Customer voltages are too high

Voltage

253V

216V

Time

£

V

kWh

£
## Reduce customer bills

<table>
<thead>
<tr>
<th>Scale</th>
<th>Annual Consumption</th>
<th>1%</th>
<th>2%</th>
<th>3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Domestic</td>
<td>3,000kWh</td>
<td>£9</td>
<td>£18</td>
<td>£27</td>
</tr>
<tr>
<td>BEET Trial Area (15,000 customers)</td>
<td>45,000MWh</td>
<td>£135k</td>
<td>£270k</td>
<td>£405k</td>
</tr>
<tr>
<td>Northern Powergrid (3.9m customers)</td>
<td>11,700GWh</td>
<td>£35m</td>
<td>£70m</td>
<td>£105m</td>
</tr>
<tr>
<td>Great Britain (28.5m customers)</td>
<td>85,500GWh</td>
<td>£257m</td>
<td>£513m</td>
<td>£770m</td>
</tr>
</tbody>
</table>

### Estimate of Annual Customer Saving
(for given percentage voltage reduction)

**Assumptions:**
- 1% voltage reduction causes 1% reduction in energy consumption
- Unit price for domestic energy: £0.30 per kWh
Smart meter voltage measurements

11kV Target Voltage

Audby Lane Primary

Leeds Road Primary

Warren Lane Primary

Smart Meter Gateway

Fundamentals

BEET-Box

Network Management System
Indications and Controls on Network Management System

BEET-Box

Target Voltage

Error or Warning

PowerOn NMS

Indications

Target Voltage
Voltage
MW
MVAr

Error or Warning

Control

Enable / Disable BEET Algorithm
Guard Rail - Upper Limit
Guard Rail - Lower Limit

Substation AVC

Target Voltage
Voltage
MW
MVAr
Baseline Programme

October 2021  
- Preparing for the trial.

January 2022  
- BEET algorithm developed and infrastructure built

April 2022  
- BEET-Box ready for testing.

July 2022  
- All system components tested

August 2022  
- Voltage control goes live.

August 2023  
- Further testing & refinement.

November 2023  
- Trial ends.

2023+  
- If the trial is successful ... regional rollout

We are here!
Challenge 1 – Infrastructure
Challenge 2 – Number of Business Functions

OT
Field Operations
Asset Management

NPg Departments
Smart Grid IU
Innovation
IT Security

Telecoms
Smart Metering
IT

Principal Suppliers

Fundamentals
SIEMENS Siemens Advanta
GE
Challenge 3 – Smart Metering

500 smart meters polled for voltage reading every 30 mins for 7 days.
Questions & Answers

For further information please contact me:

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