GrDF 2030
Preparing the future

IGU – PGCE

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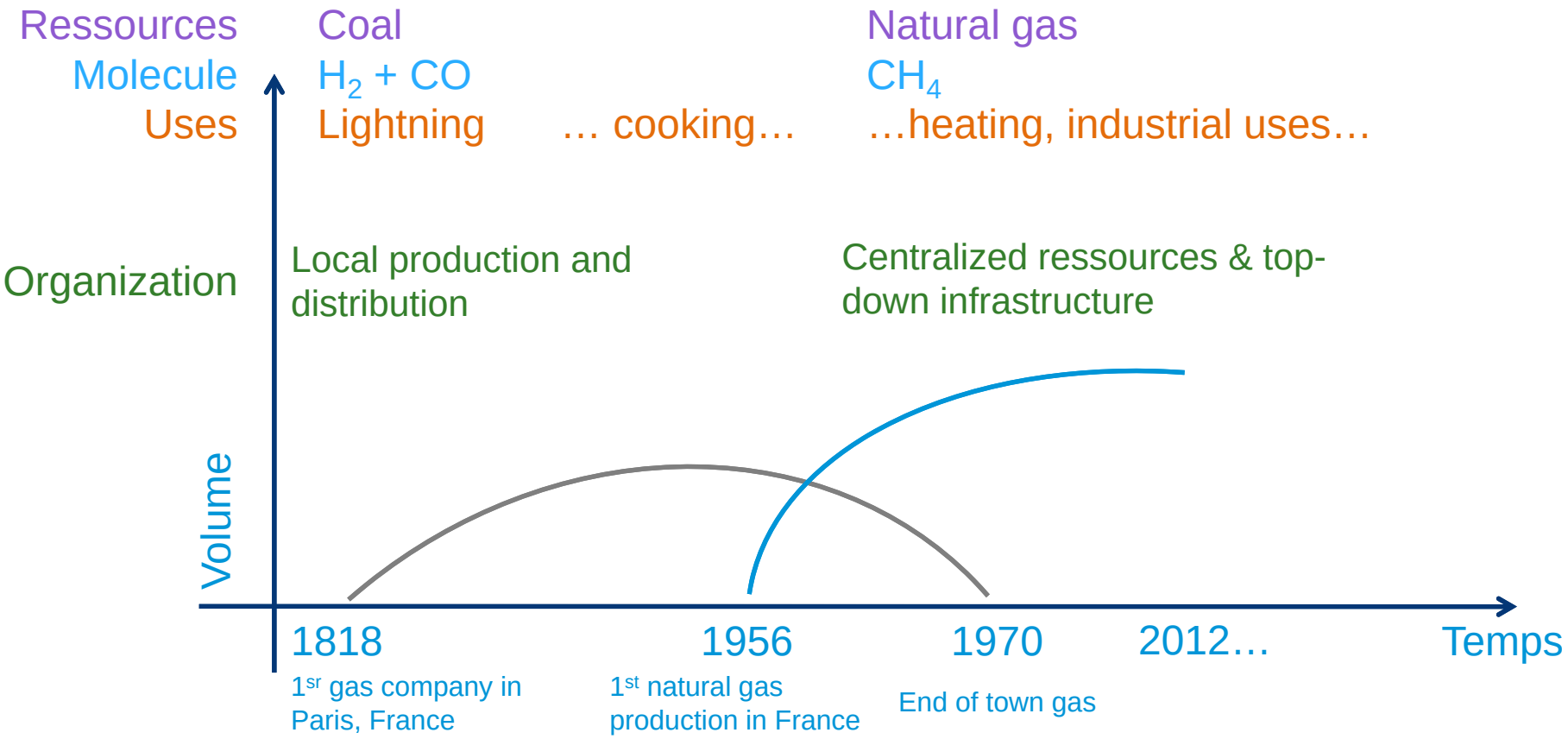
History of gas : a historical transition



- Gas industry successfully managed the first energy transition
- What the next transition means for us ?

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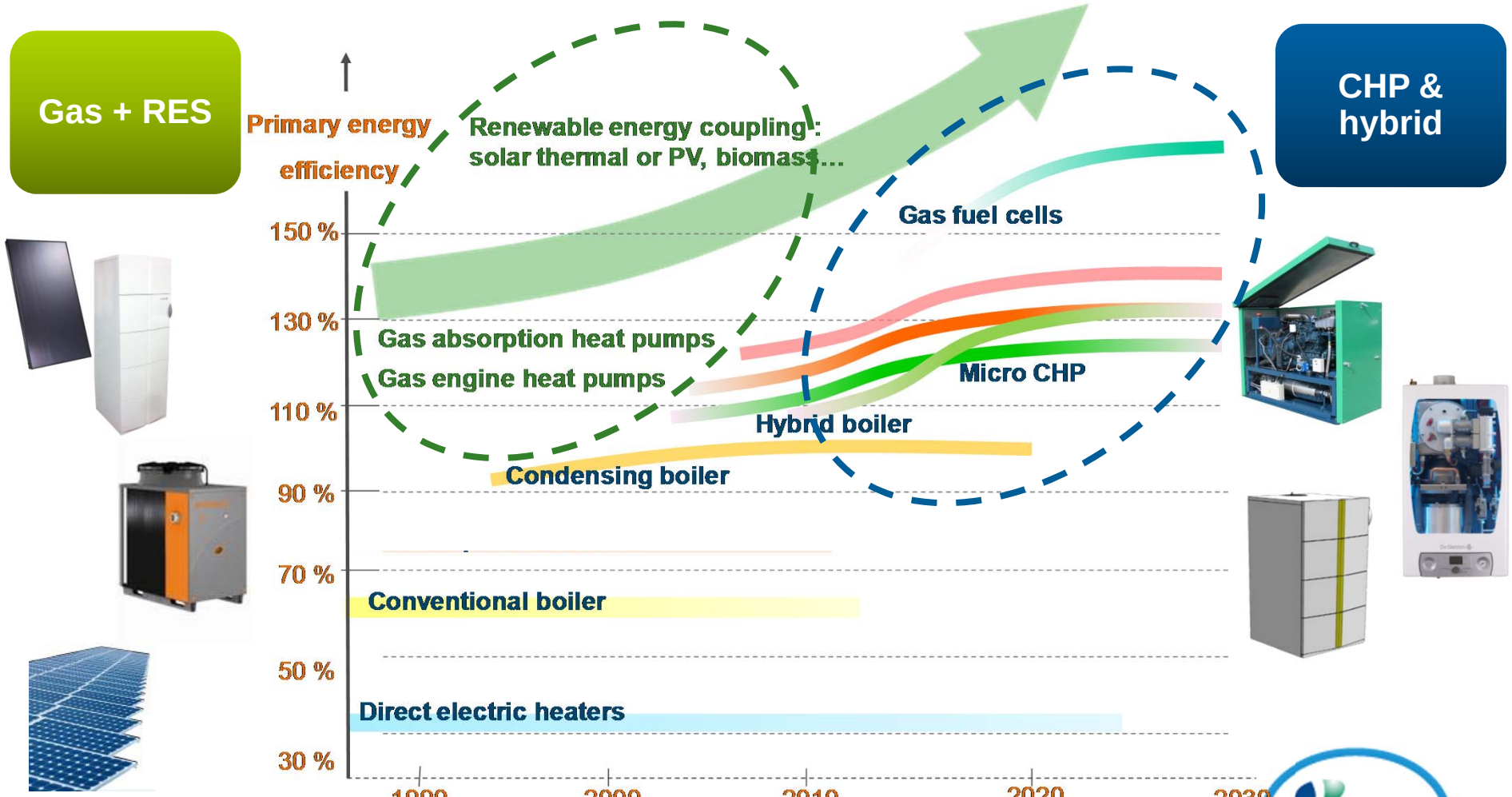
2. Gas resources

