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News Analysis

EU has Set Ambitious New Energy Targets – Can They be Achieved?



Introduction

As the war in Ukraine has been escalating following the Russian invasion of February 24, with no signs of early ending, the European Union is getting more and more concerned with its huge reliance on Russian oil and gas imports. As already reported and analysed by the IENE (1), almost 40% in average of European gas imports come from Russia and hence a decoupling from such high exposure is now becoming top priority for Brussels planners but also for most national governments. In this context, the EU has laid out some specific plans aimed at reducing fossil fuel imports from Russia.

More specifically, on March 8, 2022, the European Commission proposed an outline of a plan, known as REPowerEU, to make Europe independent from Russian fossil fuels well before 2030, starting with gas, in light of Russia's invasion of Ukraine (2). This plan also outlines a series of measures to respond to rising energy prices in Europe and to replenish gas stocks for next winter. Europe has been facing increased energy prices for several months, but now uncertainty on supply is exacerbating the problem. REPowerEU will seek to diversify gas supplies, speed up the roll-out of renewable gases and replace gas in heating and power generation. This can reduce EU demand for Russian gas by two thirds before the end of the year.

This plan is important as it expresses the position of the European Commission, but how are its goals to be implemented over a really short period of time as by the end of 2022, or longer by 2030? This News Analysis attempts to focus on the details of REPowerEU and through a series of arguments to present the challenges and disadvantages that this plan must deal with.

What is REPowerEU?

According to the European Commission, phasing out Europe's dependence on fossil fuels from Russia can be done well before 2030. To do so, the Commission proposes a REPowerEU plan that will increase the resilience of the EU-wide energy system based on two pillars:

- Diversifying gas supplies, via higher LNG imports and pipeline imports from non-Russian suppliers, and higher levels of biomethane and hydrogen.
- Reducing faster Europe's dependence on fossil fuels at the level of homes, buildings and the industry, and at the level of the power system by boosting energy efficiency gains, increasing the share of renewables and addressing infrastructure bottlenecks.

The EC supports that full implementation of "Fit for 55" proposals would lower Europe's gas consumption by 30%, equivalent to 100 bcm, by 2030. Together with additional gas diversification and more renewable gases, frontloaded energy savings and electrification have the potential to jointly deliver at least the equivalent of the 155 bcm imports of Russian gas.

The energy efficiency first principle is more relevant than ever and should be applied across all sectors and policies, with demand response measures complementing those on the supply side. Given the circumstances, the co-legislators might also want to consider to boost the “Fit for 55” proposals with higher or earlier targets for renewables and energy efficiency.

The Commission stands ready to propose a REPowerEU plan based on an identification, in dialogue with Member States, of the most suitable projects and reforms, at national, regional and EU levels. This will build on National Energy and Climate Plans and their updates, existing Recovery and Resilience Plans (RRPs), cohesion policy operational programmes and any other relevant plans and climate resilience needs. Projects which help in internal energy market completion and those with a strong cross-border dimension should be prioritised, for instance the critical connections between Bulgaria and Greece.

