Action plan for implementing REPowerEU

Accelerating the scale-up of renewable gases for more affordable, secure, and sustainable energy

March 2022

GAS FOR CLIMATE
A path to 2050

Guidehouse

Executive summary

Europe needs urgent action to reach independence on Russian energy imports, in particular natural gas, which currently covers more than 40% of EU consumption. This independence should coincide with an accelerated energy transition while minimising negative effects on households and companies. A quick ramp-up of renewable gases (biomethane and green hydrogen) is an integral part of the solution, as stipulated by the ambitious REPowerEU communication by the European Commission.

In response to this communication, Gas for Climate developed a 10-point action plan to rapidly implement the REPowerEU targets for renewable gases. The action plan proposes measures to scale-up renewable gas supply and develop the market, increase funding for critical technologies and streamline permitting procedures, and manage the integration of biomethane to the existing natural gas network and the development of an integrated hydrogen transmission infrastructure. Most of these actions could and should already be implemented by the end of 2022. Others can only be fully implemented by 2030, but it is imperative to start now. The urgency is clear, and if the action plan is implemented as a whole, it could significantly contribute to more sustainable, secure, and affordable energy in Europe.

Action Plan for implementing REPowerEU

GAS FOR CLIMATE
A path to 2050

Supply & Market	Funding & Permitting	Infrastructure
1. Implement the Gas Decarbonisation Package in phases so that renewable gas supply and hydrogen infrastructure can be rapidly developed		
2. Anchor the 35 bcm biomethane and 31 bcm RFNBO domestic production targets in EU legislation	**6.** Allocate and increase funds to fast-track commercialisation of renewable gas technologies	**8.** Facilitate biomethane integration into the gas grid infrastructure
3. Implement Union data-base and gas GO systems with urgency to enable well-functioning EU market for renewable gases	**7.** Simplify and shorten planning and permitting procedures for renewable energy projects	**9.** Enable rapid development of an integrated pan-European hydrogen transmission system with ENTSOG in charge of the network planning
4. Mobilise sustainable feedstock supply chains to scale up biomethane production.		**10.** Ensure development and proper renumeration of underground hydrogen storage capacities
5. Make the RFNBO production rules more flexible and update the electrolysis target in the EU Hydrogen Strategy		

Green hydrogen   Biomethane

Renewable gases are key for sustainable, secure, and affordable energy supply in Europe

Building on the European Commission's (Commission's) recent REPowerEU communication,[1] Gas for Climate developed 10 concrete, short-term measures to accelerate renewable gas uptake in Europe and replace a significant amount of Russian gas imports. This acceleration can:

- Increase European **energy security** by reducing dependency on Russian natural gas.
- Speed up the implementation of **climate goals**.
- **Alleviate** part of the **energy cost** pressure on households and companies.

Renewable gases (i.e. green hydrogen and biomethane) play a critical role in meeting the 2030 greenhouse gas (GHG) reduction targets and achieving net-zero emissions by 2050. In light of the invasion of Ukraine, supply security and affordability have become policy priorities. Renewable gases can be part of the solution.

Recent analyses by Gas for Climate and continued work on the European Hydrogen Backbone have shown that an acceleration of renewable gas uptake is feasible.[2,3] The analysis shows that Europe has a supply potential of 43 bcm (450 TWh) for green hydrogen and 35 bcm (370 TWh) for biomethane in 2030.[4] However, Gas for Climate concluded in its recent call for a binding target of 11% renewable gas by 2030 that existing EU energy and climate policies (even when fully implemented by Member States) and national energy and climate plans will not be sufficient to lead to a meaningful deployment of renewable gases by 2030 and 2050. REPowerEU is a step in the right direction but needs to be substantiated with prompt actions to become reality.

While an immediate response to address the challenges of supply security and affordability is critical, the Commission should also continue to focus on implementing Fit for 55. A delay may put mid- and long-term climate targets at risk by creating uncertainty for investments in renewable gases. Coherence and acceleration across Europe's energy and climate policy is needed for more affordable, secure, and sustainable energy.

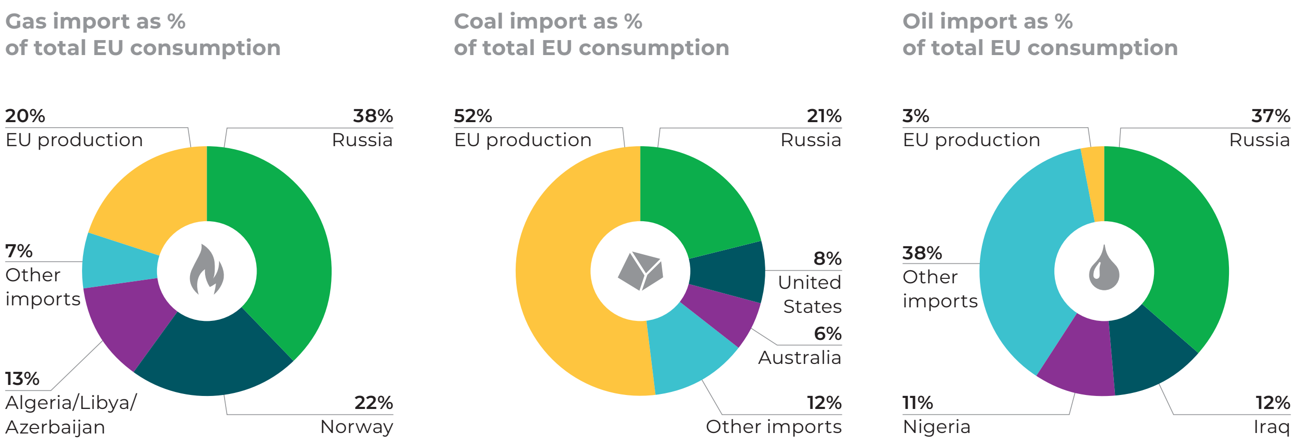
1 European Commission (2022). *REPowerEU*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN
2 Gas for Climate (2020). *Gas Decarbonisation Pathways 2020-2050*. https://gasforclimate2050.eu/wp-content/uploads/2020/04/Gas-for-Climate-Gas-Decarbonisation-Pathways-2020-2050.pdf
3 Gas for Climate (2021). *Setting a binding target or 11% renewable gas*. https://gasforclimate2050.eu/wp-content/uploads/2021/01/Gas-for-Climate-Setting-a-binding-target-for-11-renewable-gas.pdf
4 European Hydrogen Backbone (2021). Analysing future demand, supply, and transport of hydrogen. https://gasforclimate2050.eu/wp-content/uploads/2021/06/EHB_Analysing-the-future-demand-supply-and-transport-of-hydrogen_June-2021_v3.pdf

