



BIOCOGEN 2030 Webinar

Market Perspectives for Biomass-Based CHP

3rd December 2020

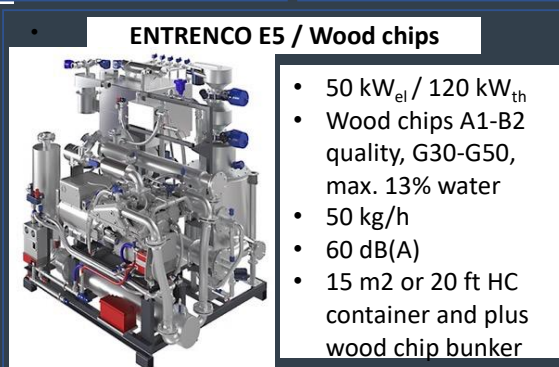
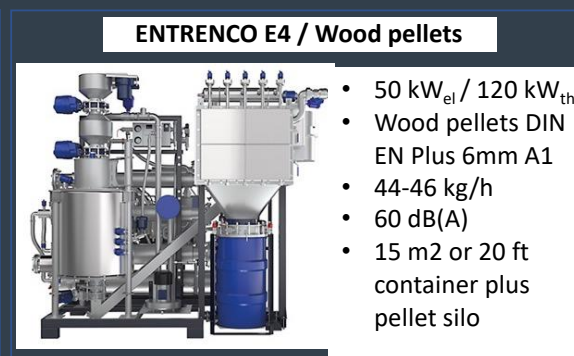
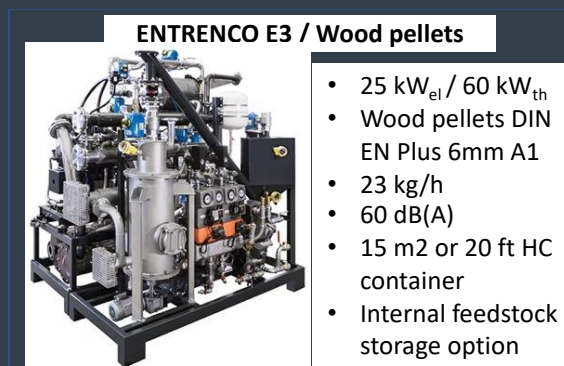
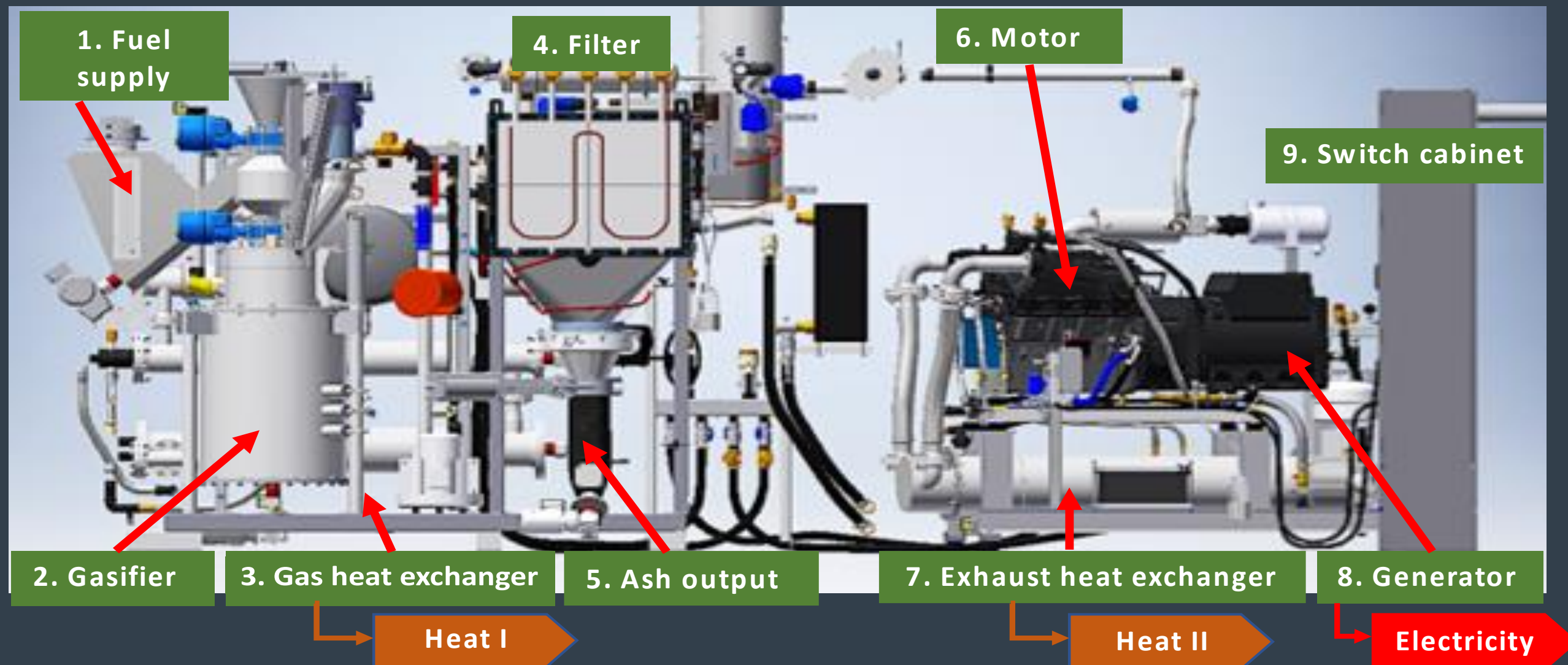
AGENDA

1. ENTRENCO'S PROFILE
2. PRODUCTS AND TECHNOLOGY
3. ATTRACTIVE MARKETS
4. CHALLENGES
5. USE CASES

PRODUCTS AND TECHNOLOGY

Step 1: Gasification

Step 2: Energy generation



ENTRENCO applies fixed-bed, downdraft gasifying with long-life components and stable process.

The individual plants have an output of 50 kW_{el}/120 kW_{th} and are usually operated in 20 inch containers. Lined up, up to 2 MW can be installed.

At present, wood pellets (plant type E4) and wood chips (E5) are used as fuel, the extension to biological waste materials such as rice husks, straw, nut shells etc. is planned.

These CHP plants allow decentralised energy production for a wide range of applications: hotels, residential areas, greenhouses, forestry, industry/process heat, etc.

CHALLENGES

- Many CHP units on the market are unreliable and expensive in their maintenance
- CHP's produce ash that is considered toxic waste
- The units are sold with non-transparent after-sales plans
- Uptimes are often exaggerated

- CHP's are still too expensive to be competitive without subsidies in most markets.
- The simultaneous need for heat and electricity in the same place requires intelligent business development
- The technology is relatively new and requires extended technical expertise from users
- Customers demand complete solutions, which requires a high level of knowledge about interface products
- Service & Monitoring is Key!

ATTRACTIVE MARKETS (1)

For identifying attractive markets for small scale CHPs in terms of potential sales and profitability, these are the main criteria:

Positive political environment for renewables

Feed-in tariff (FIT) subsidy for electricity

Sales price for heat

Price for feedstock

Availability of feedstock

Intensity of competition

In addition, country profiles should provide sectors with beneficial use cases for biomass based CHP against fossil energy usage:

Market volume of use cases

Utilization of electricity (hours)

Utilization of heat (hours)

Pay-back period for investment

ATTRACTIVE MARKETS (2)

Japan



Japan shows significant growth in the CHP market. Although the forestry industry infrastructure is a bottleneck for growing industry

A high Ee. FIT increases the demand in the forest industry, SPAs, agriculture, and hotels.

A significant partnership with a large project developer was accomplished

Italy



The Italian Market will grow significantly through the newly introduced Italian **FER2** scheme.

Publication is still pending due to political allocation infights in the coalition

Italy's largest energy provider Enel is very renewable energy conscious

Established partnership promises a fast access to the Italian market

Germany



Partnerships in Germany promise sales in a slow, but stable market

Germany's new EEG plans to install 225 MW biomass energy annually over the next 10 years.

