



**AUCTIONS IN EU MEMBER STATES, CURRENT TRENDS
AND CHANGES**

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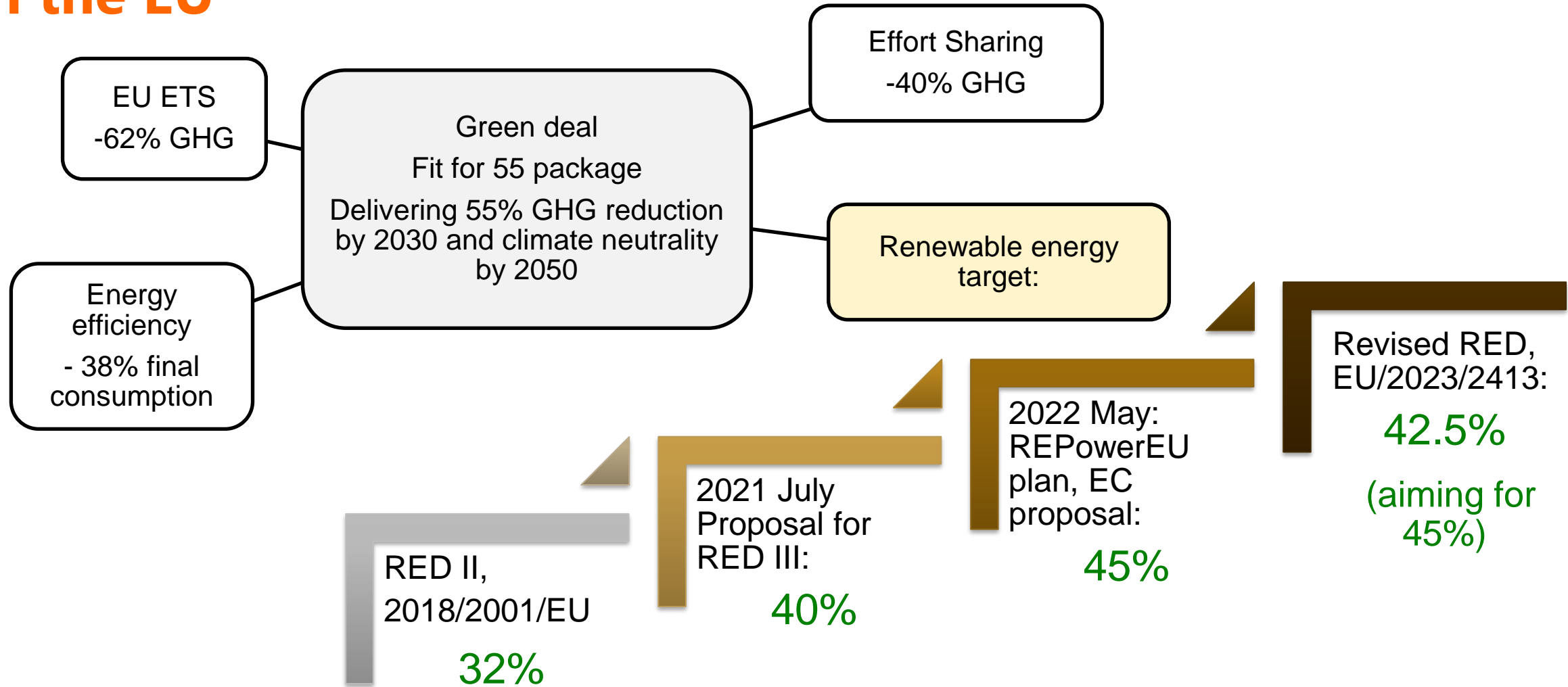
*Current state of government auctions in EU
and ENC member states*

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Agenda

- Introduction of the regulatory and economic context
- Operation of auctions as a support tool
 - New adopters
 - Administrative setup of auctions and the main design elements
 - Application of pre-qualification criteria
 - Technology focus and innovations (with an outlook on offshore wind auctions)
- Outcomes of the conducted auctions
 - Competition level
 - Prices
- Popularity of PPA as an alternative
- Conclusions

