

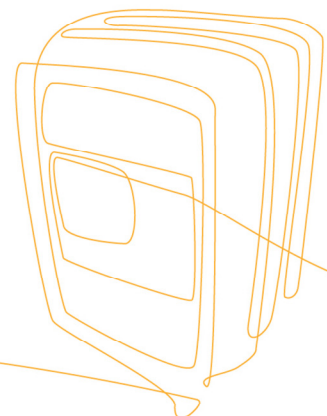
# 6<sup>th</sup> Annual Delta 'Micro-CHP in Europe' Summit: 2011

## Summit Highlights

### August 2011

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## Delta 'Micro-CHP in Europe' Summit: 2011

Over 40 people from Europe's leading boiler manufacturers, energy companies and micro-CHP technology companies took part in the 6<sup>th</sup> Annual Delta 'Micro-CHP in Europe' Summit in Copenhagen, Denmark on 6<sup>th</sup> June 2011.

This paper provides highlights of the Summit.

### Organisations attending

Baxi Innotech, Robert Bosch, Bosch Thermotechnik, BDR Thermea, Calor Gas, Ceres Power, Cogen Microsystems, Cortexo, Danish Gas Technology Centre, Dantherm Power, EDF, Efficient Home Energy, Energetix Genlec, Enertek, E.ON Ruhrgas, E.ON Engineering, Gaspol, GDF Suez, Hexis, HOMA Software, Honda, IE-CHP, Infinia, iNRG, JX Nippon Oil & Energy Corporation, Microgen Engine Corporation, Micro Turbine Technology, Primagaz, RWE, Sandvik Materials Technology, Topsoe Fuel Cell, Vaillant, Yanmar

### About Delta

Delta provides expertise on the emerging energy technologies and markets on the 'customer side of the meter'. Services comprise subscription-based research services (including the Delta Micro-CHP Service), consulting and specialist Summits. Clients include energy companies, manufacturers & technology companies, the finance sector, and policy makers across Europe and beyond.

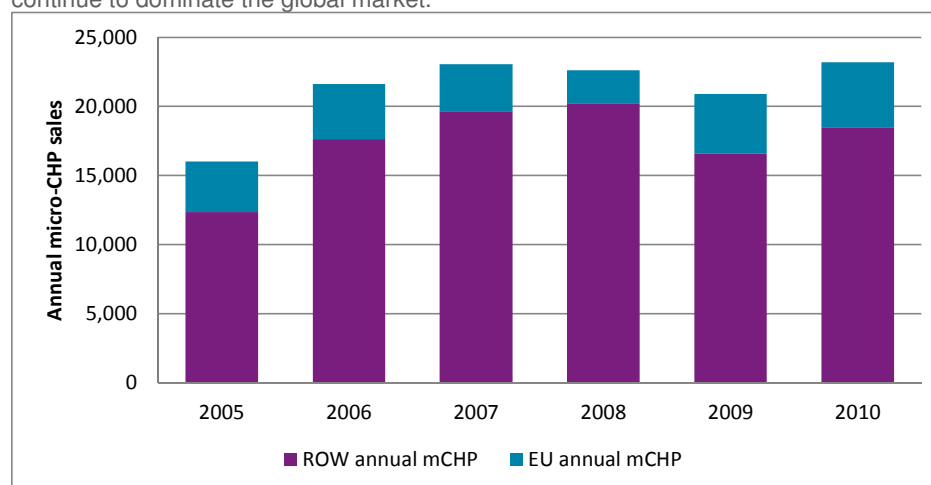
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## 1 Delta's Market Update

**Scott Dwyer, Manager of the Delta Micro-CHP Service**, presented Delta's roundup of product available on the market; sales in 2010 and Delta's outlook for 2011 and beyond. In summary, the global 2010 micro-CHP<sup>1</sup> market comprised 33 MWe of capacity and was worth €366 million.

**FIGURE 1: GLOBAL MICRO-CHP SALES**

Japan – with South Korea starting to make some contributions – dominate Rest of World micro-CHP sales, which continue to dominate the global market.

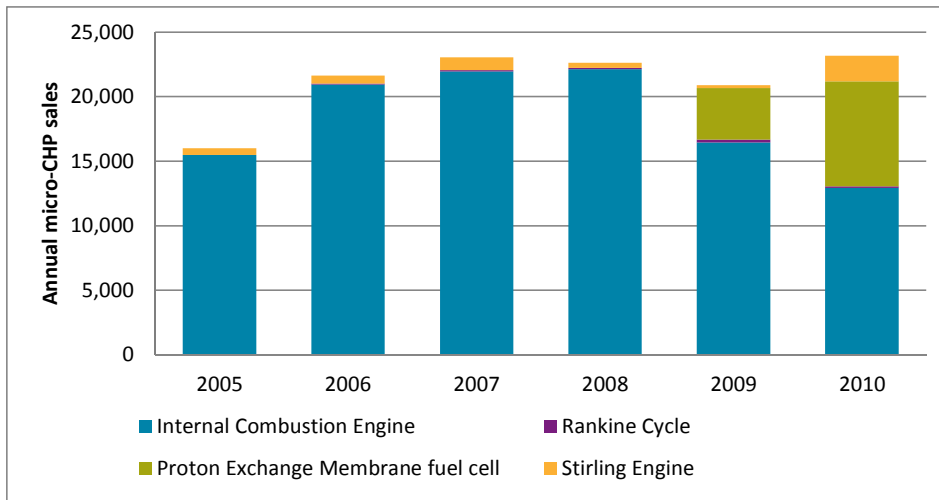


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<sup>1</sup> Defined as 5 kWe and below