3. Smarter gas infrastructure

Gas uses (1/3) : heat & DHW for building

Gas technologies are a real asset for energy efficiency toward 2020-2030



Gas uses (2/3) : industry

Overall optimization of process/fluids/heating & new consumption to respect environmental constraints

- Gas consumption is expected to decrease due to overall optimization of energy uses for process, fluids and space heating
- But industrial sites have to evolve to respect stricter environmental constraints and new policies
  - In the short term, investments in downstream treatment with possible new gas uses
  - In the long term, investment in process using directly less polluting energy such as natural gas




Gas uses (3/3) : sustainable mobility

CNG & bio-CNG are a key technology for sustainable mobility

- CNG & dual-fuel vehicles are a mature available solution, with high environmental and economic gains
- Even in 2030, electric vehicles will not be suited to long distance travels & carriages, heavy duty uses (bus, taxi…)
- Since 2011, CNG is the first alternative fue in the world, +18% market growth per year

- Bio-CNG is the biofuel presenting the best sustainability impact assessment. Produced from waste or solid biomass, bio-CNG is not in competition with human food production





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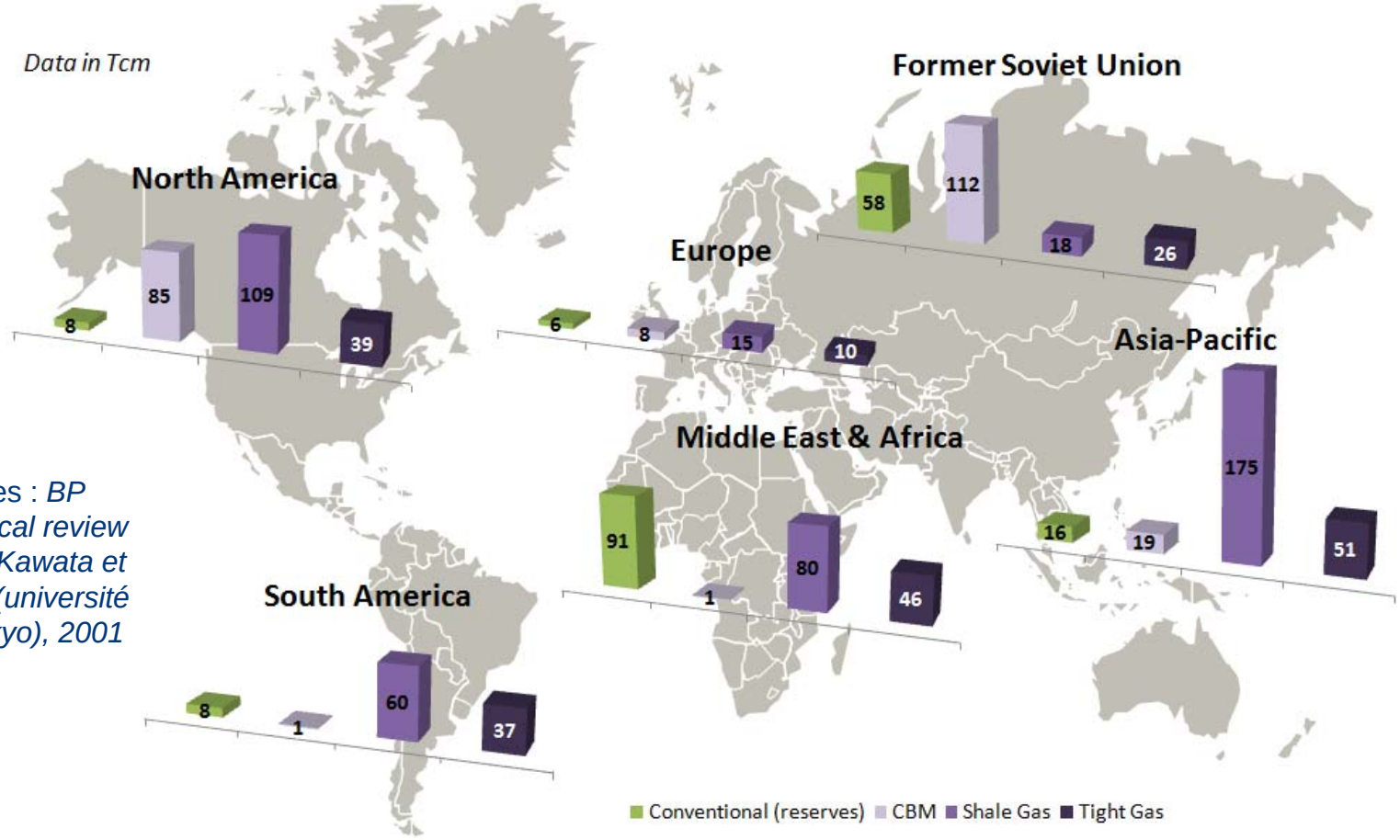
1. Gas demand evolution

