

Micro-CHP: Global Industry Status and Commercial Prospects

World Gas Conference
5 - 9 June, 2006
Amsterdam

Jon Slowe
Director, Delta Energy & Environment
www.delta-ee.com



Introducing Delta

- Specialist decentralised energy research and consulting company
- Research products include:
 - Micro-CHP Service
 - Mid-Scale Decentralised Energy Technologies and Markets

Agenda

Micro-CHP today

Micro-CHP in 2007

Micro-CHP by 2010

Micro-CHP Products on the Market in 2005



ECOWILL 1 kW ICE



SenerTec 5 kW ICE



Ecopower 5 kW ICE



Yanmar 5 kW ICE

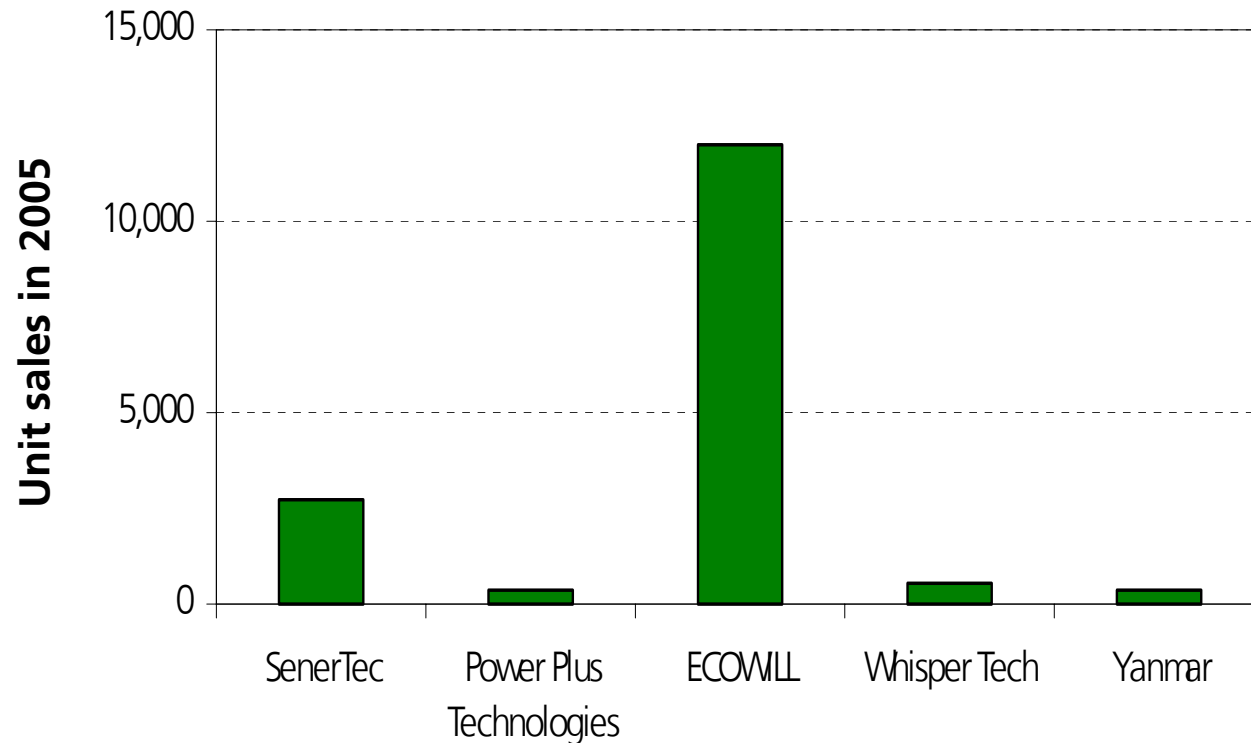


Whisper Tech 1kW SE

Sources: Osaka Gas,
Sener,Tec, Vaillant,
Whipser Tech, Yanmar

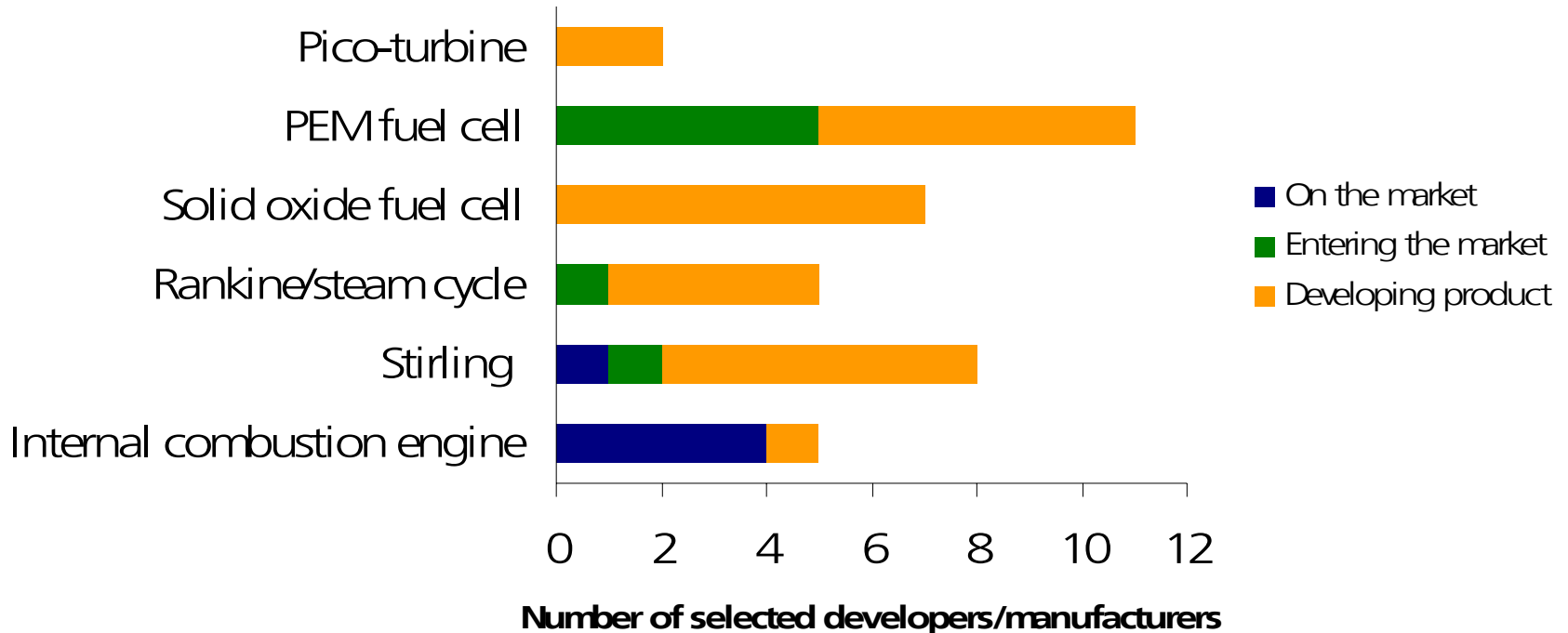
Note: Aisin Seiki, Sanyo,
Yanmar and SOLO have
products between 5 kW
and 10 kW

