Building a Low-Carbon Smart Society

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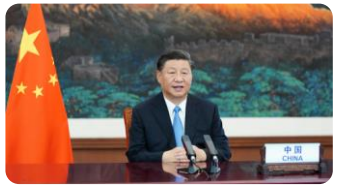
“Carbon neutrality" brings an energy revolution, low-carbon transformation of industry is being accelerated

“Carbon neutrality” has become a global development 44 countries have identified carbon-neutral timings



China
2060

EU
2050

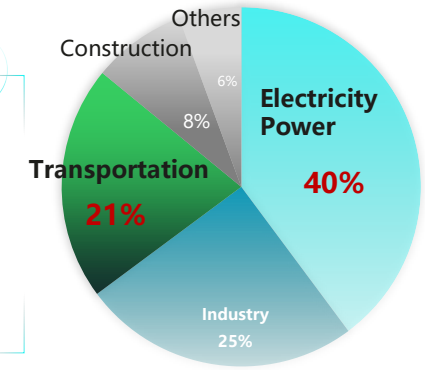
U.S.
2050

The main sources of carbon emissions are electricity generation and industry, transportation

Power electrification

Electricity as a share of power consumption

2018	2050
25%	51%



Global Carbon Emissions in 2020

Sources: IEA

Low carbon power generation

Clean generation in electricity

2018	2050
25%	90%

Intelligence of Electric Power System

Carbon neutrality relies on Renewable power generation, green ICT, and green travel

Green power generation

- China issued whole countryside distributed photovoltaic promotion
- EU issued green strategy, many country issued energy storage subsidy policy

Green ICT

- Data Center PUE from 1.67 to 1.25 (2030)
- SEE (site energy efficiency) from 60% to 85% (2030)

Green travel

- Electric vehicles quantity from 4 million to 12 million (2025)
- Charging infrastructure boasts rapid growth and multi-country subsidies

Integrated smart energy

- Green city, Green campus, Green building

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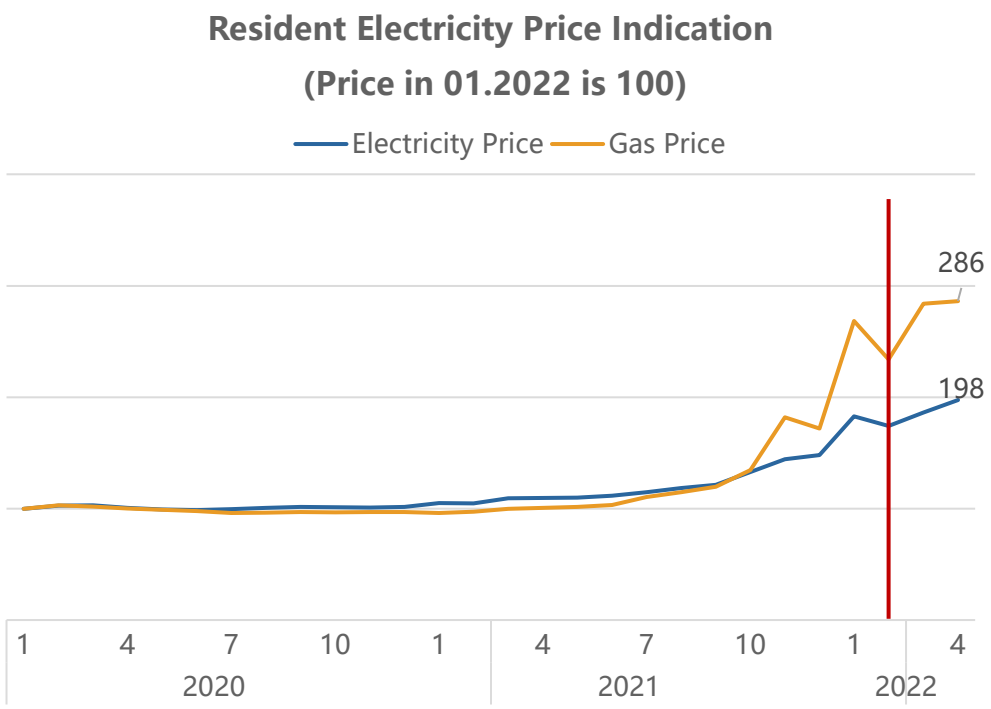
Energy Resource Challenge: As residential energy prices soar, some countries keep stable to lower the impact on residents

European residential electricity and gas prices soar 04.2022 vs 01.2020

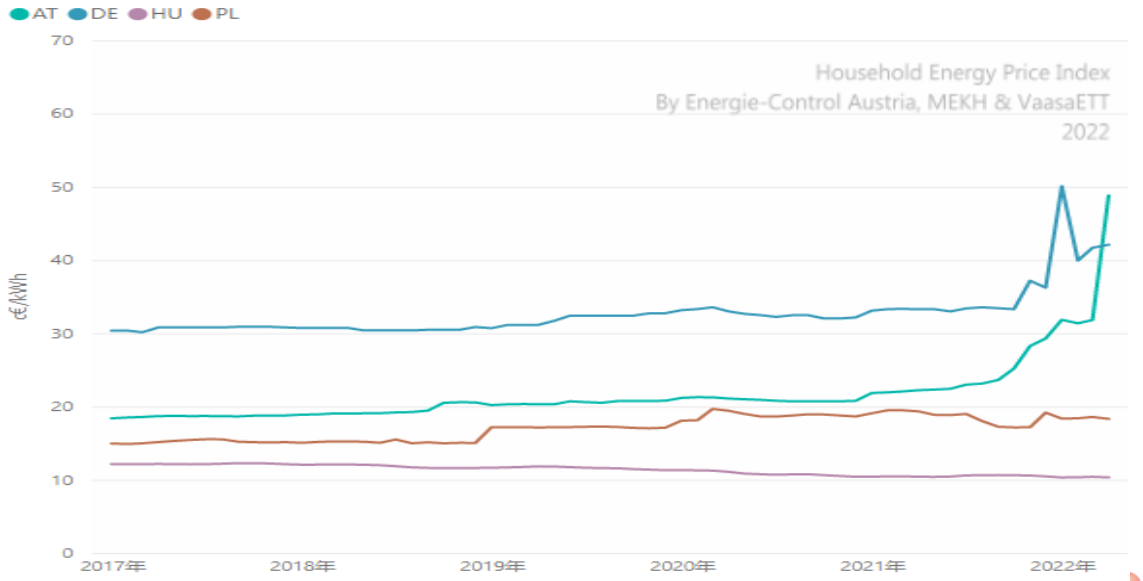
- European household energy prices start to rise rapidly from the second half of 2021
- **Compared with January 2020, the electricity price of 2022.04 is 1.98 times higher than that of January 2020. Natural gas prices rose to 2.86 times**



the residential electricity price in different countries

- Countries are significantly increased higher, such as **Germany, Austria, Netherlands, and Estonia from 2021 to 2022.**
- Countries as **Poland and Hungary** keep stable residence price to lower the impact the residence life.