Increasing and more ambitious decarbonization goals in the EU

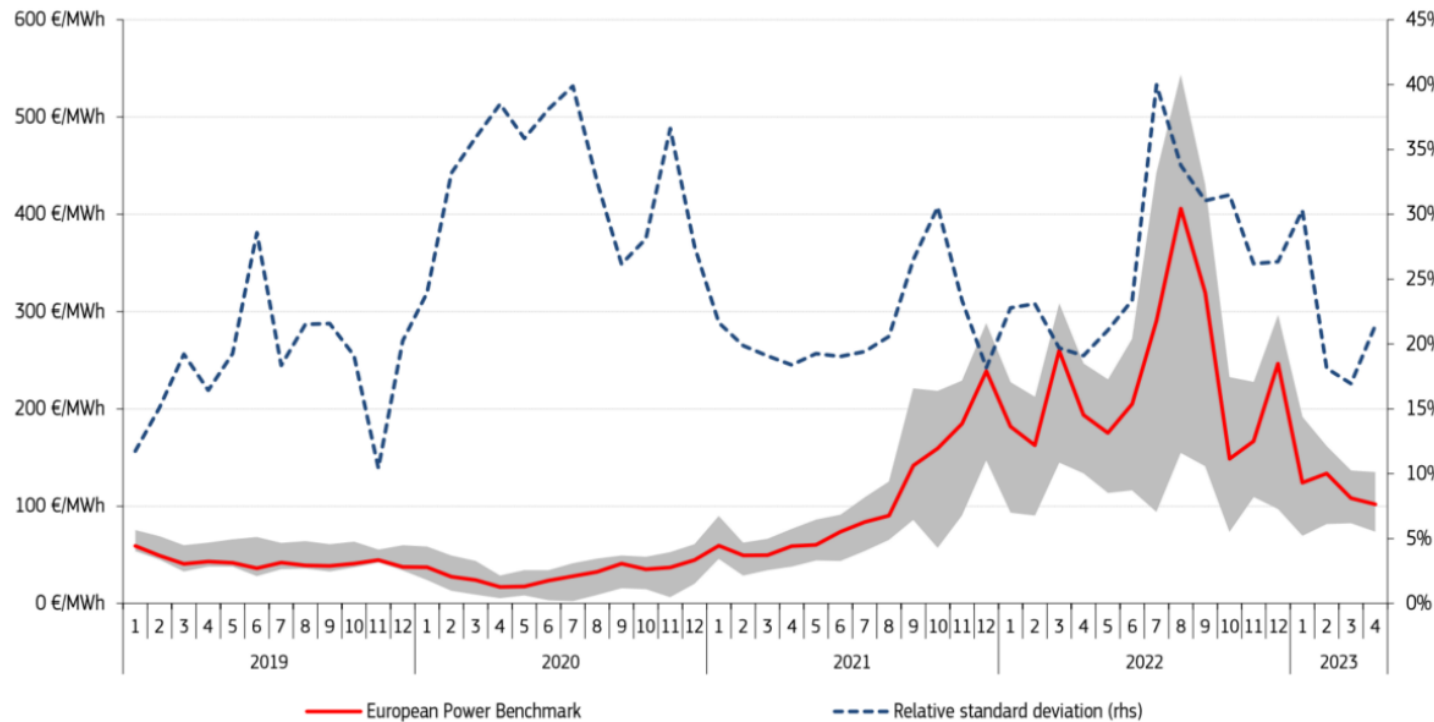


- EU member states contribute with national targets set in their NECPs
- + sector-specific sub-targets (buildings, H&C, H₂, transport)

The market environment also brings challenges

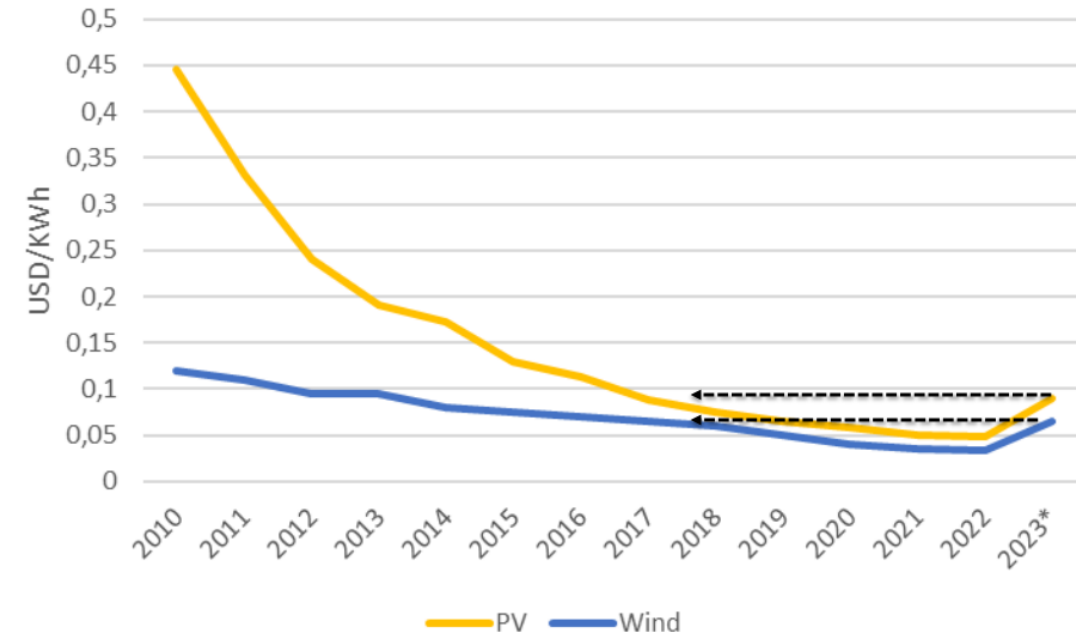
- Outstanding volatility of electricity prices
- Increasing inflation, interest rates, input costs and higher cost of capital led to higher LCOE

European electricity prices



Source: S&P Global Platts, European power exchanges. The shaded area delineates the spectrum of prices across European regions.