In addition, a partnership is being negotiated with the German market leader for wood boilers and wood chip feeders.

SERVICE CONCEPT



12 process diagrams enable remote control of each individual plant

The time series of key parameters can be used to verify successful self-regulation

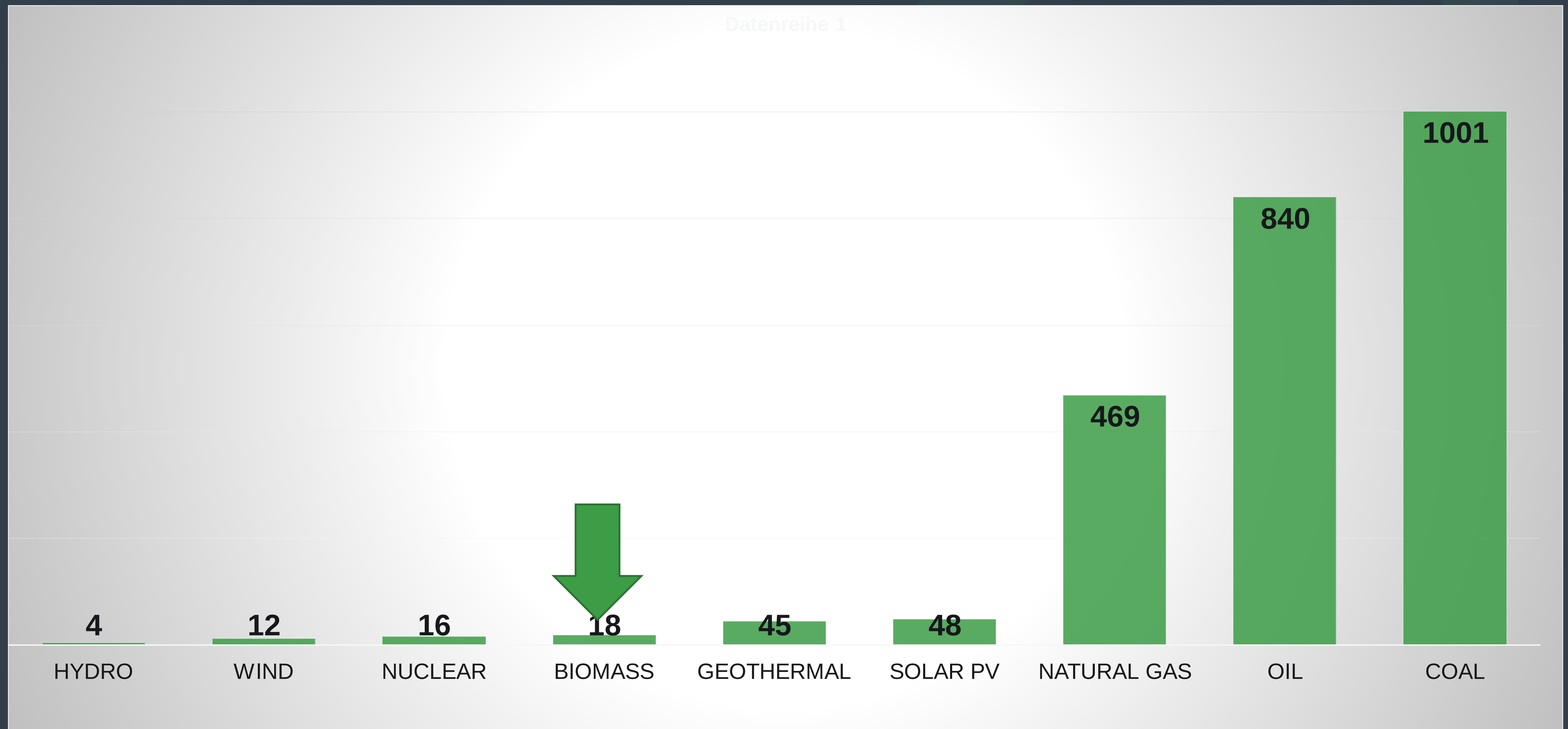
Thanks to highly developed sensor technology and software, the plant is able to intercept disturbance variables such as poor fuel quality in a self-regulating manner.

Comparative tests have shown that our technology can process important wood species better than the competition.

In addition, our service centre in Regensburg monitors and controls every plant installed worldwide around the clock. This ensures high plant availability and limits the intensity of on-site support.

