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BUILDING ENERGY INDEPENDENCE IN EUROPE: WHAT ROLE FOR GAS?



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EDITORIAL

BUILDING ENERGY INDEPENDENCE IN EUROPE: WHAT ROLE FOR GAS?

The new geopolitical realities with Russia's invasion of Ukraine and the subsequent rise in hydrocarbon prices have highlighted the urgency of Europe's energy security.

Today, gas represents about 25% of the total energy consumption in the EU, and to make Europe less dependent on fossil fuels, it is necessary to break the system of dependence on supplies, in particular that of Russia, which has provided 45% of our gas needs in 2021. The international situation is forcing us to invest in our own capacities in order not to depend exclusively on external suppliers.

With the Fit for 55 package and the RepowerEU plan published in May by the Commission, the European Union wants to accelerate the energy transition by increasing the target of 45% of renewable energy by 2030. This strategy aims essentially to bring about a systemic change in the way we produce, consume and store energy, such as the deployment of renewables in the electricity grid for industry, buildings and transport in order to strengthen its energy autonomy and stimulate investment.

Electricity currently accounts for only 20% of total energy demand in the EU, with heating playing a major role in terms of demand with 70% of our gas consumption. So how can we change the role of gas in the European energy system? A good solution would be to take the role of biogas and hydrogen to balance the electricity grid and district heating to be a direct source when electrification is not technically or economically the best solution.

To strengthen our arsenal, the Commission has published two delegated acts on the definition and production of renewable hydrogen that underline the importance of hydrogen in the future energy system.

Other initiatives are being implemented such as an action plan on biomethane with the creation of a new industrial alliance to increase production, the creation of new LNG terminals, gas interconnection projects.

The deployment of interconnected infrastructures, compatible with different gases (hydrogen and gas) also remains a priority for energy development in Europe to accelerate carbon neutrality. A new energy diplomacy is also necessary to diversify our supplies

with the upcoming creation of a new energy platform for the EU which will allow the joint purchase of gas, LNG and hydrogen.

In this special issue, the different speakers alert us that Europe is at the crossroads of climate emergency and energy insecurity and that it is more than necessary to reassess and adjust the role of gas, renewable energies and other energy sources in the future European energy mix. It is important to reiterate that energy efficiency and energy savings remain an imperative for security of supply and that this requires changes in individual behavior and efficiency in our energy consumption.

In this edition you will see the vision of the speakers about this whole situation. Most of them try to show that Europe should not invest in a new fossil fuel dependency with another country, but rather create new alliances and above all develop new alternative energy sources and regain its energy sovereignty while accelerating its climate transition.

Editor-in-Chief
LAURENT ULMANN

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JOZEF SÍKELA

Czech Minister of Industry and Trade

Building energy independence in Europe – Gas Diversifying gas supply sources for Europe

On 24 February of this year, the world changed. The Russian invasion in Ukraine started. More than 100 days have passed since then and over the whole time, Ukraine has faced Russian aggression and the countries of the European Union have faced a Russian energy war.

The difference between the impact of Russian aggression on the EU states and on Ukraine itself can be summed up in a very raw, yet true fact. Every morning, day by day since the beginning of the aggression, my subordinates have been providing me with statistics on gas supplies in Czech storage tanks while Ukrainian President Volodymyr Zelensky has been receiving daily counts of killed soldiers and civilian casualties.

The main burden of Russian aggression has been borne by Ukraine. This is indisputable. As is the fact that Europe has a moral and strategic obligation to help Ukraine against Russian aggression. Russian dictator Vladimir Putin has been trying to dissuade us from providing this help and that is why he has unleashed his energy war against the countries of the European Union. And the energy crisis that he has caused must completely change our approach that we take towards the energy industry.

First of all, we need to admit our mistakes. In the past, many EU countries, including the Czech Republic, came to believe that the future of energy could be linked to cheap gas supplies from Russia. Now we are harvesting the bitter fruits of that decision. And perhaps no reasonable person in Europe today doubts that we need to rid ourselves of our dependence on Russian fossil fuels as soon as possible.

This must be one of Europe's main objectives for the coming years. If we are to



achieve this, it is essential that EU countries remain united. A united European Union is much stronger than Russia in any war, including the current energy war.

Achieving that will not be easy at all. The impact of the Russian energy war on individual EU members greatly varies. Countries that are more dependent on Russia are more affected than those that are more independent. Our community of democratic countries is only as strong as its weakest member.

That is why I have been saying since the beginning of the Russian invasion: "We must share the pain." In other words, the pain caused by the Russian energy war must be shared across all Member States. In order to do this, we need countries less dependent on Russia to help those that are more dependent. Countries that have the possibility of obtaining energy supplies from alternative suppliers must help those that will suffer from the lack of Russian raw materials.

The EU needs to join forces and agree to make joint purchases of natural gas and other energy resources. And to share these raw materials in a fair way without allowing any of the Member States to run into unsolvable problems.

The European Union's actions so far fill me with hope that we can actually stand up to Putin and his energy war. We have been taking difficult steps in a relatively short time that we were hesitant to do for years in the past. The REPowerEU package presented by the European Commission this May is a very good plan for success.

I very much welcome the fact that a platform for joint gas purchases is included in the package. This must be followed by the faster development of energy infrastructure that will better connect the countries of the European Union. In short, it is necessary to connect countries that are more dependent on fossil fuels from Russia to countries to which surplus gas purchased from alternative



suppliers can be transported, precisely through the joint purchasing platform.

In the case of natural gas, this will mainly involve LNG terminals located along the coasts of EU Member States and the construction of sufficient transport capacity to transport gas from such terminals. For everything to work, the capacity of these terminals and the transport capacity in the downstream pipelines must be distributed among the Member States so as to compensate to the maximum extent for the shortfalls in their

development of renewable energy sources. Therefore, it is a good thing that this, too, is part of the REPowerEU package mentioned above. The countries of the European Union have long been sitting on a train that has started to move towards energy transformation in order to ensure more environmentally friendly energy production.

However, some countries, including the Czech Republic, hesitated for a long time on the platform in front of this train, deciding whether or not to board it. Now this train is

debated what to do will have no choice but to quickly catch up with the runaway train and jump on board. Our government is already looking at how to invest even more money in the development of renewable sources than we originally planned. We are also changing legislation to encourage the development of renewables.

The element of the strategy for freeing ourselves of dependence on Russia that can be put into action most quickly of all is energy savings. These are also an essential part of the REPowerEU package. They can be achieved in two ways. Voluntarily and through technology.

We need to step up our efforts to achieve both types of savings. First, we need to encourage businesses and households to acquire technologies and materials that will help them save energy. And second, we need to complement this with an awareness campaign, including an explanation of the importance and benefits of energy savings, as well as guidance on how this can be done.

But what is the most important thing right now? Correctly call our situation what it is and being aware of its implications. Whether we want to admit it or not, we are in an energy war with Russia that will not end any time soon. And war hurts.

We have a few months ahead of us that will by no means be easy, and any hesitation will cause us further pain in the future. As I say, if you are going through hell, do not stop. And we really cannot stop now.



supplies from Russia.

In this respect, it was very good news for us that last week the Czech Republic acquired a stake in a future LNG terminal in the Netherlands.

In the energy war with Russia, we will also have to significantly accelerate the

speeding up and, more importantly, it appears that this train is moving not only towards more sustainable energy production but, more importantly, towards energy production that is independent of Russia.

So it is clear that those countries that have so far just stood on the platform and have



FATIH BIROL

Executive Director of the
International Energy Agency (IEA)

Natural gas markets are set for a historic transformation after Russia's invasion of Ukraine

Russia's unprovoked invasion of Ukraine has set in motion major changes in global energy markets.

We are now living through the world's first truly global energy crisis, with volatile prices at or near record levels for a wide range of fuels and critical minerals. This differs from the energy crises of the 1970s when impacts were largely limited to oil, and globalisation was not as advanced as it is today. But as in the 1970s, the current emergency should accelerate innovation, enhance energy efficiency measures and unlock investments in clean energy supplies, including low emissions gases. The world now has an opportunity to build a safer and more sustainable global energy system.

The International Energy Agency has reacted swiftly to the market turmoil caused by Russia's war. IEA member countries have carried out the two largest ever releases of oil from their emergency reserves to counter the risk of shortfalls in supply. And we acted rapidly to provide timely advice to policy makers, recommending immediate actions in our [10-Point Plan on Reducing the European Union's Reliance on Russian Natural Gas](#) and our [10-Point Plan to Cut Oil Use](#).

The current crisis threatens the global energy sector and economy in multiple ways. Soaring energy prices are hurting households and industries, adding to inflationary pressures. The sharp spike in natural gas prices has led electricity suppliers to resort to using more coal-fired power generation, which is contributing to higher emissions at a time when the world needs to rapidly accelerate efforts to reduce them.

However, with foresight and well judged policies, governments have the ability to

limit the damage from these negative effects considerably.

The fracturing of EU-Russian gas trade

Russia plays an oversized role in global energy markets, especially in Europe.

The European Union's commitment on March 11 to phase out dependency on Russian fossil fuel imports "as soon as possible" is set to transform energy markets. Russia's share of EU natural gas imports has risen from 30% in 2001 to about 40% in 2021. This happened despite the IEA repeatedly raising concerns about Europe's growing reliance on Russian supplies and urging governments to diversify their supplies for the sake of energy security.

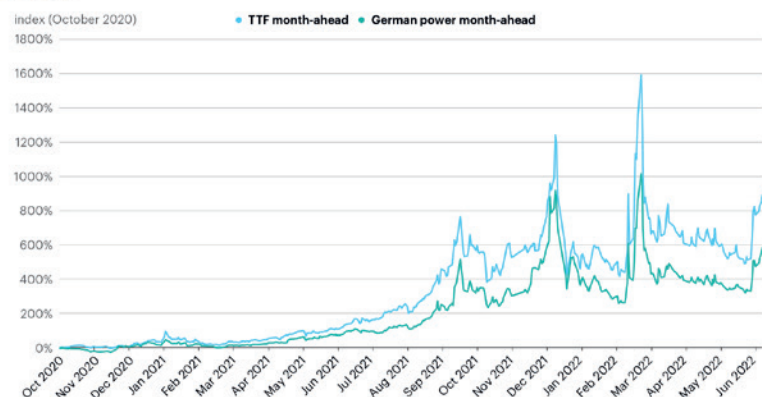
Russia was already distorting gas markets well before it invaded Ukraine in February, highlighting its willingness to use energy supplies as a political weapon. Since the invasion, its unilateral introduction of a ruble-payment system, the cutting off of gas supplies to multiple European countries, disruptions to transit and damage to

infrastructure in Ukraine have all added to tensions in European energy markets. Russia's shutting down of the Yamal-Europe pipeline creates additional supply security risks ahead of next winter.

Increased liquefied natural gas (LNG) imports, primarily from the United States, have so far shielded the European market from the full force of Russia's destabilising behaviour. But Europe's increased LNG imports have in turn affected global markets as cargoes once destined for Asia are increasingly lured to Europe. The EU's LNG imports during the eight months from October 2021 to May 2022 were up by 50% compared with the same period a year earlier. Without such a strong increase in LNG flows, the EU would be today in a much more vulnerable position with regard to Russian supplies and would not be able to refill its storage sites ahead of next winter.

The European gas market is most vulnerable during the heating season from early October to the end of March, which accounts for about 60% of annual consumption.

Evolution of European gas and electricity prices, October 2020 – June 2022
IEA analysis



Almost half of this gas is typically consumed by the residential and commercial sectors for space heating purposes, with demand strongly linked to variations in temperature.

In the current uncertain context, policy actions should focus on strengthening the resilience of EU energy markets – especially the gas market – ahead of the next heating season. The EU's target of filling its gas storage to 80% by 1 November, and several EU member countries setting higher mandatory fill levels, are steps in the right direction.

Russia's recent supply cuts via Nord Stream and through Ukraine, combined with an extended outage at the Freeport LNG plant in Texas, could reduce global gas supply by 35 billion cubic metres between mid-June and the end of 2022. The tighter supply is already weighing on efforts to fill storage, making the EU's 80% target considerably harder to reach. This is a red alert for the EU for next winter – below average storage levels would leave the EU even more vulnerable later in the year when colder temperatures push demand higher. In response, stronger actions now need to be taken to reduce demand so storage levels are as high as possible ahead of winter.

Ensuring an orderly phase-out of Russian gas supplies

A growing number of EU member states have started taking action to cut their reliance on Russian gas supplies, and the IEA is [working with the European Commission and 17 member states](#) on many of these efforts. Ensuring that an accelerated phase-out of Russian gas is orderly requires a combination of supply- and demand-side measures.

The global LNG market provides the EU with the greatest near-term potential to diversify

supplies, and in some countries this requires expanding import capacity. With careful investment planning, there are opportunities for these to facilitate future imports of hydrogen or ammonia.

But LNG imports alone cannot fully replace Russian gas supplies in the immediate term, especially since liquefaction capacity additions are set to slow down significantly in the next few years before recently planned investments come on stream after 2025.

Long lead times to build fossil fuel infrastructure, together with strong global demand for LNG and reduced Russian piped imports, point to tight market conditions lingering into the medium-term.

Quick actionable measures such as stopping wasteful leakage of methane from oil and gas production should be favoured. IEA analysis indicates that reducing methane leaks and gas flaring in countries with spare liquefaction or export pipeline capacity that currently export to the EU could save around 46 billion cubic metres of natural gas a year, equal to over 13% of the EU's total gas and LNG imports in 2021.

Nevertheless, the primary focus should be on the demand side, with policies to reduce and replace gas demand through energy efficiency measures, renewables-based electrification and the scaling up of low emissions gases. In the IEA's global pathway to reaching net zero emissions by 2050, rapid efficiency gains and an accelerated shift to clean energy totally eliminate the EU's need for Russian gas imports before 2030.

A new impetus for low emissions gas markets

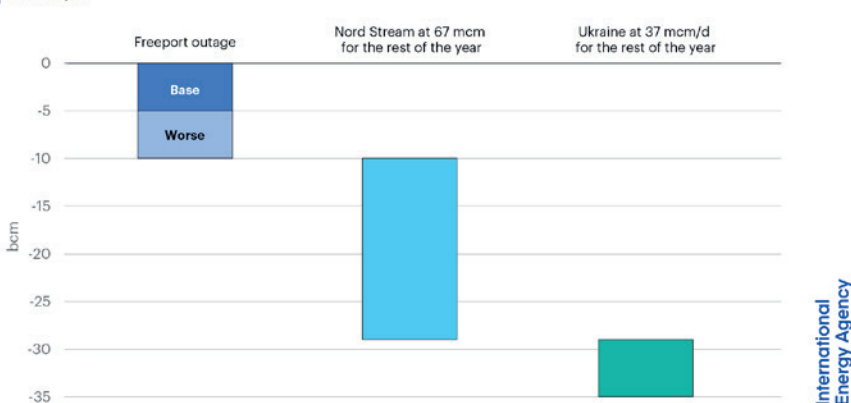
EU efforts to phase out Russian fossil fuels pave the way for the creation of a resilient

market for low emissions gases, including biomethane and low-carbon hydrogen. These gases are at the intersection of energy supply security and decarbonisation efforts. Besides helping to lower emissions, domestically produced low-carbon gases enhance market resilience and can reduce the reliance on fossil fuel imports significantly.

Accelerating their deployment requires stronger policy support to "pull" investments across the entire value chain. Publicly funded programmes and state-backed risk-sharing mechanisms can help de-risk investments. Demand creation is a key instrument to stimulate investments in low-carbon hydrogen, including via quotas and public procurement rules. Existing natural gas infrastructure can enable the deployment of low emissions gases by providing network access, reducing transport costs and ultimately facilitating their integration into the broader energy system.

This will all need to take place in the context of a European gas market contending with major uncertainties and changes. The immediate attention of policy makers should be on ensuring energy supply security ahead of next winter. Bringing an end to Europe's decades-long reliance on Russian fossil fuel imports in the coming years will require actions on both on the supply and demand sides – and a strong degree of unity and solidarity among EU countries. This must be done in a way that accelerates rather than impedes the transition to cleaner energy. The IEA is already working closely with the European Commission and EU member states to help make this a reality.

Potentially lost gas supply volumes (Jun-Dec 2022)
IEA analysis





MAIREAD MCGUINNESS

Commissioner for Financial Stability and Capital Markets Union

Supporting the transition to renewables: the role of the taxonomy

The EU is overly reliant on Russian gas and today Russia is using this reliance against us. It is trying to blackmail Europe, with Gazprom having cut off delivery to some EU member states.

The commission has proposed a pathway for the EU – RePowerEU – to end our dependence on Russian energy and accelerate the move to a clean, secure, competitive and sustainable energy system.

Ramping up green energy production and diversifying supplies is urgent. In an ideal world, we would make the switch to renewables and abandon fossil fuels immediately.

But we are far from that place and there is a need, as we move more rapidly towards renewables, for some member states to

continue to use gas and nuclear power in the medium term.

These energy sources are essential for the transition to renewables in certain circumstances, particularly as there is an urgent need for countries to move from the dirtiest sources of energy like coal.

Ramping up the roll-out of renewable energy – wind, solar, hydro, hydrogen and so on – is the over-riding priority of the European Commission, on the road to climate neutrality by 2050.

This is what the European Green Deal is about.

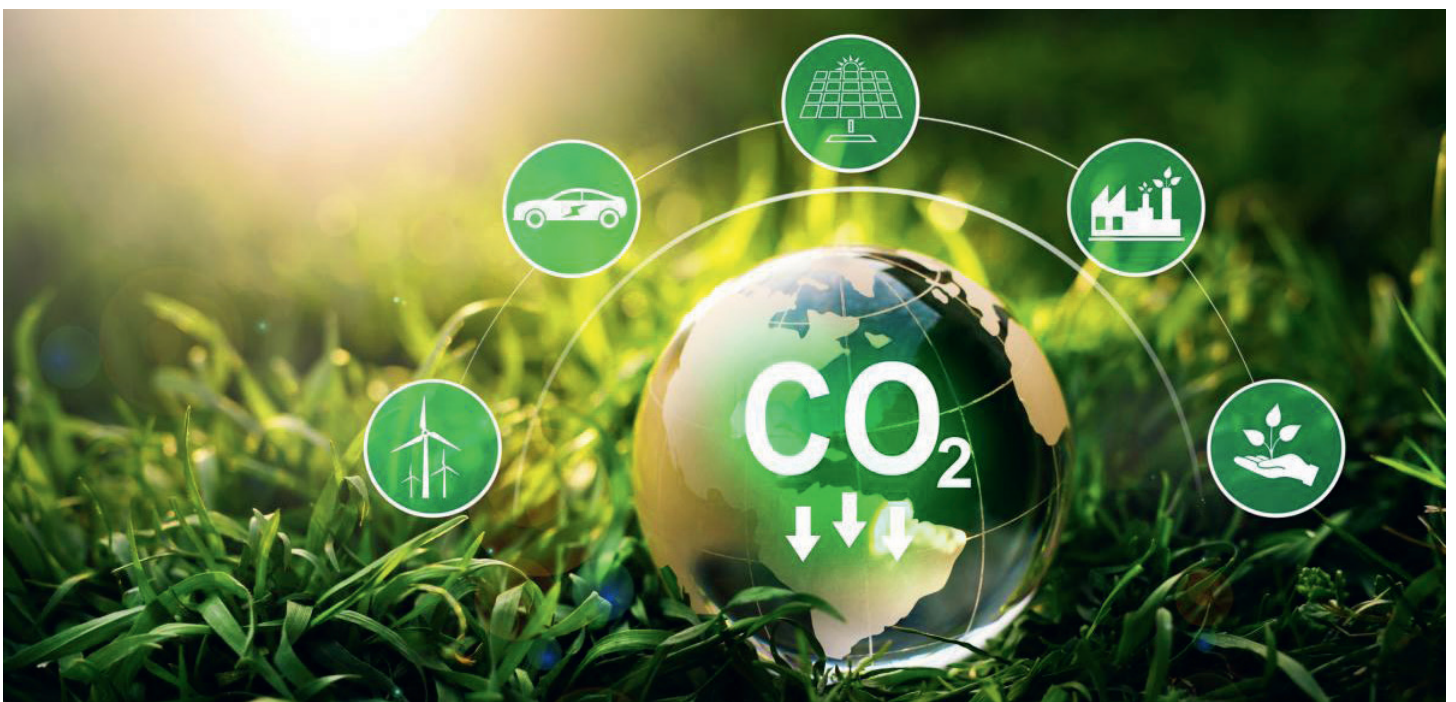
It is my responsibility as Commissioner for Financial Services to ensure that investment flows towards businesses and enterprises

that match our climate ambitions, providing guidance to companies and financial institutions on the EU sustainable finance agenda.

The EU taxonomy is a central part of this agenda, providing guidance to companies and investors about what is sustainable (green). It also provides guidance on what constitutes “transitional” and “enabling” technologies.

The EU taxonomy is a voluntary tool to channel investments into sustainable activities. It does not mandate these investments, rather it provides clarity about what technologies are green, transitional or enabling.

It is up to private investors to decide where they put their money. But if they want to align with the European Green Deal, their



investments should be in line with the EU taxonomy.

Absolute priority

Renewable energies have absolute priority. The first list of sustainable economic activities that contribute to our climate goals – the so-called Climate Delegated Act, already in force since January 1st this year – includes 25 energy activities based on renewables.

It also contains extensive energy efficiency measures and improvements to help reduce emissions in a wide range of sectors, such as building renovations and electric heat pumps.

Only renewables qualify as sustainable under the taxonomy.

Only renewables are green. These are and will continue to be the focus for green investors and green financial products.

The commission has proposed that certain gas and nuclear activities, subject to strict conditions, are classified as "transitional" activities, providing a bridge away from the most polluting sources of energy like coal.

In reality, we do not have enough capacity in renewables at present. Investment in gas and nuclear will continue for the time being.

We believe strongly that it is better to limit and guide these investments in a way that will help the transition towards a more sustainable economy and society. The Complementary Delegated Act applies only if there is a full switch away from natural gas, and towards renewable and low-carbon gases. It is the only incentive of its kind in EU rules. We appreciate that including natural gas and nuclear in the EU taxonomy divides opinion.

This reflects diverse views between and sometimes even within member states.

However, the commission has proposed that where gas and nuclear are included in the taxonomy, clear conditions, in line with the EU's climate targets and with strong safeguards against significant environmental harm, apply.

On gas, there are strict conditions including limits on emissions. Gas plants have to be efficient, and they qualify only where renewables are not available at sufficient scale.

And they must be fully committed to switch completely to renewable and low-carbon gases in the near future and by 2035 at the latest. Any gas plants must be built ready for such gases from the get-go – so no stranded assets.

