Shocked into action

Answering multiple threats to their security, European countries are accelerating the shift from fossil fuels towards renewables.

Published date: 02.06.2022

Authors: Paweł Czyżak, Erika Uusivuori, Andrei Ilas, Alison Candlin

Contents

About

In this report, CREA and Ember analyse European national responses to the gas crisis and Russia's war on Ukraine. They show that the majority of European countries have significantly stepped up their ambition in terms of renewable energy deployment since 2019, while decreasing planned 2030 fossil fuel generation to shield themselves from geopolitical threats. A full breakdown of policy announcements by country is available in the Annex.

Highlights

19

19 European governments accelerated their decarbonization in response to the COVID-19 pandemic, the gas crisis and Russia's aggression

63%

Under latest national plans, EU countries will reach 63% of renewables share in electricity generation by 2030, up from 55% under previous commitments

31%

EU countries cut planned 2030 fossil fuel power generation by 31% (272 TWh) compared to national strategies from 2019 (NECPs)

Executive Summary

Recent crises have accelerated EU countries' energy transition

In response to Russia's aggression and soaring fossil prices, most EU Member States have announced significant increases in renewables deployment, while scaling down plans for fossil fuels.

Russia's aggression and corresponding volatility in global electricity prices has underlined the need to phase out fossil fuels and accelerate decarbonization. The electricity transition is not solely an issue of climate concerns, but also one of ensuring stable supplies of energy for European households and businesses. This is especially obvious for the biggest importers of Russian fuels, with Germany, Italy and the Netherlands scaling up wind and solar ambitions, France subsidising housing insulation, and others ramping up heat pump installations and electrifying transport.

These national policies are systematised under the European Commission's REPowerEU proposal, which increases the renewable energy target from 32% to 45% by 2030 and aims for a 13% reduction of energy consumption by the same date compared to the former 9%.

Europe is responding to a new geopolitical environment, paving the path for governments worldwide.

01 Latest EU country plans see 31% less fossil fuel electricity in 2030 compared to 2019 strategies

Analysis of the latest EU country policies show plans for fossil fuel electricity generation in 2030 have been slashed by a third compared to National Energy and Climate Plans from 2019 (NECPs). Planned fossil fuel

electricity generation for 2030 is now 595 TWh, a steep drop from the previous plans for 867 TWh.

02 EU country strategies now plan for 63% renewable electricity in 2030

EU member states plan to accelerate renewables deployment to replace fossil fuels. Latest policies show an expected 63% share of electricity from renewables in 2030, up from 55% under the previous national strategies that were published in 2019. REPowerEU will lead to a further increase to 69%.

03 19 European governments have increased ambition on decarbonisation in last two years

Germany, the largest importer of fossil fuels from Russia, is increasing the planned share of renewable electricity to 80% by 2030, up from 62% by 2030 under previous commitments. Together with the Netherlands, Denmark and Belgium, the country also plans to build 150 GW of offshore wind by 2050. Another top Russian fossil fuel importer - Italy, increased the planned share of renewables electricity from 60 to 70% by 2030.

04 5 countries introduced additional low carbon measures for heating and industry

The EU is setting forth a total of 10 million heat pump units to be deployed over the next five years, and is doubling funding to EUR 3 billion to finance innovative electrification and hydrogen applications in industry, as well as to finance innovative clean technology manufacturing. Germany, France, the

United Kingdom, Ireland and Denmark have all announced measures aimed at advancing the decarbonization of heat, industry and transport.

The EU has put the energy transition on turbocharge, with governments getting serious about cutting out costly fossil fuels. There's a consensus that ramping up wind and solar power quicker can help the EU head off multiple crises.

Pawel Czyzak
Senior Energy & Climate Data Analyst,
Ember

Europe now recognises that fossil fuels equal volatility. The current energy landscape is unprecedented, but a jump in ambition to cut fossil fuel dependence is now putting countries on a path to more security.