2017.01 ~ 202.04 Resident Electricity Price in Austria, Germany, Hungary, and Poland (c€/kWh)



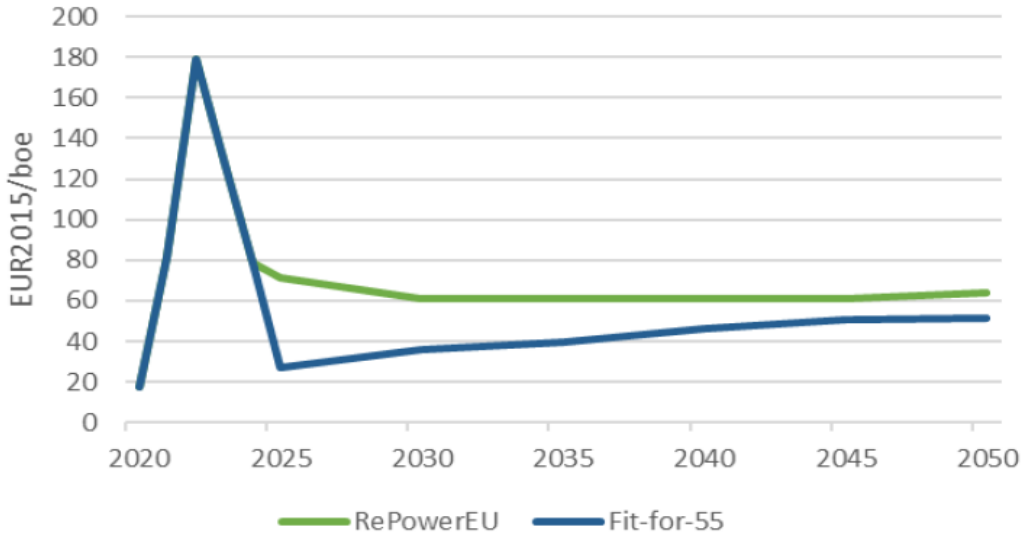
Source From: Energy Price Index,

Energy Resource Challenge: Energy prices are expected to remain high until 2030

Natural gas prices will remain high for a long time

European Commission predicts that the natural gas price will reach 180€/boe (106€/MWh) in 2022, drop sharply after 2023, and maintain 60€/boe (35€/MWh) after 2030**, more than three times the 2020 price**.

European Commission Gas Price Forecast for RePowerEU and Fit55

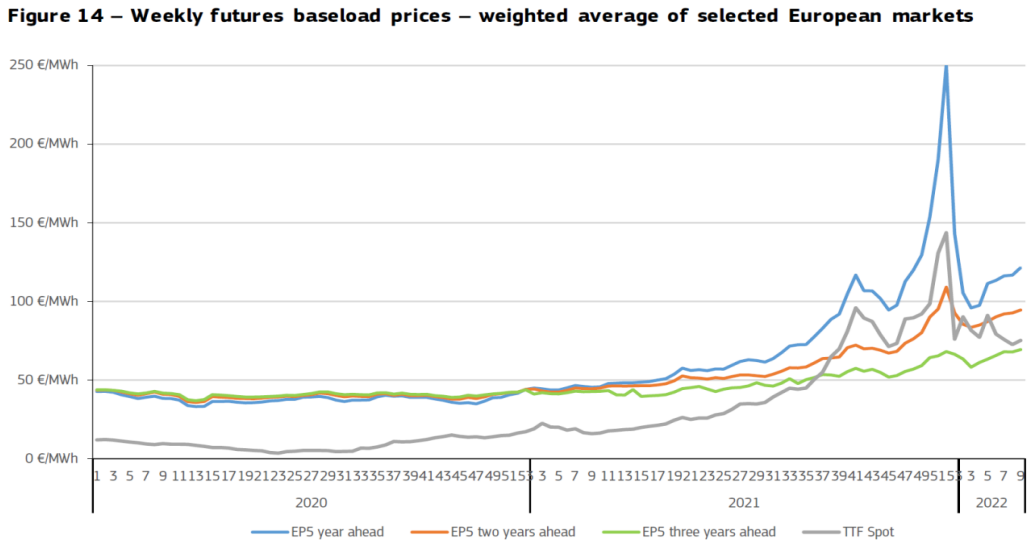


Source: European Commission
Note: 1boe=1.7MWh

European electricity futures prices rise

Rising natural gas and carbon prices in Q4 2021 have brought electricity futures prices to record highs. By the end of December 2021, one-year, two-year and three-year electricity futures prices rose to 250€/MWh, 109€/MWh and 68€/MWh respectively, **2-6 times the same period in 2020**

EU Electricity Futures Price



Source: European Commission

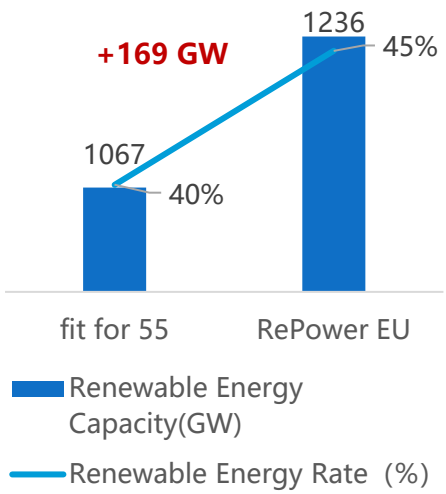
REPowerEU aiming to realize EU dependence by 2027

REPower EU's policy framework was released on May 18.