3. Smarter gas infrastructure

Gas resources (1/5) : natural gas

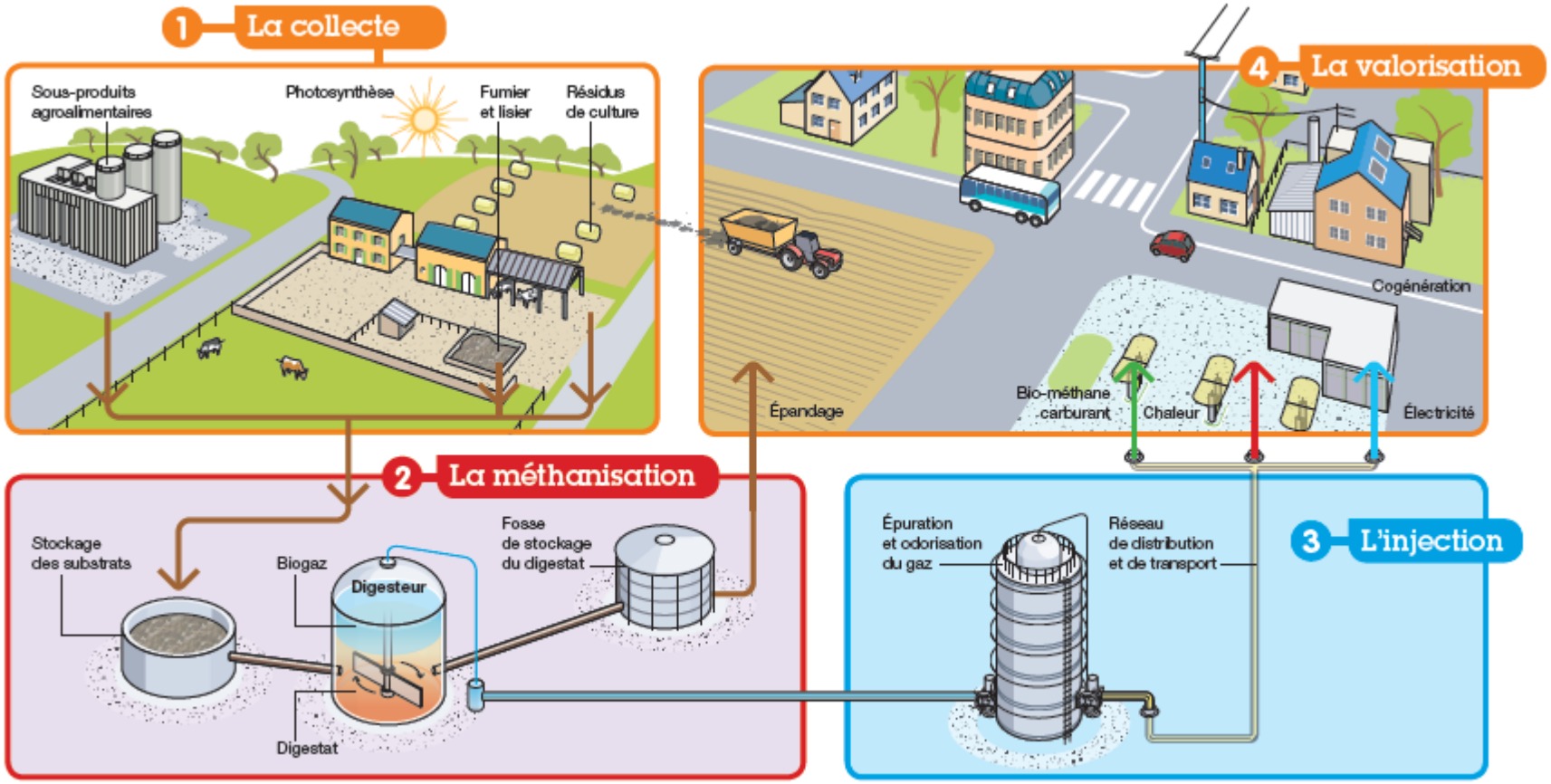
Natural gas from conventional & unconventional sources will meet the demand



Sources : *BP statistical review 2010, Kawata et Fujita (université de Tokyo), 2001*

