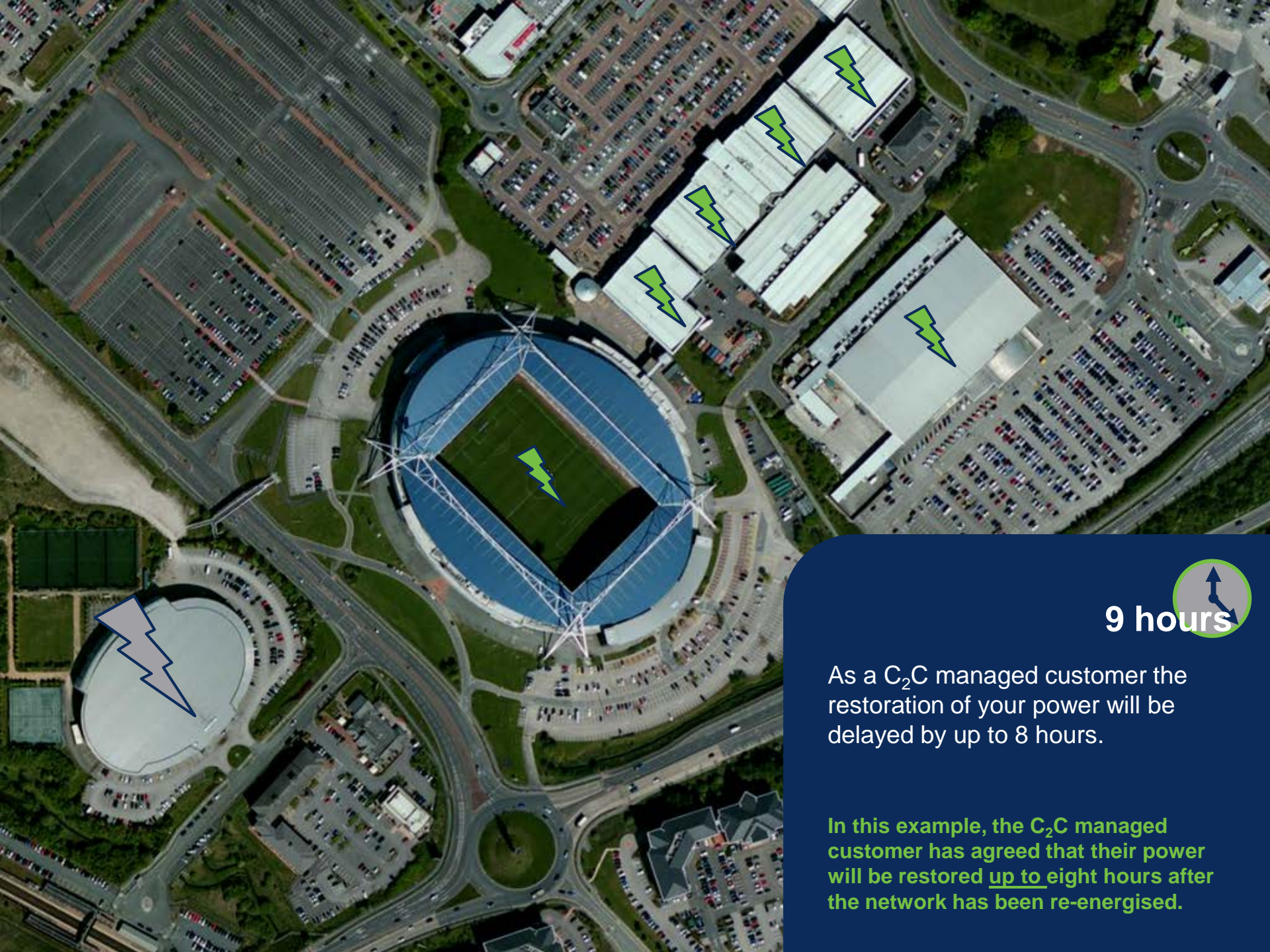
In this example, the Bolton Arena is a C₂C managed customer.



1 hour

As a C₂C managed customer, your supply restoration will be delayed longer than your neighbours.

Normally, following a HV fault, the supply is generally restored within one hour.



9 hours

As a C₂C managed customer the restoration of your power will be delayed by up to 8 hours.

In this example, the C₂C managed customer has agreed that their power will be restored up to eight hours after the network has been re-energised.

What this all means for you

- └ As a customer your supply will be as **reliable as usual**
- └ These changes will allow us to restore supplies to other customers **more quickly than we can today**
- └ The delayed restoration **will only occur if your part of the network is overloaded at the time**

What's in it for the customer?