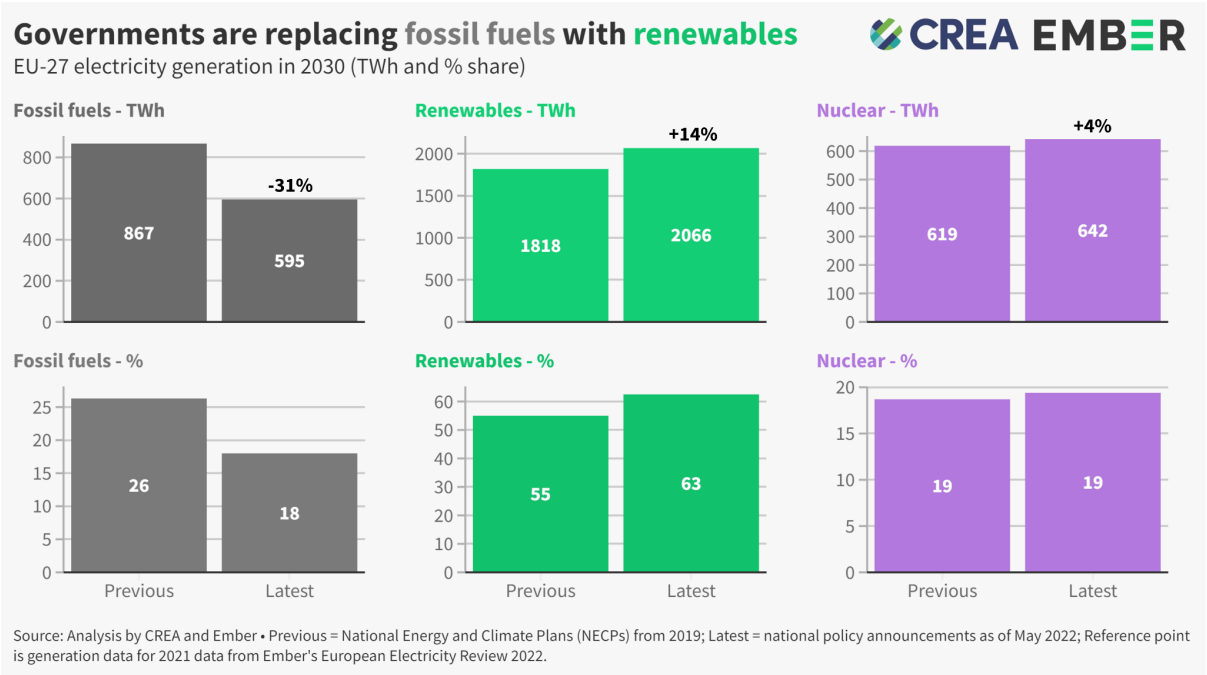
Erika Uusivuori
Analyst,
Centre for Research on Energy and Clean Air

New policies

Governments are replacing fossil fuels with renewables in response to Russia's aggression

Much has changed since the adoption of National Energy and Climate Plans (NECPs) in 2019 that shaped the energy policies of EU Member States. Europe is going through a pandemic, followed by a gas crisis and a war.

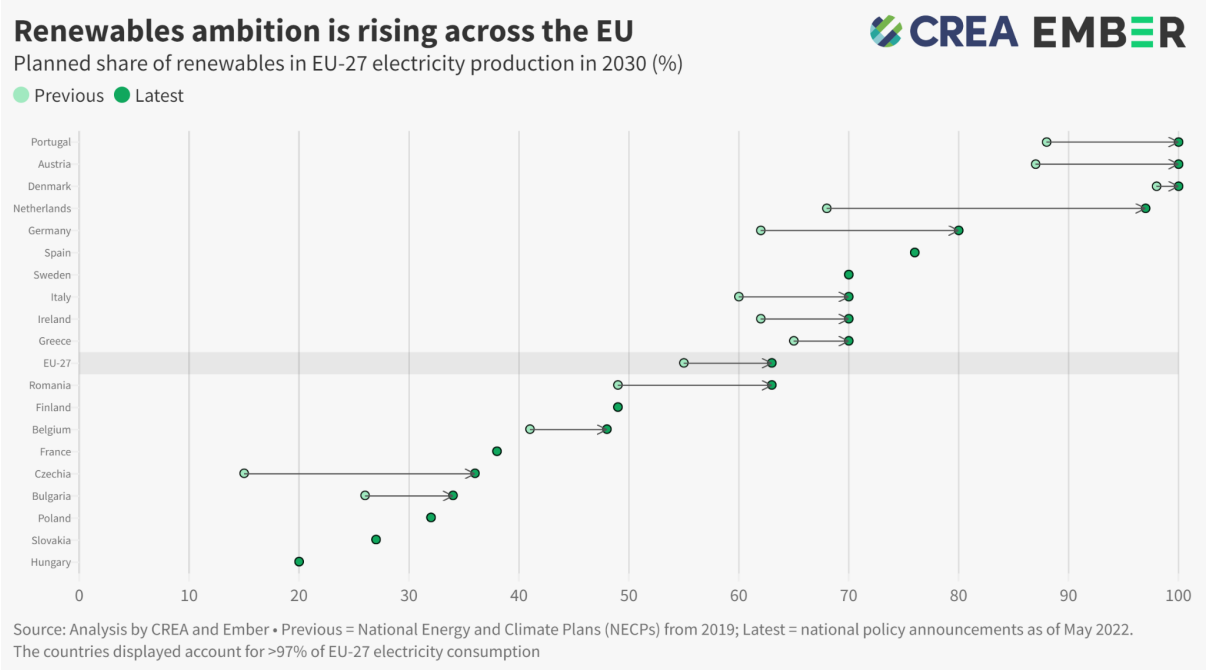
Since then, the European Commission and most EU Member States have increased the planned pace of renewables additions to shield themselves from fossil fuel import dependence. In the last two years, **19 European governments have announced policies that will accelerate decarbonisation**.



