

## PRESS RELEASE

### The Green Value of the Ceres Power Micro-CHP Hydrogen Fuel Cell Home Boiler

*Those who are concerned about climate change find the CHP Hydrogen Fuel Cell Boiler concept particularly appealing and many say they are very likely to install one (amongst owner-occupiers on mains gas supply)*

Montreal, Dec 17<sup>th</sup> 2008

#### Key Findings

In late-September/early-October 2008<sup>1</sup>, Haddock Research conducted a product profile test on a hydrogen Fuel Cell home boiler, based on the Ceres 1kW Fuel Cell Module, amongst nationally representative samples of over 1,000 people per country in Canada, England and the USA. A key insight from this research is that, in each country, there is strong consumer interest in the hydrogen Fuel Cell home boiler (although the proportion of households on mains gas is higher in England than in either Canada or the USA). In England, around a sixth of owner-occupiers, with homes connected to mains gas, can be described as "Enthusiasts" - that is that they find the boiler as "very appealing" and that they are "very likely" to install one when their current boiler needs replacing.

The research also shows that the boiler has particular appeal amongst those concerned about climate change - the group we have termed *Climate Citizens*. A quarter of *Climate Citizens* are "Enthusiasts" of the Fuel Cell boiler (and *Climate Citizens* represent around a third of English owner-occupiers on mains gas). This is a much higher level of interest than amongst those who are *Sceptical or Uninvolved* with climate change. This insight is particularly useful since a recent UK-based study indicated that more standard demographics, such as income groups or regional variation, do not show differences in attitudes towards micro-generation adoption<sup>2</sup>.

In summary, this research suggests that the green credentials of the CHP Fuel Cell boiler has the potential to provide a compelling "low-carbon" marketing story amongst those concerned with climate change. The Environmental Choices study also shows that *Climate Citizens* are worried about climate change, and the Ceres boiler has the opportunity to help address this unmet psychological need. Yet society is very divided about climate change. Those who are *Sceptics or Uninvolved* with climate change tend to feel annoyed, bored or even angry when asked to think about climate change - and they would likely reject a "low-carbon" positioning for the boiler.

The survey also showed that a top concern amongst "Enthusiasts" was finding the money to undertake major house improvements. This indicates that whilst the green credentials of the CHP Fuel Cell boilers could stimulate desire for the products, Ceres Power and Ceramic Fuel Cells (along with their commercial partners) will also need to consider carefully how to make a compelling price proposition to promote their CHP boilers. In England, this would likely mean aligning their activities with emerging government strategies to support micro-generation<sup>3</sup>.

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<sup>1</sup> Conducted as part of the Environmental Choices study, see [http://www.haddock-research.com/public\\_opinion\\_monitor](http://www.haddock-research.com/public_opinion_monitor)

<sup>2</sup> Page 10, point 4. May 2008, "The growth potential for microgeneration in England, Wales and Scotland, URN 08/912, <http://www.berr.gov.uk/whatwedo/energy/sources/sustainable/microgeneration/research/page38208.html>

<sup>3</sup> June 2008, "UK Renewable Energy Strategy: Consultation Document", [http://renewableconsultation.berr.gov.uk/consultation/consultation\\_summary](http://renewableconsultation.berr.gov.uk/consultation/consultation_summary)

## About Ceres Power, Ceramic Fuel Cells and Fuel Cell Boilers

Micro-CHP is an emerging technology which provides electricity from home boilers. Micro-CHPs can be categorized as, either those based on hydrogen Fuel Cells, or those which are not (such as the Stirling Engine). Ceres Power and Ceramic Fuel Cells are well progressed in the development their CHP hydrogen Fuel Cells home boilers, as is described in recent company announcements<sup>45</sup>. Both these company's business models are based on developing internationally, by partnering with energy companies which already have direct channels to millions of customers.

The Ceres Power CHP Fuel Cell boiler is due to be commercially available from 2011. As might be expected, Ceres Power is very optimistic about the commercial potential of this boiler. This optimism is supported by recent forecasts for micro-CHP technology from the Energy Savings Trust<sup>67</sup> and the European Union<sup>8</sup>. These forecasts indicate that micro-CHP boilers are anticipated to make significant contributions to tackling climate change emissions targets and meeting energy needs, in UK and Europe, to 2020 and beyond. This is a remarkable degree in confidence for a technology which is not yet commercially available.

