

# Türkiye's Climate Goals and The Impact of CBAM

## Türkiye'nin İklim Hedefleri ve SKDM'nin Etkisi

IREC Istanbul Meeting

November 2, 2023

# The Paris Climate Agreement signed in 2015 has been a milestone in terms of global climate change policies



## Climate Change Negotiations and the Paris Agreement

- > The agreement reached at the Paris Conference in late 2015, with the participation of almost all countries in the world, marks an important turning point for the global climate change regime. The agreement entered into force in **November 2016**, with **55 countries ratifying the agreement**, accounting for more than **55% of global greenhouse gas emissions**.



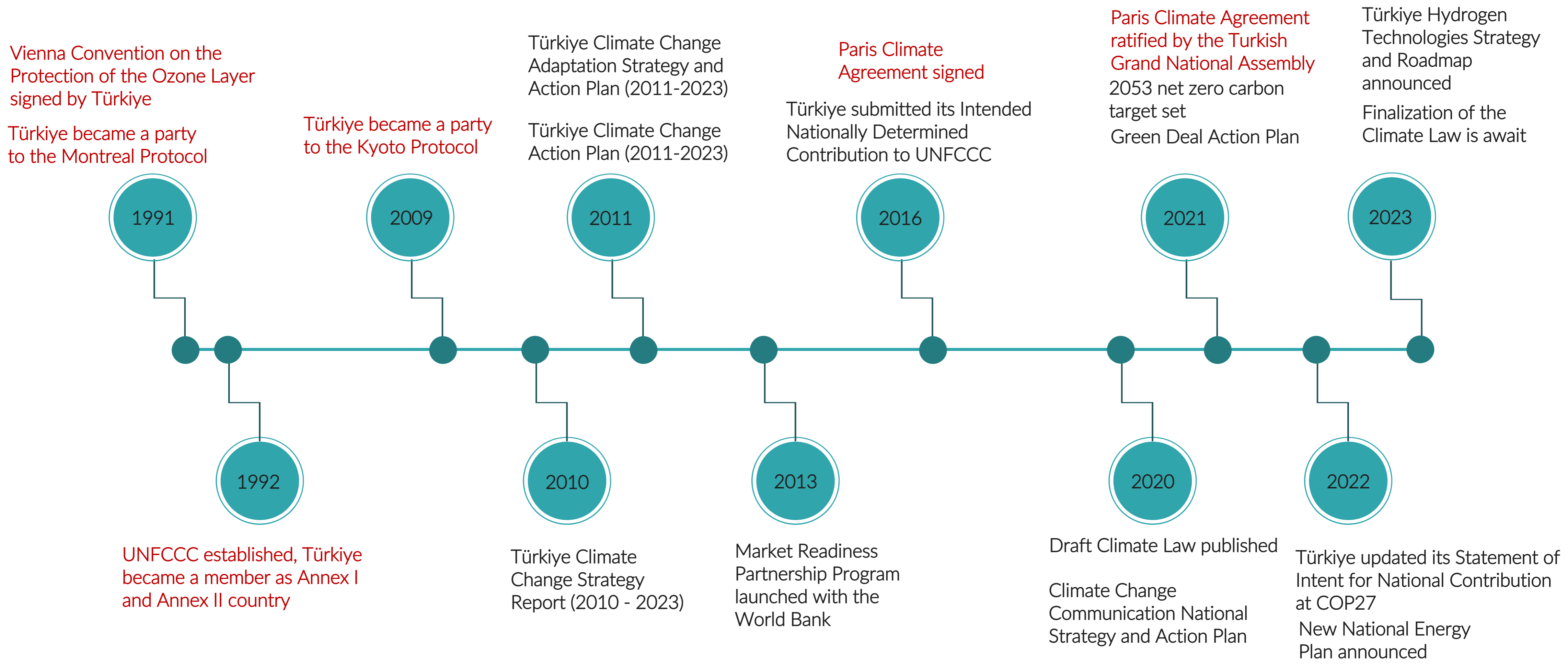
- > The difference of the Paris Agreement from previous climate change agreements is that the mitigation commitments of the participating countries are determined according to each country's own national conditions, capabilities and priorities in order to limit global average temperature increases to 2°C.

## Türkiye's Participation in Climate Negotiations

- > Accession to the agreement marks a turning point for Türkiye to undertake a climate change mitigation commitment for the first time. Türkiye submitted the INDC document on **30 September 2015** and officially signed the agreement on **22 April 2016**. The Paris Agreement was submitted to the Turkish Grand National Assembly as a law proposal on **October 1, 2021**, and after the agreement was passed by the parliament, it was published in the Official Gazette on **October 7, 2021** and entered into force.

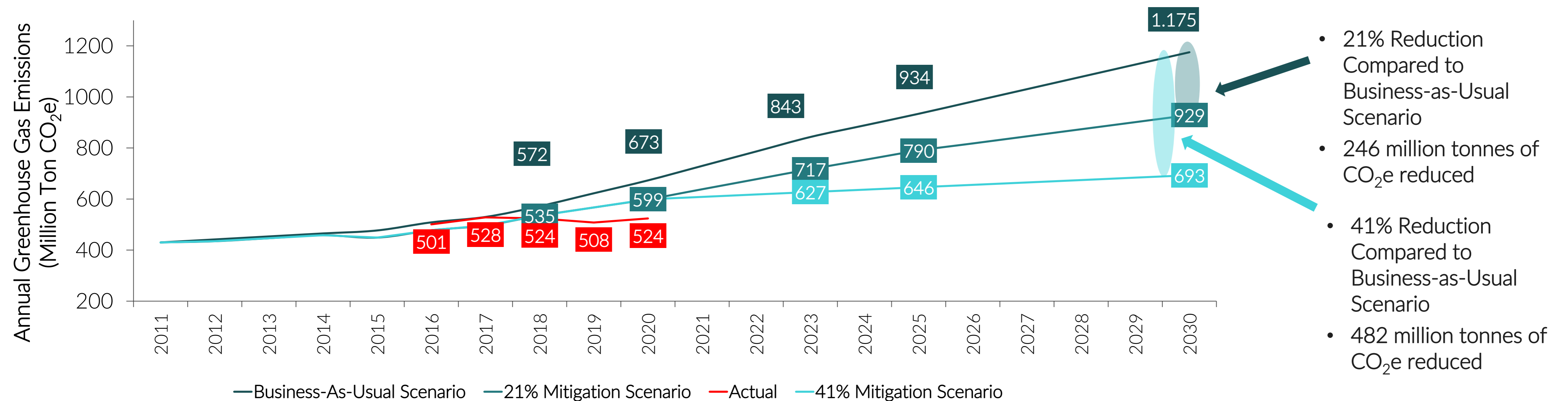


# Türkiye's climate change policies reached a turning point with the ratification of the Paris Climate Agreement in 2021



# Although Türkiye's 2030 greenhouse gas emission "reduction from increase" target, which was presented as 21% in 2015 within the scope of the Paris Climate Agreement, was updated and increased to 41% at COP27, its widely considered an insufficient sufficient target to reach the net zero emission targets

- > The country's first INDC included a commitment to reduce the country's greenhouse gas emissions by 21 per cent by 2030 compared to the business-as-usual scenario. Under the business-as-usual scenario, Türkiye would emit **1.175 million tonnes** of CO<sub>2</sub> equivalent by 2030. Therefore, the country's commitment implies a reduction of 246 million tonnes of CO<sub>2</sub>e for that year.
- > Then, the emission reduction target in the same Business-as-Usual scenario was updated to 41 per cent according to the new INDC announced at COP27. Accordingly, this reduction corresponds to **482 million tonnes** CO<sub>2</sub>e. It was also announced at the same conference that the peak level of greenhouse gas emissions is planned to be seen in 2038.



