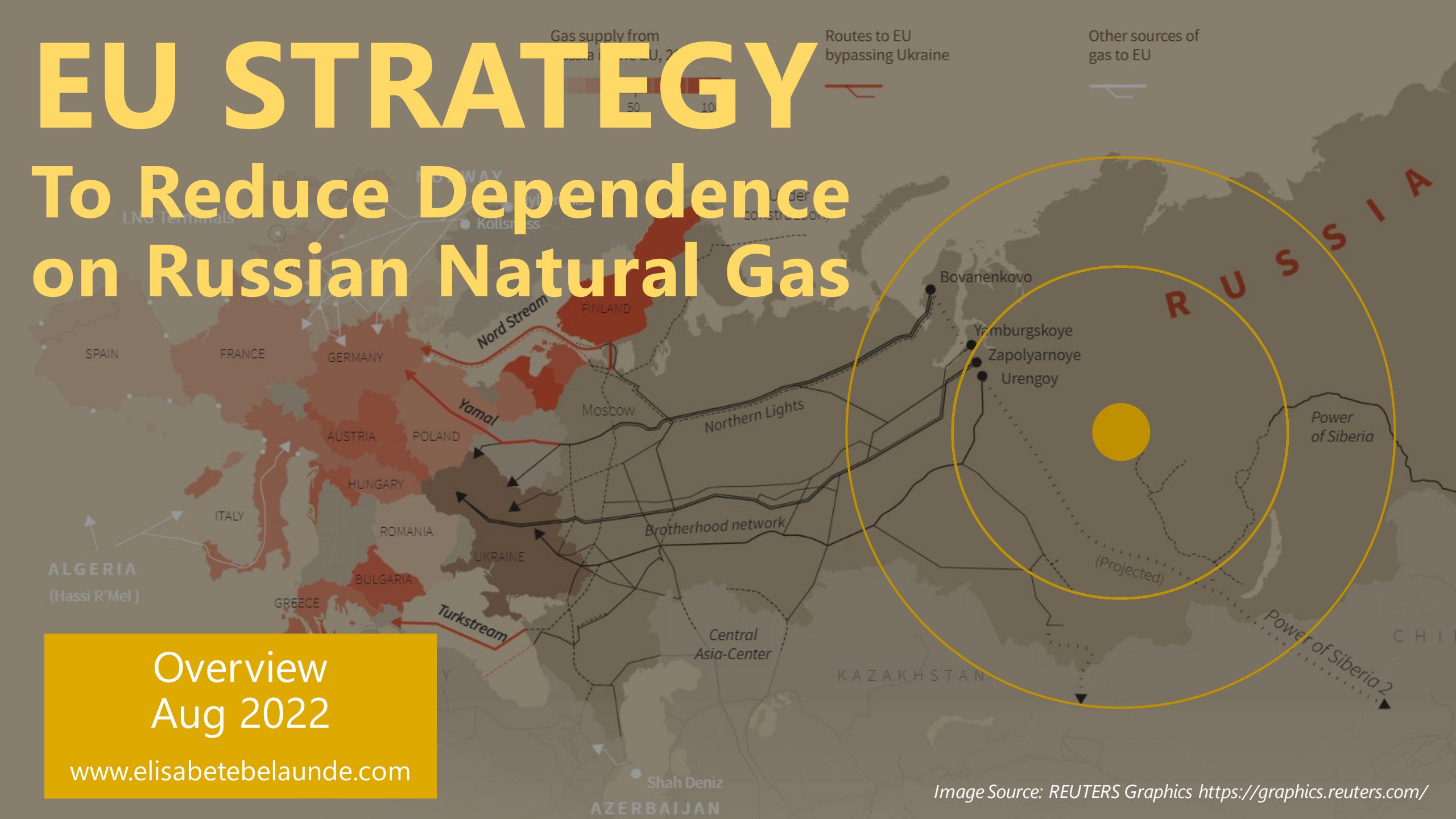
EU STRATEGY

To Reduce Dependence on Russian Natural Gas



Overview
Aug 2022

www.elisabetebelaunde.com

Image Source: REUTERS Graphics https://graphics.reuters.com/

Contents

1 Introduction

Oct-Nov 2021

- Russia reduced natural gas supplies by 25% to the EU during the fourth quarter of 2021 versus same period in 2020, while it did not fill its storage sites in the EU to adequate levels.

