

COGEN EUROPE

Towards an efficient, integrated and cost-effective
net-zero energy system in 2050



COGEN
EUROPE

Our Vision

Resilient, decentralised
and carbon neutral
European energy system
with cogeneration as its
backbone

2050

Our 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.

Members

National Associations



Corporate Members



Heating & Cooling is “hard to decarbonise”



Buildings & districts

- **40%** of energy consumption & **36%** of GHG emissions.
- **80%** of buildings demand comes from heating and hot water
 - **High seasonal differences** between summer & winter
- **75%** is based on inefficient and oil boilers
- Only up to **45%** of heat could be electrified.



Industry

- **70%** of industry's total energy demand is represented by H&C
- Large amounts of **high temperature heat** needed in chemical, pulp & paper, food& drink, ceramics, greenhouses, alumina refineries across the EU
- **Electrification not cost-effective** in most cases

**CHP is a key solution to deliver efficient H&C
across a range of increasingly RES fuels**

COGENERATION

Single Input

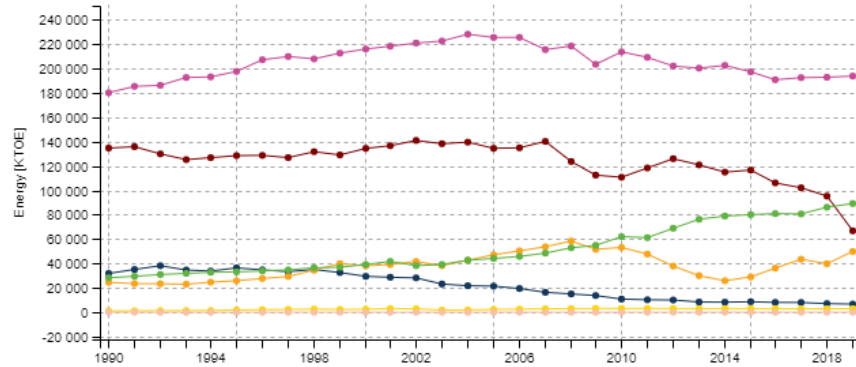
Two Outputs



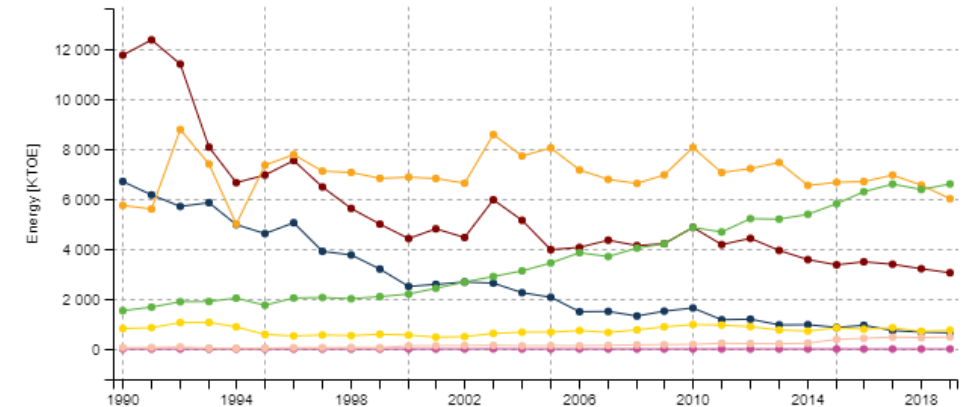
Cogeneration transforms 90% of the energy into useful heat and electricity for factories, offices, public buildings and homes.