Further increase target on Fit for 55

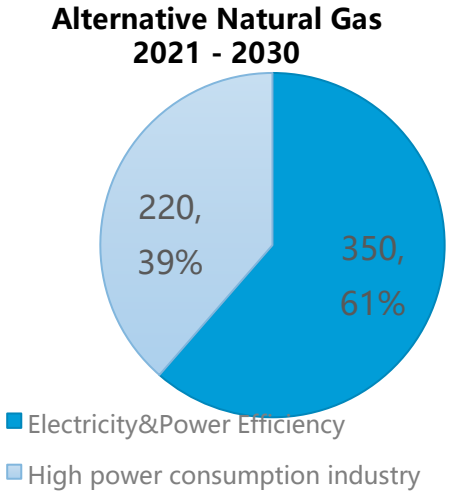
Renewable energy

Substitute natural gas 65 billion m3/year



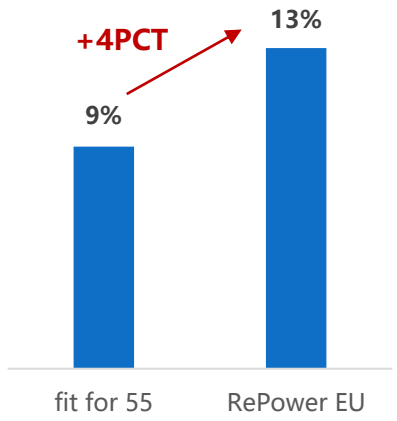
Green industry

Substitute natural gas 57 billion cubic meters/year



Energy saving

47 billion m3/year reduction of natural gas

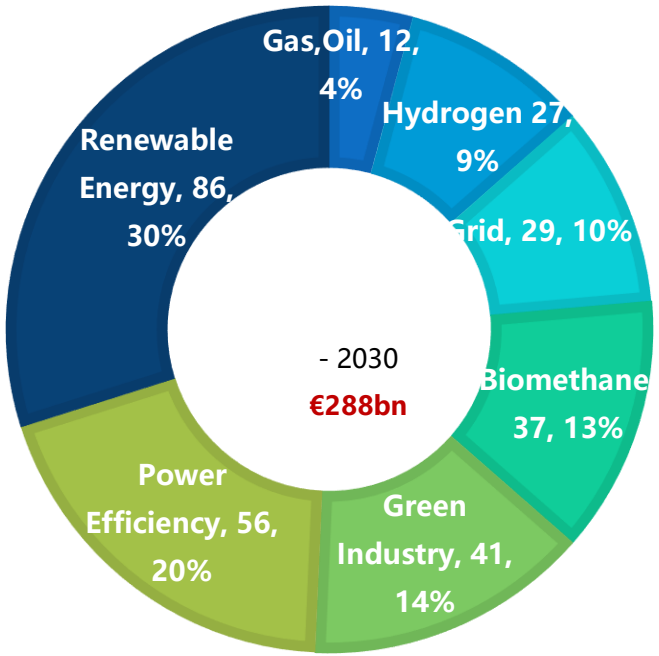


Data source: European Commission

Till 2030, REPower EU Infrastructure Investments

€288 billion, Among it, Renewable energy part occupy 30%

Unit: 1 Billion euros

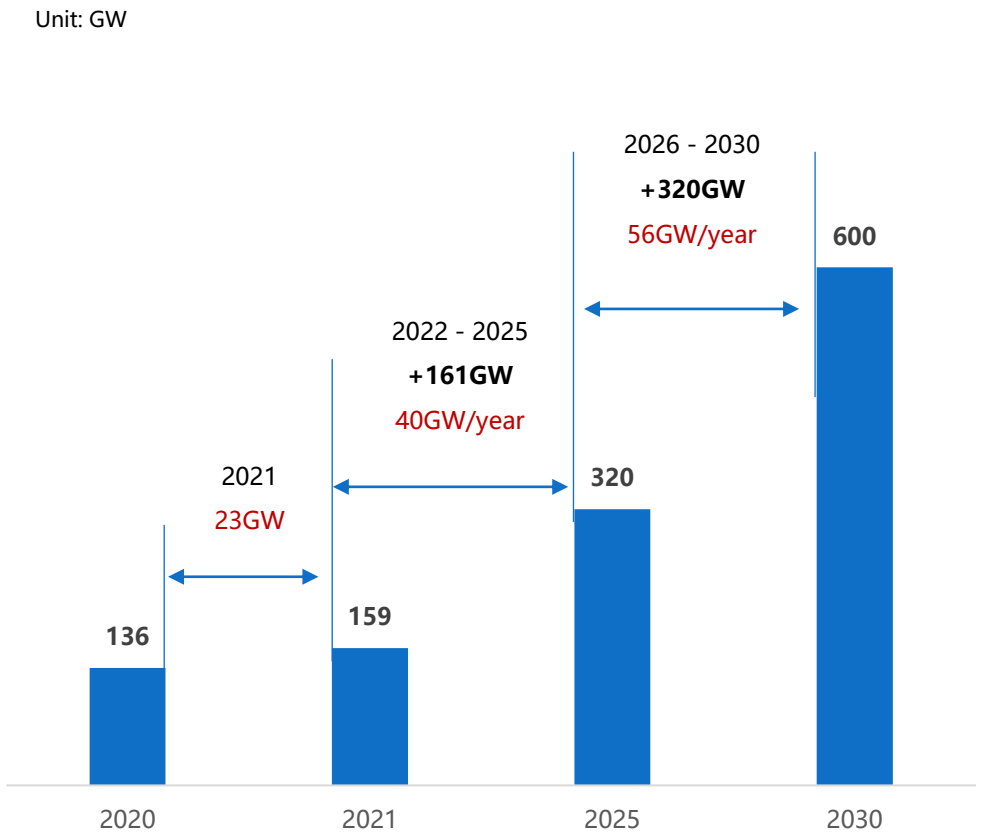


Data source: European Commission

The EU Solar Energy Strategy : PV installed capacity 23 GW -> 56 GW/year

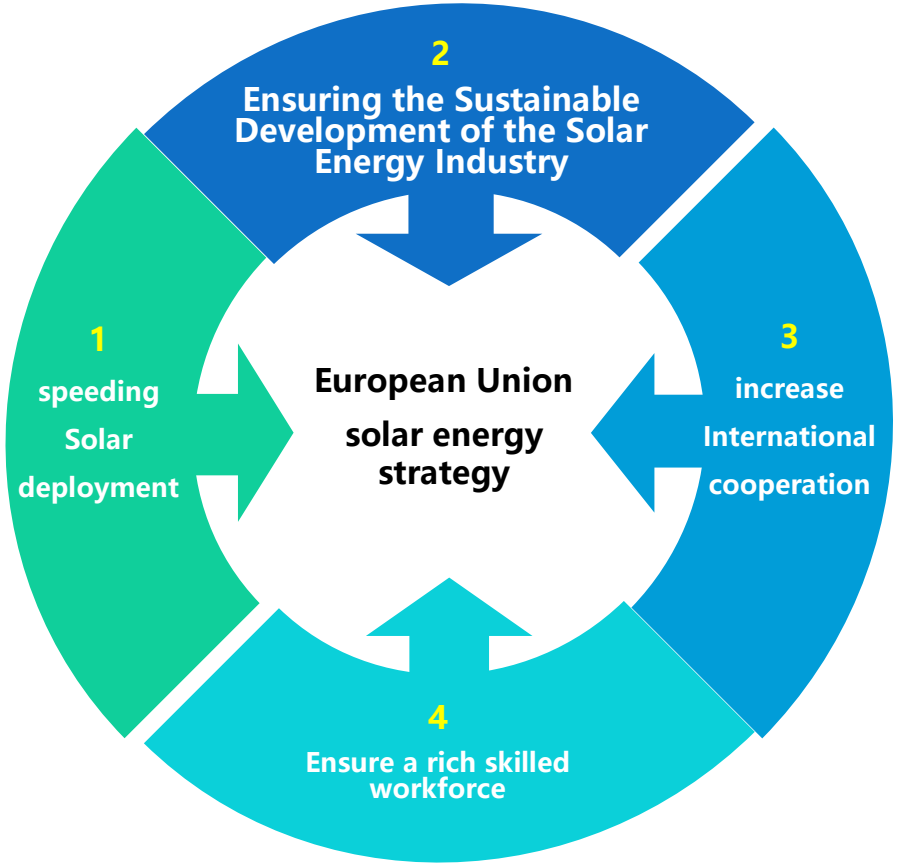
PV Construction Objectives