Gas resources (2/5) : biomethane

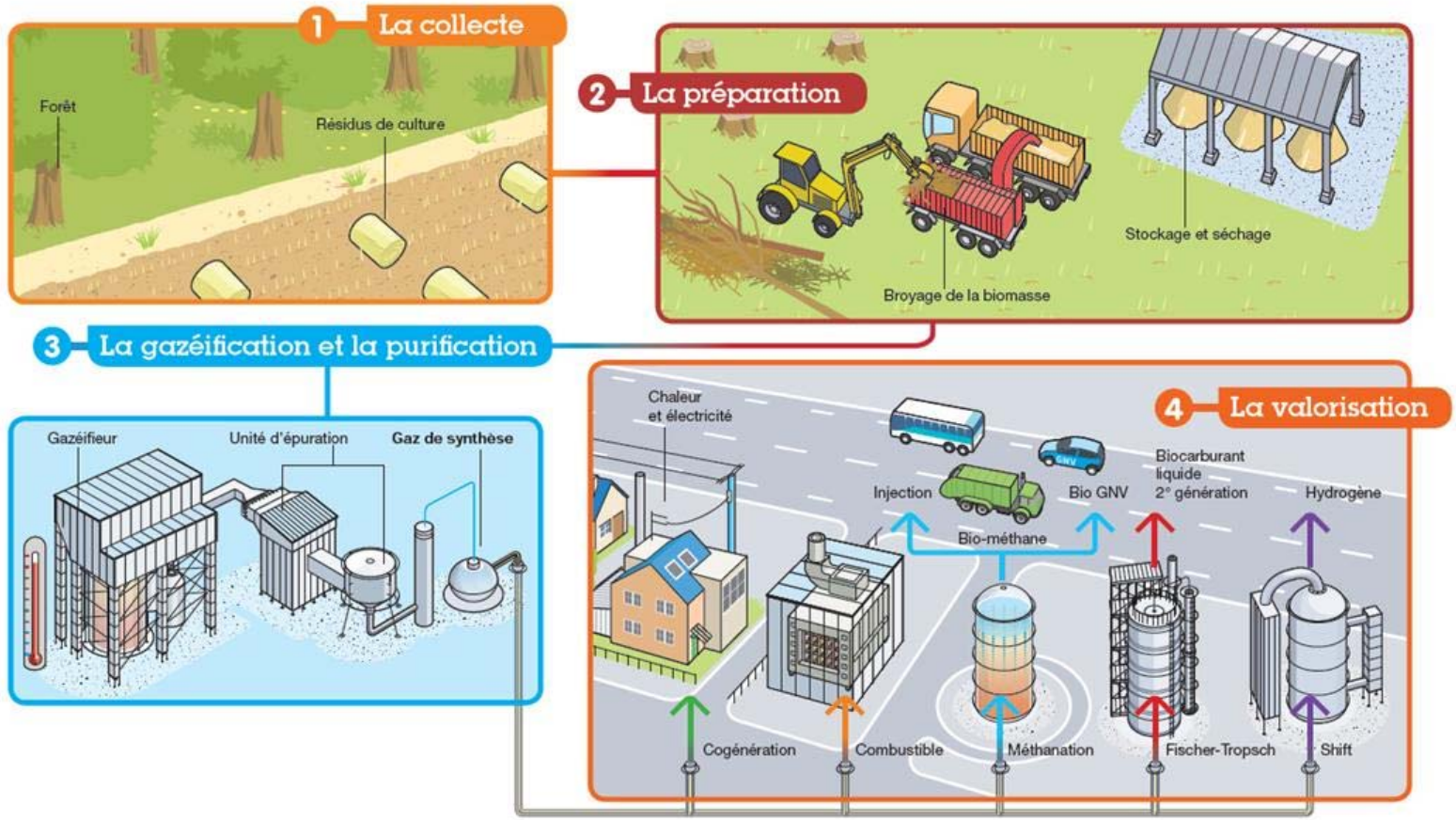
Currently available technology : waste anaerobic digestion



- An expanding technology in Europe driven by waste treatment and renewable development preoccupation

Gas resources (3/5) : gasification

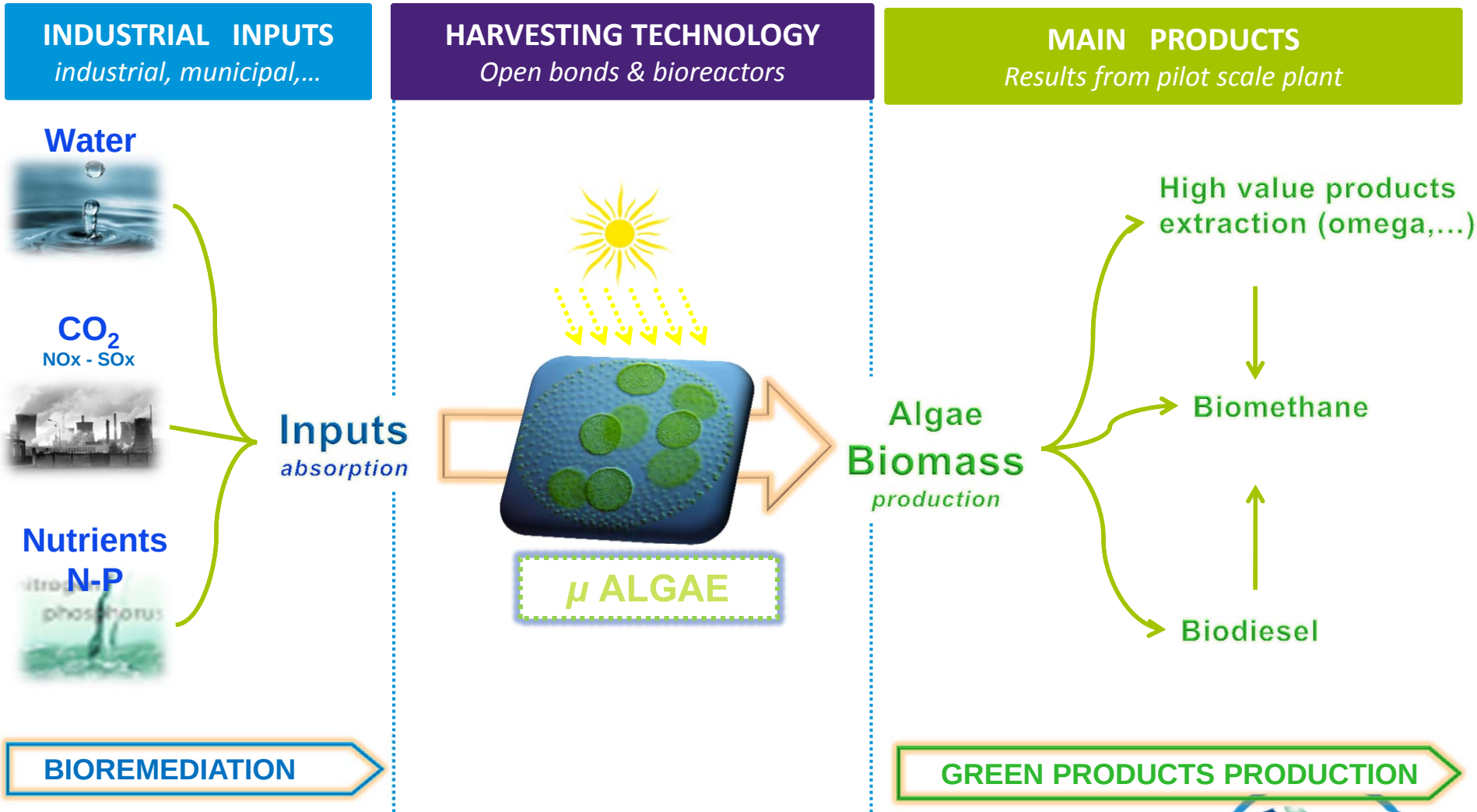
A high efficiency technology at industrial pilot stage