The criteria also require replacing high emitting coal plants and delivering clear emissions reductions. We need to move away from coal as a matter of urgency.

Climate neutrality

Our target is climate neutrality by 2050 and a reduction in emissions by 55 per cent by 2030. All our efforts go in this direction – incentivising the transition to a decarbonised energy system – with the extra and immediate challenge of cutting out Russian energy sources as soon as possible.

We recognise that member states are at different starting points in decarbonising their energy mix. We need to be in this together and help all member states on their transition towards climate neutrality, understanding that each faces a different set of challenges. Ultimately, what matters is that all member states and the EU as a whole deliver on our collective climate ambition. Achieving this outcome requires pragmatism and political courage to point out the complexity of the process and the need for workable, real world solutions.

The EU's ambition is a low-carbon, sustainable future, powered by renewable energy and phasing out the most carbon-intensive energy sources like coal. We cannot get there by flicking a switch, and that may mean accepting pragmatic and managed solutions during the transition.





TERESA RIBERA RODRIGUEZ

Deputy Prime Minister and Minister for the ecological transition, Spain

Renewable hydrogen, key to decarbonizing the industry

The public conversation around renewable hydrogen has intensified in recent months. The reason? It is no longer just a technical solution suitable for decarbonizing complex industrial processes or facilitating energy storage. It is also a way to reduce Europe's exposure to Russian gas. While the European Hydrogen Strategy envisaged to reach a production of 10 million tons in 2030, in the recent REPowerEU Plan, the European Commission proposes that the EU should consume twice as much green hydrogen by the end of the decade, 20 million tons.

We already knew that we needed to implement specific policies to stimulate industrial demand and the gradual incorporation of renewable hydrogen in those activities using hydrogen (such as petrochemicals or fertilizers) and in those that require it to decarbonize (such as the steel industry or cement manufacturing). In the current context, an additional reason needs to be added: the industrial deployment of this key sector for the energy transition will enable to reduce Europe's energy vulnerability.

RENEWABLE HYDROGEN, A COUNTRY PROJECT

In Spain, the development of renewable hydrogen is considered a country project, due to the great opportunities and benefits it can bring. We have an internationally well-established clean energy industry that also aims to be a reference in the field of renewable hydrogen. Spain hosts the largest hydrogen production facility for industrial use in Europe and the largest operating plant in the world, in Puertollano.

Spain has abundant renewable resources and occupies leading positions in terms of installed power: the country ranks fifth in the world in installed wind energy and renewable energy already covered nearly 47% of our

electricity demand last year. The government has developed a stable regulatory framework that enables the deployment of sustainable technologies and the promotion of innovation, which is key in the case of renewable hydrogen, where we must stimulate both supply and demand.

Investors are also aware of this competitive advantage and place us at the top of international rankings for investment attractiveness. Companies looking for a clean, cheap and secure supply also value Spain's position, as we rank first in terms of signing long-term power supply contracts (PPAs).

On this basis, which clearly points to Spain's capacity to obtain competitive hydrogen from renewable sources within a few years, we are implementing a strategy to develop hydrogen that, in line with the EU, looks both to 2030 and 2050.

REPLACING FOSSIL HYDROGEN

Our Renewable Hydrogen Roadmap sets out our targets for 2030, including reaching 4 GW of installed electrolyzer capacity, 10% of the European Union's goal, and replacing a minimum of 25% of the current industrial consumption of fossil hydrogen, which is around 500,000 tons per year, mainly for ammonia production and refining processes. In line with the greater European ambition, we are currently revising upwards the objectives of our energy planning for 2030.

In the short term, we want to encourage the production of renewable hydrogen at points close to demand, creating small ecosystems around the technology, which will allow us to identify best practices and extrapolate them, gaining economies of scale, in the medium term. Companies are already forming alliances that integrate the links in the production and consumption value chain.

Among the different regulatory and incentive tools, we have developed a Strategic Project for Renewable Energies, Hydrogen and Storage (PERTE ERHA) to position Spain as a technological reference in the production and use of renewable hydrogen. A budget of EUR 6,900 million from the European Next Generation fund has been allocated to the project, which will mobilize investments worth EUR 16 billion. 22% of the budget, EUR 1.555 billion, is specifically earmarked for promoting renewable hydrogen.

The Spanish government has already launched several calls for hydrogen grants within the framework of PERTE ERHA, for pilot projects and the promotion of the industrial value chain, endowed with EUR 400 million. The response has been extraordinarily positive and, in the coming months, we will launch a call for hydrogen clusters and valleys and another one for large-scale pioneering projects. We estimate that the total investment in renewable hydrogen from this extensive promotion program alone will be around EUR 4.3 billion over the next few years.

The government has consulted the market and received more than 500 proposals with an investment volume of more than EUR 10 billion. These proposals are focused on the development of an innovative value chain, end-use applications and the creation of hydrogen ecosystems. Thanks to the pre-conditions explained above and this political impetus, 20% of all hydrogen projects worldwide are nowadays located in Spain, with the industry as one of the major players.



JEAN-FRANÇOIS CARENCIO

Chairman of the CRE

Taking advantage of the energy transition to produce low-carbon and green gas in Europe

Interview conducted on 21 June.

*Mr. Carencio has been appointed on 4 July, 2022, Minister of Overseas France

As a counterpart to coal, which has become a big polluter, extremely controversial nuclear power, and renewable energy sources, with their intermittent nature which needs to be compensated for, natural gas has long appeared the obvious option for many European countries. It used to be relatively abundant given the numerous fields worldwide, and cheap. However, achieving carbon neutrality and the Russian invasion of Ukraine are forcing us to rethink our perception of gas and its role in the short, medium, and long term.

Gas accounts for about 25% of the total energy consumption in the EU, with 20% used for electricity generation and 39% for heat production. Dispensing with it immediately is impossible without seriously harming the European economy and social cohesion. Yet, the new European commitments to achieving carbon neutrality by 2050 are condemning natural gas to virtual extinction and are calling for a firm development of renewable and low-carbon gases.

At the same time, Russia's invasion of Ukraine and the need to emancipate ourselves from Russian gas have made the supply of natural gas even more strategic and valuable. We are therefore faced with two contradictory demands: finding natural gas in the short term and moving away from it in the medium term.

Numerous initiatives are underway to bring gas to Europe by every means possible: investments in LNG terminals, negotiations with producing countries, new filling goals for the natural gas storage facilities, gas interconnection projects rising from the ashes, new searches for deposits in the Eastern Mediterranean... So many initiatives which had been deemed unnecessary by many less than two years ago.

In this context, the French Energy Regulatory Commission (CRE) wishes to call for caution in the face of the "lock-in effects" that may result from hasty decisions that would fail to consider the real needs and interests of the consumers.

The current priority is storing and saving gas to get through next winter with limited risks. In this respect, I am delighted to see that the measures implemented in France in 2018 to regulate the underground storage are being generalised at European level and have made it possible for France to approach the 2021 winter with 95% full storage facilities. The current filling campaign is unfolding at the same rate as in previous years.

The other short-term challenge is to diversify the supply sources to bring an end to our dependence on Russian gas. This new objective is disrupting the geopolitics of gas, traditionally dominated by flows from North to South and from East to West. However, new large-scale gas infrastructure projects, in particular pipelines, which would bring gas from the South to the North of Europe, such as the MidCat project between Spain and France, must be addressed with the utmost caution. Alternative, less costly and more efficient solutions, such as building LNG terminals near areas dependent on Russian gas, and strengthening the France-Germany interconnections, should be given greater priority.

This war on our doorstep also highlights our dependence on fossil fuel imports. Let us take advantage of the energy transition to produce a renewable gas on European territory that meets the needs of consumers and draws on local resources.

The development of biomethane has skyrocketed in France in recent years thanks to support measures and initiatives to adapt the

networks, and under constant European law. In 2021, the production quantities injected into the gas network have doubled, with 4.3 TWh at the end of 2021, compared to 2.2 TWh at the end of 2020. The on-going projects waiting to be connected to the network amount to an annual production of 20 TWh. The European objectives should be ambitious and common, but the means to achieve them should be appropriate and kept simple. Complex solutions, such as tariff exemptions for biogas at interconnection points or a reconsideration of the network tariff architecture, would be inefficient and costly.

Hydrogen will also be a key asset for decarbonising gas uses. Here again, we ought to be pragmatic. The availability of decarbonised hydrogen will depend on the electricity available to produce it. We will need to mobilise all the means of low-carbon electricity production, with renewable energies and nuclear power at the forefront, to cope with the sharp increase in electricity demands. But decarbonised hydrogen remains very costly: its use should be focused on industrial production areas, where it is the most useful. Mixing a mere 5% of hydrogen with natural gas would generate a net loss for the community. Relying on imports, up to 10 million tonnes as proposed by the European Commission, might just result in a renewed dependence. Finally, the hydrogen market is not yet mature. It would be premature and detrimental to innovation to set strict market rules as early as in 2030, especially regarding the links between network operators and hydrogen producers.

Gas decarbonisation in Europe entails immense challenges. The European Union must be the driving force behind the ambitions, a crucible of solidarity and the framework for economic efficiency. It is up to the national players to seize this opportunity, and create a relationship based on trust and subsidiarity.



MATTHEW BALDWIN

*Deputy Director-General for Energy,
European Commission*

REPowerEU Plan: How to decrease Europe's energy dependency

The Russian invasion of Ukraine has adversely affected so many different aspects of our lives in recent months – and requires a range of policy responses from the EU. Nowhere is this more marked than in the energy sector.

In recent years, as the EU has reduced its use of coal for generating energy and seen domestic gas production decrease significantly, we have conversely witnessed an increase in our dependence on imports to fuel our energy sector. Mainly fossil fuels. And much of it has come from Russia. In 2021, the EU imported more than 40% of its total gas consumption, 27% of oil imports and 46% of coal imports from Russia.

The energy mix is of course a choice left to Member States – and national politicians will argue that this dependence on Russia was always going to be temporary in the context of the longer-term transition towards cleaner energy. In hindsight, even before we take into account the Kremlin's military ambitions, this was a dangerous level of dependence on one single – and unreliable – supplier.

In response to Russia's war of aggression, the Commission has put together a plan called **REPowerEU**. The [original blueprint](#) was outlined in March, and this was followed in May by a substantial package of proposals.

And within our energy department, DG ENER, the Commission has established a special task force charged with helping wean the EU off Russian imports. Indeed, President von der Leyen has made clear that we will get substantially out of Russian gas this year and altogether by 2027.

So I welcome this opportunity to outline (to *the European Files*) what we are doing to achieve this overarching ambition.

The first point is that REPowerEU amplifies the European Green Deal – the Commission's top priority. In 2021 the Commission tabled proposals aimed at reducing our greenhouse gas emissions by 55% by 2030 – the "Fit for 55" package, including reducing our gas consumption by 30% by 2030.

Clearly we now need to go further.

The first element of our approach comes via **energy efficiency**. Let's not forget that energy efficiency and energy savings are the quickest and cheapest solution to increase our energy security and address high energy bills. The cheapest form of energy is the one that we don't consume! So in concrete terms, we propose to increase the binding 2030 energy efficiency target in the Energy Efficiency Directive from 9% (proposed last year) to 13% relative to projected consumption at the end of the decade. We also published a [Communication on saving energy](#).

The second element is to **deploy renewables more quickly** – in all their variety. We can use renewables to generate electricity, but also to accelerate renewable hydrogen as a viable alternative to gas. We have proposed to our Member States to amend the Renewable

Energy Directive to increase to 45% our target for renewables in our energy mix by 2030, instead of 40% as proposed last year (already an increase on the existing target for 2030 which is just 32%).

This is not empty target setting. To back this up, the Commission has presented sectoral strategies to [boost solar energy deployment](#), accelerate the production of green hydrogen and double the production of [biomethane](#) by 2030. A Commission [Recommendation](#) to **tackle the slow and complex permitting for major renewable projects** will also address one of the major bottlenecks that investors face.

All this to underline that there is no backing off the Green Deal – indeed we want to accelerate the green transition. That said, the combination of more energy efficiency and increased renewable energy output will take some time to be rolled-out to the extent that we can replace fossil fuels imports altogether. We are fully aware of the potential implications for energy security in the short term.

And this brings me to the third pillar of REPOWER EU – diversifying our sources of supply.



The EU has made considerable progress over the past decade, investing in infrastructure to ensure all Member States have more than a single source of supply. Today, thanks to these efforts, all regions have access to LNG or other alternatives. Through this EU-funded investment in Projects of Common Interest (PCIs), we have the flexibility to source gas supplies from elsewhere, notably LNG.

We have therefore been working with international partners in recent months to diversify supplies. Just last month, the Commission signed a memorandum of understanding with Israel and Egypt to supply LNG. In March, President Biden pledged to President von der Leyen that the US would supply an additional 15 bcm this year, rising alongside with other international partners to 50 bcm by 2030. We will do more to step up coordinated action which has the potential to grow further the current record levels of LNG imports, and help us to fill our storage facilities. I must also underline that this agreement with the US also refers to future cooperation on clean energy, i.e. it does not lose track of our long-term ambition by locking us into a permanent commitment on LNG.

Now, together with Member States, the Commission has established an [EU Energy Platform](#) to coordinate this effort. It aims to pool EU gas demand (and looks ahead to the hydrogen era), optimize the use of infrastructure and support international outreach as necessary first steps towards buying gas on a more coordinated basis across Europe.

In parallel, the Commission is working closely with Member States to reinforce our preparedness for possible major supply disruption. With an unreliable Russia increasingly weaponising its energy exports where possible, we are encouraging Member States to conclude bilateral agreements in the spirit of European solidarity. And the EU is preparing carefully for the coming winter. We must be ready, and we will be ready for whatever challenges are thrown our way in the coming months.

Finally, I must just recall that none of this will be free of charge. We estimate that **additional investment** worth roughly 210 billion EURO will be needed between now and 2027 to phase out all fossil fuel imports from Russia. But this should be seen relative to the approximate 100 billion EURO or so that we pay Russia every year for fossil fuels.

Most of this will come from private funds, but there will be substantial amounts necessary from public funding in order to facilitate and leverage this investment. In this sense, the EU is making significant funding available. The Recovery and Resilience Facility

(RRF), set up to support our post-pandemic economic recovery, will be at the heart of implementing the REPowerEU Plan, providing additional EU funding. In this context, we have asked Member States to add a REPowerEU chapter to their Recovery and Resilience Plans to channel investments to REPowerEU priorities and make the necessary reforms. Member States can use the remaining RRF loans (currently **225 billion EURO**) and new RRF grants funded by the auctioning of Emission Trading System allowances, currently held in the Market Stability Reserve, worth **20 billion EURO**.

But this is not all. We are providing additional flexibility for national government to rechannel EU cohesion and agricultural funds, and the newly established innovation fund (derived from ETS revenue) will also

Related links

- [REPowerEU: affordable, secure and sustainable energy for Europe](#) (May 18 webpage)
- [Joint European action for more affordable, secure energy](#) (March 8 outline)



be available. Investment for infrastructure is also available through the Connecting Europe Facility.

All in all, we face a challenging period ahead – made considerably worse by an unpredictable and unreliable regime in Moscow. From our side, it is clear that we are stronger and more efficient by working closely together – also of course with Ukraine and Moldova, and our partners in the Western Balkans. We are determined to achieve not only much greater energy autonomy, but also to deliver on the Green Deal and accelerate the clean energy transition. These efforts are two sides of the same coin.





JENS GEIER

(S&D Group – Germany), Rapporteur Gas Directive ITRE Committee

The gas directive, a new approach

The revision of the gas market directive is the key instrument to create a regulatory framework that supports the decarbonisation of the gas market. It lays ground for the ramp-up of the European hydrogen market and paves the way for more energy system integration.

The Russian war against Ukraine injects an additional sense of urgency to the gradual phase-out of fossil gas, in particular from Russia. Diversifying our imports of gases is an important objective that the European Union is currently working on and that allows us to be more independent in the short to medium term. At the same time, we have to promote the use of renewable gases, especially hydrogen, in order safeguard the contribution of the gas markets to the EU's 2030 and 2050 climate targets.

At least since the European Commission published the European Hydrogen Strategy in 2020, we were seeking for the right answers regarding the uses of hydrogen, how to distinguish between different types of hydrogen and its integration in the existing gas market.

Hydrogen will remain a scarce commodity for the foreseeable future. Therefore, we have to ensure that its use is prioritised for customers in hard to decarbonise sectors with the highest greenhouse gas abatement potential where no more energy and cost efficient alternatives are available. In the early stages of the market development, these sectors have to be the heart of a consumer-centered and energy efficient approach in the hydrogen market. The hydrogen demand of these specific sectors will drive production capacity expansion, infrastructure development and overall market liquidity.

The renewable hydrogen production probably will not scale fast enough to meet the expected growth in demand for hydrogen in Europe. For that reason, low carbon hydrogen may play a preliminary role in the energy transition and back the

transition of Europe's industry in hard to decarbonise sectors where no more energy or cost-efficient options are available. Consequentially, we need clarity on the definition of low carbon fuels and low carbon hydrogen as soon as possible. Therefore, a fossil fuel comparator with threshold of 94 gCO₂eq/MJ is introduced and the life-cycle assessment of emission specified. However, in the long-term renewable hydrogen will be the only sustainable option.

Hydrogen adds another dimension to the integration of energy systems and receives a key role in promoting energy efficiency across all sectors. There are multiple connections between the energy systems that directly affect the network planning in each silo, for instance, in terms of repurposing, the natural gas and the hydrogen grid are interdependent and demand-side solutions not requiring new natural gas infrastructure have to be taken into account. Similarly, the hydrogen network development cannot be managed without considering power to gas assets and hydrogen-ready plants. Hydrogen as energy storage will increase the flexibility of the electricity system. As a consequence, the national joint scenario frameworks should not only to consider natural gas, electricity and hydrogen but also district heating.

Integrated planning is of special importance on local level since most households use natural gas for heating and are directly affected by fuel switches. A mandatory local heating and cooling planning on distribution level aims to support the use of local renewable sources in the most efficient way and energy system integration on local level. They should include a strategy that defines the requirements of the infrastructure necessary on distribution level in order to meet the current and future demand of heating and cooling of a specific area. The strategy should provide transparency for the public and final customers as well as a reliable timeframe for

investors and distribution system operators to meet an area's heating and cooling needs

The afore mentioned objectives can only be achieved by an interconnected hydrogen network that will constitute the backbone of the integrated European hydrogen market. In order to ensure a fast infrastructure development, we have to base our efforts on repurposing the existing natural gas infrastructure and mirror well established rules for the network operation.

In the long term, rights and obligations for the transport of hydrogen will be the same as for the transport of natural gas. For this reason, the regulatory framework for electricity and gas should also apply to hydrogen. First, this includes to distinguish between transmission and distribution of hydrogen and to apply the unbundling of distribution system operators to hydrogen distribution network operators. Second, this means to acknowledge that all three unbundling models of transmission system operators in the natural gas market, namely Ownership Unbundling (OU), Independent Transmission Operator (ITO) and Independent System Operator (ISO), have proven to be equally successful to ensure transparent and non-discriminatory network access while delivering the investments needed in the energy networks. As a result, all three models should be an option for the unbundling of hydrogen transmission system operators. Third, this means to use the synergies that the joint operation of hydrogen and gas networks create in order to promote a faster and more cost-efficient development of the hydrogen network. Therefore, repurposing existing natural gas pipelines is essential and should not be hampered by the legal separation of activities related to hydrogen transport and transmission or distribution of natural gas.

The gas market directive puts the decarbonisation of the gas market and energy system efficiency in the centre and, thus, takes the first step towards a net zero infrastructure.



CRISTIAN BUSOI

MEP (EPP Group – RO),
Chair of the ITRE Committee

Strengthen the security of gas supply and solidarity between Member State

The Union is based on cohesion, improved competitiveness, sustainability and solidarity between Member States and this is reflected very well in the Union acquis on energy policy. While some instruments clearly contribute to make our energy markets competitive (such as the Electricity and Gas Directives) and innovative (Energy Efficiency legislation), others like the Renewable Energy Directive set the necessary goals to have a sustainable future.

But only a few are the real life expression of solidarity and improved cohesion between Member States such as the Security of Gas Supply Regulation and the TEN-E that puts common interest - expressed through enhanced security of supply and interconnection capacity - above immediate markets' interests.

On the 60th anniversary of the Treaty of Rome, Jacques Delors and Jerzy Buzek (at the time President of the EP) signed a joint declaration "Towards a new European Energy Community" where it stated that, "The EU must have the ability to pool its supply capacities and to engage in coordinated energy purchasing, should the need arise. In the long term, if we are faced with a major energy crisis, common strategic reserves must be available, and managed throughout the continent in a spirit of solidarity". 12 years have passed since that document was signed and this political ambition remains as valid as ever if not more and, as it is usually the case, the Union steps up its game when facing critical challenges.

At the same time, recent events showed us more than ever that the EU cannot afford to rely on single suppliers or supply routes and that solidarity in times of crisis is not an ethereal concept, instead it needs to be defined and concrete measures be in place

before disaster strikes. The effects of disruptions in the Union were only a side effect of the Ukraine-Russia commercial disputes (in 2006, 2008, 2009...) and we did not appropriately assess potential ulterior motives or geopolitical consequences of our commercial decisions. We assumed everyone played by our rules.

What was unthinkable has happened. Russia's waging an unwarranted war on Ukraine, causing a bloodshed and shelling its towns and villages. At the time of writing this article, the Russian aggression in Ukraine has been going on for over four months. Inflation is reaching historical proportions, largely driven by high energy and food prices, over 8 Member States have totally or significantly stopped receiving Russian gas, the Union has decided to sanction coal and oil imports from Russia, millions of Ukrainians have been welcomed in the Union while the conflict goes on, and, in an unprecedented move, Ukraine and Moldova have been granted candidate country status. These are challenging times.

Measures are being taken to ensure our Gas storage is full by November 1st, to avoid that our critical storage infrastructure is in the hands of those wanted to destabilise us, to allow for the joint purchase of gas to take advantage of being a market of 450 million people, to strengthen solidarity measures between Member States, to speed up our achievement of the Green Deal objectives, to increase the share of renewable and indigenous low carbon energy sources in the Union, to put solar panels in all our rooftops, to invest in the necessary interconnections between Member States to ensure that gas will flow wherever it is needed within the Union, to diversify suppliers, to palliate the effects of rising energy prices and to set the basis for a new energy diplomacy.

Throughout the years, the European Parliament has stood unequivocally in support of an EU energy policy based on the principles of competitiveness, sustainability and security of supply. Energy independence, through the triple diversification of sources, suppliers and routes of supply has always seemed like a far reaching goal as Member States saw energy policy a matter of national security therefore measures were usually taken at national level.