- 21% Reduction Compared to Business-as-Usual Scenario
- 246 million tonnes of CO<sub>2</sub>e reduced
- 41% Reduction Compared to Business-as-Usual Scenario
- 482 million tonnes of CO<sub>2</sub>e reduced

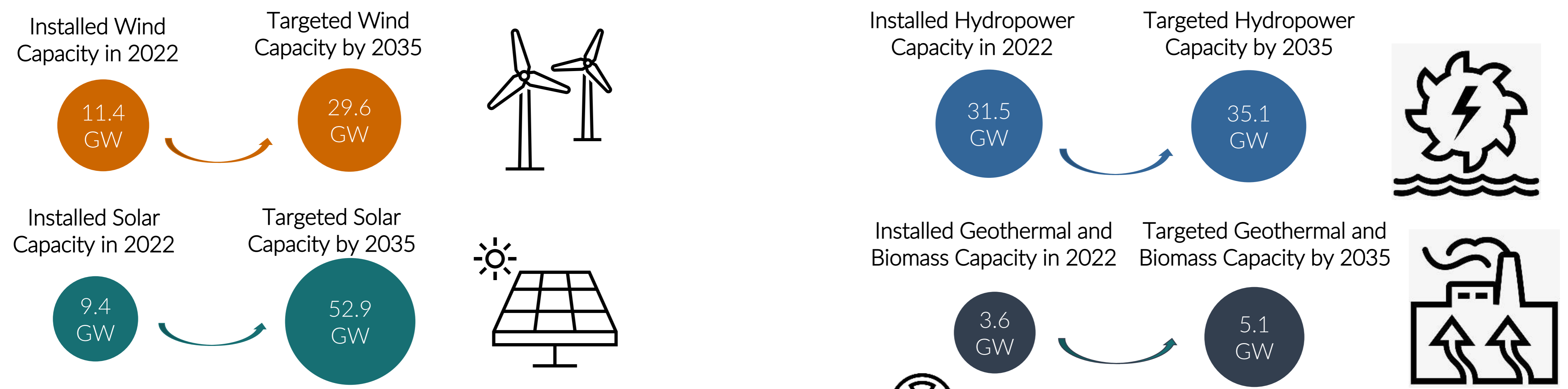
# Türkiye has developed various climate change policies under the influence of factors such as the Paris Climate Agreement and CBAM, and the energy sector has entered a transformation process. This will lead to an increase in renewable energy investments in the coming period


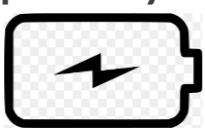

- > Green Deal Action Plan (2021): Strategy for harmonisation with mechanisms such as **CBAM and the Emissions Trading System**
- > Paris Climate Agreement (2021): **2053 Net Zero Emission target**, climate change and carbon mitigation strategies
- > Climate Council (2022): Discussing a total of 217 recommendations, 76 of which were prioritised
  - > Preparation of the **'National Green Finance Strategy'** in line with the 2053 Net Zero Emission Target by the end of 2023
  - > The work for the establishment of the **Emission Trading System (ETS)** in Türkiye will be accelerated; the design of the system in line with the European Union (EU) legislation and the implementation of the ETS will be completed in 2024
  - > Development of carbon capture, utilisation and storage technologies in coal-fired electricity generation towards **Net Zero Emission Targets**
  - > Preparation of **Türkiye's National Energy Efficiency 2030 Vision and Strategy** by the end of 2022 and National Energy Efficiency Action Plan (2024-2030) by mid-2023 Ensuring the implementation of digital transformation, storage and demand side applications to adapt to the transformation in the energy sector



# The new National Energy Plan announced by the end of 2022 lays out the long-term strategy to reach net zero emissions by 2053

## Installed Capacity Targets

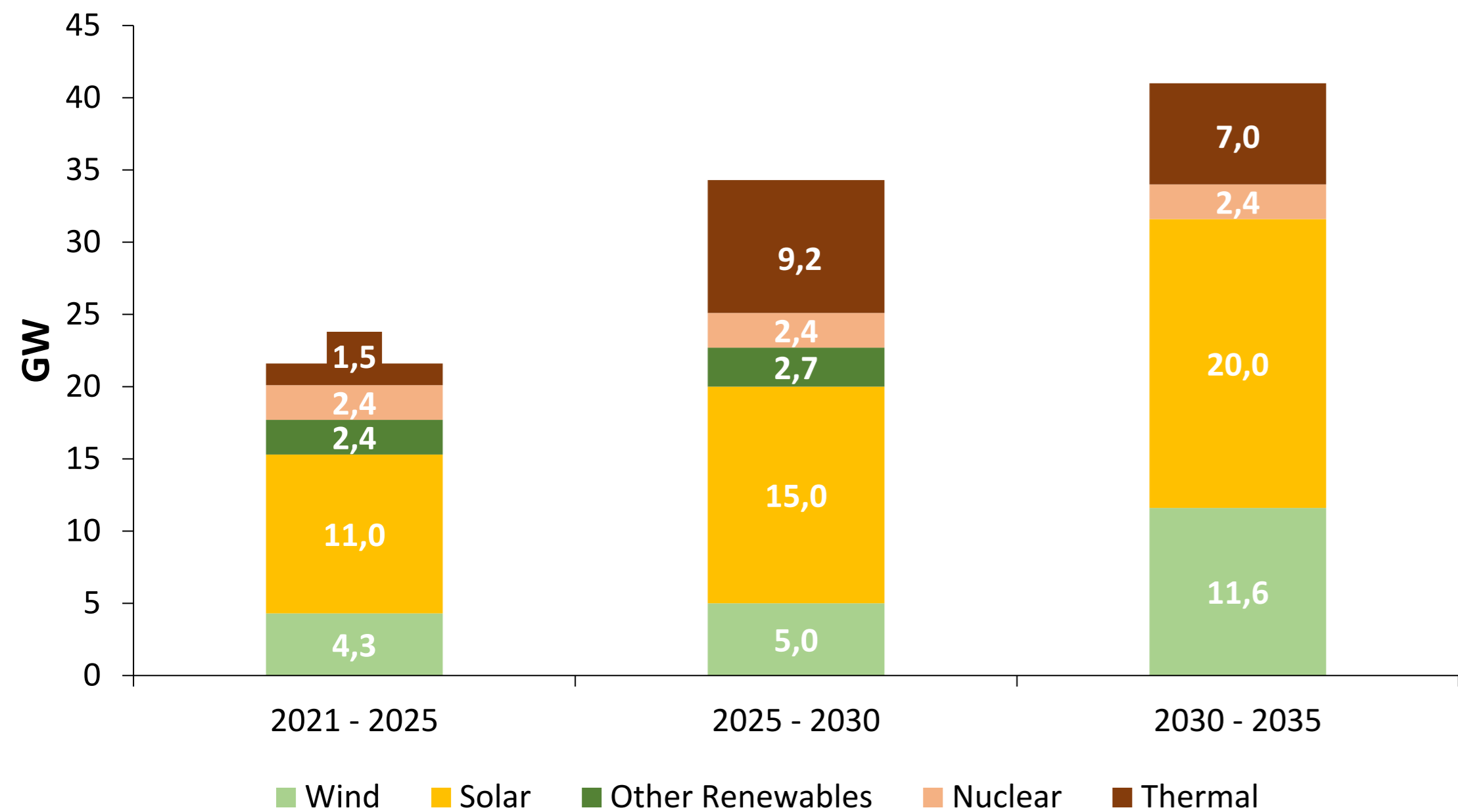


- By 2035, the total installed nuclear power in the system is planned to reach 7.2 GW. 
- By 2035, the battery storage capacity in the system will increase to 7.5 GW. The capacity in the direction of load reduction and load increase on the demand side rises to 1.7 GW. 
- For the year 2035, the share of hydrogen in gas mixture is determined as 3.5%.
- In line with these policies, it is aimed that the installed power capacity of the electrolyser will reach 2 GW in 2030, 5 GW in 2035 and 70 GW in 2053. 