- Key competitive advantage: a conversion efficiency 25% higher than liquid biofuel competitors

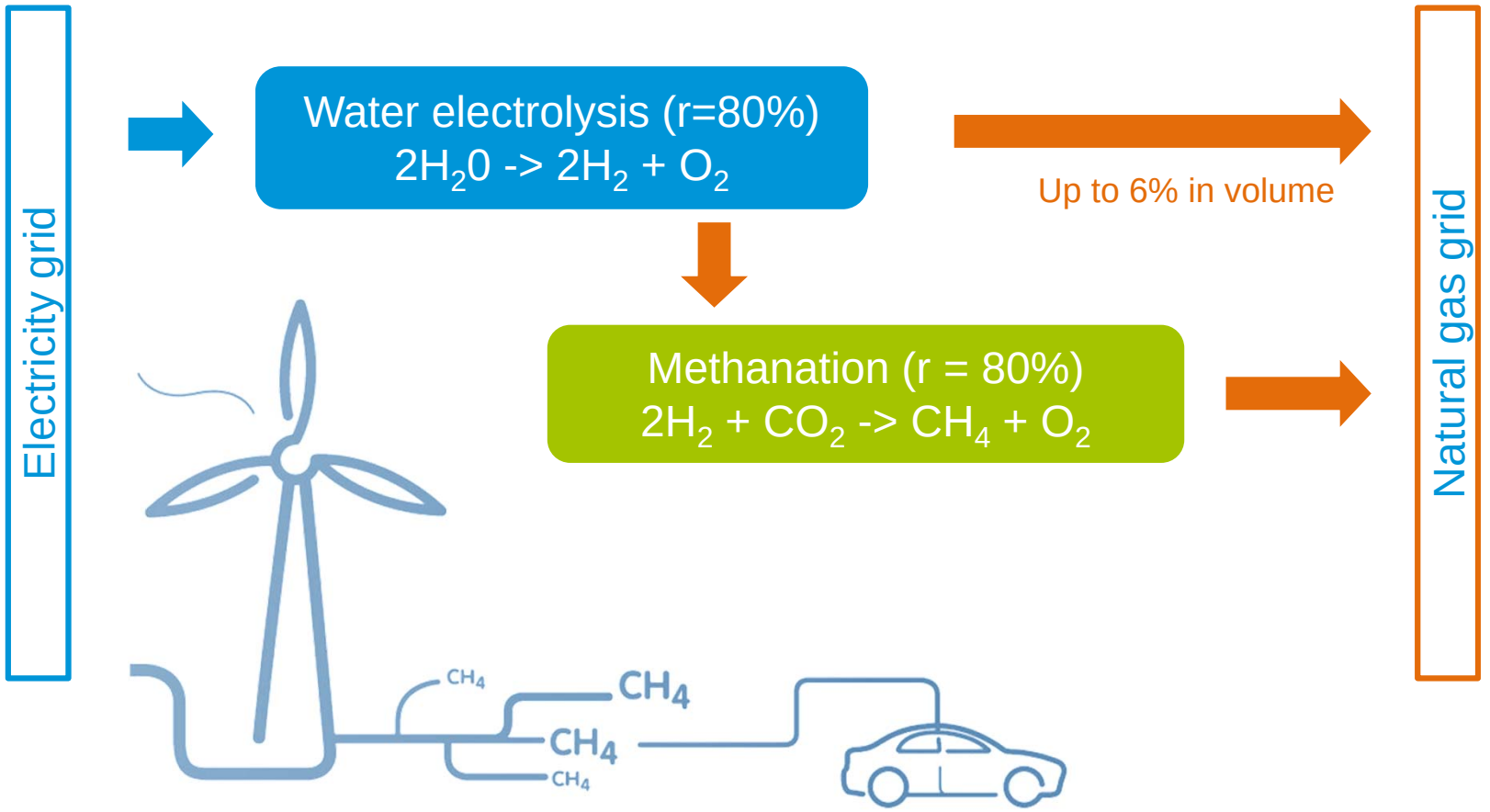
Gas resources (4/5) : Biogas from microalgae