Member States were correct in the assessment that energy policy is a matter of national security. They were, in my opinion, wrong in their approach about how to solve the problem. We cannot pretend that we are fully sovereign in our energy decisions when our markets are interconnected and decisions or emergencies in one Member State directly affect the rest of the Union. The recent events have made it clear how we can benefit by acting together, with a single voice. This objective is now a political priority and the necessary processes to achieve it have been set in motion.



THIERRY TROUVÉ

CEO of GRTgaz

Shaping the European gas networks of tomorrow

With the publication of the REPower EU plan and the gas decarbonisation and hydrogen package, the European Commission has set a clear course for the transformation of the European gas infrastructure. As a key element of the competitiveness of the energy system, the contribution of infrastructure to security and sustainability issues will become even more important to face the dual challenge of the energy crisis and climate change. Infrastructure promotes sectoral integration, beyond synergies between electricity and molecules, it fosters synergies between sectors - such as industry, agriculture, waste management, and road and maritime transport - and enables fast and cost-efficient pathway to climate neutrality.

Securing and diversify supplies in a spirit of solidarity and cooperation

To prepare for potential disruptions of Russian supplies and in response to the growing risks to Europe's security of gas supply, the European Commission has adopted, among other things, a new regulation in July 2022 that introduces an obligation to fill gas storage facilities before winter. In France, such provisions were already in place since 2018 and have been strengthened. French storages will have to be filled at 100% by November 1st this year, which is equivalent to circa 30% of annual national consumption.

In addition, as an immediate response to a possible shortage of Russian gas which still represents 17% of the French supply portfolio, additional LNG capacities are available in the Fos terminal since May 2022 and will be made available in Dunkirk in the second half of 2022. France and Europe will be able to rely on an additional 5 bcm floating LNG regasification facility that will come into operation in Le Havre by summer 2023. Also, GRTgaz has worked with stakeholders and public authorities to set up a load shedding

mechanism which could be activated, if necessary, to reduce the consumption of major French gas users, to secure the gas supplies of sensitive sites and preserve its usage for household consumers. This mechanism will be an important instrument for achieving the new European plan to reduce gas demand for next winter. Finally, a website will be created to alert French consumers to possible tensions and invite them to adapt their consumption.

Scaling up the biomethane production and usages

REPower EU encourages us to accelerate our actions to develop biomethane. This locally produced renewable methane that can be directly injected in the gas grid is one of the main levers to reduce our dependence and strengthen European energy sovereignty. Biomethane production in Europe has an important potential, now estimated by Gas for Climate at 41 bcm in 2030 and 151 bcm in 2050¹. Together with Germany, Italy, Poland, Spain and Sweden, France is amongst the countries with the largest production potential, estimated at 320 TWh by 2050 (excluding hydrogen). In addition to the current technologies (anaerobic digestion and thermal gasification) and sustainable feedstocks (manure, agricultural residues and sequential cropping), other promising technologies such as hydrothermal gasification of wet feedstock will allow to unlock an even larger potential. Reaching 3 bcm in the EU today, the production of biomethane in Europe is scaling up rapidly. For example, it represents almost 28% of gas consumption in Denmark in 2022, compared with 9% at the beginning of 2019.

For France, it accounts for 7 TWh - a capacity greater than that of a nuclear reactor- and is expected to almost double to 12 TWh in the next 2 years. France has the capacity to fully replace its Russian gas supplies by renewable methane by 2030. To reach the 35 bcm targeted by REPower EU and to further strengthen this national dynamic, France is putting in place an additional set of support measures for new projects, beyond the feed-in tariffs already in place. It sets up a call for tenders for the construction of new production capacity, as well as a new financing mechanism for biomethane projects (biomethane production certificates), which is based in particular on an obligation to incorporate biomethane into suppliers' portfolios. To go further and give substance to the European ambition, we need a European alliance for biomethane, which should enable the necessary legislative provisions and financial support to be put in place in 2022.

The European hydrogen network as enabler for the creation of the hydrogen market

The development of a fit to purpose infrastructure is an essential enabler to reach the ambitious targets set forth by the European Commission for the consumption of renewable hydrogen - 10 million tonnes produced in Europe and 10 million tonnes imported by 2030, as well as for increased targets for renewable hydrogen in the industry and in the transport sector.

There will be no continental hydrogen market without appropriate logistics for transportation and storage. Europe can take advantage of its well-developed gas infrastructure and convert part of it to transport large quantities of renewable of low carbon hydrogen across Europe, at a cost 10 to 20 times lower than transporting electricity.

¹ <https://www.europeanbiogas.eu/wp-content/uploads/2022/07/2022-07-05-PR-BiomethanePotentials.pdf>

The development of local networks within hydrogen valleys constitutes a first stage where production and consumption of such commodity is relatively close. The French Hydrogen Strategy aims to develop 6.5 GW of electrolysis capacity by 2030 to decarbonise industry and has a budget of 7.2 billion euro. Such capacity would represent the production of nearly 700,000 tons of renewable and low-carbon hydrogen and would need 37 TWh of electricity. The first projects are being developed across France in valleys (Rhône, South Alsace, along the Seine River from Le Havre to Paris) and ports (Fos-Marseille, Saint Nazaire, Le Havre, Dunkerque). Cross-border projects are also emerging, such as Mosahyc, which will connect France to Germany and Luxembourg, and at the border between France and Belgium between Valenciennes and Mons.

A hydrogen corridor is foreseen to emerge in Southwest Europe from 2030 onwards, gradually connecting valleys from 2030. It will provide access to low-cost hydrogen from the Iberian Peninsula and potentially from Morocco to meet demand in France and Germany. In addition to a new interconnection between the Iberian Peninsula and France, 1,200 km of pipeline across France are needed for the creation of 200 GWh/d of capacity to supply hydrogen to Germany. 60% of these hydrogen pipelines will be converted from existing gas networks. Storage needs will also arise with the multiplicity of actors and more particularly with the needs of the power system. According to RTE, hydrogen is needed in most of the 2050 scenarios to provide seasonal flexibility to the power system.

Preparing for this type of development to respond effectively to the energy transition challenge brings us to some of the key issues to be tackled in the design of energy infrastructure: how to produce, transport and store energy the most efficient way, using different vectors like electrons and molecules? To respond to this, a coordinated planning of electricity, gas and hydrogen must be launched now to give visibility to the actors of the value chain, which would allow to seek for an optimum in terms of networks.

This planning should help to position the hydrogen storage facilities needed for power, to manage the transition from fossil gases to new gases and to redraw the map of biomethane and hydrogen networks. It should also allow the right choices to be made between developing new power infrastructure and using existing gas infrastructure for hydrogen. This will allow the best use of existing gas networks converted to hydrogen and will enable the backbone to be built at a competitive cost. This hydrogen backbone will make exchanges at European level more fluid, optimise supply and demand, and strengthen

the security of hydrogen supply for the benefit of European consumers.

To conclude, I would like to stress on three points that are key for transmission operators to play their full role in building the European gas networks of tomorrow.

- › Securing gas supplies in the context of REPower EU means developing biomethane throughout Europe and, in the short to medium term, the reversal of natural gas flows from West to East, which requires network adaptations and additional regasification facilities. A clear and efficient process is needed to select the best projects in Europe to replace Russian gas well before 2027.
- › Hydrogen is not yet a commodity and much remains to be done to build the hydrogen market. A flexible approach is needed to build on the acquis of the gas and electricity markets and to define a target model and appropriate integrated planning encompassing molecules and electrons. The implementation of these definitions should be progressive and pragmatic, according to national dynamics.
- › All three models of gas transmission system operators (OU, ISO and ITO) should be allowed after 2030. There is no reason to exclude the ITO model after 2030. ACER and the European Commission agree that all three models work well and have made it possible to create the large single energy market we know today. A gas TSO operator that would not be allowed to become a hydrogen TSO would have no interest to convert its infrastructure from methane to hydrogen and this would hinder the development of the hydrogen infrastructure.



HILDEGARD BENTELE

*MEP (EPP Group - Germany),
Member of the ITRE Committee*

Act European, Think Global: A European Hydrogen Import Strategy

Hydrogen has found its way from a niche topic to the missing piece of the puzzle aiming at ensuring clean, secure and affordable energy in the EU. That is the good news. The bad news: We are not alone and the race is on.

All subscribers to the Paris Agreement with hard-to-abate sectors are in urgent need for solutions to decarbonize them by trying to ensure their share in an emerging global hydrogen economy with many uncertainties. The EU, China, India, Japan, South Korea and Australia are among the frontrunners to promote clean hydrogen value chains. In 2017, Japan was the only country with a hydrogen strategy. Today, more than 30 countries have followed. On the supply side, Africa, the Americas, the Middle East and Oceania have the highest technical potential for renewable hydrogen production, but the ability to produce large volumes of low-cost green hydrogen varies significantly.

Our key challenge for the 2020s will be to **scale-up the hydrogen economy as effective and quickly as possible while maintaining our position as technology leader**. There is not only competition on the demand side, but our European electrolyser manufacturers are also facing strong global competition. According to BloombergNEF, electrolyser sales are projected to quadruple this year, with China accounting for 62-66% of total demand, driven by state-owned, heavily subsidized enterprises keen to show compliance with national decarbonisation goals.

Learning from Mistakes

Hydrogen demand forecasts vary significantly and depend on potential gaps between production and demand in the EU and the total cost along the entire supply chain. In the meantime, there is an understanding that **we need imports in the short and long term**. The challenge lies in ensuring a diversification of our supply and, in case of partnerships with developing countries, ensuring a partnership of mutual benefit and in benefit of the climate of our planet.

As a trained diplomat, I am not getting tired of emphasising the utmost importance of energy and climate diplomacy. To me it seems slightly odd and "un-European" to witness national ministers racing to secure national fossil energy supply, leaving behind those Member States with weaker negotiating positions and financial means. To me Ursula von der Leyen's approach to secure LNG supplies to the entire Union seems to be smarter, that means asserting the EU's purchasing power and the benefits of its internal market on the global market. Energy imports need to become a key issue of the EU's foreign and security policy. The fact that Commissioner Simson is travelling abroad to pave the way for cooperation is promising, but needs to be embedded in an overall strategy. Since the long-lasting war in the Ukraine, **resilience and diversification are more important than ever**.

Two days before the RePowerEU Communication was published, the Committee on Development of the European Parliament supported my call for **a global import strategy for renewable electricity, RFNBOs and hydrogen**.¹ Taking example from the German H2Global mechanism, the Commission should examine the possibility to support imports from third countries by setting **indicative import targets** and by establishing **a platform to auction long-term delivery contracts**. Under RePowerEU, the EU increased its renewable hydrogen target to 10 million tonnes of annual domestic production and an additional 10 million tons of annual hydrogen imports and raised the prospect of establishing a joint platform for the purchase of hydrogen. From a general international dimension chapter under the EU Hydrogen Strategy to a possible joint platform in two years: Constant dripping wears away stone, but we need to move faster.

We need to send clear signals to materialize as many concrete projects as possible. Currently, the principle of additionality as well as

other feed-in requirements under RED II are perceived as stumbling blocks by many investors. The Commission needs to do its homework on standardisation and certification; our partner countries need clear requirements for the guidance on the recognition of guarantees of origins. Given the intense time pressure, I pledge for a **transitional fast track procedure for voluntary schemes** subject to a grandfathering clause.

Reduce Metal Dependencies

Diversification is key, not only for our direct energy supply, but also for the necessary technologies. Renewable energy technologies drive our demand in critical raw materials, and this applies to electrolysers, too. Alkaline, the most mature and commercial technology (and rapidly growing in China) might run into cost-pressure as it competes with battery technologies for nickel. Competition on nickel is also up for solid oxide electrolysis cells (SOECs), the least mature technology. PEM, proton exchange membrane, represents the majority of current demonstration projects outside China, but relies on platinum and iridium, the latter being a bottleneck simply due to scarcity, but with promising innovation ahead to replace these critical materials altogether. This is why a diversification strategy has not only apply to hydrogen imports, but also to access to critical raw materials, **both from primary and secondary sources**.

Make It Work

All we need to do is to connect the dots - act together and think global. **A quickly and efficiently implemented European global import strategy for hydrogen entails only advantages**: We send clear signals to investors and partner countries, secure European and global increasing demand, ensure resilience through diversification, support our local partners in their own efforts towards climate neutrality and open new possibilities for our European hydrogen industry.

¹ https://www.europarl.europa.eu/doceo/document/DEVE-AD-719604_EN.pdf



CHRISTIAN EHLER
MEP, EPP ITRE Coordinator

Financing hydrogen energy infrastructure projects to make the European energy system more resilient and scalable

The Russian war in Ukraine requires a reorientation of our European energy policy. This means above all the accelerated expansion of renewable energy, which will have an impact on energy prices in the medium term. A large-scale green power and hydrogen import strategy will also ultimately make Europe less dependent on a few suppliers of fossil energy. Scaling up alternative energy sources and carriers is more urgent than ever. The Pieper report on renewable energies contains, among other things, the proposal that in future these investments are "in the public interest" and should therefore be given preferential approval. The report also calls for a large-scale green power and H₂ import initiative with specific volume targets. The report also proposes transitional low-carbon solutions to reliably meet the CO₂ target.

The biggest step with regards to facilitating the use of hydrogen on the EU level so far has been the Hydrogen and Decarbonized Gas Market Package, published by the European Commission in December 2021, which highlights the importance of hydrogen in the future energy system. This package is a crucial counterpart to the Fit For 55 package to develop this pathway from a regulatory side. It really has to facilitate the integration of renewable and low-carbon gases in the existing gas grid and enable the development of dedicated hydrogen infrastructure and market, allowing hydrogen to become a key component of the energy sector. This gas package must be the tool to deliver this ambitious decarbonization trajectory in the gas sector.

Our task is now to accelerate. Europe's hydrogen economy is being built today. Clean hydrogen already proves its value to decarbonize our economy. And – even better – it is beginning to be competitive also from an economic point of view. But we are not there

yet. If we are to meet our climate goals, and end our dependence on Russian fossil fuels, we must ramp up our ambition. The European Commission has doubled in its new plan, REPowerEU, the EU hydrogen targets for 2030 to ten million tons of renewable hydrogen produced annually in the EU by 2030. And another 10 million tons in annual imports. We must call on the Commission to increase the coordination of the planning and financing for needed electricity, energy, hydrogen, CO₂ and heating/cooling infrastructure and draw attention in particular to the need for a large-scale green power and hydrogen import strategy. Furthermore, we need to call on the Commission and the Member States to bring down the time needed to issue permits substantially and create fast-track permitting procedures for infrastructure that supports industry in the energy transition. Here we must emphasize the need for the development of a hydrogen backbone in Europe and further develop the interconnections across our continent.

The European Hydrogen Backbone (EHB) plays a key role with regards to accelerate the decarbonization of the European energy system. Since its foundation in 2020, the EHB initiative has already made a break-out to the development of a European hydrogen market through its work. A European Hydrogen Backbone can only create an opportunity to accelerate decarbonization of the energy and industrial sectors whilst ensuring energy system resilience, increased energy independence and security of supply across Europe with the right political framework. We need to ensure investments in the conversion of natural gas networks, which will form an essential basis of the future hydrogen infrastructure. Otherwise, the development of a hydrogen infrastructure connected throughout Europe will not be possible in the long term, as the necessary line sections

are not available and accordingly no internal market for hydrogen trading is created.

The EU recovery plan, NextGenerationEU, is worth 750 billion euros over 4 years. Over one third of this will finance the goals set in the European Green Deal to ensure sufficient renewable electricity to produce the renewable hydrogen. 9.3 billion euros of recovery funds are going straight into hydrogen projects. At the same time, the Commission is assessing State Aid for hydrogen projects as a priority. The entire hydrogen transition is about cooperation to de-risk investment, build a massive project pipeline and push the innovation frontier. The recently launched new Clean Hydrogen Partnership will add one billion euros to research and innovation, matched by another one billion from industry. It's a new step to bring innovative technologies from the laboratory to the factory floor and, ultimately, to European businesses and consumers.

Because for this cooperation to intensify and become a virtuous cycle industry and private investors need predictability. The EU is giving targets for 2030. The technology and public investment are getting on stream. The Commission has recently presented, as part of REPowerEU, the hydrogen accelerator. With this, all regulatory measures announced in the European hydrogen strategy have now been completed. This means that the actual construction of an integrated gas and hydrogen infrastructure, including storage and port infrastructure can start.



CRISTINA BALLESTER HERRERA

VP Large Industries Europe
AIR LIQUIDE

Hydrogen will contribute to Europe's energy security. Regulating private H₂ supply infrastructure however will not help in this perspective

In the future, hydrogen will be used for energy purposes in different applications (power to gas, heating..), in replacement of Natural gas. Lower technical and purity standards apply to the hydrogen used for these applications, enabling long-distance transport in refurbished regulated Natural gas infrastructure.

However, hydrogen is currently predominantly used as a locally produced feedstock in the industry and its outsourced supply is an existing competitive business-to-business market that does not require regulation. The dedicated infrastructure to this specific supply should be left out of the scope of the "Gas package"/directive.

Hydrogen markets and their infrastructure

When Hydrogen is used in industrial applications, consumers that are mainly represented by chemical industries have the choice between self-production or outsourcing. Today in Europe, around 10% of the hydrogen production is outsourced, and thus produced and delivered by industrial gas companies such as Air Liquide. When outsourced, different forms of supply can apply. One example is production on the site of the customer, but where such on-site production is not practically possible, hydrogen supply can be ensured through dedicated private pipelines.

These private pipelines are needed to ensure a safe and reliable supply to industrial customers, who notably use hydrogen as a feedstock. Hydrogen used as a feedstock cannot be substituted by alternative molecules or by hydrogen with lower characteristics: this usage of hydrogen requires very limited tolerance in terms of purity fluctuations, contaminants and pressure from the supplier. **The private hydrogen infrastructure has indeed been designed for such specific customers' needs and ensures reliability, safety and quality of supply that is of utmost value to them. The capacity of these pipes is dedicated to these customers.**

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As even the smallest impurities in hydrogen supply to customers with sensitive processes can cause great damage to their production process, industrial end-users served by private hydrogen networks commonly require tight purity from 99.95% for General industrial applications to 99,999% for Semiconductor applications.



Air Liquide and Siemens Energy announced in June 2022 the creation of a joint venture dedicated to the series production of industrial scale renewable hydrogen electrolyzers in Europe. This Franco-German partnership will enable the emergence of a sustainable hydrogen economy in Europe, foster a European ecosystem for electrolysis and hydrogen technology to make competitive renewable hydrogen available sooner.



Air Liquide and Groupe ADP strengthened their collaboration in June 2022 by creating the first engineering joint venture dedicated to accompanying airports in their project to integrate hydrogen in their infrastructure. As the first hydrogen-powered commercial aircrafts are expected by 2035, airports need to start reconsidering their infrastructure as of today. In particular, they must look at how liquid hydrogen will be supplied and how it can also serve other ground mobility usages, notably heavy duty mobility or light ground support equipment.

The diameter of such H₂ pipelines goes up to around 25 cm.

As of today, industry is the main user of hydrogen and is poised to remain so in the near future. It will take time before demand for hydrogen from 'new' applications will increase. Indeed, Hydrogen used for mobility and heating applications is in its infancy. This is particularly the case because, contrary to where hydrogen is used as feedstock, for these 'new applications' hydrogen is currently not the only technically possible solution.

The uptake of hydrogen for combustible applications might gradually evolve around a future interconnected 'hydrogen backbone' replacing the existing natural gas infrastructure. Such **infrastructure, transporting large amounts of "bulk" hydrogen to be used as combustible, will have, also in order to be cost-competitive, lower specification requirements than hydrogen used as**

feedstock. The diameter of average natural gas pipelines vary from 60 cm to 120 cm and more.

When to regulate hydrogen infrastructure?

In order to ensure the uptake of hydrogen and thus the development of a 'hydrogen economy', a flexible, fit-for-purpose and progressive approach towards a regulatory framework is paramount.

The liberalization of the Natural gas market via the previous gas packages was triggered by the desire to create competition in vertically integrated geographical monopolies where the infrastructure was already widely developed and often managed by one national public company. Applying similar rules to Hydrogen would not make sense as the infrastructure and market dynamics are very different depending on its application whether it is power-to-gas and heating,

mobility or feedstock for industry. Another main difference with natural gas is that renewable and low-carbon hydrogen can be produced locally in the vicinity of consumers, if a reliable electricity supply is available. It is therefore essential that the development of renewable and low-carbon electricity supply and distribution be accelerated to enable the production of local renewable/low carbon hydrogen.

Access conditions, tariffs, and the ownership structure of natural gas transportation and distribution networks were regulated because public service networks are considered a natural monopoly. **If hydrogen is to flow instead of natural gas in natural gas pipes, it only makes sense to apply the same regulatory measures to the same networks used to transport it.** Regulation should furthermore apply as public money is involved, notably for refurbishing or repurposing of natural gas infrastructure that would carry hydrogen as a combustible over long distances.

In light of the RepowerEU plan to replace natural gas by hydrogen, the proposal of the Commission to regulate the future public backbone within the gas package review is logical. Whereas, hydrogen pipelines aiming to connect consumers with production facilities, in the context of private contracts, should not be seen as *Hydrogen Networks* within the scope of the Gas Directive.

As a world leader in gases, technologies and services for Industry and Health, Air Liquide is present in 75 countries with approximately 66,000 employees and serves more than 3.8 million customers and patients. Air Liquide has close to 60 years experience in supplying Hydrogen and endorsed a pioneering role over the last 20 to shape the role of hydrogen as a key energy transition enabler.

The Group has developed unique expertise enabling it to master the entire supply chain, from production and storage to distribution, contributing to the widespread use of hydrogen as a clean energy carrier, as well as in processes and technologies necessary to decarbonize industries and energy use. Air Liquide is committed to further develop hydrogen markets in Asia, the Middle East, the US and Europe, in industry to decarbonize, steelmaking processes, electronics, chemistry, refineries as well as the mobility market ranging from waterborne, road and aerospace sector.

Also, Air Liquide is present at every step of the biogas value chain and supports the circular economy: from waste to mobility.



NICOLÁS GONZÁLEZ CASARE

MEP (S&D Group, Spain), Member of the ITRE

Renewable Hydrogen, an essential vector for Europe's energy future

A year ago, the global energy system was shaken by a surge in energy prices linked to post-pandemic recovery. But since Russia's aggression against Ukraine, this shock has turned into a significant disruption, causing severe energy insecurity and hardship for citizens due to rising energy prices. In the Union, our high dependency on external energy and on fossil fuel sources explains a large part of our vulnerability. The current situation has also highlighted the Union's over-dependence on Russian fossil fuels.