600GW@2030, replacing 900 million m³ of natural gas consumption



EU Solar Strategy

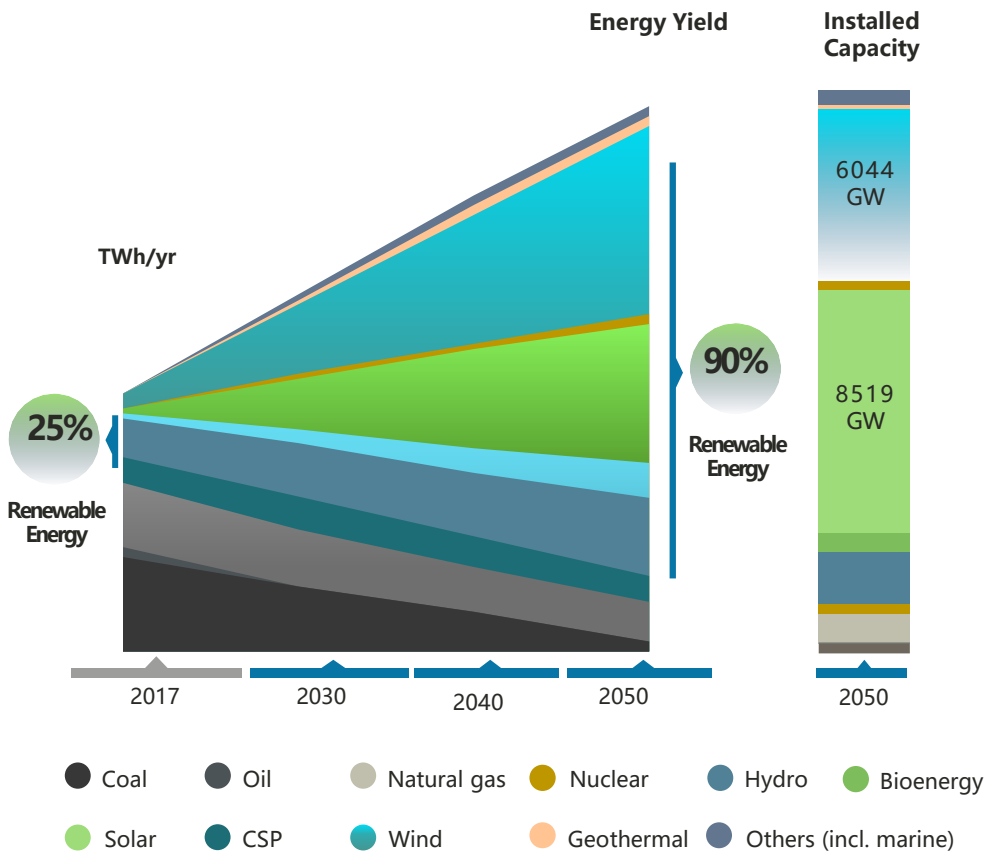
4 initiatives



Data source: European Commission

Trend 1: "Wind and Solar" as Renewable Energy will be the main power

Renewable Energy Will Become the Main Energy@2050



Source: IRENA

Build A Clean Energy Power Generation System with Solar, Wind and ESS as the Main Force

- From 2020 to 2050, The global investment in **PV power generation will exceed $ 40 trillion**, and the total investment in wind power generation will exceed $ 50 trillion
- PV & Wind will be everywhere
- **The cost of kilowatt-hour electricity continues to decrease**
- Comprehensive digitalization and intellectualization

