COGEN EUROPE

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

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European Energy Forum (EEF)
Dinner Debate: Energy Efficiency & Industry

Strasbourg, 8 June 2022

OUR 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

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

COGEN · COGEN Czech · atee Association Technique Energie Environnement · B.KWK · MKET Magyar Kapcsolt Energia Társaság · ITALCOGEN · Kogen Polska · COGEN Portugal · Jožef Stefan Institute, Ljubljana, Slovenia Energy Efficiency Centre · COGEN España · Turkish Cogen and Clean Energy Techn. Association · Combined Heat and Power Alliance

Corporate Members

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Industrial Process Heat is “Hard to Decarbonise”

- Industrial competitiveness depends on the **continuous, affordable and secure supply of energy.**
- **Process heat at medium/high temperature represents 70%** of industry’s total energy demand.
- **Electrification of process heat is not technically possible or cost-effective** in most cases.
- Industrial decarbonisation will rely on a **mix of energy efficiency & uptake of low carbon, decarbonised and renewable sources, including on-site cogeneration.**

COGENERATION

Single Input

Two Outputs

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

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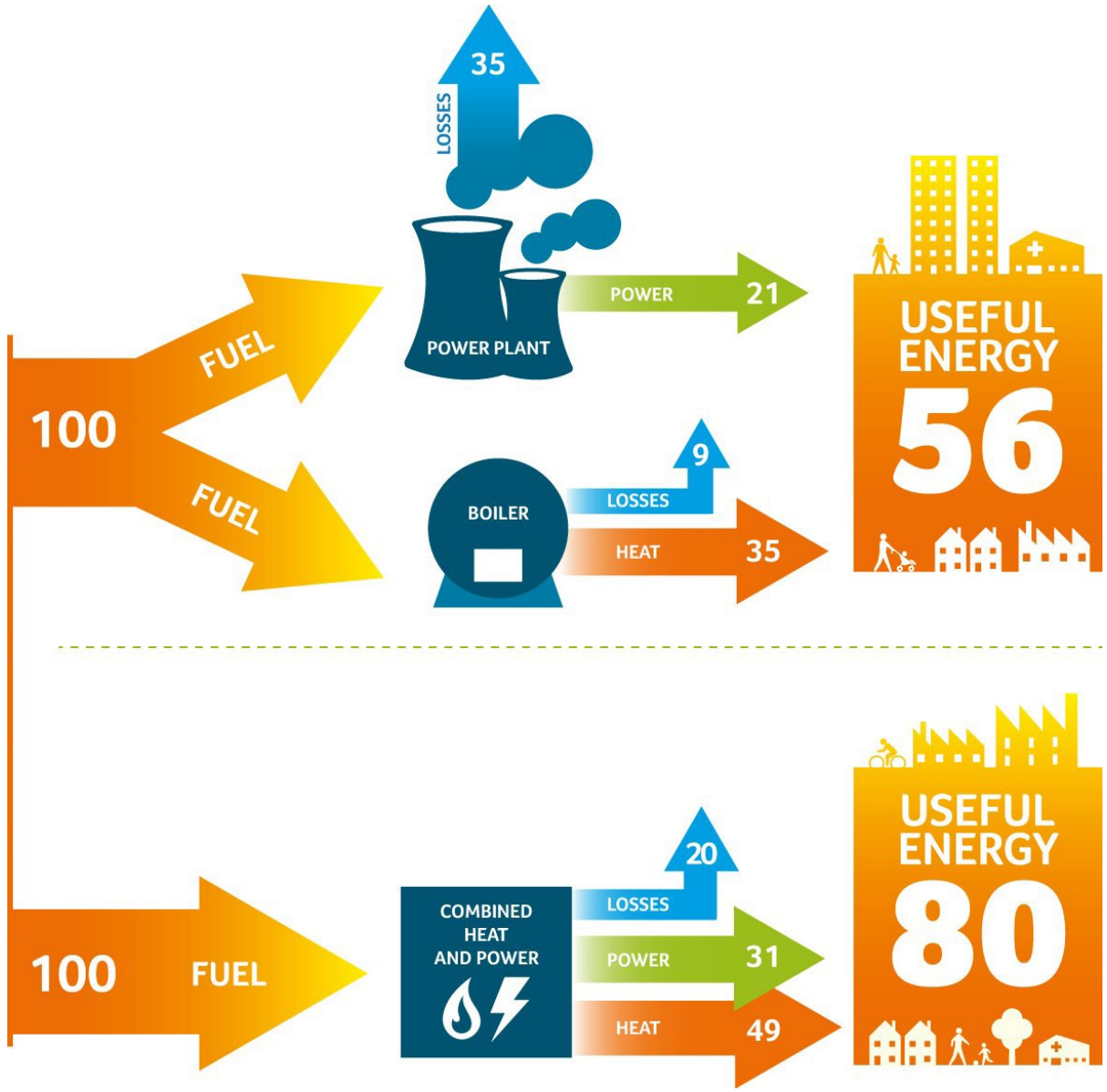
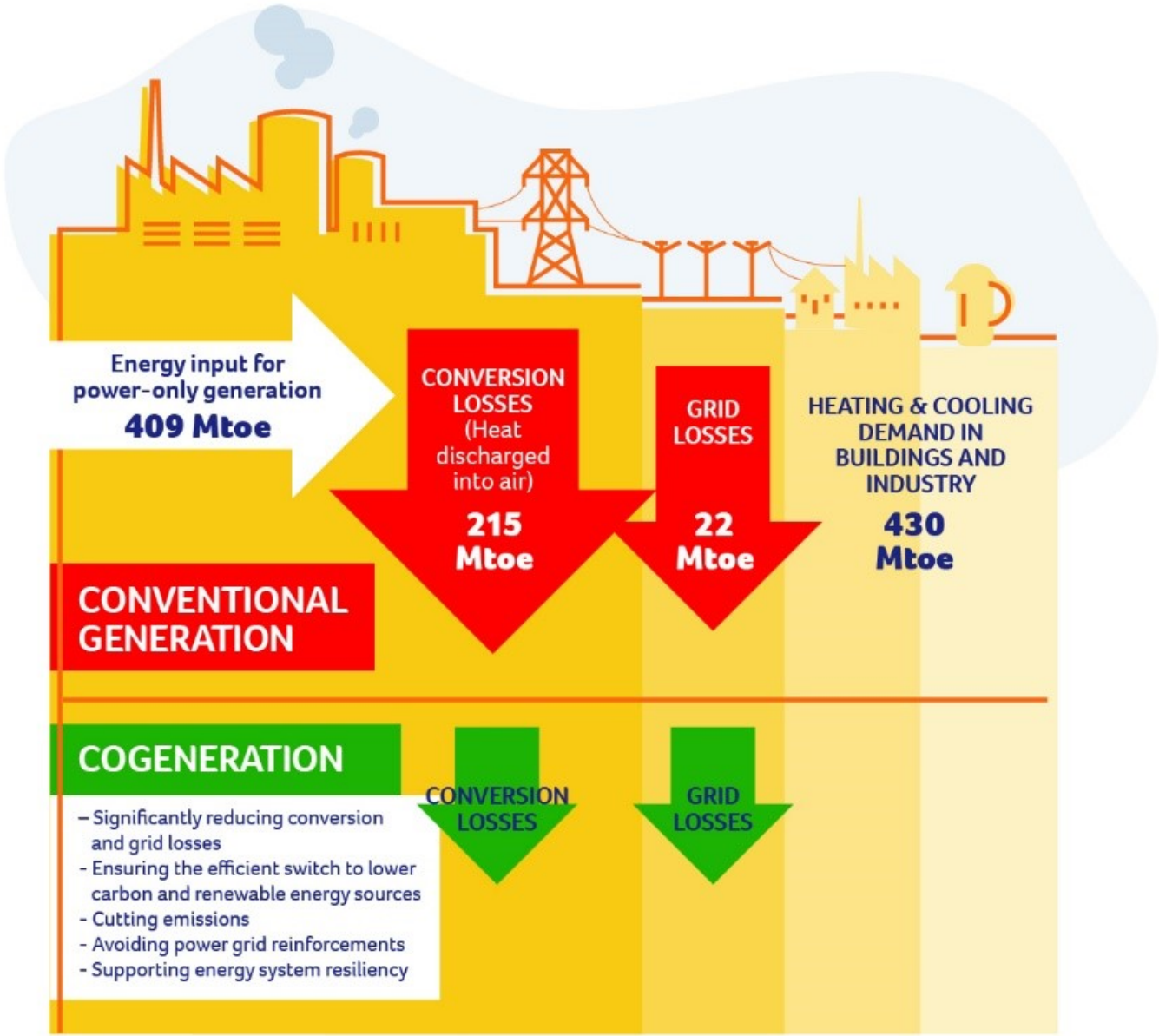
Cogeneration: A Key Efficiency Principle



