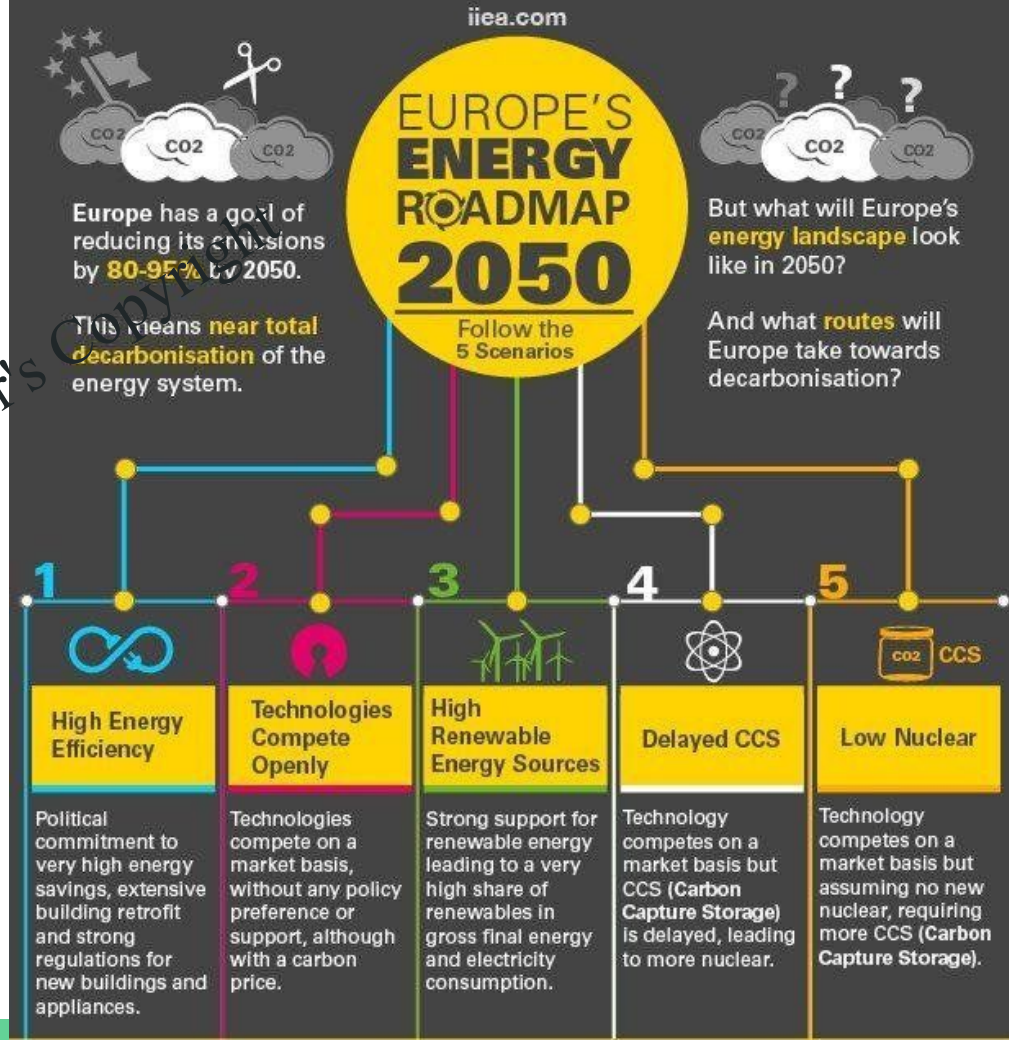


Renewable Energy Roadmap for Central Europe until 2050: A scenario based techno-economic analysis

with assistance of IEA - International Energy Agency and
EC - European Council for an energy efficient economy.

Introduction

It's necessary to define, that European Union had planned his industrial growth and renewable fuel resources for 40 years, since 2010 up to 2050 year. Well-developed countries like Germany, Switzerland, Austria are prepared for this industrial leap, but less-developed countries (like Poland) still have weightened dependency on fossil fueled power generation.