It is expected that new capacity amounting to 21.6 GW needs to be put into operation in 2021–2025, 34.3 GW in 2026–2030 and 41.0 GW in 2031–2035

New Installed Capacity Commissioned

New Installed Capacity Commissioned in Five-Year Periods



Year-End Electrical Installed Capacity

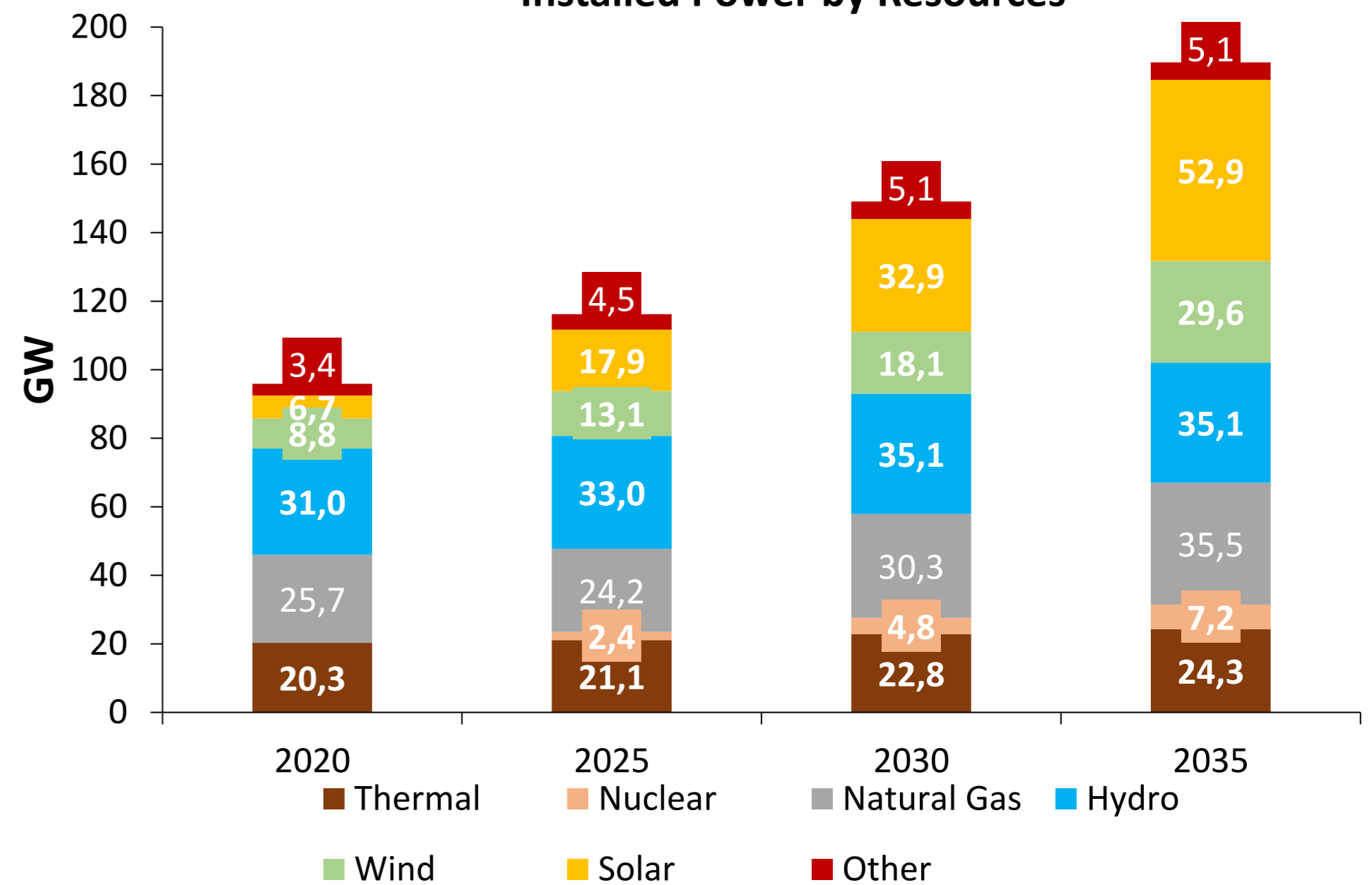
2022: 104.1 GW

2025: 116.2 GW

2030: 149.1 GW

2035: 189.7 GW

Installed Power by Resources



> The new capacity that needs to be put into operation in the 2021–2035 period is 96.9 GW. Of this installed capacity increase, 74.3% is expected to come from renewable energy sources, most notably solar and wind power. The annual new capacity requirement for solar and wind power is 3.1 and 1.4 GW on average, respectively.

Flexibility

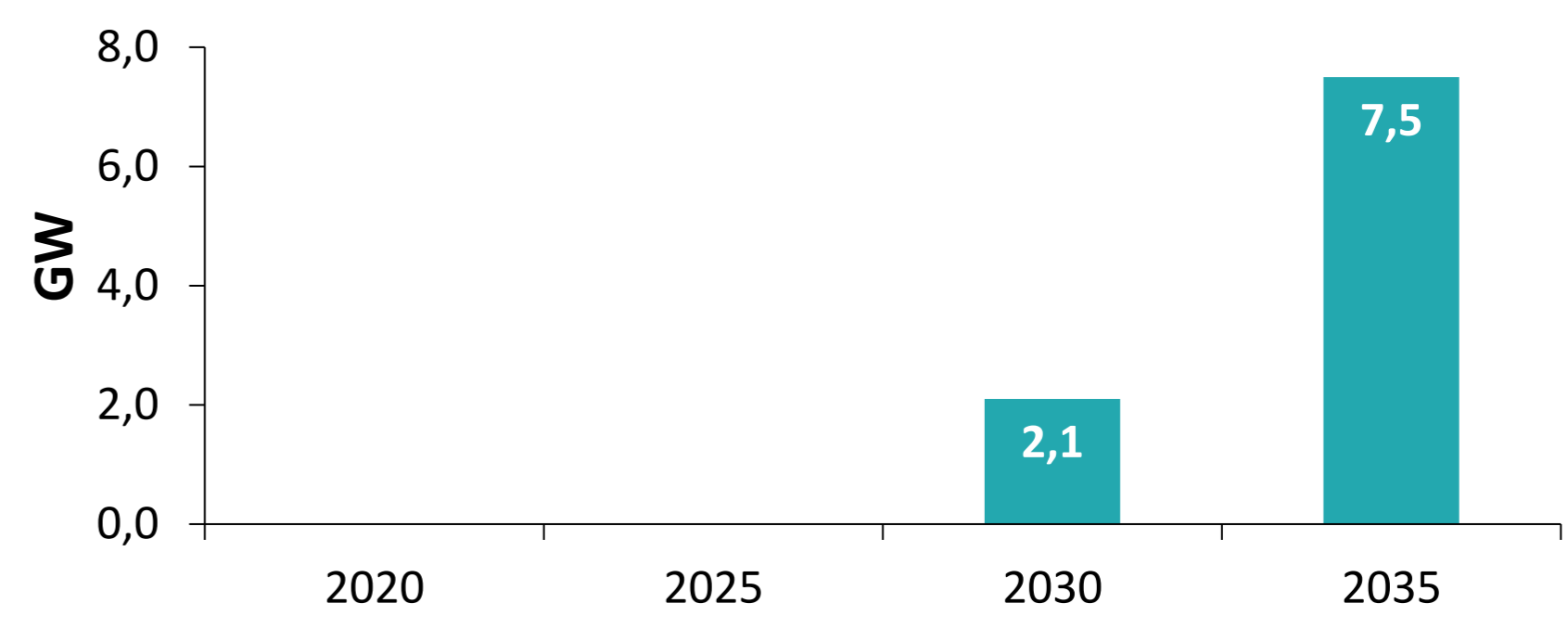
- > The flexibility of the system is expected to increase by ensuring the integration of intermittent renewable energy sources.
- > In the applied model, battery capacity increases depending on the increasing installed capacity of intermittent renewable energy sources. The expected 2.1 GW in 2030 will increase significantly by 257.1% to 7.5 GW in 2035.