FUEL MIX TRENDS IN ENERGY

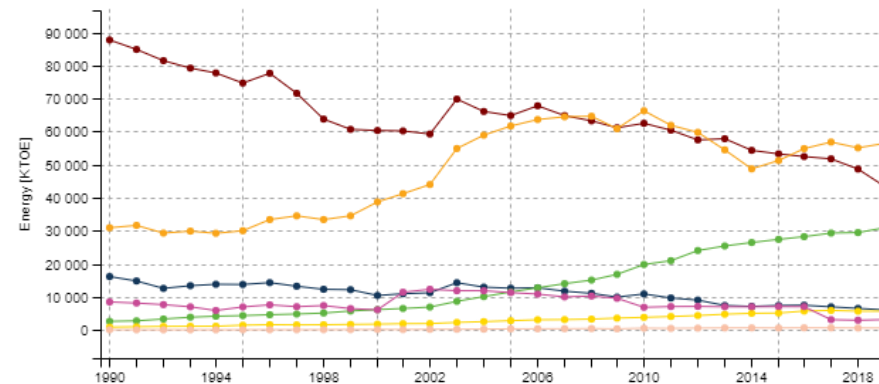
Fuels going into Electricity only
European Union (27 countries)



Fuels going into Heat only
European Union (27 countries)

