



CERAMIC FUEL CELLS LIMITED

Clean power for your home

High Volume Fuel Cell Manufacturing Plant

Heinsberg, Germany



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Ceramic Fuel Cells Limited
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Overview

- **Introduction to Ceramic Fuel Cells**
- **Increase Volume, Reduce Costs**
- **Fuel Cells to Complete Systems**
- **Volume Manufacturing Plant**
- **Location**
- **Acknowledgments**

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Introduction

Ceramic Fuel Cells is a global leader in fuel cell development

- Solid Oxide fuel cells, convert natural gas into electricity and heat through a silent electrochemical reaction
- World's highest electrical efficiency
- **Meet the growing need for energy and reduce greenhouse gas emissions**

We make fuel cell modules to go inside 'appliances' for homes and other buildings

- Leading energy and appliance company partners in Germany, France, UK and Japan
- First products are 'mini power stations' for homes (2kW power, plus heat)
- Many large global markets: Europe, Japan, Australia, North America

More than 140 million Euros invested since 1992

- 90 staff in Australia, UK and Germany
- Listed on the ASX and the London AIM market (code CFU)



Leading Partners

Germany



Among the largest German utilities: innovative energy products incorporating electricity, gas and telecommunications. Sales of €4.7bn across 4,700 staff. Leader in DG and fuel cells. www.ewe.de



Specialist German boiler and thermal store manufacturer with over 44 years experience. Flexible manufacturing facilities, various brands. www.bruns-heiztechnik.de

France



Global energy group formed between Gaz de France and Suez: energy supply in gas and electricity. Global sales of €74.3b across 196,500 staff. www.gdfsuez.com



De Dietrich Thermique is a leading French boiler manufacturer. Extensive sales & distribution network supported by significant R&D resources. Part of the De Dietrich Remeha group. www.dedietrich-heating.com

United Kingdom



One of the UK's largest integrated electricity and gas companies: second largest generator in the UK. Sales of €12bn across 15,000 staff. Experience with deploying CHP units. www.eon-uk.com



UK based boiler and thermal store manufacturer. Innovative tank designs for maximalising thermal efficiency from CHP technologies. www.gledhill.net

Japan



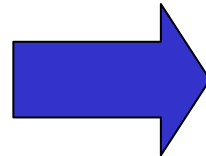
Leading global gas appliance company. Based in Japan, operations in Asia, Oceania, Americas. Owns Rheem and Solahart brands. Sales of US\$2.5bn, 15,000 staff. www.palomaglobal.com

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Increase Volume, Reduce Costs

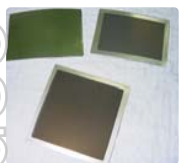
- To generate revenue and profits, fuel cell companies must move from 'hand made' to 'automated' production
 - *Increase volumes to reduce costs*
- Ceramic Fuel Cells has built a plant in Heinsberg, Germany for the volume production of fuel cell stacks
 - *One of the first in the world*



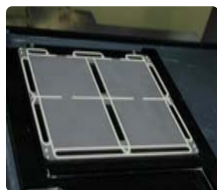


Fuel Cells to Complete Systems

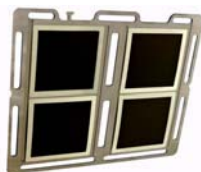
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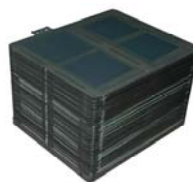
Individual fuel cells



Metal interconnect & seals



Layer set



Fuel cell stack



GENNEX

Fuel cell module



Fully integrated mCHP



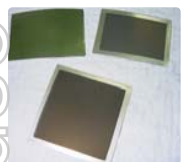
BlueGEN
Modular Co-Gen

Ceramic Fuel Cells has 'end to end' experience and know-how

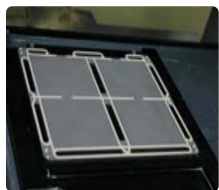


Fuel Cells to Complete Systems

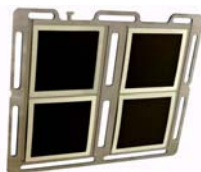
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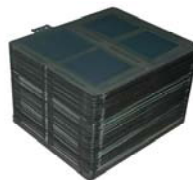
Individual fuel cells