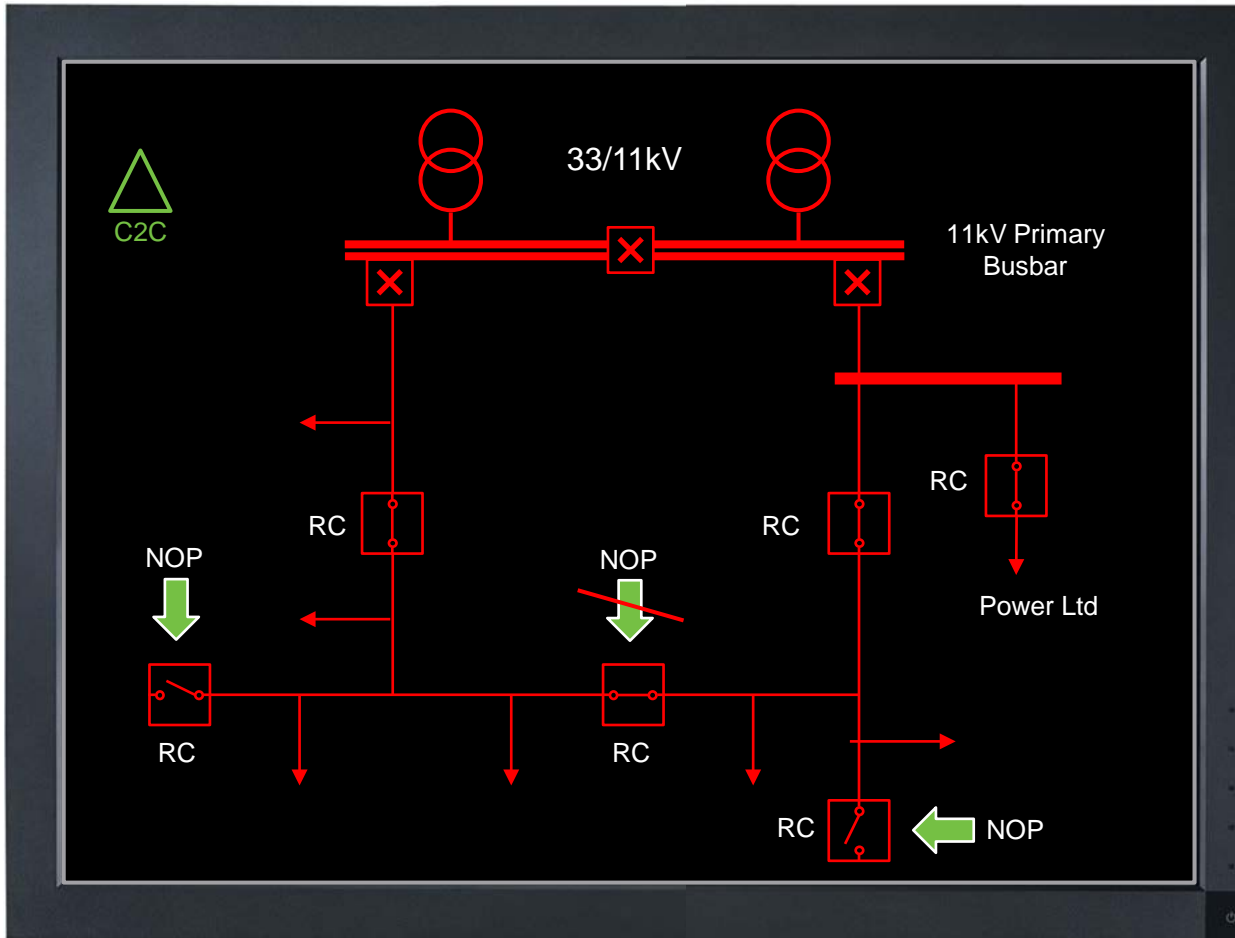
- ☒ In addition to benefiting from more stable bill prices, by accepting an agreed delay in restoring your supply to full power, the customer will be **financially rewarded**.
- ☒ It is the contract format and examples of financial reward which we wish to engage with customers to understand their preferences to making the C₂C concept as attractive as possible.