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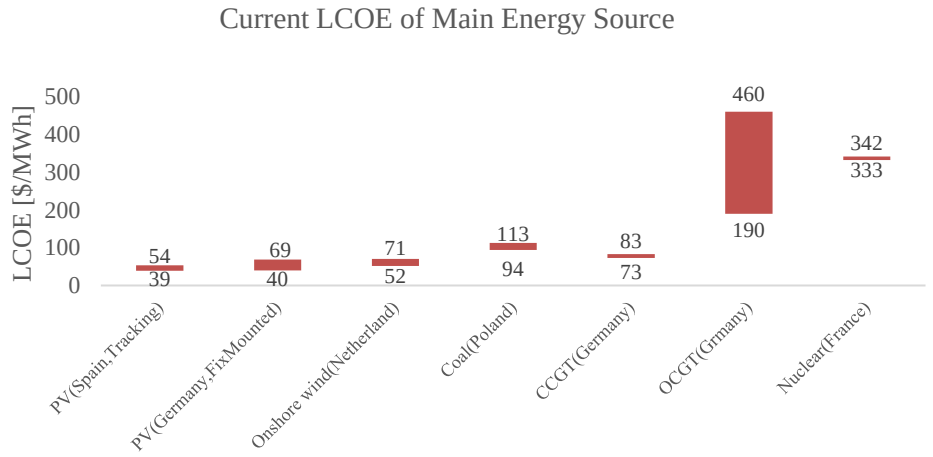
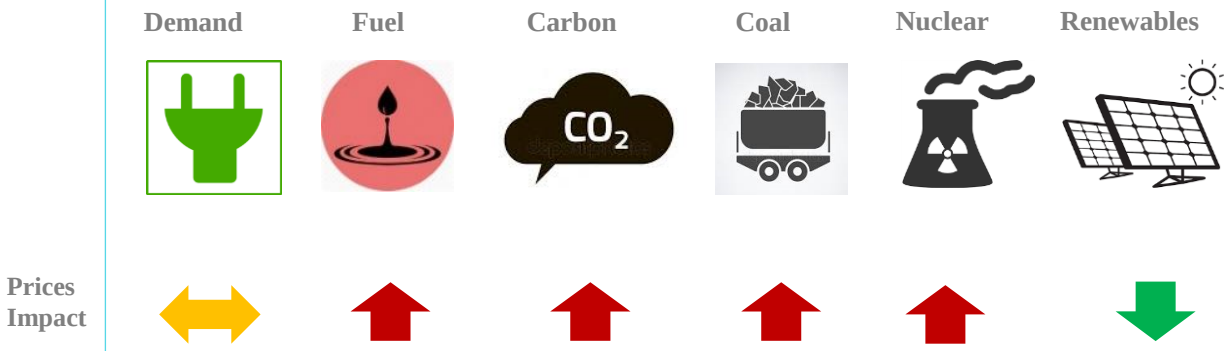
Trend 2: Lower electricity generation costs make it possible for photovoltaic self consumption of C&I and Residential scenarios

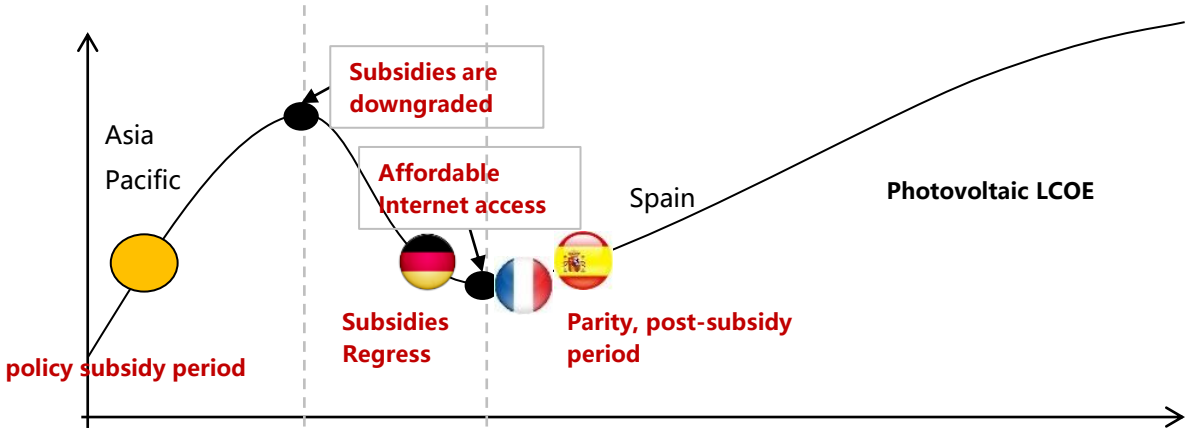
EU Renewable Energy Generation



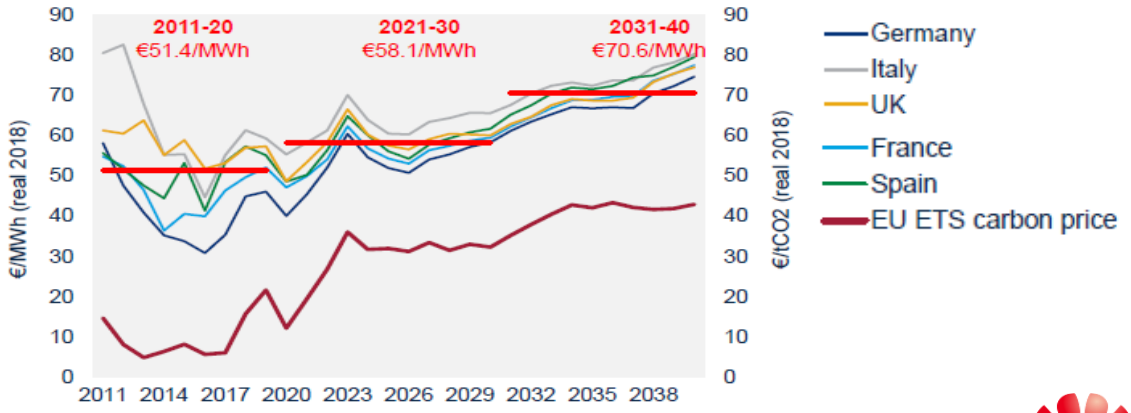
Environmental protection, safety and policy factors



Subsidy is not a must as LCOE lower,
PPA mode will gradually become the mainstream.