The European Union has long been working to transform the challenge of combating climate change into an opportunity to move to a cleaner and more sustainable, secure, affordable, and socially just economy. The solutions for the current crisis are align with those for climate change: more efficiency, renewable energy sources, and less fossil fuels. The difference is that we now need to accelerate decarbonisation quickly. This requires rethinking the European energy strategy with rapid, short-term actions and reinforcement of medium- and long-term measures, as we cannot rely in the same way on so-called transition fuels.

Since the Ukrainian crisis, the Commission, with the mandate of the Council, has proposed several strong measures in diversification, interconnections, more renewables, and energy efficiency. The REPowerEU is an ambitious plan to accomplish the Herculean task of eliminating energy links with Russia by 2027. Correspondingly, implementing the Fit for 55 package should pave the way in the medium to long term. The goals remain in line with the Paris Agreement. The European Green Deal continues to be the essential path to protecting ourselves from climate change, but it is also crucial to reduce our dependence on foreign energy and fossil fuels.

One of the main pillars of this action is accelerating renewable energy deployment. The REPowerEU proposes increasing the share

of renewable energy sources to 45 percent by 2030, as well as reforming key instruments like the acceleration of the permitting processes for renewable installations. It is clear that the successful increase in the cost-competitiveness of renewable electricity production and its rapid growth represents one of the most cost-efficient measures to reduce emissions and increase energy independence. This must go hand in hand with further electrification of energy demand.

However, hard-to-decarbonise sectors in industry and part of the transport sector, like aviation and shipping, need other energy carriers to phase out fossil fuels and use renewable energy sources. In this sense, renewable gases will play an essential role, with a remarkable predominance of renewable hydrogen. In addition, hydrogen from renewable electricity can offer solutions to store energy produced from variable renewable sources, taking advantage of synergies between the electricity, gas, and end-use sectors.

Today, hydrogen represents a modest fraction of the global and EU energy mix and is primarily produced from fossil fuels (fossil gas). Therefore, we are either focusing in green hydrogen or falling into the same trap. We must be consistent with our climate goals and think about the economic sense of our plans.

In this sense, the Fit for 55 package translates the European hydrogen strategy into legislation through the gas package (promoting clean hydrogen) and the Renewable Energy Directive (RED). With REPowerEU, there is a more significant step, from 5.6 million tonnes (Mt) of renewable hydrogen in the Fit for 55 package to 20 Mt (production and import).

The deployment of clean hydrogen should focus on sectors difficult to electrify, such as the high-temperature industry, maritime, and aviation sectors, through synthetic

fuels. It would be a bad strategy to focus on deploying hydrogen where there are cheaper alternatives through electrification. The Commission has emphasised promoting green hydrogen in the Renewables Energy Directive with very ambitious goals in transport and industry.

As co-rapporteur of the RED, I believe that we must ensure that only sustainable and additional renewable hydrogen is promoted in this Directive. Furthermore, some adjustments are needed in this Directive to focus renewable hydrogen better on hard-to-abate sectors. The framework for developing green hydrogen must also be an opportunity to promote a European industry and jobs associated with the massive green hydrogen production needed.

In this regard, we are waiting for a crucial delegated act specifying the criteria of the renewable fuels of the non-biological origin (RFNBOs) for developing the projects on green hydrogen. It should be balanced and encourage additional renewable electricity without blocking investments. Additionality is necessary to make sense of the fact that the renewable hydrogen produced has an added value in the penetration and promotion of renewable energy. If we remove renewable electricity from electrical end uses to produce hydrogen, we only lose energy performance.

We are at a decisive moment where it is easy to make mistakes because we must take bold steps. We need additional energy infrastructure to swift energy flows and switch energy carriers. We must be clear that these measures avoid investments in stranded assets or that they make us trade one dependency for another. It cannot be done overnight, but it needs to be done quickly, considering the territories and populations. The way forward is decarbonisation through the sustainable and just obtaining and use of energy. With this in mind, it will be easier to pave the way for an optimal energy transition.



TSVETELINA PENKOVA

*(S&D Group -Bulgaria),
Member of the ITRE Committee*

Boosting domestic gas production can improve our security of supply and reduce prices for consumers

The long-term energy and environmental goals of the EU are supported by most of our citizens. What they fear the most, however, is the uncertainty around the upcoming transformation. The disruption in our energy system will have to be managed in a way that people feel safe about their careers as well as for the prices they will pay for the consumed energy. This is precisely why we need instruments like the Just Transition Fund and the Social Climate Fund to support the regions, which will be hit the hardest by the energy transition.

EU policies should focus precisely on the most vulnerable citizens and aim at lifting them out of energy poverty. We cannot talk about having a strong union if some of our citizens feel left behind. The inflation we see in the last months is caused mostly by the high energy prices. The energy system of the future is one that integrates all available technologies. It will require the most efficient technologies that bring the biggest improvement in the value chain at an affordable price. We need pragmatic decisions on how to best decarbonise our energy production in the long term, while we keep the prices manageable for our businesses and consumers.

We need to invest and improve all aspects of our production and consumption of energy. We need to improve our energy efficiency so we can consume less in our production facilities. We have to use less for the heating and cooling of our residential and office buildings. We need to decrease the usage of fossil fuels. This is the baseline for the measures set by the Fit for 55 package, which aims to speed up the mid-term transformation by 2030. The RePowerEU initiative also doubles-down on these targets. We should be aware, however, that we need technical time to reach our goals.

The proposed Taxonomy Complementary Delegated Act, which lists natural gas and nuclear energy as transitional technologies is an attempt to do just that. There will be no single technology that will miraculously help us transform our energy system overnight.

We should not forget that the baseload and balancing power are crucial. This is precisely where the role of nuclear energy and natural gas comes into play. If we now want to truly reduce our dependence, we should do something more than simply finding alternative suppliers. We should not just change our dependency from one supplier to another. Moreover, the current global liquefied gas market just cannot absorb the demand we want to put on it. There is not enough capacity for transport and storage at the moment.

The high prices of natural gas on the international markets make it financially viable for EU companies to explore the possibilities for domestic production within our own borders. Contrary to the popular belief, Europe has not depleted all of its gas fields.

There are significant reserves that are already mapped and which could help us reduce our dependency from outside sources. According to the latest research, if we use the combined gas reserves in the EU and Norway we could get an equivalent amount as the volumes we import from Russia for about 20 years. This is a considerable resource we should not ignore. Especially when it could generate domestic job creation and lead to more innovations in the field. EU companies are already one of the leaders in the field. The international situations has once again reminded us that we should invest in improving our own capacity and not rely so much on outside suppliers. Moreover, the development of domestic production facilities will bring jobs to areas where they are needed the most. Our citizens demand from us to deliver on their vision for the future and it would be unacceptable if we do not use all of our potential resources to do that.





**FRANÇOIS-RÉGIS MOUTON DE
LOSTALOT-LASSALLE**

IOGP, Regional Director Europe

The energy Europe needs is around us. Let's use it

In addition to saving energy, diversifying our gas imports and accelerating the deployment of renewables, Europe should also look inwards to secure its energy supply. Our continent still holds vast reserves of gas which can help substitute Russian imports – and gas imports in general- and help contain our import bill in the process. By incentivizing their production now while working to implement other REPowerEU measures, European policymakers can make our future energy system even more resilient to supply disruptions.

While boosting Europe's own gas production was one of the main – if not the first – measures to be taken to gradually substitute Russian gas imports, it was not seriously considered in the REPowerEU action plan published this May which shows that this topic remains a taboo in EU discussions despite the significant long-term potential which could be unlocked.

While Europe's own production has dropped overtime, together, the EU and Norway still hold a whopping 3470 bcm of known gas reserves⁽¹⁾, equivalent to 22 years of Russian gas supplies. Granted, ramping up the production of these reserves alone will not be enough to replace Russian imports, but it certainly deserves more attention.

In the months and years ahead, Europe will need to use the full range of sustainable options it has at its disposal. If the EU is ready to do what it takes to install 10 million heat pumps in the next five years, find an extra 50 bcm of non-Russian gas imports and produce 35 bcm of biomethane by 2030, and produce 10 million tonnes of domestic renewable hydrogen, why couldn't it make as well the most of its known gas reserves and try to find additional ones?

In order to build real resilience, our approach to energy security will need to balance affordability, sustainability and strategic autonomy. As recently confirmed

by the European Parliament's vote on its inclusion in the EU Taxonomy – a relief I must say - natural gas will have a key role to play in ensuring the functioning of our energy system while reducing emissions on the way to climate neutrality.

In adapting the European energy system to the new geopolitical reality, maximizing the recovery of our domestic gas resources should be pursued as an objective alongside other measures presented in REPowerEU.

Enough wishful thinking, time to start planning

In 2019, pre-pandemic, the EU produced around 100 billion cubic meters (bcm) of natural gas, equivalent to about 20% of its own demand. This figure dropped to around 50 bcm in 2021, sending our reliance on Russian gas imports over 40%.

Political signals suggesting we no longer needed gas, supported by gas demand forecasts disconnected from economic reality

certainly aggravated the situation. This was also fueled by activist organizations' campaigns which facilitated the proliferation of bans and moratoria on oil & gas exploration: why worry about it if gas demand is going to drop by magic?

The post-pandemic recovery showed us all the key role of gas in our societies, from balancing renewables to replacing offline nuclear plants, serving as feedstock in hundreds of industrial processes including the production of fertilizers which has a strong impact on food production, heating households, fueling glassmakers, and even pasteurizing our morning milk !

In the longer term, the EU will have to compete for gas volumes on the global market. This is why investing in parallel in our domestic production as of today will help mitigate volatility tomorrow, while delivering significant revenues which can help support vulnerable consumers.



EU institutions and Member States can act by lifting existing bans on exploration now, list the remaining regulatory and physical barriers which prevent existing fields from boosting output, fast-tracking permitting processes, or even replicate at EU level and to the extent possible the UK's Maximizing Economic Recovery (MER) Strategy.

All of this can be accompanied by a long-term plan to gradually transition European oil and gas producing assets so they can deliver the skills, technology and infrastructure needed to meet the EU's climate neutrality objective, starting with the much-needed development of CCUS technologies.

The EU and Norway's combined reserves are enough to cover 20% of current EU gas consumption for another 35 years. To this one may add over 5000 bcm of further resources, part of which may be produced as well if economic and technological conditions are met.

These figures may even be revised upwards should the EU decide to encourage exploration for gas. Recently, Greece announced it may hold 600 bcm of recoverable reserves, while Romania intends to produce 10 bcm per year from the Black Sea in 2026!

Can the EU afford to ignore the potential of the Mediterranean and the Black Sea as it tries to replace Russian gas supplies? Should we reconsider the de facto ban on shale gas production in Europe, the same shale gas which made the US a global leader in US gas production, and our main alternative to Russia in the near-term?

Europe, home to oil & gas leaders

The gas industry lifecycle is both time and capital-intensive. Years go by from exploration to site appraisal, and infrastructure development to actual production. If the EU wants to reap the full benefits of its own reserves and limit its future import bill, the time to act and setting the necessary regulatory conditions at EU and national level is now.

The good news is that Europe is home to some of the world's largest and most efficient oil and gas companies, with world-leading skills, financial capabilities, advanced and innovative technologies. Our companies are the ones that are called upon to help develop the world's most complex and largest oil and gas projects.

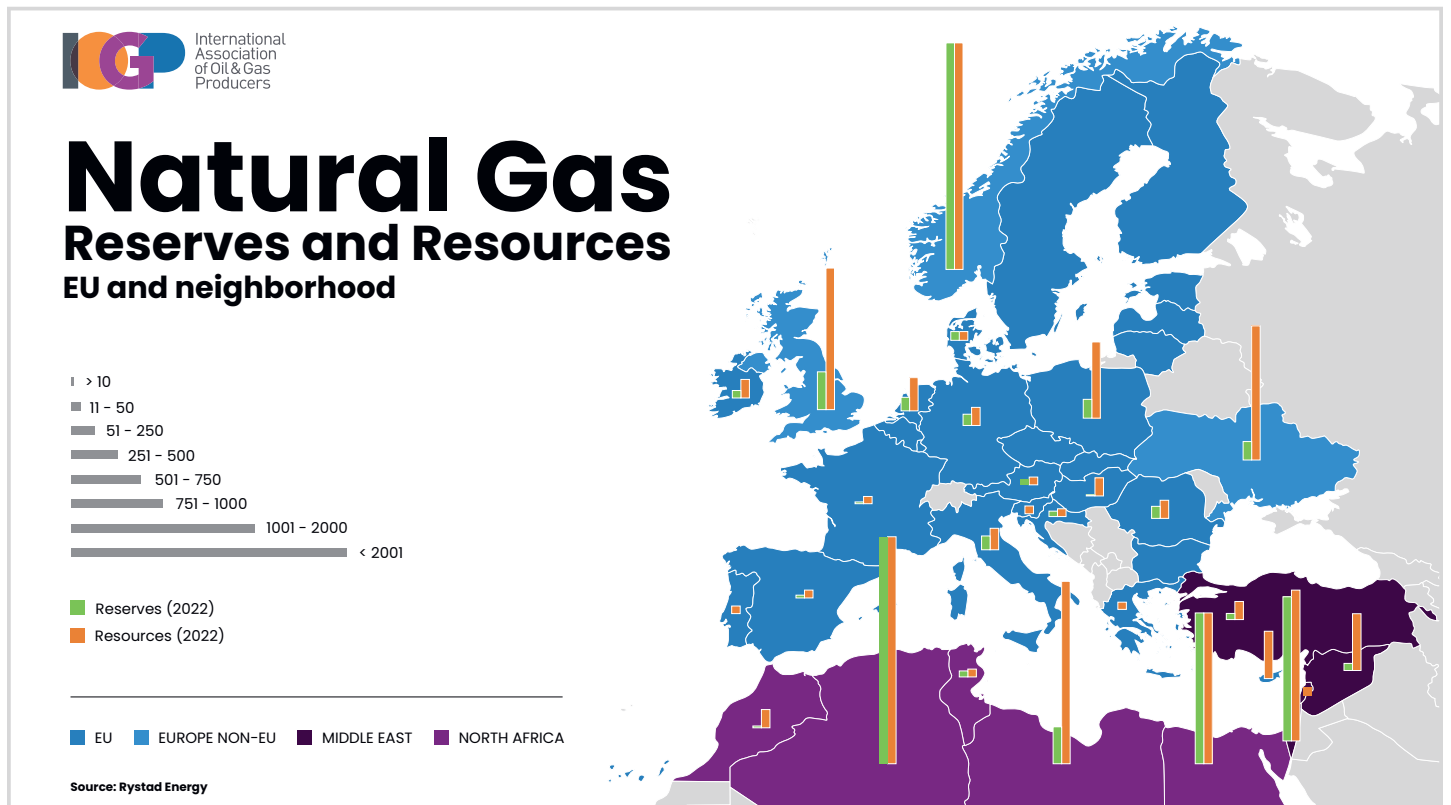
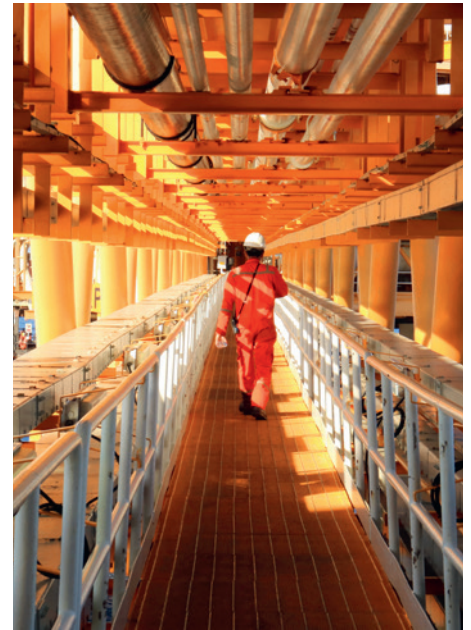
In the EU's quest to become independent from Russian energy supply, accelerating existing efforts to save energy and develop renewable energies is a no-brainer. Every week, one of our member companies announces the development of a new wind, solar, green hydrogen development, or charging station project. And every one of them knows how much their gas production assets are complementary for the energy transition underway.

Last but not least, European gas production is subject to the world's highest environmental standards, resulting in a 30% lower environmental footprint than the global production average, with nearly no upstream methane emissions left to mitigate: each cubic meter of domestically produced gas would therefore

help the EU reach climate neutrality faster than with imported volumes.

Given the continued role of gas on the way to EU and global climate neutrality, the risk of stranded assets is minimal. Furthermore, combined with Carbon Capture Use and Storage, our gas reserves can be decarbonized and turned to hydrogen, helping the EU reach its Hydrogen ambitions.

There are many reasons to act, few not to. By breaking the taboo, the EU can walk into the new geopolitical environment stronger than it ever was, and still come out the global climate leader it needs to be.





ISMAIL ERTUG

(S&D Group – Germany), Vice-Chair of the S&D Group, Member TRAN Committee

AFIR – An ambitious H₂ infrastructure for the deployment of emission-free mobility

Traffic and mobility are core parts of our daily lives that influence the well-being of European citizens. Sustainable alternative fuels and expansion of their infrastructure such as hydrogen refuelling of a car play a key role in the transition to successful decarbonisation of the transport sector. However, the transformation towards clean and sustainable road transport can only be made if we persuade people to accept this. The Alternative Fuels Infrastructure Regulation (AFIR) gives us the opportunity to do that. It covers aspects such as expansion of the refuelling infrastructure of hydrogen in Europe.

The EU committed to the Paris Agreement and to climate neutrality by 2050 and hydrogen from renewable energy can be a clean alternative to fossil fuels. It can make an important contribution to the economic and energy transition. However, hydrogen represents only a small part of the European energy mix as renewable hydrogen is not competitive yet and often very expensive. Therefore, our strategy should primarily be based on renewable hydrogen as only this is sustainable in the long term. To ramp up renewable hydrogen fast enough, low-carbon hydrogen can play a transitional role. It is of utmost importance that fossil-based hydrogen is phased out as soon as possible. Now, in these terrifying times, we see our dependence on gas. I truly believe in hydrogen and in its future as an alternative means of sustainable fuel. Hydrogen could be one solution to be finally independent from fossil fuels. Therefore, I truly welcome the REPowerEU initiative as it is an excellent basis for completely diversifying mobility. The EU has now the potential to reduce the demand for Russian gas by two-thirds within a year.

The expansion of a hydrogen infrastructure will provide the right incentives, also in the

mobility sector. Now is the time when we have the opportunity to organize emission-free mobility much more quickly. This applies to both electric vehicles and vehicles based on hydrogen. I was the Rapporteur for the AFID back in 2014, and I currently see many parallels with regards to hydrogen and the recharging infrastructure. There is a huge so-called chicken and egg dilemma coming up because what do we need first? Hydrogen cars for which we build an infrastructure or an infrastructure for hydrogen cars? We need to take a brave step forward ahead of time to find solutions for these questions. If there is no sufficient infrastructure, there will be a high risk of stranded assets for the industry. In addition, neither consumers nor manufacturers is ready to wholeheartedly buy or produce hydrogen powertrains. According to the Commission's proposal, it is still too early for the full deployment of a hydrogen infrastructure.

The Commission proposal states that by 2030, publicly accessible hydrogen stations along the TEN-T core and comprehensive networks are being deployed. In my opinion, this proposal is not ambitious enough. The EU should incentivise the hydrogen infrastructure development and not LNG for trucks on road for example. The plans of the major manufacturers suggest that fuel cell trucks will be ready for series production as of 2026. It is therefore absolutely worth having a discussion around the binding targets not only for 2030. In my draft report on AFIR, I do suggest a hydrogen infrastructure for trucks as of 2027 and a card payment obligation like in charging stations which is more ambitious than the Commission's proposal.

Now a rapid technology development is taking place. While drafting my report, I met a lot of stakeholders developing and investing in this technology. And I believe that

Europe must harness the full potential of the hydrogen refuelling ecosystem. We should now give the manufactures the security for further investment and development for the hydrogen technology. Also, for maritime ports I call for infrastructure deployment of hydrogen as of 2030. In addition, I propose to further examine other modes of transport for hydrogen such as rail or aviation. Airbus has recently launched their hydrogen pilot project which shall be ready by 2035. Another example is from my home country Germany where Deutsche Bahn is currently testing solutions for supplying trains with hydrogen by developing mobile hydrogen filling stations. Green hydrogen is produced on site using green electricity which is then stored in a mobile storage facility. With this method, a train could be refuelled as quickly as a diesel train. The overall aim should be to replace all diesel trains in regional transport first, and then beyond. With green hydrogen, local CO₂ emissions can be reduced to zero. The first on field trial operation is planned for 2024, and I think we should support these brave initiatives on EU-level. We have to back such initiatives with green technology, but unfortunately, these two modes of transport were not being considered by the Commission in its current AFIR proposal. Yet, I am convinced that we must take them into account in order to reach a more sustainable and greener transport in the future.



PHILIPPE BOUCLY

President of France Hydrogène

How France can be a key pillar of REPower EU's Hydrogen Accelerator

The current energy crisis, intensified by the Russo-Ukrainian War, has demonstrated to Europeans the urgent need to move away from fossil fuels. The increasingly frequent repetition of violent climatic episodes is raising awareness of the reality of climate change and increasing the need to find operational solutions to reduce our GHG emissions.

Among them, clean hydrogen currently appears to be part of the solution for at least three main reasons: firstly, the cost of renewable energies has fallen considerably over the past decade, with the cost of solar energy, for example, having been divided by 10 in 10 years. Furthermore, the cost of hydrogen technologies has also dropped considerably; these technologies, which a few decades ago were reserved for the conquest of space or for defense, are now easily accessible. Finally, hydrogen is a means to store massive quantities of renewable energy on an inter-seasonal basis.

Electricity, which currently accounts for 20 to 25% of final energy consumption, will take on a larger share in the future. Most forecasting models give it a share of 50 to 60% by 2050. This electricity will be produced by low-carbon and renewable generation technologies, particularly solar and wind, and large quantities of electricity will have to be stored between summer and winter to ensure needs throughout the year. Hydrogen currently appears to be the only means of storing these large quantities.

Worldwide, more than 40 countries are now committed to implementing a hydrogen strategy or a roadmap. France is at the forefront, along with Germany, Japan, South Korea and China. The French Hydrogen Strategy is based on 3 pillars:

- Decarbonise industry by relying on large quantities of renewable or low-carbon hydrogen needed to develop a competitive French electrolysis industry and

reach an electrolysis capacity of 6,5 GW by 2030.

- Decarbonise professional mobility, i.e. heavy-duty transports (buses, coaches, lorries, refuse collection vehicles, trains, boats, aircraft) or intensive mobility (last mile logistics, taxis).
- Maintain a high level of excellence for French R&D&I in hydrogen technologies and develop skills and training for the sector.