Evolution of renewable energy targets



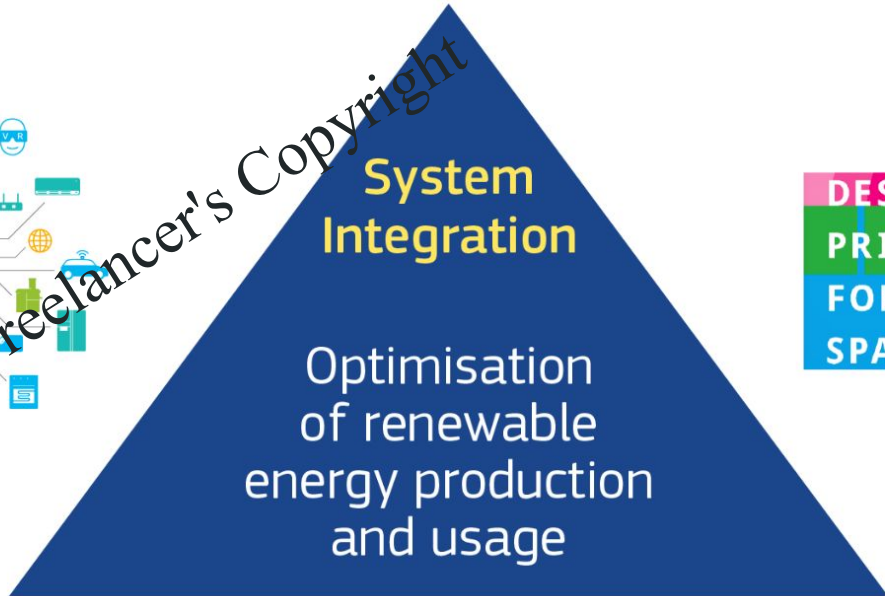
The European Government has a well-planned energetical industry till 2050 year.

It contains four planning scenarios to develop and maintain solar, electricity safety and energy transformation, accumulation and rework.

It's necessary to understand that the European Union has fixed ambitious goals in the name of reducing the GHG emissions by 20% until 2020 and 80% until 2050 for a sustainable European economy.



Renewable Energy



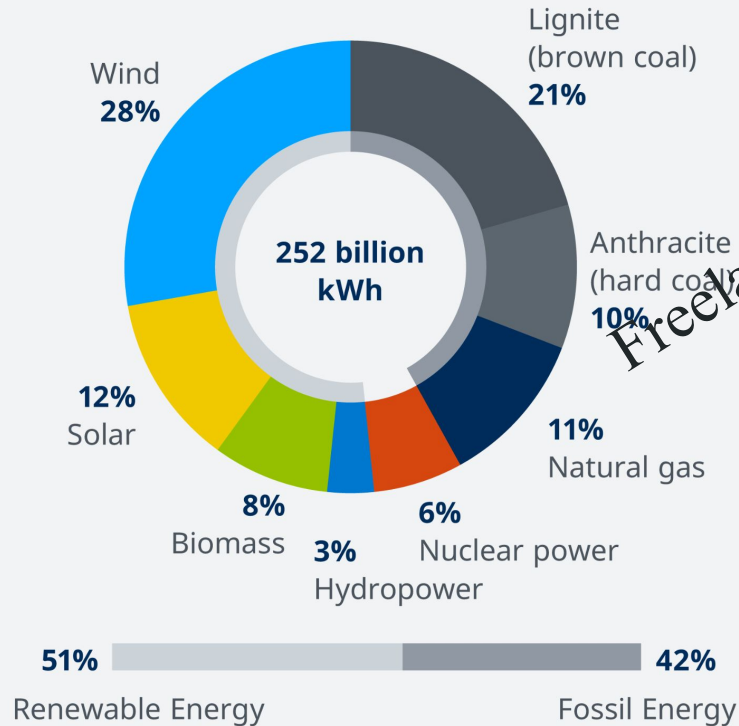
Bi-directional EV-charging

Smart Home and Buildings



Electricity mix in Germany 2022

Average values from January to June 2022*



There is a list of countries that are prepared for this attitude, so the main work process goes to Central Europe (Germany, Austria, Switzerland, Hungary, Poland, Slovenia, Slovakia and the Czech Republic).

Germany, for instance, pursues a phase-out of all nuclear power plants by 2022 due to the Fukushima accident in March 2011, starting with an immediate closure of the eight oldest plants.

NATIONAL ENERGY & CLIMATE PLANS:

3 key elements for effective delivery

The National Energy & Climate Plans (NECPs) are the key instrument to drive the energy transition. On paper they look good for renewables: the EU Commission says the commitments add up to 33% renewable energy by 2030, just above the EU target. But countries will only deliver their commitments if their policies are right. 3 issues are key:

- **Auctions.** Giving visibility of how much renewable energy will be auctioned and when, and designing auctions right;
- **Electrification.** Driving the electrification of heating, transport and industry, crucial to increasing demand for renewables; and
- **Permitting.** Making it easier to get permits for new wind farms and to repower existing ones.

The NECPs are meant to set out clear measures in all 3 areas. The Plans that do this well will attract the most investments. This infographic shows our assessment of how well they do it. We first look at the EU as a whole. And then 12 individual countries.



EU AUCTIONS

How clear and visible is the forward schedule of renewables auctions? Do the auction volumes deliver the 2030 commitments? Is the auction design right - does it offer stable revenues? 2-sided Contracts for Difference are the best model for this.

ELECTRIFICATION

How well do the Plans push the electrification of heating, transport and industry? Electricity is only 23% of the EU energy mix today. The rest is heavily fossil-fuel dominated. We have to electrify as much of it as possible. And this will help drive demand for renewables.

PERMITTING

Will the Plans help simplify the rules and processes for getting permits for wind farms? The current system is too complex and slow - and won't deliver 33% renewable energy by 2030. This is an issue both for new wind farms and the repowering of existing ones.