- **CHP generates 40% more productive energy** than **average** heat-only and power-only & **CHP saves at least 10%** of primary energy compared to **best-in-class** generation.
- **CHP avoids the waste of heat** by thermal power generation, increasing fuel efficiency from 30-50% to 75-95%.
- **Distributed CHP production reduces electricity grids losses** and the need for grid reinforcements, complementing electrification.

“Efficiency” of the Power System

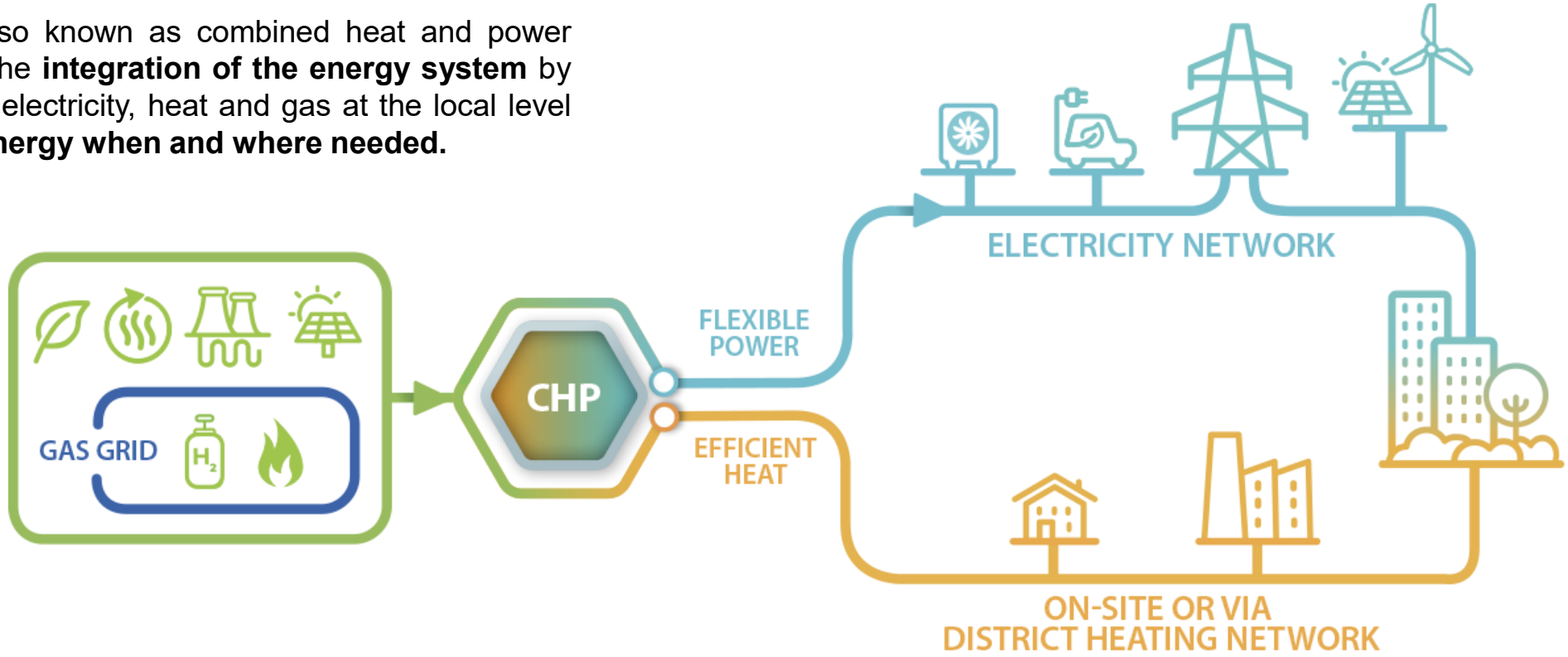


WHY COGENERATION?