Although the New Energy Plan was announced at the end of 2022, the details under the plan indicate that it was prepared in the summer of that year. This means that the new battery storage integrated wind/solar scheme was not as yet operational. APLUS view is that the battery installed capacity targets under the plan are fairly low and don't reflect the situation in the market after November 2022 which saw a great deal of interest in the new battery storage scheme. The details are given in [page 248](#).

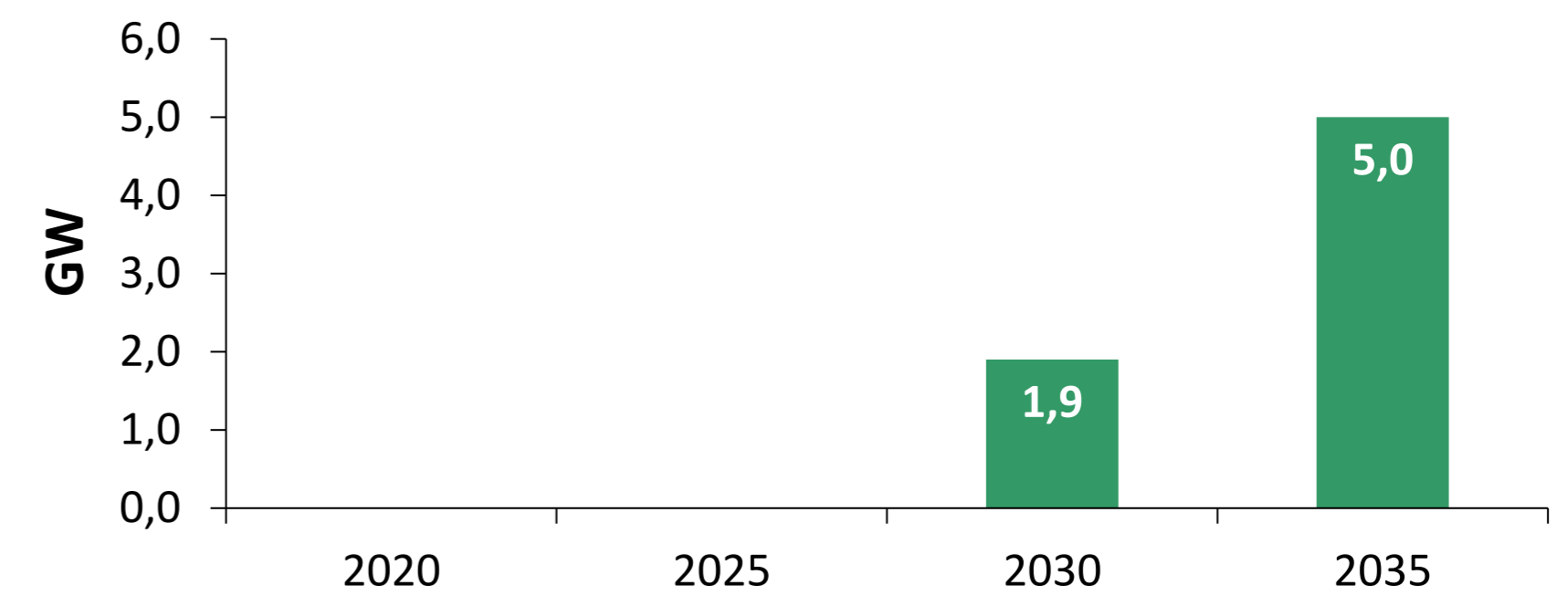
- > Electrolyser capacity based on hydrogen and synthetic methane mixed with natural gas is increasing in line with the emission reduction targets. In 2035, this capacity is expected to reach 5.0 GW.

- > When the demand-side response is analysed, it is observed that the contribution of load decreases and increases to the system increases depending on the development of peak demand.

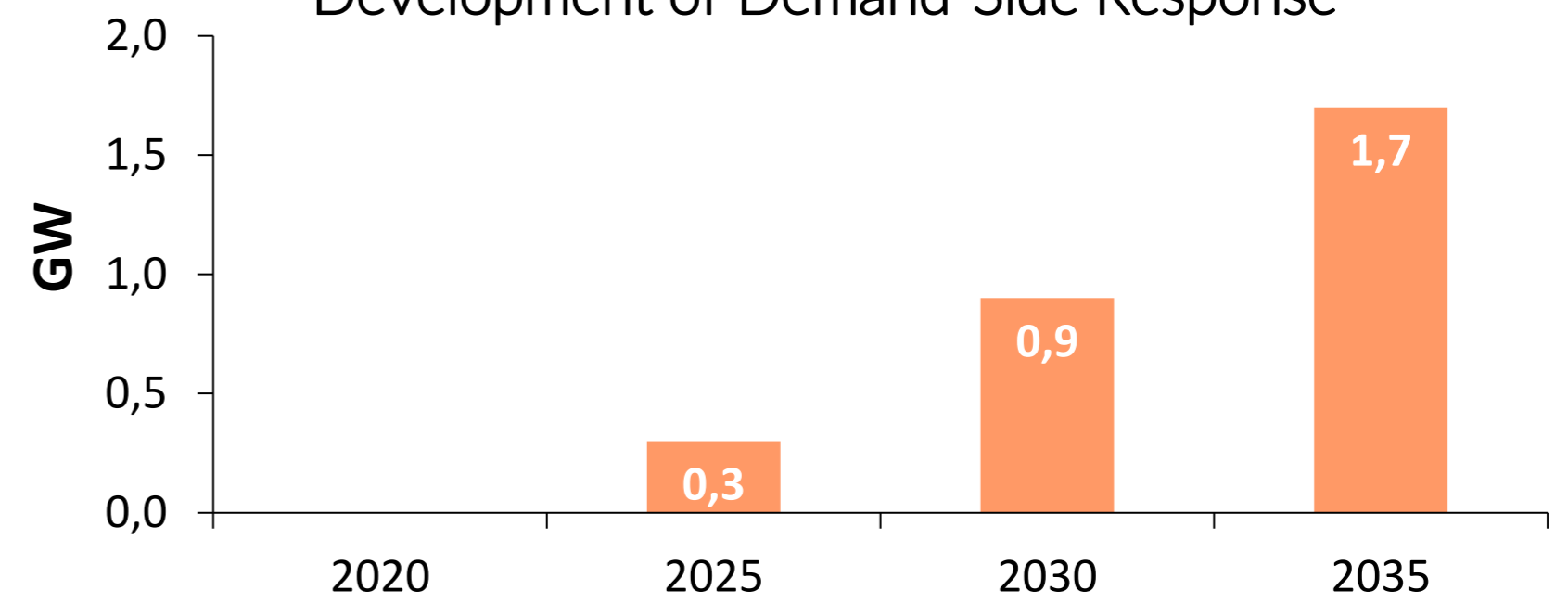
Development of Battery Capacity



Development of Electrolyser Capacity



Development of Demand-Side Response





## Thermal and Carbon

The EMBA Hunutlu Power Plant project was undertaken by a partnership of the Shanghai Electric Power (SEP) and AVIC International Project Engineering from China. The project constitutes the largest Chinese FDI into the country with around 1.7 billion USD. The project is also significant as one of the last China funded coal projects abroad due to the declaration by China to cease coal power plant financing overseas in September 2021.