Source: Analysis by CREA and Ember • Previous = National Energy and Climate Plans (NECPs) from 2019; Latest = national policy announcements as of May 2022; Reference point is generation data for 2021 data from Ember's European Electricity Review 2022.

Even before considering the impact of EU-wide commitments, these new national measures will already lead to an increase in the share of renewables in power generation — from 55% under the NECPs to 63% under current policies.

Under the new plans, by 2030 four countries will generate close to all of their electricity from renewables: Portugal, the Netherlands, Austria and Denmark. A new 80% RES target puts Germany close behind, while Italy, Ireland and Greece all increased their ambition up to a 70% share of renewables in electricity production. Most EU Member States are now aiming for above 50% RES by 2030 and ambition is likely to increase further: the recently announced EU commission strategy REPowerEU targets 69% of electricity from renewables by 2030.

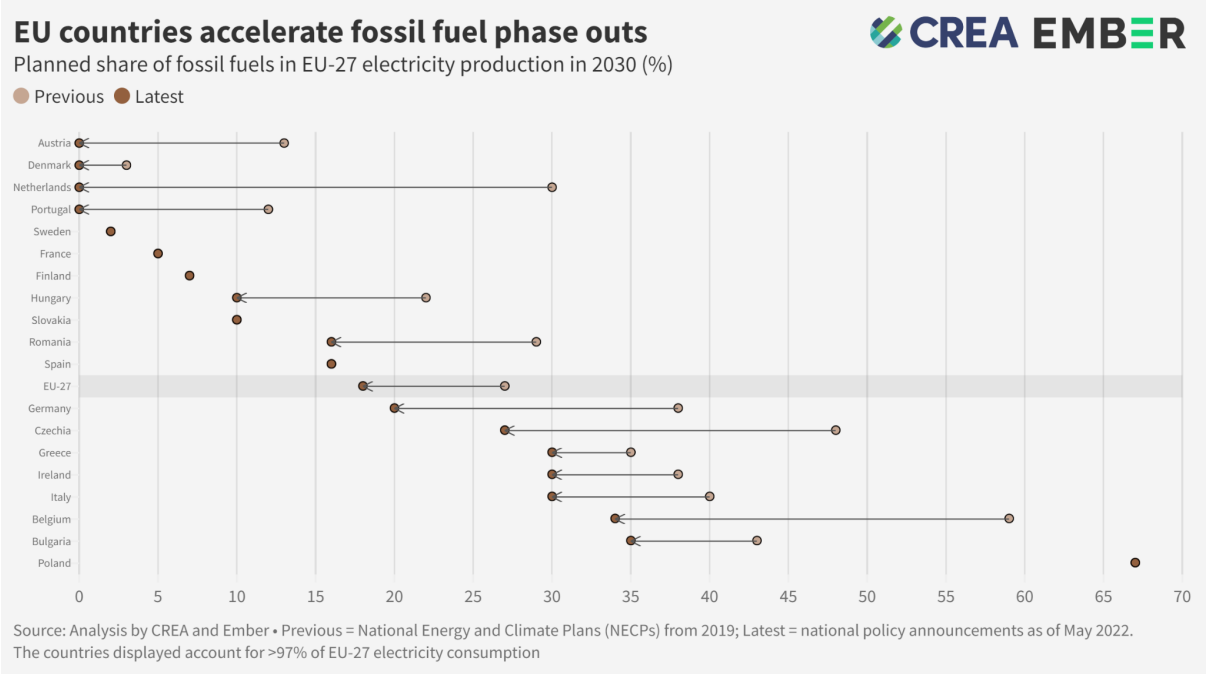


While renewables are gaining traction, planned fossil fuel generation is decreasing even quicker - by 31% (272 TWh) compared to the NECPs.

Between 2020 and 2022 several countries - Bulgaria, Croatia, Czechia, Poland, Romania and Slovenia officially announced coal phase-out dates, and Germany accelerated its target date from 2038 to 2030. Coal may have experienced temporary generation increases since mid-2021 due to skyrocketing gas costs, but its own extremely high price is now also contributing to increased consumer tariffs in countries like Poland.