A promising technology



Gas resources (5/5) : Hydrogen & methanation

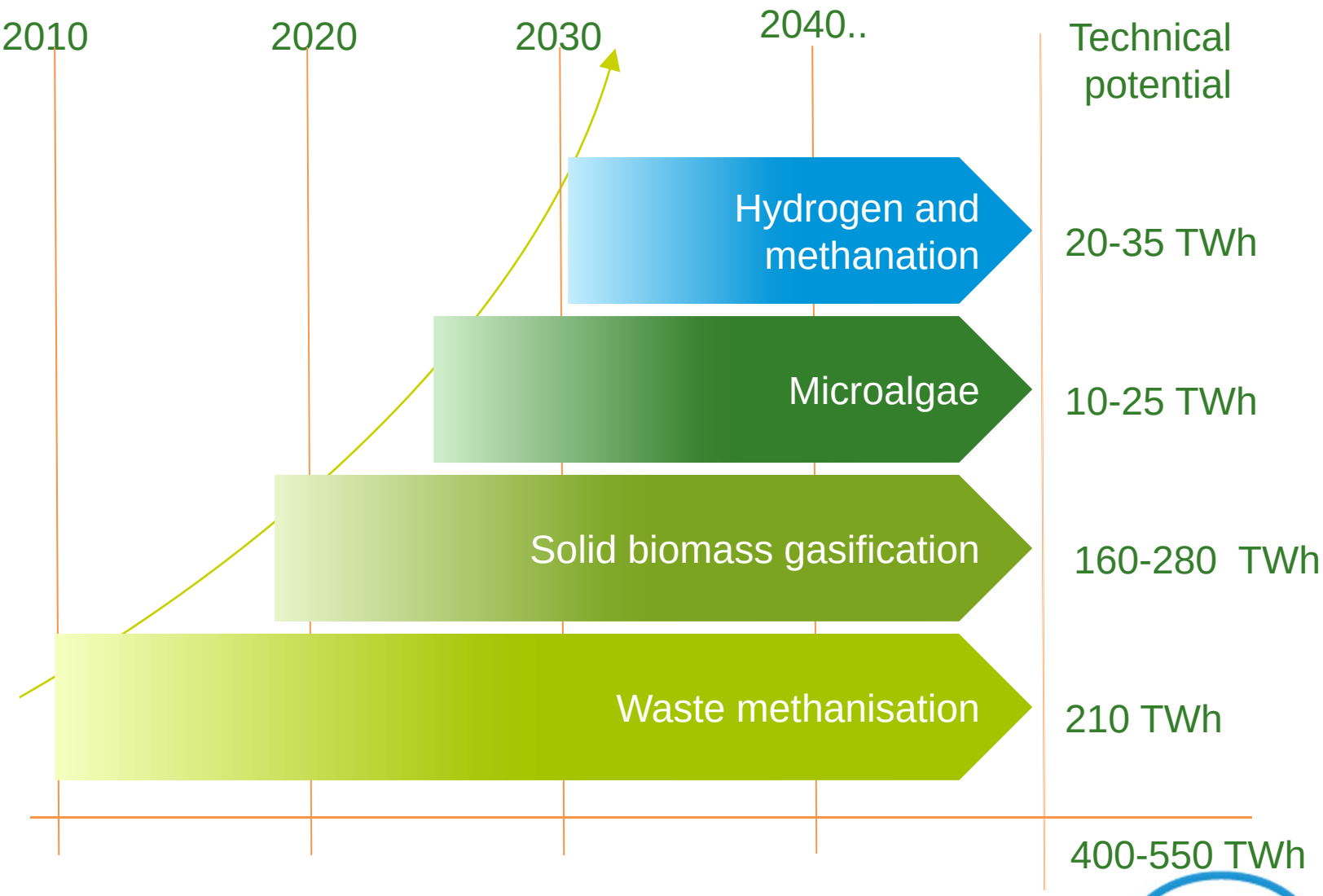
A path to convert green electricity



- Hydrogen and syngas from methanation can play a major role in electricity conversion if intermittent generation exceed demand

Gas resources conclusion

A 100% green gas supply is technically feasible



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1. Gas demand evolution
2. Gas resources

Gas grid (1/4) : smart meters

Better grid knowledge & better empowerment of end-users to optimize their energy use

1 **Customer satisfaction**

2 **Energy savings**

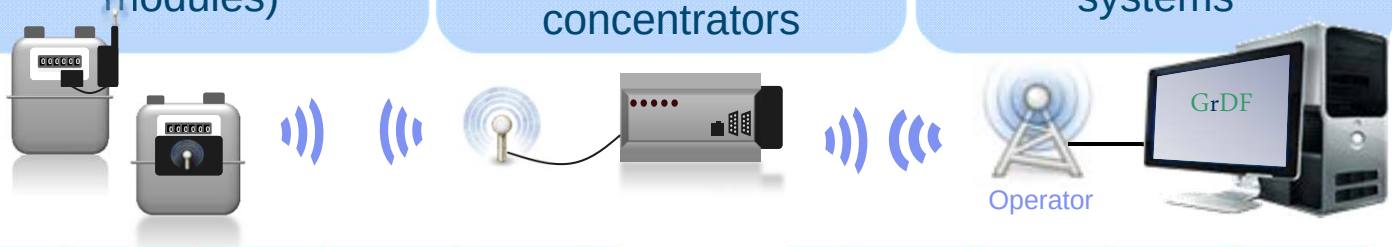
3 **DSO's efficiency**

The project consists in …

The replacement of **11 millions new meters** (or radio modules)

The installation of **a communication network** of around 20,000 concentrators

New information systems and impacts on existing systems



2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020	
S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2