New connection customer contract (demand or DG)

- ┌ The contract is **permanent** with the following termination clauses for both parties:
 - The customer can terminate (cost capped in real terms cost of reinforcement)
 - The DNO can terminate the agreement post trial (cost of reinforcement borne by the company)

- ┌ Reinforcement savings passed to the customer

Our C₂C network management system



Architecture

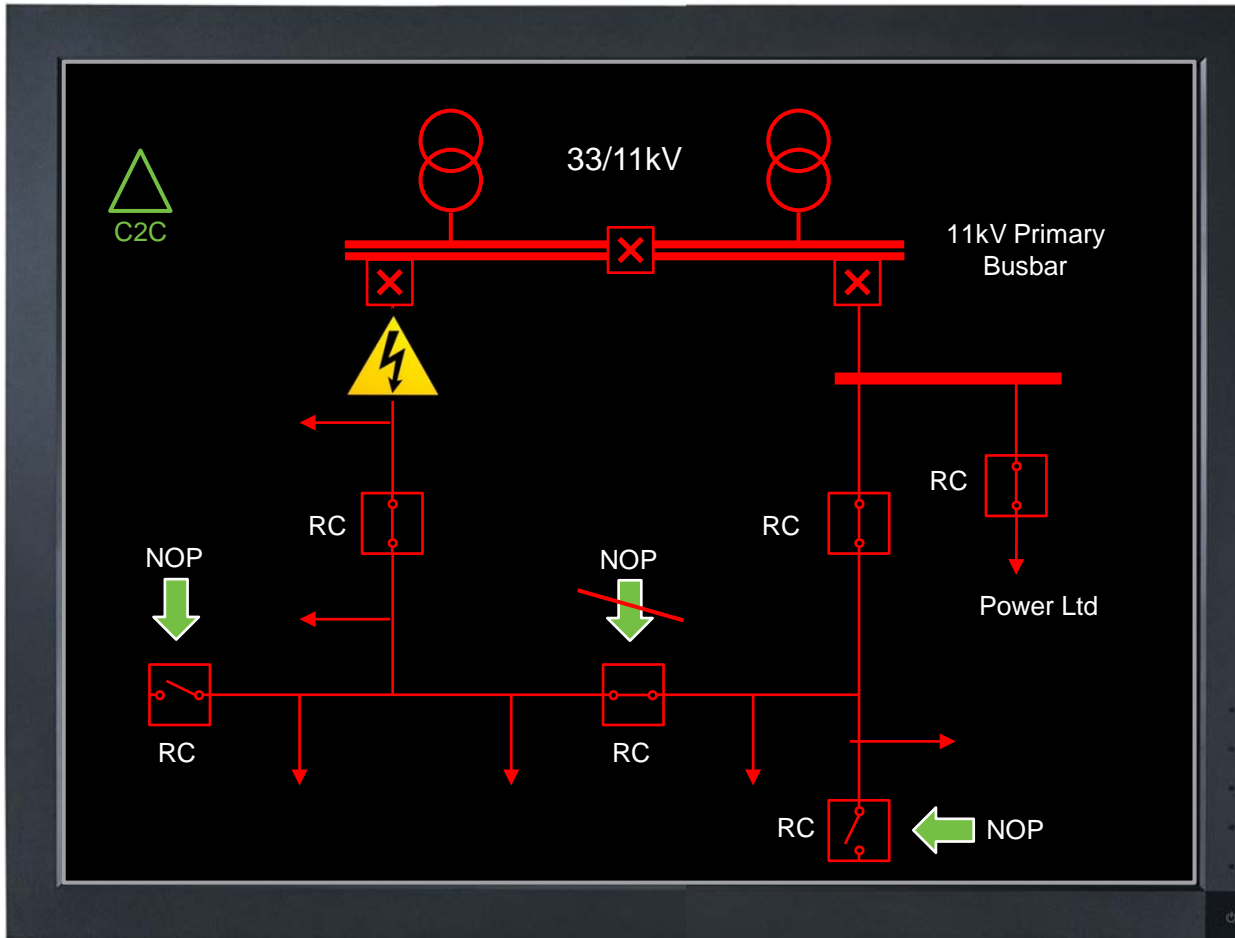


Power Limited

C ₂ C events per year	NA
Maximum duration per event	8 hours
Protected date	NA
Protected day and time	NA
C ₂ C event start time	15 minutes
Current events per year	0