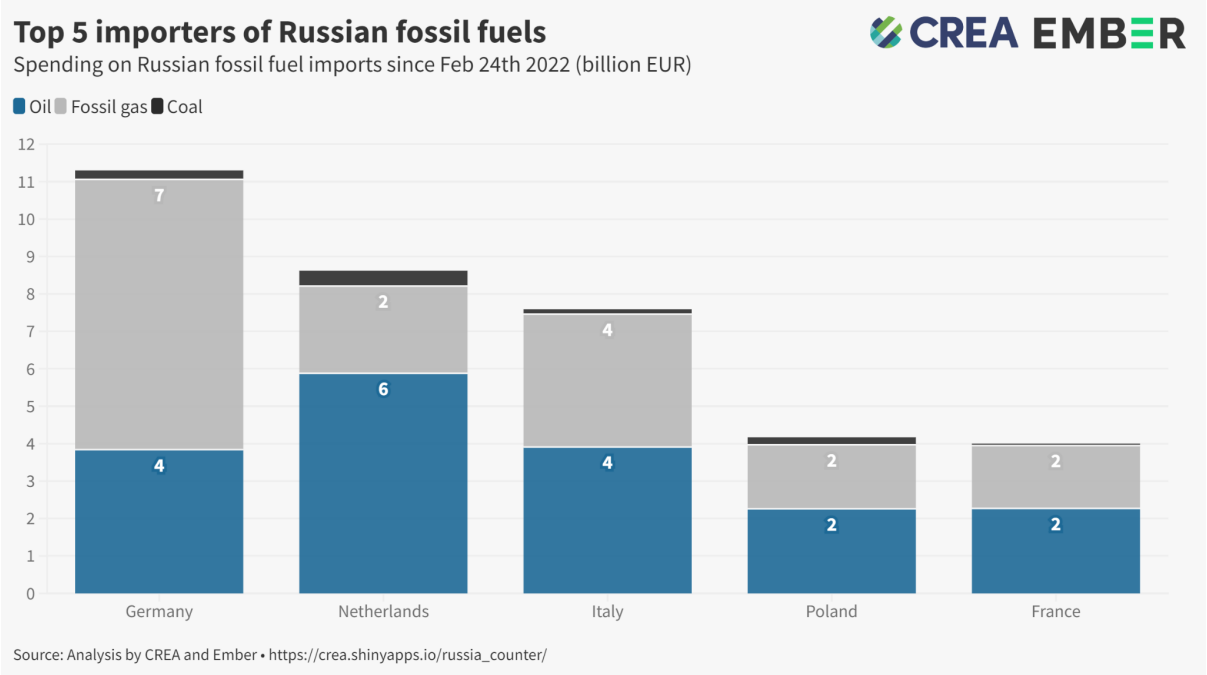
A hesitant rethink of planned gas investments is also starting to simmer in both Poland and Belgium, the two countries that planned the largest gas in power expansion under their 2019

NECPs. Gas is also driving high electricity prices in countries like Spain and Italy, who are accelerating RES deployment to cope with the economic impacts of fossil fuel dependence.



The largest importers of Russian fossil fuels are leading the way

The war in Ukraine has provided additional tailwind to the uptake of ambitious renewable energy policies across the European continent, with many countries making significant announcements. The top importers of Russian fossil fuels — Germany, the Netherlands and Italy — are putting forward some of the most ambitious plans to replace Russian dependency with wind and solar energy.



Germany, the largest European Union economy, is also the largest European Union importer of fossil fuels from Russia. Over at least the last three decades, Germany has been powered by affordable fossil fuels from Russia, mainly delivered through long-term supply contracts in which a significant amount of political capital was invested and long negotiation processes were put into place.

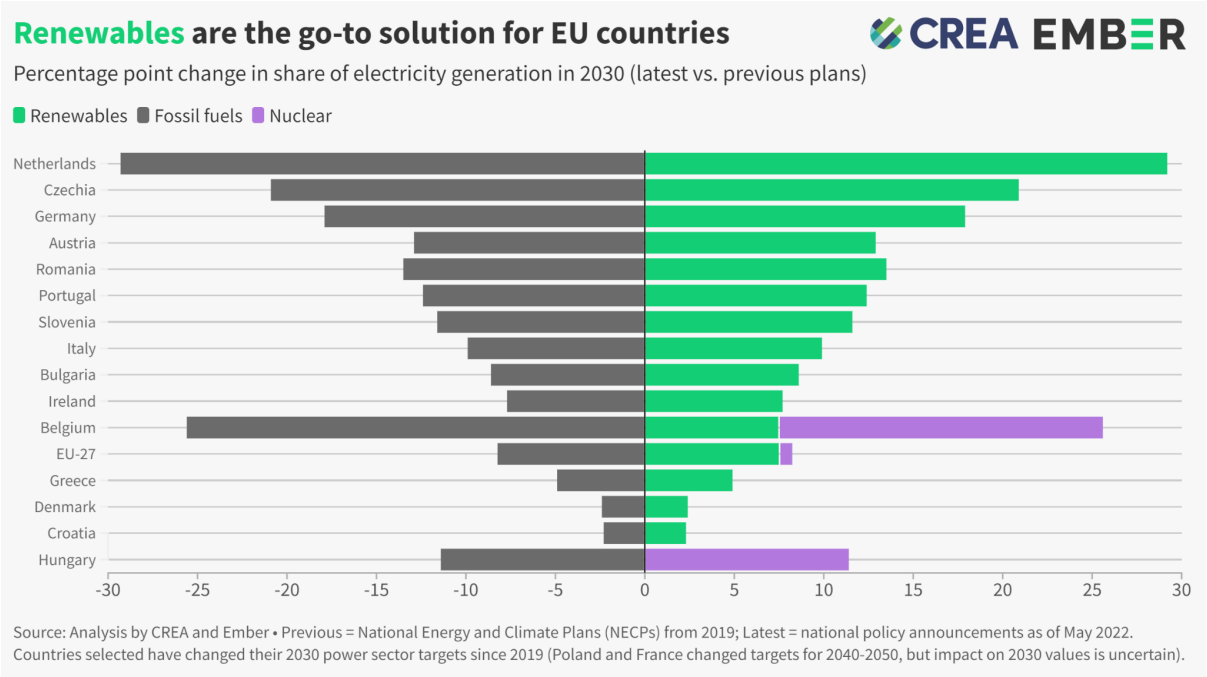
Italy, like Germany, has been heavily dependent on gas imports: 95% of the gas it uses is imported, of which 45% comes from Russia. This is significant considering gas represents 42% of Italy's energy consumption.