Cogeneration:

backbone of local and integrated energy

Cogeneration, also known as combined heat and power (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.**



Cogeneration: EU Industry Clean Solution of Choice

HyFlexPower, France

- Smurfit-Kappa paper mill
- Excess renewable electricity stored as H2.
- Existing CHP upgraded to use fuel mixtures up to 100% H2.

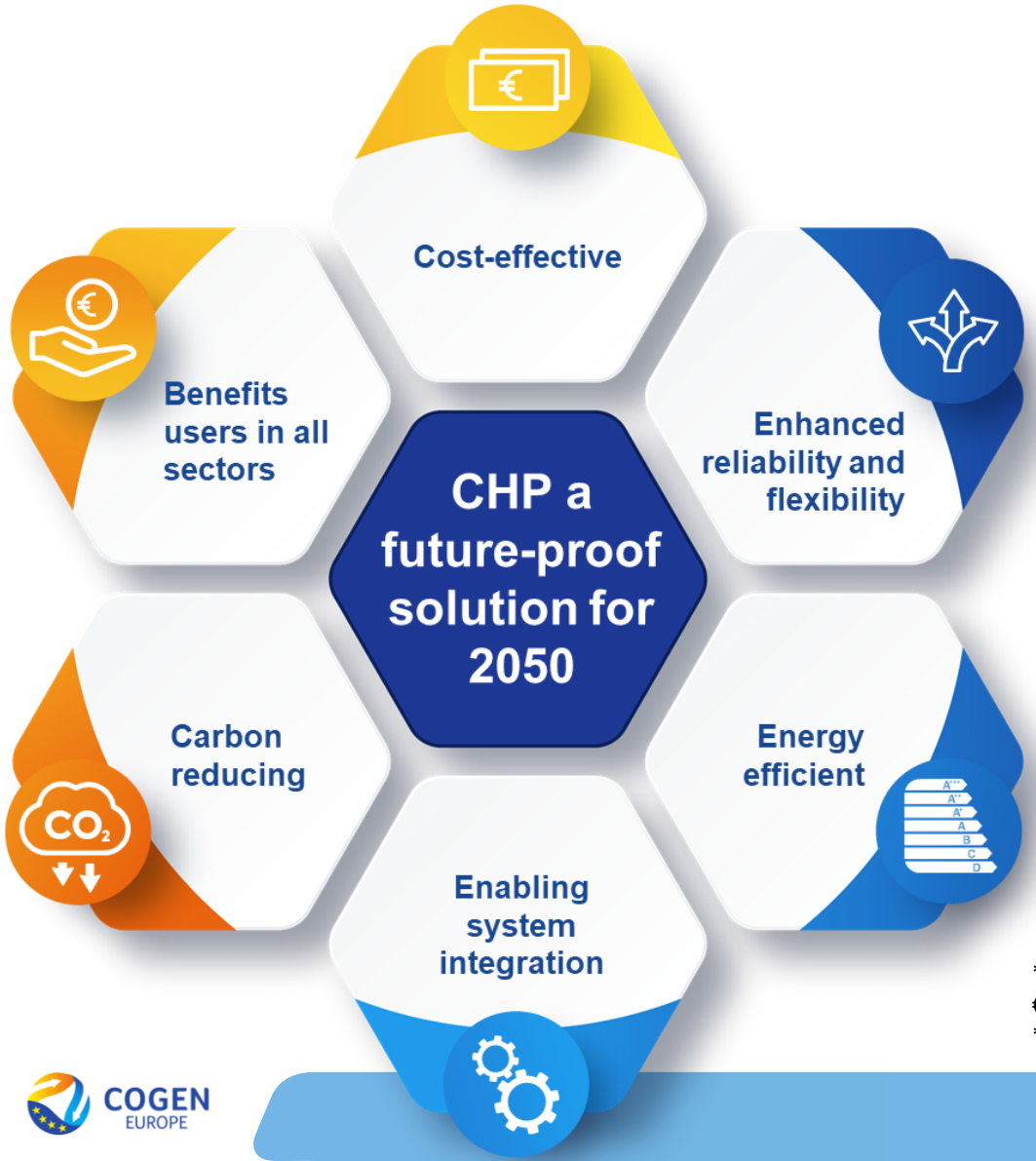
Ochain Energie, Belgium

- Family farm biogas plant & on-site CHP.
- CHP heat used in biogas production & in nursing home nearby.
- CHP power supplied to the grid, for extra revenue to the farm.

iRecovery, Italy

- Steelmaker ORI Martin.
- On-site CHP uses exhaust gases to reduce pollution.
- CHP heat supplied via DHC to 2,000 homes.
- CHP power supplied to 700 homes.

CHP's Multiple Benefits by 2050



Industrial CHP Cost Savings

3 - 10M €
for 684 GWh

Industry
(high-temperature)

1.5 - 7.1M €
for 500 GWh

Industry
(medium-temperature)

0.9 - 16 M €**
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.

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Cogeneration: An Enabling Solution on the Path to Net-zero Emissions by 2050

TODAY

Provide 12% of electricity in Europe

Provide 16.5% of heat in Europe

357 TWH
OF PRIMARY ENERGY SAVINGS
INCL. **15 bcm of natural gas reductions equivalent to 10% of REPowerEU**

250 MT
OF CO_2 AVOIDED
OR the emissions of 100 million petrol cars.

eurostat

2030

Provide 20% of electricity in Europe

Provide 25% of heat in Europe

870 TWH
OF PRIMARY ENERGY SAVINGS
INCL. **20-30 bcm of natural gas reductions equivalent to 20% of REPowerEU**

350 MT
OF CO_2 EMISSION AVOIDED
OR 1/3 of the additional efforts required to reach -55% GHG reductions.

CODE 2 COGENERATION OBSERVATORY AND DISSEMINATION EUROPE
Realising Europe's identified potential for cogeneration