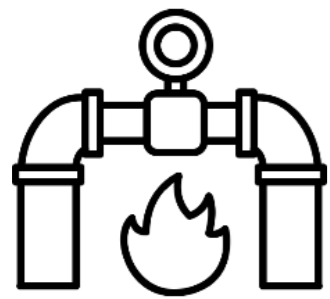
## Coal



- > In 2022, a new imported coal power plant (EMBA Hunutlu) with an installed capacity of **1.3 GW** is commissioned. By 2030, an additional **1.7 GW domestic coal power plant** is expected to be included in the system. Between 2030 and 2035, **1.5 GW of additional domestic coal** installed capacity is expected to be commissioned. The total increase in domestic coal capacity reaches **3.2 GW in 2035..**

The 10 GW additional capacity target for natural gas is considered unrealistic by APLUS Enerji especially given especially given the lack of financing for thermal power plants. We can also observe this phenomenon in forecasted thermal utilization rates under the Energy Plan detailed in the following pages .

## Natural Gas



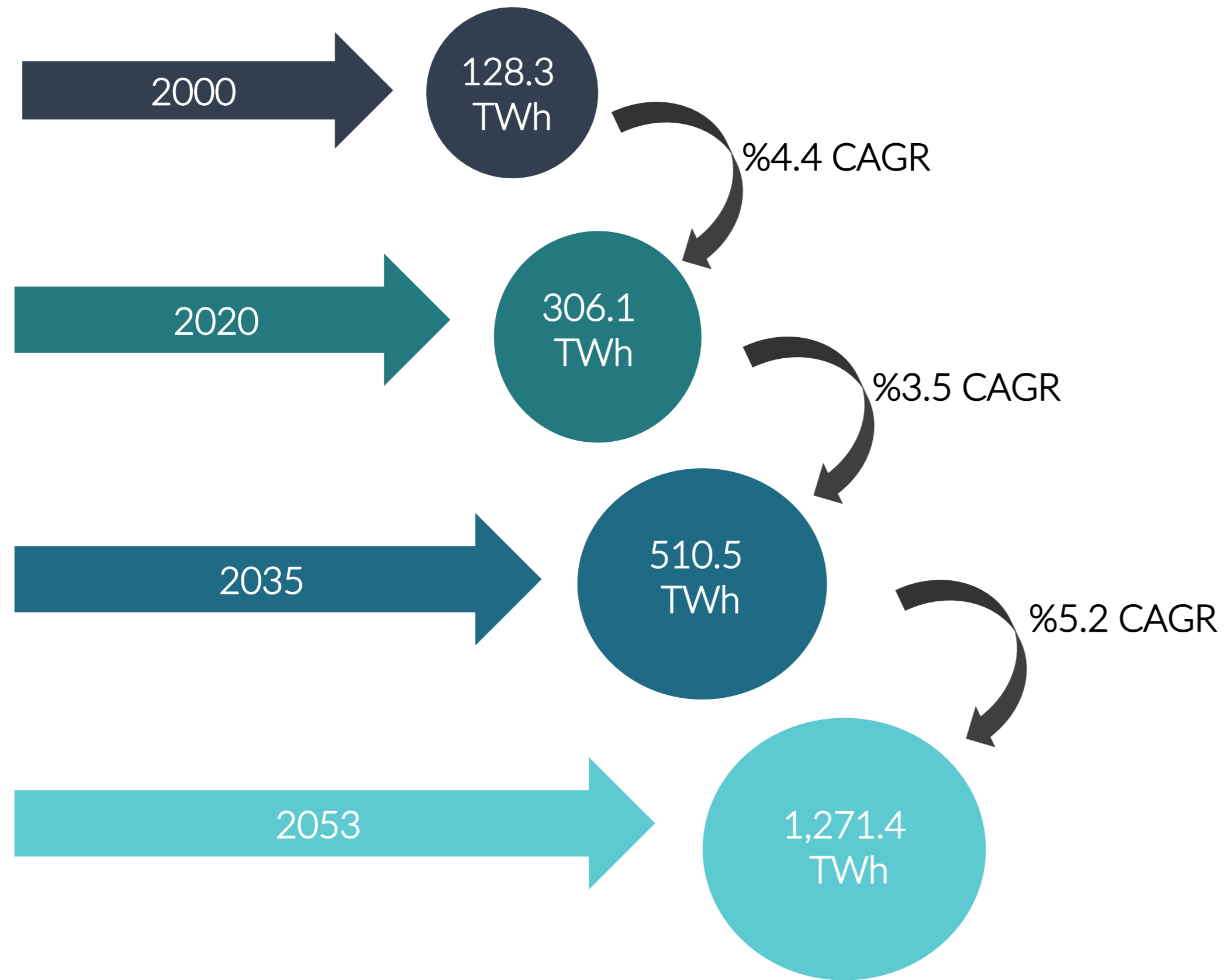
- > It is assumed that **2.4 GW** of installed capacity will be commissioned by 2030. Around **10 GW** of new (additional) natural gas combined cycle power plant is expected to be operational by 2035 in addition to the abovementioned investments to contribute to the management of the imbalance of intermittent renewable energy plants in the system, and to the sustainability of energy supply security.
- > The capacity of small-scale natural gas-fired power plants that are mostly used to meet heating requirements in industry, and in which electricity and heat are co-generated, will increase by **0.2 GW** in the 2021–2025 period and by **0.4 GW** in the 2026–2030 period.