**FIGURE 2: GLOBAL MICRO-CHP SALES BY TECHNOLOGY**

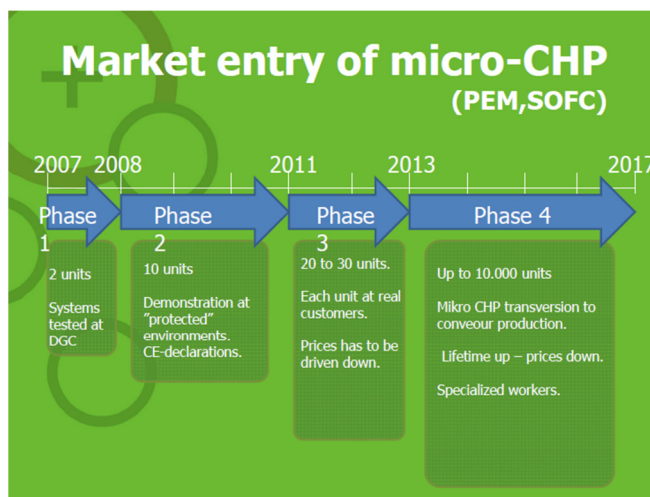
Internal combustion engines share of the market is falling as fuel cells and Stirling engines gain market share.



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## 2 Danish Hydrogen and Fuel Cell Programme

**Aksel Mortensgaard** of the **Danish Partnership for Hydrogen and Fuel Cells** explained how Denmark has the world's 5<sup>th</sup> highest level of R&D funding for hydrogen and fuel cells, together with a strong cluster of fuel cell micro-CHP companies. High penetration of renewable electricity and the need to provide flexibility in the system are key drivers of the Danish activity.



**Kristina Juelsgaard** of Danish utility **SEAS-NVE**, chair of the Danish Micro-CHP Programme explained progress made in demonstrating micro-CHP systems – with units from Dantherm-Ballard, Dantherm-Topsoe, and IRD being installed.

Installations consist of units running on natural gas, as well as direct hydrogen fuelled systems.

### 3 Stirling engines hit the market in Europe, fuel cells in Japan – and some progress in the US

#### Stirling engines in Europe on the market in UK, Netherlands, Germany

Leading European boiler manufacturer BDR Thermea, and Efficient Home Energy (a joint venture between Whisper Tech and Mondragon, the 6<sup>th</sup> largest industrial company in Spain) both presented their experience in launching mass produced micro-CHP units onto the market.

**Mike Small**, Group Product Manager – Micro-CHP for **BDR Thermea** explained how they had successfully carried out controlled launches of their Stirling engine product in the UK, Netherlands and Germany. The company plans to widen its Stirling engine product range, as well as continuing to manufacture internal combustion engine micro-CHP and extensively demonstrate fuel cell micro-CHP.

**Marcos Morras** of **Efficient Home Energy** presented their product and progress, with distributors in place in Germany, Netherlands, Belgium and the UK. Mr. Morras explained that creating awareness of micro-CHP was a critical challenge as this new product was introduced into the market.

#### Fuel cell sales in Japan exceed expectations

**Tomonari Komiyama** of **JX Nippon Oil and Energy Corporation** gave an update on market introduction of PEM fuel cells in Japan, with several thousand units expected to be sold in financial year 2011-12. JX, together with Panasonic and Toshiba market their products under the common ENE-FARM brand. Distributed power systems – including fuel cell micro-CHP - are expected to have a stronger policy focus after the Fukushima disaster.


Mr. Komiyama explained their longer term market expectations, and that the company was planning to introduce its solid oxide fuel cell product into the Japanese market this autumn.

#### Gradual steps in the US

**Jon Slowe**, **Delta Director**, gave an overview of micro-CHP developments in the US. Three products are 'on the market', but sales numbers are very low and unlikely to take-off in the near future.

