

Cogeneration key for decarbonisation in buildings

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18 February, 2019, Brussels



COGEN Europe Mission

Cross-sectoral voice of the cogeneration industry

Work with EU Institutions and stakeholders to shape better policies by:



**BUILDING A ROBUST
EVIDENCE-BASE
DEMONSTRATING
THE BENEFITS OF
COGENERATION**



**USING THE
EXPERTISE OF OUR
MEMBERSHIP**



**ESTABLISHING STRONG
COALITIONS AND
PARTNERSHIPS**

COGEN Europe Members

National Members

Belgium
(Flanders)



Hungary



Slovenia



Czech
Republic



Italy



Spain



France



Poland



Turkey



Germany



Portugal



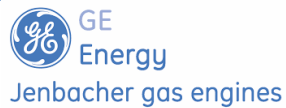
Greece



United Kingdom



Corporate Members



COGEN Europe's Vision

The cogeneration sector is committed to creating
a resilient, decentralised, carbon neutral European energy system **by 2050,**
with **cogeneration as its backbone**

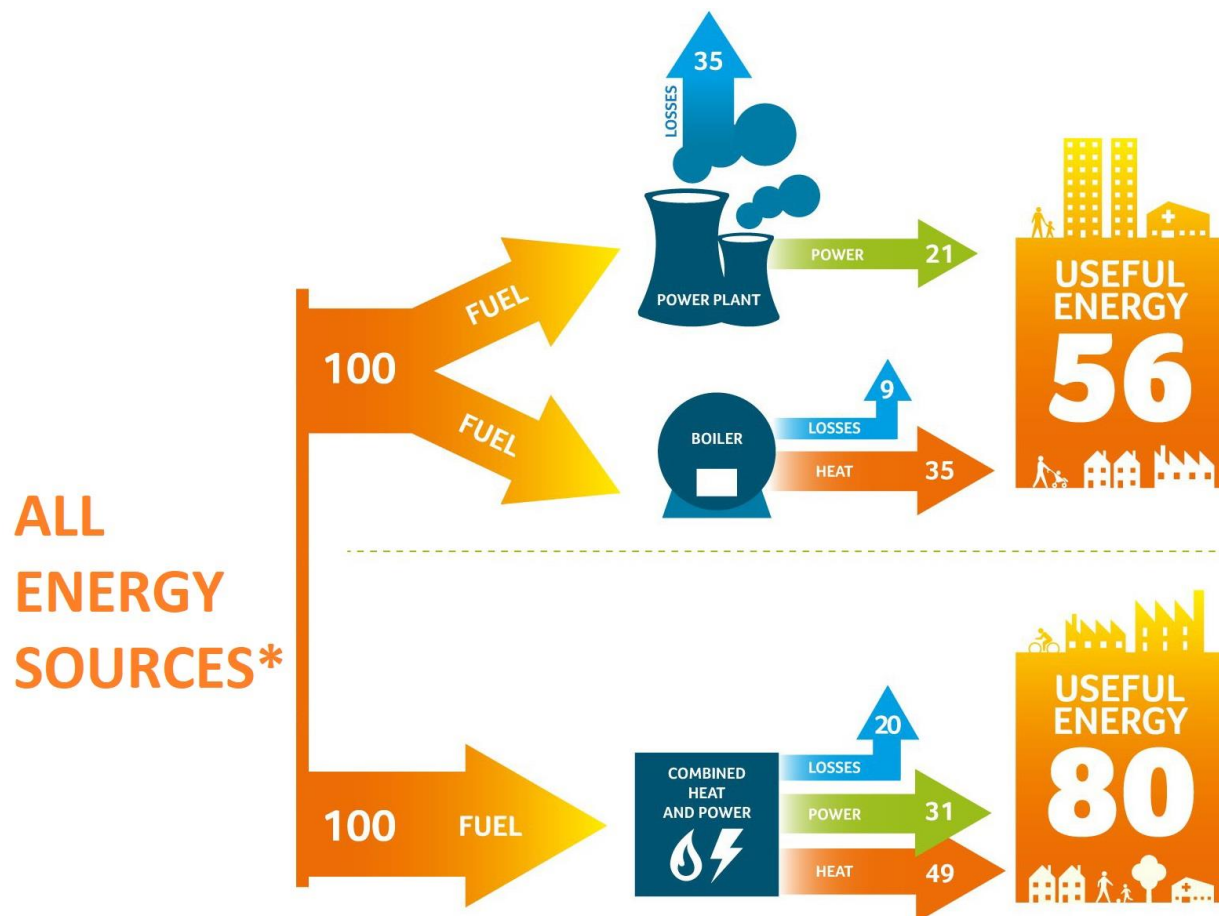


empowering European citizens and industry to generate their own efficient, reliable and affordable clean heat and power locally

bringing together heat, electricity and gas networks, allowing the efficient integration of substantial amounts of renewable energy and providing energy when and where needed

enabling an integrated energy system and a cost-effective transition towards a sustainable future