This strategy has been given a budget of 7.2 billion euros and a governance, with the National Hydrogen Council chaired by the ministers of the economy and ecology and co-chaired by the chairmen of Air Liquide and Faurecia. 1.9 billion euros were added to the initial budget, as part of the new France 2030 plan presented by President Emmanuel Macron on 12 October 2021 for the development of the French hydrogen sector until 2030.

To clarify this vision, France Hydrogène conducted a study in 2021 on the deployment of renewable or low-carbon hydrogen in France by 2030. Given the current and potential hydrogen demand as well as the announced projects, it appears very likely that hydrogen will develop within seven main hydrogen valleys: the ports (Dunkirk, Nantes Saint-Nazaire, Fos-Marseille), the valleys (the river Seine from Le Havre to Charles de Gaulle airport, the Rhone valley) as well as the trans-border areas with Spain (Lacq basin) and with Germany. These major consumption areas will concentrate nearly 85% of hydrogen demand by 2030. The rest of the territory will mainly be covered with the deployment of hydrogen refueling stations along the main motorways and in urban nodes (TEN-T).

According to our reference scenario, the objective of 6,5 GW of electrolysis could be reached by 2030 for the domestic production of 680,000 tons of renewable or low-carbon hydrogen with 37 TWh of electricity needed.

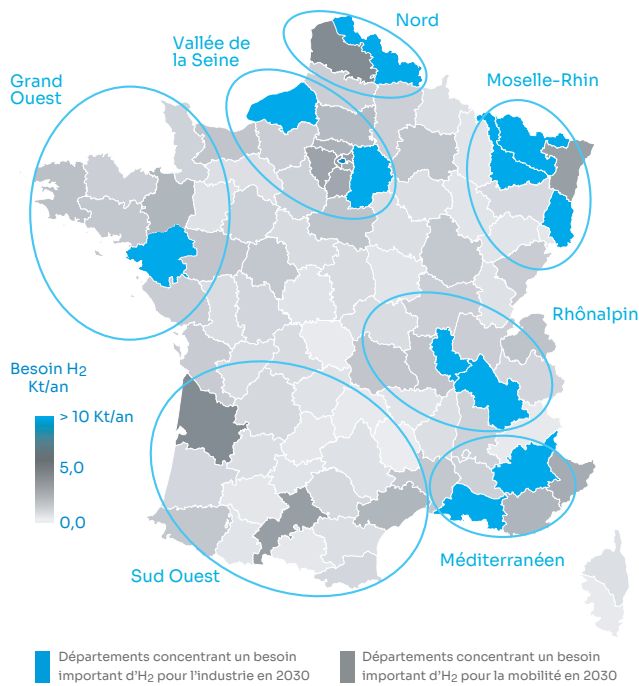
However, given the new requirements from the Fit-for-55 Package, France Hydrogène has also modeled a more ambitious "Ambition 2030 +" scenario in which 1,09 million tons and 10 GW of electrolysis capacity are reached (60 TWh of electricity needed). Within the valleys, France Hydrogène expects first pipelines of hydrogen, mainly retrofitted from gas pipelines, to be deployed before progressively interconnecting valleys with each other.

This dynamic expected in France will take place in the European context and will contribute to the REPower EU objectives of consuming 20 million tons of clean hydrogen by 2030, to move away from Russian fossil fuels as quickly as possible. Half of it is expected to be produced domestically in the EU, while the other half would be imported from neighboring third countries. The European Commission proposes to raise the targets for renewable hydrogen from 50 to 75% in the industry and from 2.6 to 5% in the transport sector (RED III), as well as to double the number of hydrogen valleys by 2025.

To import the required quantities, efforts should be made to develop first networks of hydrogen pipelines and storage infrastructures across the EU, as well as import terminals, especially along the three main import corridors expected along the North Sea (Great Britain, Norway), North Africa (Morocco, Egypt) and Ukraine.

Regarding these objectives, the French hydrogen sector must tackle four challenges in this European context:

- **Reduce costs.** Hydrogen technologies are mature, as the numerous demonstrators developed so far have largely shown. However, their cost remains very high given their low deployment. The sector must now scale-up in order to reduce costs. This goal can be achieved by developing large-scale territorial ecosystems that will bring together users from industry, mobility and even energy. The



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scale-up should follow a factor 1000. In France, at present, barely 400 vehicles run on hydrogen. With our "Ambition +" scenario, France Hydrogène aims for 450,000 vehicles by 2030. For electrolysis, barely 5 MW are currently in place in France, while the objective is between 6.5 GW and 10 GW by 2030.

➤ **Promote technological neutrality.** The EU hydrogen strategy promotes electrolysis as the preferred means of producing renewable hydrogen. However the production of 10 million tons of clean hydrogen targeted by REPower EU requires 550 TWh of electricity and hundreds of GW of new dedicated renewable capacities (+300 GW with solar only or +135 GW with offshore wind only). Such huge quantities require a drastic increase of the pace of deployment of renewable energies. With a risk of a lack of additional renewable electricity, low-carbon electrolytic hydrogen can contribute as a complement to the ramp-up of the electrolysis market, to help matching the EU demand for clean hydrogen, and to decarbonise hard-to-abate sectors (industry, heavy-duty transport). The EU should also acknowledge the role of fossil-free hydrogen from nuclear electricity, producing low-carbon hydrogen below the legal or EU Taxonomy thresholds (3.38 kgCO₂_{eq}/kgH₂). EU support policies such as incentive targets should be extended to low-carbon hydrogen, particularly to meet the increased REPower EU targets for clean hydrogen in the industry (75%) and the transport sector (5%) by 2030. While acknowledging the fact that

electrolysis is the most mature technology, other technologies also allow the production of renewable or low-carbon hydrogen, in particular the continued production of hydrogen by steam reforming of natural gas, provided that this process is equipped with a carbon dioxide capture and use or sequestration unit (CCU). Production of hydrogen from biomass as well as plasmalysis processes (by microwave or by plasma torch) should also be developed.

➤ **Contribute to the reindustrialisation of the French economy.** The deployment of hydrogen technologies must be a lever for the reindustrialization of the French economy and be supported by EU industrial cooperation. This is the purpose of the gigafactories projects that have been notified to the European Commission within the framework of the Important Project of Common European Interest (IPCEI) for electrolyzers (McPhy, John Cockerill, Elogen and Genvia), fuel cells (Symbio) and key components (Faurecia, Plastic Omnium, Hyvia and Arkema). Green lights are expected by this summer to unlock investment decisions all over Europe.

➤ **Build up infrastructures to transport and store hydrogen.** France's particular geographical position between countries richly endowed with renewable energy and capable of massively producing competitive renewable hydrogen (Spain, Portugal, North Africa) and countries in the northwestern part of Europe with a high level of demand for low-carbon or renewable hydrogen (Germany, the

Netherlands) can give it the status of a transit country for hydrogen. The deployment of hydrogen infrastructures in France would offer access to clean hydrogen at an advantageous cost to French consumers. It is premature to establish a timetable for the development of these interconnections between French valleys and neighboring countries (Spain, Germany, the Netherlands). This development will be based on customer demand and it is in this sense that French TSO's GRTgaz and TERECA have launched a national market consultation and have started identifying offer and demand. But it is important to stress that the deployment of infrastructures such as hydrogen pipelines or storage sites is a long-term process. As it takes at least 5 years to implement such investment decisions, it is important to continue the reflection to be ready to respond to market demands and thus offer French consumers a quality and economically acceptable hydrogen supply over the long term.

Given the issues at stake and the scale of the challenges to be met, the key word for the coming years will be cooperation. Cooperation between States and the private sector, between regions and companies, between industrials and research centers, between multinational groups and SME/start-ups. And in terms of geopolitics, a concerted hydrogen diplomacy will have to emerge. This is the only way to achieve the ambitious objectives set out by the EU Hydrogen Strategy, thus enabling an effective fight against climate change and strengthening our strategic autonomy.



CHRISTIAN BUCHEL

EDSO Chairman, Enedis board member

Christian Buchel: Electrification as a quick answer, coordination of network operators as a support.

All sectors of the economy have to contribute to achieving EU ambitions to reach carbon neutrality by 2050. To do so, the European Commission has always pledged that electrification first should be the main driver. This position has always been endorsed by E.DSO Members. However, in some sectors where it is hard-to-abate to ensure a full transition to decarbonised electricity¹ (industry, maritime...) low-carbon and renewable gases will be needed for a transition time.

The invasion of Ukraine and the energy prices increase call for a rapid EU independence from fossil fuel energy that is mainly imported from foreign countries. Electrification is a quick answer to all of these emergency situations. Renewable and decarbonised electricity will contribute to decrease GHG emissions while increasing EU strategic geopolitical autonomy. European Commission's REPowerEU plan aims to achieve these objectives by saving energy, boosting renewables and investing in tomorrow's energy infrastructure.

DSOs' role is to accompany energy policies and adapt their networks accordingly. Indeed, they will concretely address those issues by connecting RES to increase renewable energy targets and solar rooftop PVs on buildings. However, the fast implementation of heat pumps, renewable energy sources and EV chargers to the grid require targeted

Optimising the capacities of the European Gas Network

investments to the relying infrastructure. For this reason, E.DSO warmly welcomes the additional 29 billion € in electricity grid announced by the European Commission.

Representing the leading DSOs in Europe, E.DSO strongly defends this position in favour of electricity but also believes cooperation is needed, even essential, in some Member States. Of course where gas cannot be dramatically shortly reduced. Cooperation between gas and electricity network operators must not be detrimental to the integration of enormous shares of renewable energy, the deployment of electro mobility and the decarbonisation of buildings, allowing consumers to definitively leave fuel, and efficient management of energy consumption thanks to smart meter data...

Considering the growing role of DSOs to address the energy transition goals, the official launch of the EU DSO Entity in June 2021 was a real milestone. A merged organisation with gas DSOs as considered in the Gas Regulation is not an efficient solution as upcoming challenges for both energy carriers are obviously not the same. A similar model to ENTSO-E and ENTSO-G, with a mirroring, separate entity dedicated to gas DSOs must be adopted.

When it comes to the Gas Directive proposal² to reinforce cooperation between network operators and the development of joint scenarios. It also acknowledges the growing role of distribution system operators and allow a visibility of the needed investments in the electricity grid. In Europe, there is not a "one size fits for all" and the share of gas and electricity is not the same everywhere. In some areas where cooperation will be still required,

it must first and foremost take place at local and/or regional level because of large differences between urban, rural and industrial structures. Joint scenarios will allow for optimised infrastructure planning and development by explicitly showing the needed investments while fostering transparency for social acceptance.

Coordination within the energy system needs innovative tools. Investments in digitalisation, interoperability, and smart grids are one of the main means to improve such a coordination. Data plays a key role in supporting decision-making in the process of energy transition. As an example, data provided by gas and electricity meters would bring added value to consumers to assess their energy consumption, assess the efficiency or the need of renovation works or even to better manage the respective network infrastructures...

The main question all system operators ask themselves is: how can we contribute to the Green Deal objectives?

Today, electricity distribution operators are aware of their historical mission that will be fulfilled while ensuring in the same time the resilience of the networks in a more and more unstable environment with severe climatic hazards. They will allow for new connections, uses, energy efficient decisions to contribute to the ultimate target: the climate neutrality of EU continent in 2050.

1 EU Communication on sector integration

2 Exact reference to be added



SUSANA SOLIS PEREZ

*MEP (Renew Europe - Spain),
Member of the REGI Committee*

Are we ready for electric mobility? The race secure charging infrastructure

European car manufacturers have dominated the market for years, but in the next decade we face an unprecedented challenge: the transition towards cleaner transport.

Transport continues to account for a quarter of the EU's overall greenhouse gas emissions, making clean mobility key in our fight against climate change. But whenever we speak about zero emissions mobility, the same question arises: "are there enough charging stations across Europe?"

The European Parliament voted in June the *de facto* sales-ban on all fossil fuel cars by 2035. This house is following industry and consumers by doing so. For the first time ever, more than half of car buyers surveyed worldwide want their next purchase to be an electric or hybrid model, and practically the

totality of producers are now fully committed to gradually phasing out of the Internal Combustion Engine (ICE).

However, these optimistic forecasts for electric vehicles (EV) come with some significant challenges, the most pressing being the uneven and slow deployment of charging infrastructure across Europe.

In the EU, only 15% of EV charging stations are located in public spaces, with most being situated in private residential or commercial buildings. There are also huge disparities in the availability of infrastructure amongst Member States. For example, France, Germany and the Netherlands alone hold 69% of the Union's charging infrastructure. In comparison, even though Spain is the second largest country in the EU by area, it hosts a mere 3% of the bloc's charging stations. EV travel between

European countries will therefore remain non-viable until the availability of charging stations is harmonized in the Union.

The Regulation on the Deployment of Alternative Fuels Infrastructure (AFIR) can be the solution to the problem. For the first time, we will have a Regulation that sets binding targets for Member States to ensure the rollout of charging and refueling infrastructure across the Union. Undoubtedly it is a step in the right direction. But although the Parliament's position is quite ambitious, the Council and the Commission maintain a conservative stance that does not seem likely to completely put an end to the shortages.

The Commission estimated an average consumption of 12kw/100km per Electric Vehicle that translates to 1kW power output per electric vehicle target, however, industry and



consumer associations agree that the figure is far too low. Each vehicle should have at least 3kW available so at least at the beginning, that's the goal we should strive for. Considering the current deployment of charging infrastructure and the sales of electric vehicles we now face a classic "chicken and egg problem". If a higher deployment during the first years of the electric vehicles is not pursued we will not be able to achieve a higher market share of these vehicles. And vice versa.

Therefore, the solution proposed in the ITRE committee where I worked as a Shadow Rapporteur, to establish power targets based on the percentage of the electric cars is, in my view, optimal. We first set very ambitious targets to end the "charge point anxiety" and promote the use of electric vehicles and then we remove those targets and let the market regulate by itself. On top of that, there is an urgent need to ensure the deployment of fast chargers, those that allow charging in half an hour. We cannot let one American company dominate these types of chargers. AFIR needs to address this.

Yet a big question remains. How do we tackle the distribution between urban and rural areas? Should we set the same targets for all regions regardless of their population? This will be the battleground during the inter-institutional negotiations or future trilogues. The Council, pressed by nordic countries, is advocating for certain derogations for depopulated areas such as reducing to half the available electric chargers in main roads in areas facing demographic challenges. But what if these low-populated areas are vast

extensions of territory in the core of the country

The objective of having a regulation with binding targets is to ensure that all European citizens can travel across all EU territory with zero emissions vehicles. But if we start fragmenting territories based on population we will hinder the green transition in regions that are already facing severe challenges.

My position in the Parliament has been that of keeping the overall targets regardless of population but acknowledging that a "one size fits all" approach cannot work. We need to provide flexibility to set the targets where they are needed, provide further financial support in those areas now that we have the Recovery Plan and allow for certain derogations in those places where there is a very low traffic density, not population density.

This ability to travel seamlessly across all Europe can also be in peril if we don't find a good agreement among us and with the Council when it comes to payment options. Right now we have a fragmented market whereby consumers need to download endless apps and have to deal with different payment methods and uneven transparency requirements depending on the Member State or even region. With this regulation we must strive to create a single market that allows drivers to use their contactless credit card, regardless of their car model, brand or nationality.

The automotive sector is changing completely and we have to offer certainty, legal security and a regulatory framework that

allows us to bet on innovation and public-private collaboration and to ensure that all climate legislation is reviewed as a package. Moving along through the electrification of the car industry won't be possible without a massive investment in public chargers. We've set up very high ambitions and goals, and we must be ready in 13 years to stop selling polluting vehicles.

While AFIR is without doubt a step in the right direction to achieve carbon neutral mobility, we cannot turn a blind eye to the challenges that electrification will bring. Will the grid be ready to support vehicles plugging in at the same time? Will we stop depending on Russia for oil to start depending on China for critical raw materials? Is it too late to start massively investing in gigafactories?

Deadlines are necessary, but without the proper infrastructure they will be useless. Nowadays we face an evident truth: electric vehicles are luxury goods. And if people can't manage to travel inside their own countries, the market won't start growing as fast as we need it to. People will not buy electric cars.

In short, either we work on building the foundations or we will fail on our green transition.



**BART JAN HOEVERS**

ENTSOG President

**PIOTR KUŚ**

ENTSOG General Director

Gas Grids to support the REPowerEU Plan and strengthen Europe's security of gas supply

The need to react and adapt quickly to an ever-changing energy landscape has never been more evident than during the last few months. In response to Russia's invasion of Ukraine, the European Commission (EC) published its REPowerEU Plan, to enable a secure energy supply by ending dependence on Russian gas and to accelerate the roll-out of renewable energy. The expedited legislative procedure to publish the Gas Storage Regulation, expected to enter into force in July 2022, aims to address current security of supply risks and gas markets volatility.

Immediate solutions and short-term measures for crisis management and EU supplies diversification

With respect to disruptions to supply or to infrastructure, ENTSOG continues to play an important and significant role in the context of cooperation between the gas transmission system operators (TSOs), to manage emergencies and minimise potential negative impacts. ENTSOG has established specific groups (Regional Coordination, or ReCo, Teams) which are groups of TSOs assigned to supply corridors, providing relevant information via ENTSOG to other stakeholders and EU bodies, such as EC, the Gas Coordination Group and the Member States. ENTSOG publishes the Summer and Winter Supply Outlooks and supports EC in risk assessment of a potential Russian gas supply disruption scenario, as well as undertaking short-term analysis of the preparedness of the gas infrastructure for the upcoming gas seasons. ENTSOG provides frequently updated data in its [gas flow and seasonal outlook dashboards](#).

The REPowerEU Plan reinforces the need for gas TSOs' preparedness and resilience, including the acceleration of technical measures to increase reverse flow capacities from west to east for the upcoming winter, and the consideration of technical requirements on gas composition.

Mid-to-longer term objectives: Gas Grids to decarbonise and enable transport of renewable and low-carbon gases, including hydrogen

The TSOs will facilitate the REPowerEU ambitions by providing future-proof infrastructure. The REPowerEU Plan requires the diversification of gas pipeline routes, including a higher load factor on existing pipelines, in the short term. By 2027, it aims to adapt existing gas networks to biomethane and renewable hydrogen. In the longer term, Europe requires the development of pan-European hydrogen infrastructure, enabling integration of hydrogen supply and demand centres, to meet the target by 2030 of 10 million tonnes of imported hydrogen and 10 million tonnes of hydrogen produced in the EU. Therefore, the objectives of the 'Fit for 55' and Hydrogen and Decarbonised Gas Market Package is to step up the rollout of biomethane and hydrogen, leverage existing gas networks, encourage investment and enable the development of (re)dedicated infrastructure.

EC's 36th European Gas Regulatory Forum, also known as the Madrid Forum, concluded in May 2022 that improvements should be made towards a more integrated infrastructure planning at national level, including the future hydrogen sector, and an alignment between the network planning procedures at European and national levels. The Forum also noted the importance of using existing infrastructure by identifying and repurposing existing suitable networks for the transport of hydrogen.

Taking cognisance of the REPowerEU Plan objectives, the ENTSOG TYNDP 2022 will include new or repurposed infrastructure projects to transport hydrogen, projects for retrofitting infrastructure to further integrate hydrogen, and biomethane development projects. These developments to support the EU energy in meeting the Paris agreement and Green Deal objectives are regularly discussed at ENTSOG's Advisory Panels for

Future Gas Grids, with participation by CEOs of Brussels-based associations of gas, bio-methane, hydrogen and electricity value chains. These Panels commenced in 2021 and the discussions continue into 2022 to provide a platform to exchange ideas on how to best repurpose and retrofit the gas grids by 2050.

Additionally, the technical challenges and feasibility to handle gas quality in fluctuating blends, as well as pure hydrogen grids in our future gas system are discussed by stakeholders in the Prime Movers' Group on Gas Quality and Hydrogen Handling. ENTSOG also facilitates the roundtable on clean hydrogen transmission and distribution, as part of the EC's European Clean Hydrogen Alliance.

Working together to make a better energy future

We joined ENTSOG as President and General Director in 2021 and 2022 respectively, both with the same goal – to maintain and further strengthen the association's role to contribute to a secure, sustainable, and affordable energy future for all European citizens. We recognise that transformation of gas networks can be successful only by working together with stakeholders along the whole gas value chain. We, along with the gas TSOs, are ready to provide the practical solutions needed for short to medium term security of supply measures, whilst also addressing the longer-term goal of integrating hydrogen and biomethane at an industrial scale into our grids. ENTSOG will continue to be proactive, providing technical expertise on gas transmission related topics on a European level, as it has been demonstrated over the years. We invite you to visit the [ENTSOG website](#) and learn more about our current and planned activities.



NIELS FUGLSANG

MEP (S&D Group - Denmark),
Member ITRE Committee

Making our energy efficiency targets binding will make sure member states take them seriously

Interview by Hughes Belin, freelance journalist

You are leading the revision of the Energy Efficiency Directive in the European Parliament. What's the potential of energy efficiency to reduce our dependence to Russian gas?

It's huge. Every time we increase our energy efficiency by 1%, we reduce our gas imports by 2.6%, in other words if we insulate our buildings, we import less gas. It's a key tool to fight Putin and to make sure we don't finance his war in Ukraine. Buildings are the EU's largest gas consumers, responsible for approximately 38% of EU gas use, according to the IEA. Heating accounts for 70% of our gas consumption, largely because the majority of households in the EU have gas boilers.

What more can be done on this front?

Another way is to use excess heat wasted from industry, data centres and agriculture to heat homes. By warming up water with the excess heat and sending it into a pipeline, the excess heat can be used in a district heating system. That's why I proposed to request from municipalities of 20,000 inhabitants or more to consider District Heating & Cooling plans. By making this analysis, they may consider District Heating as a tool to increase energy efficiency. We also need to pursue the electrification of our heating system, by installing heat pumps instead of gas boilers.

Despite the willingness of the European Commission to double the rollout of heat pumps, how would you solve technical issues such as the consequent need to retrofit the electric system and the insulation of homes, and more generally the limits of the current power grid to meet a sharp increase of peak electricity demand in the winter?

The effort required not simple indeed. Because we need to do more than one thing at the same time. Heat pumps are part of a general effort to electrify the energy system in EU. For that we need more renewable electricity. We can increase the output of the offshore wind, for example. **Denmark, Belgium, Germany and the Netherlands recently pledged a joint offshore wind target of at least 150 GW of capacity installed by 2050.** At the same time, grids and infrastructure need to improve, such as the north-south connection in Germany to use the wind from the North Sea. It's easier said than done. For that, we should use wisely the EU recovery funds.

As far as home renovation is concerned, it's true that installing heat pumps in uninsulated houses makes no sense. The current annual renovation rate is below 1% in the EU. That is not sufficient: we need to at least double it. The Commission proposal to renovate at least 3% of the total floor area owned by public entities annually to a nearly zero-energy standard is an important step to increasing energy efficiency in buildings overall. This legislation mustn't be watered down, I will insist on it.

