

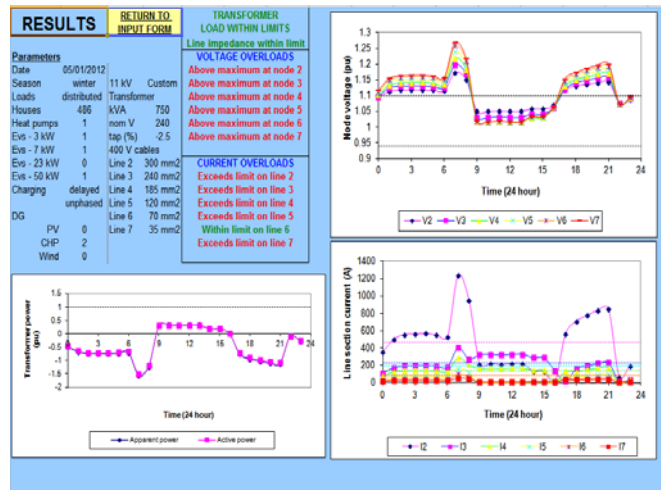
A Modelling Tool to Evaluate the Likely Impact of Electric Vehicles on the Electrical Supply Infrastructure

The User Input Screen displays a network diagram at the top with a source (Z_{source}) and lines (Z_{line}) connecting to nodes 1 through 7. Below the diagram are several input sections:

- Electrical Loads:** A table for nodes 1-7 with columns for No. of houses, No. of heat pumps, No. of domestic EVs (-3 kW), No. of domestic EVs (-7 kW), No. of public EV points (-23 kW), Non-domestic load - type, Non-domestic load - number, and Public EV point - 50 kW.
- EV charging mode:** Fields for Start charging (3 kW), Start charging (7 kW), and Phased (no/yes).
- On-Site Generation:** Fields for PV (0 kW), CHP (2 kW), and Wind (0 kW).
- Distribution Network:** Fields for Transformer kVA (750), Nominal voltage (V) (240), and Transformer tap (-2.5%).
- Detailed feeder:** A table with columns for Line, Type, and Length (km).

Buttons for 'SHOW RESULTS' and 'DATA TABLES' are located at the bottom.

USER INPUT SCREEN



RESULTS SCREEN

The model based tool allows the user to evaluate the impact of the deployment of Electric Vehicles (EV) charging posts on the Low Voltage (LV) power distribution network. The tool is intended to be easy to use by policy makers, network operators and other stake holders to predict and prepare for the increased use of electric cars and how it will affect the power network. It will enable them to assess the impacts of EV charging in the presence of other low carbon technologies, e.g. heat pumps and micro-generation. The model has been verified using real data.

The user enters the relevant system data such as number of houses, shops, schools, factories etc., the number and type of EV chargers to be installed, and the model then establishes the effects of the chosen installation and highlights areas of weakness in the power distribution system to allow remedial measures to be put in place prior to the installation of the chargers.

The development of the new grid capacity calculator was the result of a collaboration involving Northumbria University and Charge Your Car North, a UK government programme which funds innovative transport solutions.

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