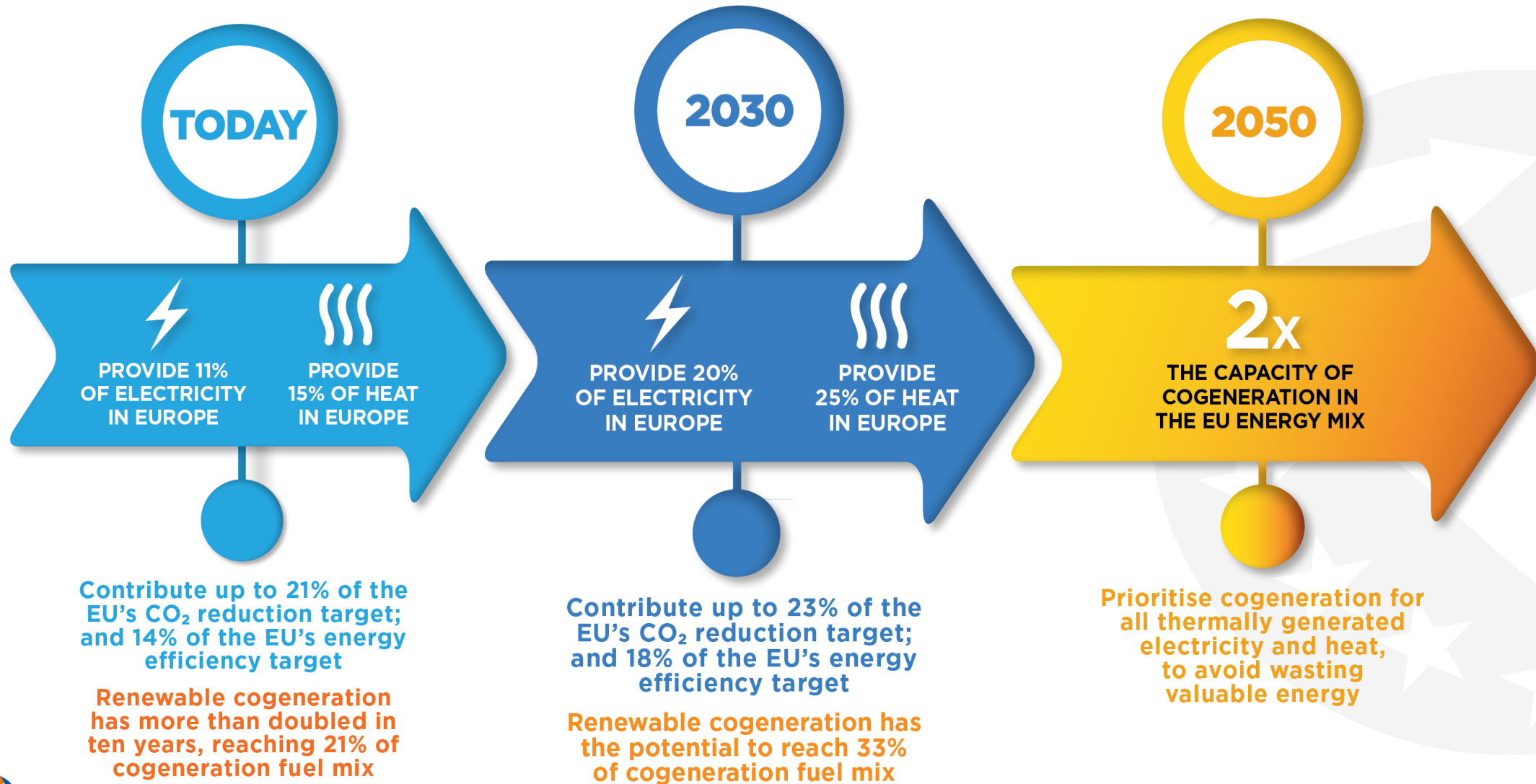
Benefits of Cogeneration



* Including, but not limited to, biomass, biogas, coal, geothermal, hydrogen, (bio-)LPG, natural gas, residual waste and solar thermal

- Energy efficiency
- Reliability
- Fuel-flexibility
- Distributed generation
- Power at low-voltage level

Contribution of Cogeneration towards Future Energy System



Cogeneration

A multi-applications solution

Households



*District
heating &
cooling*



*Public
buildings*



Industry



The Future: Smart grids and energy-storage

Storage of renewable energy → *“Power to Gas”*

“We don’t have an energy problem but a storage and distribution challenge!”

- Storage capacity of the grid = batteries is very limited; the need for storage is many times higher than the materials on this planet even to produce enough batteries: examples
 - All EV’s in Germany in 2020 (target 1 mio) can, when fully used, store **0,04 TWh**, whereas the need for storage in 2020 will be **40 TWh**! Where will they store the other **39,96 TWh**?
 - An average all-electric home in the Netherlands with a heatpump needs to store **3500 kWh** for space heating in Winter. One Tesla Powerwall can store **6kWh**. Who is going to buy and install **580** of those PowerWalls !?
- The Storage capacity of the Gas-grid in Germany now is already **200 TWh** !

Energy valley movie http://www.youtube.com/watch?v=4iin3HKw-9U&feature=player_embedded