2050

+40 GW
More than today's capacity

2.5 x
More capacity than projected in EC 1.5 TECH*

220 TWH
OF PRIMARY ENERGY SAVINGS
OR **2.5 x annual electricity consumption of Belgium**

8.2 BN €
SAVED YEARLY
OR 9.5 x of LIFE Climate Action funding.

Artelys OPTIMIZATION SOLUTIONS | STUDY ON THE ROLE OF COGENERATION

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Fit for 55: Key Asks for Industrial Decarbonisation

Energy efficiency first across the entire energy value chain, in demand but also supply, transmission and distribution.

Decarbonise process heat via all cost-effective solutions: RES, energy efficiency, CCS/CCU.

Prioritise high efficiency cogeneration

over less efficient heat-only and power-only generation.

Set a **secure investment environment** for

future-proof high efficiency cogeneration.

EED: Support an Ambitious Approach for High Efficiency CHP

Article 24 on “Heating and cooling”: High efficiency CHP must be prioritised over less efficient power-only & heat-only generation in both DHC and industry, to complement intermittent RES & electrification.

Article 8 on “Energy Savings Obligation”: Account for all savings achieved by energy in industry, incl. high efficiency CHP that is compatible with RES/decarbonised sources.

Annex III on “High efficiency CHP definition”: Set ambitious, but achievable criteria.

Maintain 10% primary energy savings (vs best-in-class separate generation)	Exclude coal & fuel oil from new/refurbished CHP	Introduce new criteria as of 2030

Annex III: Emissions threshold for CHP

Carefully consider the impact of an overly strict threshold for CHP, in the absence of emissions thresholds for less efficient generation	Introduce a threshold as of 2030 for new/refurbished CHP

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