Experiments | Design, Construction, Tests | General roll out

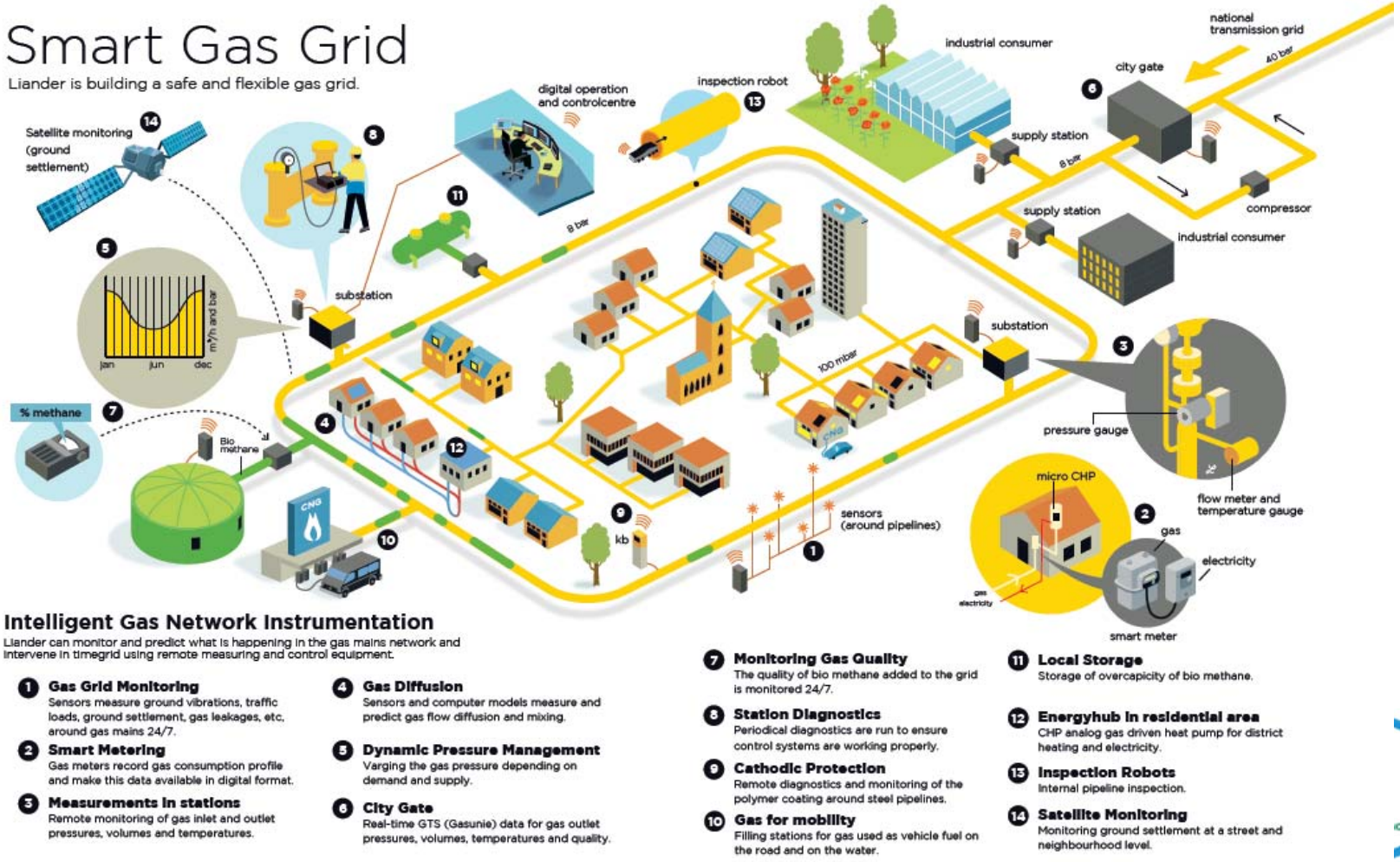
Decision for construction phase

Decision for the roll out

Gas grid (2/4) : smart gas grid

Improving efficiency and security in operation and emergency response

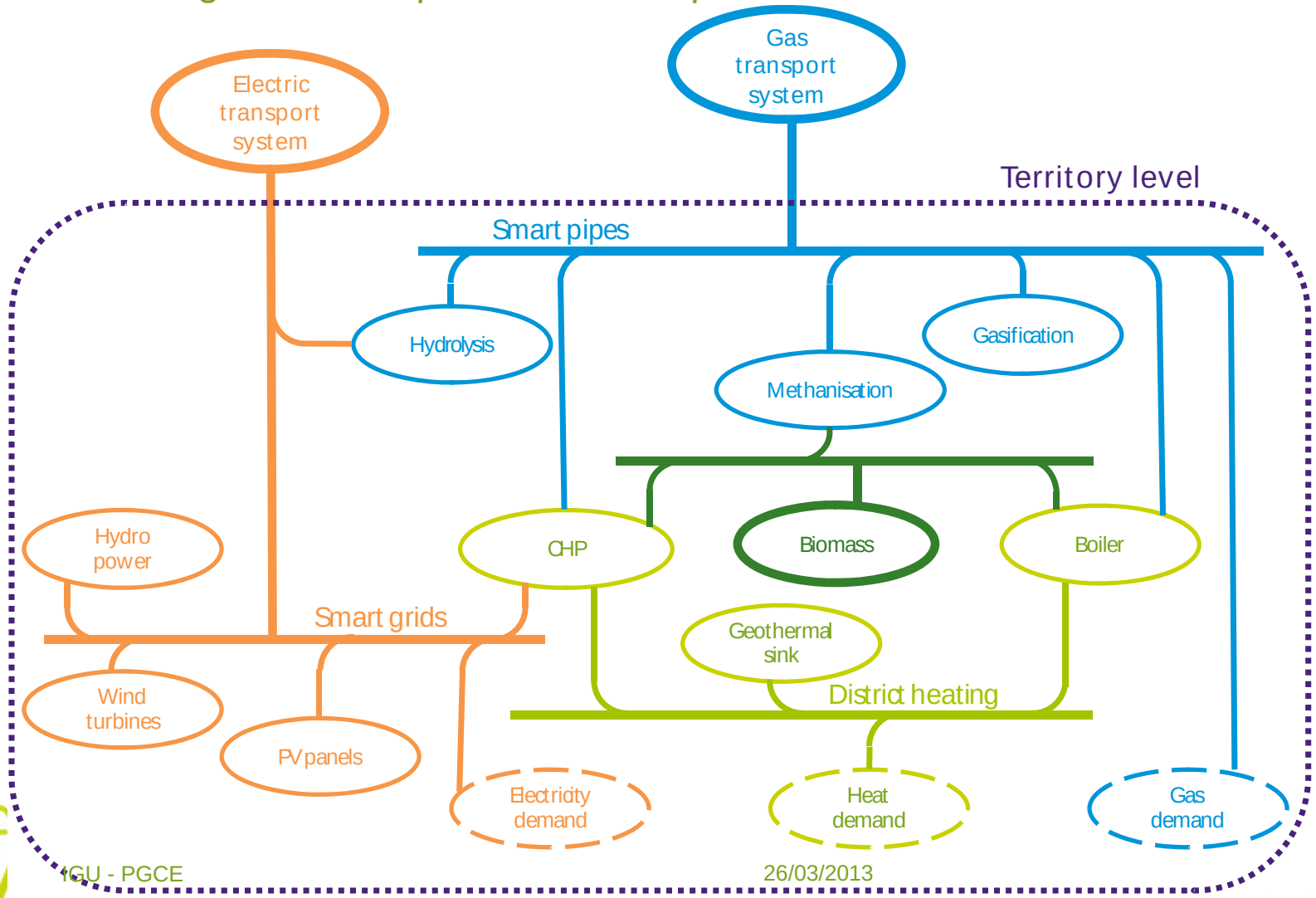
- Thanks to system robustness and gas properties, quality of operation is good but can be improved tomorrow with gas smart grids