LCOE development

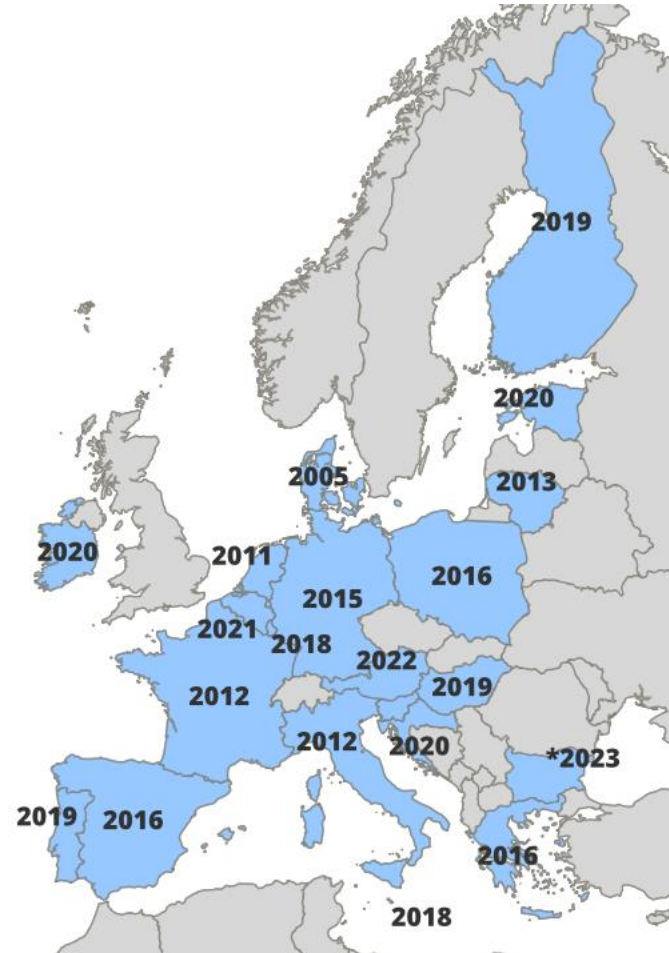


Source: IRENA, Renewable Power Generation Cost study, PV Magazine

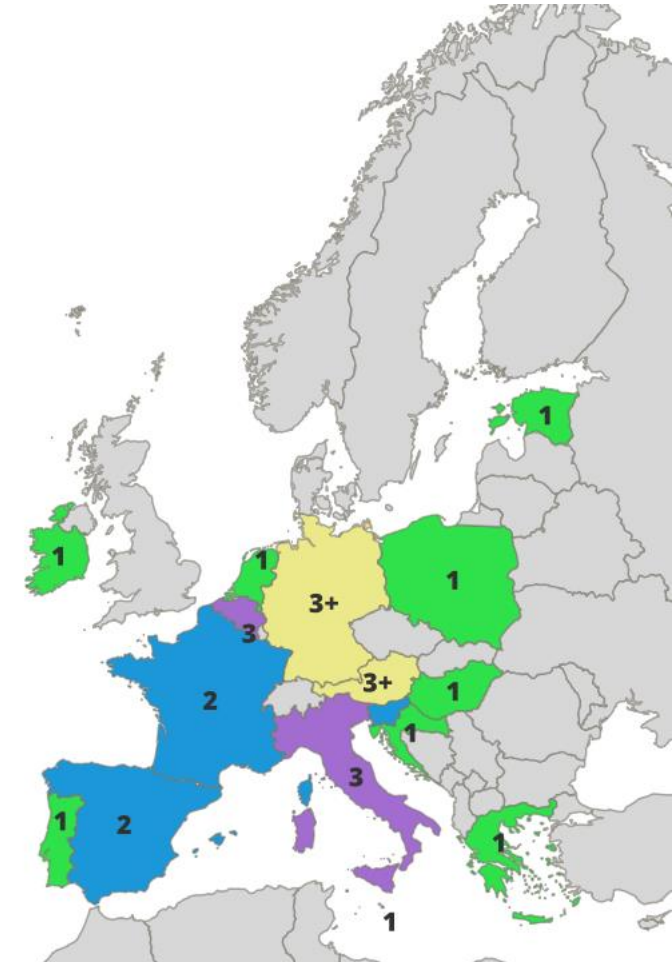
Spread of auctions as the main tool of RES support

- List of the new adopters:
 - 2020: Croatia, Estonia, Ireland
 - 2021: Belgium (Flanders region)
 - 2022: Austria
 - 2023: Bulgaria and Romania's 2023 introduction plans were postponed to 2024
- Croatia and Estonia progressed from small-scale auctions to large-scale by 2023
- Countries not (yet) introduced auctions:
 - Czech Republic, Latvia, Slovakia, Sweden
- Most of the European countries organize one auction round per year
- A few countries, like France, Germany and Italy generally announce and plans to announce high number of auction rounds (two or more)

Year of the introduction of auctions



Number of average auction rounds per year (per technology, in case of PV and wind)

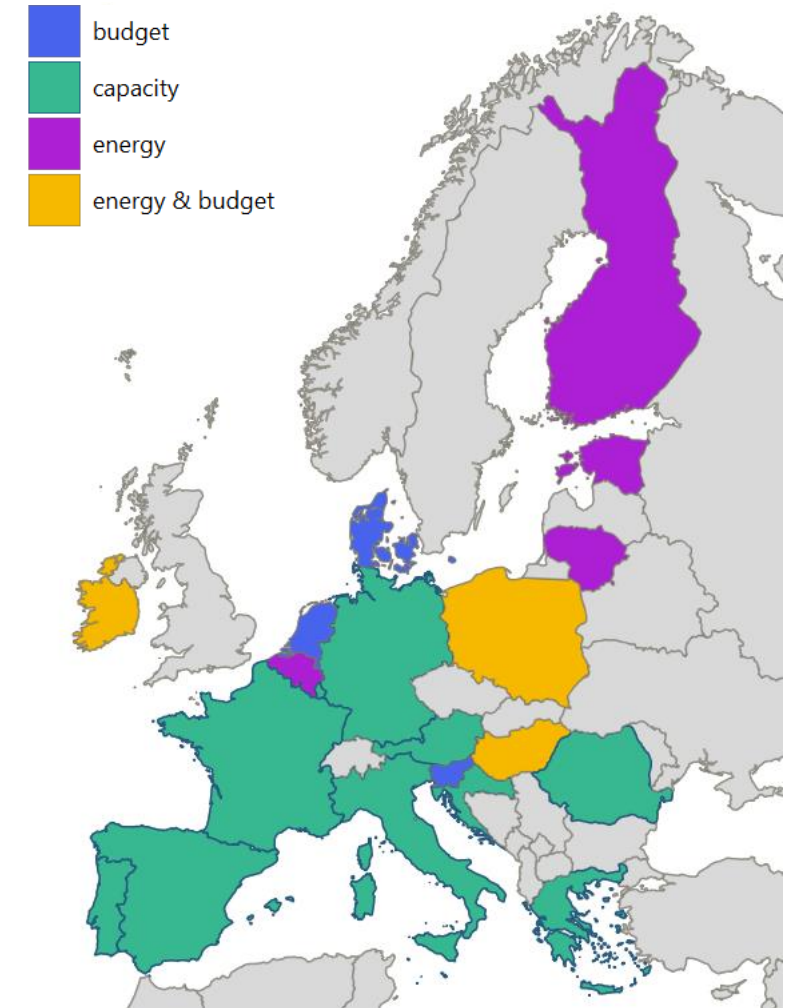
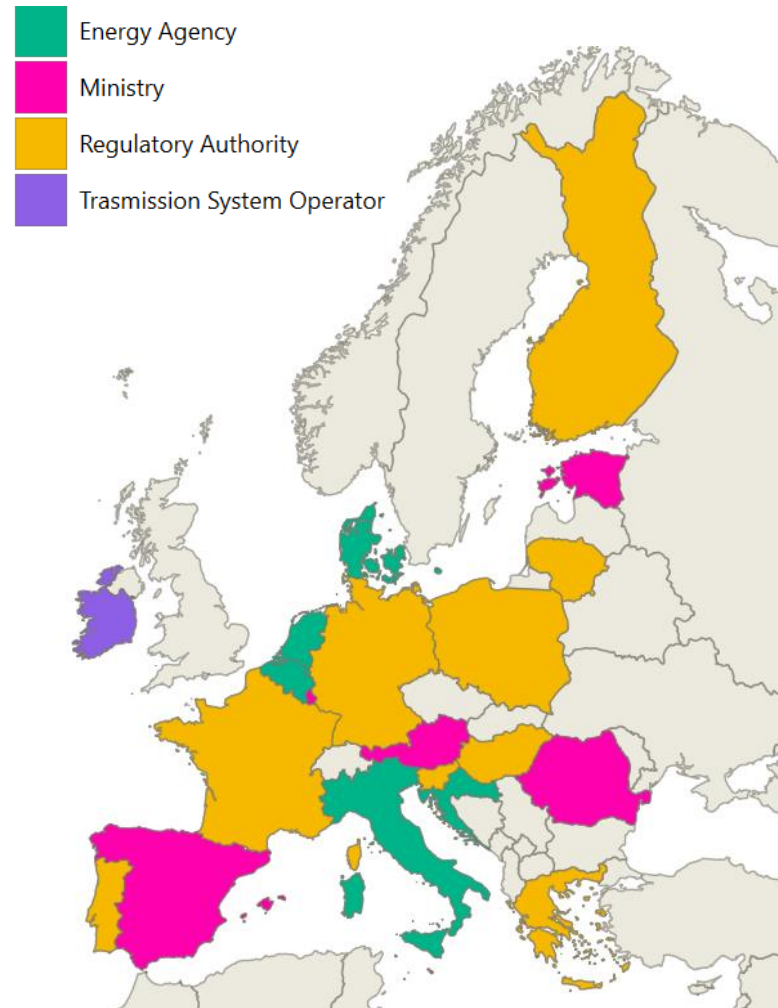