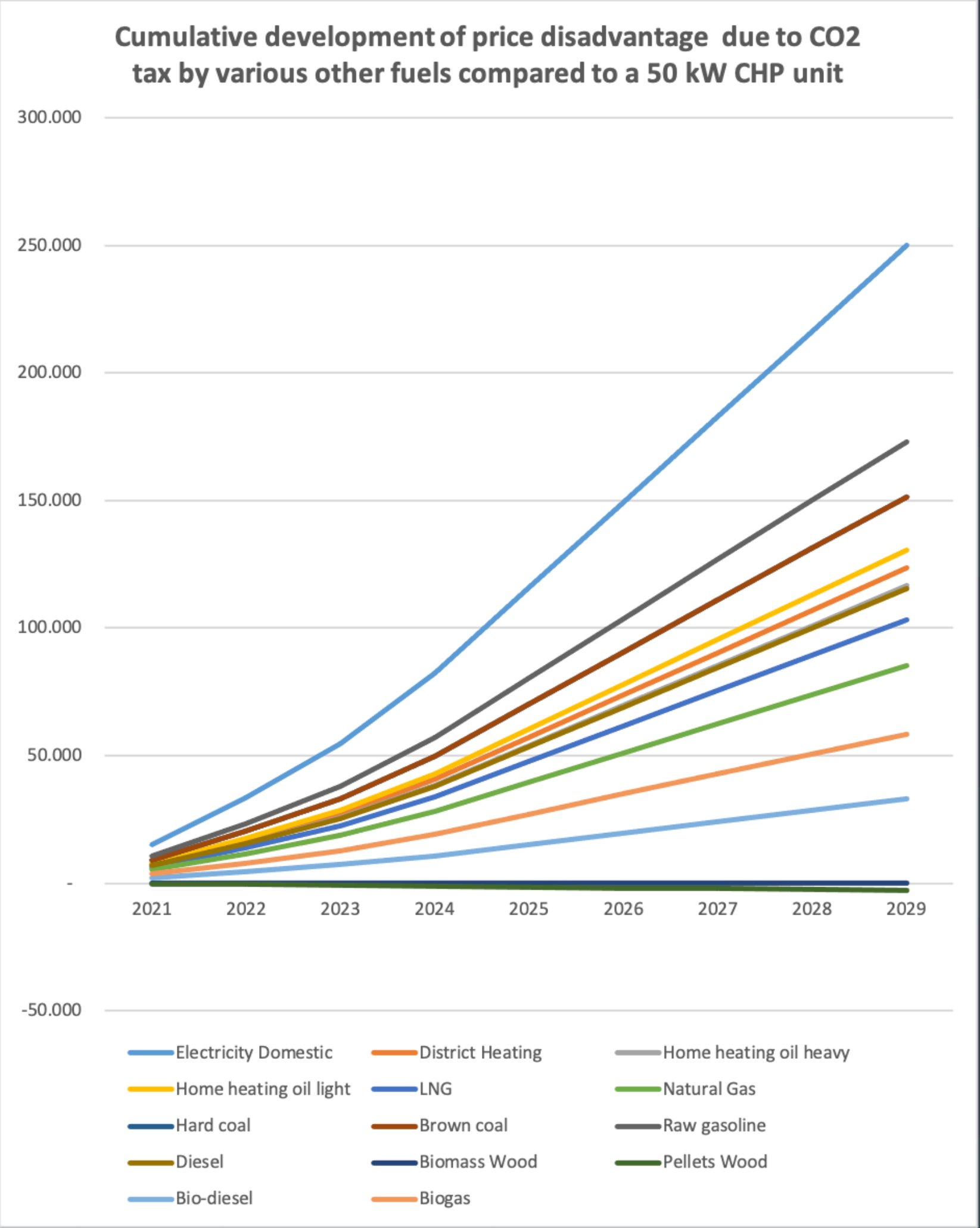
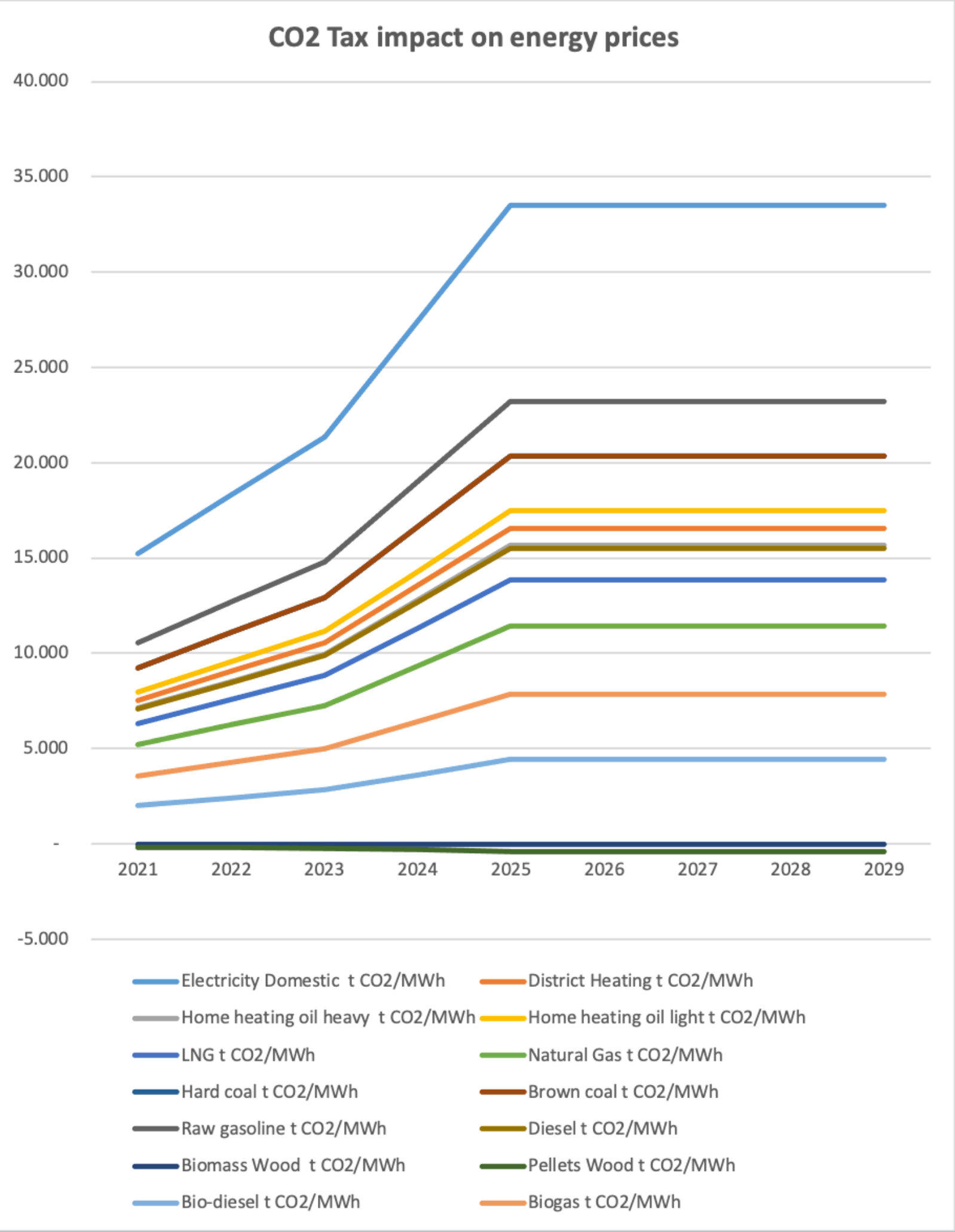
Furthermore, the documented performance behaviour of the core components allows for more targeted service calls.

Carbon Intensity of Electricity Generation (CO₂eq/kWh)

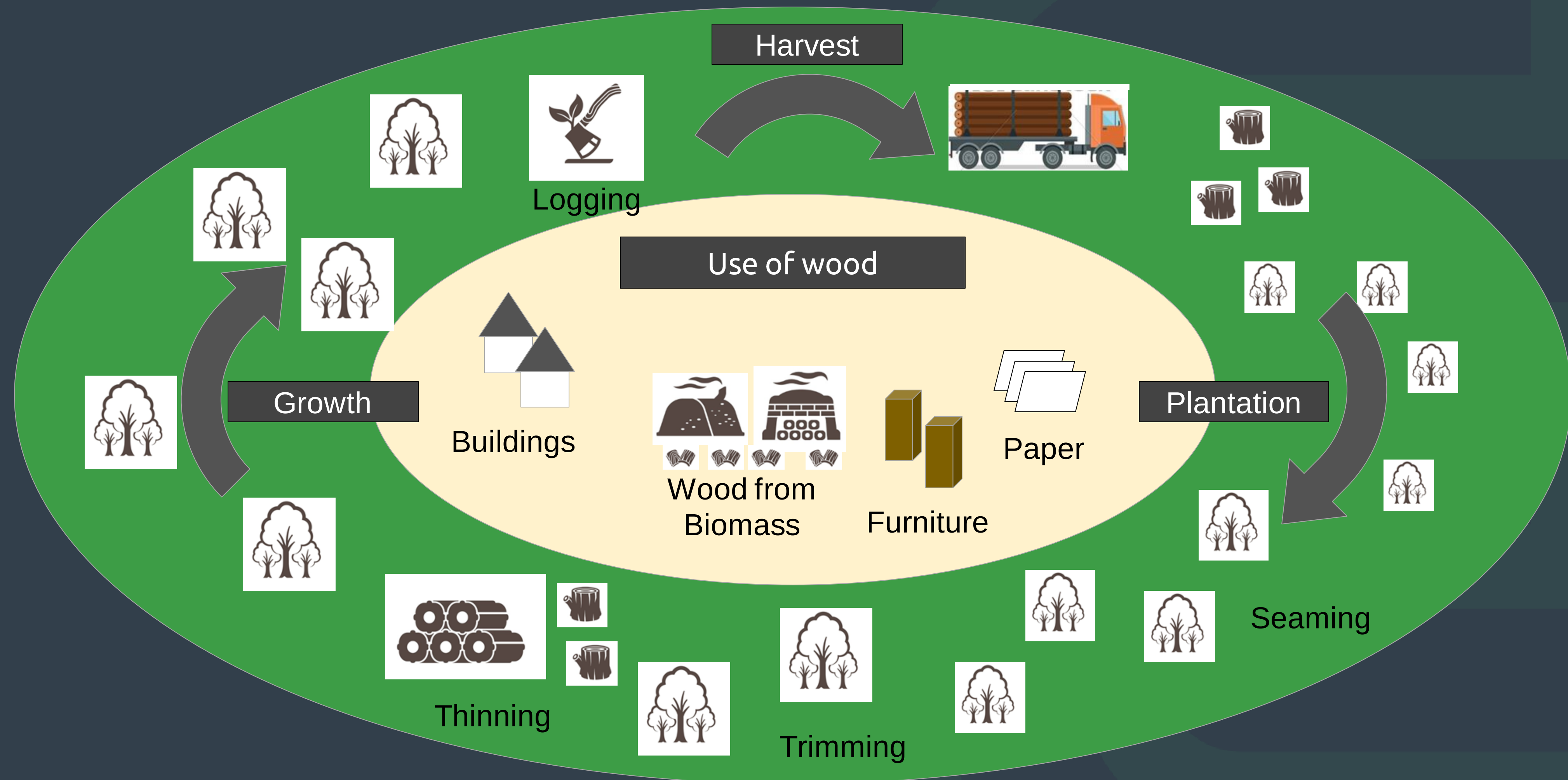


CO2 PRICING

Additional cost p.a. that is imposed on fossil-fuels due to their CO2 emission, based on kWh produced by single 50 kW CHP (cap at EUR 55 / per ton CO2)