Architecture

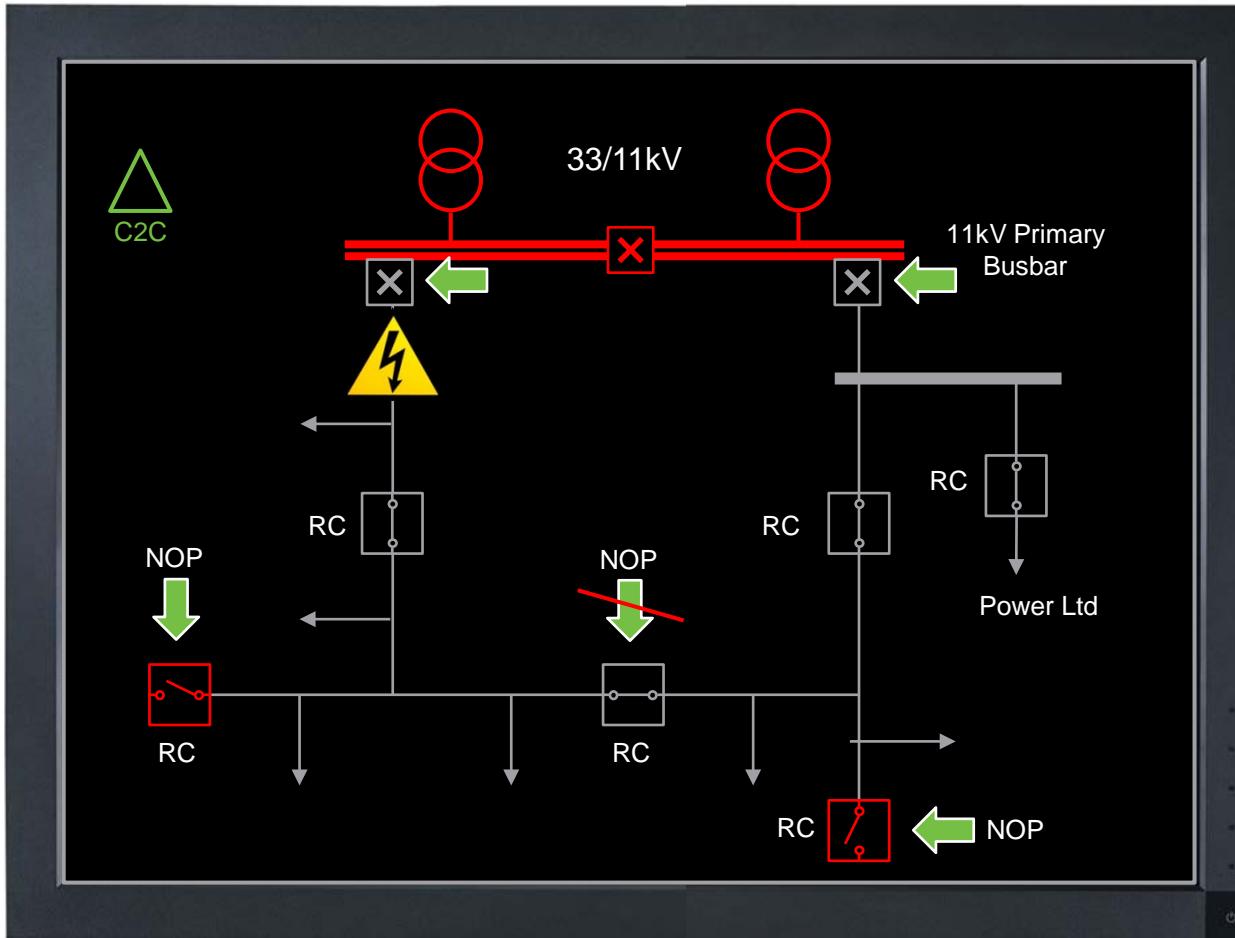




Architecture



Fault time

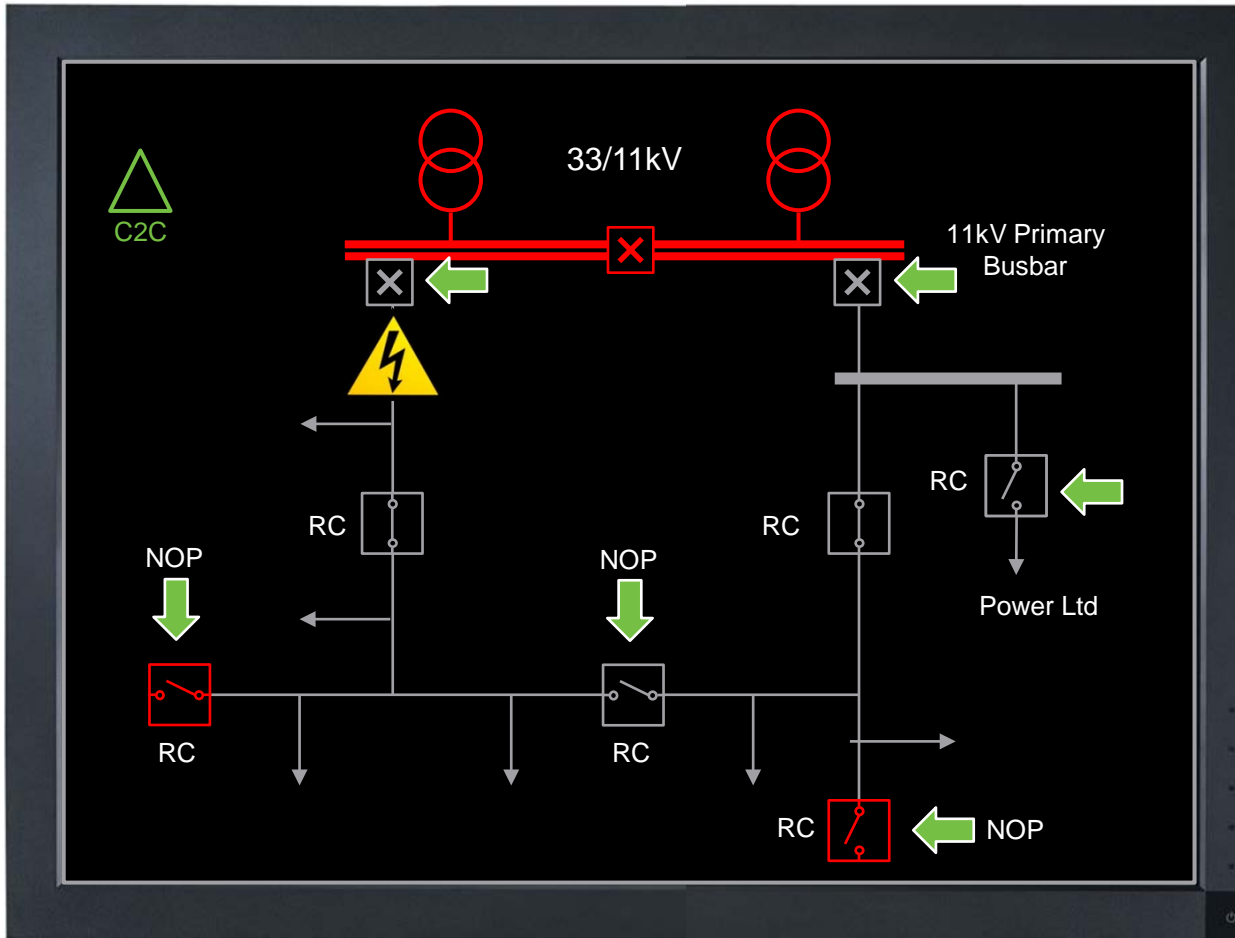


Architecture



Fault time

≤ 1 minute

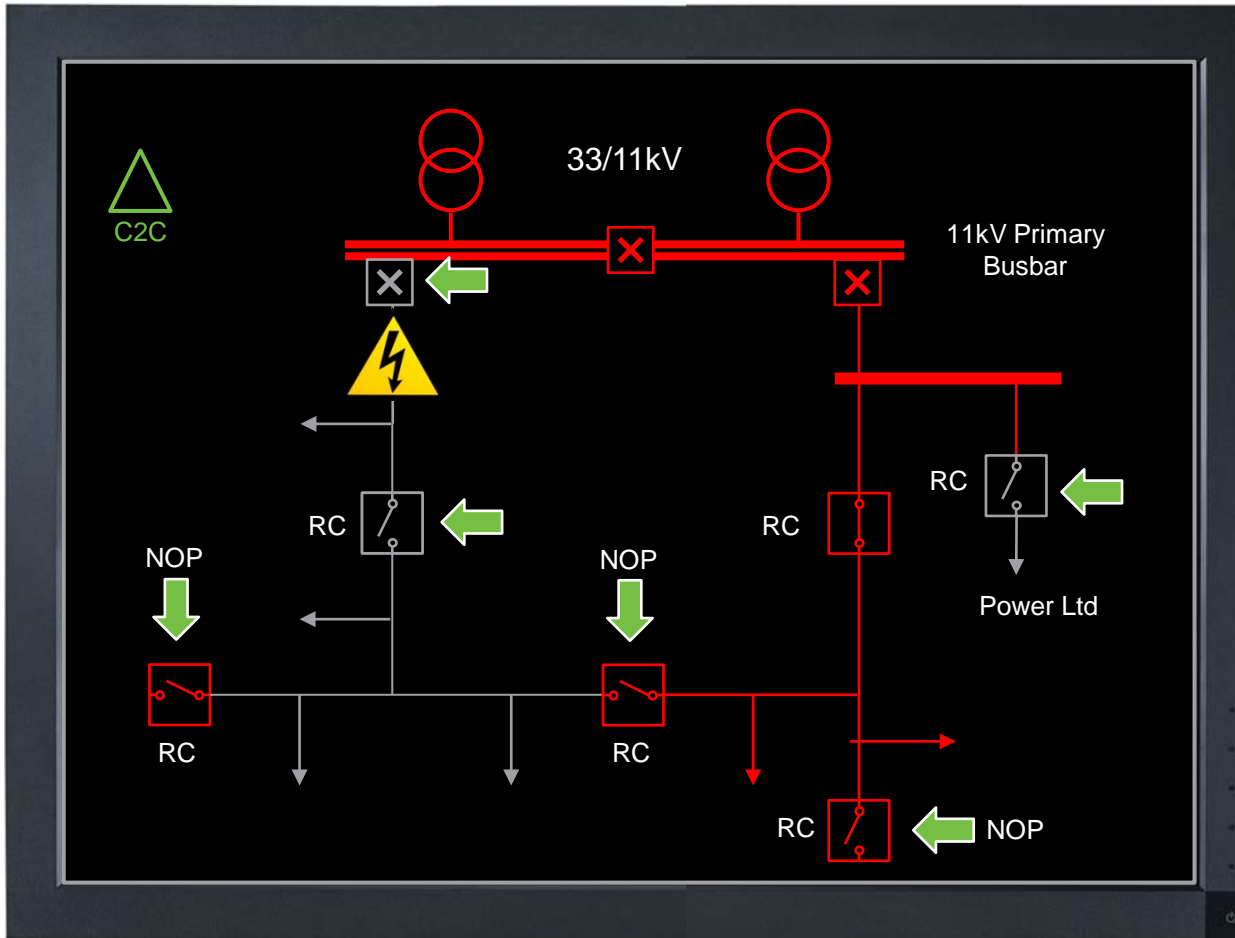


Architecture



Fault time

