

The role of Fuel Cell micro-CHP in delivering Belgium's energy transition

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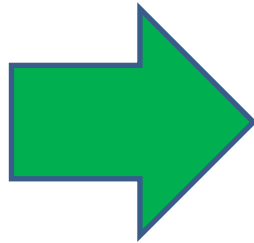


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➤ EU Energy Goals by 2030:

- 27 % energy savings
- 40 % less greenhouse gas
- 27 % renewable energy



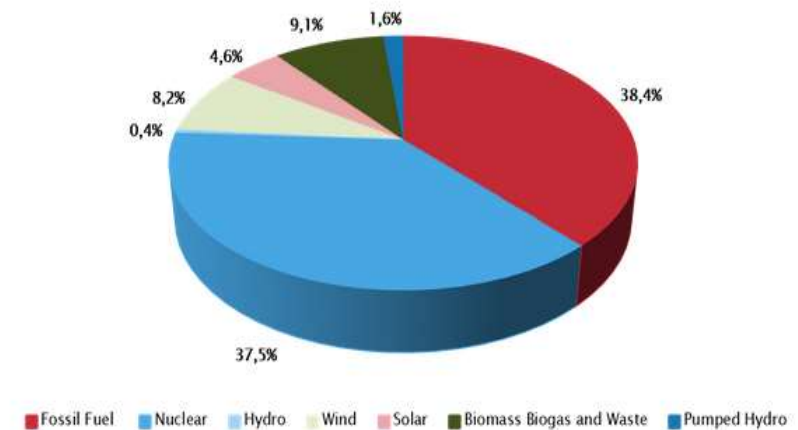
Fuel cells mCHP today :

- 25-60 % less primary energy
- 50-100% less CO₂ , NO_x , SO_x, particles etc.

➤ The transition to decentralized power generation is irreversible (why?):

- Efficiency !
- Many renewables are decentralized
- Huge imbalance in production Belgium
- Nuclear (fixed base-load) doesn't match with fluctuating Renewables

Total net electricity production in Belgium by source in 2015* (65,5 TWh)



An incorrect view that needs correction:

“It uses ‘natural’ gas, so it’s not renewable, so it should not be supported”.

In reality....

- Today fuel cells are dispatchable, aggregated, cleantech generating assets
→ fuel cells increase the amount of renewables that can be connected to the grid.
- They *can* operate with renewable fuels (bio, Power to Gas)
→ fuel cells can, and will, be renewable, in 2050 100%
- They are reversible, so they can store renewable energy
→ fuel cells enable full decarbonisation
- They will keep the lights on when Sun and Wind aren’t available
→ fuel cells are the missing link next to renewables



Fuel cells create jobs in many EU countries

Examples: FC production in Heinsberg (D) and Mezzolombardo (IT), Distributors and Installers Belgium





