

An introduction to mini-CHP products & markets in Europe

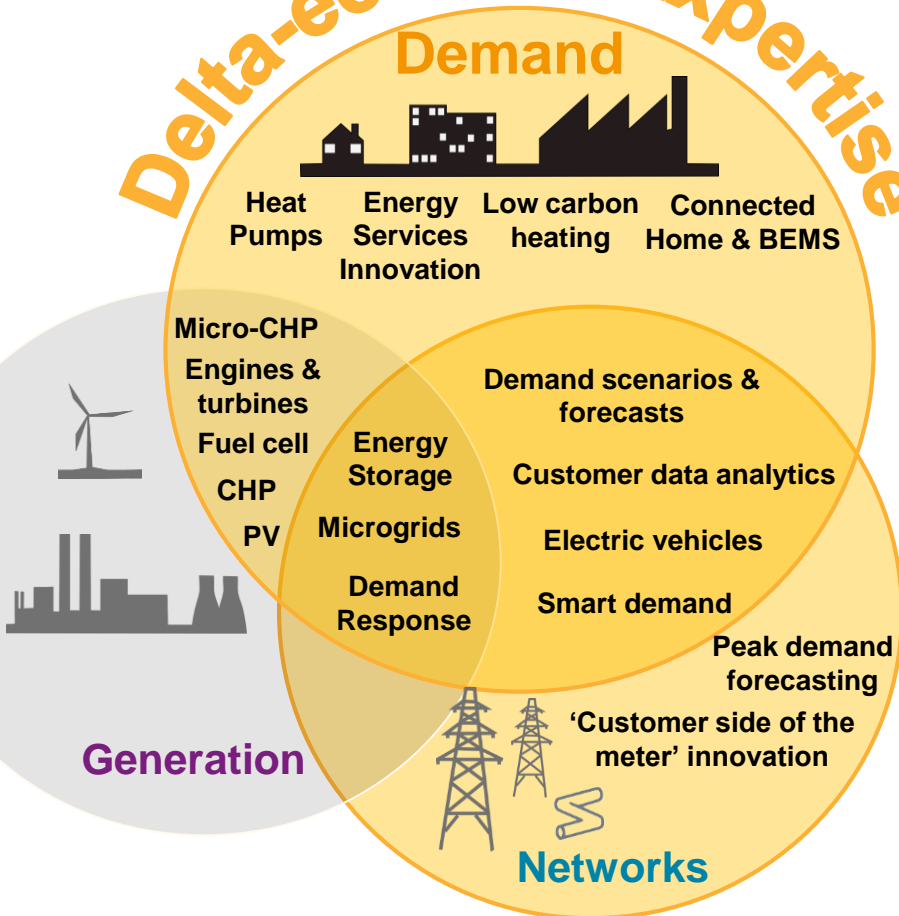
**Joint Workshop: New market-ready gas utilisation
technologies for commercial users**

Marcogaz/GERG Office, Brussels

9th March 2016



Delta-ee Core Expertise



Energy Companies

Manufacturers

Others

Research Services

Digital & Services Innovation

- ▶ Connected Home Service
- ▶ Customer Data Analytics
- ▶ Energy Services Innovation

Distributed Generation & Demand Side Flexibility

- ▶ Energy Storage Service
- ▶ Distributed Power Service
- ▶ Demand Response In Europe

Heat

- ▶ Microgen Insight Service
- ▶ Heat Pump Research Service
- ▶ Roadmap Service
- ▶ Pathways[®] Tool
- ▶ Micro-CHP Service

Consultancy

- ▶ Market analysis and forecasts
- ▶ Strategy
- ▶ Propositions and customer research
- ▶ Technology and product
- ▶ Policy & regulation
- ▶ Demand forecasts

Summits

- ▶ European 'Connected Homes and Energy'
- ▶ Energy Services
- ▶ Micro-CHP
- ▶ Heat Pumps & Utilities

What is Mini-CHP?