The Future: Smart grids and energy-storage

Storage of renewable energy → ***“Power to Gas”***

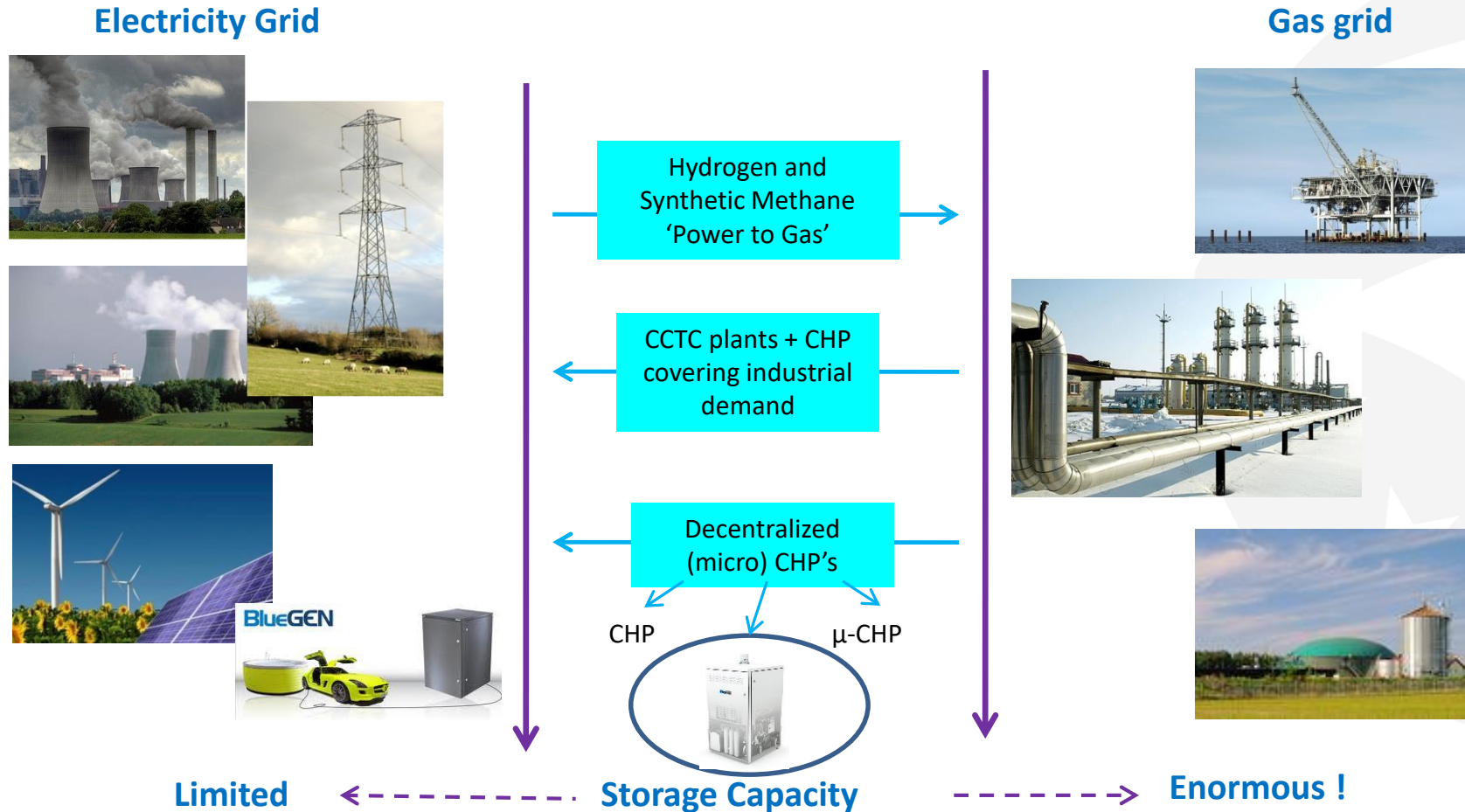
“We don’t have an energy problem but a storage and distribution challenge!”

- The cost of full electrification is more than double the cost towards using both existing infrastructures: the electricity and the gas-grid.
- Both grids will become 100% carbon neutral probably by 2050
- **Two recent reports** underpin the above: **EcoFys Gas for Climate** report:
www.gasforclimate2050.eu/files/files/Ecofys_Gas_for_Climate_Feb2018.pdf
- KPMG UK report **The Future of Gas**
- <http://www.energynetworks.org/assets/files/gas/futures/KPMG%20Future%20of%20Gas%20Main%20report%20plus%20appendices%20FINAL.pdf>

Hydrogen and Biogas are also ‘GAS’ and fully renewable!

The future: Smart-grids and energy-storage

Storage of renewable energy with – “*Power to Gas*”