REPowerEU aims to make Europe independent from Russian gas

Europe is heavily dependent on energy imports from Russia. In 2020, Russian natural gas (39.3% of total consumption, 155 bcm, 1,635 TWh[5]), coal (21.3% of total consumption, 42.9 Mton, 349 TWh[6,7]), and crude oil (36.5% of total consumption, 113 Mtoe, 1,314 TWh[8]) made up a large share of energy imports to the EU (see Figure 1). While some EU Member States have a low dependency on Russian natural gas (e.g. ~10% for Spain and Portugal) others, especially countries in Central and Eastern Europe, are heavily dependent on Russian gas imports (e.g. Germany, Poland, and the Czech Republic).[9]

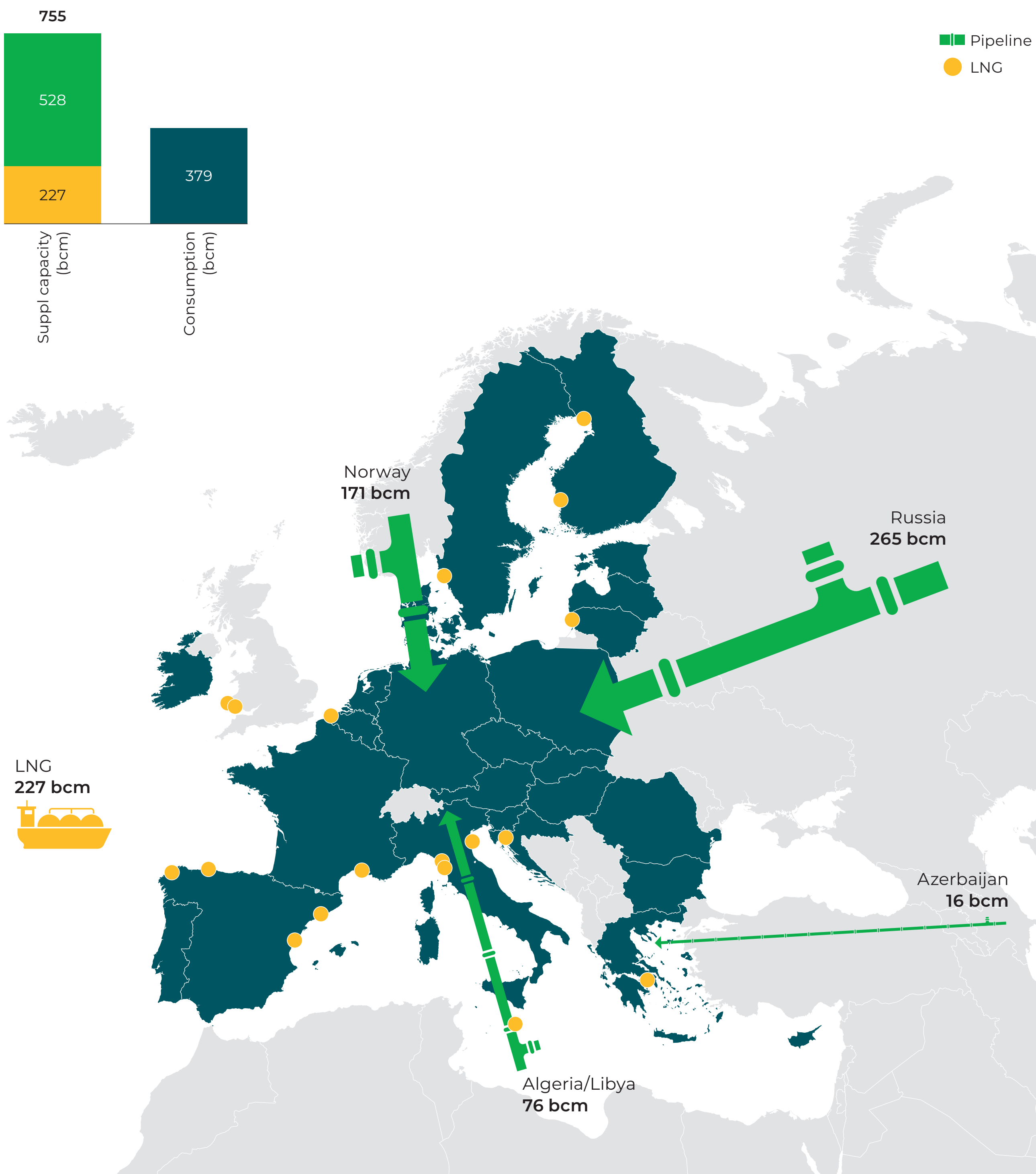
Figure 2 shows that the yearly import capacity of pipelines transporting natural gas from Russia to Europe is 265 bcm/yr per year, exceeding the import capacity of pipelines from Norway (171 bcm/yr) and Algeria/Libya (76 bcm/yr), Azerbaijan (16 bcm/yr) as well as the current total capacity of Europe's liquefied natural gas (LNG) terminals (227 bcm/yr).[11] Increasing LNG imports is not a viable short-term solution as most terminals are located in Western Europe and pipeline transport capacity to Eastern Europe is a bottleneck.