Metal interconnect & seals



Layer set



Fuel cell stack



GENEX

Fuel cell module



Fully integrated mCHP



BlueGEN

Modular Co-Gen

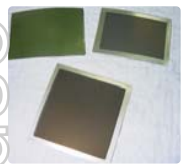
External suppliers and CFCL Melbourne

Appliance Partners

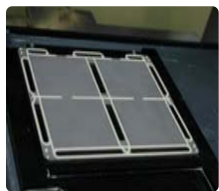
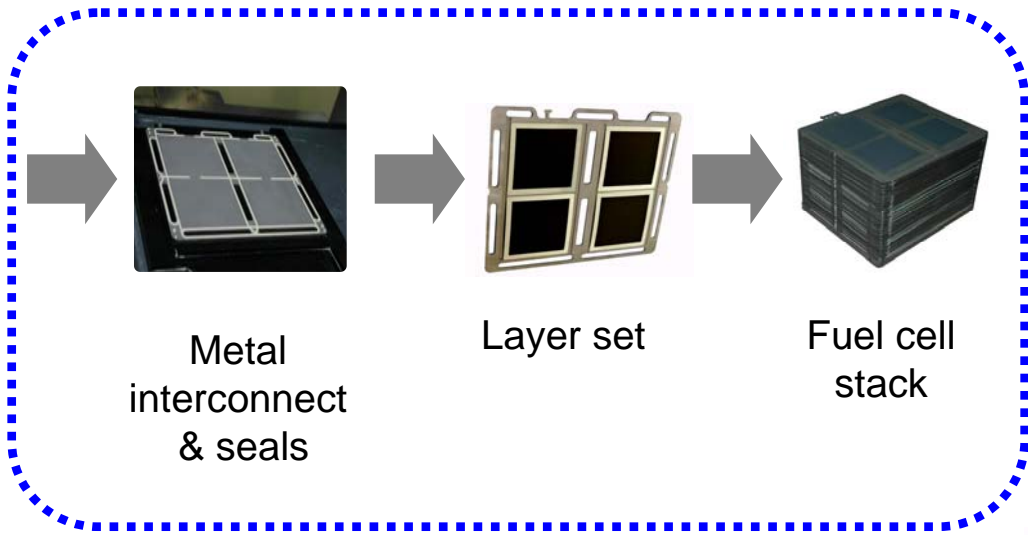


Fuel Cells to Complete Systems

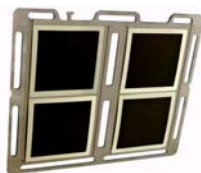
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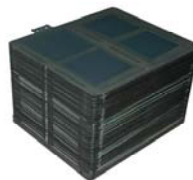
Individual fuel cells



Metal interconnect & seals



Layer set



Fuel cell stack



Fuel cell module

CFCL
Heinsberg



Fully integrated mCHP



Modular Co-Gen



Manufacturing Plant

Industriepark Oberbruch, Heinsberg, Germany

- 2007 = Opened local office, hired 3 local staff
- 2008 = Announced the project, site preparation, environmental and building approvals, placed orders for equipment
- 2009 = equipment built, installed and commissioned on-site
- Completed in September 2009
 - Final cost of 9.5 million Euros
 - Zero injuries or safety incidents
- Designed for capacity of 10,000 fuel cell stacks per year
 - With future expansion - install more equipment in the same building, plus option over 'greenfield' site



Precision Manufacturing Equipment

Key items of equipment:

- Ink Mixing Equipment to produce seal material
- Two Robotic Seal Dispensing Machines
- Two Curing Ovens for pre-drying dispensed seals
- A Robotic Assembly Machine for 'pick and place' assembly
- Three Furnaces for firing fuel cell stacks
- Three Testing machines to test fuel cell stacks before delivery

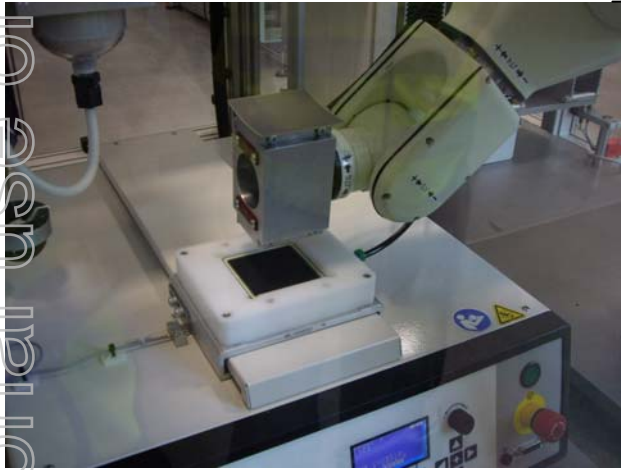
Plus a BlueGen

- Makes power and hot water
- Real working unit to show customers, suppliers and partners





Precision Manufacturing Equipment



Automated
Quality Control



Automated
Seal
Dispensing



Robotic
Assembly
Machine



Furnaces

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Location

- Germany is a leading and large market for clean energy products
- Central location, close to The Netherlands, Belgium and France
- North Rhine-Westphalia has highly skilled labour and strong support for new clean energy technologies, especially fuel cells
- Strong network of local suppliers and research bodies
- North Rhine-Westphalia Government financial support for the project
- Innovative services offering from the Industriepark Oberbruch





Dankeschön!

Thank You for Contributing to a Successful Project:

- The Government of North Rhine-Westphalia
- The City of Heinsberg
- Industriepark Oberbruch
- Project Managers CEL International Limited and contractor BFT Planung
- Suppliers
 - BIS HIMA GmbH
 - Eisenmann Anlagenbau GmbH
 - Intega GmbH
 - Netzsch Feinmahltechnik GmbH
 - TF Automation Ltd
 - Theod. Mahr Söhne GmbH



Ministry of Economic Affairs
and Energy of the State
of North Rhine-Westphalia



Netzwerk
Brennstoffzelle und
Wasserstoff NRW



**S T A D T
HEINSBERG**



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