Table: Targets of REPowerEU

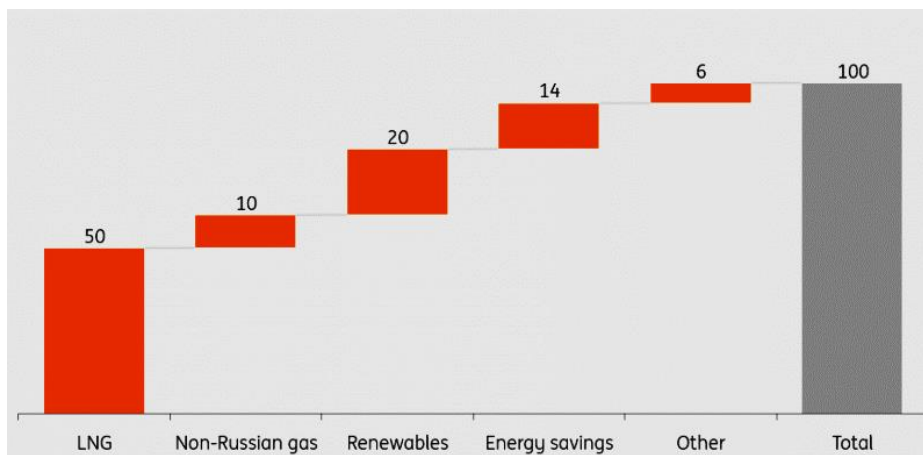
REPOWER EU TRACK	FOCUS	FF55 AMBITION BY 2030	REPOWEREU MEASURE	REPLACED BY THE END OF 2022 (BCM equivalent) estimate	ADDITIONAL TO FF55 BY 2030 (BCM equivalent) estimate
GAS DIVERSIFICATION	NON-RU NATURAL GAS	-	LNG diversification	50*	50
		-	Pipeline import diversification	10	10
	MORE RENEWABLE GAS	17 bcm of biomethane production, saving 17 bcm 5.6 million tonnes of renewable hydrogen, saving 9-18.5 bcm	Boost biomethane production to 35bcm by 2030 Boost hydrogen production and imports to 20mt by 2030	3.5 -	18 25-50
ELECTRIFY EUROPE	HOMES	Energy efficiency measures, saving 38 bcm	EU-wide energy saving, e.g. by turning down the thermostat for buildings' heating by 1°C, saving 10bcm	14	10
		<i>Counted under overall RES figures below</i>	Solar rooftops front loading – up to 15 TWh within a year	2.5	frontloaded
		30 million newly installed heat pumps installed in 2030, saving 35 bcm in 2030	Heat pump roll out front loading by doubling deployment resulting in a cumulative 10 million units over the next 5 years	1.5	frontloaded
	POWER SECTOR	Deploy 480 GW of wind capacities and 420 GW of solar capacities, saving 170bcm (and producing 5.6 Mt of Green Hydrogen)	Wind and solar front loading, increasing average deployment rate by 20%, saving 3bcm of gas, and additional capacities of 80GW by 2030 to accommodate for higher production of renewable hydrogen.	20	Gas savings from higher ambition counted under green hydrogen, the rest is frontloaded
TRANSFORM INDUSTRY	ENERGY-INTENSIVE INDUSTRIES	Front load electrification and renewable hydrogen uptake	Front load Innovation Fund and extend the scope to carbon contracts for difference	<i>Gas savings counted under the renewable hydrogen and renewables targets</i>	

**all figures are estimates*

Source: European Commission

Such projects will improve the interconnection of the European gas and electricity networks and other infrastructure and fully synchronise its power grids, such as between the Baltic States and the Continental European Network. A regional analysis should underpin Member States plans. The Commission would provide support as done for RRP and technical assistance via the Technical Support Instrument. Financing needs will be assessed based on a comprehensive mapping of the needs of Member States as well as of cross-border investment needs. To meet these, all resources and tools available at national and EU level should be mobilised, with public funding designed to crowd-in private investment.