Yet there are more sceptical opinions about the commercial<sup>9</sup> and technical appeal<sup>10</sup> of the Ceres CHP boiler. Both Ceres Power and Ceramic Fuel Cells are listed on the London AIM market and valuations show investor confidence is currently low.

A certain amount of caution is understandable given the low current use of microgeneration in the UK<sup>11</sup>. Whilst forecasts show enormous growth of microgeneration in the UK, and of micro-CHP Fuel Cell boilers in particular once commercialization is achieved<sup>12</sup>, these forecasts explicitly recognize the need for better information about consumers' willingness to pay for these microgeneration systems<sup>13</sup>.

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<sup>4</sup> Ceramic Fuel Cells, 27.11.08, "2008 - AGM Results", <http://www.cfcl.com.au/>

<sup>5</sup> Ceres Power, "November 2008 - Ceres Power Holdings plc Annual Report 2008" - [www.cerespower.com](http://www.cerespower.com)

<sup>6</sup> Energy Savings Trust, "Potential for Microgeneration, Study and Analysis, Final Report", 14<sup>th</sup> November 2005, <http://www.berr.gov.uk/whatwedo/energy/sources/sustainable/microgeneration/research/page38208.html>

<sup>7</sup> "Generating the Future: An analysis of policy interventions to achieve widespread microgeneration Penetration, Energy Savings Trust, November 2007". (pdf)

<http://www.energysavingtrust.org.uk/uploads/documents/aboutest/MICRO.pdf>

<sup>8</sup> Page 52, "Second Strategic Energy Review - Securing our Energy Future, November 2008; Europe's current and future energy position Demand - resources - investments"; [http://ec.europa.eu/energy/strategies/2008/2008\\_11\\_ser2\\_en.htm](http://ec.europa.eu/energy/strategies/2008/2008_11_ser2_en.htm)

<sup>9</sup> David Toms at Numis Securities provides a sceptical view, Reuters, 14 January 2008, "Centrica to buy 10 percent stake in Ceres", <http://www.reuters.com/article/companyNews/idUKL1471144220080114>

<sup>10</sup> Chris Goodall, "Domestic Combined Heat and Power", 1 October 2007, <http://www.carboncommentary.com/2007/10/01/19>

<sup>11</sup> Current estimates are available in "Numbers of microgeneration units installed in England, Wales, Scotland, and Northern Ireland, Final Report, For BERR, 17/11/2008",

<http://www.berr.gov.uk/whatwedo/energy/sources/sustainable/microgeneration/research/page38208.html>

<sup>12</sup> Slide 11, Energy Savings Trust, "Potential for Microgeneration, Study and Analysis Final Report", 14<sup>th</sup> November 2005

<sup>13</sup> Slide 67, Energy Savings Trust, "Potential for Microgeneration, Study and Analysis Final Report", 14<sup>th</sup> November 2005

## **About Haddock Research & Branding, Inc.**

Haddock Research & Branding Inc. is a full-service market research agency focusing on climate change and the low-carbon economy. Making use of the latest advances in survey design, Haddock advises businesses on how best to develop profitable low-carbon opportunities; and provides governments with the vital information they need to mobilize people to take action on climate change. For further information, visit our website - [www.haddock-research.com](http://www.haddock-research.com)

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*On the next pages are charts showing data described in this press release. Free summaries of the survey are available from the Haddock website<sup>14</sup>.*

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<sup>14</sup> Visit the Free Reports section of [www.haddock-research.com](http://www.haddock-research.com); and registration is required to download the free reports. More detailed results are available in the paid reports.

## Appeal & Intention to install the *hydrogen fuel-cell home boiler*

Owner-occupiers with mains gas at home

Haddock

3.d Green energy

- free summary data

Please consider the following description of a hydrogen fuel-cell home boiler which is due to be available in 3 years time (in 2011):

### HYDROGEN FUEL-CELL HOME BOILER

Looking much like a typical home boiler, it is compact and designed to be mounted on a wall. It converts natural gas piped into the home into heat and electricity. It can provide all the hot water and central heating required in a typical home as well as much of the electricity. Since the electricity is created at the home, it is created at two or three times the efficiency of the electricity provided by power stations which have to travel through large distribution networks.