Gas grid (3/4) : smart networks

Interactions between all urban infrastructure including gas grid allow new optimizations

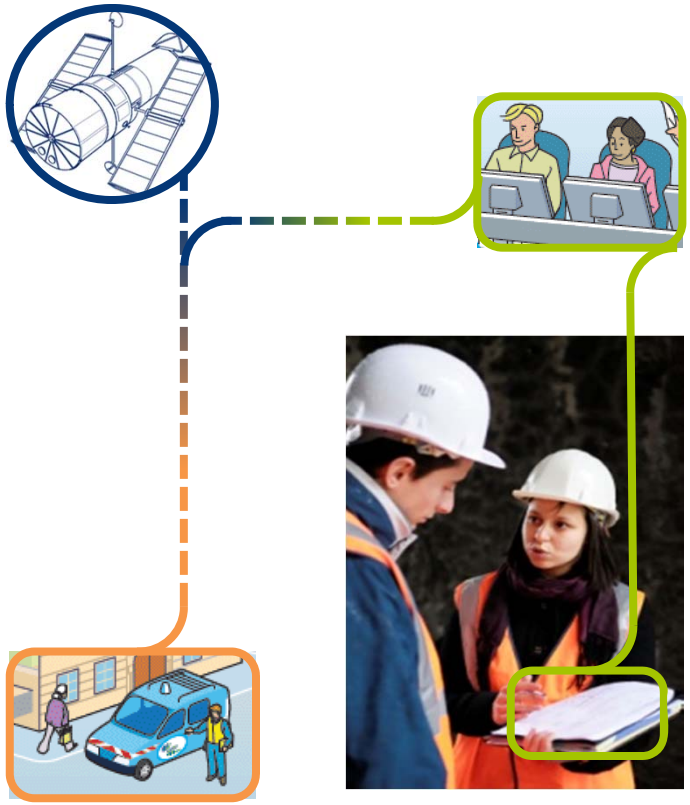
- Gas smart grids will be part of overall optimization of urban infrastructures



Gas grid (4/4) : smart people

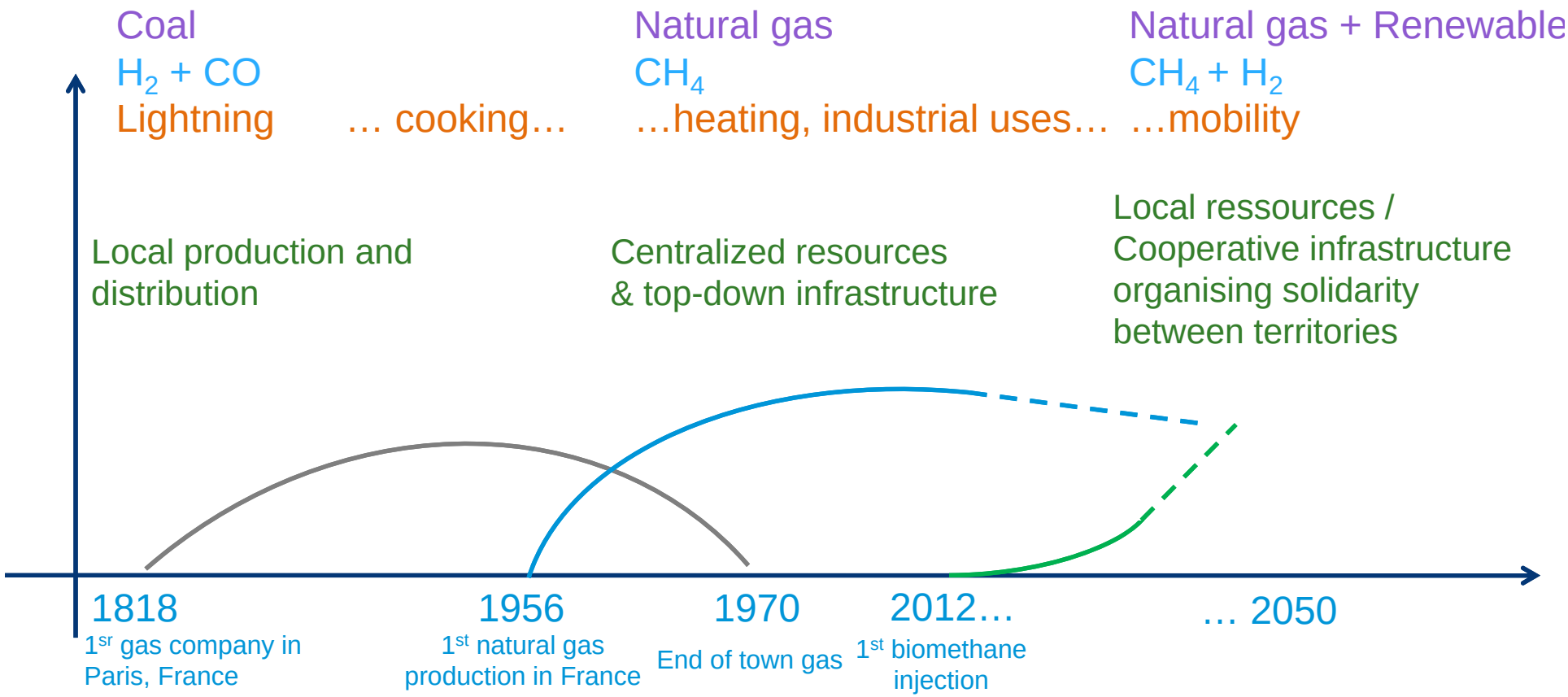
The skills of gas distribution system operators will be enhanced by the use of communication technologies

- Operators are being equipped with new technological devices to improve their efficiency
  - Advanced communication terminal for equipment identification (RFID), distant database interrogation…
  - Geosatellite positioning of service vehicles linked with advanced grid and urban mapping



- The future of grid operations will still strongly rely on human skills

Future of gas : an already engaged transition



- Gas industry is able to lead the next energy transition for a more sustainable growth

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Thank you !