Micro-CHP Sales in 2005

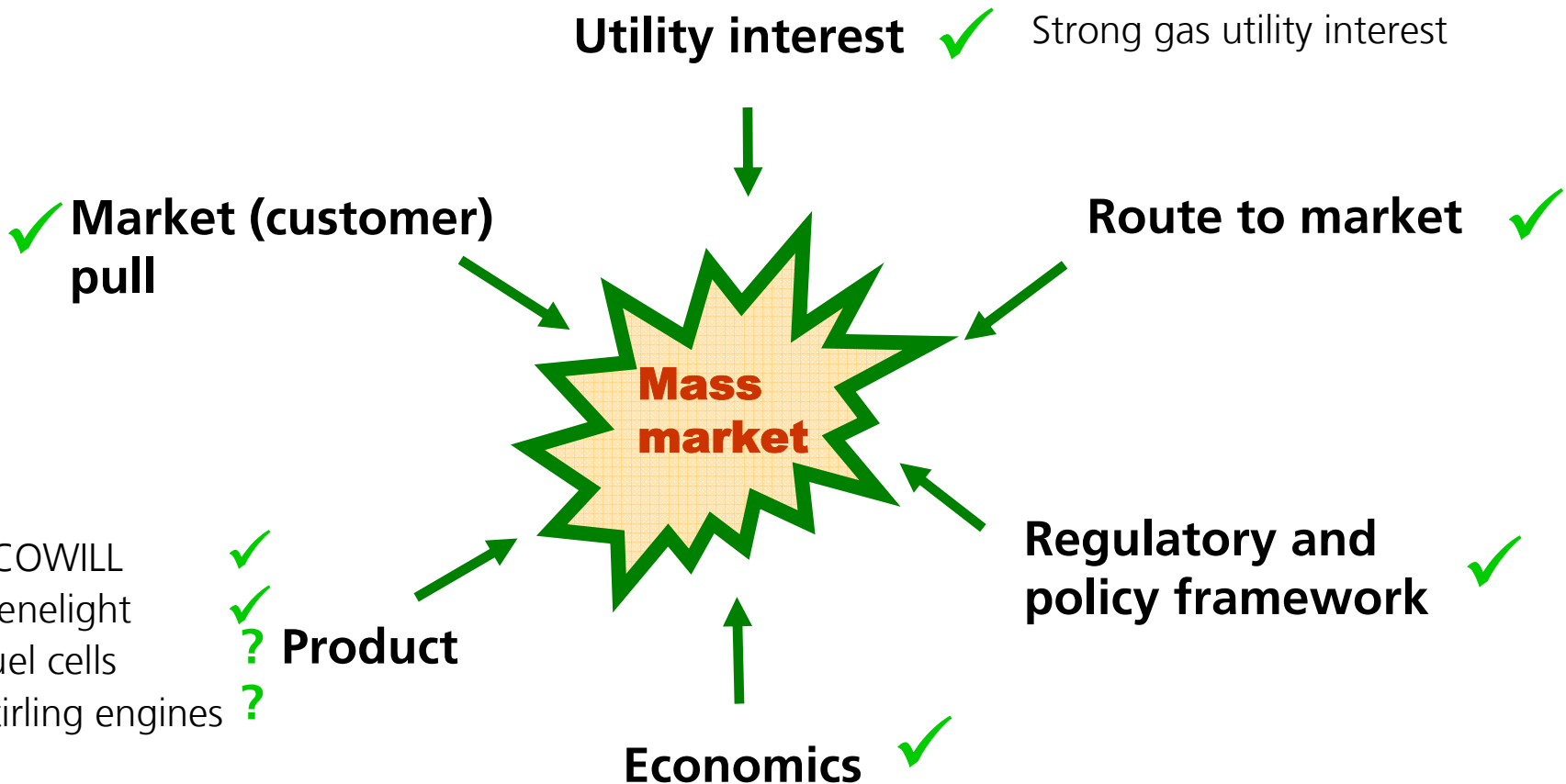


Note: Micro-CHP defined as 5-kWe and below