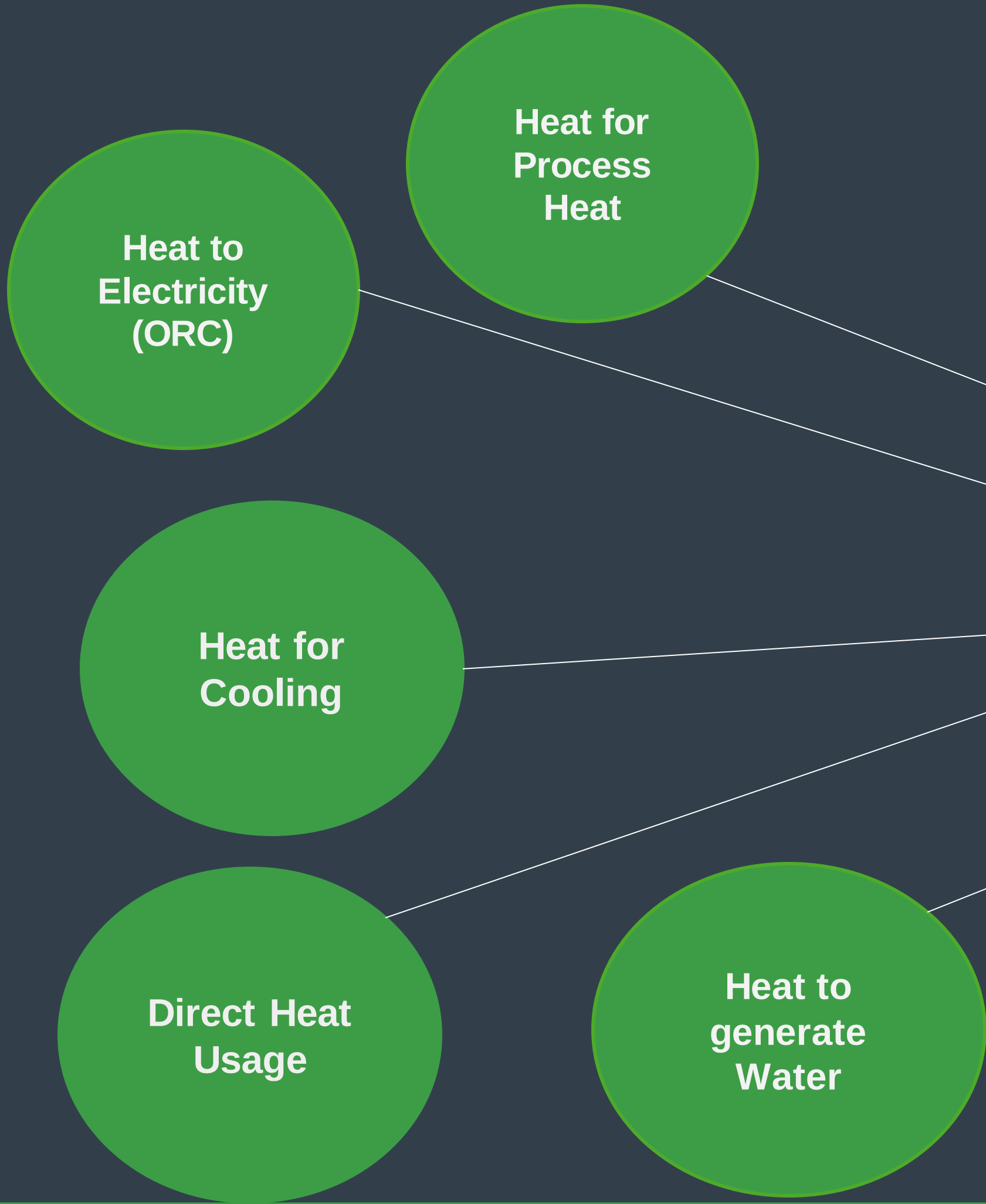


CO2-CYCLE

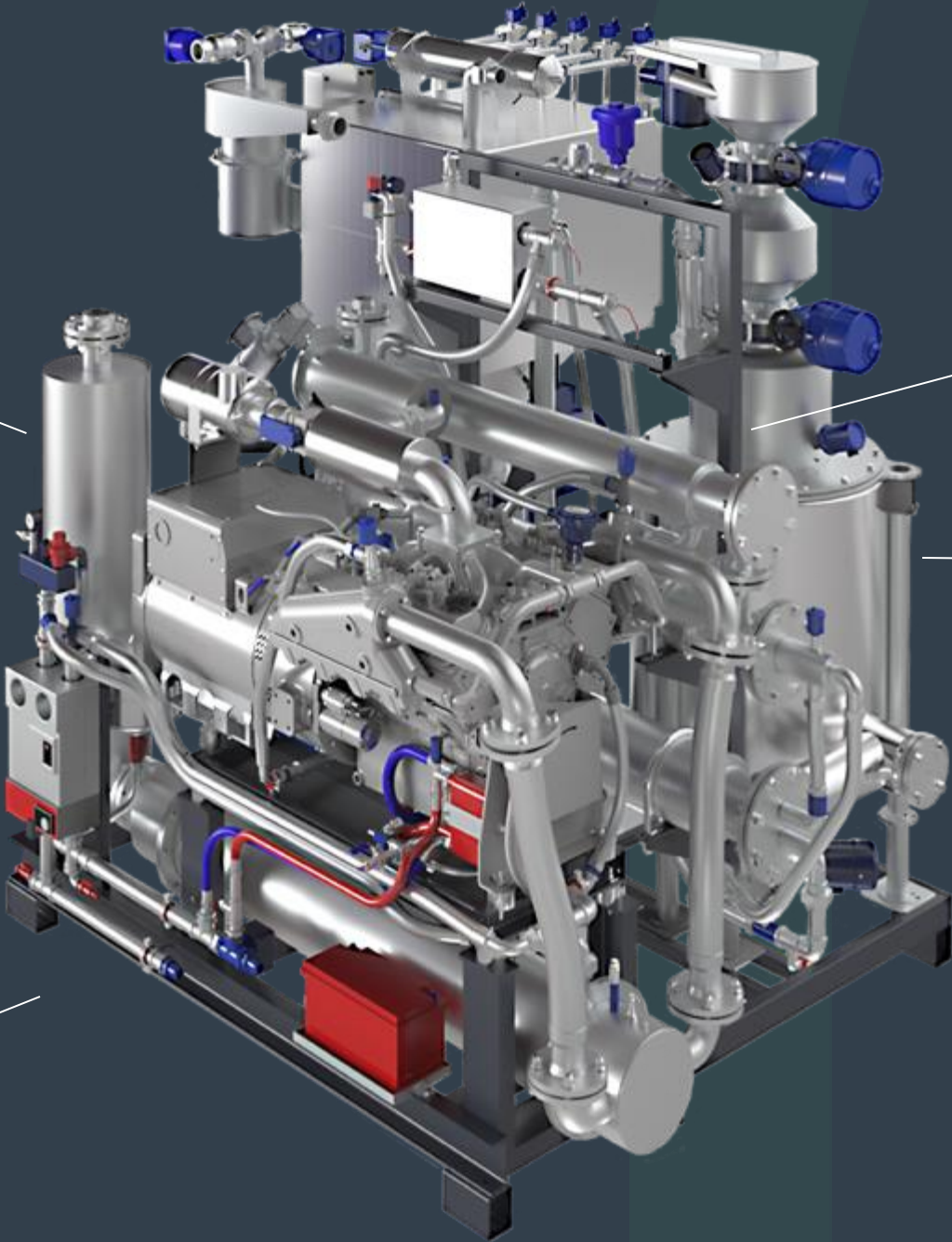


USE CASES

HEAT

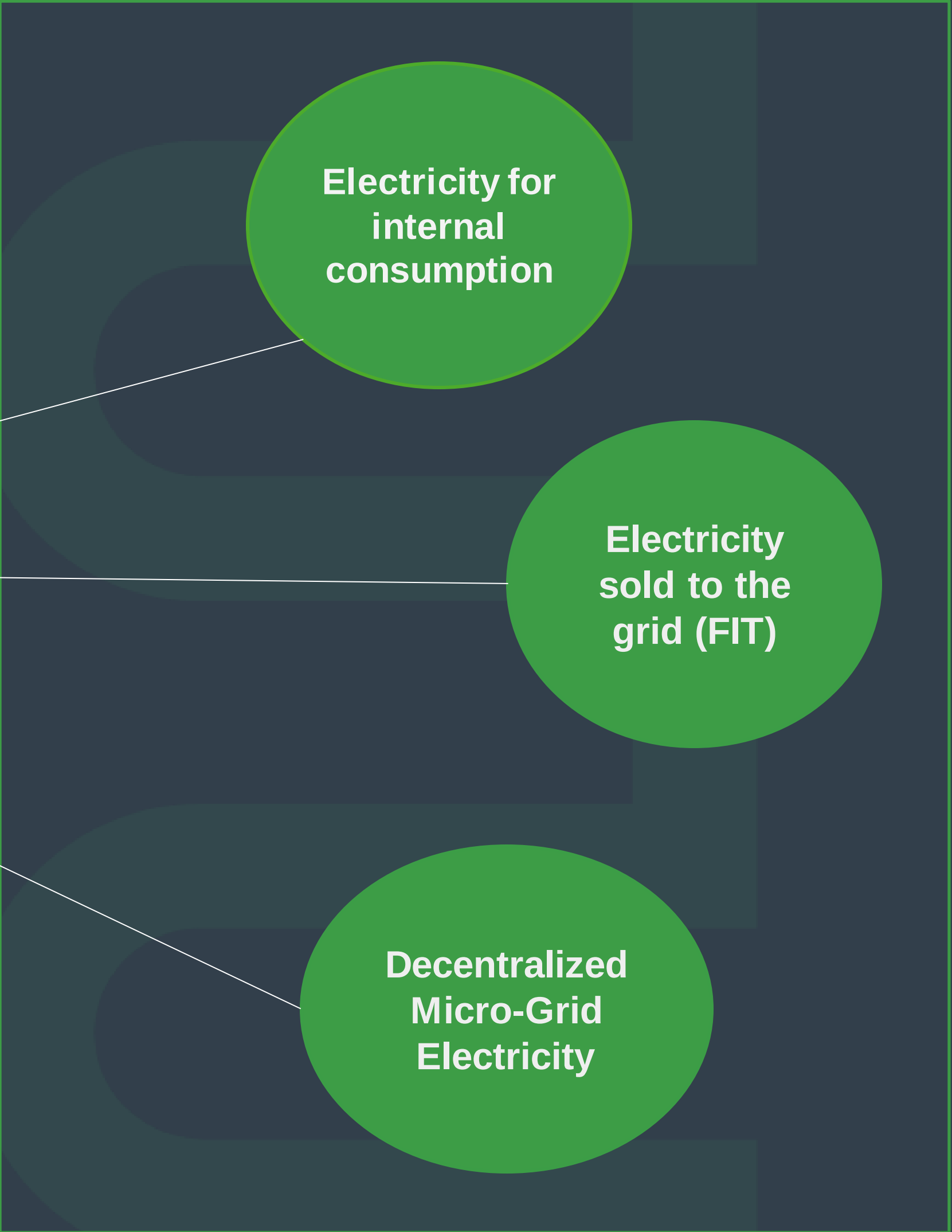


Electricity & Heat



Application areas of a ENTRENCO E5 CHP plant

ELECTRICITY



Vision and Value Proposition



ENTRENCO aims to change the biomass-CHP market by introducing turn-key solutions for specific use cases.

This requires stable gasification supported by machine learning.

Giving customers access to a flexible and worry-free power-plant with high uptimes supported by remote-monitoring to fix most problems.

USE CASE: DIRECT HEAT USAGE

Heat is directly used for drying of wood, agricultural products (crops, chicken-, algae-, mushroom-farms), district heating, greenhouses, and more.



ENTRENCO has knowledge on greenhouse heating



ENTRENCO completed a project in wood drying in Japan



ENTRENCO has knowledge on district heating

USE CASE: MICRO-GRID ELECTRICITY

ENTRENCO has completed a decentralized micro-grid project in Japan.

The CHP unit will supply heating and electricity to an Eco-Village, which will have the possibility to run decentralised and off-grid.



USE CASE: HEAT FOR COOLING

The CHP generated heat can be converted into cooling, using an absorption chiller.