## Carbon Capture and Storage (CCS)

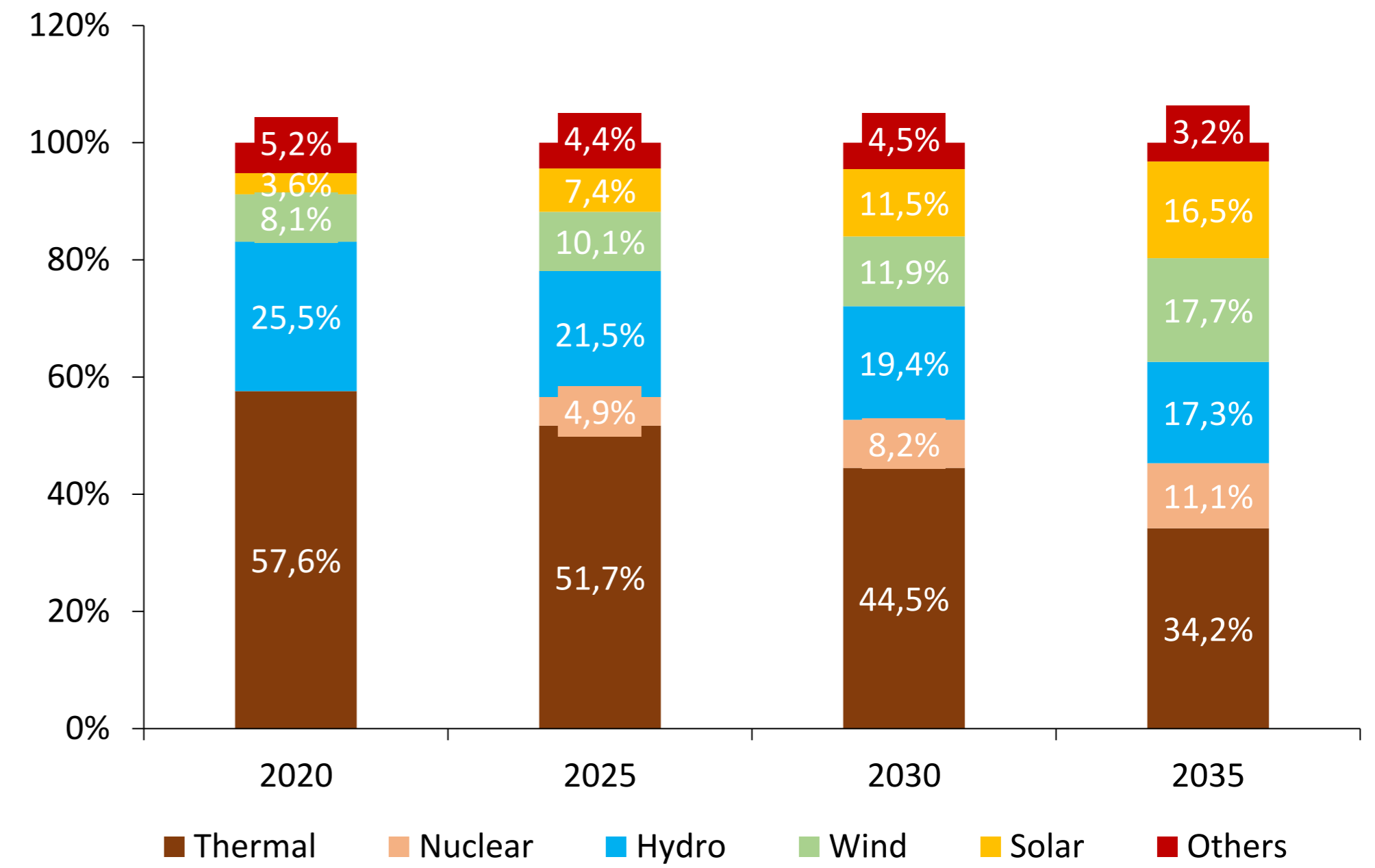


- > Until 2035, no new coal or natural gas power plant using **CCS technology** is expected to be commissioned due to high costs. It is stated that CCS technologies can be used depending on technological developments, and coal-based production can be achieved above the target.