The share of Russian gas in the Netherlands' total gas consumption is relatively low, standing at only around 15%, or 6 bcm. Despite this, the Dutch government is aiming to end its Russian energy imports by the end of this year and possibly even earlier, since Gazprom suspended sales to Dutch trader GasTerra from May 31st, 2022.

Compared to other European countries, France is less dependent on Russian fuels. That being said, close to 20% of its gas imports come from Russia.

In the UK, imports from Russia account for 4% of gas and 8% of oil. While this is significantly lower than the EU's dependency as a whole — which sources 40% of its gas and 27% of its oil from Russia — the outbreak of the war still raised concern about this external reliance, especially in light of the autumn 2021 "panic over fuel".

These countries are now proposing some of the most ambitious advancements in terms of renewables deployment, heating, transport and industry transformation.



Germany

Since the invasion of Ukraine, Germany's Economic Minister Habeck emphasised the importance of phasing out fossil fuels and announced higher ambitions in renewable energy. Germany is accelerating its clean energy plan by increasing the share of renewable energy from 65% to 80% by 2030. This will include additions of 110 GW of onshore wind by 2030 up from 54.4 GW in 2021, 30 GW of offshore wind by 2030 and a further 70 GW by 2045 up from 7.7 GW installed capacity today, and 200 GW of solar PV by 2030 up from 53.8 GW in 2021.

In early 2021, Germany introduced a tax on carbon emissions caused by the combustion of fossil fuels in buildings. The tax currently stands at EUR 30 per tonne, and is expected to increase to EUR 55 by 2025. The German government plans on banning new fossil fuel heating in buildings in 2025.

Italy

Italy's first offshore wind farm and the first in the Mediterranean was commissioned at the end of April 2022. The country is also discussing an increase in the offshore wind target to 5 GW by 2030. The country's Prime Minister Mario Draghi addressed Italy's dependency on Russian fossil fuels amid the invasion, and announced that a rapid shift to renewables is the only viable strategy in the long term. The government is currently considering increasing the

target share of renewables in electricity generation to 70% from a previous target of 60%. Lastly, in March 2022, Italy's cabinet approved six new onshore wind farms.

The Netherlands

The Netherlands announced plans to double the country's production of offshore wind capacity to 21 GW by 2030. If the plans go through, wind energy would be the largest source of electricity by 2030. The intention is to use this electricity for industry and households. The country has ambitious plans for all of its energy supplies to come from renewables by 2050, and is maintaining its decision to stop production at Europe's largest onshore natural gas field by the end of this year.

France

In early February, the French president announced a "rebirth" of the nuclear energy industry alongside ambitious renewable energy objectives. The latter entails a 2050 target of 40 GW offshore and 37 GW onshore wind power generation capacity, as well as 100 GW of solar photovoltaic parks. On the other hand, nuclear power generation has been proposed to expand by 25 GW through 14 new reactors to be built by state-controlled Electricitė de France SA. This is contrary to earlier discourse on reducing nuclear dependence.

The "MaPrimeRenov" subsidy scheme will be reformed: subsidies for new residential gas heater installations will be scrapped, with households incentivised to switch over to renewable heating systems through EUR 1,000 increases in the subsidy for "virtuous residential heating". This encompasses heat pumps and biomass heaters, including hybrid systems. 150 million euros of new support is also offered to companies and municipalities to aid in switching to renewable heating, especially to biomass, through state environment and energy agency ADEME. Furthermore, public buildings are encouraged to lower their temperatures by 1°C to save energy.