Cooling is especially for buildings, to reduce CO2 emission from electricity



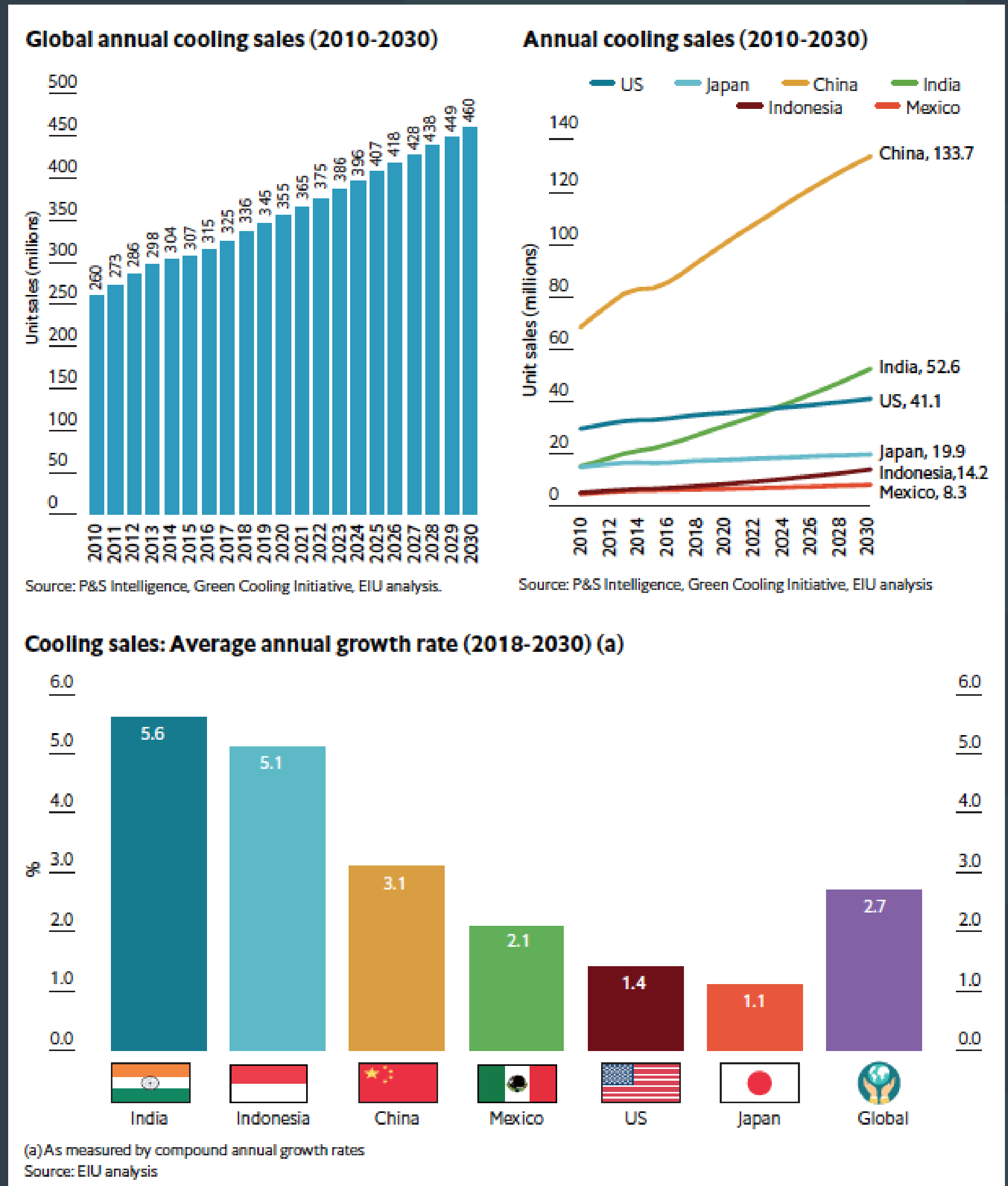
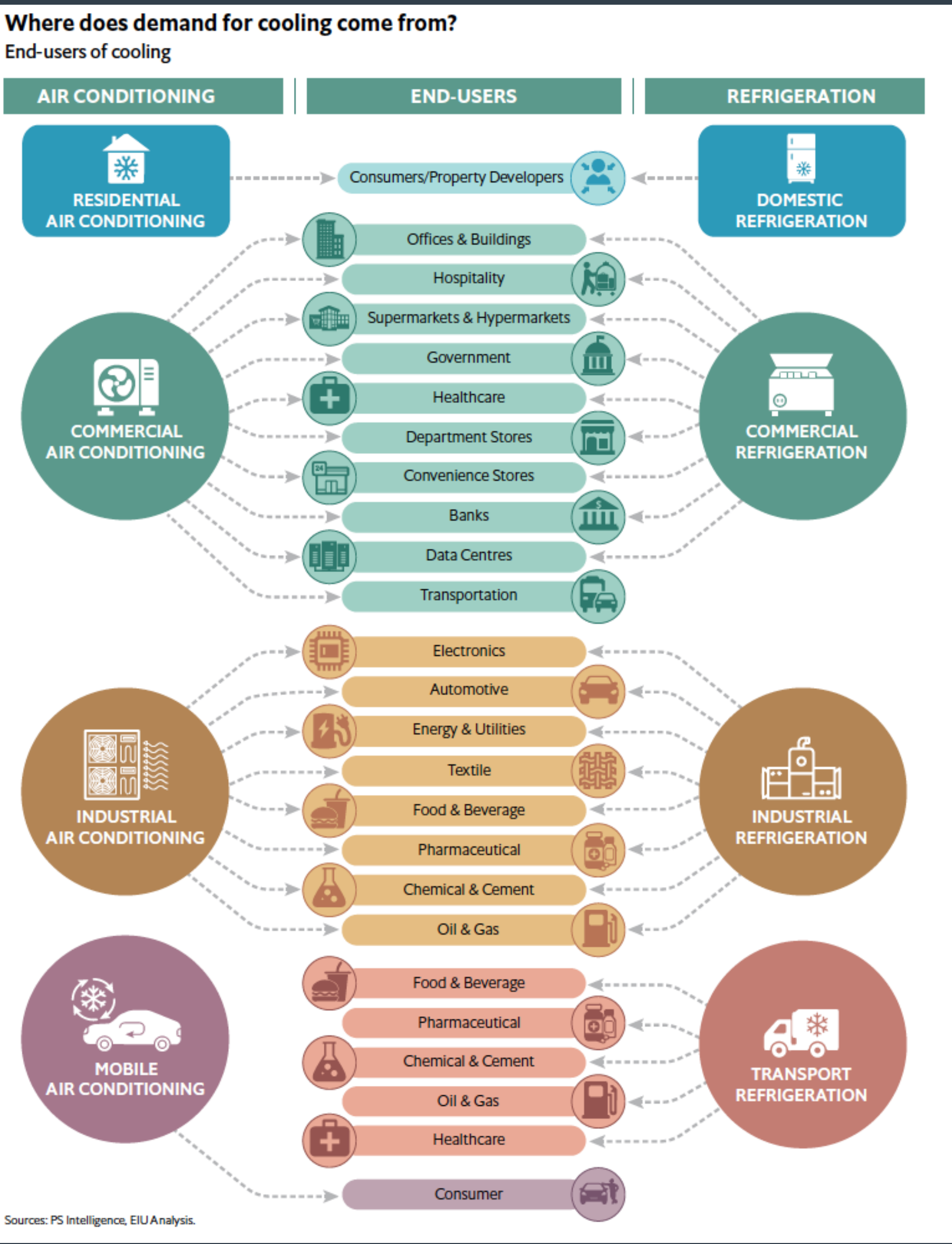
Applications such as algae farming have a seasonal need for cooling



Cooling in biomass rich regions can make companies and people more independent of unreliable electricity grids.