Figure 1: Alternative Solutions to Russian Gas Pipeline Flows in bcm



Source: European Commission

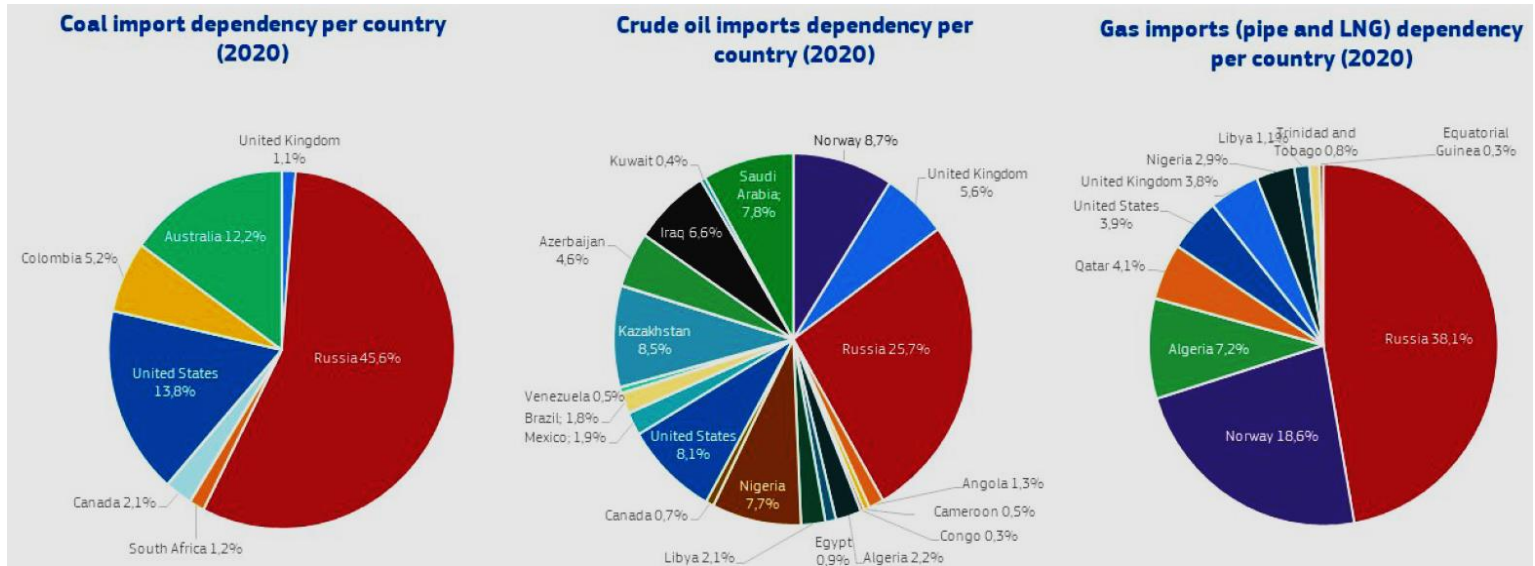
Current Situation

Following the invasion of Ukraine by Russia, the case for a rapid clean energy transition has never been stronger and clearer. The EU imports 90% of its gas consumption, with Russia providing about 40% of the EU’s total gas consumption. Russia also accounts for 26% of oil imports and 46% of coal imports, based on Eurostat’s data (3). In 2020, Europe, including Turkey, imported about 185 bcm of Russian gas: 168 bcm of pipeline gas and 17 bcm of LNG. Meanwhile, the European Union imported 156 bcm of Russian gas in 2021, including 142 bcm of pipeline gas and 14 bcm of LNG.

Accelerating the green transition will reduce emissions, reduce dependency on imported fossil fuels, and protect against price hikes. Rising fossil fuel prices hit energy-poor or vulnerable household consumers particularly hard, who spend a high share of their total income on energy bills, exacerbating the disparities and inequalities in the EU. Businesses, in particular energy-intensive industries, as well as the agri-food sector face higher production costs.

Providing companies and households with affordable, secure and clean energy requires decisive action, starting immediately with price mitigation and storing gas for next winter.

Figure 2: EU’s Energy Import Dependence on Russia, 2020



Source: European Commission

Very high energy prices are hurting the economy. The European Central Bank estimated before the invasion that the energy price shocks will reduce GDP growth by around 0.5% in 2022. Continued high energy prices are likely to increase poverty and affect business competitiveness. Energy-intensive industries in particular have faced higher manufacturing costs. High energy prices also mean higher prices for other commodities, notably food. A combination of higher energy, transport and higher food prices would exacerbate the pressure on low income households, with increased risks of poverty. (4)

The Commission’s toolbox (5) of October 2021 has helped mitigate the impact of high energy prices. The measures should be continued as long as necessary. To address the current emergency, the Commission will look into all possible options for emergency measures to limit the contagion effect of gas prices in electricity prices, such as temporary price limits. It will consult as a matter of urgency all concerned actors and propose options in the coming weeks. The Commission will also assess options to optimise the electricity market design to reap the benefits from low cost energy. It will take into account the final report of the European Union Agency for the Cooperation of Energy Regulators (ACER) and other contributions on the functioning of the electricity market on benefits and drawbacks of alternative electricity pricing mechanisms. It will follow up as appropriate to keep electricity affordable without disrupting supply and further investment in the green transition.