≤ 1 minute



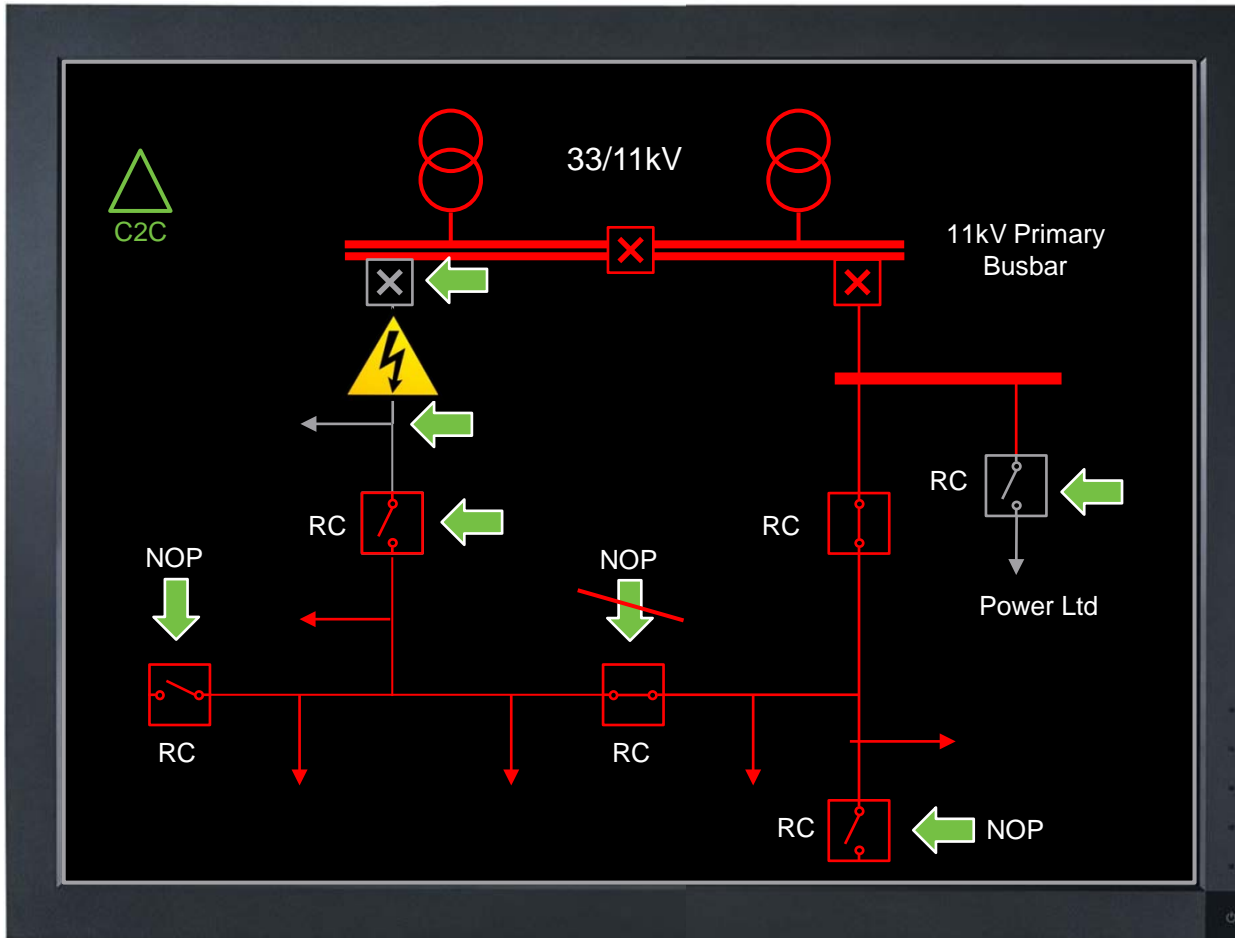
Architecture



Fault time

1 minute

Our C₂C network management system

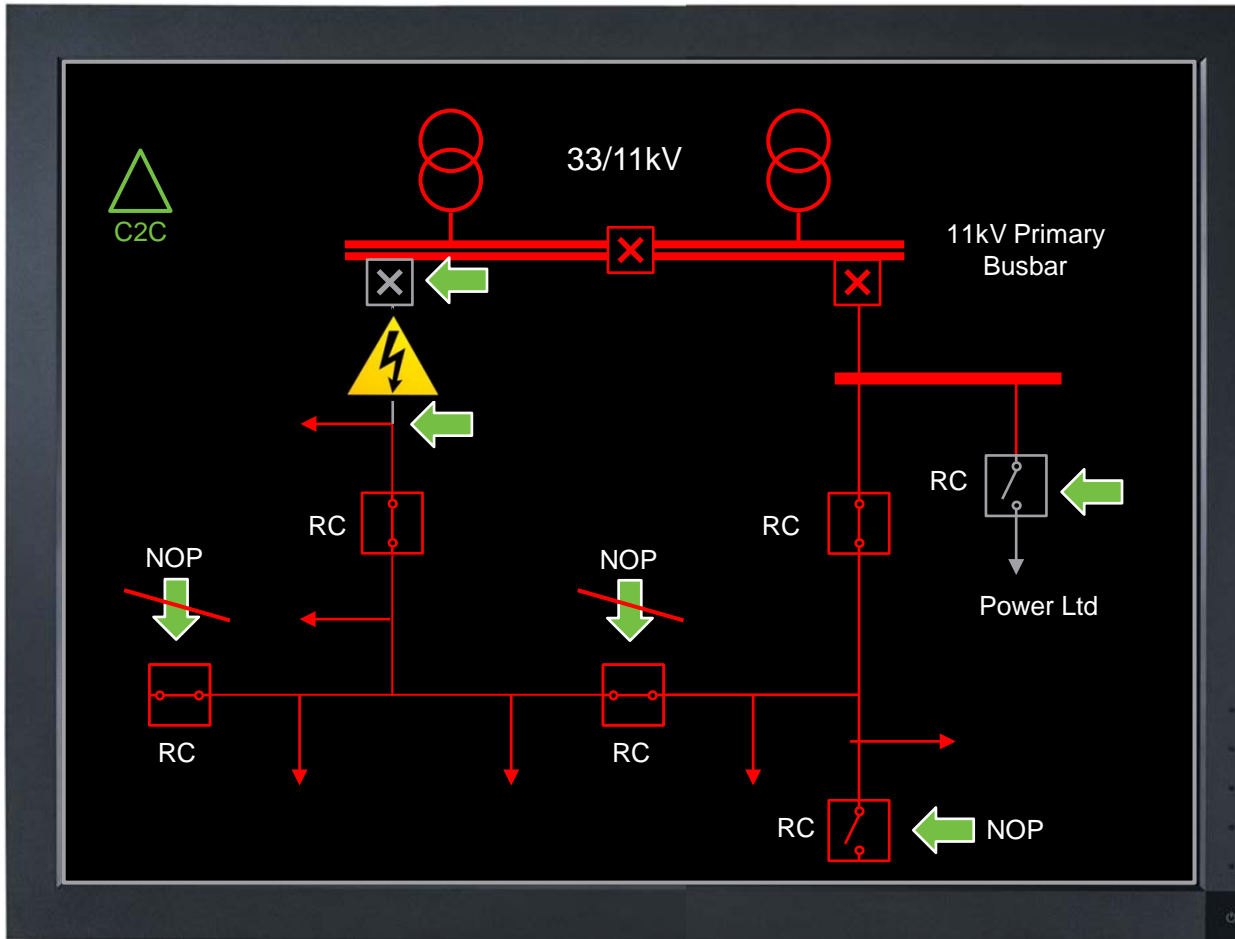


Architecture



Fault time

43 minutes

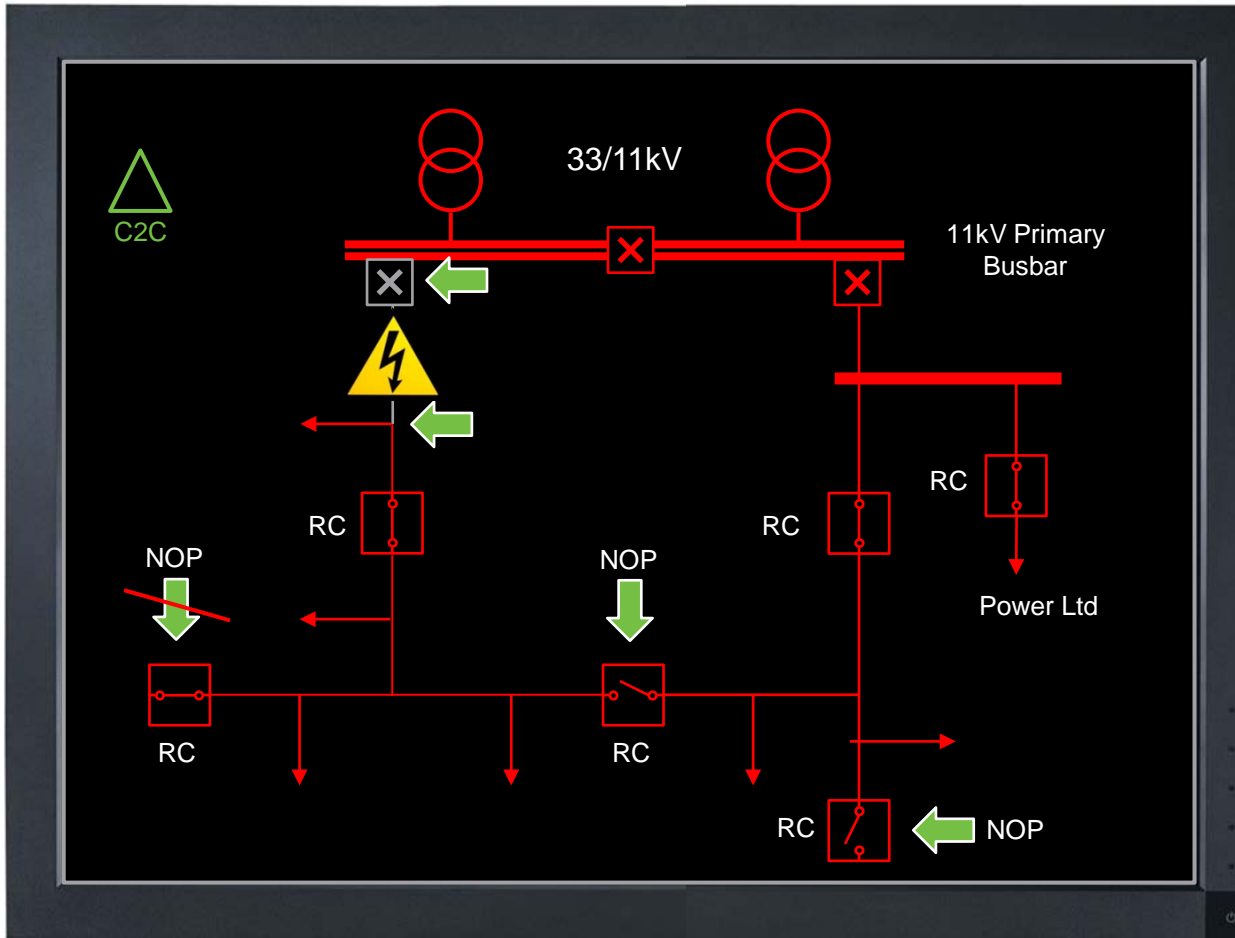


Architecture



Fault time

48 minutes



Architecture



Fault time

50 minutes

Power Limited

C ₂ C events per year	NA
Maximum duration per event	8 hours
Protected date	NA
Protected day and time	NA
C ₂ C event start time	15 minutes
Current events per year	1

Architecture



Fault time

50 minutes

- Managed connection agreement with **savings passed to the customer**
- The delayed restoration **will only occur if your part of the network is overloaded at the time**
- Contract must be signed by **30 September 2014** to participate
- Older projects may be considered

- Case Study 1 Demand
- Case Study 2 Generation

 For further information please contact:

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