Is there a political momentum for energy efficiency, today?

First of all, we have the money to fulfil our ambitions: 37% of EU funds such as the recovery facility are earmarked for climate-related issue. And in the longer term, energy efficiency projects will save a lot of money after their payback period. We need to reap the quick wins by increasing the renovation rates of low-efficiency buildings. Making our energy efficiency targets binding will make sure member states take them seriously. There has never been so much attention than right now with the war in Ukraine, it's a popular topic. We are realising that energy comes from somewhere – for some of it, it happens

to be Russia. We don't want to finance the war and we can also be blackmailed if we remain dependent on Russia's energy. Now everybody agrees that we should get rid of Russian oil and gas. Hence there is a higher ambition than before. There is a political momentum to do more on this topic, at least in the European Parliament.

At the end of the day, is this a brutal realization that we are spoiled by overconsumption?

We need to change our consumption behaviours. We have lived in a "consume-and-waste" society for a long time, pretending that resources are infinite. This fairy tale has nothing to do with reality. Overall, the whole climate and environmental crisis shows that it is crazy to keep on consuming and wasting. We need to change that perspective, and that is huge task for our society because as citizens, we need to change the way we live and consume. It will change the direction of our lives by not using and wasting that much and by recycling more. It won't necessarily be a bad life, but a good life. However, it requires a change of mentality: as lawmakers, we need to push that forward but we also need a genuine cultural change.



TORBEN BRABO

Chief Executive Officer,
Energinet Gas TSO, and President of
Gas Infrastructure Europe (GIE)

A world without Russian Gas?

The summer didn't even start, but it is already time to focus on next winter. Europe needs to be prepared. And this is what European gas infrastructure operators are doing as we speak.

The objectives proposed by the European Commission are very ambitious. That is quite a challenge that the whole Union has on its plate. With the gas infrastructure we have today, we cannot manage all of the volumes requested by the REPowerEU plan. Drastic efforts are required to prepare the infrastructure to manage more and provide the necessary volumes for a sustainable, resilient and decarbonised energy market. Financial and legislative support, including fast-track permitting, must come along to enable the industry to properly play its role in protecting the lifestyle of our European citizens and adapt to today's new constraints.

For instance, if we look at how the gas system was originally built: it was direct flows from east to west. Today, it needs to be prepared for the vice-versa flow. Securing new imports, we see an increasing need for LNG capacities (small as well as big). And this requires the pipeline system to enable the LNG volumes to flow from harbours through Europe. New transmission capacity investments are therefore needed to solve these bottlenecks in the infrastructure. Our members have several projects fast-tracked on this.

The good news is that there are no significant negative effects caused by the actual disruptions, yet. Even if 6-7 EU Member States have stopped deliveries from Russia. Even if some Member States manage to increase their LNG capacities. Challenges are expected towards autumn. Simulations on the critical entities' consumption are performed in order for non-critical consumption to be reduced

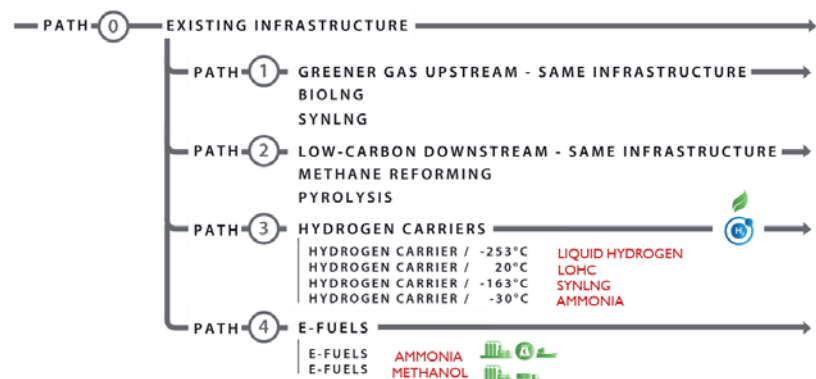
in case of further disruptions, and to have as much gas ready for the coming winter.

What it is important to understand is that investing in new gas infrastructure doesn't rhyme with the "lock-in effect". Today, part of our infrastructure is already future-proof, and can transport biomethane and to some extent hydrogen. With adapted financial support, we could have the whole network – transmission, storage, and LNG terminals, future-proof. We are convinced that it is still needed to support research and development, and transitional towards innovative technologies. Our infrastructure can support both the security of supply of Europe and the decarbonisation of its economy. Investing in our infrastructure doesn't mean a lock-in effect. Our infrastructure is future-proofed. In fact, we developed several studies identifying decarbonised pathways for LNG terminals and storage.

A political agreement of principles was reached in the council on the 6th sanctions package. It was as well agreed that in the short term, the priority is to diversify the sources of supply and LNG terminals can support Europe in that regard. As part of the measures, a dedicated structure to deliver on the Energy Purchase Platform was developed while efficiency and energy savings became a priority. Preparedness should be improved through cooperation Agreements and solidarity plans. Another good news is that the EU understood that the storage filling level was of maximum importance to ensure that households and critical consumers are protected – also in the coming winter – and in coming years.

The plan is to decarbonise the European economy. Along the way, some parts cannot be efficiently electrified. Besides, the growing demand for renewable and low-carbon gases means that we will need to import, transport,

Many decarbonisation pathways use existing and upgraded LNG terminals



Extract "The role of LNG in the energy sector transition, Regulatory recommendations", a study by Frontier Economics' for GIE – Final results

https://www.gie.eu/wp-content/uploads/filr/2595/Frontier-Economics_Study_GIE-The%20role-of-LNG-in-the-energy-sector%20transition-regulatory-recommendations.pdf

store and export large volumes of renewable and decarbonised gases in various forms. Within and outside Europe. Gas infrastructure can do that.

In the short term - in other words for next winter - Europe needs to find alternative gas sources, and secure gas stocks. Change the flow patterns from the traditional import and transport routes. Individual gas TSOs will adapt their commercial offers and operations to change and optimize those flow patterns. And these are massive efforts! 10s and 100s of gigawatts (GW) to be rerouted in a very short timeframe. Several FSRUs come in place. In the medium term – 2023-2025 - we need to improve the current situation with small investments. First, we need to amend the existing and build some new gas infrastructures. We need to make sure it is a well-interconnected and integrated EU gas market. Second, Europe needs to accelerate decarbonisation with biomethane and hydrogen production. In the long term, after 2025, we need to design a new gas supply framework ensuring energy transition with low carbon and renewables gasses. That includes securing new LNG for Europe. Because after 2025, new large future-ready LNG terminals

are coming online. For that, additional production abroad is needed, and Europe can only secure that with long-term contracts with key producing countries. Furthermore, Europe needs to foster renewables inside and outside Europe. We need all neighbouring countries and potential partners around the world on board at an early stage on the uptake of hydrogen.

To sum up, Europe will continue to import a lot of energy in the future, with an increasing share of domestic production of European renewable. Securing energy supplies is therefore crucial to ensure growth and prosperity. As Europe swaps from fossil to renewable and low-carbon fuels, energy diplomacy and legislative decisions will be key levers to achieve this.

Background information:

- [GIE Narrative on the Hydrogen and Gas Market Decarbonisation Package](#)
- [GIE response to REPowerEU](#) (Press release)
- [GIE response to REPowerEU](#) (Report)





LAURENCE POIRIER-DIETZ

Chief Executive Officer, GRDF

Building smart grids to operate a renewable gas system

To build tomorrow's city, the natural gas network is being transformed today to become more efficient, more economical, more ecological and complementary to other networks. The grid evolves to enable a greener and more efficient gas market with a triple objective: firstly, integrate always more renewable energies in consumption; secondly, continuously increase service quality and users' satisfaction; thirdly, integrate high-performance gas technologies for the benefit of customers.

Developing smart, digitalised, and connected grids is also essential to address the heterogeneity of European housing stock - in age, volume, renovation stage or heating source. They are already a reality in Europe and especially in France, where GRDF has been committed to digitising the network and improving performance while further development is still required to enable better energy consumption control and the use of new energy sources.

By integrating more renewable and local energy, building smart gas grids is a lever for the energy transition. It is an enabler to four major strategic objectives of gas distributors and in particular in France, of GRDF.

1. Enhance local resources in a circular economy approach by promoting the injection of locally produced green gases

Building smart grids maximises the network's capacity to integrate the decentralised production of different types of green gases, such as biomethane, synthetic biomethane or hydrogen, and supports decarbonisation of end-uses (heat, cooking, industrial processes and mobility). Biomethane, a 100% renewable and produced locally from organic waste, perfectly suits the distribution network and seasonal energy uses, as it is easy to store for months at low costs in the existing gas storage facilities.

2. Contribute to the development of renewable energies at a controlled cost, by making available the storage capacities and flexibility of gas infrastructures

During the cold winter months, the energy peak demand increases, and it is of utmost importance to count on resilient networks with the adequate capacity to relieve the electric system, inflexible by nature and experiencing significant commissioning and growing intermittent supply. By allowing coupling of energies and making available the storage capacities and flexibility of gas infrastructures, smart gas grids can meet this challenge. They are efficient to balance energy consumption, at a controlled cost.

Upstream, smart gas grids facilitate the integration of electric renewable energies in the network, by exploiting the flexibility and inter-seasonal storage potential of the natural gas infrastructure. Technology such

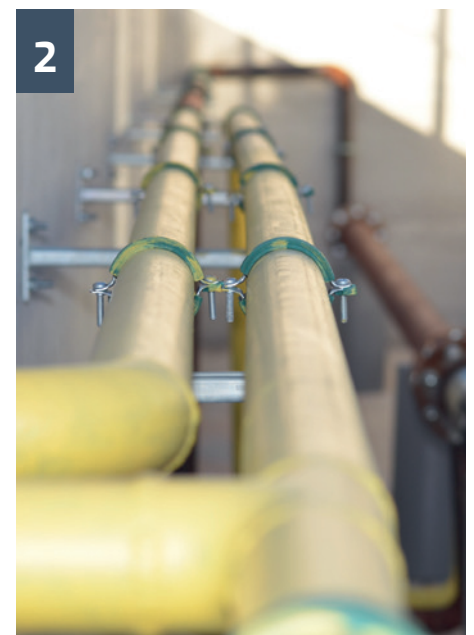
as power-to-gas creates a bridge between the electricity grid and the gas grid via the hydrogen vector. Thus, methanation (power-to-methane) presents great synergies with biomethane injection in the existing grids and the promising development of hydrogen production.

Downstream, smart gas grids offer demand flexibility services through the deployment of smart and controllable hybrid gas solutions, such as micro-cogeneration or hybrid boilers, which consists in a combination of a gas condensing boiler and a low power electric heat pump.

This innovative gas equipment provides competitive flexibility solutions to the electricity network to limit the need for network reinforcement linked to the development of new eco-districts, electric mobility and decentralised renewable energies.



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3. Encourage actions to control energy demand by integrating innovative technologies and making data available

The development of smart technologies, notably in the heating and cooling sector, is a crucial starting point of energy management solutions. Indeed, by supporting customers and regional players in gaining a better understanding of their gas consumption and promoting the integration of solutions that combine performance and comfort for users (connected heating systems, controllable equipment), smart gas and hybrid equipment give customers free access to their energy consumption data and ability to act. To that aim, GRDF has rolled-out smart gas meters, an efficient tool for accurate billing and energy demand management, which allows private individuals and professionals to benefit from daily consumption data.



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4. Offer less polluting mobility solutions by facilitating the connection of renewable gas stations

Smart gas networks facilitate the connection of Natural Gas Vehicle (NGV) refuelling stations, which are particularly suited to heavy duty vehicles such as buses, vans or trucks, fuelled with natural gas. NGV is an economic and ecological fuel, especially compared to diesel, and even more when using renewable gases such as biomethane (bioNGV).



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DIEGO PAVIA
CEO of EIT InnoEnergy

Cleantech start-ups delivering green gas solutions can reshape the EU gas industry landscape and uphold the REPowerEU ambition. Investors need clear market and policy signals

Gas is dead, long live the gas

The unprovoked Russian invasion of Ukraine has significantly impacted decision-makers' priorities and accelerated Europe's need to end its decades-long dependency on Russian coal, oil, and gas. However, investing in new energy infrastructure and intermittent renewables will not suffice to implement the REPowerEU plans and the long-term Green Deal goals. Instead, and notably to reduce the need for fossil baseload, we will need all kinds of energy technologies alongside mainstream renewables - solar and wind - including promising wave and tidal energy, as well as rolling out large-scale electrical energy storage. Biomethane, green hydrogen and other green gases are bound to play a significant role with new, cleantech

start-ups delivering innovative and sustainable solutions.

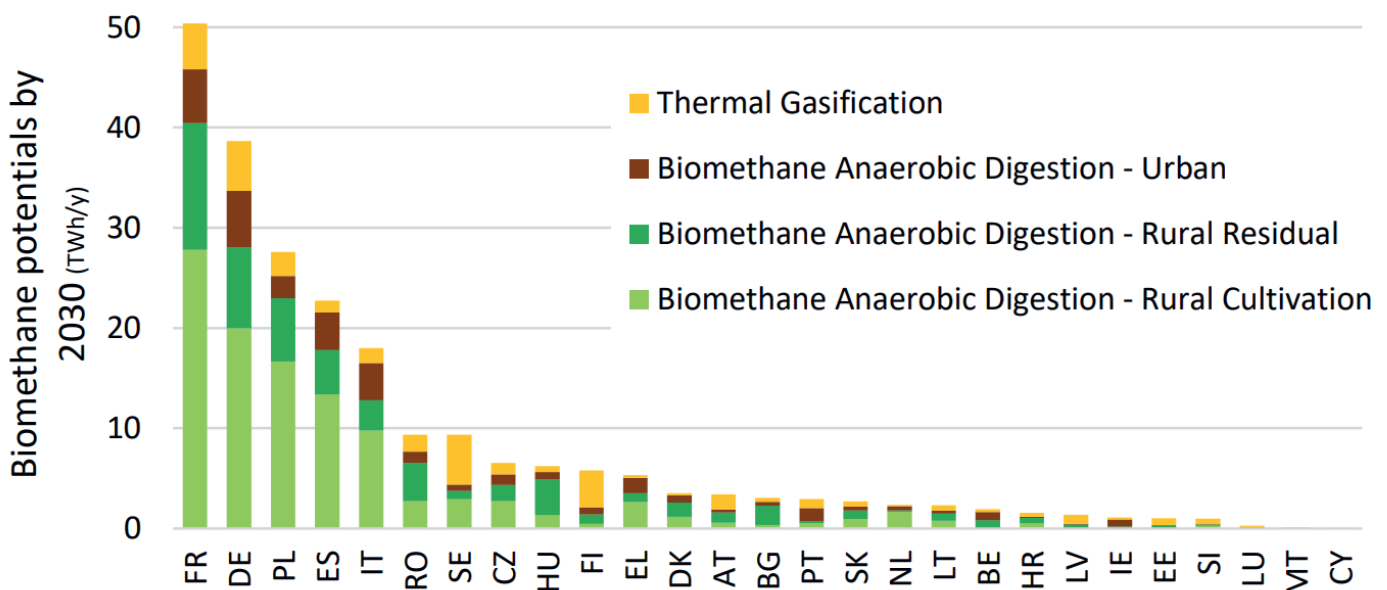
New opportunities

Recent events and European Commission's REPowerEU plan have significantly changed the perception of fossil gas as a transition fuel. They have given renewable gases, such as biomethane and green hydrogen, a new impetus. The increased plan to ramp up biomethane production to 35 billion cubic metres (bcm) by 2030 - a twofold increase of the current EU production - creates many opportunities to reduce our dependence on fossil energy sources. It shall also mean new business opportunities for the biogas value chain. Similarly, the strategic importance of green hydrogen by doubling the EU's green

hydrogen production target previously set out in the European Hydrogen Strategy to over 10 million tons of domestic production gives a strong market signal.

Funding and financing in hydrogen have risen on the back of surging interest in energy sovereignty and the necessity to replace gas and other fossil fuels with green hydrogen in hard-to-abate sectors - mainly in heavy industry, chemicals, long-distance transport and everywhere else where electrification will meet technology or cost barriers. However, to meet the ambitious 2030 REPowerEU targets for a still nascent hydrogen economy and make 10 million tons of domestic green hydrogen production a reality, innovative hydrogen projects must

Source: European Commission, Directorate-General for Energy, Joint Research Centre, Bossmann, T., Cornaggia, L., Vautrin, A., et al., Assistance to assessing options improving market conditions for bio-methane and gas market rules: final report, Publications Office, 2021, <https://data.europa.eu/doi/10.2833/912333>



Biomethane potentials in 2030 by European Member State (scenario with less straw and no sequential cropping)

reach commercial-scale earlier and with a bigger impact. Hence, we must leverage the expertise and capabilities of seasoned cleantech investment experts and use that expertise to facilitate industry-scale hydrogen economy projects. This is the logic behind why InnoEnergy created EGHAC – the European Green Hydrogen Acceleration Center, supported by Breakthrough Energy. EGHAC is well placed to catalyse hydrogen projects bridging the silo mentality between various sectors of the European economy with their value chain approach. It creates industrial players and de-risks and accelerates their green hydrogen (and derivatives) projects and does this through early-stage investment and acceleration services delivered in collaboration with its ecosystem.

No silver bullets

Yet, for making the full decarbonisation of the energy system a reality, also other green gases are needed to meet demand, especially from industry. This is the context in which green gases and, in particular, biomethane become a vital energy source. Capable of displacing as much as 20% of Russian natural gas imports by the end of the decade, biogas - where necessary upgraded to biomethane standards - will play a key role in the energy transition by providing an immediate source of clean energy.

Therefore, EIT InnoEnergy supports start-up companies that are on the front line of this activity. These businesses often have a profound societal impact in rural areas, while improving carbon neutrality and waste management practices within essential food value chains. But not every country in the EU has tapped into the biogas potential equally yet. Germany is the European leader in biogas production, and recently France announced new investments in this sector, coupled with extensive support for biomethane producers. Last year, the country counted 365 installations designed to inject biomethane into natural gas networks, with a capacity of 6.4 terawatt-hours (TWh) per year.

The greening of existing gas infrastructure and creating a well-functioning guarantee of origin scheme should be a European priority. EIT InnoEnergy, as a truly pan-European impact investor, strongly believes that cross-sectoral partnerships including grid owners and energy companies will play a significant role in the successful deployment of biomethane projects across the Union. And innovations will serve as a toolkit to extend the role of existing infrastructure, relying on it rather than making it redundant, and enabling more meaningful involvement of incumbent companies in the energy transition. This is



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our experience with our portfolio start-ups and scale-ups such as [Arol](#), [Deltalys](#), [Naoden](#) or [Enosis](#). Unlocking distributed bio- and waste-derived feedstocks as sustainable, local natural gas substitutes could reduce the burden on the environment, provide additional income in rural areas and become one of the steppingstones on the pathways toward a net-zero Europe. In addition, diverse technological pathways for green gas production (gasification, pyrolysis, biomethanation, etc.) should be embraced, also at an EU regulatory level. Success stories of biogas-to-biomethane purification expert Arol, or small-scale bio-syngas producer Naoden demonstrate how technology and innovation open new prospects for sustainable use of locally available resources, strengthening distributed energy generation role in the overall energy transition.

Much remains to be done. Countries like Germany, the Netherlands, Denmark, Sweden and France are already using meaningful amounts of biomethane. Yet in countries like Poland, the biogas potential is not sufficiently tapped into, and beyond biogas, no biomethane production nor gas grid injection takes place in the country at all. Polish long-term estimates indicate a potential of even 31 TWh, with the use of main substrates coming from waste in agriculture. But the country is off to a slow start. For years this lack of growth could be explained by the gap between the natural gas price and the price of biomethane. However, nowadays, the CO₂ price and supply constraints give biomethane a competitive edge, and European funding - as well as the boosted targets for green gases - further incentivise biomethane project development.

Creating a European biogas economy for the long-term

A long-term and robust strategy to support innovative technology companies in the biogas sector should be at the centre of the ongoing energy transition planning and discussions. Ambitious policies and aspirational targets mean clear signals for investors and translate into tangible business opportunities for solution providers and energy companies alike. At the same time, the EU must give a clear signal that the use of biogas to decarbonise crucial sectors, especially industry, is a long-term solution beyond 2030. With high CAPEX costs for biogas plants, investors and companies would otherwise not make the decision to start projects. This will support faster technology implementation but will also create an economy of scale, enhance economic growth in the sector and create high-value-added jobs.

As outlined above, it remains crucial to tap into the local potential of waste streams for biogas production. Waste streams, such as food or biomass residues, that are currently not used for energy purposes and would end up in landfills make up a feedstock that has to be tapped into. Therefore, the proposal in REPowerEU that the Member States should assess their local biogas potentials as well as identify their application areas will make sure that countries are aware of their feedstocks and that an adequate strategy for each region is drawn up. Only with such analysis and detailed national biogas strategies is the 35bcm target a realistic one.



MICHAEL BLOSS

MEP (Group of the Greens/European Free Alliance - Germany), Member ITRE Committee

Caution: Ending fossil addiction will benefit us all

Our society is addicted. Our whole system is dependent on burning fossil fuels, mostly stemming from outside Europe. Putin's war in Ukraine exposed the geopolitical path dependencies that such a system can have. The suffering of the Ukrainian people teaches us: Climate policy is security policy and vice versa. We Europeans realized that we need to renew our fuel infrastructure quickly, **but we must not replace fossil path dependencies on Russia with new ones. Europe must expand its own fuel infrastructure and it must put us on the right track towards climate neutrality.** Only then can we end our fossil addiction.

I consider three steps to be crucial for quitting. We must provide the infrastructure for the mobility of the future first. This process has to be accompanied by suitable policymaking to cope with the adequate speed the climate crisis sets for us. Those efforts are going to be useless however, if the European Union does not manage to push the energy transition, the overarching prerequisite to develop a fuel infrastructure that is self-sustaining, independent and climate neutral.