Critique on REPowerEU

Although “REPowerEU” plan is a step in the right direction, it is not enough to put a quick end to the EU’s fossil fuel imports from Russia, nor to phasing out fossil fuels in general. A massive acceleration of energy savings and renewables requires a full scale mobilisation of all EU funds in order to tackle the climate crisis, protect consumers from price surges and achieve energy independence from unstable regions.

The European Commission’s plans also fail to include substantial reforms to EU funds for accelerating investments in energy savings, renewable energy, storage and wider supporting infrastructure or flexibility measures. To genuinely deliver on the promise of phasing out Europe’s dependence on fossil fuels, nothing short of a full scale mobilisation of EU funds is needed.

In the short-term, it is notably urgent to front load clean energy investments in recovery plans, while replacing planned investments in fossil gas related infrastructure with clean energy alternatives. In the medium term, it is crucial to ensure that Operational Plans for the EU Budget 2021-2027, territorial just transition plans and State Aid rules are aligned with the needs to accelerate cuts in energy consumption, roll-out of sustainable renewable energy projects and socially supporting people not to leave them behind.

In the current climate crisis, bold action should be taken immediately, as a new IPCC report revealed recently (6). The EU should do this by treasuring and increasing the ambition of the “Fit for 55” legislative package in line with limiting temperature increase to 1.5°C. Reducing emissions is key to move away from dangerous fossil fuels and exporters, while crucial to tackling the climate crisis, ensuring energy security and protecting people from price surges.

LNG

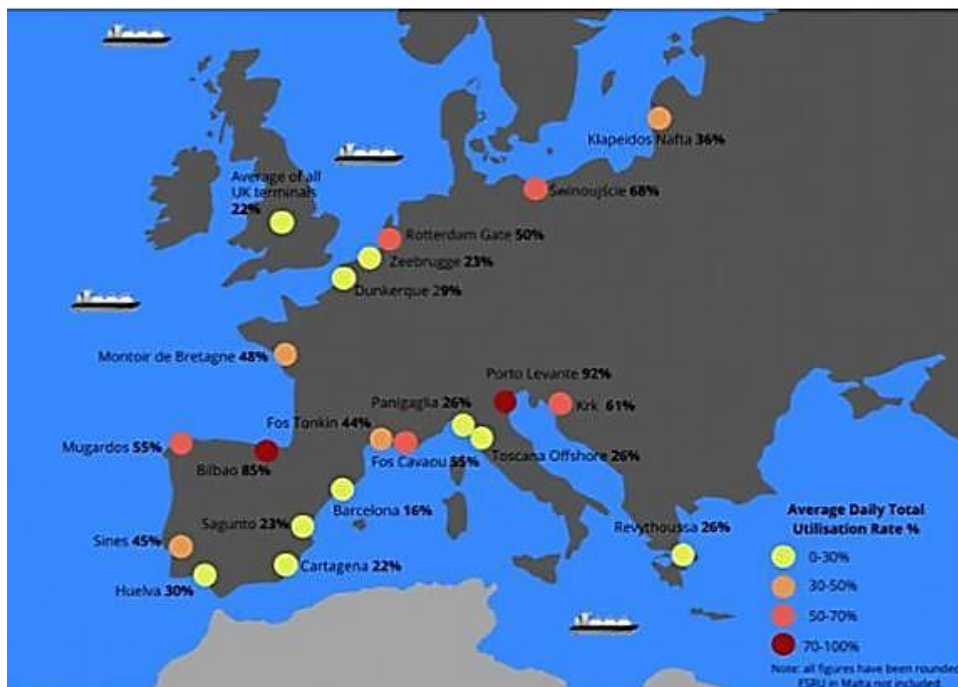
According to “REPowerEU” plan, the EU could import 50 bcm more of LNG (e.g. from Qatar, USA, Egypt, West Africa) on a yearly basis, equivalent to 37 million tonnes of the superchilled fuel. Diversification of pipe sources (e.g. Azerbaijan, Algeria, Norway) could deliver another 10 bcm of yearly savings on Russian gas imports. Such an objective seems very challenging, given current European import capacity and the cost at which this would be done. It is worth noting that the EU and the UK together imported 67.55 million tonnes last year and 73.5 million tonnes in 2020.