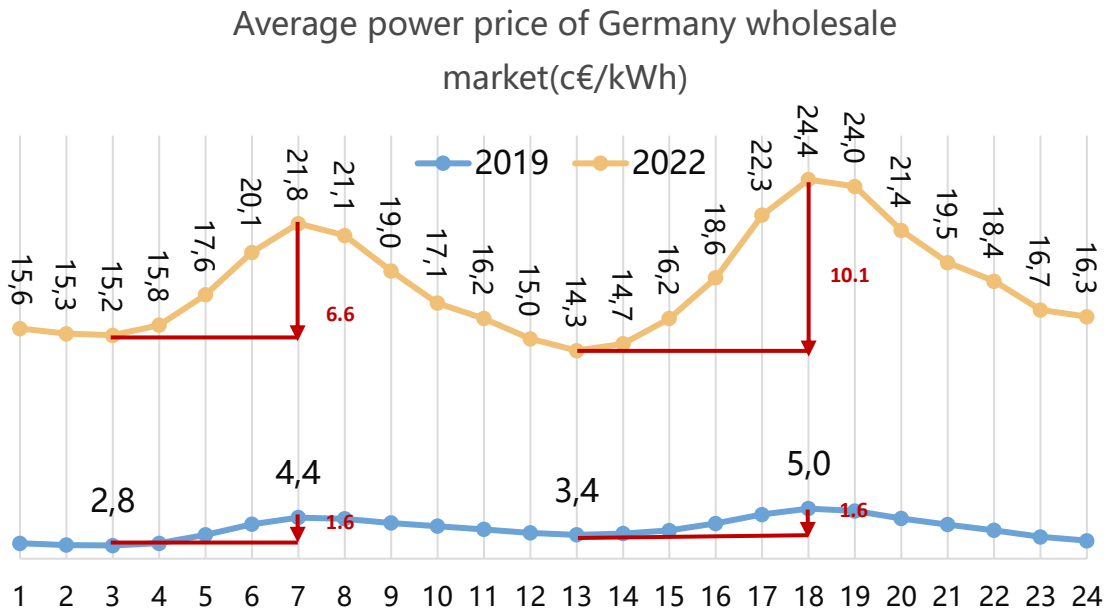
Price of wholesale electricity market will continue to rise,
photovoltaic self consumption become more successful



Trend 3: The peak-to-valley price difference in the trading market widened to over 4 times vs 2019, promoting the development of the ESS energy storage market.

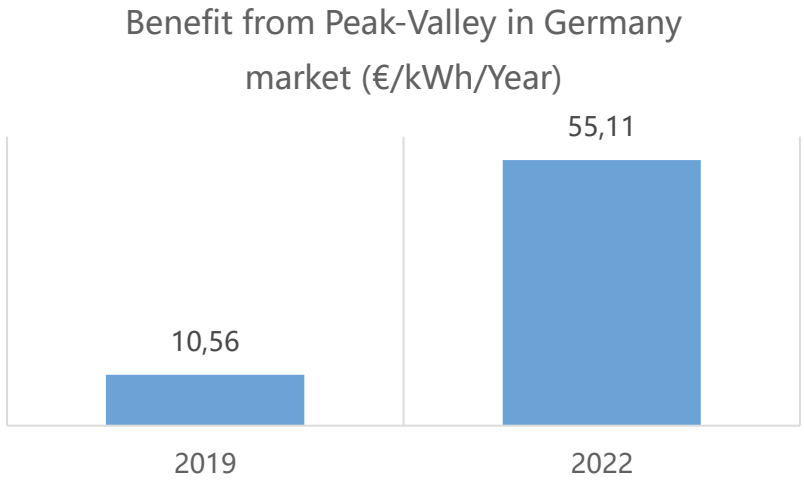
German peak-valley price spread widened to 5.2×

- The difference between the two peak-to-valley prices in the German market for the year **2019 was 1.6c€/kWh**
- Spot market prices rose significantly **before 2022, and the peak-to-valley spread widened to 6.6 and 10.1c€/kWh**, and the intra-day peak-to-valley spread widened to **5.2× in 2019**
- The two peak rates are at 7 a.m. and 18 p.m.



Peak-Valley Price Difference Promotes the Development of ESS Energy Storage Market

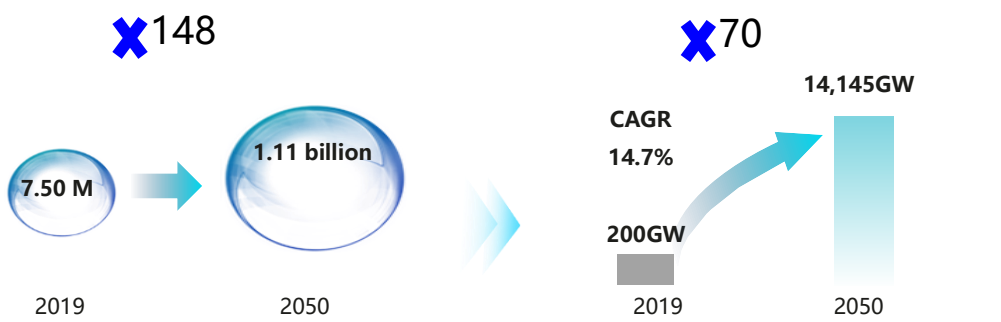
- **EU investment of EUR 10 billion** in REPowerEU energy storage will also accelerate the market development
- **C&I energy storage**: Calculated based on the current electricity, ROI time will be 6 years
- **Power plant-level energy storage**: Renewable Energy Installation Increases, Demand for Frequency Adjustment and Peak-Valley shaping Increases



Data source: energy-charts.info

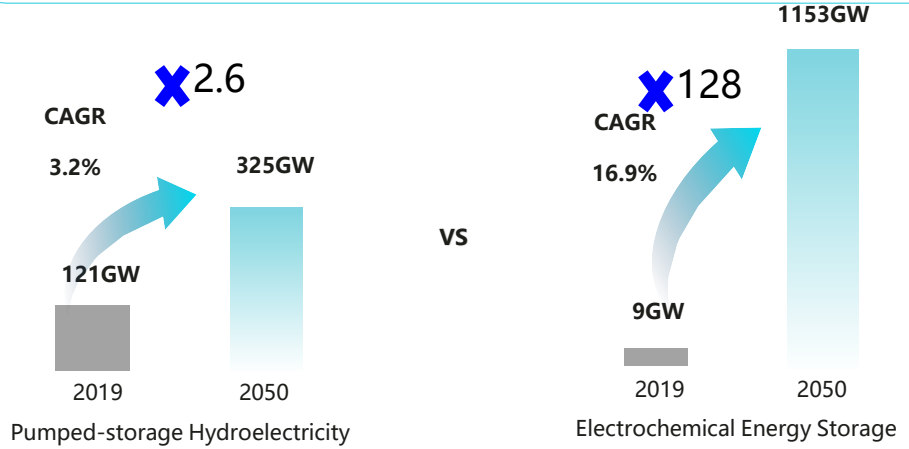
Electrochemical Energy storage is an essential for power supply