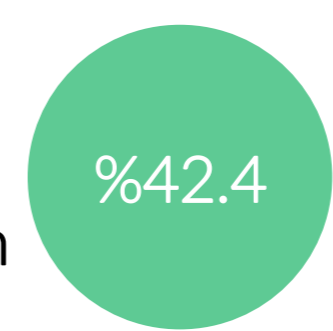
Electricity Consumption Forecast



Electricity Generation by Source

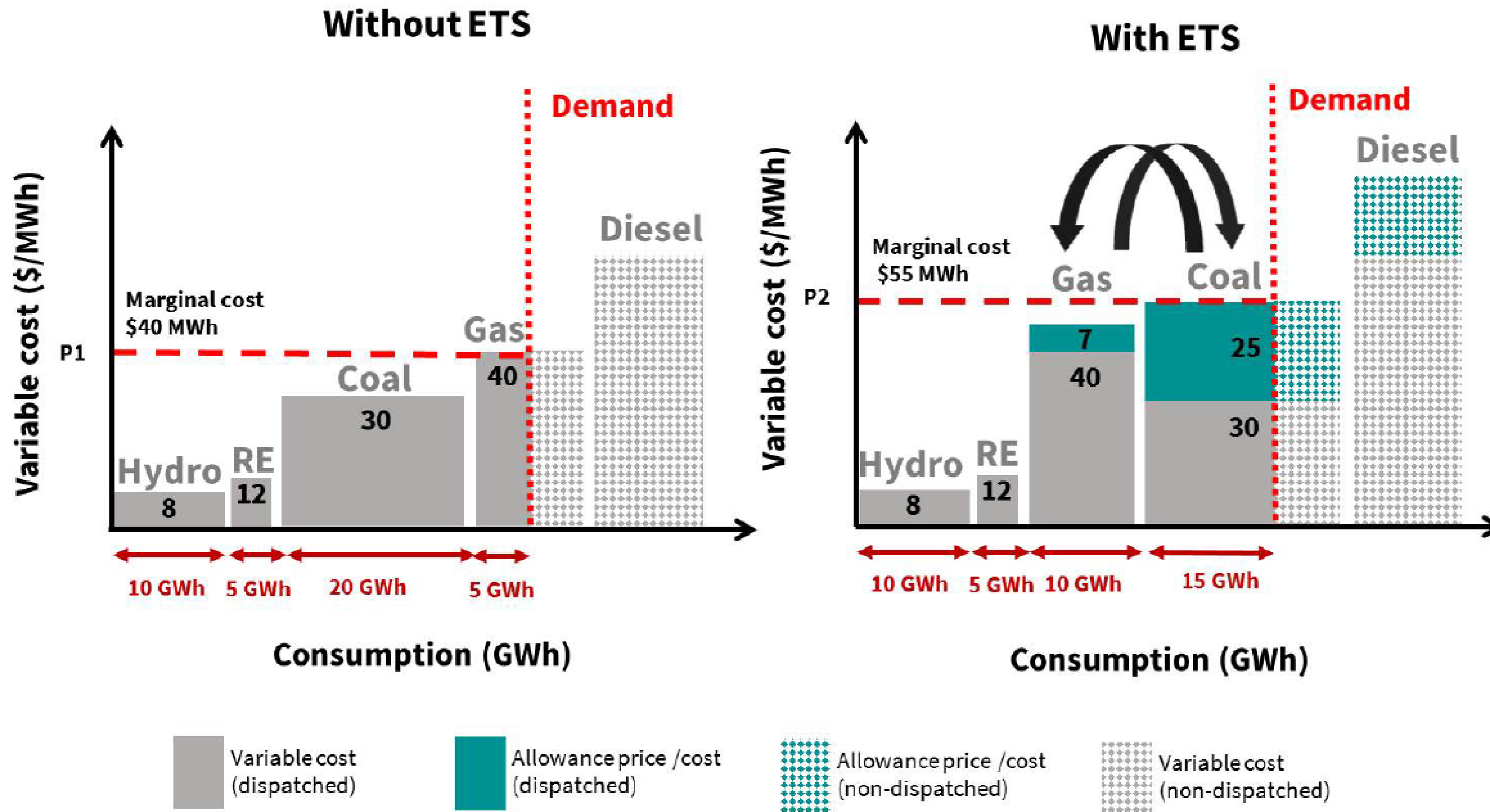


Share of Renewable Energy Sources in Electricity Generation in 2020

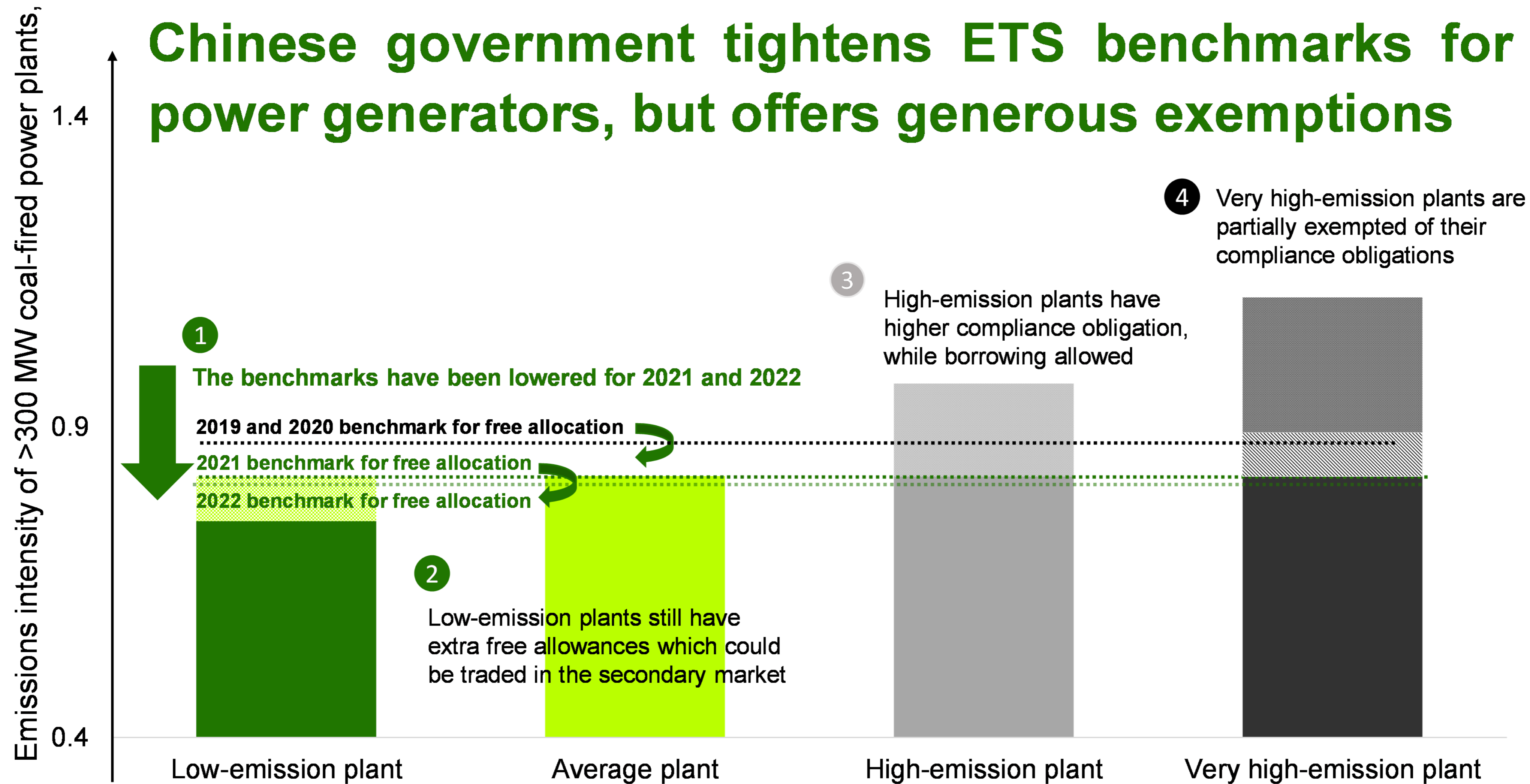


Share of Renewable Energy Sources Targeted in Electricity Generation in 2035

According to the inference made from the available data, it is understood that a high rate of additional electrification is not assumed until 2035 in sectors such as industry, buildings and transport. After 2035, it is seen that increasing electrification plays an essential role in the increasing electricity demand, and the transformation in these sectors is predominantly left to occur after 2035.



# Chinese government tightens ETS benchmarks for power generators, but offers generous exemptions



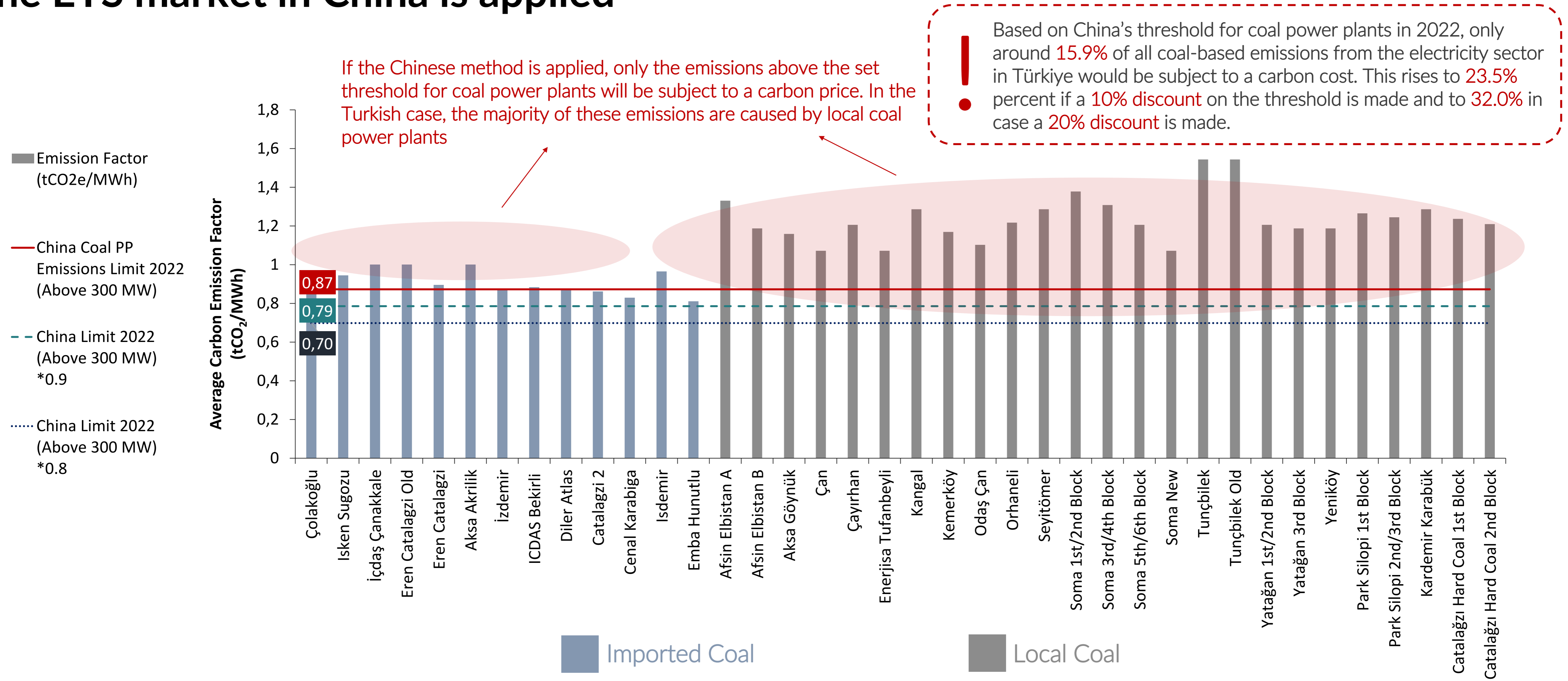
DATA: CRU Sustainability

**The power plants under the Chinese ETS system are currently provided significant exemptions based on a determined emissions benchmark for different technologies. This benchmark is expected to be gradually lowered over the coming years**