Figure 1:
EU dependency on fossil energy carriers in 2020[10]



5 1 bcm = 10.55 TWh. Source: European Commission (2021). Energy. https://ec.europa.eu/energy/sites/default/files/quarterly_report_on_european_gas_markets_q4_2020_final.pdf
6 Statista Research Department (2022). "Coal imports to the EU 2005-2020." https://www.statista.com/statistics/1260337/eu-coal-import-volume/#:~:text=Coal%20imports%20into%20the%20European,lower%20hard%20coal%20production%20levels.
7 1 exajoule = 277.78 TWh. Source: Statista Energy Department (2022). "Coal consumption in the European Union 2005-2020." https://www.statista.com/statistics/332372/coal-consumption-of-the-european-union-eu/.
8 1 Mton of oil equivalent = 11.63 TWh. Source: European Commission (2022). "Oil and petroleum products - a statistical overview." https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Oil_and_petroleum_products_-_a_statistical_overview&oldid=552698#Imports_of_crude_oil
9 NPR (2022). How Europe's reliance on Russia's gas plays into the war in Ukraine. https://www.npr.org/2022/02/09/1079338002/russia-ukraine-europe-gas-nordstream2-energy?t=1647952313545
10 European Commission (2022). "Energy production and imports." https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_production_and_imports
11 At peak, the daily European demand is much higher than the daily average.

Figure 2:
Yearly gas supply capacity (in bcm) in Europe[12,13]



12 Tesio et al. (2021). "High gas prices in Europe: a matter for policy intervention?" https://cadmus.eui.eu/bitstream/handle/1814/73596/PB_2022_06_FSR.pdf?sequence=4&isAllowed=y
13 While the supply capacity exceeds the average annual gas consumption, peak demand in the winter months is much higher, leading to full utilisation of the import infrastructure.

The invasion of Ukraine has created a lot of uncertainty on the future of energy imports from Russia. As a result, natural gas prices have increased sixfold from €20/MWh to around €120/MWh between March 2021 and March 2022, threatening the competitiveness of Europe's industry and amplifying the risk of energy poverty. Biomethane production costs are €50-€90/MWh depending on feedstock and plant scale,[14] which is competitive against current natural gas prices (see Figure 3). At a natural gas price of €100/MWh, the production costs of grey hydrogen are around €6/kg,[15] while the productions costs for green hydrogen are between €4/kg and €7/kg[16] (see Figure 4). This indicates that renewable gases can be cost-competitive in the short term, alleviating energy costs for consumers and companies. However, a supportive policy framework needs to be put in place to get to the lower end of the cost range for renewable gases.

Figure 3:
Benchmark prices for natural gas in Europe (TTF)[17] and production costs for biomethane in 2022

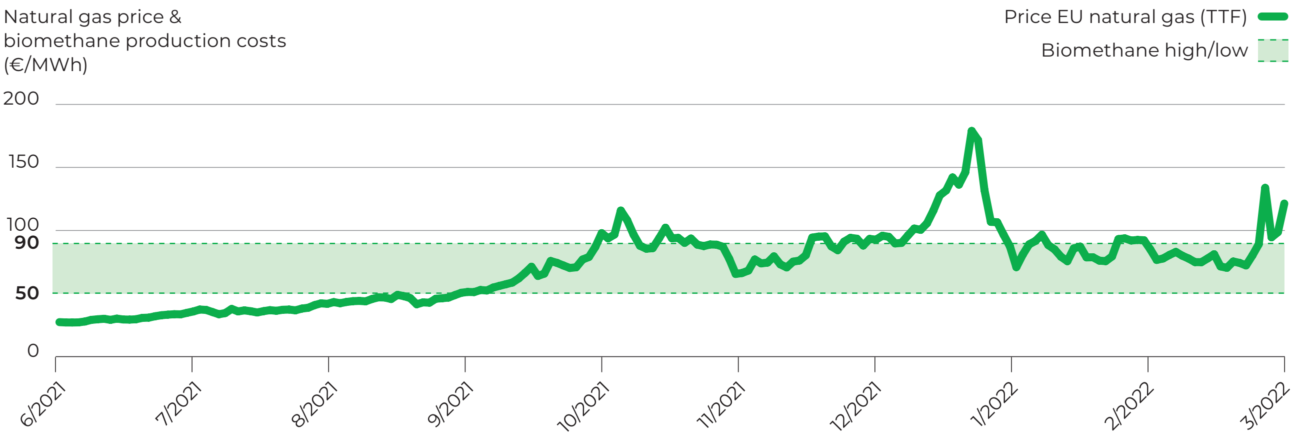
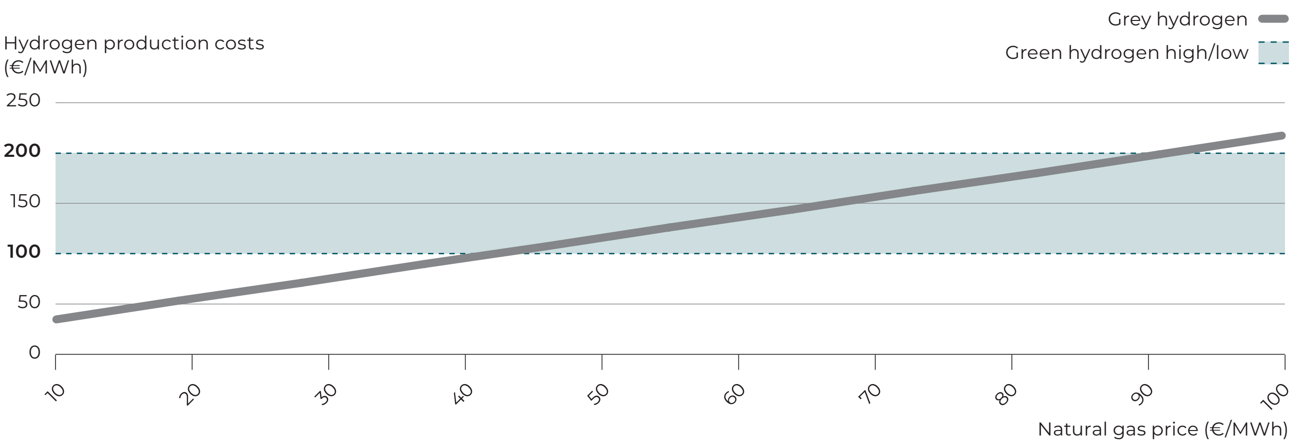


Figure 4:
Grey and green hydrogen production costs with increasing natural gas price