### 4 Micro-CHP as a Virtual Power Plant

**Jeremy Harrison** of **E.ON** explained how micro-CHP's value proposition can be significantly more than the energy cost savings – compared to the grid and a gas boiler – that it brings. Additional value arises from its ability to capture values such as:



#### UK Potential for micro CHP

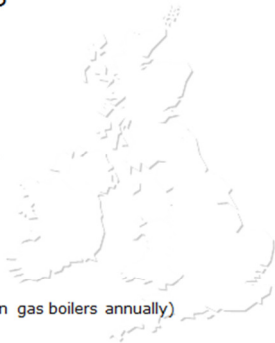
**Engine based micro CHP**

- 15-22GWe installed capacity (at 230V)
- Mainly peak following
- equivalent to nuclear capacity (not output)
- 12 million suitable homes in UK
- 12-30 million tonnes CO<sub>2</sub> reduction annually

**Fuel Cell based micro CHP**

- Up to 24GWe installed capacity (at 230V)
- Mainly baseload capacity
- Competes with nuclear...or CCGT?
- Most UK homes technically suitable

Utilises existing fuel supply infrastructure  
Utilises existing route to market (1.5 million gas boilers annually)  
Incremental, "no regrets" solution



- ▶ Peak demand
- ▶ Balancing services
- ▶ Frequency response
- ▶ Reactive power
- ▶ Enhanced energy trading
- ▶ Generation capacity
- ▶ Avoidance of network costs

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He explained how E.ON sees an opportunity to capture these values in the future with micro-CHP.

**Simon Kolin** of **HOMA Software** explained the main technical requirements for a micro-CHP virtual power plant, and different options and solutions for these requirements. These include:

- ▶ Access to and acquisition of electricity meter data
- ▶ Heat buffer
- ▶ Access to control electronics of micro-CHP (and heat buffer)
- ▶ Channel for communication with micro-CHP
- ▶ IT system for the realisation of the various VPP functions

**Kristina Juelsgaard** of Danish utility **SEAS-NVE** joined Jeremy and Simon in a panel discussion, and emphasised the value of flexible micro-CHP in the Danish market, given the high level of wind power penetration.

## 5 What does micro-CHP 'do' for the customer?

There was open discussion on how to position micro-CHP (and indeed how to explain micro-CHP) to customers – for example on the energy cost savings, benefits of greater electricity grid independence, a 'green' product etc. There was discussion about whether micro-CHP would ever be a topic of conversation at a dinner party (one participant noting that heat pumps – at least on one occasion – already is!). Some thought that customers could be sufficiently excited to talk about micro-CHP in this way, others were sure this would very rarely happen.

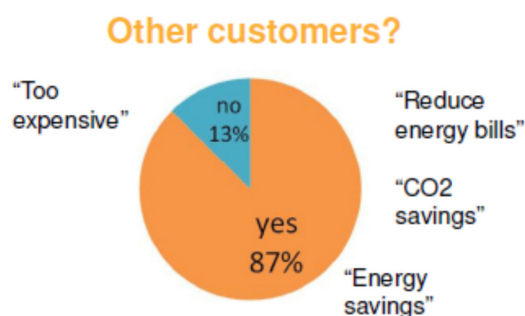
Some possible positioning of micro-CHP that was discussed:

- ▶ Micro-CHP should offer the customer a three year payback or better.
- ▶ Micro-CHP should be positioned as a low carbon product.
- ▶ Micro-CHP should be positioned as an 'emotional' or 'aspirational' product – such as a Toyota Prius.

There was no clear consensus. Some agreed this area should be a clear focus of the future. There wasn't any consensus on whose job this is, but agreement that installers will often be critical in customer decision making..

## 6 Feedback from Installers

Scott Dwyer, Manager of the Delta Micro-CHP Service, presented Delta's ongoing research with installers of micro-CHP and customers that are using micro-CHP.



Interestingly, 87% of installers Delta has contacted would recommend micro-CHP to future customers.

Installers active with micro-CHP are also typically active with a number of other low carbon technologies, such as solar thermal and PV.

## 7 Updates from Developers and Manufacturers

The final session featured quick-fire updates from nine micro-CHP manufacturers, product developers and other associated product and service providers. These companies were:



The full Summit presentations are available for download. Please contact Scott Dwyer on [scott.dwyer@delta-ee.com](mailto:scott.dwyer@delta-ee.com), +44 131 625 3213 for more information.

About Delta Energy & Environment, [www.delta-ee.com](http://www.delta-ee.com)

Delta is a specialist decentralised energy (DE) research and consulting company, helping energy companies and others understand and exploit DE opportunities – for example micro-CHP, larger CHP, heat pumps, and electric vehicles.

We deliver bespoke **consultancy**, **subscription services**, and **specialist Summits**.

Our clients include electric and gas utilities, oil and gas majors, equipment manufacturers and developers, policy makers and investors across Europe and beyond.

### Delta Research Services

#### Micro-CHP

The Service tracks and analyses Micro-CHP developments in Europe and beyond.

#### Air Source Heat Pump Innovation Monitor

This service enables subscribers to capture and harness the latest innovation 'hot spots' for their business.

#### Strategies for Success in Mass Market Energy Services

This multi-client study explores how markets for mass market energy services will develop in Europe, and the potential roles and opportunities for utilities.

#### Home Energy Management (forthcoming)

This Service will enable energy suppliers and others to harness the growing wave of HEM and smart demand innovation and activity.

### Delta Consultancy

#### Market assessments and forecasts

#### Technology evaluation

#### Route-to-market and value chain analysis

#### Policy advice

#### Development of strategy & tactics

#### Due diligence and transaction support