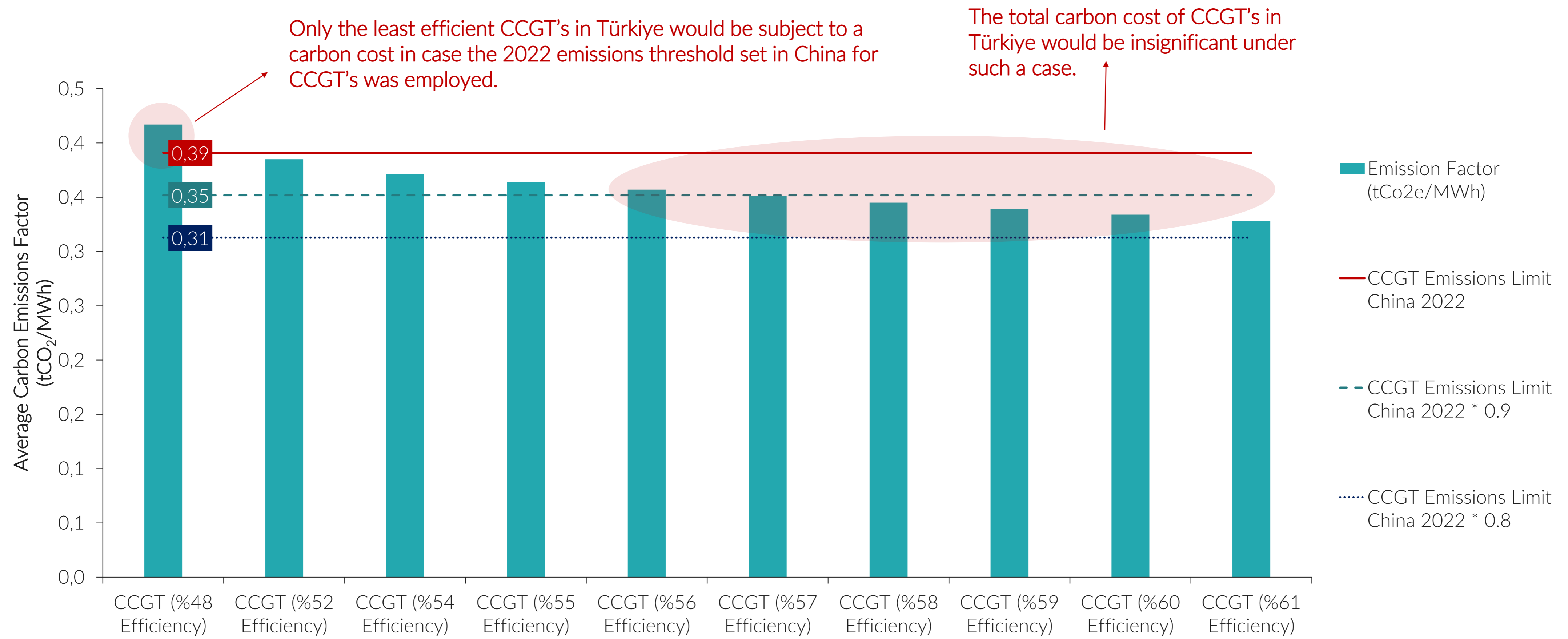
Year	tCO <sub>2</sub> / MWh			
	Conventional coal units (above 300 MW)	Conventional coal units (below 300 MW)	Unconventional coal units*	Gas-fired units
2019 - 2020	0.877	0.979	1.146	0.392
2021	0.8218	0.8773	0.935	0.392
2022	0.8177	0.8729	0.9303	0.3901

\* refers to coal gangue or coal water slurry

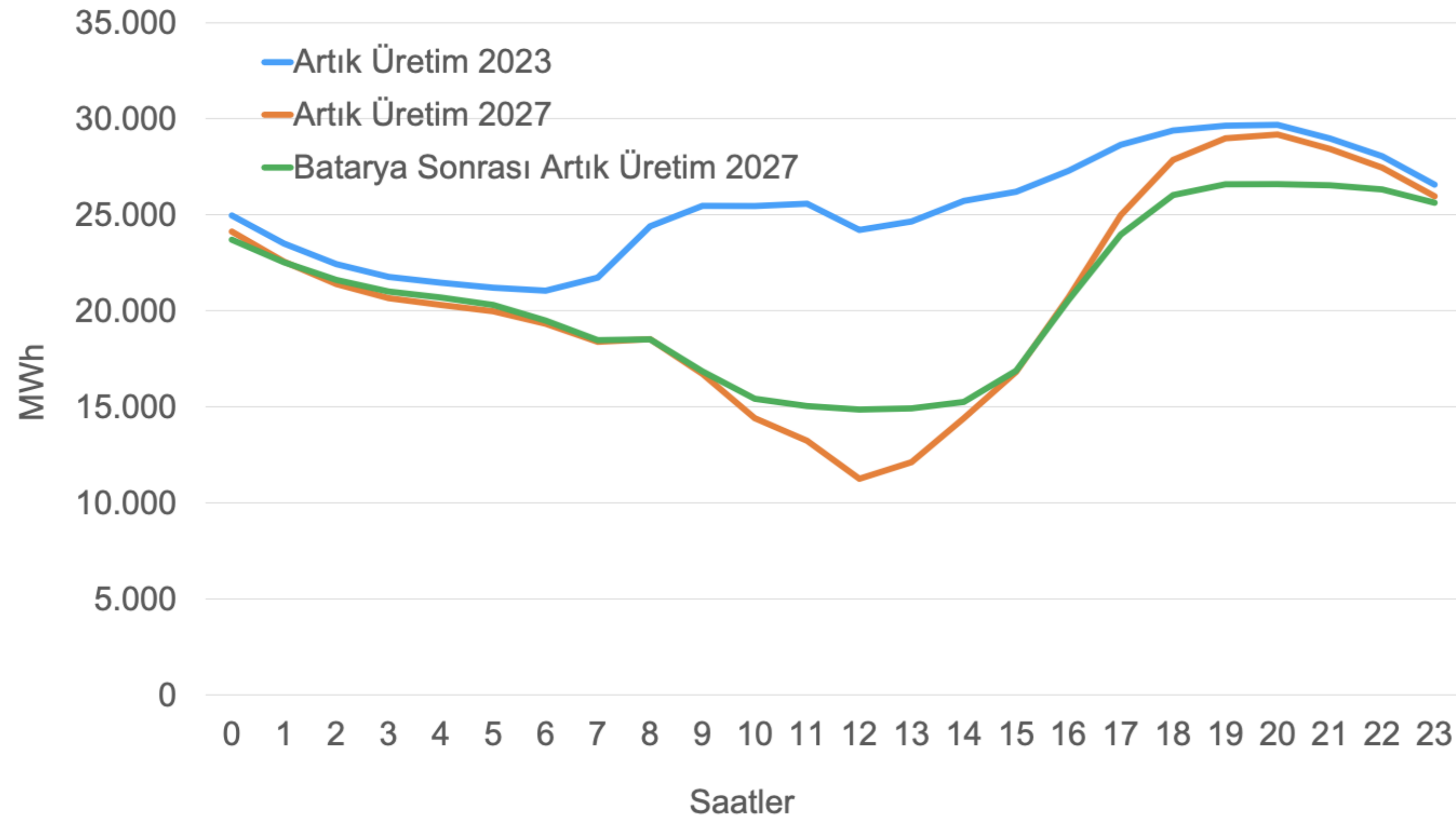
# An important share of the emissions from the electricity generation sector wouldn't be under a carbon price scheme in case an emissions threshold similar to the ETS market in China is applied



# The emissions limit set for natural gas under the Chinese ETS scheme compels only the least efficient CCGT's to bear potential carbon costs



# Increased generation from intermittent resources will distort the load profile and change the generation plan for baseload operating power plants



*Eylül 2022 – Ağustos 2023 arası Artık Üretim*

*Eylül 2026 – Ağustos 2027 arası Bataryalar sonrası Artık Üretim*

+ 20 GW GES

+ 6 GW RES

+ 2.4 GW Nükleer

+ %10 Talep Büyümesi

**+ 15 GWh Batarya (%80 DoD)**



## **CBAM is an enabler of green energy transition for Turkey but we need to make sure our plans are inline with the Net Zero target**

- > Exporting companies are investing heavily in licence-exempt facilities (5.1.h.) with around 9-10 GW expected solar capacity to be installed in 3 years
- > Storage + renewable investments will be very crucial for both system management and renewable penetration
  - > 30-35 GW capacity is being provided to companies
- > ETS price level and allowances are highly crucial to have a functioning support scheme for further green energy investments
- > Huge potential for hydrogen exports need to be utilized
- > Grid investments need to be expedited for a smooth transition, allowing almost 70% intermittent resources in total electricity generation (as per National Energy Plan target!)