Another key factor which EU planners tend to disregard is the instant availability of almost 10% of global LNG production. In other words, where are these extra quantities of LNG going to come from? Which countries are going to supply 50 bcma at short notice and at what cost? And where is this additional LNG going to be stored? These are serious questions which are begging for answers.

In general, LNG is shipped to specialised regasification terminals. The combined regasification capacity of all EU terminals is notionally 169.38 bcm per year. However, this assumes maximum utilisation across the year, and sufficient gas storage and transport capacity within Europe to smooth out uneven consumption, meaning that realistically capacity is likely to be lower.

With the EU having imported 98 bcm of LNG in 2021, its regasification terminals have a notional additional capacity of about 71 bcm, less than half of the 153 bcm of gas provided last year by Russian pipelines. In the unlikely event that Russia were to cut off gas to the European continent altogether or Europe is willing to stop receiving gas from Russia, increased LNG shipments might help in the immediate term. However, Europe’s dependence on Russia is too great to be offset by existing LNG capacity for any prolonged period of time. Projects are under way to expand some existing LNG terminals and construct new ones, but these have multi-year timelines, and the volatility of natural gas markets has slowed construction. In addition, the spatial distribution of existing LNG terminals in the European continent is not analogous to EU gas needs.

Map: The Locations of LNG Gasification Terminals in Europe



Source: Eurogas

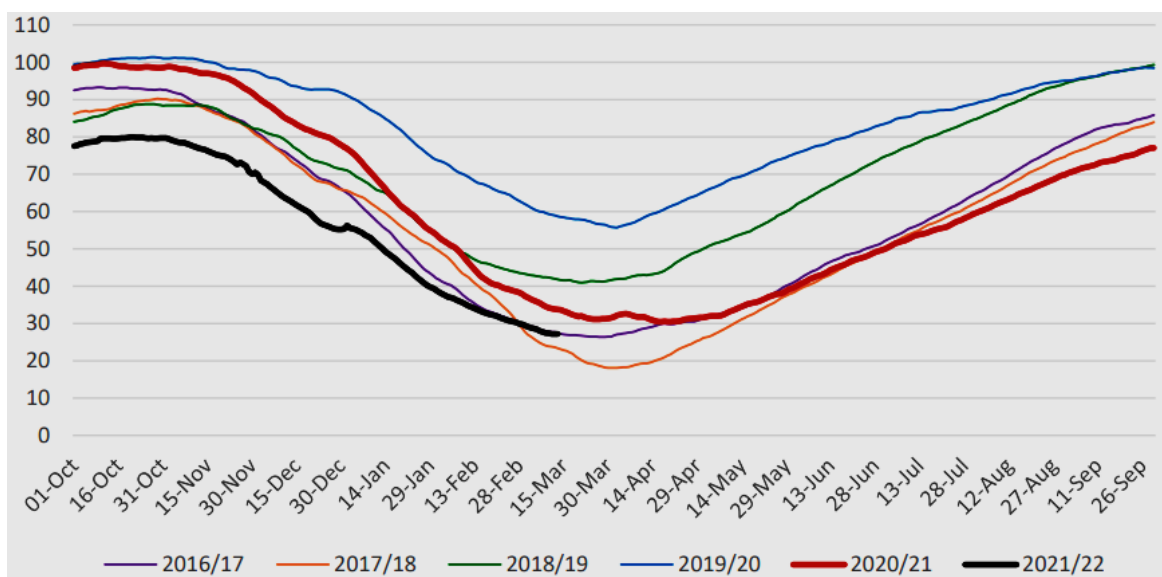
A substantial amount of the EU’s LNG import capacity is in Spain and Portugal. The pipeline capacity between Spain and France is just 7.5 bcm per year, while flows on this route totalled just 0.5 bcm in 2021. The existence of 7 bcm per year of available pipeline capacity from Spain to France is a serious bottleneck to utilising the 36.2 bcm of LNG import capacity that was