Source: AURESII database and REKK data collection

Administrative setup of auctions

- the organizing authority and the auctioned product

- There are many options from which the **responsible body** can be selected, but the most common choice is the **regulatory authority**
- There is no clear evidence that any of these choices would lead to a more effective auction scheme than the others
- In terms of the auctioned product, **capacity is the most popular** choice in Europe, and was usually chosen when the countries started the scheme
- Budget as the auctioned product brings quite a lot of uncertainty in terms of awarded quantity
- Energy+budget is the most risk-avoidant option



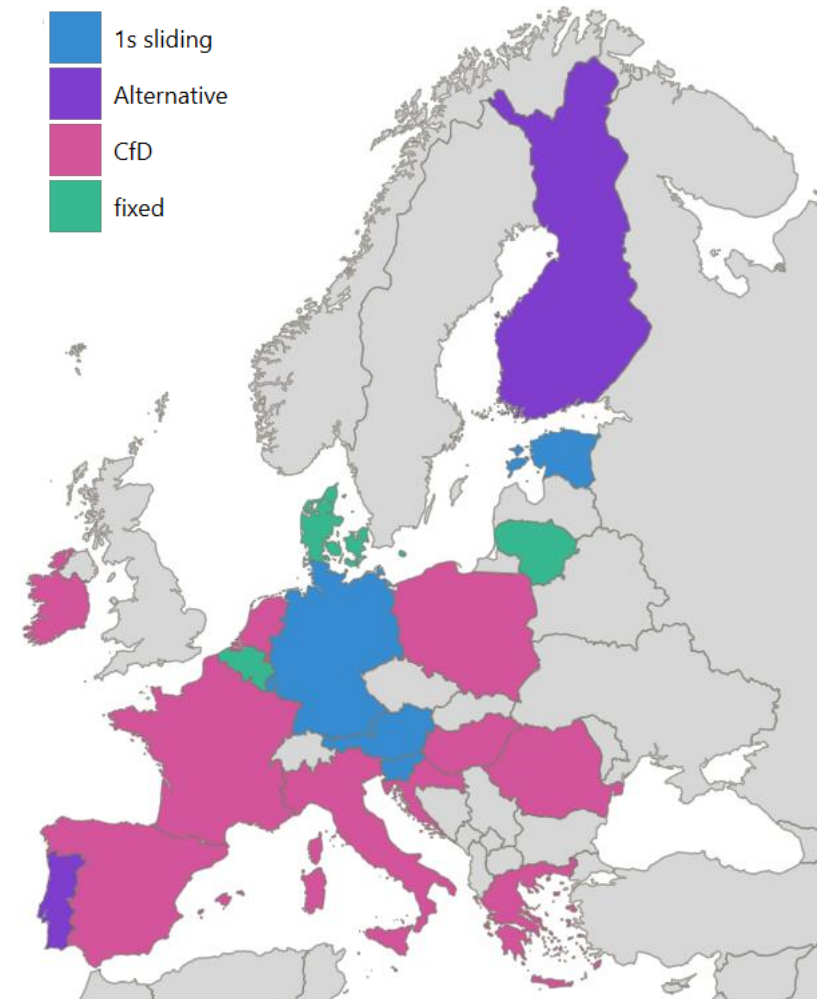
Administrative setup of auctions

– remuneration scheme

- **One-sided sliding premium:** producers are compensated by the difference of their bid price and the market price, but only if the market price is the lower (if it is higher, they can keep the excess revenue)
- **CfD** (or two-sided sliding premium): if the market price is lower than the bid price, the producers are compensated by the difference, if the market price is higher, they have to pay the difference
- **Fixed premium:** fixed amount of financial support regardless of market price paid after unit of electricity produced

CfD is the most popular choice, but many European countries apply different schemes