BlueGEN fuel cell + Heatpump = most efficient heat and power

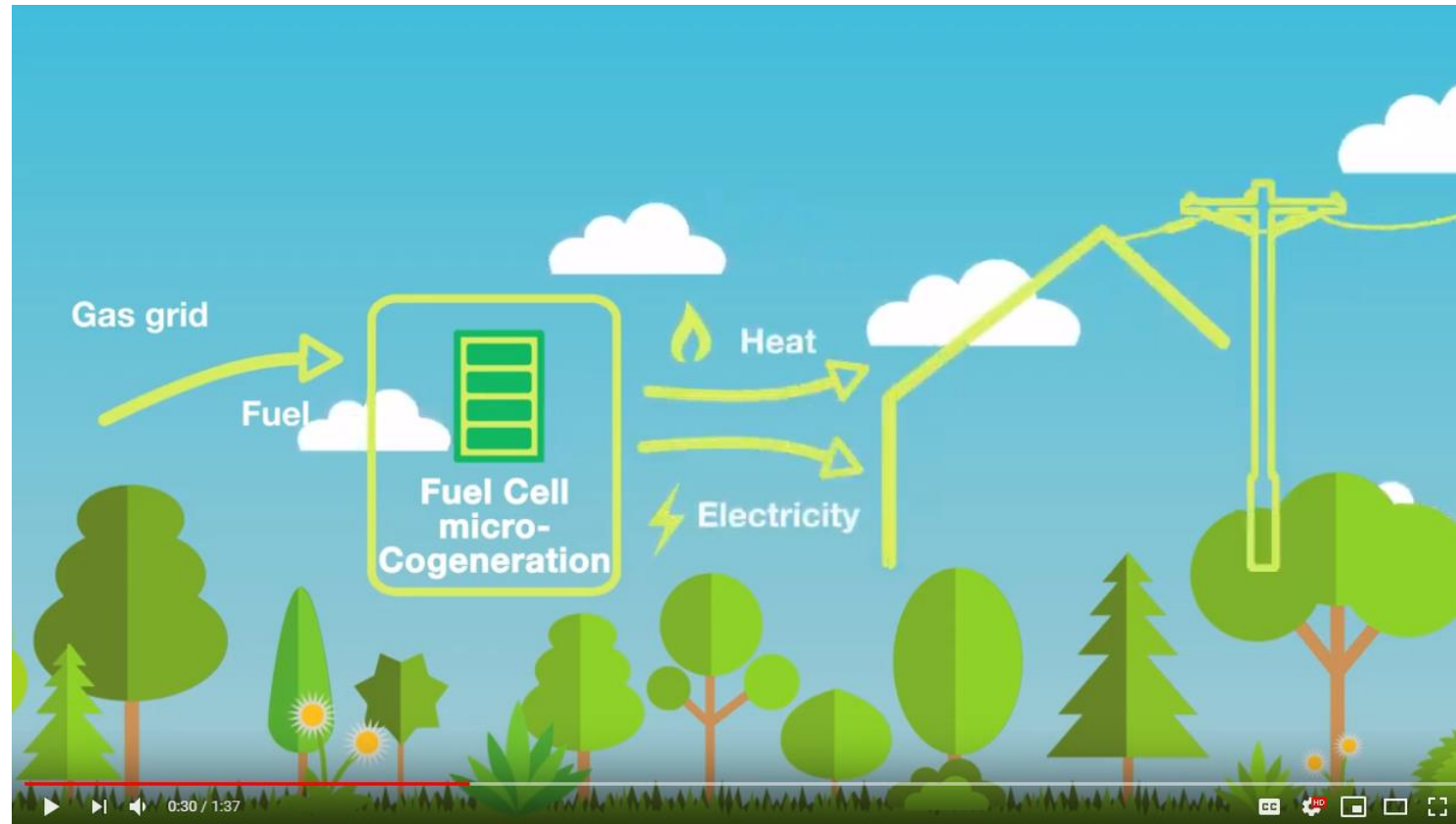
	<u>Gas-boiler</u>	<u>Electric Heat- pump</u>	<u>BlueGEN + Heat- pump</u>
Fuel-Source	Gas	Grid-power	Gas
Cost per kWh in €	0,06	0,23	0,06
Carbon (kg CO ₂ /kWh)	0.19	0.51	0.19
Average Efficiency	90%	300% (COP 2 en 4)	400% (COP 4)
cost /kWh heat	0,07	0,08	0,02*
CO ₂ /kWh heat (kg)	0.20	0.17	0.04

*Because BlueGEN takes care of the 'high temp. use water' supply, the average COP or PER of the heat-pump can increase to 400% (or more with higher COP's).