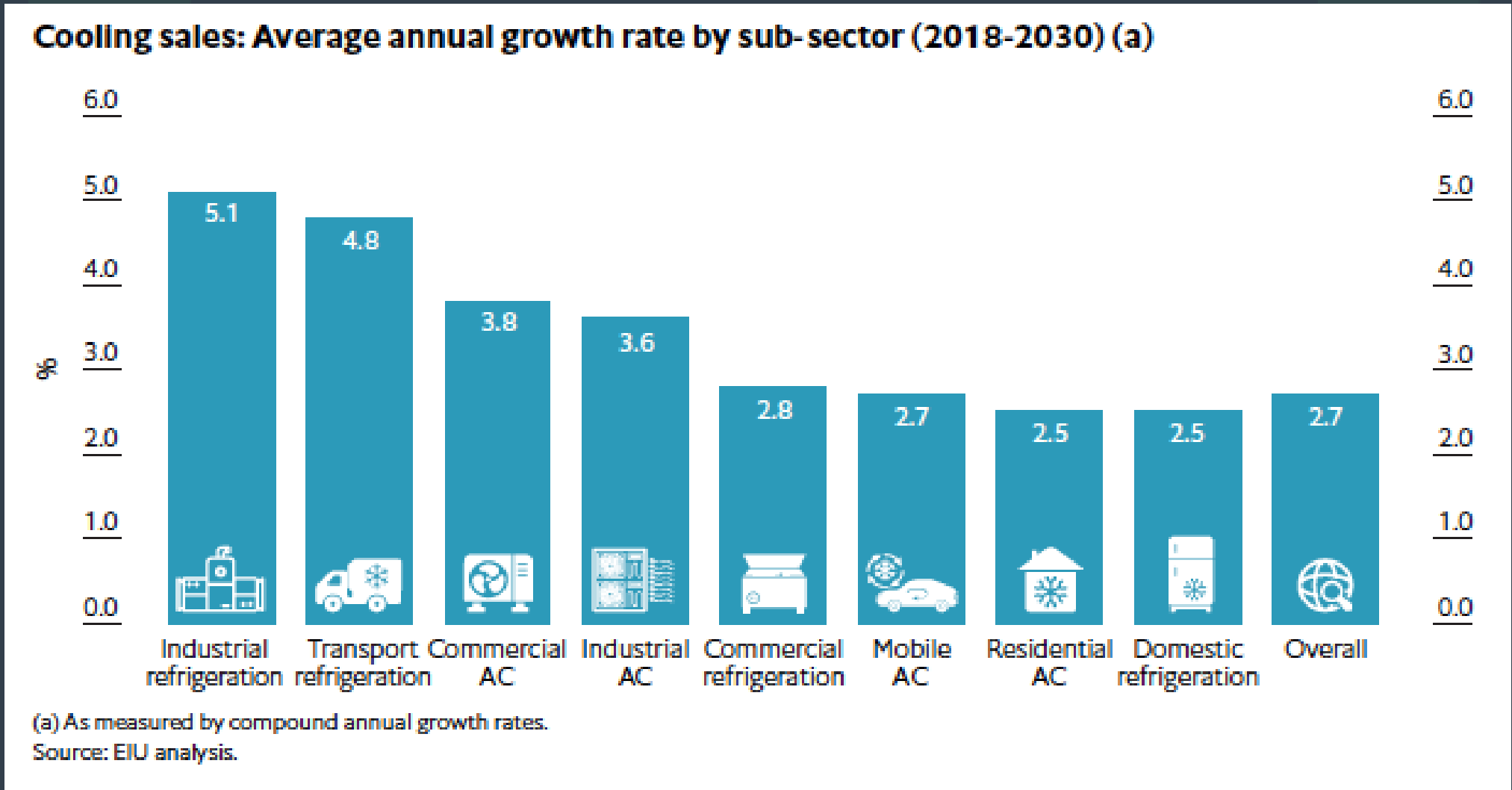
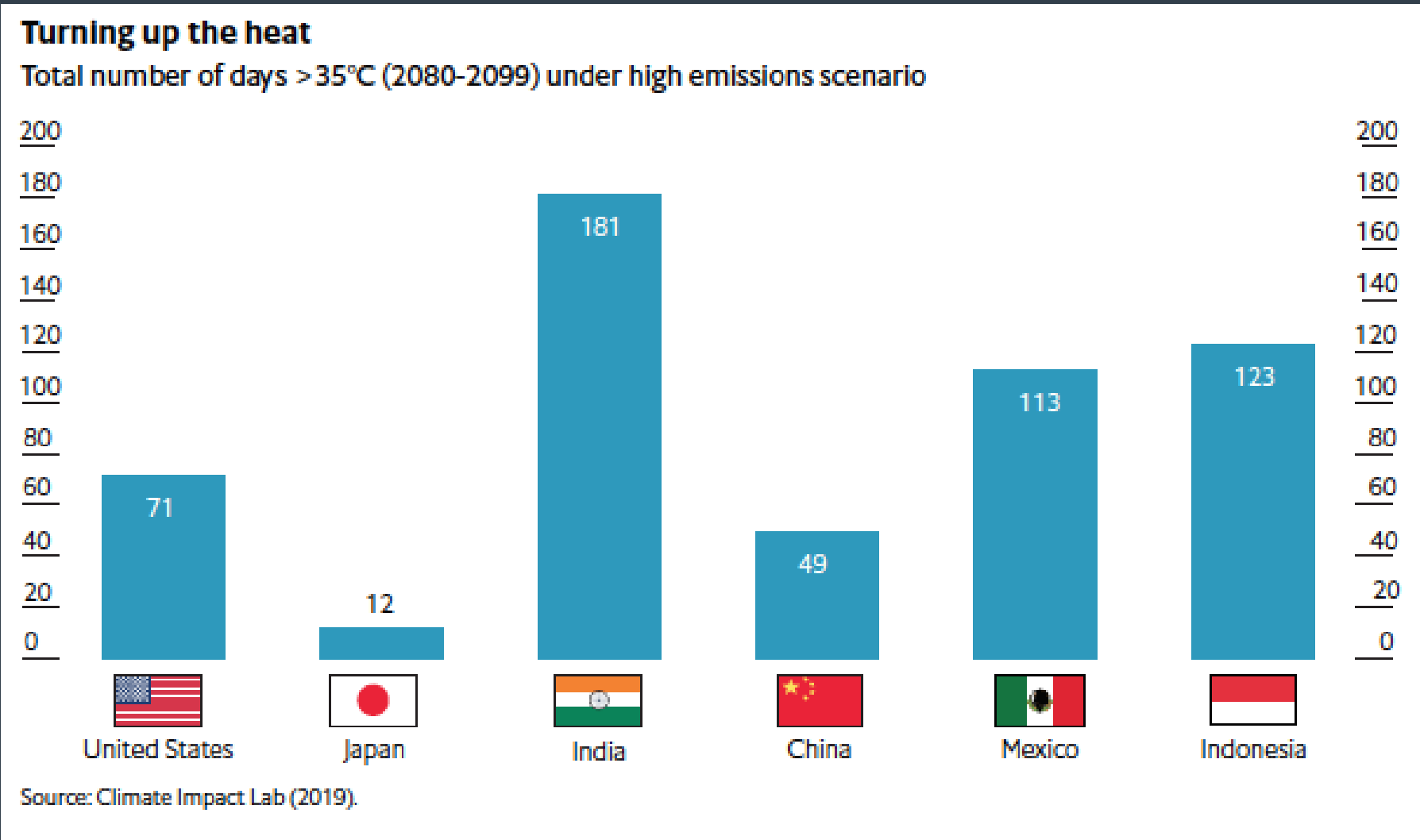