EU Neighbours: The UK and Norway

The recently updated British energy security strategy aims to increase the country's renewable capacity by 15% by the end of 2023. The UK currently has 14 GW of both onshore wind and solar power, and has ambitious plans to increase onshore wind capacity in Scotland, and a target to deploy five times more solar power by 2035. Furthermore, the government has targeted up to 50 GW of offshore wind by 2030 — up from its current 10 GW of offshore wind capacity. A crucial way of supporting the upscaling of renewables is by cutting the process time for steps, such as permits, in half. This action aligns with the UK's net-zero by 2050 policy.

On the demand side, the strategy's plan is to accelerate energy efficiency by, for instance, installing 600,000 heat pumps per year by 2028. As of May 2022, over 90% of UK households are still heated with fossil fuels. The goal is for all buildings to have low carbon heating by 2050, and households are incentivised and supported through various grants and funds. Financial assistance has also been provided to families and businesses struggling with energy bills — such as the 9.1 billion pound support package for households and increased compensation schemes for businesses.

The Norwegian government announced plans to develop 30 GW of offshore wind by 2040 in plans unveiled on May 11, 2022 as opposed to less than 5 GW announced previously in 2020.

Delivering and building on ambition

Increased targets are undoubtedly needed, but to successfully decouple from fossil fuels, EU member states will need to anticipate the next set of challenges - the first one being the approval of the REPowerEU package by all Member States. This is critical for Europe's security: it will provide a framework for country-level policy advancements and help coordinate efforts to reduce exposure to fossil fuels.

Delivering on renewables ambition
The next step is ensuring the delivery of the already announced policy - no small thing. The required scale of renewables deployment is unprecedented. At the moment it takes several years to build a wind farm, grid bottlenecks are blocking solar farms, and missing guidelines or legislation are slowing down RES adoption by prosumers and industry.

These issues are being noticed, with REpowerEU including a recommendation on permitting, a Solar Strategy, and guidance for Power Purchase Agreements (PPA). However, the successful adoption of these measures will depend on all Member States, who need to deliver on their declarations. Countries like Poland, still hanging on to a planned 67% fossil fuel share in electricity generation in 2030, need to align with the joint effort to ensure their own security.

How will EU ambition be funded?
While REpowerEU might be seen as costly by some governments - it entails an additional investment of EUR 210 billion until 2027 on top of what is necessary to reach Fit for 55 goals

- it will also save up to EUR 100 billion a year in fossil fuel imports by 2030 (EUR 80 billion in gas, EUR 12 billion in oil and EUR 1.7 billion in coal). The program mobilises EUR 300 billion to help with implementing the additional measures, also doubling the funding to decarbonise industry through innovative technology to EUR 3 billion.

Several countries have already announced new funding for renewables, heat pumps, and energy efficiency. However, Spain, Italy, France and Germany have spent approximately EUR 20 billion since September 2021 by subsidising power, gas, gasoline and diesel prices. The introduced price capping measures can alleviate the burden on lower income citizens, but they also have downsides — they can potentially hinder advancements in energy efficiency, conservation and reduction in consumption and they can negatively affect the security of supply. On the other hand, previous oil price spikes have become catalysts for demand reduction, fuel substitution, development of new energy supply sources and generally policies aimed at reducing demand for oil. Therefore, market interventions need to prioritise solutions that will have positive effects in the long-term (e.g. subsidising heat pumps) while also being socially responsible — reducing rather than deepening inequalities.

No sector left behind

EU countries cannot afford to limit focus to the power sector: measures should span across the whole economy. Meanwhile, the oil sector has still not seen direct country-level measures to reduce demand in the short run — which could help countries avoid a crunch with the ban on Russian oil. REPowerEU proposals targeting industry, such as hydrogen uptake, fuel substitution and energy efficiency are expected to lead to a marginal decline in oil demand. A vote by the Environment Committee of the European Parliament to ban the sale of internal combustion engines in the EU by 2035 should help accelerate the uptake of electric vehicles and drive down oil consumption, but more ambitious short-term actions are needed to reduce oil demand

Conclusion

Speeding away from fossil fuels

Recent EU national policies show a growing consensus that fossil fuel dependence exposes countries to geopolitical and economic threats. But a few remaining laggards need to update their policies for their own security.

Russia's invasion of Ukraine brought into stark relief for Europe the security risks related to fossil fuel import dependence. Under this new paradigm, it is not just climate change but geopolitics driving swift renewable energy deployment and accelerated fossil fuel phase-outs.

Addressing the new situation, EU national governments have already increased their RES targets, on average from 55% under the NECPs to 63%, which will likely increase further to 69% under REpowerEU. At the same time, planned 2030 fossil generation dropped by a third, showing how seriously national governments are treating the security risks associated with fossil import dependence.