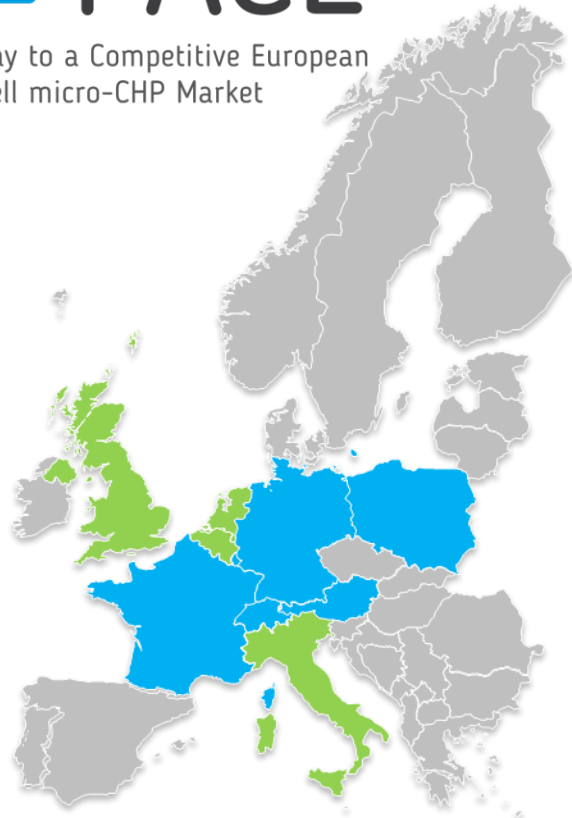
For illustration purposes only

Fuel Cell micro-Cogeneration...

...latest addition to the Cogeneration “family”



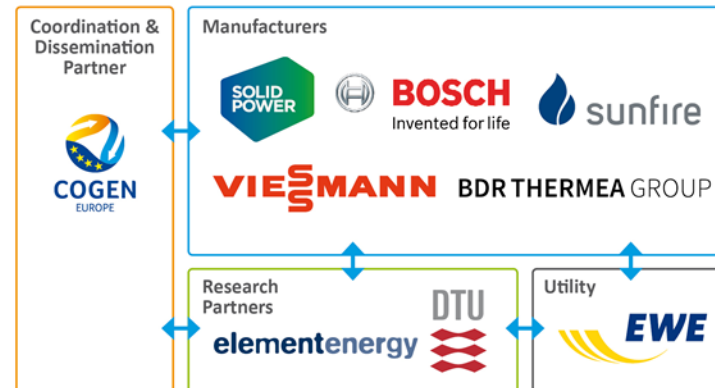
Video available at: <https://www.youtube.com/watch?v=3JX5HL-gu1I>



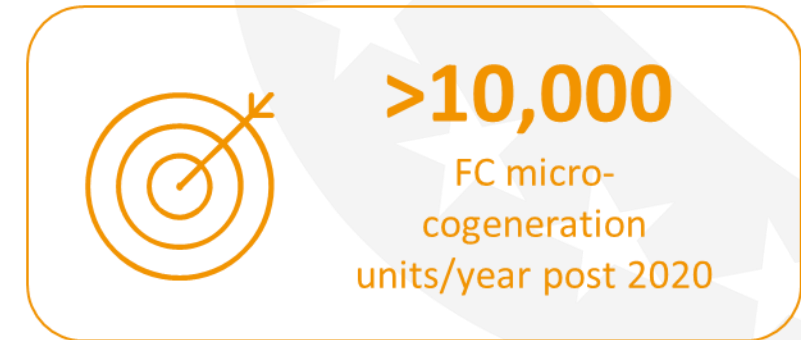
- Field trial + installer training + targeted market & policy development activities
- Field trial + local installer training

Promoting a successful transition to the large scale uptake of Fuel Cell micro-Cogeneration across Europe