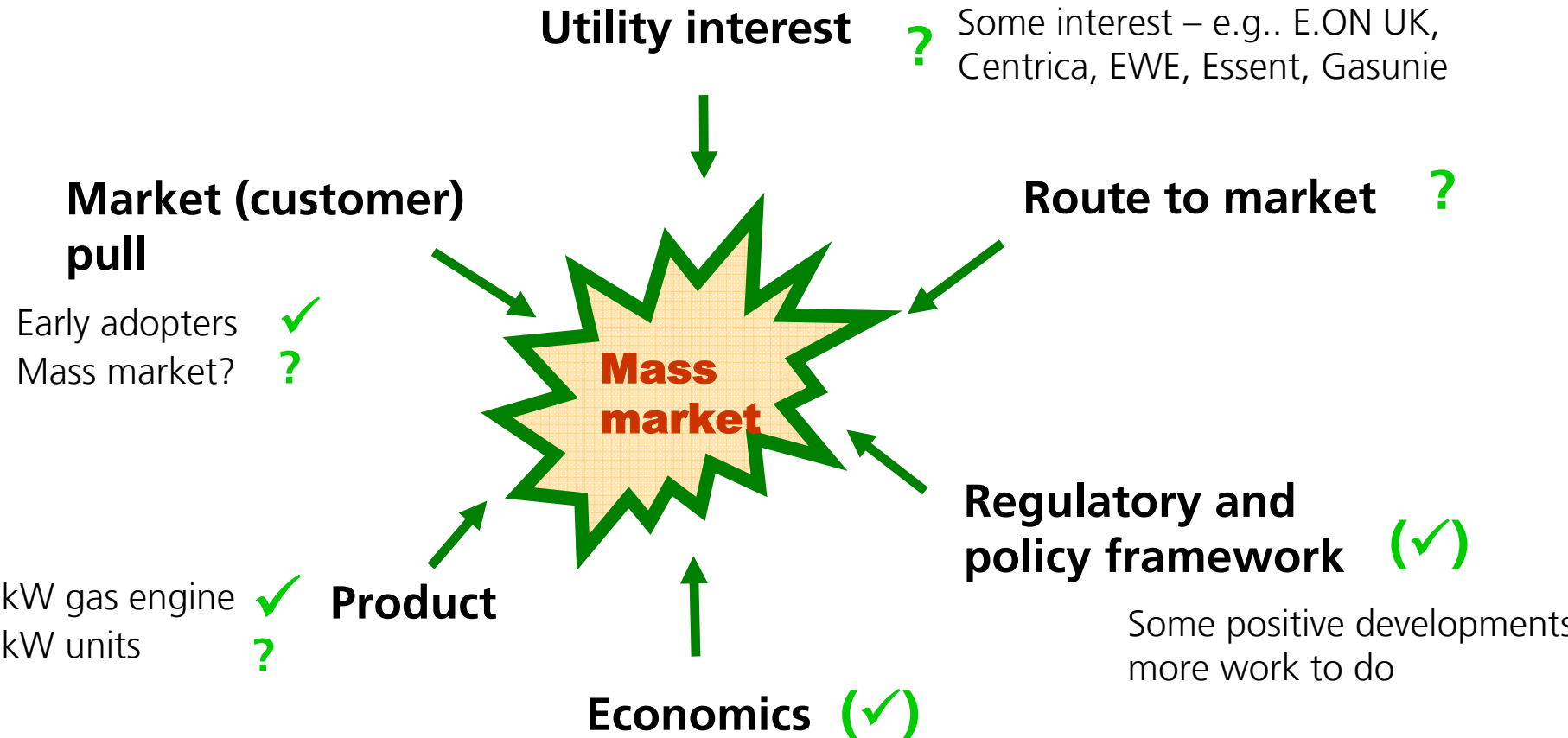
Selected Micro-CHP Product Developers and Manufacturers