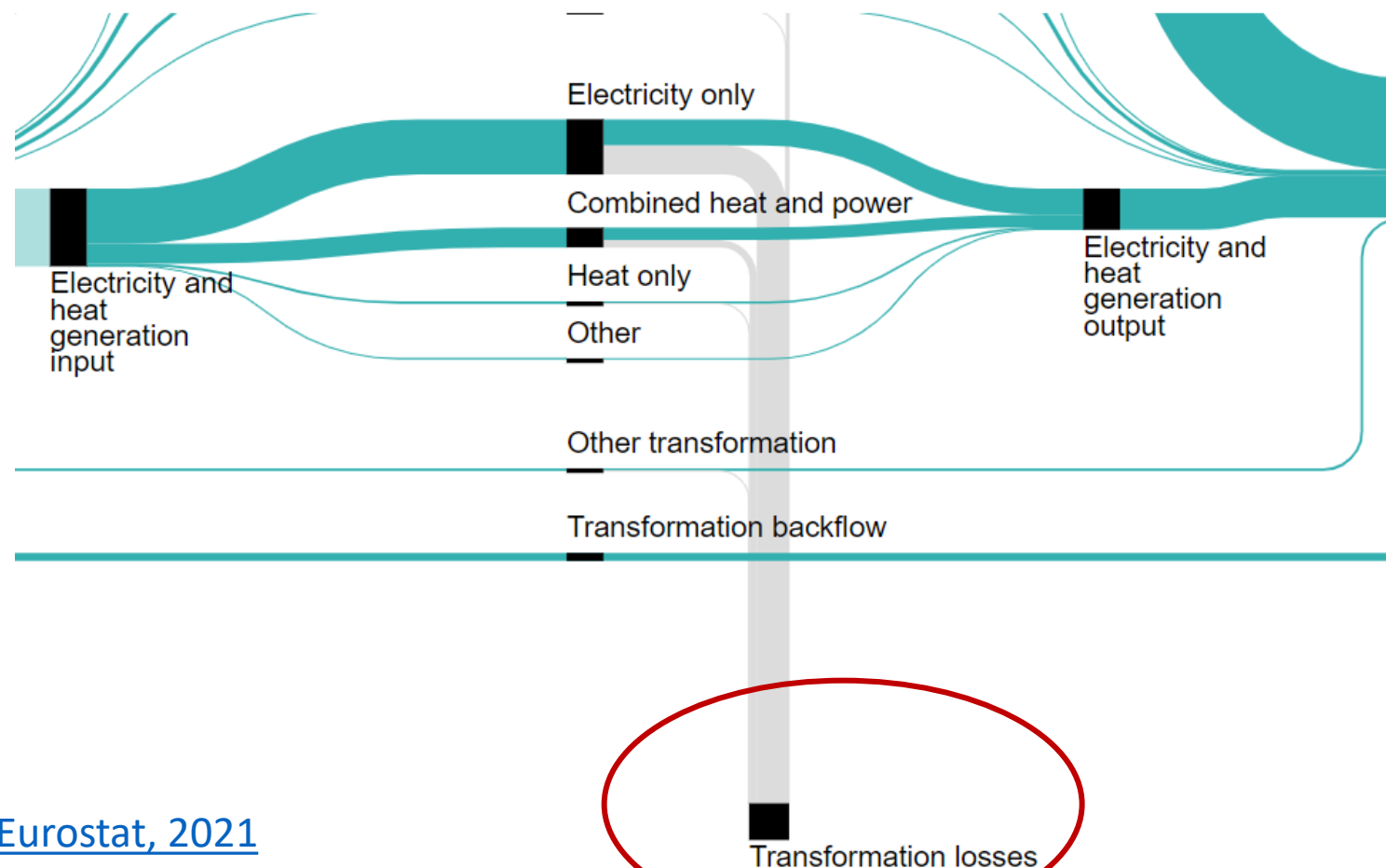


Fuels going into Combined heat and power
European Union (27 countries)



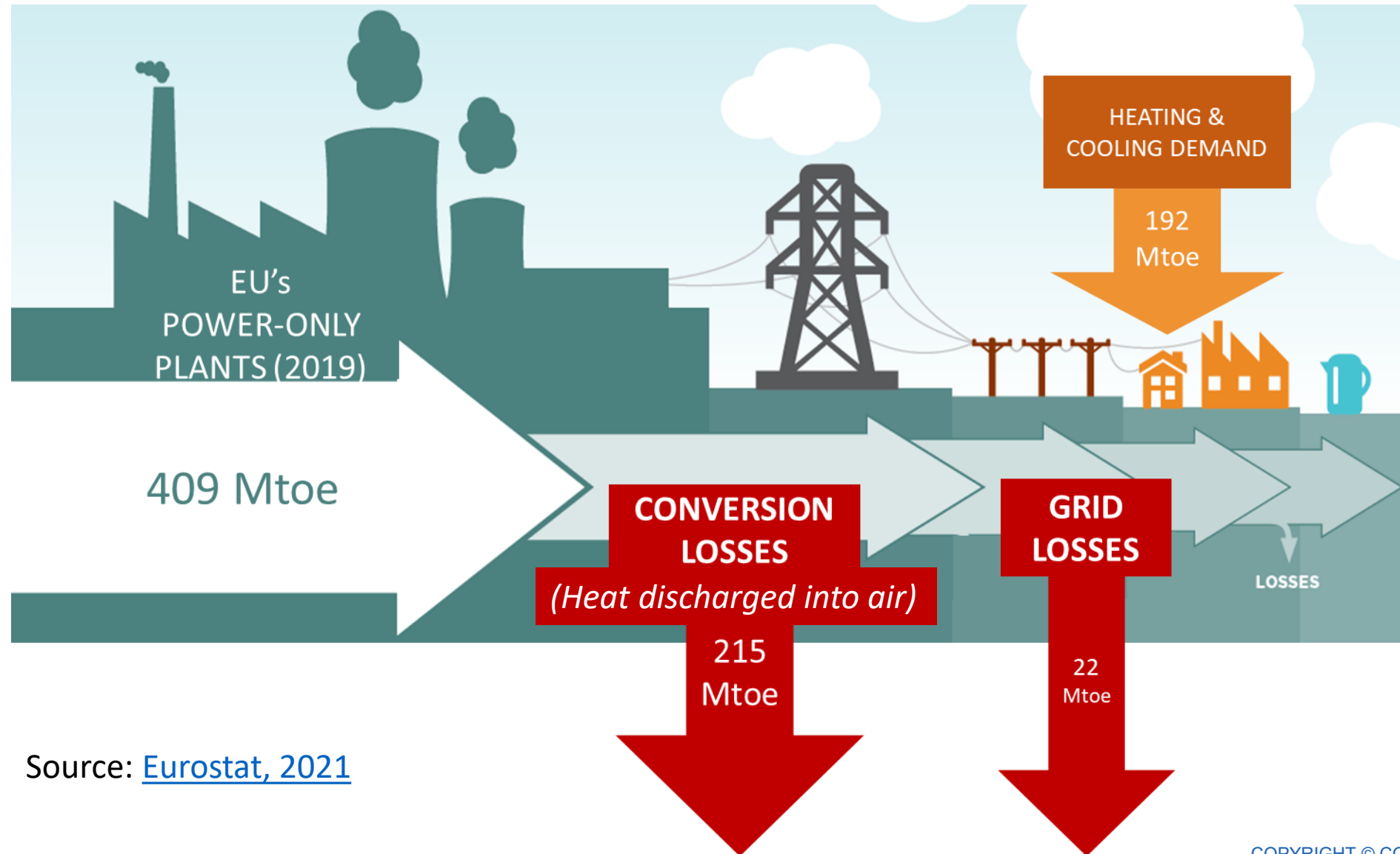
■ Solid fuels
 ■ Oil and petroleum products
 ■ Gas
 ■ Renewable energies
 ■ Non-renewable waste
 ■ Nuclear heat
 ■ Heat