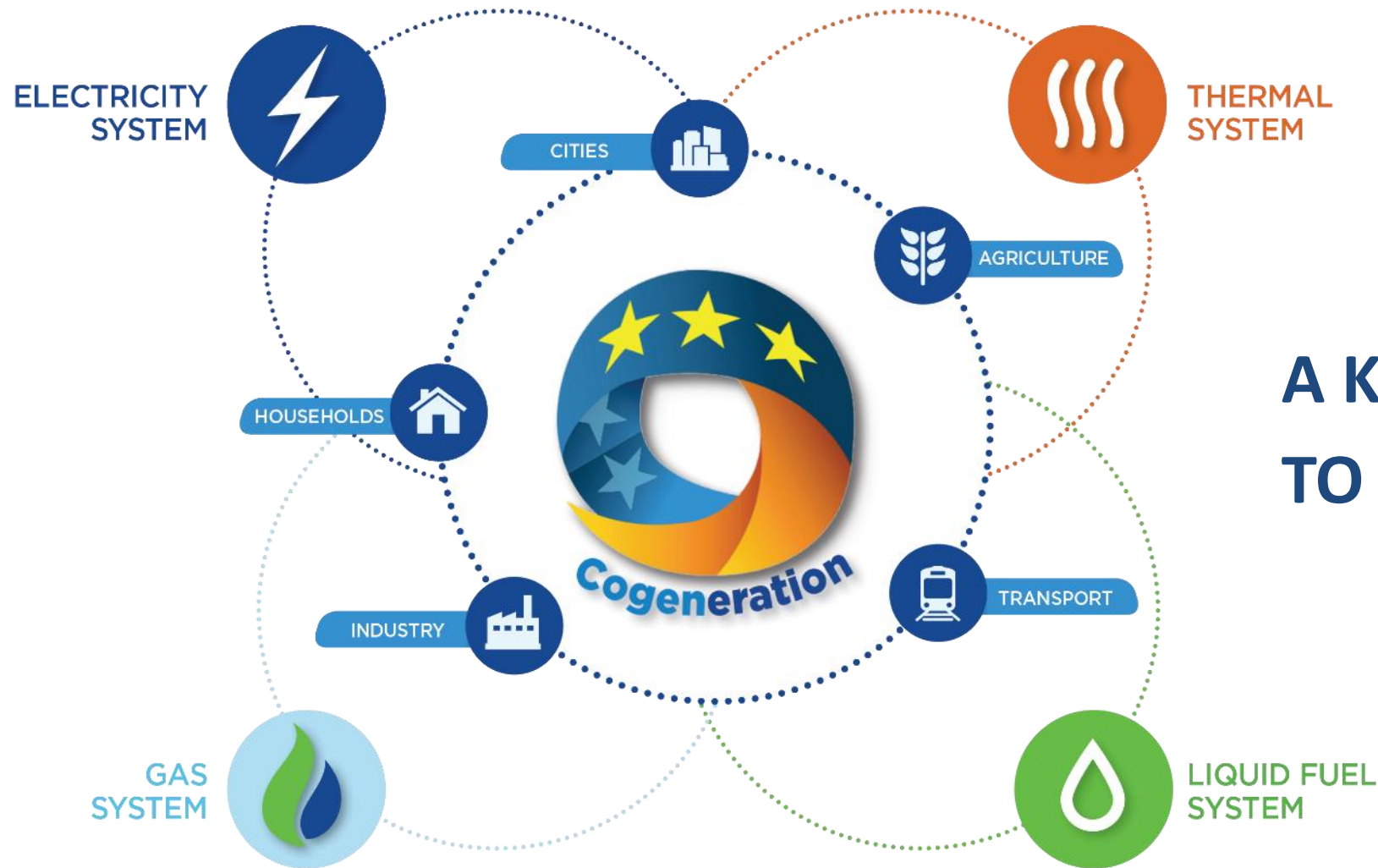
9	> 2,800	>500	10	4	€90m
Partners	Fuel Cell micro-Cogeneration units	Systems per manufacturer	Countries	Countries	Total budget
Representing manufacturers, utilities & research community	To be deployed across Europe between 2016-2021	Established production capacity per manufacturer	Where the units will be installed	Selected for policy & market development (Belgium, Italy, Netherlands and UK)	Including €33.9m Horizon 2020 funding via FCH JU



Read more: www.pace-energy.eu



CHP: Key local integration solution



**A KEY ROLE TODAY
TO GROW IN THE FUTURE**

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