First half of 2022

- After Russia's military invasion of Ukraine on 24 February, several EU countries have experienced unilateral and unjustified gas supply cuts from Russia.
- Resulting rising energy and electricity costs have put financial pressure on consumers and businesses in Europe
- It is urgently needed to contain the rise in energy prices and ensure adequate gas supply for next winter and beyond. EU gas inventory levels reached over 67% of their capacity at the end of July 2022

EU Strategy

- There is a double urgency for EU27: ending EU's dependence on Russian fossil fuels, which are used as an economic and political weapon, and tackling climate crisis
- REPowerEU is the European Commission's plan to end the dependency on Russian fossil fuel imports before 2030: saving energy, producing clean energy, and diversifying our energy supplies.
- In the medium term, more structural solutions are needed, including investments in LNG terminals and gas interconnectors to fully integrate the energy market.
- The EU's commitment to speed up the phase-out of Russian gas imports is transforming Europe's gas market, with repercussions for global gas dynamics

IEA Plan

- The IEA's 10-Point Plan to Reduce the EU's Reliance on Russian Natural Gas identified measures to reduce gas imports from Russia by over one-third within a year

2 Overview of Russian Gas Supply to EU 2021-22

Source IEA https://www.iea.org


gas

3 Role of Russia in Global Energy Markets

Russia is a major player in global energy markets, as the world's largest exporter of both oil and natural gas in 2021. Russia's revenues from oil and natural gas made up 45% of Russia's federal budget (2021).

Russia one of the world's top three oil producers, with Saudi Arabia and the United States

- Russian crude and condensate output reached 10.5 million bpd (year 2021), **14% of the world's total supply**
- Russia exported ~4.7 million bpd/year of crude globally, with China the largest importer (~ 1.6 million bpd)
- Russia exports a significant volume of crude to Europe (~ 2.4 million bpd/year), **~27% of EU's total imports**

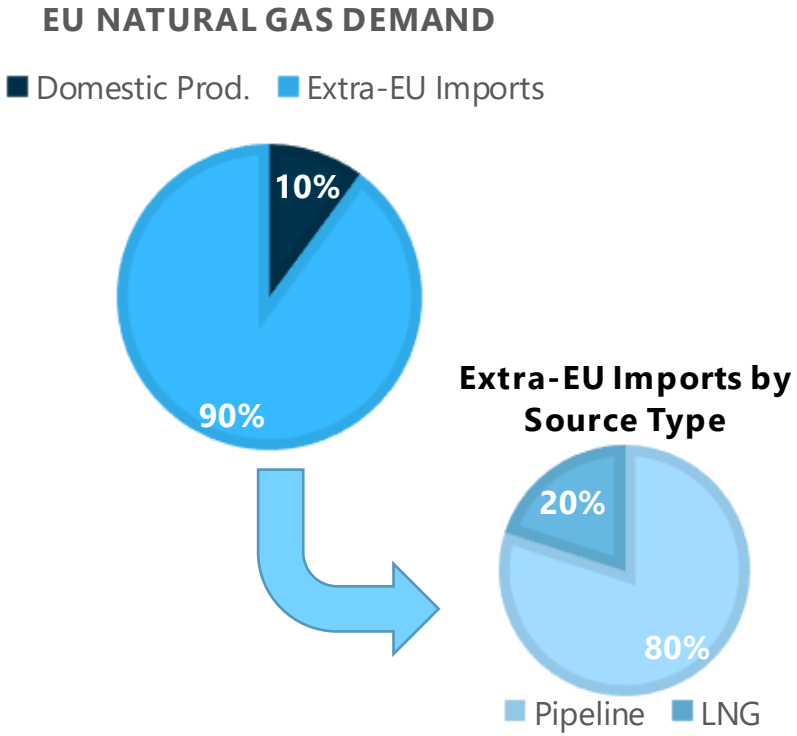
Russia a "giant" in natural gas markets:

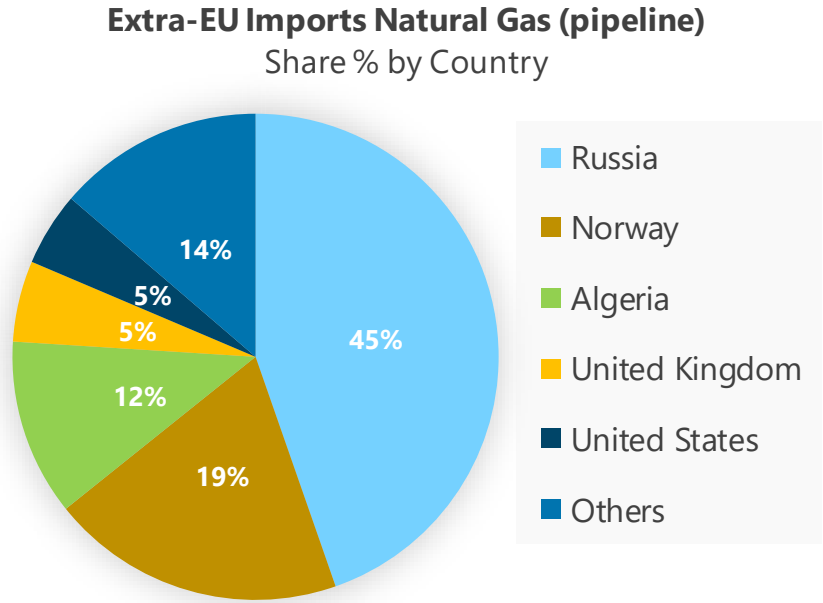
- Russia is the **world's second-largest producer** (762 bcm in 2021), behind the United States, and has the world's largest gas reserves.
- Russia is the **world's largest gas exporter** (210 bcm of natural gas via pipeline in 2021)
- Russia is the **world's 4th largest LNG exporter** (~40 bcm of LNG in 2021, ~8% of global LNG supply)
- **State-owned Gazprom** is the largest gas producer (68% of Russian gas production in 2021)
- **Germany, Turkey and Italy are the largest importers** of Russian natural gas.
- Russia natural gas accounted for 45% of imports and almost 40% of European Union gas consumption in 2021. The EU sends to Russia roughly €400 billion a year in return.

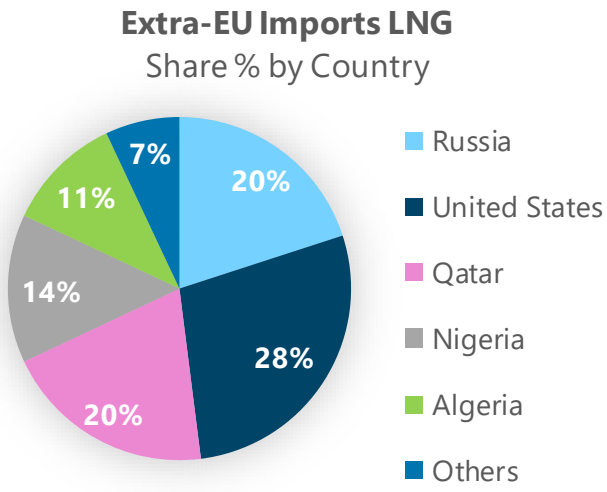
Source IEA https://www.iea.org & EC https://energy.ec.europa.eu/

4 EU Natural Gas Market

- **Natural gas currently represents around a quarter of the EU's overall energy consumption** (~26% is used in power generation, ~23% in industry and the rest is used in the residential and services sectors)
- ~10% of EU's gas needs are met by domestic production, being **EU the world's biggest importer of natural gas.**
- In 2021 the **extra-EU's natural gas demand was ~400 bcm**, including LNG imports with a share of 20% (~80bcm).
- **Russia is Europe's main natural gas supplier**, followed by Norway and Algeria, and to a lesser extent, the UK, USA and Qatar.