E-mobility has been agreed to be the technology of the future when it comes to decarbonizing road transport. Effective climate policy and decreasing fuel dependency must begin here as the sector accounted for over 25% of all European CO₂ emissions in 2018. **To enable a smooth transition, a standardized charging infrastructure for electric vehicles presents the essential first step.** Within the Industry Committee I negotiated for a Europe-wide supply of e-charging stations by 2025, 5 years prior to the Commission's initial proposal. This network will be built within the next 3 years and cross a crucial checkpoint to achieve climate neutral mobility. Charging plug-ins for the vehicles are going to be standardized while refueling will be possible by

cashless payment without a myriad of apps per provider. Transparent pricing policy will be mandatory for operators and will make consumer payments for recharging as easy as possible. In the end, this will not only be an advantage for consumers, but also for the manufacturers. In addition to standardized charging stations and systems for electric vehicles, producers can now also look forward to a stable pricing policy. That way, we have taken an important **first step and are rapidly creating the infrastructure necessary for climate neutral mobility of the future.**

The climate crisis urges us to act with extreme haste. Summer has not even started and the first heat wave with drinking water rationing, crop failures and energy problems has already hit us. There are only a few years left until we exceed the CO₂ budget set by the Paris climate goals. This calls for change. A second step thus involves setting economic and political guidelines to accelerate the change necessary to become climate neutral. Some car manufacturers have already arrived where we have finally decided to go politically: **The official date for the end of the combustion engine in 2035.** This decision was important because it sets a clear mark: in just over 10 years, no car with a combustion engine will roll off the production line in the future. By incentivizing and setting clear-cut targets, we can create planning security for industry and citizens while ensuring to stay within the time frame the climate crisis sets for us. But where does the green energy come from?

The green energy transition lies at the core of all this in a third and most essential step. We must boost renewable energy generation on the one hand, but also create an extensive and resilient European energy grid that can provide the electricity needed to meet peak loads and store electricity in

times of overproduction. Solar and wind generation are the energy systems that will fuel the new infrastructure. Building a European super grid is going to be essential to harness the power of renewables. The Commission proposal called *REPowerEU* goes in the right direction here. A European solar obligation, a rebuilding of the European solar industry, higher targets for renewables till 2030. This is necessary, but must not be paid for by climate pollution. If we really want to become energy independent and offer Europe's charging infrastructure with 100% green electricity in the future, we need fresh money - a European energy independence fund. The energy transition does not come for free.

Developing an alternative fuel infrastructure for Europe bears enormous benefits for the continent, its people and nature. Synergies will arise and can be used as the electric mobility transition and the development of a European electricity grid go hand in hand. We must strengthen key domestic industries and therefore save and create millions of jobs in renewables within Europe. The cessation of European use of oil, coal and gas will ultimately benefit everyone and will decrease our dependence on autocrats and war mongers. Since the beginning of the war, our fossil fuel dependency has flushed over 60 billion Euros into Putin's war chest. **More sun and more wind thus ultimately imply more peace.** Quit fossil fuels now, means benefits for all in future.



DENIS BONVILLAIN

Head of EU Public Affairs at Veolia

Biogas and biomethane are key partners to decarbonise territories while diversifying Europe's gas supply

Renewable gases are already playing a major role in remedying the current natural gas supply crisis. They include biogas (resulting from the digestion of organic waste in the absence of oxygen made up of 65-70% of methane and CO₂) as well as biomethane that has been upgraded from raw biogas and that can be injected into existing natural gas grids or used as biofuel for mobility. **Zooming on biomethane, according to the European Biogas Associations (EBA) latest estimates: the 2030 annual production potential is estimated at 370 TWh which represents a GHG saving potential of 128 million tons of CO₂eq; and the 2050 potential at 1,000 TWh which represents a GHG saving potential of 345 million tons of CO₂eq.** This major production and GHG saving potential could not be disregarded and should be fully exploited across Europe given the current unstable geopolitical and climate-stressed context we are all living in.

Veolia has been one of the most important facilitators of the deployment of local scale biogas production and use. We offer our clients - both public and private - a variety of solutions that enable the implementation of the circular approach at territory scale as well as increase resilience when faced with unprecedented crises such as the one we are witnessing nowadays. Biogas can be generated in various manners and in various sectors, including capturing methane from landfills and digesting residual sludge from wastewater treatment plants (methanisation). It is a source of renewable energy that can take the form of a gas re-injected directly into the grid, be captured and recovered in the form of electricity (Veolia produces 1.2 million MWh of electricity from over 14 million metric tons of landfill waste annually), heat for district heating networks in cogeneration facilities, as well as a low-carbon biofuel (BioLNG).

In 2022, Veolia together with industrial partners commissioned [one of the largest biomethane production units in Europe](#), and France's largest biomethane production facility in Claye-Souilly in the Île-de-France region¹. This fully automated and remotely controlled production unit recovers and treats the biogas from landfill waste to transform it into biomethane which is then reinjected into the existing gas network. The biomethane produced on this site is competitive thanks to a feed-in tariff granted by French authorities to this type of installation. **When fully operational, the facility will produce 120 GWh of biomethane annually - the equivalent of the annual average consumption of 20 000 households or 480 buses fuelled by BioLNG - and will avoid approximately 25,000 tonnes of CO₂ annually.**

In Bulgaria, Veolia is operating the wastewater treatment plant of Kubratovo on behalf of the city of Sofia. In 2009, a new cogeneration system was installed in order to use the biogas produced from the methanisation of sewage sludge. The aim was to optimize the operation of the plant and its energy efficiency as well as to reduce carbon emissions. To further improve its performance, the cogeneration system has been modernized in 2019, aiming at becoming 100% energy sufficient in the coming years, relying only on the renewable energy produced on-site. **Since the commission of the cogeneration installation in 2009: 198 million kWh of renewable energy were produced; 92 million m³ of biogas were consumed, and 1, 080 tons of CO₂ emissions were avoided.** This local energy loop provides several benefits for the city of Sofia (greener

city, cost efficiency), for the territory (protecting the environment by recycling waste, reduced carbon emissions), but also for the community (on-the-job training ground for young engineers).

That makes Veolia one of the world's fast movers of biogas production, with primary energy resources of almost 6 TWh. A world leader in ecological transformation, we aim to accelerate the production of biomethane from waste and water treatment, and thereby contribute to the energetic autonomy of territories, communities and economic activities. In this journey, we are working hand in hand with gas network operators who are a key link in the development of biomethane projects, in particular by approving connections to the grid. We therefore support setting out EU-wide rules enabling quick and affordable grid connection of biomethane projects. Moreover, the biomethane sector represents an important source of future job creation², which by nature cannot be delocalised outside Europe.

Yet, to reinforce our abilities to support our clients (cities, territories, businesses) in their transition towards greater energy independence and security as well as their efforts to stave off climate change, we need a stable, predictable and most of all, ambitious policy framework for the promotion of biogas and biomethane at EU and national levels. This framework needs to comprise clear and ambitious intermediary targets (for 2025,

² Conducted under the aegis of the French Ministry of Labor, Employment and Integration, [a prospective study on employment and skills in the gas, heat and associated energy solutions sector](#) highlights that the sector will represent up to 401,000 sustainable jobs by 2030. 170,000 new hires are expected in gas production (including hydrogen, biomethane and biopropane) and in energy services (renovation, installation, operation maintenance of equipment and facilities).

¹ Veolia already produces a total of 1.4 TWh of biogas in France, equivalent to 10% of the French biogas production target set out in the 2023 Multiannual Energy Plan.

2030, 2040 and 2050 horizons) and appropriate incentive mechanisms to ensure cost-competitiveness of biogas and biomethane production. This would require Member States to develop national strategies on the role of biogas and biomethane in cooperation with the relevant stakeholders, to create a long-term policy framework for the development and support of the biogas and biomethane value chain.

In this sense, France can be seen as a genuine model: recently, the country set a target of 7% of biogas consumption "in the event of a drop in the cost of production" by 2030, or even up to 10% "in the event of a higher cost reduction", i.e. 39 to 42 TWh³. The government roadmap provides for 6 TWh of biomethane to be injected in 2023, and between 14 TWh and 22 TWh by 2028 (up from the current capacity of 6.4 TWh). New biomethane production facilities are eligible for a regulated biomethane feed-in tariff of between 52 and 140 euros per megawatt-hour. Last but not least, the government raised the level of support for the costs of connecting biomethane to natural gas networks - the connection costs to natural gas networks will be borne by the community at 60%, instead of 40%. France's biomethane production potential could even be more

³ The equivalent of half of what the country imports from Russia.

effectively tapped if co-digestion of solid organic waste with sewage sludge would be authorized, like in many Member states. Despite all this, the French context remains a perfect example of how public policy can drive optimistic market development that will benefit individual consumers as well as entire territories, while helping reduce the overall carbon footprint. This example can be replicated in other Member states where the biogas market is quasi inexistent, with specific guidance and devoted resources - including funds for innovation and R&D - coming from the EU.

With the adoption of the [REPowerEU Plan](#) published on 18 May 2022 in response to the war in Ukraine, we are glad to see the intention of the European Commission to pursue its strategy to replace the EU's reliance on Russian fossil fuels through a massive scale-up in renewable gases, electricity and fuels in power generation, industry, buildings and transport. **We very much welcome and support the Commission's promotion of biomethane production materialized by the ambitious target of reaching 35 bcm annual production by 2030 (eq to 370 TWh), which is achievable according to the recent [study](#) from Gas for Climate consortium. However, we call on the European Commission to anchor this target into legislation - for example by placing it in the revised Renewable Energy Directive - to send an even stronger message**

to the biomethane market and value chain. This market needs a clear target but also governance to pave the way to the required deployment of solutions, adequate policy framework and needed investments. For that reason, Veolia is committed to taking an active role in the upcoming Industrial Partnership on biomethane to be launched during Autumn 2022.

While there are clear indications that biogas production becomes more and more competitive⁴ - especially given the fact that we are probably entering a long period of high gas prices - still, to increase the capacity of its production in the EU and promote its conversion in biomethane, estimated investments need to amount to 36 billion euro by 2030. That means that more and better financing tools will have to be mobilized, from public and private sources to achieve our ambitions. **That is why we call on decision-makers to also design adequate financing tools, in consultation with relevant stakeholders, to enable fast and widespread deployment of biogas and biomethane projects in Europe. Veolia is fully prepared to contribute to this collective effort to diversify Europe's energy mix while breaking off our dependence on gas deliveries from outside Europe**

⁴ See: "[Gas Crunch: time to factor in volatility and externalities to reveal its true costs](#)"



Wastewater treatment plants are strategic assets to produce biogas and biomethane for local needs, across Europe. Here the Kubratovo wastewater treatment plant operated by Veolia on behalf of the City of Sofia (Bulgaria)

**ANDRIS PIEBALGS**

Part-time Professor at Florence School of Regulation, former EU Commissioner for Energy

**MARIA OLCZAK**

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Methane emissions mitigation serving the security of gas supply¹

The European Union is facing the worst energy crisis since the 1970s. The spiking energy prices and worries about reliable supply fuelled by the invasion of Russia in Ukraine have revived discussions and calls to end the EU's dependence on fossil fuel imports from Russia. Achieving the EU's energy independence will require considerable effort and time. One of the immediate options is to increase the efforts to avoid methane emissions in the fossil fuels value chain.

The upcoming EU Methane Regulation² will provide an essential regulatory tool both for limiting climate change and increasing the efficiency of the use of fossil fuels. As the EU isn't a major producer of fossil fuels, we can't expect a substantial contribution to the gas supply. Still, the increased efforts to capture and use methane emissions will serve in using methane emissions from agriculture and waste sectors. As methane is a highly potent greenhouse gas (GHG), the capture and use of methane emissions serve well to avoid climate crisis and strengthen the energy independence of Europe.

In mid-May 2022, the European Commission unveiled the [REPowerEU](#) strategic document enlisting measures to both drastically reduce EU dependence on Russian fossil energy supplies and accelerate the clean energy transition. As one of the measures on gas specifically, the EU Commission has suggested over a tenfold increase in EU biomethane production, from the current ~3 billion cubic meters (bcm) to 35 bcm by 2030, doubling the

biomethane production target suggested in the Fit for 55 Package, published last summer.

To this objective, the EU Commissions unveiled several measures in the [REPowerEU Plan](#): to establish industrial biogas and biomethane partnership, encourage the establishment of energy communities, provide incentives for biogas upgrading into biomethane, promotion of infrastructure upgrading, R&D funding and facilitate access to finance via Connecting Europe Facility (CEF), Cohesion Policy, Recovery and Resilience Facility (RRF) and a Common Agricultural Policy.

Although higher gas prices could incentivise biomethane production in the short term, additional measures will be necessary to reach the 2030 target. To make biomethane more cost-competitive vis-à-vis natural gas in the longer term, the [International Energy Agency](#) (IEA) has suggested putting a value on methane emissions (which would otherwise be emitted from the decomposition of organic waste in the agriculture and waste sectors) avoided. Some jurisdictions already allow such possibility, i.e. offsets generated by installing the anaerobic digesters can be used for compliance under the [California-Québec Cap-and-Trade system](#).

This could be an interesting option for the EU to support the achievement of its [Global Methane Pledge](#) commitment to contribute to a 30% reduction by 2030 compared to 2020 levels across all man-made sources. Agriculture and waste are the major sources of [methane emissions in the EU](#), accounting for almost 80% of total EU methane emissions. Moreover, boosting the biomethane production from agricultural wastes and residues would also help to reduce GHGs in the sectors, which for the time being, have not been at the forefront of the EU climate efforts. Methane constitutes a significant part of total GHG emissions in agriculture and waste, accounting for 54% and 88% respectively.

The EU circular economy strategy has already recognised an essential role of biomethane production via anaerobic digestion in reducing GHG emissions. Hence, the EU circular economy framework could help boost biomethane production by alleviating energy security concerns. But it requires better policy coordination in four focus areas: (a) the development of a measurement, reporting and verification system of methane emissions from the agriculture and waste sectors; (b) continual improvement of best practices to mitigate methane emissions, e.g. by introducing further requirements concerning landfill gas management; (c) production of biomethane from sustainable sources; and (d) responsible operation of biomethane plants minimising potential methane leaks.

The accelerated transition to the circular economy could help to address climate change threats and energy security concerns. Achievement of the European Green Deal will not be possible without reducing the methane emissions dominating GHGs in the agriculture and waste sectors. Captured methane could also provide a clean source of EU-produced energy. While some regulatory steps were already made in the waste sector in the 1990s, in the agriculture sector, we are still at the beginning.

Globally, a step change could be achieved by putting activities and targets to mitigate methane emissions from all sectors under Nationally Determined Contributions (NDCs). This would provide a more focused and stable policy framework. At the regional/national level, regulatory framework incentives to promote biogas and biomethane production are needed because these low carbon fuels compete with fossil fuels. An increased carbon price or putting a value on abated methane could be helpful, but more efforts are needed to monitor the sustainability of biomethane value chains.

1 The article is based on the recent FSR Policy Brief written by the authors: Olczak, Piebalgs (2022) [Energy security meets the circular economy: a stronger case for sustainable biomethane production in the EU](#). Issue 2022/34, April 2022.

2 Proposal for a [regulation](#) of the European Parliament and of the Council on methane emissions reduction in the energy sector and amending Regulation (EU) 2019/942, COM/2021/805 final.



SEAN KELLY

MEP (EPP Group -Ireland),
Member ITRE Committee

The role of renewable gas in building efficiency

There can be no doubt; we are in a pivotal decade in the fight against climate change. Europe is rightfully a climate leader, but the challenges cannot be overstated nor the enormity of the task more broadly.

The Fit for 55 Package essentially aims to drive an ambitious systemic change in how we produce, consume and store energy. It is clear that addressing sustainability challenges and climate change will be central to the future growth of our economy, as the cost of inaction now will be far exceeded by the costs involved with adaptation, never mind the social and political instability this would create.

The past few years have not been shy in presenting a series of incredibly difficult challenges. The pandemic has affected the economy and society in ways we are still coming to terms with and we remain in a Brexit groundhog day, but Vladimir Putin's callous war in Ukraine has caused a fundamental shift in European energy policy.

Considering the massive contributions to the EU's climate and energy targets, the building and construction sector has seen a marked difference in public attention as a climate solution. Buildings are addressed directly and indirectly via several elements of the legislative ecosystem that is the Green Deal.

The Energy Performance of Buildings Directive (EPBD) is the main EU legal instrument in this area and introduces new standards for energy performance to decarbonise the building sector, with changes to definitions of energy performance standards, revisions to national building renovation plans and a new requirement for life-cycle emission calculations for new builds.

Ensuring the success of the Renovation Wave will essentially come through five interlinking factors: the money to pay for renovations, the workers to do the work, the supply of materials, an overarching secure regulatory framework to incentivise building owners to undertake

renovations and decarbonisation of the energy system.

We need to see a coordinated and clear effort by the Commission and Member States to address the issue of skills. Member States must invest in capacity building, technical assistance and on upskilling and reskilling policies to realise the twin transition of a green and digital transition.

The Commission in the REPowerEU plan has proposed to establish an EU Solar Industry Alliance and a large-scale skills partnership. This in my view should include much more of an emphasis on an EU skills initiative that enables intermediaries such as installers, architects or contractors to advise, prescribe or install relevant solutions for energy efficiency programmes and a decarbonised building stock. Some actions have been taken under the Pact for Skills, but unfortunately, I remain underwhelmed at their progress.

To complement electrification and the intermittency of renewable electricity sources, renewable and low carbon gases used efficiently with the likes of cogeneration will be needed for hard to decarbonise buildings, where an existing gas network can be decarbonised effectively and alternatives such as electrification are not feasible or cost-effective.

In the majority of cases across the Union, full electrification at individual level and district heating from renewable sources will be the most beneficial option, taking into account efficiency, reliability and cost. In this sense, the main role for biogas and hydrogen will be to balance the electrical grid and the district heating as well as being a direct source when electrification is not technically or economically the best solution.

However, in reality, the build environment greatly varies across the EU and represents an expression of cultural heritage and a visualisation of a region or country's history. We all are at different starting points with different complexions of infrastructure (physical and

administrative) and capacity, making the need for balanced mix of modern technologies all the more important, especially for renewables ready heating technologies.

We must keep the overarching goal at the core of any plans; in this case, we should seek to ensure the system is energy efficient and that will need to incorporate gas solutions. There will be excess pressure on the system at peak times and to manage a sustainable (and affordable) energy transition all renewable energy production, storage, grid capacity and possible synergies should be readily utilised.

Renovation roadmaps for decarbonising European heating and cooling in buildings must include diversification of energy supply towards higher uptake of renewable energy sources, including efficient use of renewable gases. The EPBD must reflect this simple reality.

For zero-emission buildings (ZEBs) for example, in the Commission proposal (in addition to energy efficiency requirements) the current definition states the need for energy from renewable sources generated on-site, from a renewable energy community or from a district heating and cooling system.

There are opportunities to ramp up domestic supply of renewable gases, but we must also do this in conjunction with the municipal and agricultural waste recycling and industrial sectors.

This is too restrictive, ZEBs should be able to meet minimum energy needs by being able to use renewable energy irrespective of the grid used, the market player involved or the distance to the renewable energy sources.

Without providing such options to Member States, we risk imposing unnecessary cost and not utilising existing infrastructure efficiently. All of which will have a direct effect on the cost of the transition, that ultimately will be passed on to the end consumer in some fashion.

The goal is to decarbonise the building stock and every technology that can deliver on this should be considered.



BERNARD VANHEULE

EU Affairs Director, Costa Group

The role of gas in the decarbonization of maritime transport

Becoming carbon neutral by 2050 is a necessity for human mankind.

The EU pathway to decarbonize our economy by 2050 brings us also to a more near-term deadline: 2030.

The EU leadership in decarbonizing is translating this near-term objective by a legislative package call "Fit for 55", in other words the objective to reduce our GHG emissions in Europe by 55% by 2030.

If becoming carbon neutral is a necessity for human mankind it also means that all sectors need to do everything they can to reach this 2030 objective. Including shipping.

But what is the potential "role of gas in the decarbonization of the maritime transport"?

Let me address this maritime dimension firstly, and the issue of fuels and energy secondly.

First and on the maritime dimension, it is worth reminding the role Costa Group is playing. We are a key European cruise operator (our 25 vessels fly all a European flag – Italian –; they are all built in European shipyards; and Europe is a key destination) with ambitious projects towards decarbonization.

Decarbonization efforts are not new at Costa Group: our first ship fully operated with LNG (Liquified Natural Gas) was ordered back in 2015, i.e. seven years ago. Since then we worked with authorities to pave the way to the introduction of LNG for the cruise industry playing a key role and supporting all the involved stakeholders to create the conditions to make this happen.

Additional initiatives were undertaken to deploy our capacity to increasingly contribute to the decarbonization objective: investments in plug-in devices for shore power; in batteries development; in fuel cell development.

We even have a concept ready for the first zero-emission cruise ship to be delivered in a decade.

As a maritime leader in decarbonization efforts we have ambitious objectives. And for turning ambitious objectives into realities, both industry and regulators have to take the actual realities of this world into account as not all modes of transport have the same features and what fits for one mode of transport may not fit for another. This was actually well reflected in the "Fit for 55" impact assessment.

The impact assessment highlights that shipping is one of the most challenging sectors to decarbonize. And changes in ship design will not be sufficient to reduce GHG emissions to the magnitude needed. In fact, one can say that more than 2/3 of the GHG emissions reduction in shipping will directly depend on the availability of alternative fuels on the bunkering market.

On top of that, and as still highlighted by the "Fit for 55" package's impact assessment, not all alternative powers fit all modes of transport. Batteries systems available today can perfectly support the automotive industry but are not able to provided the needed energy for the propulsion of a cruise ship

The availability of alternative fuels will hence be critical for decarbonizing shipping.

In the long term, i.e., beyond 2035-2040, E-fuels, the so-called synthetic fuels made of renewable electricity, are expected to be available at scale and play a crucial role.

But what about the near term between 2022 and 2035 and potentially beyond?

It is crucial then to bridge from this period to the next era and that we take advantage of the most advanced related technology available today, i.e. the natural gas. The importance of gas to support that transition

was recently recognized by the "RePowerEU" Plan presented mid-May by the EC.

In shipping, natural gas plays a significant role under LNG format: Liquified Natural Gas. With LNG, ships can now reduce their SOx and NOx emissions by 100% and their CO₂ emissions by 20% as measured on a full lifecycle (Well-to-Wake) basis, compared to conventional fuel oils. Even the methane slip issue is increasingly addressed with engine solutions available today, which have almost no slip (half of the new build orders of vessels used in deep-sea shipping). For others, manufacturers have identified pathways to virtually eliminate it by 2030.

LNG is not an objective *in se*, as LNG is a fuel of transition: the beauty today with LNG is that this fuel and the existing related technology and infrastructure, will support the deployment of bio-LNG and E-LNG, later on. LNG-fueled ships can use bio-LNG and renewable synthetic LNG (e-LNG), produced from renewable electricity, without any modification as they are fully fungible drop-in fuels. Similarly, ships can be supplied with bio- and synthetic LNG using the same LNG storage tanks and transportation infrastructure. This is a significant advantage to avoid stranded assets in vessels and in land infrastructures.

Gas and in particular bio-gas and e-gas will play a crucial contribution in the decarbonization of shipping, side by side with other developments. As such they deserve a faire place in the maritime related provisions of the Fit for 55 legislative package.



