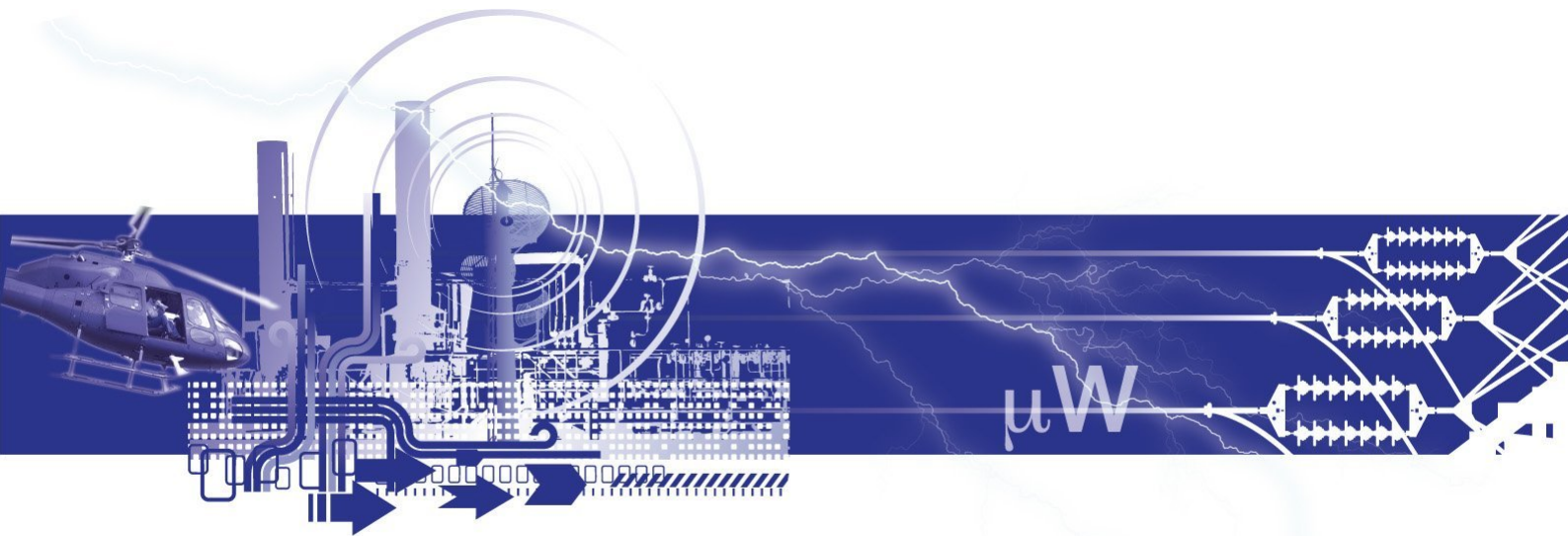




CONFIDENTIAL REPORT

Prepared for:
VPhase



EA Technology Energy and Carbon Saving Calculations for the VPhase VX1

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Client
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EA Technology Energy and Carbon Saving Calculations for the VPhase VX1

This report contains EA Technology's calculation of the energy savings realised through the installation of a VPhase plc 'VX1' domestic voltage optimisation unit at the listed properties. The unit reduces and regulates the voltage supplied to circuits used for lighting and appliances within homes.

Process of evaluation

To calculate the energy savings requires that the energy consumption of each property is repeatedly measured under two conditions: with and without the VX1 actively optimising the voltage at the property. A comparison is then made between the energy consumed at the property when the VX1 is active, and when the VX1 is idle.

A time-switch has been used to activate the VX1 internal bypass relay, which cyclically switches the unit in and out of the supply. The utility supply and VX1 output voltage have been measured and used to verify that this cyclical condition is occurring.

Allowances have been made for both the energy consumption of the unit itself and energy effects related to the switching in- and out-of-circuit of the VX1 unit.