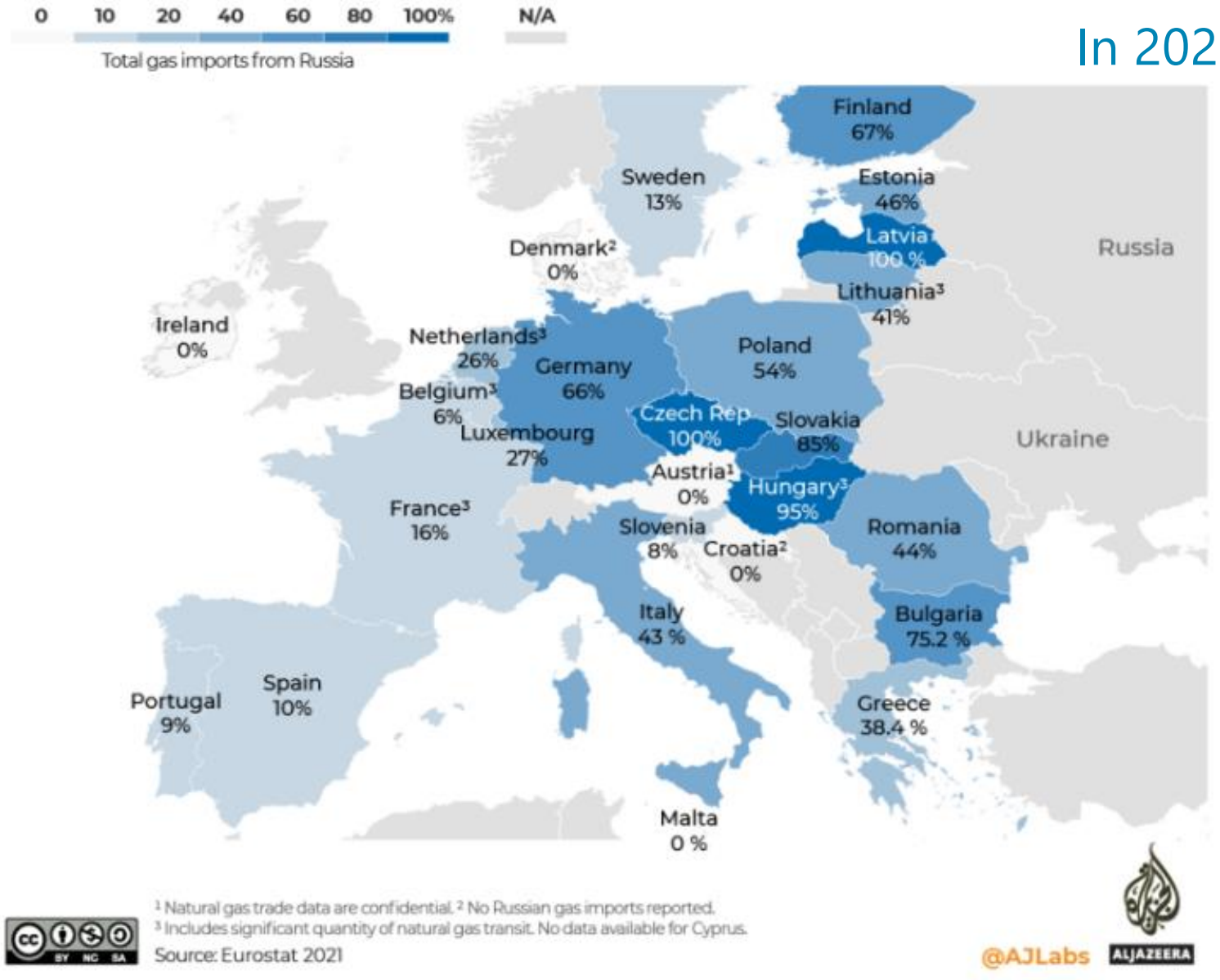






Sources: Eurostat Database 2020-2021 & European Commission https://energy.ec.europa.eu/

4.1 EU Reliance on Russian Gas



In 2021: The EU imported approximately 155 bcm of natural gas from Russia (140 bcm by gas pipeline and around 15 bcm as LNG).