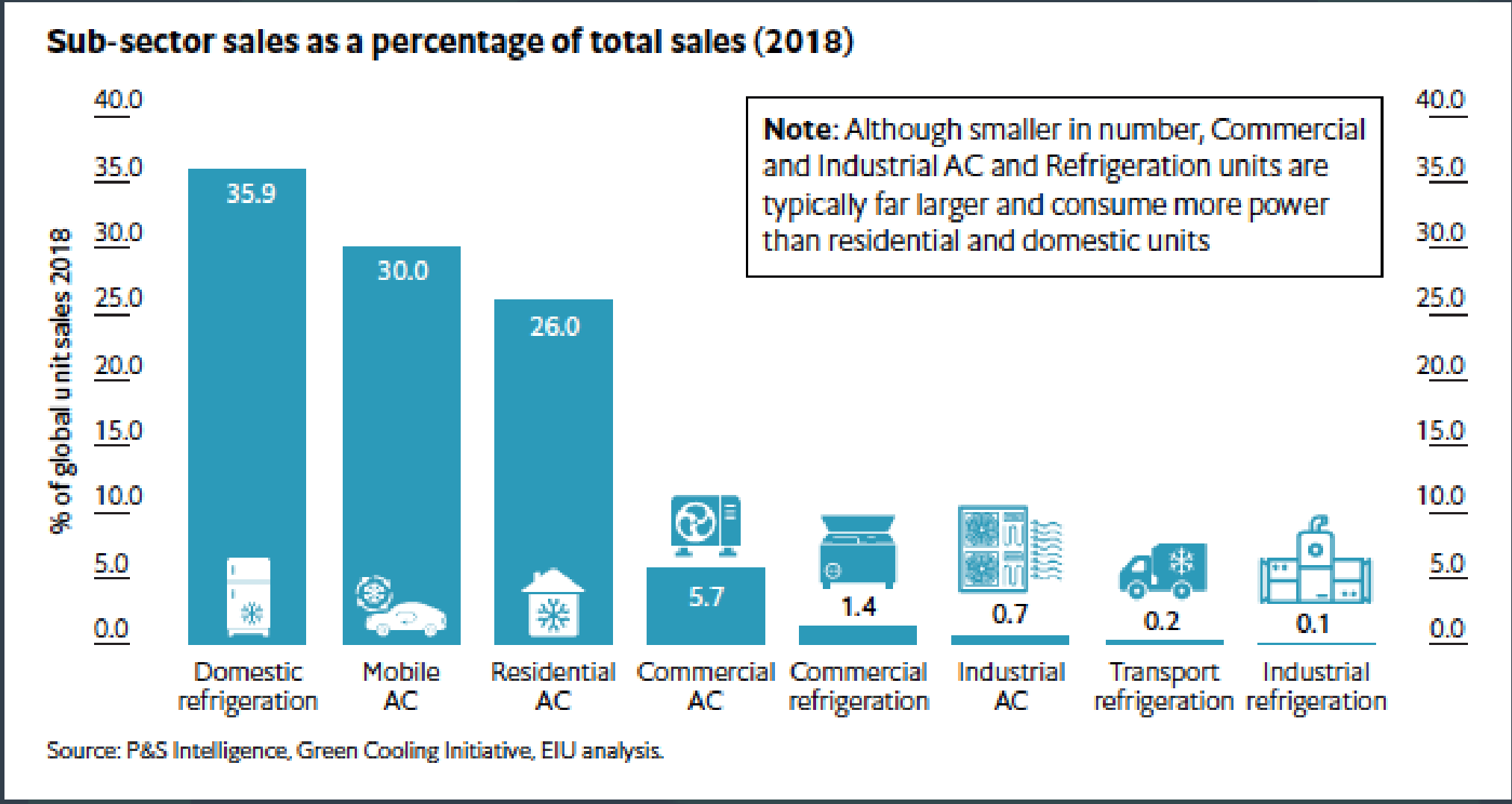
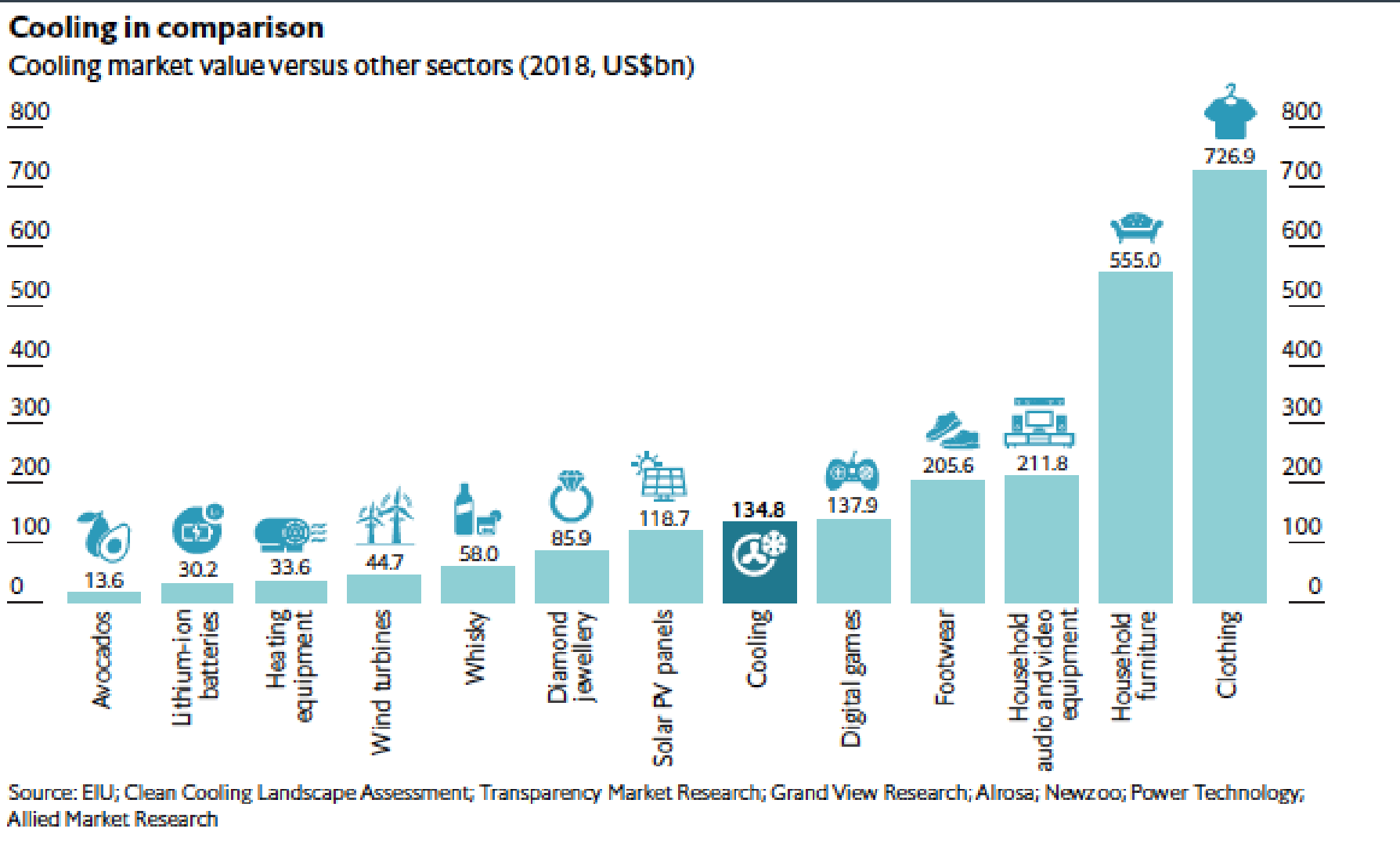
COOLING: A SEGMENTED AND GROWING MARKET