- Technology:
 - ▶ Gas engines
 - ▶ Normally spark-ignition, reciprocating engine
- Size range:
 - ▶ Typically from 5 kWe to 400 kWe
- Fuel types:
 - ▶ Natural gas
 - ▶ LPG
 - ▶ Biogas
- Efficiencies:
 - ▶ Electrical: 25 to 35%
 - ▶ Thermal: 50 to 65%
 - ▶ Total: ~90%

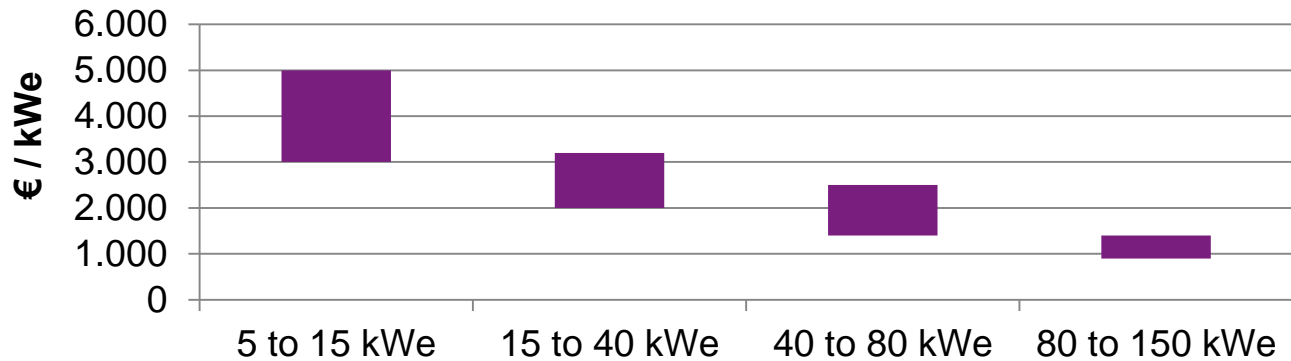


A selection of European mini-CHP players

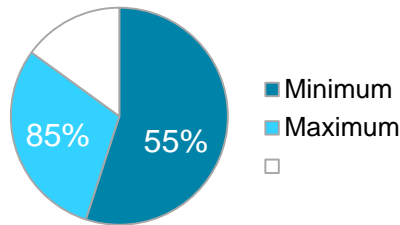


Mini-CHP Prices: €/kWe falls as mini-CHP sizes increase

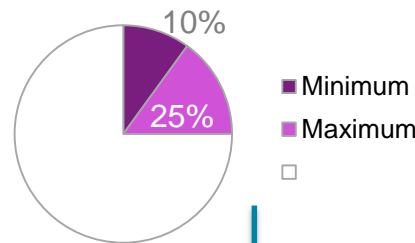
Mini-CHP: Typical Fully Installed Cost



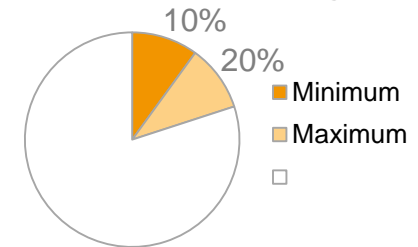
Unit Price



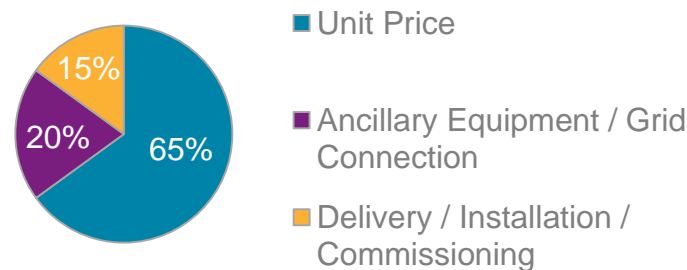
Ancillary Equipment / Grid Connection



Delivery / Installation / Commissioning



Typical Installed Cost Breakdown



Germany: By far the largest mini-CHP market in Europe and will continue to be so by 2020.



Market Drivers:

- Supportive Policy (E.g. CHP Law in Germany)
- Building Regulations (E.g. UK)
- Spark Spreads
- EU Heating & Cooling Strategy

Future Prospects:

- **To 2030:** Gas-fired CHP is a great 'stepping stone' for the next 10 to 20 years
- **To 2050:** Longer term, only if Europe's gas grid de-carbonises, can gas-fired CHP continue to provide high-efficiency power and heat (& cooling) to Europe's buildings.