EMD reform may enhance convergence towards CfD



Pre-qualification criteria – Material

- Almost all the European auctions apply **material and financial pre-qualification** in parallel
 - Therefore, there is either **no pre-selection round** is present (proof of fulfilling pre-qualification requirements and bids are submitted simultaneously) or the **pre-qualification round is a technical check** of fulfilling the well-defined criteria
- **Stricter pre-qualification** criteria may lead to **less intense competition** thus higher prices, but **higher realisation rates**
- Material pre-qualification usually (but not for all countries) associated with project implementation milestones

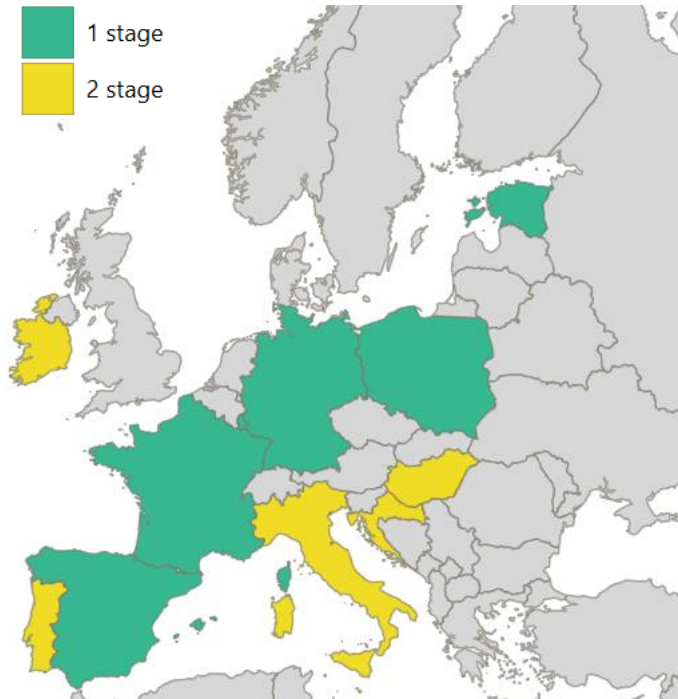
Denmark	Germany	Greece	Poland
No debt exceeding 100 000 DKK, off-shore wind: former experience, minimum annual turnover, equity ratio of min. 20% or investment grade credit rating	Onshore wind: environmental permits. PV: Proof of access to the site, adopted land use plan and eligibility of site for ground mounted plants	Generation license, Grid connection agreement/offer	Building permit, environmental permit, grid connection agreement, land use plan, schedule of works and expenditures

Source: Szabó et al (2020): Auctions for the support of renewable energy: Lessons learnt from international experiences

- In some countries in the relevance of **environmental** related pre-qualification increased
 - Netherlands (Environmental impact assessment), France (Life-cycle GHG emission limit for PPs), Spain (Circular economy strategy)

Pre-qualification - Financial

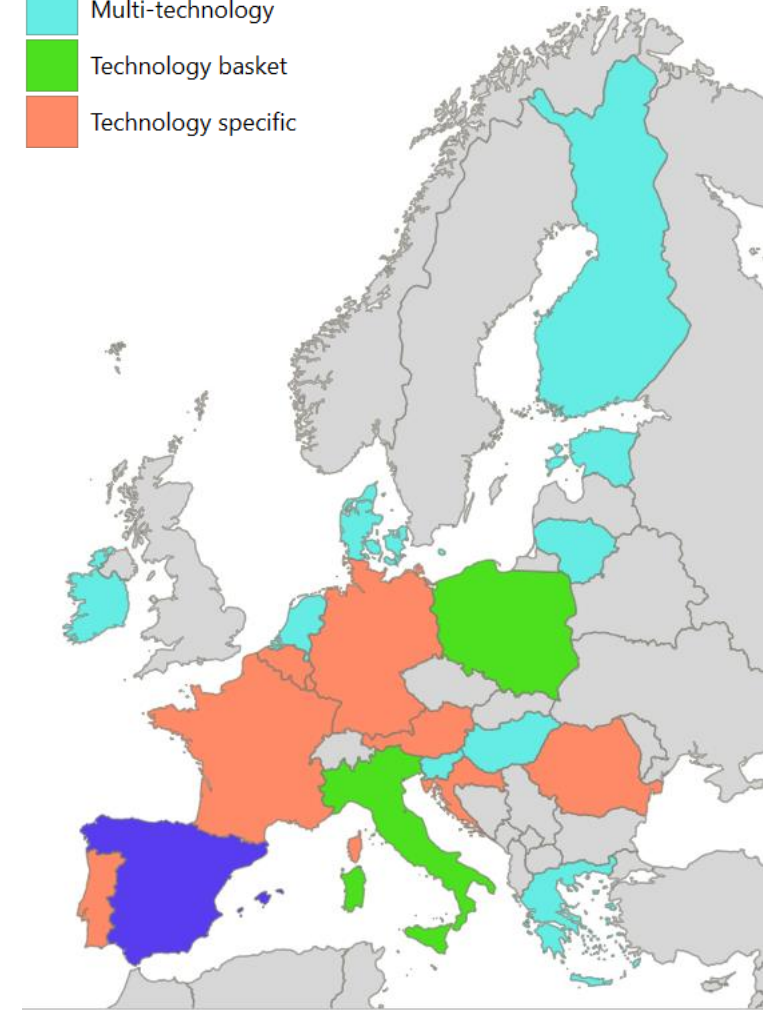
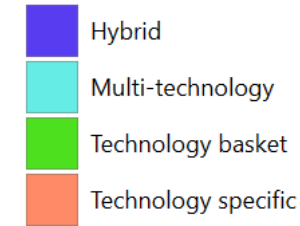
- Most of EU auctions require financial securities which are lost in case of non-completion
 - **1st stage bid bond:** Required when the promoters **submit the bid** at the auction
 - **2nd stage bid bond:** Required when the project determined **winner of the tender round**
- In few countries (like Germany), bonds are lower if certain additional material pre-qualification requirements are fulfilled (like having grid connection agreement)