Electric Vehicles drive rapid growth of mobile storage



Source: BNEF

Electrochemical energy storage growth much faster



Source: BNEF

What is the Trend of ESS

- ESS as Energy storage is **everywhere**
- System-level **proactive safe** ESS
- **Circular usage & maximize resource utilization**
- **Cloud** BMS, **digitalization, intellectualization**

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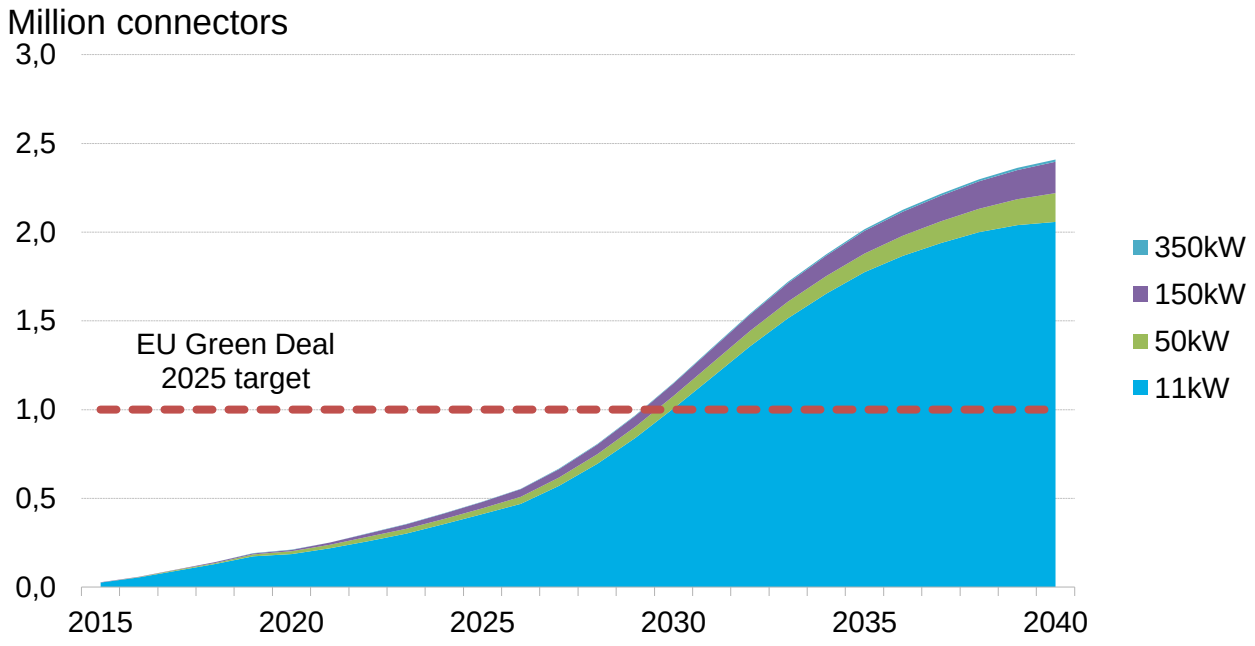
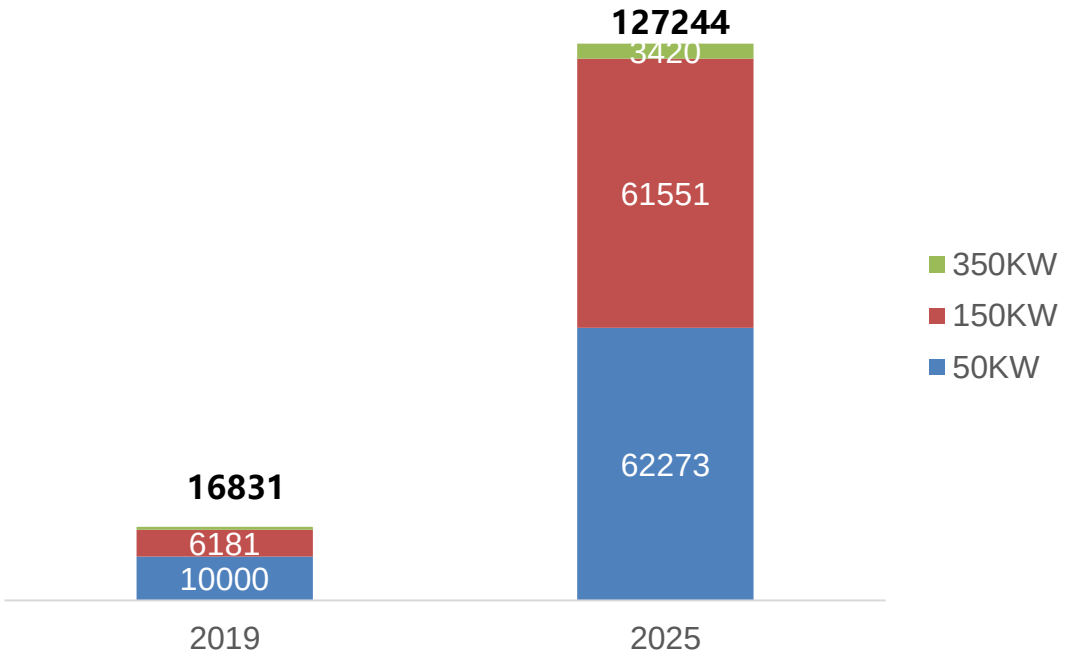
Trend 4: Electrification of transportation and vehicle, accelerating demand for charging facilities

Europe Electric Vehicle Public Charging Piles Installed Volume Forecast



Pubic charging piles forecast(2025 vs 2019)



- Forecast for 2025: **9.7 million electric vehicles, 7.94 million new vehicles from 2020 to 2025**, with an average annual increase of 1.32 million
- Charging infrastructure is one of the priorities of the EU's recovery plan. The central objective of the scheme is to **reach 1 million public charging points across the EU by 2025.**