Installation and configuration of the VX1 units, property selection and acquisition of data were all performed by VPhase plc. The data from these recorders was then passed to EA Technology for energy saving verification. The data is classed as personal and as such EA Technology will not maintain its own copy of the analysis. The data sets will be maintained in perpetuity by VPhase plc.

Where cost savings have been presented, these have been determined by estimating the yearly energy consumption per property on a pro-rata basis. Energy costs have been calculated by taking an average of the four cheapest standard tariffs in the postcode area of each property, supplied by Uswitch¹.

Carbon savings have been presented by using the Building Research Establishment's 'Standard Assessment Procedure' carbon emissions factors² for electricity consumed. These take into account the impact of carbon and other greenhouse gas emissions arising from energy use.

Where percentage carbon savings have been presented, they have been expressed in terms of the percentage reduction against the estimated emissions due to electricity and gas consumption in each property. Gas consumption has been estimated in the same proportion to the regional average gas consumption as each property's electricity consumption (to the regional average) and using Standard Assessment Procedure emissions factors as before.

¹ www.uswitch.com, accessed 12/02/2010

² SAP 2009, Revised Emissions Factors for the National Calculation Methodologies, 31/03/2009.

Equipment used

Voltage and average power measurements have been made using DENT Elite Pro data recorders. The purchase, installation and calibration of this equipment as necessary, was handled by VPhase plc.

Calculation accuracy

The energy saving calculations are subject to a degree of uncertainty, due to the effects of customers switching loads on and off, which fall either across or within adjacent measuring periods. The combination of many thousands of measuring periods in the energy saving calculation reduces this uncertainty. The uncertainty has been calculated to a confidence level of 95%, and listed for each property, i.e. for a 7% saving at an uncertainty of 0.5%, there is a 95% certainty that the true savings lies between 6.5% and 7.5%.

Effects on energy savings

The energy saving itself is known to vary in accordance with the number and type of connected loads; the incoming supply voltage and VX1 target voltage. These vary by time of day, property occupation and numerous other factors. The period of evaluation, average supply voltage, estimated yearly consumption and VX1 target voltage are therefore listed for each property. Electrical energy consumption at these properties was close to the Manchester 2008 average of 3900 kWh/year³.

Verification process

The energy savings calculations have been checked internally at EA Technology by a series of check calculations performed on the data received. These check calculations are verified as correct by two staff members. Externally to EA Technology, the parent company of VPhase plc, Energetix Group have performed their own energy savings calculations. The two sets of calculations have been compared for a selection of properties and are in good agreement.

Energy saving results

Site	Daily Consumption (kWh)	Saving (%)	Calculation Uncertainty (±%)	Average Supply (V)	Target Voltage (V)	Trial days	Trial Period	Electricity Price (p/kWh)	Estimated yearly consumption (kWh)	Estimated yearly bill (£)	Estimated yearly saving (£)	Estimated yearly carbon saving (kg CO2)	Estimated CO2 reduction (%)
A	10.8	8.5%	0.6%	242	220	41	16th February to 29th March	12.5	3952	£ 494	£ 42	199	3.5%
B	9.8	8.9%	0.6%	242	220	31	16th February to 29th March	12.5	3579	£ 447	£ 40	189	3.7%
C	8.5	8.7%	0.3%	244	220	49	9th April to 28th May	12.5	3115	£ 389	£ 34	160	3.6%
<i>Average</i>		<i>8.7%</i>									<i>£ 39</i>	<i>183</i>	<i>3.6%</i>

³ DECC, Regional and local authority electricity consumption statistics 2005:2008, available at www.decc.gov.uk, accessed 4th May 2010.

Appendix 1

Suggested analysis statement

VPhase plc supplied recorded data from several properties that had been fitted with a VPhase VX1. EA Technology has analysed the electricity consumption data for these properties, for the period between 16th February and 29th May 2010. The electrical energy savings over this period ranged, for these properties, from 8.5% to 9.0% (Average 8.7%) . Estimated whole house carbon savings ranged from 3.5% to 3.7% (Average 3.6%).