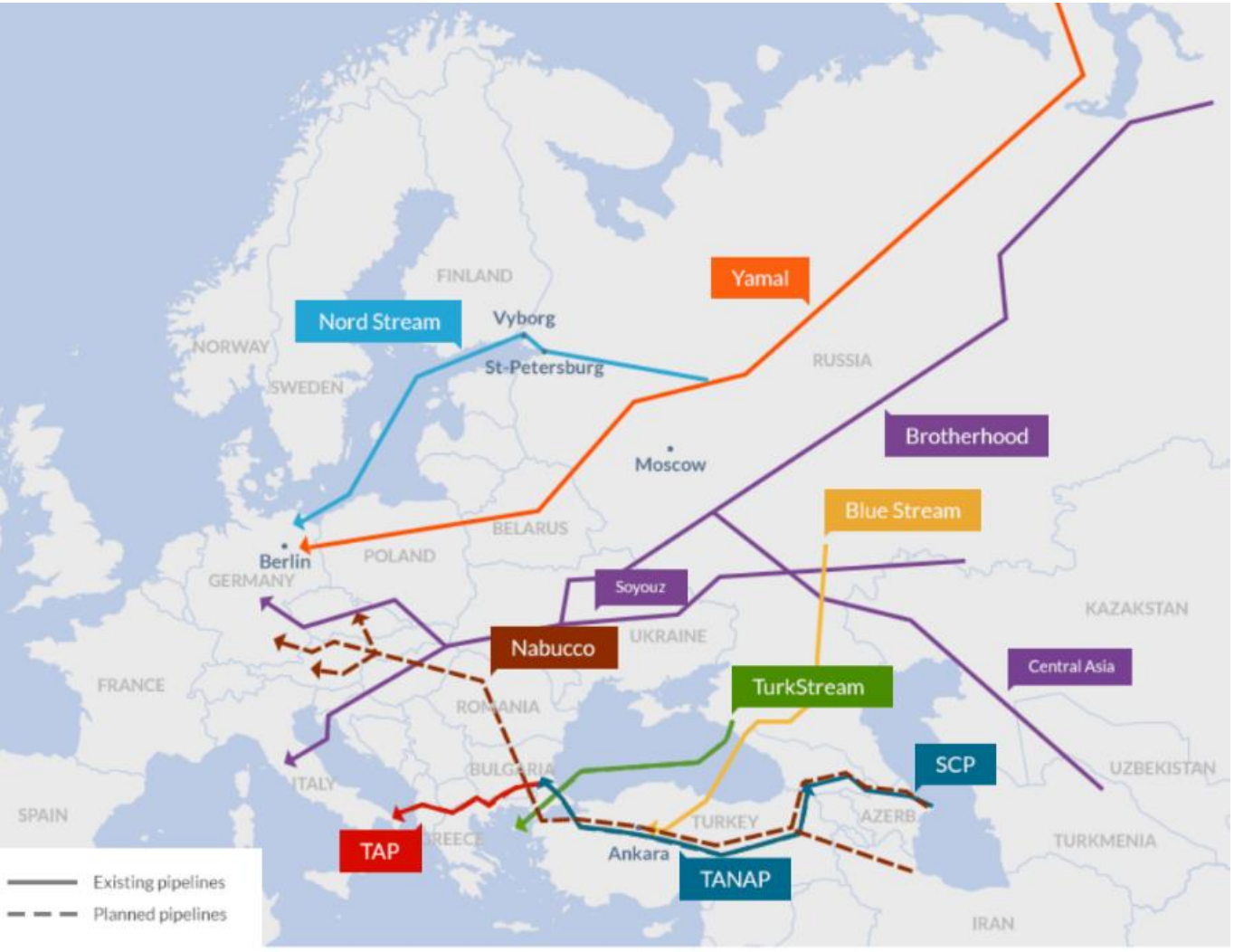
This total accounted for ~45% of the EU's gas imports and ~40% of EU's total gas consumption.

Germany (~20% share), Italy (~16% share) and France (~12% share) were the main EU importers of Russian gas, which they use to generate electricity and heat, and also to power their manufacturing industries.

Most reliant EU countries on Russian gas were Hungary, Czechia, Bulgaria, Latvia and Slovakia.

Source IEA https://www.iea.org & EC https://energy.ec.europa.eu/

4.2 Gas Pipelines Linking Russia and Europe



Sources : Gazprom export ; Gazprom ; Tanap ; Trans Adriatic Pipeline ; BP ; Natural Gaz Europe ; Nord Stream ; South Stream Transport

5ème Gauche for Planète Énerg

Source: INFOGRAPHICS Gas pipelines between Europe, Russia and Caucasia
https://www.planete-energies.com/

Russia has a large gas export pipeline network, both via transit routes through Belarus and Ukraine and via pipelines directly into Europe.

North

- **Nord Stream I**. (Cap: 55bcmpa) inaugurated in 2011, links directly Russia and Germany running under the Baltic. Accounts for around a third of all Russian gas exports to Europe. A second parallel pipeline, **Nord Stream 2** was completed in 2021 but commissioning was suspended.
- **Yamal** (Cap: 33bcmpa) through Belarus and Poland.
- **Brotherhood** (completed by **Soyuz**) (Cap: 40bcmpa) passes through Ukraine.

South

- **Blue Stream** (Cap: 16bcmpa: 1,213 km-400 km of which run under the Black Sea) supplies Turkey since 2003
- **Turk Stream** (Cap: 31.5bcmpa) since Jan 2020, up to European countries to collect the gas at the border between Turkey and Greece.

Caspian Sea

- **Nabucco.** EU began its construction in 2002, was replaced by the Southern Gas Corridor:
- **SCP South Caucasus Pipeline** (Cap: 25bcmpa) links Azerbaijan to Turkey.
- **TANAP Trans-Anatolian Natural Gas Pipeline** (Cap: 16bcmpa) carries gas through Turkey to Europe.
- **TAP Trans Adriatic Pipeline** (Cap: 10bcmpa) completes the Southern Gas Corridor, crossing through Bulgaria, Greece, Albania and the Adriatic Sea, before reaching Southern Italy.