unused in Spain and Portugal in 2021, based on ENTSOG data¹. The EU less Iberia (also deducting Malta) would not appear to have enough capacity to import an additional 50 bcm of LNG to the markets that actually need it.

In addition, global LNG market is already tight. Even if it were possible to produce the extra LNG, purchases would be astronomically expensive as European importers would have to pay top-dollar to wrest whatever cargoes they could away from Asian rivals. So, whatever happens in the Russia-Ukraine war, European gas prices will remain high. Brussels says public financing for the plans will be assessed on countries' needs, but Jonathan Stern with the Oxford Institute for Energy Studies points out that the Commission fails to provide any cost estimates — which he reckons will likely be in the hundreds of billions of euros. (7)

On top of that will be the cost of meeting the Commission's plan to fill EU gas storage to 90% of capacity by October 1, 2022. Inventories are now less than 30% full, meaning more than 60 bcm would have to go into storage by then. For comparison, summer injections in 2020 (43 bcm) and 2021 (45 bcm) were significantly smaller, while the summers of 2017, 2018, and 2019 saw injections range from 58 bcm (2019) to 66 bcm (2018). This implies that European summer injections in 2022 need to be around 20-25 bcm higher year-on-year, back to the volume injected between April and September 2018. So, not only does Europe need to combine 63.5 bcm of extra supply and 38 bcm of lower demand to offset 101.5 bcm of lower supply from Russia, but Europe also needs to find an additional 20-25 bcm for higher year-on-year storage injections.

Figure 3: EU-27 Gas Storage Stocks



Sources: Gas Infrastructure Europe, Oxford Institute of Energy Studies²

¹ ENTSOG, 2021. Transmission capacity map 2021. <https://www.entsog.eu/maps#transmission-capacity-map-2021>

The European Commission also remained silent on where it will get the extra LNG, basing the numbers on its own internal estimates. It says it has spoken to current suppliers and buyers in Japan, South Korea and India about lending Europe a hand. But it has not said how the bloc intends to source the volumes - Cargo swaps? New long-term agreements? All of the above? Brussels has also remained mum on how active a role it intends to play. Commercially, the first hints of a sea change may have emerged: France's Engie has extended an existing deal with US developer Cheniere for 900,000 tonnes per year to 20 years. (8)

Biomethane and biogas

According to "REPowerEU" plan, doubling the objective of "Fit for 55" for biomethane³ would lead to the production of 35 bcm by 2030. To do so, Member States' strategic plans should channel funding to biomethane produced from sustainable biomass sources, including in particular agricultural wastes and residues.

On biomethane specifically, the European Commission said production in 2022 could deliver 3.5 bcm to replace Russian gas, and reach 35 bcm by 2030, which is higher than the 17 bcm the EC had flagged by 2030 under its "Fit for 55" proposals published last year. "REPowerEU is a decisive step towards the rapid development of the biomethane industry in Europe", the European Biogas Association (EBA) said in a statement. "The sector is ready to deliver the 35 bcm by 2030 proposed by the EU and calls for the inclusion of this target in the recast of the Renewable Energy Directive, currently under development", it said. "Close cooperation between the European Commission, member states and the biomethane value chain will be required to ensure immediate action". (9)