- This hydrogen fuel-cell boiler is designed to save more than 25% on the total energy bills compared to the best current gas boilers.
- It does not require any lifestyle changes – the connections and maintenance contracts will be the same as for existing gas boilers.
- Please assume that any excess electricity that you produce can be sold to your electricity provider.



9% - not at all appealing

12% - not at all likely to install

12% - not very appealing

17% - not very likely to install

52% - quite appealing

50% - quite likely to install

27% - very appealing

21% - very likely to install

Source: Q50 & Q51, The Environmental Choices syndicated study, 2008 'Overall, how appealing do you find the idea of this hydrogen fuel-cell boiler?' & 'Assuming that you considered the price "reasonable", how likely do you think you would be to install one of these boilers to replace your current boiler once it needed replacing?' (fieldwork: 25 Sep to 3 Oct 2008)

Base: English owner-occupiers with mains gas supply to their homes, n=650

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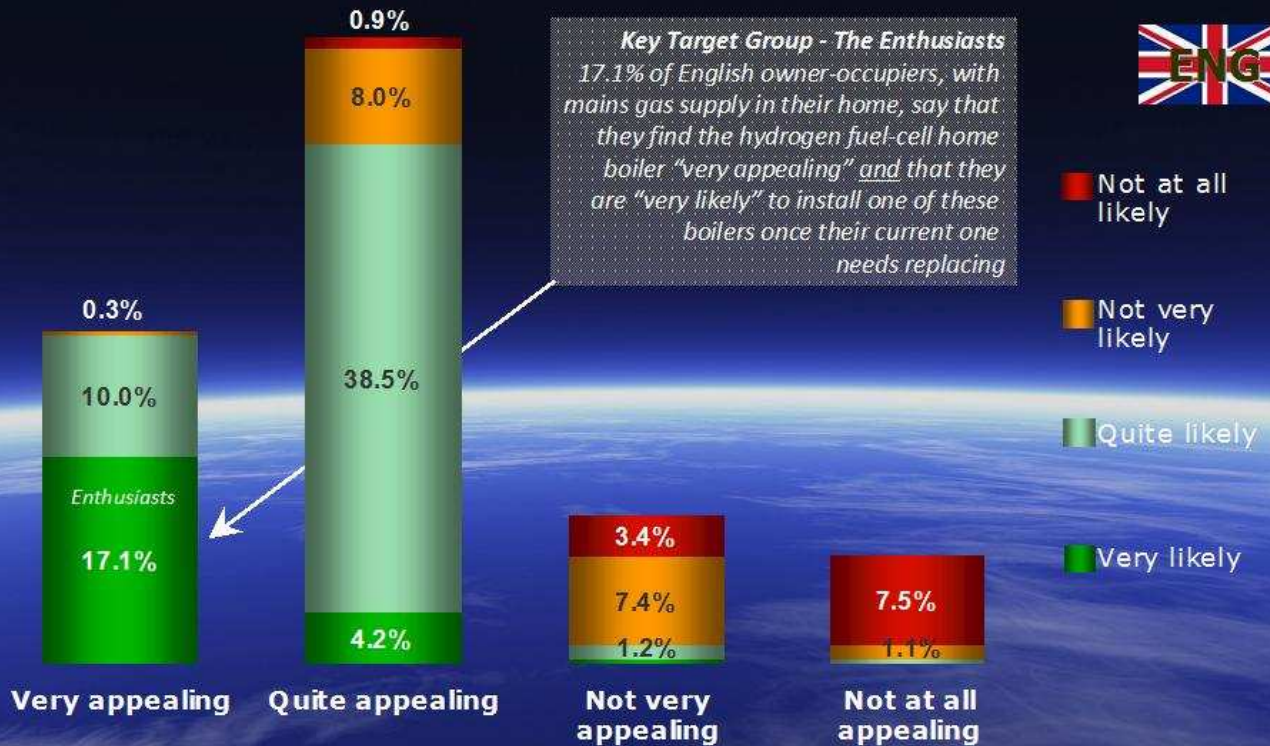
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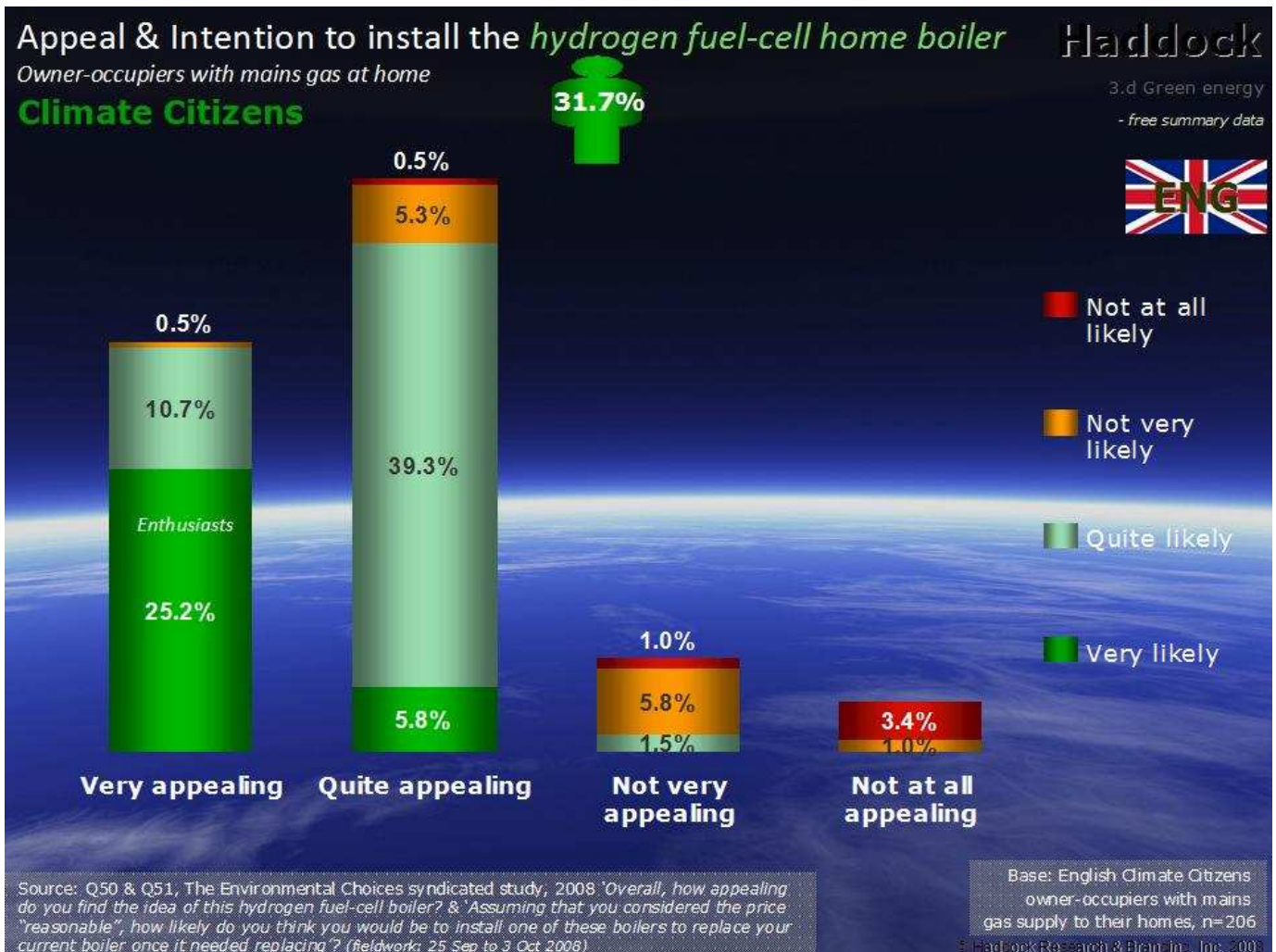
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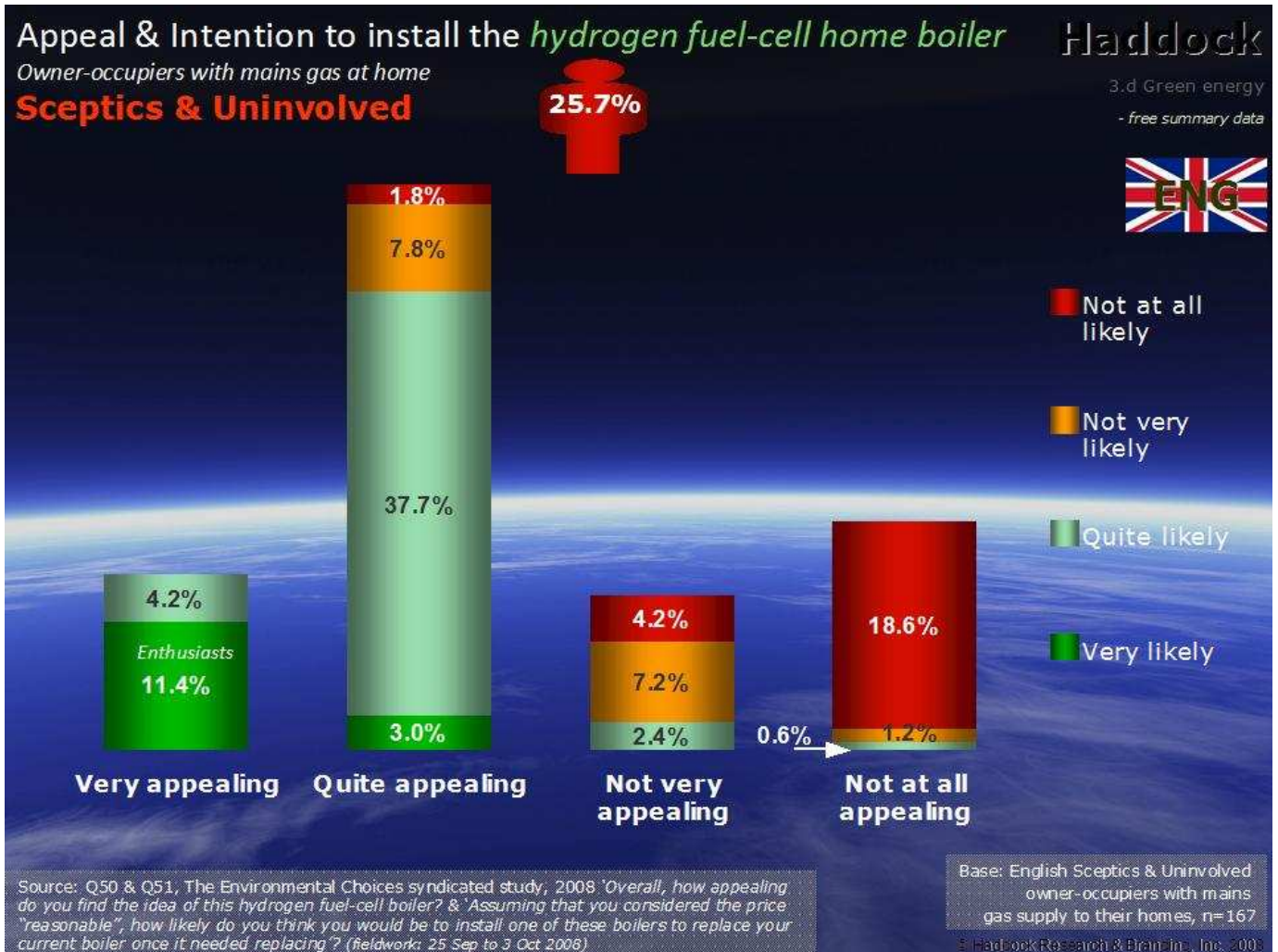
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## Attitudes towards doing major house improvements

Enthusiasts who are owner-occupiers with mains gas supply with responsibility for major house improvements



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■ Agree strongly   
 ■ Agree somewhat   
 ■ No opinion   
 ■ Disagree somewhat   
 ■ Disagree strongly

A major difficulty with spending money on major household improvements is finding the money to do it



I like the idea of using "green electricity" at home (i.e. buying electricity from a zero/low-carbon supplier/tariff)



I like the idea of my home being a "mini power-station"



A major difficulty with spending money on major household improvements is finding the time to plan/do it



Thinking about how to improve the energy performance of my home is a passion or mine



A major difficulty with spending money on major household improvements is reaching agreement with other household members



Source: Q40, The Environmental Choices 2008, 2-stage Likert test. "Please indicate whether you agree or disagree with the following statements to do with investment in your home". (fieldwork: 25 Sep to 3 Oct 2008)

Base: English Enthusiasts (owner-occupiers with mains gas supply to their homes and find the fuel-cell boiler both very appealing and are very likely to install one), and have at least some responsibility for major home improvements, n=105

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