5 IEA's 10 Point Plan

On 03 March 2022

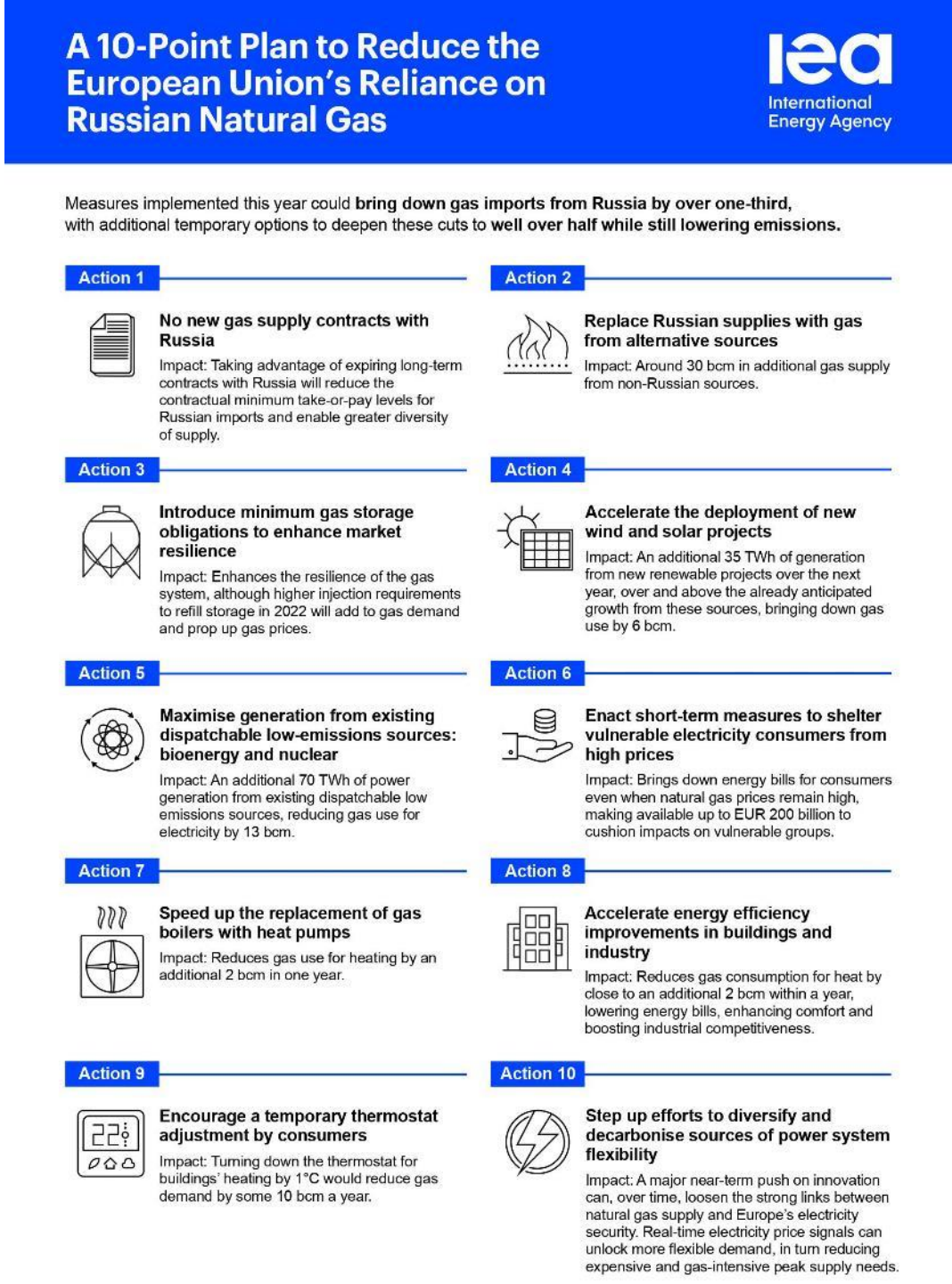
IEA released the 10-Point Plan to Reduce the European Union's Reliance on Russian Natural Gas.

It stressed the need to maximize gas supplies from other sources; accelerate the deployment of solar and wind; make the most of existing low emissions energy sources, such as renewables and nuclear; ramp up energy efficiency measures in homes and businesses; and take steps to save energy by turning down the thermostat.