Although such targets are now sending clear signals to investors in terms of decarbonizing gas and scaling up renewable gases, biomethane production in Europe totaled only 3 bcm in 2020, which was a 25% growth from 2019 and the biggest year-on-year increase in biomethane production at the time, despite the pandemic. However, reaching the target of 35 bcm by 2030 is difficult, if not impossible. It is worth noting that biogas⁴ production is a controversial issue within the agricultural community. While some see this as an opportunity to supplement their incomes, others argue that it takes valuable resources, such as manure and crop residues, away from the farms and soils. Meanwhile, biogas production suffers from a lack of

² Fulwood, M. et al. (2022), "The EU plan to reduce Russian gas imports by two-thirds by the end of 2022: Practical realities and implications", <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2022/03/Insight-110-The-EU-plan-to-reduce-Russian-gas-imports-by-two-thirds-by-the-end-of-2022.pdf>

³ When carbon dioxide and trace gases in biogas are removed, a methane rich renewable gas substitute is left in the form of biomethane. Biomethane can be injected into the gas grid, used as a vehicle fuel or used for combined heat and electricity generation.

⁴ The primary product of anaerobic digestion is a methane-rich renewable gas composed of 45-85 vol% methane and 25-50 vol% carbon dioxide.

acceptability in local communities, as well as a lack of funding, meaning that it has so far fallen short of its potential in the EU.

Looking at the EU-27 and considering a similar increase, estimates would place biomethane production at about 2.8 bcm in 2021, or about 0.5 bcm year on year. By contrast, the European Commission's "REPowerEU" strategy aims for an additional 3.5 bcm by end 2022. Record high gas prices improve biomethane economics and one can expect government support to continue in countries where measures are already in place and even increase in countries not yet focusing on biomethane to help diversify gas supply options away from Russian gas and increase indigenous production, but additional growth of 3.5 bcm seems extremely optimistic.

Hydrogen

According to "REPowerEU" plan, an additional 15 million tonnes of renewable hydrogen on top of the 5.6 million tonnes foreseen under the "Fit for 55" can replace 25-50 bcm per year of imported Russian gas by 2030. This would be made of additional 10 million tonnes of imported hydrogen from diverse sources and an additional 5 million tonnes of hydrogen produced in Europe, going beyond the targets of the EU's Hydrogen Strategy (10) and maximising the domestic production of hydrogen. Other forms of fossil-free hydrogen, notably nuclear-based, also play a role in substituting natural gas.

In July 2020, the European Commission issued the proposal for Europe's Hydrogen Strategy with the clear targets of deploying 6 GW of electrolysis and the production of up to 1 million tonnes of renewable hydrogen by 2024 and 40 GW of electrolysis and up to 10 million tonnes of renewable hydrogen by 2030.

The adoption of ambitious binding renewable hydrogen targets serves as basis to set associated national support schemes to unlock private investment and help first European movers to deliver these targets at least cost. De-risking projects and bringing down the "green premium" of renewable hydrogen remain key challenges. Industrial and energy frontrunners are ready to invest based on a clear, supportive framework that helps close the cost gap of renewable hydrogen until it reaches cost parity with polluting fossil-based alternatives.

"REPowerEU" pushes for significant hydrogen production. However, due to the low efficiency of hydrogen in displacing gas, such a strategy will leave the EU still dependent on 24 bcm of gas imports from Russia alone, Bellona estimates in a recent analysis. (11)

Renewables

To support the communication of the EU's energy resiliency, Executive Vice-President for the European Green Deal Frans Timmermans suggested that Europe "dashes into renewable

energy at lightning speed” (12). That is also indicated by the name of the plan, REPowerEU, as renewables are good at producing power from solar and wind energy.

But renewables do a poor job at producing heat to keep Europe’s buildings comfortable and to run high-temperature processes in manufacturing. And that’s what Europe needs half of its energy for. This heating demand is predominantly generated by gas and coal use. Only a fifth of Europe’s energy stems from power generation, and there gas is only one of the many energy sources that can be used.