BlueGEN



**COMMERCIAL -
CE full appr. 2010**

BlueGEN

1.5 kW

60%

85%

1:3

Floor standing

Yes

ENGEN™ 2500



**FIELD TEST PRODUCT
CE batch appr. 2015**

EnGen-2500

2.5 kW

50%

90%

1:3

Floor standing

Yes

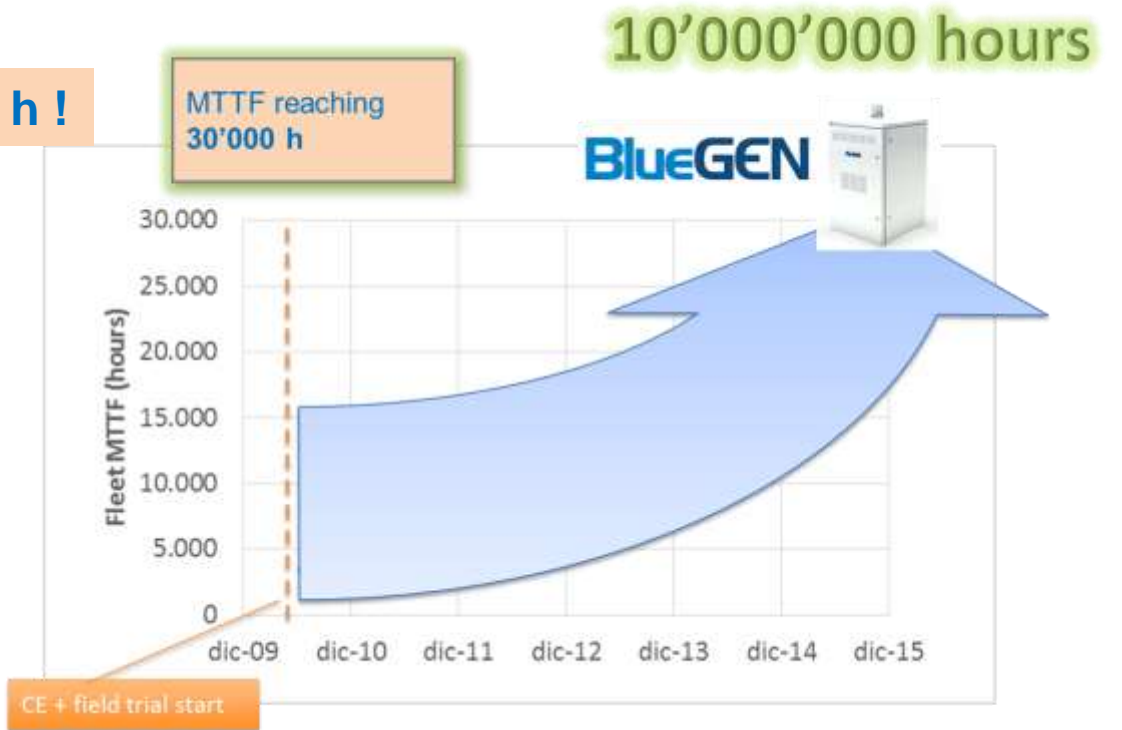
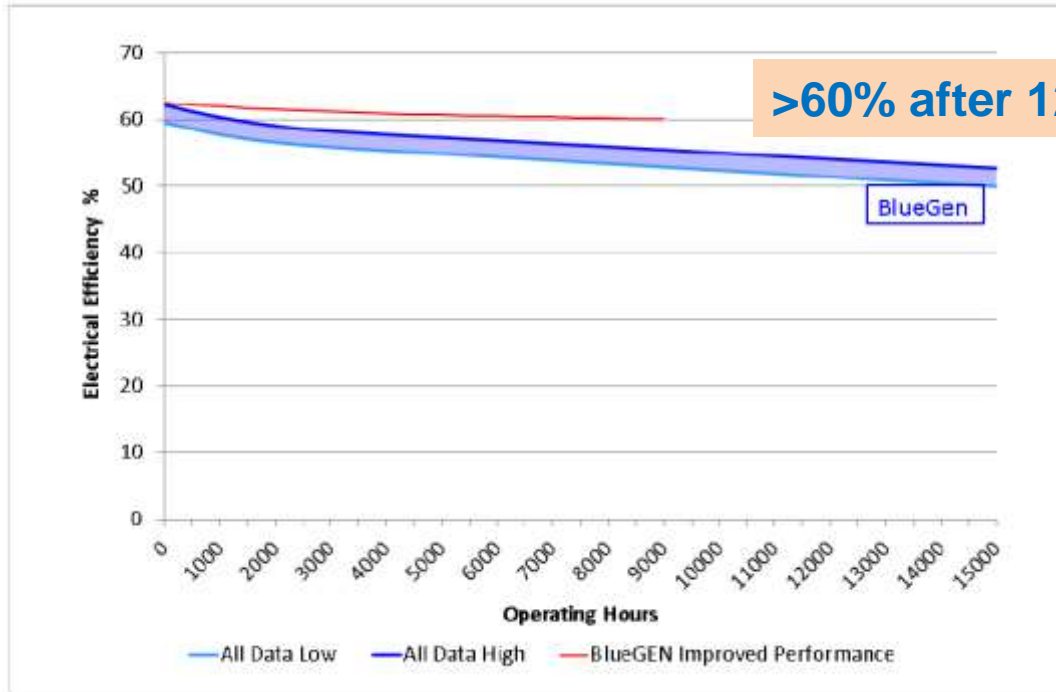
Product specs

- Electricity power output (net, AC)
- Electric efficiency (net AC, LHV)
- Cogeneration efficiency (LHV)
- Modulation range
- Installation
- Grid connected