Cooling is a fast growing economies such as China and India



COOLING:

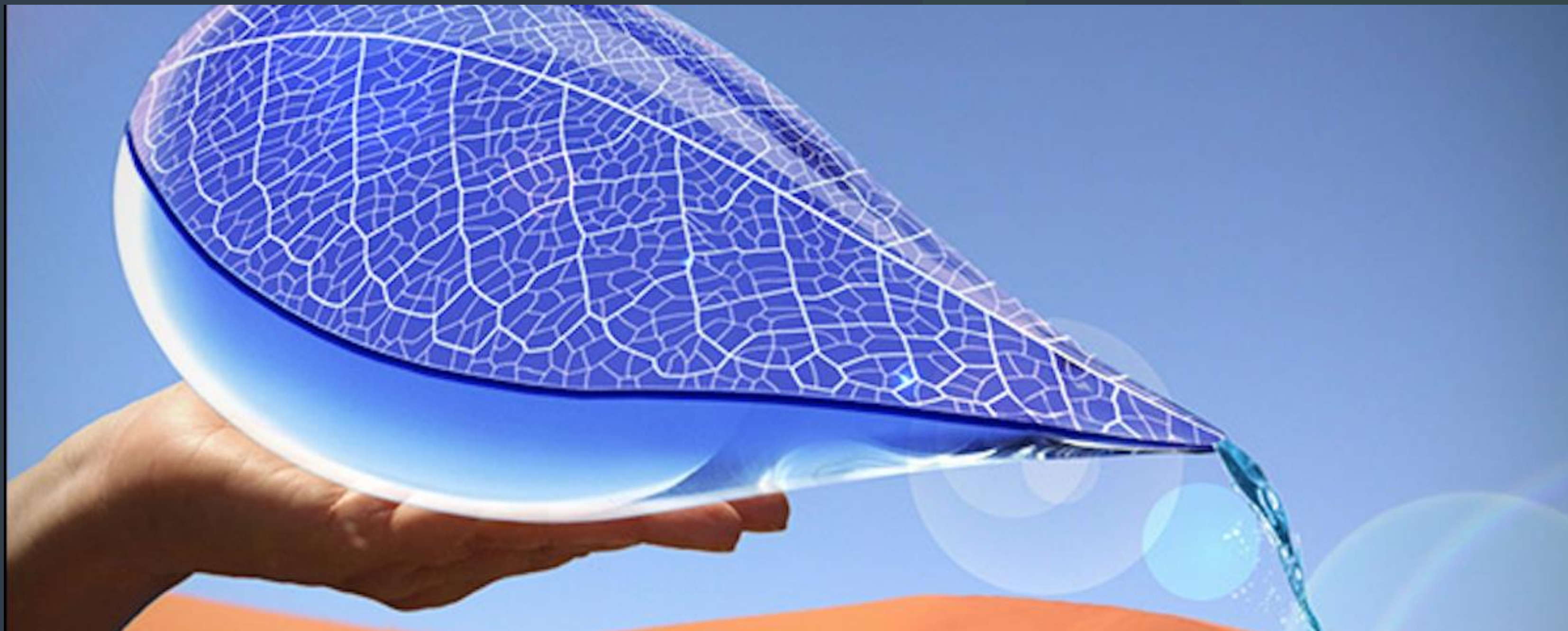
Domestic refrigeration and residential air-conditioning are the most important markets, strongest in India and Indonesia



USE CASE: HEAT TO WATER

International companies have developed technology that enables it to take water from thin air. In a time of polluted rivers and water sources the technology can help the local population with clean water.

Depending on humidity a significant amount of water can be generated. ENTRENCO's CHP systems enable it to install the technology off-grid. This helps communities in very rural areas to thrive.



USE CASE: HEAT TO ELECTRICITY

Technological advances indicate that electricity generated by ORC, will become more efficient. The market evidently change once the methods become either more efficient or more affordable.



R&D: ASH TO BIO COAL - THE KEY TO AN ORGANIC FERTILIZER

ENTRENCO has developed a first prototype of a CHP attachment that is able to convert the toxic ash into valuable fertilizer. Certification has shown that the bio coal has a CO-content of 80%



THANK YOU FOR YOUR ATTENTION

IF YOU HAVE ANY QUESTIONS THAT CANNOT BE ANSWERED DURING THIS SESSION YOU ARE
WELCOME TO CONTACT ME OR OUR TEAM VIA

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OR VIA OUR WEBSITE

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