

# Chariot

## High-tech sensors and web apps for more engaging energy advice

Chariot is a web-based service for collecting, interpreting and displaying information about a home's temperature, humidity levels and energy consumption. It shows whether a home is providing a comfortable and healthy environment for the people who live in it.

Chariot can improve the quality of energy advice for all householders but is particularly suited those at whose health is at risk from a cold or damp home

Chariot uses small, high-tech wireless sensors to measure and record energy use, temperature and humidity in key areas like the kitchen and sitting room.

This data is sent - via the home's internet connection or the mobile phone network - to a cloud hosting service where it is stored anonymously and securely and can be used to analyse the household's heating patterns and the impact this has on the warmth and humidity levels in the home.

This in-depth diagnosis of the home's energy performance can help identify anomalies and opportunities for wiser energy use.

What makes Chariot particularly special is that the data is also presented in an engaging way, using interactive graphs and visualisations that make sense to the householder and mean the advice given is more likely to be acted on.

An energy advisor and householder look at the home's data on a tablet →



## The Chariot kit and data trail



Chariot sensors inside and outside the home collect temperature, humidity and (in some cases) CO<sub>2</sub> data and send to the hub (3)

Consumption-monitoring devices are attached to the home's electricity and gas meters and send data to the hub (3)

The Chariot hub receives data from the sensors and meters and sends it to the household's internet router (4)

The internet router sends information to the cloud (5) via the home's broadband cable. This can also be done with a wireless dongle that connects to the mobile phone network.

An energy advisor can view, analyse and display the data on a tablet or PC using the interactive Chariot web interface.

The Chariot interface is web based and viewable on tablet or computer screen. It offers the user a range of functions and presentation options with which to visualise and analyse the data.

The image below is an annotated screen-shot of the Chariot interface and shows the temperature and humidity levels in the upstairs bedroom and the gas usage of the house over a 7-day period.



The buttons on the top bar allow you to set the view. In this example, the user has selected a week-to-view (1) starting on 14 January (2), with the notes option switched on (3). You can add notes to the screen by clicking here (4), or export the data to a spreadsheet here (5).

This column (6) shows the available data streams. Data from each sensor can be turned on and off, and in this view the user has selected just the upstairs bedroom's humidity (7) and temperature (8) sensors, along with and the home's gas consumption (9).

The figures from the three data streams selected are plotted against vertical axes on the main graph. Humidity in parts per million (10), temperature in °C (11) and gas and electricity use in kWh (not showing on this view).

The horizontal axis (12) is the time period, which is showing 7 days in 12 hour increments.

The shaded portions of the graph (13) are time periods with notes attached.

The right-hand 'stats' column (14) shows minimums, maximums and averages for humidity, temperature and gas use, plus the cost of the total gas consumed.

We anticipate that Chariot will be of interest to energy agencies, energy suppliers, public health professionals and social housing providers - anyone, in fact, who needs to evaluate the energy performance of a home and deliver intensive and engaging energy advice to clients.



The Chariot platform continues to evolve with new analytics and functionality under development. For further details please contact either Dr Joel Fischer at the University of Nottingham ([joel.fischer@nottingham.ac.uk](mailto:joel.fischer@nottingham.ac.uk) or 07545 024497) or Dr Nick Banks at the Centre for Sustainable Energy ([nick.banks@cse.org.uk](mailto:nick.banks@cse.org.uk) or 0117 934 1418).

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