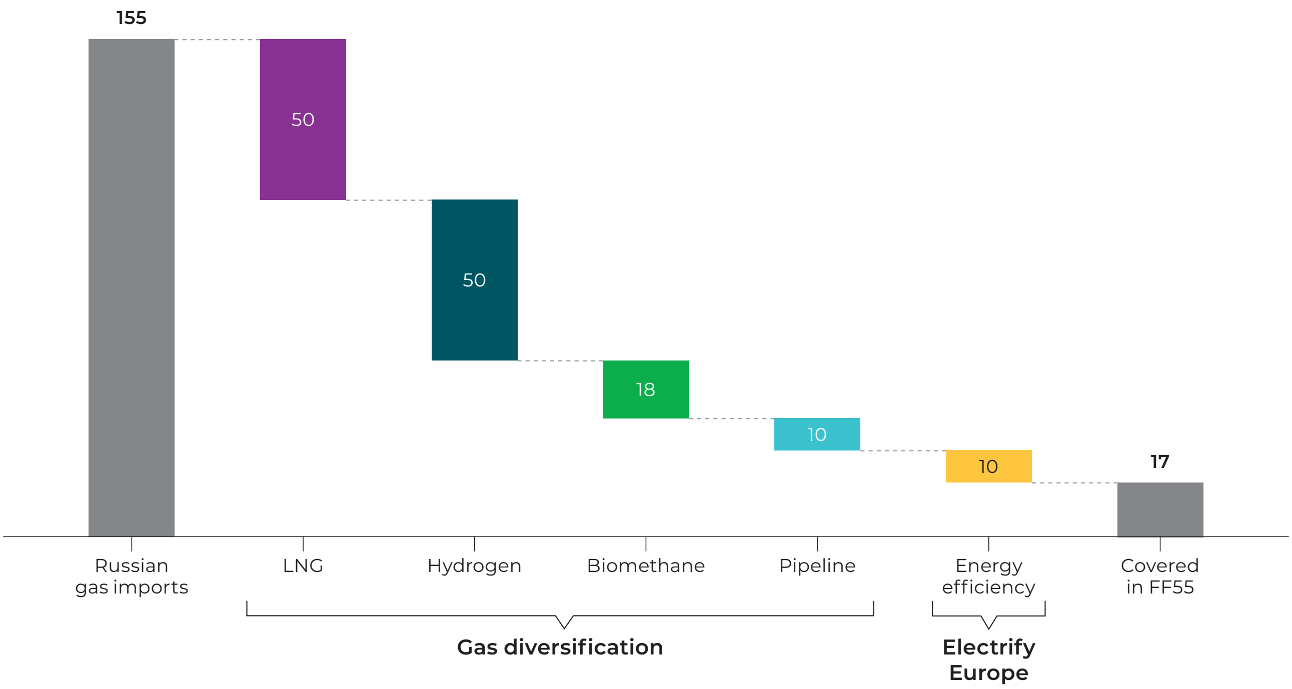
14 Gas for Climate (2021). *The future role of biomethane*. https://gasforclimate2050.eu/wp-content/uploads/2021/12/The_future_role_of_biomethane-December_2021.pdf
15 ING (2021). "High gas prices triple the cost of hydrogen production." https://think.ing.com/articles/hold-1of4-high-gas-prices-triples-the-cost-of-hydrogen-production/
16 Agora Energiewende (2021). *Making renewable hydrogen cost-competitive*. https://static.agora-energiewende.de/fileadmin/Projekte/2020/2020_11_EU_H2-Instruments/A-EW_223_H2-Instruments_WEB.pdf
17 Data extracted from Investing.com (2022). https://www.investing.com/

On March 8, 2022, in light of Russia's invasion of Ukraine, the European Commission published REPowerEU, a plan to make Europe independent from Russian fossil fuels well before 2030, starting with replacing the 155 bcm of natural gas. REPowerEU outlines a series of measures adding up to 138 bcm by 2030 (see Figure 5). Together with frontloaded energy savings and electrification, the potential to jointly deliver at least the equivalent of the 155 bcm of Russian natural gas exists.

Renewable gases play a key role in meeting the REPowerEU ambition. The EU produces 3 bcm of biomethane and 17 bcm of biogas (2020).[19] The REPowerEU communication sets a target of 35 bcm of biomethane production per year by 2030—an increase of 18 bcm of biomethane compared to the volume envisaged in the Fit for 55 package. Some of this 35 bcm of biomethane could be met by upgrading the existing biogas production to biomethane, but meeting the target will also require a significant increase in production.[20]

The “hydrogen accelerator”, as part of REPowerEU, aims to develop infrastructure, storage facilities, and ports, and replace demand for Russian gas with an additional 31.6 bcm (333 TWh) of imported renewable hydrogen and an additional 13.9 bcm (147 TWh) of domestic renewable hydrogen, totalling almost 50 bcm of additional hydrogen in 2030.

Figure 5:
Gas savings additional to Fit for 55 as stated in REPowerEU for 2030 (in bcm)[18]



18 European Commission (2022). *REPowerEU*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN
19 Gas for Climate (2021). *The future role of biomethane*. https://gasforclimate2050.eu/wp-content/uploads/2021/12/The_future_role_of_biomethane-December_2021.pdf
20 Biogas produced via anaerobic digestion typically contains around 60% methane and 40% carbon dioxide. It can be used directly to generate renewable electricity or heat. Upgrading biogas to biomethane means removing the carbon dioxide and other gas impurities to produce a grid-quality methane that can be injected into the gas grid.

The Gas for Climate Action Plan for implementing REPowerEU: 10 concrete measures

Our action plan is a detailed overview of urgent actions needed to achieve a significant scale-up and integration of renewable gases in Europe as envisioned in REPowerEU. If successfully implemented, it could significantly accelerate the energy transition in Europe. The action plan is structured into three main categories:

- **Supply and market:** Actions related to the implementation of the Hydrogen and Decarbonised Gas Market Package (gas decarbonisation package), setting binding EU targets for biomethane and Renewable Fuels of Non-Biological Origin (RFNBOs), addressing the certification and tradability of renewable gases, and ensuring feedstock and renewable electricity availability for biomethane and RFNBO production. These actions are necessary to assist market creation for biomethane and hydrogen and should be **implemented by the end of 2022.**
- **Funding and permitting.** Availability of funding for biomethane and hydrogen technologies along with simplified and shortened permitting and planning procedures for renewable energy projects is essential to speed up investments in renewable gases. Actions should be **implemented by the end of 2023.**
- **Infrastructure.** Infrastructure improvements and developments to integrate renewable gases are a prerequisite to functioning biomethane and hydrogen markets. The requirements for biomethane integration into natural gas grids need to be specified and an integrated pan-European hydrogen infrastructure, including provisions on large-scale hydrogen storage, developed. The work on these actions should commence immediately, and they should be **implemented by 2030.**

It is imperative that these actions are approached with urgency and implemented as a whole. With their implementation, energy security concerns, speeding up of climate action, and reduced economic burden on consumers could all be addressed.

