

## Heat Map Explanation Note

These heat maps are designed to give an **indication** of the relative energy demand for private cars<sup>1</sup> alongside loading on the electricity distribution network in SP Energy Networks' Manweb licence area.

They have been produced using early data from 'Charge'<sup>2</sup>, an Ofgem Network Innovation Competition funded project currently underway with SP Energy Networks. Transport demand has been derived from a model developed by PTV Group, using their Visum software.

At this stage, only primary substations are shown. A *primary* substation typically provides the electricity feed to several thousand consumers; this is where a connection would need to be made for significant new chargepoint installations, such as larger rapid charging hubs. Smaller chargepoint installations, such as destination chargers or single rapid chargers can often be supplied from smaller *secondary* substations on the nearby electricity network. Such installations are outside the scope of this capacity map but will be available in the ConnectMore tool which will be developed through the 'Charge' project.

The map for the Manweb licence area (covering Merseyside, Cheshire, North Shropshire and North Wales) consists of both transport and electricity network information.

- **Transport Data:** the licence area has been split into Census Lower Layer Super Output Area (LSOA<sup>3</sup>). The data used relates to private car trips only, on a typical weekday in the base year. The 'Total Daily trip kms' has been calculated for each LSOA – i.e. the cumulative distance travelled by all trips ending in each LSOA. A higher number is indicative of higher energy demand for private cars. The figure has been divided by the area of the LSOA to give a per km<sup>2</sup> value, to normalise the data. The maps show areas with a higher total daily trip kms in a darker shade of purple.
- **Electricity Network:** The ConnectMore tool being developed as part of the 'Charge' project will contain detailed information showing the location of electricity network assets (substations and cables/overhead lines) to which charging infrastructure could connect, and the ability to connect additional loads. This data is not available for these early heat maps. The map shows the location of primary substations groups (consisting of 33kV/11kV transformers). The primary substations are shown on the map as circles with a 1km diameter to give an approximate indication of the area that the substation could easily serve in providing EV charging infrastructure. These circles have been colour coded according to current loading compared to firm capacity<sup>4</sup> using a green, amber, red coding.

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<sup>1</sup> This is based on modelled data representing all private car trips and does not include an assumption about the proportion of these vehicles which are electric. It is therefore not reflective of current energy demand for charging infrastructure. Future modelling in the 'Charge' project will develop this approach and the results will be available in the 'ConnectMore' tool.

<sup>2</sup> <https://www.spenergynetworks.co.uk/pages/charge.aspx>

<sup>3</sup> LSOA are generated to be consistent in population size as far as possible. The minimum population in each zone is 1000, the mean is 1500. The area covered by each LSOA varies due to differences in population density.

<sup>4</sup> Firm capacity refers to the capacity available in the group during a fault situation, where one transformer is assumed to be unavailable. This means that a small number of groups have a value of over 100% - this level of loading would only occur during rare 'fault' circumstances.

This data has been published as a series of pdfs showing the full Manweb licence area followed by separate maps for each of the eight smaller areas (e.g. Chester and Wirral, Liverpool and Warrington).

The Charge project is focussing on the Manweb licence area. For this reason, transport demand data is not available for SP Energy Networks southern Scotland licence area. A map has therefore been produced showing the location and loading of primary substations in southern Scotland. An overview map is provided showing the whole licence area, followed by separate maps for each of six smaller areas. These maps also show the location of the road network (motorways and primary roads).

The data shown on these heat maps is intended to be used as an indicative guide only. A connection application would be necessary to determine to the actual ability to connect additional loads at a given location, and the cost to connect. The transport data shows the assumed indicative total energy demand from private cars and does not include an assumption about what proportion of these vehicles will be electric. It is intended to be used to show the relative demand between areas in the Manweb area, and not the absolute total, hence why no numerical values are given, and regions are shown on a 'Very Low' to 'Very High' scale.