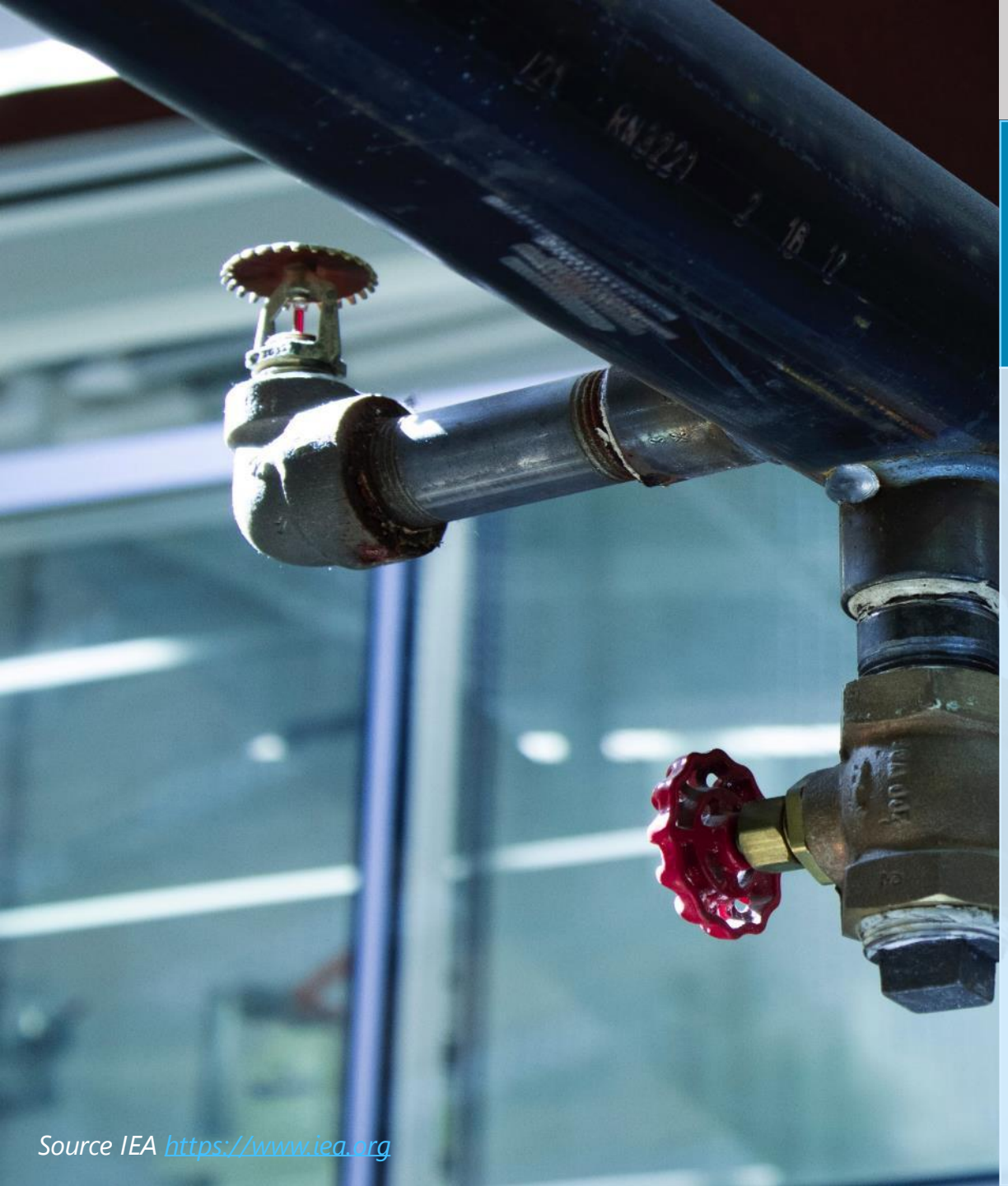
Taken together, IEA estimated these steps could reduce EU's imports of Russian gas by more than 50 bcm, or over one-third, within a year

The 10-Point Plan is consistent with the EU's climate ambitions and the European Green Deal (EU's long-term growth plan to make Europe climate neutral by 2050) and also points towards the outcomes achieved in the IEA Net Zero Emissions by 2050 Roadmap, in which EU totally eliminates the need for Russian gas imports before 2030.

Source IEA https://www.iea.org



5.1 IEA Strategy for Unified EU Action



Source IEA https://www.iea.org

On 18 July 2022, IEA proposed five concrete actions for a more coordinated, EU-wide approach to prepare for the coming winter.