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MEP (Renew Europe – France),
Member DEVE Committee

Making maritime transport more sustainable

In the transition towards a more sustainable and independent European maritime transport, which role should we give to gas? Ideally, it should not take centre stage.

Gas is a fossil fuel that pollutes, destroys marine and coastal ecosystems, marine biodiversity and has an impact on human health due to its GHG emissions. Moreover, it creates dependence on other countries such as Russia, the United States, Qatar or Saudi Arabia which have large natural reserves and supply numerous European countries. In addition to the pollution directly caused by the transport of energy, energy independence is a key element to ensure food, energy and geopolitical security throughout Europe.

Needless to say, gas is not a sustainable energy source for the maritime sector.

Strongly committed to the ecological transition, the European Union has set itself the objective of achieving carbon neutrality by 2050 with the implementation of the Green Deal. To reach this ambitious goal, a set of legislative texts gathered under the "Fit For 55" package are currently being negotiated to clearly put forward a variety of measures adapted to each sector, including the maritime sector.

The regulation on the use of renewable and low-carbon fuels in maritime transport - also known as Fuel EU Maritime - is currently being negotiated in the European Parliament

and has already been adopted within the Environment (ENVI) Committee.

It is clear that an immediate and radical stop to the use of gas is not an option. Ships, as they are currently built, rely on fuels such as oil and gas to operate, given their gross tonnage. If the challenge towards a gas-free transition is heavily linked to the aerodynamics of future ships, a first step lies in the energy mix and the direct use of renewable energies, such as wind propulsion (that should reduce emissions about a third).

I am deeply convinced that strengthening support for research is an essential step towards improving the energy efficiency of ships. This will enable the development of emerging and future innovations, and technologies that respect the principle of neutrality, but also alternative fuels, eco-design, bio-based materials or wind propulsion.

The creation of an Ocean Fund - as part of the text on emissions trading and included in Fuel EU Maritime - will be a valuable tool to support these innovations. It will also help restore biodiversity damaged by cargo ships and the use of fossil fuels.

I am not trying to minimize the magnitude of maritime transport and its role in the global economy, but I simply believe that it is possible to build differently, more sustainably.

The direct use of renewable energies must be further encouraged, including the

use of marine propulsion. The current construction of the *Canopée* ship designed by 'Zéphyr et Borée' and built in Poland by the shipyard Neptune from the Netherlands for the European Ariane Group, is an interesting example of what can be done in terms of energy mix in Europe, which could emerge as the champion of the green ships if we strengthen our cooperation.

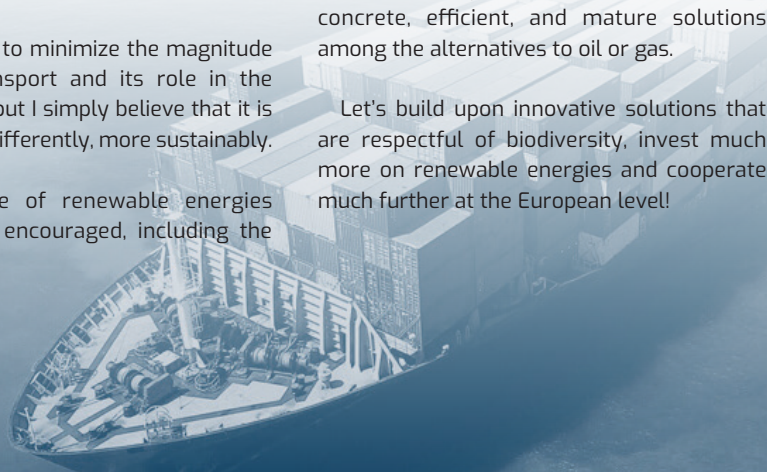
Indeed this 121-meter cargo ship will transport Ariane 6 rocket parts to French Guiana. It is a real push towards decarbonisation. Manufacturers are betting on wind propulsion coupled with an LNG engine. Direct use of (?) wind propulsion is made possible by rigid, thick, fully automated wings.

Wind remains an unpredictable energy, but it can reduce the consumption of fossil fuels by 20% to 40%.

I sincerely believe that the increased use of renewable energies is not only the way towards a sustainable and fair transition, but also towards energy independence.

Wind energy remains a very powerful source of energy, which has been used for thousands of years. It is one of the most concrete, efficient, and mature solutions among the alternatives to oil or gas.

Let's build upon innovative solutions that are respectful of biodiversity, invest much more on renewable energies and cooperate much further at the European level!





TUDY BERNIER

Senior Policy Manager at CO₂ Value Europe

Renewable & CCU fuels: an alternative to gas dependency available here & now in Europe

Russia's military aggression against Ukraine has led Europe to rethink its energy policies from both a geopolitical and a climate perspective. In a context where the world's energy system has been massively disrupted, the European Union (EU) is looking for new pathways to reduce its reliance on fossil fuels imported from Russia as well as accelerating the transition towards renewable energy systems. But what about economic activities where direct electrification is not currently possible? This is where carbon capture and utilisation (CCU) comes into play, where captured CO₂ combined with renewable hydrogen leads to renewable fuels that contribute to defossilising emissions and enable the uptake of clean energy across all sectors.

Europe stands at the crossroads of the climate urgency and of a major geopolitical crisis: with rising temperatures caused by the emissions of greenhouse gas ('GHG') emissions and energy insecurity underscored by the Russian invasion of Ukraine, EU leaders need to address both issues at once and fast.

Towards a renewable and low carbon European energy system

By adopting the EU Green Deal and giving it shape through its [Fit-for-55 proposals](#), EU authorities have been making carbon neutrality a clear horizon for the continent.

The first step to take is clear: slashing CO₂ emissions, as much as possible, wherever possible and whenever possible. It means moving away from fossil fuels like coal & oil. Some consider natural gas as playing a transitional role in climate mitigation, but as the invasion of Ukraine has shown, relying on gas means relying on outside fossil resources and seeing the independency and ability for the EU to transition to clean energies diminished. This is why building a renewable energy system in Europe is more urgent than ever.

The European Commission strongly reaffirmed this objective when publishing on 18 May its [REPowerEU Plan](#), increasing targets to reach 45% (from 40% in its initial proposal) of renewable energy to be used in Europe by 2030. This new direction is the right one: direct electrification and use of renewable energy is one of the most efficient course of action we can take right now.

Europe is absolutely right to put on track policies to scale-up renewables fast. But the story doesn't stop there.

What can CCU fuels do?

Direct use of renewables is the way to go to defossilise our economy. But what about sectors that can't be electrified immediately, or at large scale? What about steel, cement, chemicals producers which represent 14% of emissions in Europe and can't electrify production? What about aviation (4% of EU's CO₂ emissions) & shipping (4% as well) operators that won't be able to have their fleets running on renewable energy, at least in the current infrastructures and technologies? Should they turn to gas as an alternative?

Our answer is clear: even if gas could play a marginal role in transitioning from coal and oil, it remains a fossil resource and our collective objective should be to move away from fossil resources altogether and avoid investing into yet another fossil dependency.

There is a clear alternative, and it is fuels made from carbon capture and utilisation (CCU).



3 PATHWAYS TO ACHIEVE CLIMATE NEUTRALITY

1 Increase energy efficiency

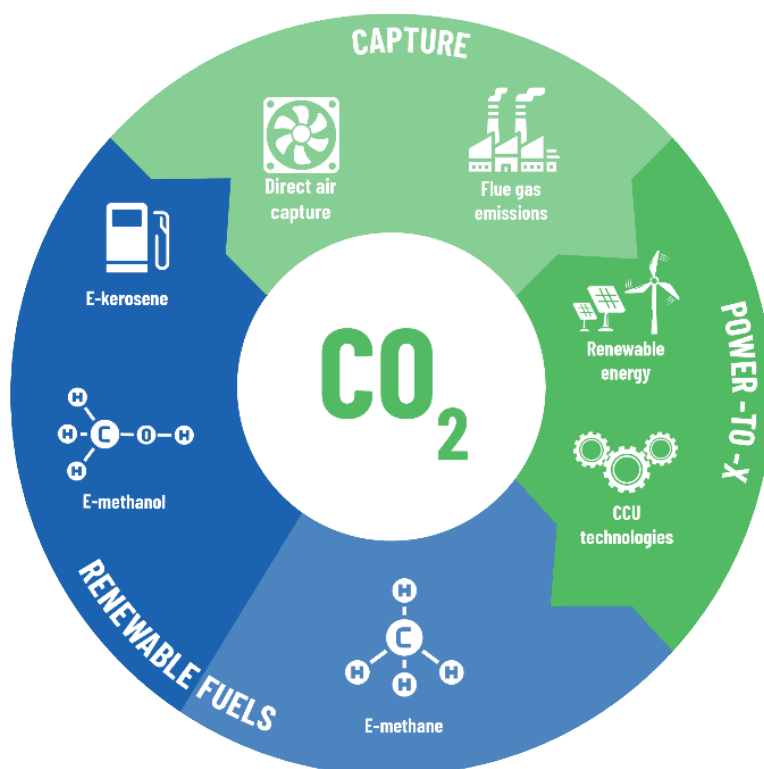
- ▶ Reduce the amount of energy use per service or process.

2 Electrification

- ▶ Electrify whenever possible with renewable energy sources.

3 Need for renewable fuels

- ▶ For sectors that cannot use electricity directly.
- ▶ CCU fuels offer drop-in solutions.



CCU is a broad concept that includes all technological and industrial processes that capture CO₂ from industrial emissions or directly from the air and convert it into a wide range of products that can replace fossil-based products, often with the use of renewable electricity. Through CCU, CO₂ is becoming a solution of providing an alternative carbon feedstock and not anymore a problem.

This process is also referred to as Power-to-X: it means converting renewable electricity into products or in other words storing electricity into products such as fuels and chemicals. It can be Power-to-Liquid (e.g. kerosene) or Power-to-Gas (e.g. methane). Regardless of the end product made, Power-to-X is about producing drop-in solutions for hard-to-abate sectors by providing them with cleaner energy, for example CCU fuels.

Such CCU fuels (also known as e-fuels), are formally defined in EU legislation as RFNBOs¹, must provide at least 70% GHG emission savings compared to conventional fossil fuels and can help industry and transport reach carbon neutrality.

By combining green hydrogen with CO₂, we create fuels that are easier to transport and store, and that can bring cleaner energies to sectors that can't use directly renewable hydrogen or renewable power.

In practice, it means CCU fuels are playing a crucial role to decrease our dependency

on fossil resources, including coal, oil & gas. Recent studies show that CCU technologies in their entirety could reduce net CO₂ emissions with an estimated potential up to 8 Gt of CO₂ utilized per year by 2050², which is equivalent to approximately 15% of current global CO₂ emissions. The estimated potential for the scale-up of CO₂ utilisation in e-fuels varies from 1 to 4.2 Gt CO₂ yr⁻¹.

In addition, CCU fuels can be used without requiring significant modification of existing production, distribution and use infrastructures. In other words, they can be produced, transported and used at large scales here and now. When Europe is looking for alternatives of natural gas, it doesn't need to look any further other than supporting the production of e-methane, produced from CO₂ and renewable hydrogen; the same molecule and a one-to-one substitute of natural gas.

What can Europe do to fast-track the uptake of CCU fuels?

EU institutions are in the midst of negotiations about new rules and quotas for the uptake of CCU fuels.

In the revision for the Renewable Energy Directive, the Commission proposes for renewable fuels to represent 2.6% of the total energy supplied to transport by 2030. In the REPowerEU Plan, the Commission goes

even further and calls to increase that target to 5%. The revision also imposes for RFNBOs to represent 50% of the hydrogen used in industry by 2030, and REPowerEU calls to increase that target to 75%. This is a major signal sent to the entire EU industry and transport operators: CCU fuels are becoming a must in the energy transition.

The new proposals on air and maritime transport are introducing specific targets on GHG emissions reductions and even specific targets for CCU fuels: for aviation, synthetic aviation fuels will need to represent 2% of the total kerosene used in 2030, 15% in 2040 and 40% by 2050. It means the EU is creating a market for renewable fuels and it will need to develop fast. In shipping, the current proposal only imposes GHG emissions reductions, but we believe similar quotas should be put in place: having CCU fuels targets for shipping mirror the ones from aviation, e.g. 1% by 2025, 4% in 2030 and more would be highly beneficial to develop a market for clean fuels in the maritime sector.

And finally, the Energy Taxation Directive will set up the rules for exemptions for CCU fuels for the years to come.

All the measures proposed go in the right direction and are giving clear signals for CCU fuels to be deployed in Europe. Some can be even strengthened, and this is what the REPowerEU Plan is clearly confirming.

It is time for EU leaders to adopt those legislations and ensure renewable fuels quickly become a new normal, and help Europe regain its energy sovereignty while fast-tracking its climate transition.

² Hepburn et al., 2019, doi.org/10.1038/s41586-019-1681-6

³ Hepburn et al., 2019, Farfan et al., 2019, RAM et al., 2020



HARMEN DEKKER

CEO of EBA (European Biogas Association)

Biomethane's contribution to REPowerEU

On 18 May, the European Commission outlined the details of the REPowerEU plan. It is the categorical response of the EU to break free from Russian energy imports while keeping up with climate targets. The REPowerEU is partly underpinned by the expansion of renewable energy production and use, including biomethane, one of the renewable gases available now and ready for further scale-up.

After the [communication released last March](#), the new package of the REPowerEU provides a set of tools to disentangle the EU from Russian fossil fuels, as well as to boost the EU Green Deal and drive investment to a more sustainable and resilient energy mix. The plan is structured around 3 key areas of action: diversification of energy sources, acceleration of the clean energy transition and increase of energy savings.

In terms of legislation, the plan has put forward a targeted revision of the Fitfor55 energy efficiency and renewable targets. It also proposes instruments to accelerate RES permitting and recommendations to facilitate renewable gas injection. This is a stepping stone to the achievement of climate-targets, the circular bio-economy and security of supply across Europe.

Targeted measures for the biomethane sector

The plan will have a direct impact in the development of renewable gas. Biomethane, together with green hydrogen, is among the ones prioritized by the European Commission in reaching a more sustainable and sovereign energy system. The REPowerEU introduces a Biomethane Action Plan with targeted measures to promote sustainable production and use of biogas and biomethane at EU and national level, as well as the injection of biomethane into the gas grid.

The plan puts forward incentives for biogas upgrading into biomethane, support to innovation and direct access to funds, loans, grants and other financial instruments. It also proposes the setup of a Biomethane Industrial Alliance to mobilise the entire value chain and a specific target for biomethane production: 35 bcm by 2030.

What will this bring to Europe?

The ambition is high, but the target is feasible: Europe is producing today 15 bcm of raw biogas and 3 bcm of biomethane (upgraded biogas) from approximately 20,000 biogas and biomethane plants. By 2030, the proposed expansion will replace 20% of the current fossil gas imports from Russia. Biomethane can be directly injected into the gas grid with no need for large infrastructure investments. It is also a good complement of wind and solar energy, as it can be easily stored and produced at a constant pace, helping balance energy supply from variable renewable energy sources.

Biomethane deployment is also economically viable. Earlier this year, natural gas prices went over €200 and are today around €85. While this happens, biomethane production costs are getting lower. Typical biomethane production costs in Europe range between 55 and 100 €/MWh, depending on location, feedstock, size and setup of the plant.

What will it take to deploy 35 bcm by 2030?

The implementation of the REPowerEU will require a smart combination of investments and reforms starting from this year. The full value chain of biomethane producers, and users, will need to cooperate with public authorities and civil society organisations to identify current bottlenecks and propose solutions for a sustainable scale-up. The sector will need guidance, including relevant

legislative and financial support in the coming years. To meet the 2030 target, the EBA foresees the need for additional capital investments. Europe will need €48 bn to build 4,000 medium-size units and €35 bn to build 1,000 large-scale plants in 8 years. It is a realistic objective: Germany alone built 6,000 plants in 9 years.

Expanding biomethane production is possible using sustainable feedstocks, including waste, agricultural residues and sequential crops. By 2030, the EBA foresees increased feedstock supply for biomethane production from food waste, industrial and urban wastewater and agricultural residues.

Beyond energy security

The expansion of biomethane will not only strengthen energy independence, it will also bring socio-economic and environmental benefits. The EBA estimates that the production of biogas and biomethane has already created 210,000 green jobs in Europe and is saving every year 60 Mt of GHG emissions (CO₂ equivalent).

Additionally, the production of biogas and biomethane is fully in line with the principles of the circular economy. On the one hand, waste is valorised and used as feedstock for energy production. On the other hand, we obtain digestate as a sort of "residue", that we call co-product. Digestate is an excellent organic fertiliser and its use helps replacing energy intensive, environmentally damaging production of mineral fertilisers. This reduces EU dependence on fertiliser imports and helps farmers bring down production costs, limiting food price volatility. Digestate offers also proven advantages in soil restoration and carbon retention. This is just an example on how renewable biogas/biomethane production can complement and support sustainable farming.



SUSANNE PAULRUD

Senior researcher at RISE Research Institutes of Sweden AB/Coordinator of the Bio-FlexGen project

Europe's energy requires both sustainability and flexibility: perspectives from the Bio-FlexGen project

Here in Sweden, just under 70% of the country is covered by forest, according to World Bank figures.¹ Paired with our forestry industry, it means that we get a lot of biomass waste. Over the years we have begun using those harvesting residues for energy without cutting down any additional trees.

According to a report by the International Energy Agency, around 60% of both Sweden's and the EU's renewable energy comes from biomass. The report also mentions that at the moment around 80% of our bioenergy comes from solid biomass.²

Compared to other European countries this source of energy has been established for many years, especially for district heating. Alongside wind energy its role will only increase in the years to come, especially as we move away from nuclear energy.

Although other countries don't talk that much about bio power, it's difficult to imagine the energy transition without it, especially since it's faster to build a biomass plant compared to building new nuclear plants.

While investment in renewable energies from solar and wind are always welcome, their ability to supply energy still fluctuates with the weather.

For a couple of years we have been talking about how renewable energy can be more reliable, flexible, and cost-effective. How quickly can we adjust to changing demand and prices when using biomass to produce power? That's been our goal in the Bio-FlexGen project for a while now. We have this innovative combined heat and power plant (CHP) technology that is very efficient. The plant can be run on both the aforementioned biomass and hydrogen that comes from renewable sources, such as wind or sun.

Our sister project EUCANWIN developed a combined gasification and gas turbine technology.³ The gasification process in this technology is nothing new, rather it is much more efficient. We will get up to 60% power and 50%

heat in our CHP, whereas in conventional technologies you usually get 25 to 30% power, and the rest is heat.

The plant's gas turbine combustion system can then adjust to changing compositions of bio-syngas and hydrogen whenever needed. This means the plant can use both hydrogen for fast dispatch and biomass for low operating costs over time.

That's the main goal; to be able to use hydrogen if we want to get fast power production and to produce hydrogen in certain times of the year if we have low prices.

Part of its flexibility comes from the four modes of energy it can flexibly generate for the broader energy system or industrial applications: electricity, heat, hydrogen and CO₂.

But this 'bio-CHP' plant is designed to work beyond northern Europe. Although we are first focusing on low quality sorted wood waste as an energy source, in the long run we will focus on blends of agricultural residues (e.g leaves and stems) which are more abundant in southern Europe.

Research from the EU's Joint Research Centre shows that of the 956 million tonnes of annual agricultural biomass production in the European Union, around 46% are considered residues.⁴ Our goal in the Bio-FlexGen project is to harness this agricultural residue to create energy, and so bring it into the circular economy.

I think it will be more and more important that we as Europeans use this type of technology to make our energy both more efficient and more flexible, especially now as we develop other sources such as wind power. Biomass plants need to be flexible to be able to adjust to these fluctuations that we will get from other sources.

I think it's a pity that the opportunities for biomass are not often discussed in other areas of Europe. We are desperate to get rid of fossil fuels and to do something about the gas situation but it's still not often actually mentioned that we can actually grow our bioenergy potential through biomass.

Part of the Bio-FlexGen project involves examining how these plants can adapt to the energy system. This includes examining if the bio-CHP plant is economically feasible and if the technology is ready to be applied to the energy-extensive industry and the energy grid.

Fortunately the prices of biomass for energy have also been very stable for many years, except for some minor fluctuations. Instead the problem is the electricity production, which has been quite difficult to make economically feasible because of the low prices on electricity. Conventional bio-CHPs have not during historical price conditions been cost-effective when they are not supplying heat. But if the electricity prices increase, it will be more interesting to also build these bio-CHP plant.

If policymakers decide to put taxes on bio-energy it will be very difficult for producers to recognise bioenergy as an economically-viable renewable source. Of course if there will be demand for more electricity and the prices increase, I think there is a chance for this technology to reach its potential.

At the moment we are testing our technology in a small pilot plant in Sweden. One of our partners is the biomass generation company Phoenix BioPower, who is working with us to develop a 25 megawatt bio-CHP plant which they envision will be close to becoming a commercial technology and is planned to enter commission sometime in 2028-2029.

As a researcher who has spent many years researching biofuels, it's exciting and interesting to work with our partners to have this technology enter the commercial phase. We aim to have this technology to be used throughout Europe so that Europe's energy mix will become truly sustainable and flexible.

1 – [Forest area \(% of land area\) – Sweden \(World Bank\)](#)

2 – [Implementation of bioenergy in Sweden – 2021 update](#)

3 – [EUCANWIN.com](#)

4 – [Brief on agricultural biomass production](#)

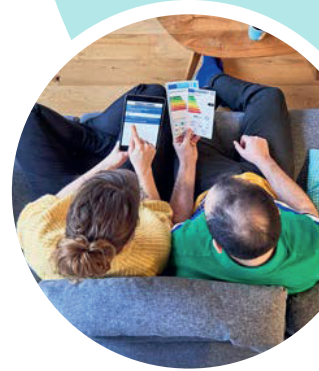


European Commission

Financing REPowerEU



MAY 2022



The **REPowerEU** Plan will rapidly reduce our dependence on Russian fossil fuels by fast-forwarding the clean energy transition and adapting our industry and infrastructure to different energy sources and suppliers. **Additional investments of €210 billion** are needed between now and 2027 to phase out Russian fossil fuel imports, which are currently costing European taxpayers nearly 100 billion euros per year.

These investments include:

€29 billion in the power grid by 2030 to enable greater electricity use



€37 billion to increase biomethane production by 2030



€ 10 billion investments to import sufficient LNG and pipeline gas by 2030

€210 billion by 2027



€56 billion for energy efficiency and heat pumps by 2030



€1.5-2 billion for security of oil supply



€41 billion for adapting industry to use less fossil fuels by 2030

€113 billion for renewables (**€86bn**) and key hydrogen infrastructure (**€27bn**) by 2030



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