2030:



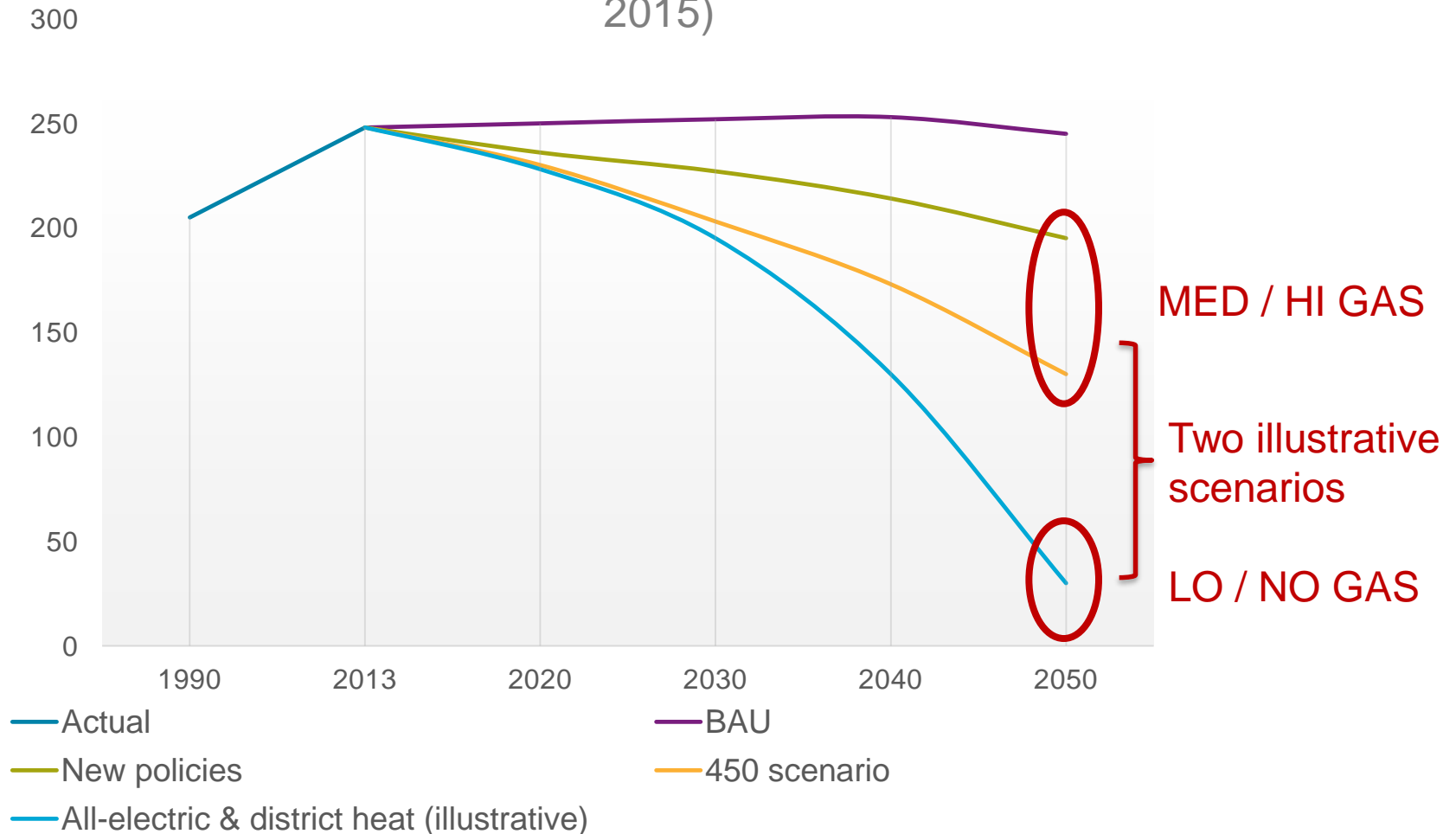
2050:



But what does the future look like for gas demand in Europe....?

Scenarios for gas demand range from growth to collapse

EU gas demand in industry & buildings, mtoe (IEA, 2015)



Thanks for listening!

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