LOSSES IN ENERGY PRODUCTION (2019)

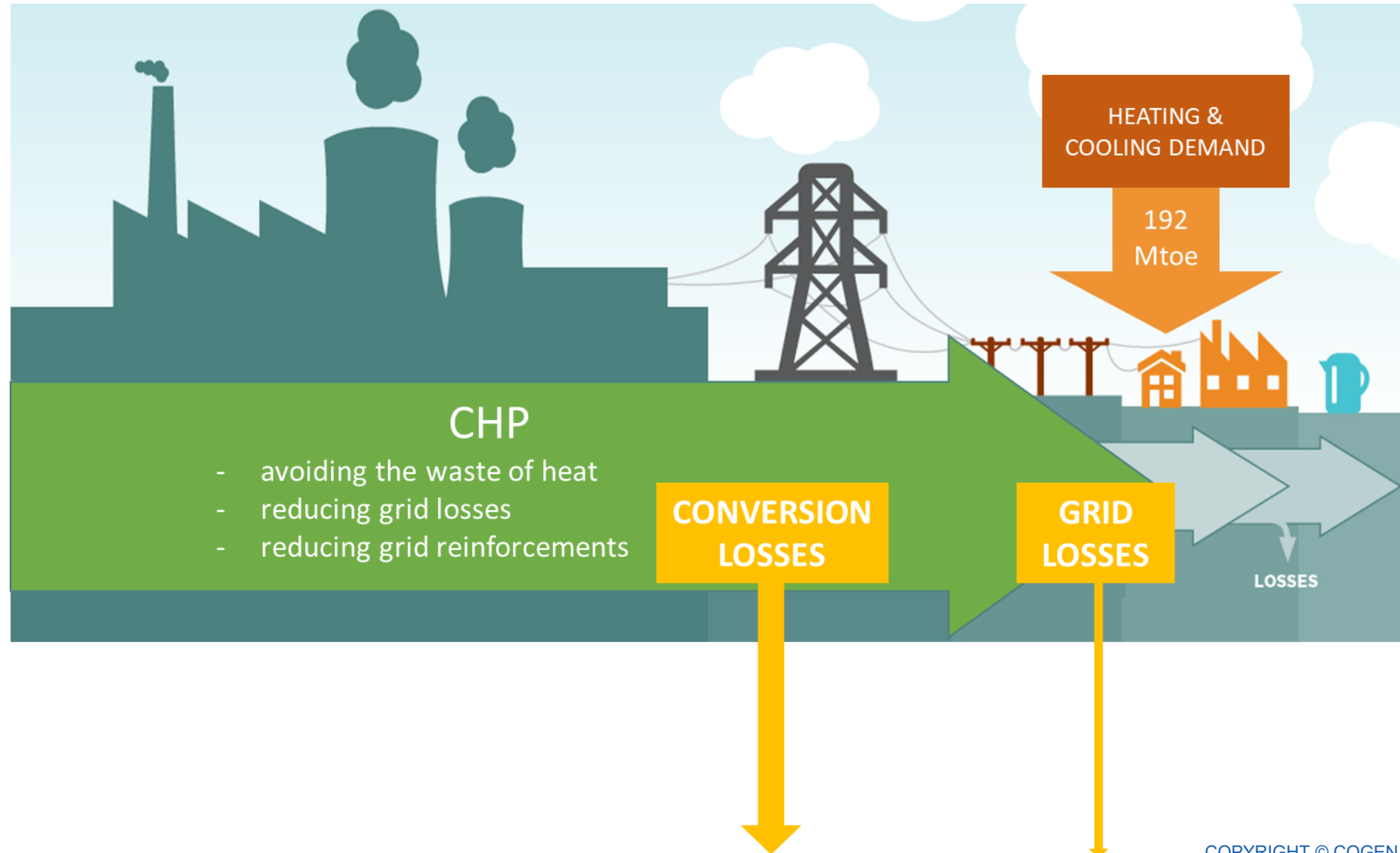


Source: [Eurostat, 2021](#)