(EUR/kW)	1st stage bid bond	2nd stage bid bond
Croatia	6.6	39.6
Estonia	13.7	
France	30	
Germany	50	
Hungary	11.25	37.5
Ireland	6.8	22.7
Italy	37.5	75
Poland	14	
Portugal	10	20
Spain	60	

Technology focus and the appearance of innovations

- Multi technology auctions where technologies at the same maturity level compete against each other are also successful
- Appearance of innovative technologies:
 - Portugal: NECP envisages more than 10 GW of **floating PV** capacities by 2030 first auction resulted in record low negative prices (-4.13 EUR/MWh), the first **floating offshore** round of 3,5 GW capacity was announced in November
 - Luxembourg: in the country's first agrivoltaic auction round 52.7 MW capacity was awarded to support 14 projects in 2023, and in the first auction round for industrial self-consumption, 16.1 EUR million funding was distributed to support 85 selected projects (46.34 MW) in three different size categories
- RES+storage obligation examples:
 - Germany: innovation auction were launched in 2020, these rounds now dominated by solar+battery projects. Two rounds were organized in 2023, the first one was very undersubscribed while the second attracted almost double of the announced capacities
 - Hungary: (10% storage obligation but at least 1MWh/MW storage capacity)
 - Portugal: in 2020 the auction call invited projects with storage component included. These projects won 72% of the awarded capacities
 - Spain awarded 880MW/1,809MWh in its first tender for energy storage to be co-located with renewables in 2023



Source: AURESII database and REKK data collection

Offshore wind auctions

- Denmark and Netherlands are the countries with the biggest announced volumes and most frequent rounds, France, Germany and Poland also organized/organizes rounds
- New adopters:
 - Spain planned the first round in 2023 in the Canari Islands region, planned volumes are 3 GW until 2030
 - Lithuania's first negative bid auction round of 700 MW only attracted two bidders. The second round with the same 700 MW volume is postponed to early 2024 and the remuneration scheme will be switched CfD
 - Estonia: first rounds for Liivi 1 and 2 projects are currently ongoing (December 2023-January 2024)
 - Greece plans its first round in 2027 and announce overall 1.9 GW in the decade
 - Belgium also plans to announce 3.15-3.5 GW offshore wind capacities in 2024
 - Finland's currently ongoing auction announces 3 GW (6 projects)
- Appearance of innovative design elements:
 - **Negative bid auctions** appeared (Lithuania, Netherlands) and they are popular and usually oversubscribed, negative bid means no financial support where bidders offer a lump-sum payment for the right to realize projects
 - **Multi criteria auctions**, for example **France or Netherlands** where price only pays for 50% of the decision-making criteria, supplemented by grid connection issues and environmental aspects