1.

Implement the gas decarbonisation package in phases so that renewable gas supply and hydrogen infrastructure can be rapidly developed.

by end of 2022

Implementation of Fit for 55 and the more ambitious REPowerEU targets require amendments to the gas decarbonisation package[21] so that the development of renewable gas supply and hydrogen infrastructure is sped up. Previous work

21 European Commission (2022). *Hydrogen and decarbonised gas market package.* https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/hydrogen-and-decarbonised-gas-market-package_en#documents

done by Gas for Climate,[22] including the call for a renewable gas target,[23] and the European Hydrogen Backbone[24] has shown that renewable molecules have a firm role in the energy transition. Gas infrastructure companies are well-positioned to rapidly develop fit for purpose and future-proof integrated hydrogen infrastructure across Europe and enable large-scale integration of biomethane due to their core competencies, experience, and existing assets. However, the regulatory framework needs to enable gas infrastructure companies to speed up the energy transition. Currently, the EU is not on the trajectory to reach the goals specified in Fit for 55 (or REPowerEU).

The revised Gas Directive and Regulation should take a phased approach to setting the regulatory framework. The minimum viable regulatory framework should be defined for the (current) market onset to create more investment certainty and incentivise regulations prioritised. Comprehensive market model rules for hydrogen (similar to current rules for natural gas) should be implemented when the European integrated hydrogen network is up and running.

Supply & Market

2.

Anchor the 35 bcm biomethane and 31 bcm RFNBO domestic production targets in EU legislation.

35 bcm

by end of 2022

The EU produces 3 bcm of biomethane and 17 bcm of biogas, which is used for local electricity and heat production but that could be upgraded to biomethane for injection into the gas grid.[25] Rapidly transitioning this biogas supply to grid-quality biomethane can directly replace natural gas and deliver the greatest energy system benefit. Similarly, the increased domestic RFNBO target (from the ~18 bcm demand target in Fit for 55 to the ~31 bcm supply target in REPowerEU) needs to be incorporated into EU legislation.

- **Anchor the 35 bcm biomethane and 31 bcm RFNBO domestic production targets in EU legislation.** This would ideally be achieved by setting a mandatory EU-wide target in the revision of the Renewable Energy Directive (RED) II. For biomethane, a standalone definition needs to be developed (differentiated from natural gas) and its benefits better recognised in Member State policies.[26]
- **All Member States shall develop and implement a national biomethane and RFNBO production strategy in line with the overall EU targets.** In addition, Member States shall describe their biomethane and RFNBO support policies in their national energy and climate plans.

22 Gas for Climate (n.d.). *Publications*. https://gasforclimate2050.eu/publications/.
23 Gas for Climate (2021). *Setting a binding target for 11% renewable gas*. https://gasforclimate2050.eu/wp-content/uploads/2021/01/Gas-for-Climate-Setting-a-binding-target-for-11-renewable-gas.pdf.
24 Gas for Climate (n.d.). *Publications*. https://gasforclimate2050.eu/publications/.
25 Gas for Climate (2021). *The future role of biomethane*. https://gasforclimate2050.eu/wp-content/uploads/2021/12/The_future_role_of_biomethane-December_2021.pdf
26 For example, reduced fugitive emissions from using manure in anaerobic digestion or reduced synthetic fertiliser demand when digestate is used as fertiliser could be recognised through the carbon farming regulation.

- **Set up a high-level public-private cooperation to meet the new biomethane target.** A group of 30 companies and organisations across the whole biomethane value chain are deploying an initiative to establish a public-private cooperation with the Commission, Member States, and the biomethane value chain. Biomethane is a decentralised form of renewable energy, and more coordination and structuring is needed.[27]
- **Facilitate imports of renewable energy.** Given the specific targets for green hydrogen (or synthetic fuels), imports from countries outside the EU need to be stimulated. Regulatory sandboxes should be considered for hydrogen interconnectors (Article 49 of the Directive sets out the rules underlying hydrogen interconnectors with non-EU countries); issuing implementation guidelines for the certification of green hydrogen imports should also be considered (see action point 3).

3.

Implement Union database and gas guarantees of origin (GO) systems with urgency to enable a well-functioning EU market for renewable gases.

by end of 2022

Enabling robust and transparent cross-border trade is imperative for the scale-up of renewable and low-carbon gases. The design of the Union database and gas GO system is critical to enable this.

- **Streamline the Union database and gas GO systems.** The systems need to work together to enable tracing of sustainability information, trade of gases, and to provide a robust accounting mechanism that can be applied for Member State target accounting and voluntary disclosure purposes. In practical terms, the transfer of gas GO from a Member State registry into the Union database should be allowed, at which point a tradeable Union database GO (or equivalent) is created. The original gas GO should be cancelled from the Member State registry upon registration in the Union database to avoid double counting.
- **Allow renewable gases injected into the gas grid to be withdrawn flexibly in the EU if the grid is physically interconnected.** The system must also allow for the use of imports of renewable gases produced outside the EU.
- **Extend the Union database to cover renewable fuels used in all energy sectors.** An extension of the Union database to cover all end-use sectors (not just transport) was proposed in the RED II revision. As renewable gases injected into the grid are used in all sectors, it is critical this extension is implemented for gases from the start of the database.

27 In December 2021, the companies signed a Biomethane Declaration recognising that biomethane is the most cost-effective, scalable, and sustainable renewable gas available today. The declaration highlights the willingness of biomethane producers and users to play their part in scaling-up sustainable biomethane. Source: Gas for Climate (2021). *Leading companies and organisations discuss biomethane scale-up with Energy Commissioner Simson*. https://gasforclimate2050.eu/news-item/leading-companies-discuss-biomethane-scale-up-with-energy-commissioner-simson/

4.