So, reducing Europe’s gas dependency on Russia has everything to do with heating demand, and far less with power demand. While it is common practice to frame the energy transition in terms of solar and wind power, the potential to reduce Russian gas demand is limited. The focus should be firmly on gas supply and demand for heating purposes. That is why REHeatingEU would have been a better name.

In addition, the “REPowerEU” plan essentially risks gas power plants becoming black holes using up large amounts of renewable energy that would be more efficiently used elsewhere. Using 1 TWh of electricity to heat homes with heat pumps (13) instead of gas boilers displaces three times more gas than using it to produce hydrogen for electricity production. Switching off gas-fired power plants to power the grid through renewables is also a much more efficient solution than turning this electricity into hydrogen for power production. How effectively Europe uses electricity will de facto determine how easily the continent moves away from fossil gas dependency in the upcoming decade.

Moreover, “REPowerEU” aims to nearly triple current installed wind and PV capacity in the EU, reaching 980 GW of installed wind and solar PV capacity combined. This entails installing 280 GW of PV and 260 GW of wind, as forecasted by “FitFor55”, and deploying an additional 80 GW dedicated to renewable hydrogen production⁵. Overall, this additional capacity will produce more than 1,000 TWh of renewable electricity⁶ - the combined demand of France and Germany - that the EU will need to decide how to use to maximise its interests. “REPowerEU” increases the EU renewable ambitions only by a small part (80 GW). If the increase alone was to be dedicated to hydrogen production, only 2.8 Mt of hydrogen could be produced.

Discussion

Europe is still far from being self-sufficient in energy production and is still largely dependent on imports. The Russian-Ukraine crisis has sped up the process to phase out fossil fuels and to become less dependent on Russian gas. But replacing two-thirds of imported Russian gas in

⁵ Since no detail was provided on the additional 80 GW of capacity, we assumed that they will be equally split between wind and solar PV.

⁶ We assumed 27% capacity factor for wind and 11% for PV (based on current German data).

fewer than 10 months is not just a technical challenge since spare LNG and pipeline delivered gas quantities are not readily available. It will also result in a substantial cost for all energy consumers. The success of the plan will ultimately depend on two factors: on the one hand, the political will to take investment and regulatory decisions in a very short amount of time, and on the other hand, the ability of energy consumers to pay their bloated energy bills and moderate their gas consumption.

The challenges are clear. Vincent Demoury with the GIIGNL LNG importers' group describes the European Commission's estimates as "very bold assumptions". But ultimately, political ambition is different from market realities. "As gas people, we could analyze each element and say this all looks very difficult and is not going to happen quickly", Professor Jonathan Stern from the Oxford Institute for Energy Studies adds. "But the spirit of this has got to be "in Europe we are going to try and reduce our dependence on Russian gas — what looks possible within a reasonable length of time?"".

What is conspicuously absent from the "REPowerEU" plan is the need to provide incentives and draw a new strategy for increasing European indigenous oil and gas production. A rebirth of the North Sea basin by providing the right tax incentives and encouragement to Greece and Cyprus, backed by Israel and Egypt, to explore and produce more gas are steps that must be taken now as it takes time to develop underwater hydrocarbon resources. Currently, available data shows that the entire East Mediterranean basin may hold as much as 3.0 to 3.5 trillion cubic metres of gas, although the region is one of the least explored in the world and may hold a lot more. This could definitely help ensure Europe's gas needs over the next 20 or so years.

Summing up, it is fair to say that although the EC in Brussels and most of the national governments appear eager to lessen European energy dependence on imported Russian oil and gas imports and are indeed ready to finalise a new energy strategy and action plan towards this direction, there appears to be utter confusion on what is realistically possible in the short term, i.e. by the end of 2022, and what needs to be channelled on a longer term basis, say by 2025 and 2030. Therefore, there is an urgent need on the part of the EC for much greater clarity and redefinition of short-term goals since in its present form the "REPowerEU" targets for 2022 have very little chances of being achieved.

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