Number of undersubscribed PV auction rounds is growing

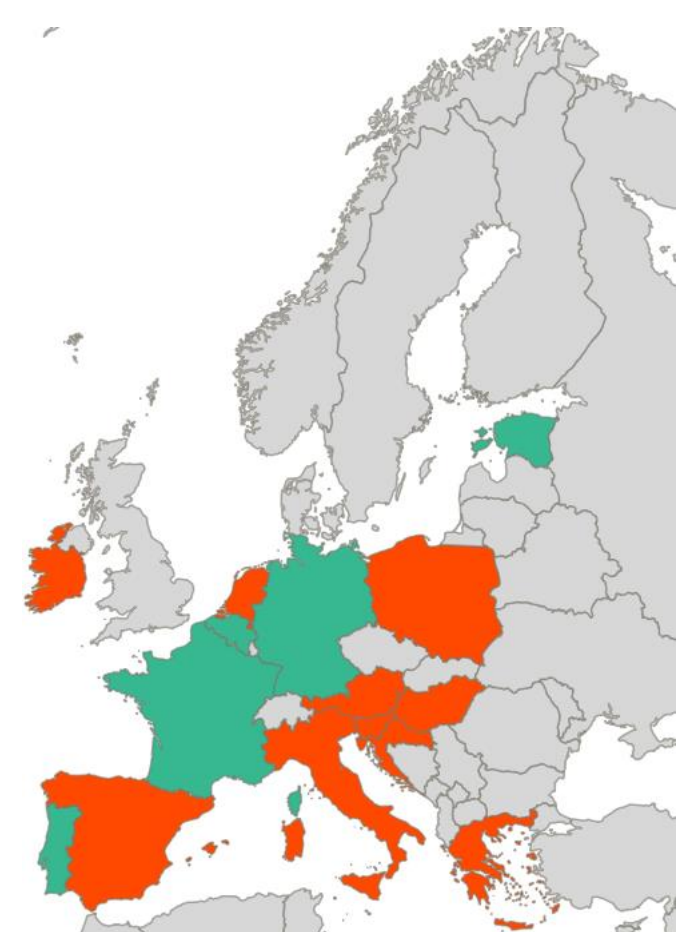
2020



2021



2022/23

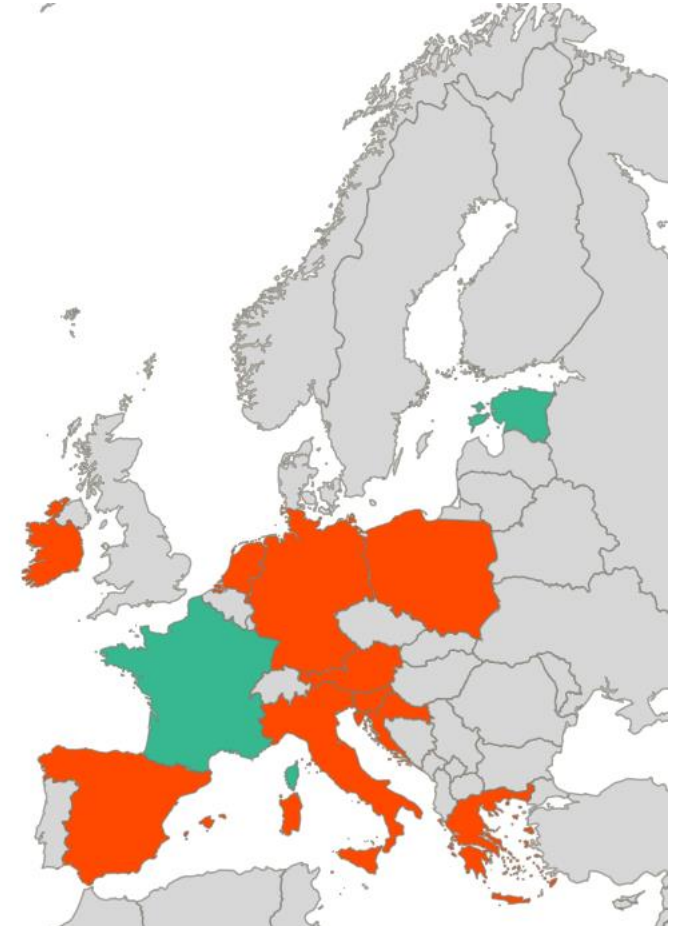


Growing number of wind auction rounds are undersubscribed

2020

2021

2022/23



Outcomes of conducted auctions: PV and onshore wind prices

- In case of these mature technologies decrease of prices is expected over time
- Nominal price changes show increase in the majority of the cases but inflation corrected prices show a more mixed picture

PV

EUR/MWh	2020	2022/2023	
Austria	No auction	65.3	New auction
Belgium	No auction	3.0	New auction
Croatia	No auction	58.7	New auction
Estonia	No auction	21.9	New auction
France	56.3	73.3	Increased
Germany	50.27	65.7	Increased
Greece	50.0	40.0	Decreased
Hungary	51.2	59.4	Increased
Ireland	72.9	89.4	Increased
Italy	64.6	56.7	Decreased
Malta	123.0	115.5	Decreased
Netherlands	39.3	33.9	Decreased
Poland	50.0	54.2	Increased
Portugal	11.14 (-24.69)	(9; -23.5)	Stagnated
Slovenia	69.9	81.6	Increased

Onshore wind

EUR/MWh	2020	2022/2023	
Austria	No auction	73.2	New auction
Croatia	No auction	53.7	New auction
Estonia	No auction	24.5	New auction
France	59.7-62.2	75.9	Increased
Germany	62	65.3	Increased
Greece	55	51.3	Decreased
Ireland	74.08	89.4	Increased
Italy	65.15	56.7	Decreased
Netherlands	21.08	23.2	Stagnated
Poland	50	54.2	Increased
Spain	30.8.*	38.1	Increased

Drivers of the observed trends

CHANGES IN THE LEVEL OF COMPETITION

Subscription rate is getting lower in many cases

- Uncertain economic atmosphere, high costs of financing and implementation incentivizes the investors to postpone their projects
- Popularity of alternatives like PPA attracts investors

High announced volumes lead to small competition

- In many cases announced volumes remained at the same level in the recent years and did not adapt to the uncertain economic environment

Country-specific burdens unrelated to auctions

- Local administrative issues like licensing or the scarcity of grid connection points can also discourage investors

PRICE CHANGES (+/-)

Very high inflation Europe-wide

- Nominal strike prices increased in almost all country between 2020 and 2022 but adjusting with inflation significantly mitigates the price effect