Decarbonization of heat and industry have also seen much needed attention. Five European countries have announced policies related to retrofits, energy efficiency in buildings, clean heat, while REPowerEU aims to target the deployment of 10 million heat pumps over the next five years. But much more could be done on tackling opportunities beyond the power sector. Especially the transport sector requires more efforts - while oil demand is expected to decrease via measures targeting industry within REPowerEU, it has not been actively targeted by policies up to now.

The way forward is now clear - the security of the European continent can only be ensured through phasing out fossil fuels. Most governments have already stepped up to this challenge and laggards need to swiftly join the united REpowerEU effort, scaling up wind and solar, improving energy efficiency and decarbonising their economies. Numerous examples show that this is both essential and beneficial, and could be used as a guideline for countries outside of Europe as the impacts of fossil fuel volatility continue to spread.

Acknowledgments

Contributors

Paweł Czyżak; Erika Uusivuori; Andrei Ilas; Alison Candlin

Ronja Borgmästars; Hannah Broadbent; Sarah Brown; Harriet Fox; Charles Moore; Lauri Myllyvirta; Maciej Zieliński

Kindly peer-reviewed by Pieter de Pous, Senior Policy Advisor, E3G

Annex

Country-level policy announcements

Country	Sector	Policy
European Union	Power	Increase renewable energy target to 45% by 2030, from original target of 32% 58 TWh more of solar PV rooftop production by 2025
	Final Energy Consumption	13% reduction in energy consumption by 2030
	Heat	10 million heat pumps by 2027
Austria	Power	100% renewable power in 2030
Belgium	Power	Nuclear phase out deferred by 10 years from 2025 150 GW offshore wind in North Sea by 2050
Bulgaria	Power	Increase wind and solar capacity by 3.5 GW by 2026 compared to 2021 values - additional 2.5 GW compared to the NECP Coal phase-out in 2038-2040 Discussions about nuclear expansion
Croatia	Power	Coal phase-out in 2033
Czechia	Power	Coal phase-out in 2033
Denmark	Power	Quadruple number of solar power and onshore wind by 2030 150 GW offshore wind in North Sea by 2050
	Heat	400,000 households switched to district heating or heat

		pumps from gas heating by 2028
	Industry	Production of 4 to 6 GW of green hydrogen annually by 2030
France	Power	40 GW of offshore wind and 37 GW of onshore wind by 2050 14 new nuclear reactors totalling 25 GW by 2050
	Heat	Subsidies for low carbon home heating installations
Germany	Power	Share of renewable energy in power will increase from 65% to 80% by 2030 150 GW offshore wind in North Sea by 2050
	Heat	Ban on fossil fuel heating in new buildings as of 2025
	Transport	Support for an EU wide ban on new ICE vehicle sales by 2035
Greece	Power	19 GW of solar PV capacity by 2030 Share of renewable electricity increased from 65% to 70% by 2030 New 204 MW solar park Nuclear project together with Bulgaria
Hungary	Power	90% carbon-neutral electricity by 2030 (achieved mostly through nuclear expansion, although the Paks nuclear plant is developed by Rosatom that could face sanctions) Coal phase-out in 2025
Italy	Power	2030 renewables electricity up to 70% from 60% (55% share of consumption) Pressure is increasing to set offshore wind of 5 GW target by 2040
Ireland	Power	70% electricity from renewables by 2030
	Heat	500,000 homes retrofitted to B2 standards by 2030
Norway	Power	30 GW of offshore wind by 2040

Netherlands	Power	Double offshore wind installation to 21 GW by 2030 150 GW offshore wind in North Sea by 2050
Poland	Power	Increase the share of renewable electricity from 40% to 50% by 2040, potentially aiming for 50 GW renewable capacity in 2030 Coal phase-out in 2049
Portugal	Power	Increase renewables share of power generation to 80% by 2026
Romania	Power	Coal phase-out in 2032
Slovenia	Power	Coal phase-out in 2033
Spain	Power	EUR 1 Billion to finance renewable energy and storage
United Kingdom	Power	15% increase in RE capacity by 2023 5 times more solar by 2035 50 GW of offshore wind by 2030
	Heat	600,000/year heat pumps installed by 2028

A total of 19 governments that updated their renewables expansion and/or fossil fuel phase-outs beyond the ambition of National Energy and Climate Plans (please note a previous estimate of 16 was increased to 19 to include new coal phase-out declarations).

A detailed analysis of the latest policy announcements in countries not covered in the main report is provided below.

Denmark

Denmark's joint offshore wind project — 150 GW to be built by 2050 together with Germany, Belgium, and the Netherlands — will partly be used for making hydrogen and green fuels for heavy industries that are more challenging to directly electrify. Denmark has set new goals to produce between 4 to 6 GW of green hydrogen annually by 2030. This is one of the highest green hydrogen targets in Europe. The plan dates back to before the war but has received wider support after the war in Ukraine.