LEGEND

- Measures are good
- Measures are included with detail but insufficiently clear or ambitious to help achieving the 2030 targets
- Measures are absent or lacking in detail

All 3 elements need to be "green" for the plans to deliver their targets

Wind
EUROPE

Below we look at 12 countries and the measures outlined in their NECPs for auctions, electrification and permitting. Remember, this is not about the commitments they've made on renewables volumes or any targets they've set. It's about whether the detailed policies in their Plans will deliver their targets and commitments.

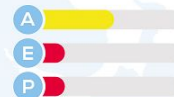
BELGIUM



DENMARK



ESTONIA



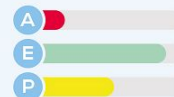
FRANCE



GERMANY



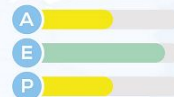
GREECE



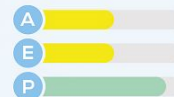
ITALY



LITHUANIA



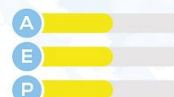
NETHERLANDS



POLAND



PORTUGAL



SPAIN



LEGEND

- Measures are good
- Measures are included with detail but insufficiently clear or ambitious to help achieving the 2030 targets
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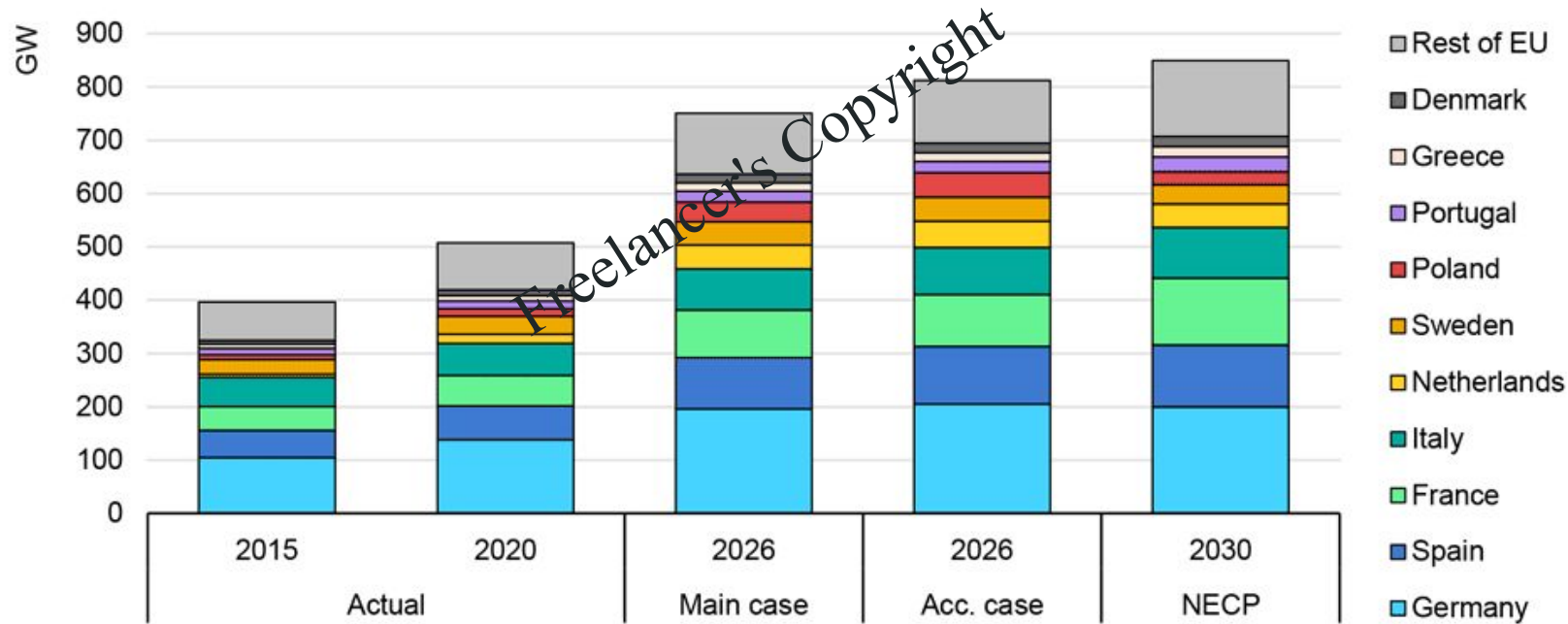
NOTE:

Situation as of July 2020.

In some regions, there is just a limited amount of wind or water potential exist which could be used, making a wide implementation of renewable power plants nearly impossible. Renewable resources depends on the geographical situation.

In conclusion it's necessary to define the positive planning of the energetic industry in EU.

EU member states installed renewable capacity and capacity expected in 2030 based on submitted NECPs



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Note: Acc. case = accelerated case, NECPs = National Energy and Climate Plans
Source: IEA analysis based on NECPs.

Thank you for attention!