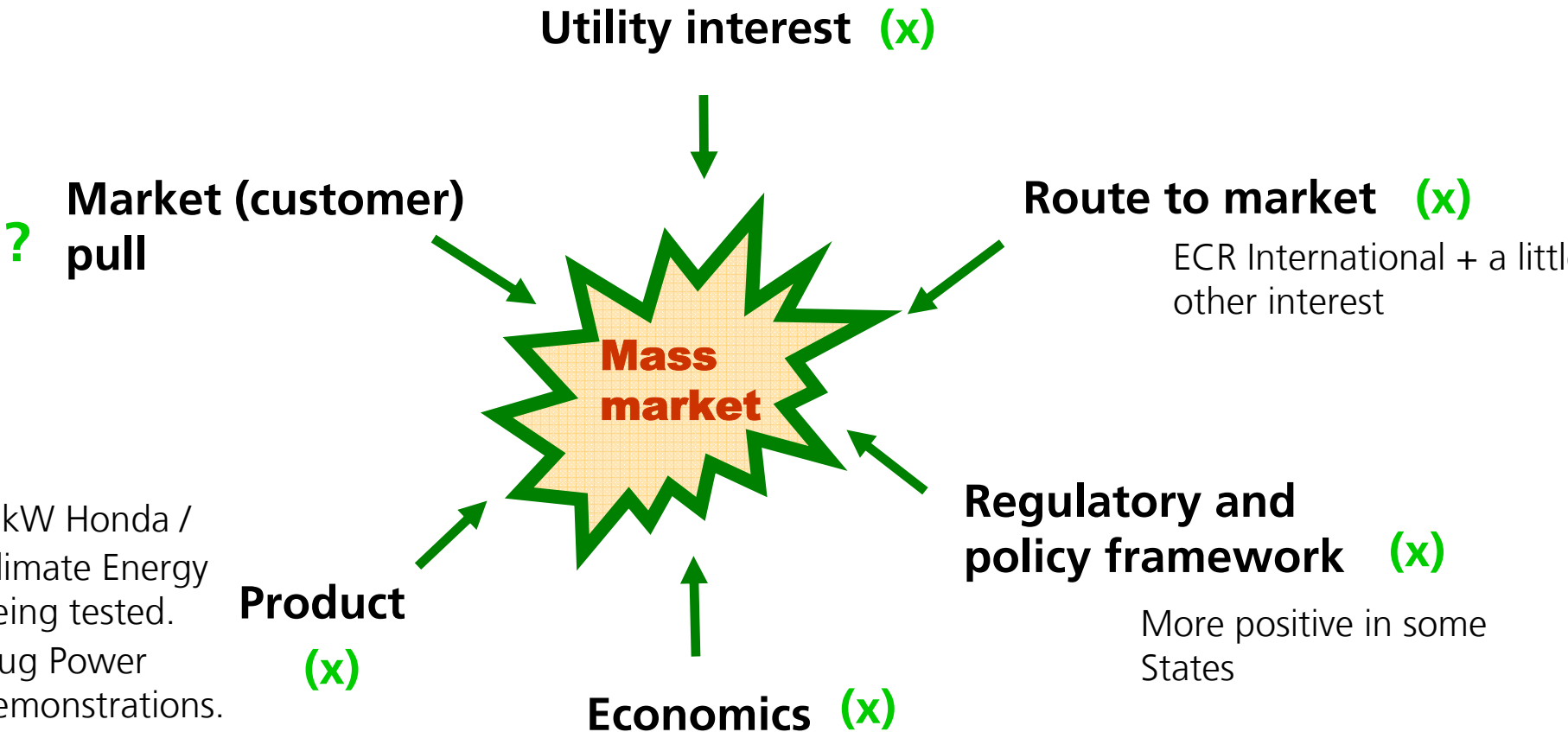
Japanese Market



European Market



North American Market



Agenda

Micro-CHP today

Micro-CHP in 2007

Micro-CHP by 2010

Gradual Growth in 2007

North America

- Honda/Climate Energy unit on the market

Europe

- Gradually increasing sales of 5 kW units
- WhisperGen sales increasing?
- Developing policy/regulatory framework
- A few 1 to 3 kW products reaching markets

Japan

- More fuel cell demonstrations
- Increasing ECOWILL and Genelight sales

Agenda

Micro-CHP today

Micro-CHP in 2007

Micro-CHP by 2010

Japan by 2010

- Established micro-CHP markets
 - ECOWILL
 - Genelight
- More products
 - Fuel cells (PEM and solid oxide) – several thousand units sold?
 - Stirling engines introduced?
- Strong gas utility marketing
 - Battle with electric utility promotion of all-electric homes

Europe by 2010

- Steady growth for 5 kW products
 - But not mass markets for these products
- 1 to 3 kW products introduced
 - Internal combustion engines (Honda + others?)
 - Stirling engines
 - Rankine cycle engines
 - Fuel cells?
 - Pico-turbine?
- **Mass market development critically dependent on:**
 - **Utility involvement**
 - **Boiler manufacturer actions**

North America by 2010

- Gradual growth for Honda/Climate Energy unit
- Possible (limited) introduction/demonstration of
 - Stirling engines
 - Rankine cycle engines
 - Fuel cells

What to Watch in the Next Three Years

- Fuel cells in Japan
- Utility and boiler manufacturer actions in Europe
- Policy and regulation in Europe
- New product introduction (Stirling engines, Rankine cycles)
- Changes in utility / HVAC manufacturer / policy in North America

Thank you for your attention

Jon Slowe

Director, Delta Energy & Environment

+44 141 227 3982

jon.slowe@delta-ee.com

www.delta-ee.com