Economic uncertainties

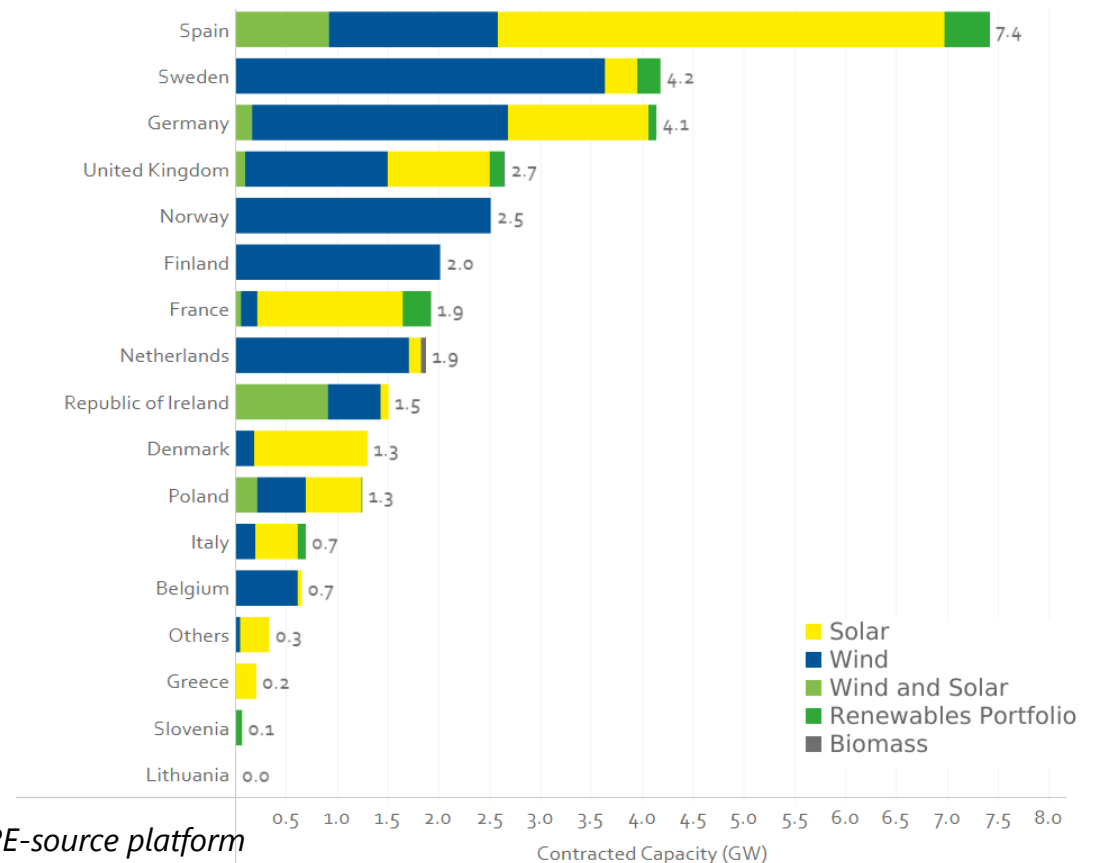
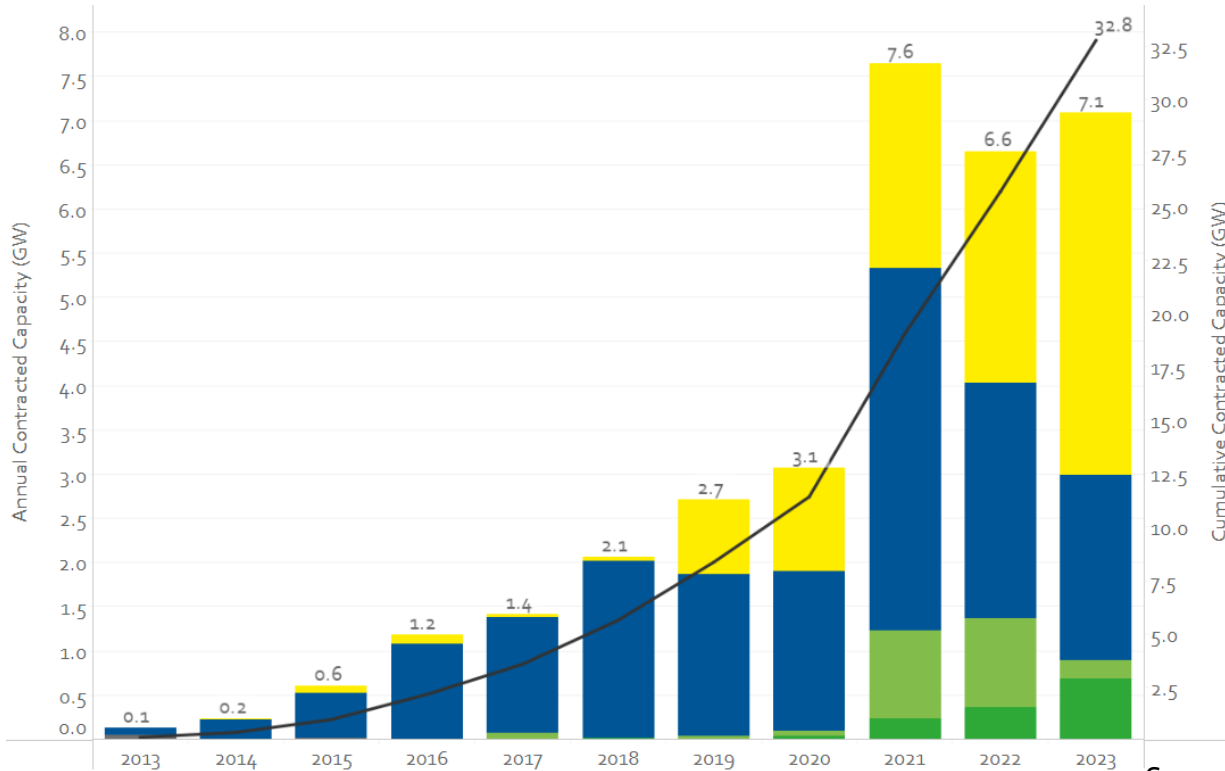
- Current conditions make investments more costly (interest rates, cost of capital etc.)

Maturity of technologies

- The only factor that is able to offset the price increasing trends is the developing maturity of certain RES technologies

Popularity of PPA contracts multiplied in the last 3 years

- Countries where auctions stopped/on hold and PPAs are popular: Finland , Denmark, Spain
- Countries where both auctioned volumes and PPAs are significant: France, Germany, Netherlands, Ireland, Poland
- Undersubscribed auctions in 2022/23 and high contracted PPA volumes in 2023
 - **Wind energy:** Germany, Ireland, Italy (smaller PPA volumes), Netherlands, Poland, Spain,
 - **PV:** Spain, Poland, Italy, Greece



Source: RE-source platform

Auction volumes and observed trends

- When a technology becomes mature enough, some countries stop to support them through auctions, that is why a decline in auctioned volumes or even the termination of auctions is observable
 - *Denmark stopped to organize traditional technology neutral tenders*
 - *Greece will close the auction scheme in 2024*
 - *Netherlands will remove PV from the eligible technologies on the SDE++ auctions from 2025*
 - *Lithuania and Finland used to organize PV-onshore wind auctions in the past but they seem to have been terminated*
- Countries which are continuing to announce the similar volumes and keep the similar frequency of auctions
 - *Examples: France, Germany, Italy, Poland*
- Countries where innovative auctions seem to be very significant in the near future:
 - *Examples: Spain (RES+storage), Hungary (RES + storage), Portugal (Floating PV, RES + storage), Luxemburg (Agri PV, industrial self-consumer auction)*

Conclusions

- **Auction designs in the EU are** still quite **heterogeneous**, which is good because each country tailors it to itself, not so good for international investors because they have to adapt to specific rules everywhere
- Auction design **has not seen a major turnaround** in the last few years, but these processes have a **slow lead time**, so it is possible that we may not yet see these reactions
 - **Offshore wind** auctions are exemptions and are definitely on a developing and expanding trajectory
- **Performance of auctions** based on the subscription rates and the resulting prices **seem to be significantly poorer than a few years ago**, as both the number of undersubscribed rounds and the prices are higher in the recent years
- It is important not to draw negative conclusion based on the first sight
 - **Inflation corrected prices** show a lot less negative picture
 - Price changes can be driven by several different factors and their unique effects are hard to determine yet
 - Current negative trends can be a result of **temporal processes**, as the investors wait for more favourable economic conditions
- Tightening pressure of the decarbonization of the EU can reorganize the preferences and switch cost efficiency in favour of fast spread of RES capacity deployment
- Competitive auctions are highly regulated support channels, which may lead the investors to other less regulated forms of support like PPAs
- It is a natural phenomenon that **highly regulated areas need less and less support** programs as the market develops