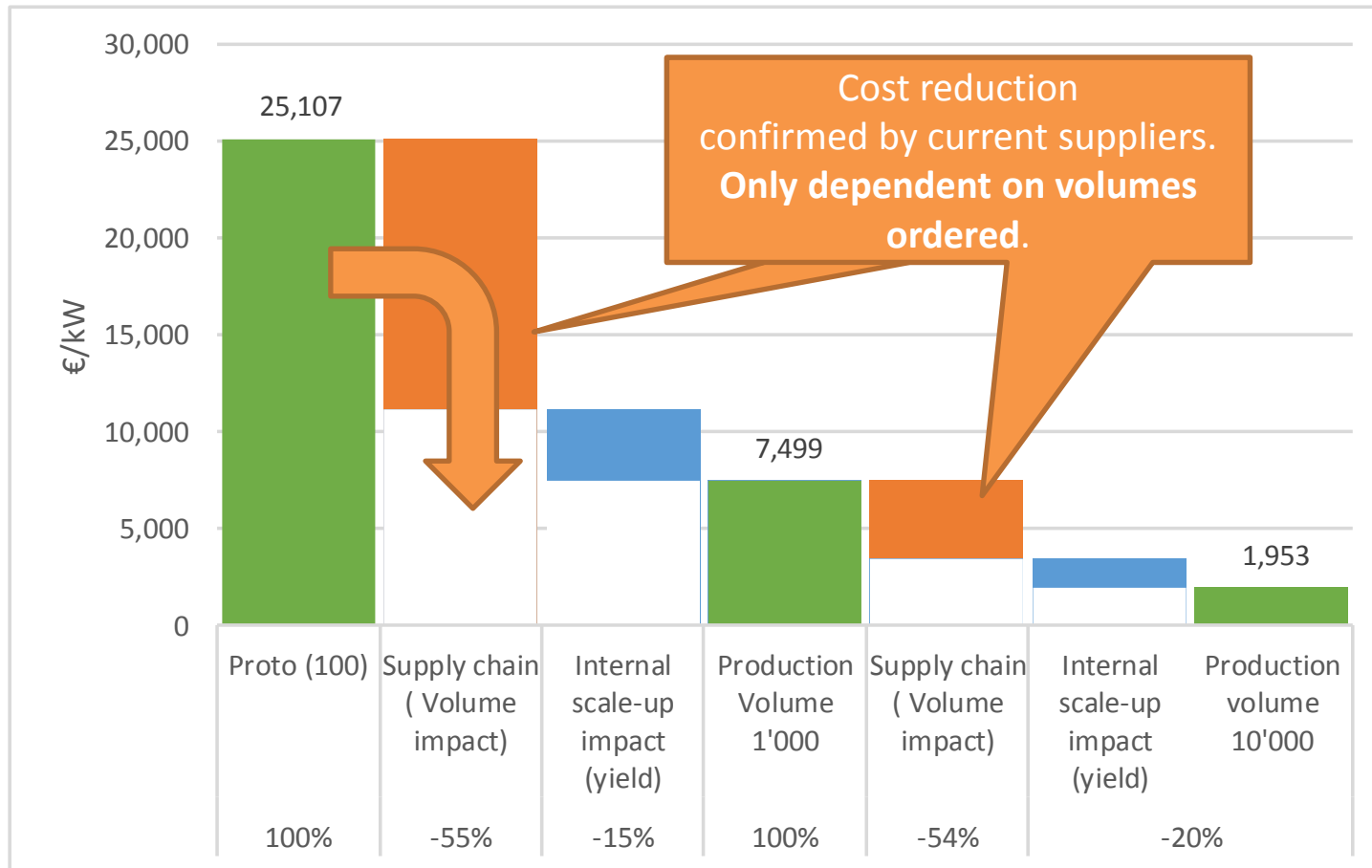


Field test programs: key to ramp-up over the 100's and 1000's

Reliability is necessary in order to ramp-up, for the bankability of the product, and to reach a post-subsidy phase



Prices are only dependent on Volumes



To reach volume we need:

1. Stable, and favorable market conditions
2. Government regulation
3. Trust and recognition of FC-technology
4. Bankability
5. New business models (ESCO's, VPP's)
6. Summarized:
"A market we can plan on"

Some good examples ...and bad examples...

Good:

- 270 German utilities will be BlueGEN distributors !



ASEW DAS EFFIZIENZ-NETZWERK
FÜR STADTWERKE

BlueGEN

- German national mCHP subsidy (TEP) has been approved!
- After ene.field, the FCH-JU will keep supporting mCHP under the PACE program!
- Reduced Taxes on high efficient equipment in Italy.

Bad:

- Bureaucracy: still no approval for grid-connection mCHP in Italy
- Dutch government is increasing tax on gas and decreasing tax on power.
- Encouragement of all-electric/ no gas-connection in new build.
- General aversion to Natural gas in some countries.

Up to now mCHP was:



let's make it:



Thank you !