EFFICIENCY OPPORTUNITIES IN POWER SECTOR



ROLE OF CHP IN SYSTEM EFFICIENCY



COGENERATION EFFICIENCY EXPLAINED

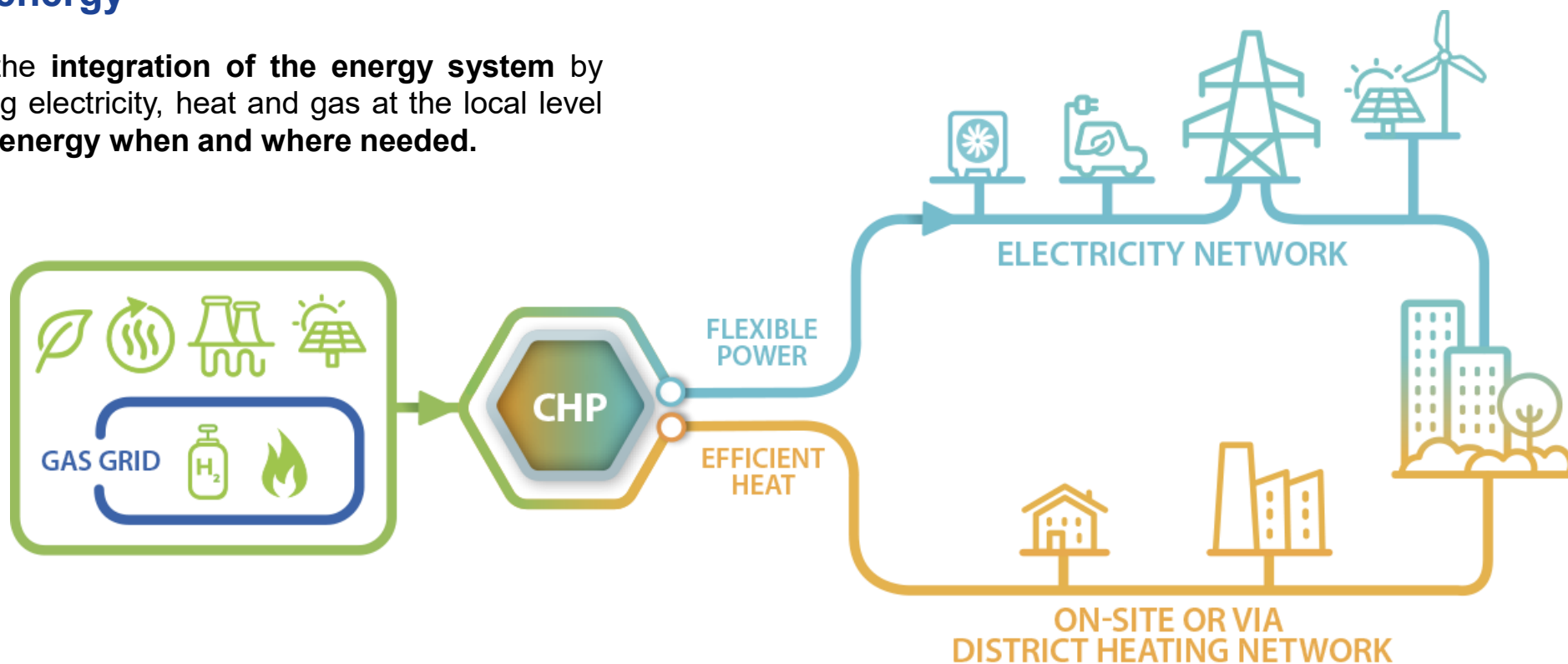


- **CHP generates 40% more productive energy** than an average boiler and power plant.
- **CHP saves at least 10%** in primary energy compared to best in class boiler or power plant.
- **CHP avoids the waste of heat.**