Mobilise sustainable feedstock supply chains to scale-up biomethane production.
by end of 2022

Several studies see a potential to scale-up sustainable biomethane supply significantly beyond current production levels—to at least 35 bcm by 2030 and greater than 100 bcm by 2050.[28]

- **In the short term, prioritise mobilisation of the available volumes of waste and residue feedstocks including manure, agricultural residues, food waste, and industrial wastewater.** These feedstocks are the cheapest and offer the highest GHG emissions savings. In REPowerEU, the Commission recommends that Member States' Common Agricultural Policy strategic plans should channel funding to biomethane produced from sustainable biomass sources, including agricultural wastes and residues.
- **The Commission should set out a clear and sustainable approach to using crops for biomethane.** This approach should include implementing guidance and appropriate definitions for the use of sequential cropping[29] as part of sustainable farming practices. Providing this certainty to farmers and the energy market on a sustainable approach to crop use for biomethane will enable the sector to develop more rapidly and in a more harmonised way.

5.

Make the RFNBO[30] production rules more flexible and update the electrolysis target in the EU Hydrogen Strategy.[31]
by end of 2022

An immense scale-up of domestic RFNBO production to 31 bcm by 2030 (~330 TWh, LHV)[32] will require more flexibility in the criteria for RFNBOs and an update to the target for installed electrolyser capacity in the EU Hydrogen Strategy. The RED II Delegated Act on Article 27, currently in preparation, should consider more lenient criteria regarding temporal correlation (between electricity production and consumption in electrolysers) requirements and **at least until 2030:**

- **A viable temporal correlation requirement would be a monthly or yearly matching.**[33] The effects of this change can be approximated by looking at simple full load hours of solar and wind resources (representing a simple hourly matching requirement) as well as an optimised hybrid solar/wind and electrolyser sizing scenario (representing best achievable case anywhere in Europe under hourly matching) in comparison to monthly temporal matching (when total renewable electricity consumption and production in electrolysers is reconciled only monthly). The effects of temporal correlation requirements

28 See Table 1 in Gas for Climate (2021). *The future role of biomethane*. https://gasforclimate2050.eu/wp-content/uploads/2021/12/The_future_role_of_biomethane-December_2021.pdf

29 Sequential cropping is the cultivation of a second crop before or after the harvest of the main food or feed crop on the same agricultural land during an otherwise fallow period, not triggering additional demand for land. Sequential cropping does not impact existing food or feed markets as no existing food or feed is used for biogas.

30 Renewable fuels of non-biological origin (RFNBOs): Per Article 2(36) of the RED II revision: "'Renewable fuels of non-biological origin' means liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass." The specific criteria for RFNBO production are being developed in the preparation of the Delegated Act on Article 27 (RED II).. In practical terms, this definition is equivalent to green hydrogen (various production technologies) and derivatives of green hydrogen (e.g. green methanol, ammonia, methane).

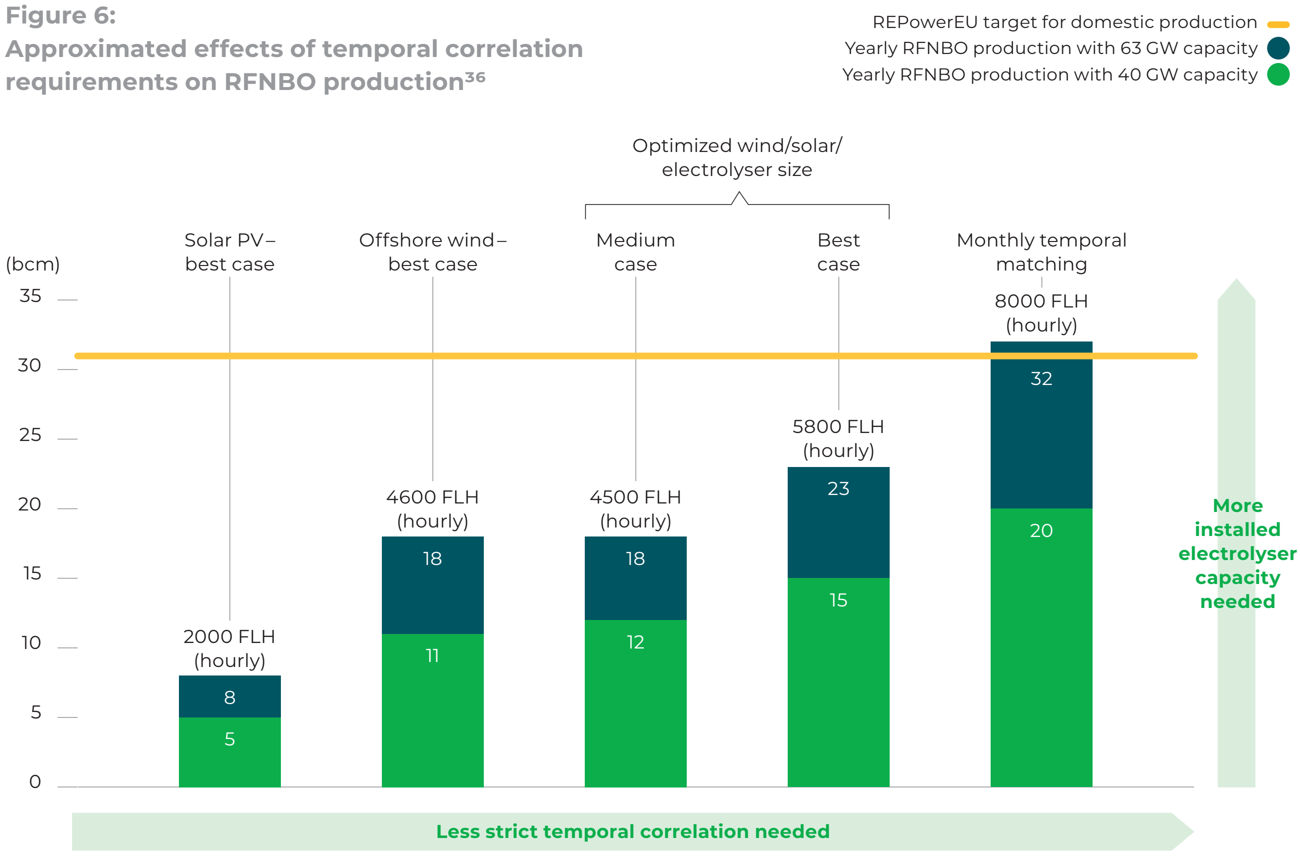
31 The Commission target is 40 GW of installed electrolysis capacity by 2030. Source: European Commission (2020). *A hydrogen strategy for a climate-neutral Europe*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN

32 Lower heating value.

33 A requirement for hourly matching was presented in the last leaked draft of the Delegated Act.

are significant (see Figure 6). With 40 GW of installed electrolyser capacity (current EU Hydrogen Strategy target),[34] the EU would produce only 5 bcm-11 bcm of RFNBO with hourly following of non-optimised electrolysers (solar, or wind) and between 12 bcm and 15 bcm in the case of fully optimised production in best renewable locations in Europe (hybrid solar and wind and optimised electrolyser sizing). With monthly following, the production would climb up to 20 bcm and unlock less favourable renewable locations in Europe for RFNBO production. However, even with the proposed monthly temporal matching, the installed electrolyser capacity targets have to be updated to at least to 63 GW to produce approximately 32 bcm (assuming an average of 8,000 full load hours). Being less restrictive on the temporal correlation requirements does not necessarily mean a large increase in the GHG emissions intensity of the produced RFNBO because of the net effect of marginal plants dispatch (see footnote 35). Electrolyser operators could be more responsive to electricity market prices and would presumably still try to avoid high electricity market prices where natural gas and coal are the price setters.[35]

Figure 6:
Approximated effects of temporal correlation requirements on RFNBO production[36]



34 Presumably, the EU Hydrogen Strategy talks about 40 GW of electrolyser capacity output, whereas here we calculate with capacity as a function of electrical input (industry standard). In either way, the strategy will need to be updated.

35 On the one hand, requiring strict temporal correlation can reduce the likelihood the RFNBO plant adds load to high-emitting marginal plants (e.g. coal- or gas-fired power plant). On the other hand, it will come at an increased cost of RFNBO production (and thus need additional subsidies) and increase the administrative burden of the administrator and market operators. Arguably, the additionality and geographical correlation requirements would decrease the chance of a high GHG footprint of the RFNBO production, especially when considering the net effect in monthly temporal matching. Assuming the total volume of *additional* renewable electricity purchased and consumed by an electrolyser is equal, the considered GHG footprint should be seen via a net effect on system emissions. If the marginal plant dispatched to meet electrolyser load is equal or less emitting (e.g. gas) compared to the marginal plant that avoided dispatch (e.g. lignite) due to the surplus renewable electricity (at times when contracted solar/wind plant production is more than electrolyser consumption), the net GHG effect is positive (i.e. no additional emissions or even emission avoidance). In the reverse situation, the net GHG effect is negative but only as much as is the difference between the two marginal plants mentioned previously.

36 Optimised cases are based on Guidehouse calculations, 66% electrolysis system efficiency and LHV are assumed.

- **Additionality could be accepted for renewable electricity power plants that commenced operation no earlier than 5 years before the electrolysis plant.**[37] This would substantially enlarge the pool of eligible renewable electricity resources for RFNBO production.
- **Renewable electricity plant operators should be allowed to contract part of their total capacity to RFNBO producers.**[38] In this way, electrolysers can be better integrated into the electricity market without significant undue burden and without compromising the renewability profile of the produced RFNBO (i.e. all purchased electricity still must come from additional renewable sources in monthly or yearly volumes).

Permitting & Funding

6.

Allocate and increase funds to fast-track commercialisation of renewable gas technologies.
by end of 2022

Fast-tracked commercialisation of more mature technologies (e.g. electrolysis, biogas upgrading plants) and of less mature yet scalable technologies (e.g. commercial-scale biomass gasification plants) is critical to reaching scale. Investments into electrolysis and biogas upgrading plants unlocks the renewable gas supply in the short term and allows these technologies reach economies of scale. Gasification then needs to be commercialised and scaled up from 2030 onwards as it opens up the potential to produce biomethane from alternative feedstocks, including sustainable woody biomass residues and mixed municipal solid waste (Gas for Climate estimates that one-third of the total biomethane supply comes via gasification in the longer term).[39]

- **Include renewable gases in General Block Exemption Regulation[40] for State aid rules.** Automatic approval of State aid programmes related to renewable gases (with a sunset provision linked to a pre-defined market maturity signpost or a date) would significantly speed up the supply development.
- **Consider earmarking Innovation and Modernisation Fund resources and carbon border tax adjustment mechanism revenues for renewable gas projects.** Next to grants and subsidies, support instruments should also include carbon contract for differences, targeting hard-to-abate end-use sectors, as well as contracts for difference, currently not included within the scope of the Innovation Fund, targeting production as a whole regardless of end use.
- **Implement stronger requirements for allocating EU Emission Trading Scheme (ETS) proceeds to climate action.** This should be done by approving Article 10(3) in the proposal for EU ETS Directive amendment[41] and encouraging Member States to allocate part of EU ETS revenues into renewable gas projects.

37 The additionality requirement asked for no more than 2 years of difference between the start of operation in the last leaked draft of the Delegated Act.
38 This would mean that the part of the total, e.g. wind farm, capacity would be contracted by the RFNBO producer and need to follow additionality requirements (e.g. not subsidized) whereas the non-contracted part could retain renewable electricity subsidies.
39 Gas for Climate (2021). *The future role of biomethane*. https://gasforclimate2050.eu/wp-content/uploads/2021/12/The_future_role_of_biomethane-December_2021.pdf
40 European Commission (2021). *Targeted review of the General Block Exemption Regulation*. https://ec.europa.eu/competition-policy/public-consultations/2021-gber_en
41 European Commission (2021). Proposal for a directive of the European Parliament and of the Council amending Directive 2003/87/EC. https://eur-lex.europa.eu/resource.html?uri=cellar:618e6837-eec6-11eb-a71c-01aa75ed71a1.0001.02/DOC_1&format=PDF

7.