Data source: BNEF

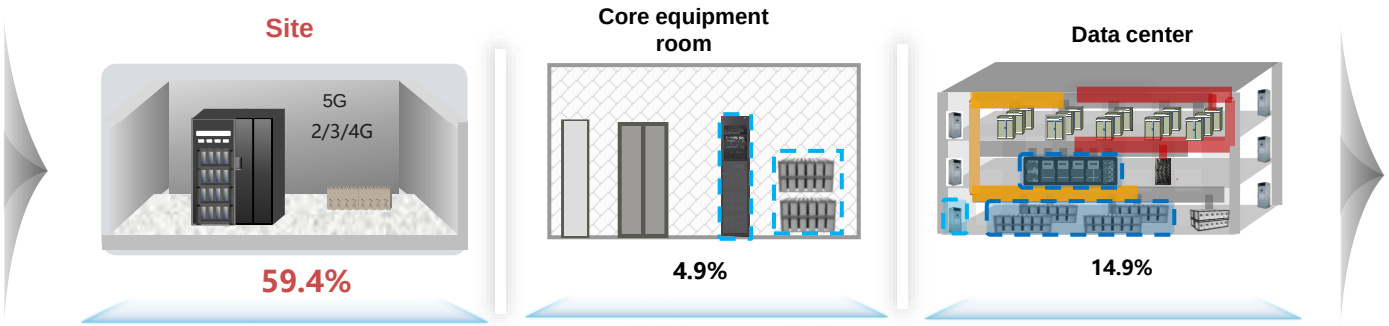
Trend 5: Green Site Strategy of Carriers, Site Power saving is the main topic

Survey  3.2%

Optimize  2.8%

maintenance  6.5%

Sites are the key to achieving carbon neutralization for Carriers



office building  2.9%

Business hall  3.6%

Finland

Carbon neutral by 2035

Austria, Iceland

To be carbon neutral by 2040

Sweden

To be carbon neutral by 2045

Denmark, Norway, Czech Republic, Slovakia, Romania, Poland, Serbia, Hungary, Greece
Carbon neutral by 2050

Turkey

Carbon neutral by 2060

Carrier	2020	2025	2035	Year 2040
VDF		100% Renewable energy worldwide	**Carbon neutral+, 95% of the year 2020**	**net zero emission**
DT		**carbon neutral**	95% of the scope compared to 2016	
Orange		Compared with 2015, the scope is 29.6% 1⁄2	1⁄2 1⁄2	**net zero emission**
Telenor			**Carbon neutral+, 1⁄27% compared to 2020**	**net zero emission**
Telefonica	100% Renewable energy in Europe	**Carbon neutral, 50% less than 2019**	70% compared to 2019	
Telia	**carbon neutral**		**net zero emission**	
Elisa	**carbon neutral**		**net zero emission**	
Turkcell			**100% Clean Energy**	

Huawei Digital Power Business in 170+ countries and regions, serving 1/3 of the world's population

Smart PV

Solar TOP supplier
175GW smart PV plant

FusionSolar smart PV solution successfully selected as 2020 - 2021 WWF Climate Solver Awarding Technology

Data center facility

Prefabricated modular DC
31% global market share

Modular UPS
41.9% global market shares

Huawei data center facility won the DCS Award from a European data center authority

Site power

TOP supplier

340+ Telecoms & TowerCos

Huawei green 5G power solution won ITU Global Industry Awards: Sustainable Impact

Sourse: IHS Markit, Frost & Sullivan

Continually Contributing to Hungary Energy Transformation: From Green Energy Generation to Energy High Efficiency Usage

Green Energy Generation

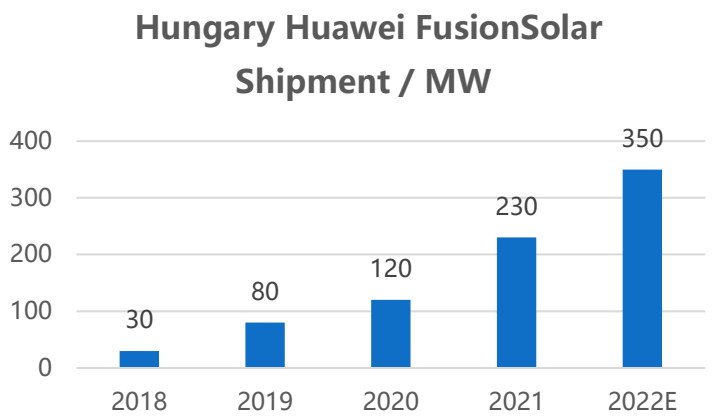
MVM
FIRST SOLAR Kft.
SolarKraft THE SOLAR CONNECTION
EXTOR
GREENPLAN TECHNOLOGY FOR THE FUTURE
photomate

DCF O&M Energy Saving

MÁV
dskbank
vodafone
thyssenkrupp
Raiffeisen BANK

Energy High Efficiency Usage

T
PPF
vodafone
CETIN MEMBER OF PPF GROUP
Vantage Towers



Green Energy Generation by Huawei FusionSolar Solution:

- Accumulated Shipment 450MW+;
- Yearly yields more than 500MWh, as a major contributor of Hungary Renewable Power Supplier;

DCF O&M Energy Saving by Huawei Data Center Solution:

- Implementing data center for ELTE / OTP Bank etc. more than 10MW, provide innovative power solution;
- Cost saving of Power consumption more than 200k Euro per year;

Energy High Efficiency Usage by Huawei Smart Site Solution:

- Innovative smart Li solution delivered to Vodafone / PPF, which provide higher efficiency for 5G site power;
- Leading solution iPV+5G Site to generate power for 100+ Vodafone/PPF 5G sites, each site power saving 10MWh per year.

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Digital Power: Your Best Partner for a Better, Greener Future

By December 31, 2021, Digital Power has helped customers

generate green power	save power	reduce carbon emissions	equivalent to planting
482.9 billion kWh	**14.2 billion kWh**	**230 million tons**	**320 million trees**

Conversion note:

Note 1: Conversion coefficient of electricity carbon emissions – 1 kWh electricity is equivalent to 475 g CO_2 (global average).
Source: IEA Global Energy & CO2 Status Report 2018

Note 2: Lifetime CO_2 absorption of trees (equivalent number of planted trees) – A tree absorbs 18.3 kg of CO_2 a year, and each tree has a 40-year lifespan.
Source: Open data of the North Carolina State University website