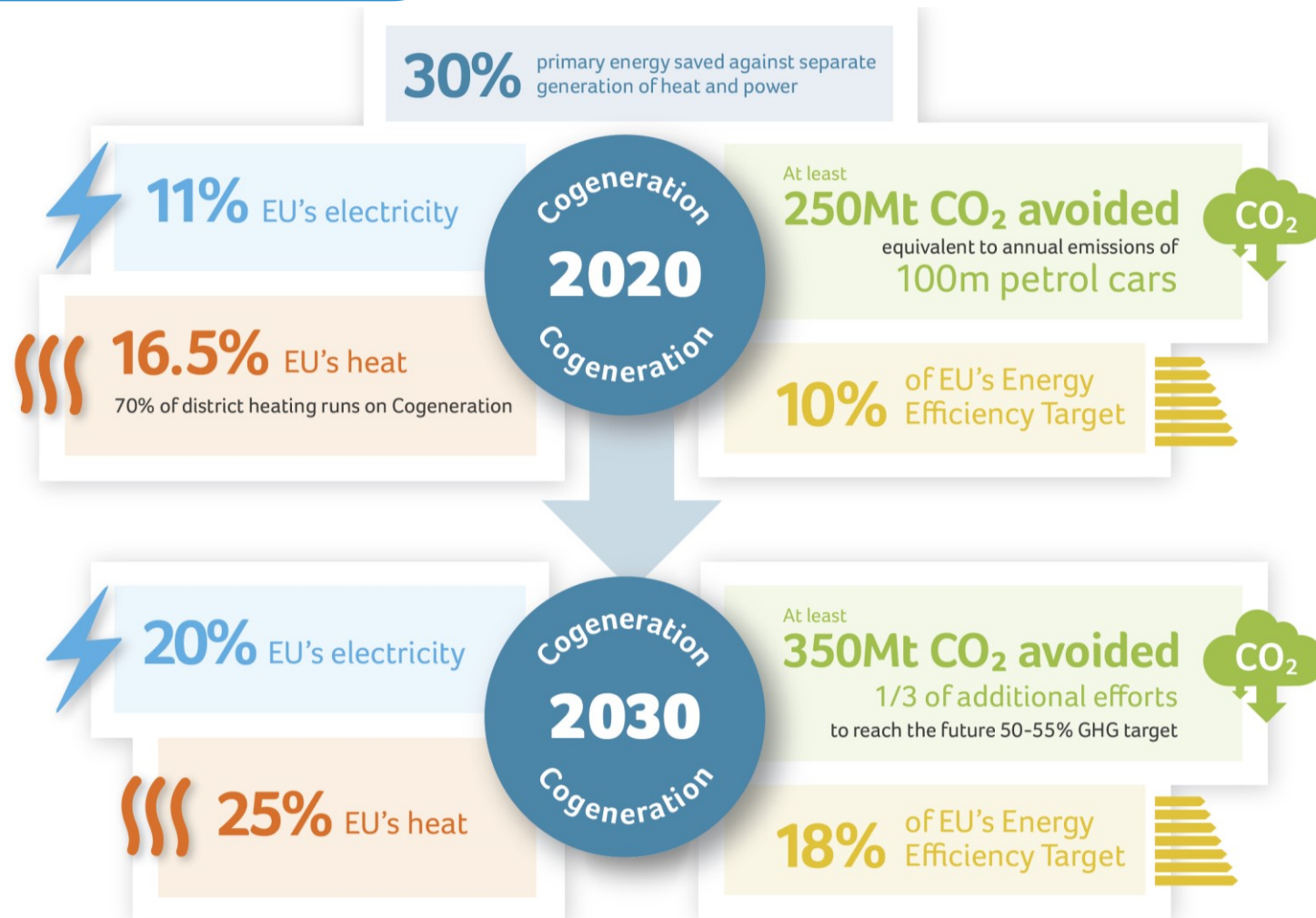
System Focus

Cogeneration: backbone of local and integrated energy

CHP enables the **integration of the energy system** by efficiently linking electricity, heat and gas at the local level and **providing energy when and where needed**.



Relevance of CHP for EU's Green Deal



Cogeneration at the very heart of Europe...



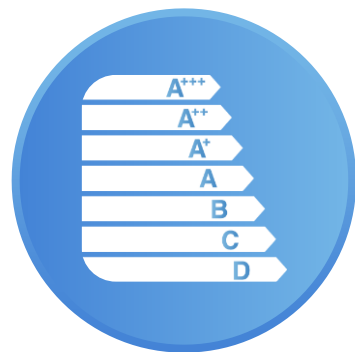
All rely on CHP for efficient heat and power.

CHP's Multiple Benefits in 2050



€4-8 Bn

cost cuts for
energy system
every year



150–220 TWh

↑ primary energy savings
across energy system



3.8 – 5.5
Mt CO₂

↓ reduction in
remaining CO₂
emissions



13-16%*
of total electricity

and ~30-36% of flexible
**thermally generated
power** at times of low
wind & sun and to cover
peak demand



19-27%**
of total heat

and **52-100%***** of
thermal heat in
buildings, industry
& district heating

* excluding off-grid RES for P2X generation.

** excluding furnaces.

*** excluding furnaces; DHC for industry is 100% CHP.

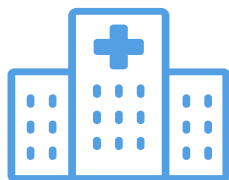
Cost Savings for CHP Users

up to 800 €*
for 10 MWh



Family Home
(hydrogen fuel cell)

6 - 52k €
for 8 GWh



Hospital

0.4 - 3M €
for 500 GWh



District Heating (DHC)

3 - 10M €
for 684 GWh



Industry
(high-temperature)

1.5 - 7.1M €
for 500 GWh



Industry
(medium-temperature)

0.9 - 16M €**
for 700 GWh



Industry and City DHC
(using residual and industrial waste and biomass)

*Based on retail power prices including taxes, levies and grid costs, self-consumed electricity and hydrogen retail price of 80-100 €/MWh. All other user cases assume cogenerated electricity is sold to market at wholesale electricity prices, excluding taxes.

**Based on biomass price of 40-60 €/MWh.

Recommendations for boosting EU's energy efficiency ambitions

1 Implement **energy AND SYSTEM efficiency first** across all energy and climate legislation in Fit for 55

3 Prioritise **cogeneration for over less efficient generation** (i.e. power-only and heat only generation).

Promote **energy efficiency across the entire energy value chain:**

- 2
- in **energy generation, transmission, distribution** and use
 - for **all energy sources**, including renewables
 - for both **primary** and final energy
 - **across energy vectors**, electricity, heat and gas

4 Foster **cogeneration to complement direct electrification**, when variable renewable sources are not available.

Hans Korteweg
Managing Director – COGEN Europe
E-mail: hans.korteweg@cogeneurope.eu

Phone: +32 (0)2 772 82 90
Website: www.cogeneurope.eu
Twitter: @CogenEurope

COGEN Europe • The European Association for the Promotion of Cogeneration

Avenue des Arts 3-4-5, 1210 Brussels, Belgium • T +32 (0)2 772 82 90 F +32 (0)2 772 50 44 info@cogeneurope.eu • www.cogeneurope.eu