Simplify and shorten planning and permitting procedures for renewable energy projects.
by end of 2023

Accelerating the development of renewable gas production requires substantial simplification and shortening of planning and permitting procedures for renewable power and renewable gas production plants and infrastructure. As stated in the REPowerEU Communication, production and integration of renewable energy projects should be considered overriding public interest and qualify for the most favourable procedure available for planning and permitting.[42] This requires the following:

- **Utilise Projects of Common Interest (PCI), Important Projects of Common European Interest (IPCEI), and Projects of Mutual Interest (PMI) processes.** PCI, IPCEI, and PMI (with third countries) processes should be used to rapidly develop key infrastructure projects for hydrogen integration (including the pipeline network, interconnectors, underground storage, import terminals, etc.). Moreover, other projects that do not qualify as IPCEI, PCI, or PMI but enable the scaling-up and integration of renewable gases to meet the REPowerEU targets (and are taxonomy-aligned) should also be subject to favourable permitting procedures.
- **Speed up the planning and permitting processes for renewable energy projects on the Member State level.** This entails simplifying existing rules for planning and permitting in some Member States—for instance by rapid mapping, assessment and allocation of suitable land for renewable energy projects by governments (especially for offshore wind, which is important for green hydrogen production), or implementation of one-stop-shop principles with a single point of access for developers with the respective authorities. In other Member States, the need for improvement is largely in an effective implementation of these rules on the national, regional, and local levels (e.g. by capacity building in local municipalities, which often issue permits, and defining the maximum time limit for permit processing).

Infrastructure

8.

Facilitate biomethane integration into the gas grid infrastructure.
between 2022 and 2030

A scale-up of biomethane from 3 bcm to 35 bcm by 2030 requires significant integration into the gas grid infrastructure.

- **Update the quality standard for cross-border gas to ensure it is fit for purpose.** The Commission should task the European Committee for Standardization to assess and, if necessary, update the quality standard for cross-border gas to ensure it is fit for purpose for a significant green transition of the gas system (i.e. if it allows for a twelvefold increase of biomethane injection to the grid in a cost-effective manner). Furthermore, it should be stipulated that Member States must not restrict cross-border flows of biomethane and other green gases.

42 European Commission (2022). Communication from the Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:71767319-9f0a-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF.

- **Identify necessary biogas pooling projects.** The gas package should also mandate the National Regulatory Authorities identify projects to pool multiple sources of biogas to a central upgrading biomethane plant for injection into the gas grid.
- **Deploy efforts to minimise connection and grid integration costs.** A rapid scale-up of biomethane can be severely hampered by the costs of connection and grid injection, which differ widely by Member State. Efforts need to be targeted to minimise these costs across the EU and to ensure biomethane producers are not burdened by these costs.
- **Implement regional mapping (zoning) of potential biomethane production in all Member States.** This will lead to an accelerated assessment of grid reinforcement needs, such as reverse gas flow units, that need to be stimulated to increase the possibility for decentralised biomethane injection. Gas infrastructure companies can play an important facilitating role in developing such projects.

9.

Enable rapid development of an integrated pan-European hydrogen transmission system with ENTSOG in charge of network planning.

between 2022 and 2030

Integrating between 31 bcm and 62 bcm (~330 TWh-660 TWh, LHV)[43] of green hydrogen into the European energy system will require accelerated development of a pan-European hydrogen transmission network. Anticipating and planning the hydrogen transmission infrastructure (including underground storage and import terminals) is crucial. Importantly, repurposing natural gas assets to hydrogen needs to be assessed related to the need to keep the current gas networks operational.

- **Task ENTSOG to develop a concrete proposal to establish an integrated hydrogen transmission infrastructure in the upcoming 10-Year Network Development Plan 2024** (e.g. concrete cross-border connections, repurposing possibilities, storage requirements).
- **Postpone the establishment of the European Network of Network Operators for Hydrogen (ENNOH).** Creation of a new governance structure for hydrogen infrastructure operators would delay market ramp-up and should be postponed. Current governance structures (e.g. ENTSOG) are better equipped to handle the requirements for the development of a pan-European hydrogen infrastructure. The European Network of Network Operators for Hydrogen can be enacted when the hydrogen market is mature.
- **Provisions on horizontal and vertical unbundling included in the Directive should not be implemented in a way that poses any unnecessary hurdles to the development of the hydrogen market and infrastructure.**

43 In REPowerEU, 31 bcm is the target for domestic green hydrogen production by 2030. An additional 31 bcm is targeted for imports; however, it is not clear whether these would be hydrogen or hydrogen-based synthetic fuels (synthetic fuels would not be transported via hydrogen infrastructure). If the targets are met, the total volume of hydrogen flowing through the pipelines by 2030 would be between 31 bcm and 62 bcm depending on the form of imports.

10.

Ensure development and proper remuneration of underground hydrogen storage capacities.

between 2022 and 2030

Large-scale hydrogen storage will be a core component of the hydrogen network and integrated European energy system (of electricity and gas). Hydrogen storage will play a key role in supply and demand balancing (hourly, daily, weekly, and seasonally) for the gas and power networks and provide energy security services.

- **Start with the development of storage capacities as soon as possible.** As the lead times to develop underground hydrogen storage are long (3-10 years),[44] here is an urgent need to estimate the storage capacity requirements across the integrated hydrogen network and start with concrete plans and developments.
- **Develop a financing and remuneration model for hydrogen storage.** Until the financing and remuneration model is developed, it is unlikely that greenfield development or repurposing of existing natural gas storage assets will take place on the scale required as the incentives are lacking. The current model for natural gas storage cannot be transferred 1:1 to hydrogen storage. First, seasonal price spreads are likely to be much lower for hydrogen than for natural gas, minimising the revenues of hydrogen storage operators. Second, the security (of supply) value of hydrogen storage assets needs to be recognised and properly monetised to create a viable business model. Regulatory intervention is required.

44 Gas Infrastructure Europe (2021). *Picturing the value of underground gas storage to the European hydrogen system.* https://www.gie.eu/wp-content/uploads/filr/3517/Picturing%20the%20value%20of%20gas%20storage%20to%20the%20European%20hydrogen%20system_FINAL_140621.pdf