Another aim regarding energy efficiency improvements is to revamp household heating systems and to have around 400,000 households switch from gas heating to district heating or electric heat pumps by 2028.

Greece
A new 204 MW solar park in Greece was inaugurated in early April, 2022, becoming the largest double-sided solar farm in all of Europe. The country's Prime Minister, Kyriakos Mitsotakis, wants to speed up renewable energy projects and the permits and licences for those as well as increase the country's renewable capacity to 19 GW (double that of now) by 2030. Additionally, on the nuclear energy side, Greece and Bulgaria are talking about a new nuclear power project to be built in Bulgaria but which would supply Greece with power as well.

Portugal
Portugal's new government released its program on April 1, 2022 and the country aims to increase its renewable energy sources for electricity output to 80% by 2026 — four years earlier than the previous target. The country also wants to double its overall installed renewable capacity over the next decade.

Belgium
Belgium is also one of the four countries that has now vowed for a massive offshore wind capacity increase in the North Sea — amounting to 150 GW. Belgium had set a nuclear phase out scheme for 2025 but has now ruled to postpone it by 10 years to avoid that the country is too dependent on other countries and due to rising energy prices. The nuclear power extension concerns two of the country's newest nuclear reactors.

Ireland
Ireland has published a National Retrofit Plan as part of its 2021 Climate Action Plan. By 2030, the plan sets out grants, funding for jobs, and an increased number of free energy upgrades, with the goal of retrofitting 500,000 homes to B2 standards by 2030.

Central and Eastern Europe

In Poland, there is growing support for achieving a 50% share of renewable energy by 2030 instead of 32% which is the current target. The Minister of Climate has recently stated that 50 GW of renewable energy can be achieved by 2030 and published draft assumptions for the new national strategy, aiming for 50% renewable electricity in 2040. Bulgaria has a pipeline of 15 GW of renewable energy projects while Romania has anywhere between 15 to 30 GW in its pipeline. Romania has recently launched a call for supporting renewable energy projects to the tune of EUR 500 million. Slovakia announced a total of nine calls to finance with more than EUR 220 Million renewable energy, repowering and flexibility of the transmission grid. Between 2020 and 2022 several countries - Bulgaria, Croatia, Czechia, Poland, Romania and Slovenia officially announced their coal phase-out dates.

Central and Eastern European countries are also seeing renewed impetus for older nuclear projects and for newer ones such as the one Bulgaria and Greece are discussing to build and operate jointly. Furthermore, Czech Republic has prequalified companies from France, South Korea and the USA to build a new nuclear reactor of 1,200 MW and Romania has recently announced a memorandum with NuScale to develop small modular reactors.

Measuring the impact of policy changes

The calculations in this report build on the NECP assessment published by Ember in 2020, applying changes to energy policies announced by national governments between 2020 and 2022. In this period several events impacted political decisions - the COVID-19 pandemic in 2020, the gas crisis in 2021, the war in Ukraine in 2022. Many coal phase-outs were announced during COP26 in 2021, together with clean power by 2035 commitments from major economies such as the UK, Germany and USA.

The changes in policies are across a number of varying metrics - e.g. wind and solar capacity increases, coal phase-out dates, RES share in generation goals. All these targets have been transformed into consistent share in generation figures for RES, fossil fuels and clean energy. Clean electricity includes wind and solar and other low-emission sources like hydro and nuclear, and excludes unabated fossil fuels, such as coal and gas.

Country-level data and references are available in the attached spreadsheet. Capacities were transformed into generation using country-level capacity factors derived from the EU Commission's MIX scenario. Where coal phase-out dates were announced and no estimates on the generation were provided, a linear reduction of generation from 2021 towards the phase-out date was assumed. One of the exceptions was Romania, where the Recovery and Resilience Plan assumes that in 2030 one last 810 MW unit will operate - to estimate its generation we've assumed a capacity factor of 20%. The other exception was Czechia, where an estimate of 15 TWh coal generation in 2030 was available in Ember's previous briefing, aligned with a 2033 phaseout date.

The resulting additional RES generation is assumed to replace fossil fuels, not nuclear energy. An exception is Hungary, where the high clean share is achieved through a nuclear program. In other CEE countries - Croatia, Czechia, Slovenia, Romania, the coal generation decreases are assumed to be replaced by renewables - not gas (due to geopolitical reasons) nor nuclear, since it is unlikely that new nuclear projects will be commissioned by 2030 (e.g.

the expansion of the Dukovany plant in Czechia is planned for 2036, three years after the coal phase-out, which means the coal generation will need to be replaced with renewables).

In some cases, clean generation might exceed 100% - e.g. in Denmark, the Netherlands, Sweden, France. Overproduction is generally seen as positive - as it could provide economic benefits to host countries and decrease fossil generation in neighbouring countries. This was however not examined in the analysis - country generation was capped at 100%.