1. **Introduce auction platforms to incentivize EU industrial gas users to reduce demand.** Industrial gas consumers can offer part of their contracted gas supply as demand reduction products for compensation, which can lead to efficiency gains and a competitive bidding process.
2. **Minimize gas use in the power sector.** This can be done by temporarily increasing coal and oil-fired generation while accelerating deployment of low-carbon sources, including nuclear power where it is politically acceptable and technically feasible.
3. **Enhance coordination among gas and electricity operators across Europe, including on peak-shaving mechanisms.** This can help reduce the impact of lower gas use on power systems. It should include strict cooperation on the operation of thermal power plants at national and European levels.
4. **Bring down household electricity demand by setting cooling standards and controls.** Government and public buildings should take the lead on this to set an example while campaigns should encourage behavioral changes among consumers.
5. **Harmonize emergency planning across the EU at the national and European level.** This should cover measures for supply curtailments and solidarity mechanisms. Unified EU action.

6 EU Strategy for Energy Security

- The EU is investing up to €12 billion in pipelines and LNG terminals to improve access to gas and oil from other countries including Egypt, Israel and Nigeria. Through investments in LNG terminals and gas interconnectors, every EU Country can receive gas supplies from at least two sources, and reverse flows are possible between neighbors.
- The Trans-European Energy Networks (TEN-E) have helped to create a resilient and interconnected EU gas infrastructure. Limited additional gas infrastructure, estimated at ~€10 billion of investment, is needed to complement the existing Projects of Common Interest (PCI) List and fully compensate for the future loss of Russian gas imports.
- Following the Russian invasion of Ukraine, the Commission adopted the REPowerEU Plan to end the EU's dependence on Russian fossil fuels as soon as possible.
- The EU has also adopted new legislation requiring EU underground gas storage to be filled to 80% of capacity by 1 November 2022 to ensure supply for the coming winter.
- Under the Gas Security of Supply Regulation, Member States must have in place national preventive action plans and emergency plans, and a solidarity mechanism guarantees supply to 'protected customers' in neighboring countries in a severe emergency.
- The Commission has set up the EU Energy Platform to aggregate energy demand at the regional level and facilitate future joint purchasing of both gas and green hydrogen, to ensure the best use of infrastructure so that gas flows to where it is most needed, and to reach out to international supply partners.

Source European Commission https://ec.europa.eu/

The EU is **succeeding in diversifying away from Russian gas imports** thanks to higher LNG and pipeline imports from other suppliers

6.1 REPowerEU: Phasing Out Russian Gas

On 8 March 2022 the European Commission Communication "REPowerEU: Joint European Action for more affordable, secure and sustainable energy" outlined measures to reduce Russian gas imports by two thirds in 2022 (from its 2021 level) and reach complete independence from Russian fossil fuels before end of decade.

On 18 May 2022 the REPowerEU Plan was published, focused on 4 key actions:

SAVING

Every citizen, business, and organisation can save energy. Small behavioural changes, if we all commit to them, can make a significant difference. Contingency measures for supply interruptions will also be needed.

DIVERSIFYING

The EU is working with international partners to find alternative energy supplies. In the short-term, we need alternative supplies of gas, oil and coal as quickly as possible, and looking to the future we will need renewable hydrogen too.

ACCELERATING CLEAN ENERGY

Renewables are the cheapest and cleanest energy available, and can be produced domestically, reducing our need for energy imports. **REPowerEU** will speed up the green transition and spur massive investment in renewable energy. We also need to enable industry and transport to substitute fossil fuel use faster to bring down emissions and dependencies.

INVESTMENT AND REFORM

Additional investments of €210 billion are needed between now and 2027 to achieve our independence from Russian fossil fuel imports, currently costing European taxpayers nearly €100 billion per year. The Commission proposes that Member States develop national **REPowerEU** plans to implement these new priorities.

SHORT TERM MEASURES

- **Common purchases of gas, LNG and hydrogen via the EU Energy Platform** for all Member States who want to participate as well as Ukraine, Moldova, Georgia and the Western Balkans
- **New energy partnerships** with reliable suppliers, including future cooperation on renewables and low carbon gases
- **Rapid roll out of solar and wind energy projects** combined with renewable hydrogen deployment to save around 50 bcm of gas imports
- **Increase the production of biomethane** to save 17 bcm of gas imports

- Approval of first **EU-wide hydrogen projects** by the summer
- An **EU Save Energy Communication** with recommendations for how citizens and businesses can save around 13 bcm of gas imports
- **Fill gas storage** to 80% of capacity by 1 November 2022
- **EU-coordinated demand reduction plans** in case of gas supply disruption

MEDIUM-TERM MEASURES TO BE COMPLETED BEFORE 2027

- **New national REPowerEU Plans under the modified Recovery and Resilience Fund** – to support investment and reforms worth €300 billion
- **Boosting industrial decarbonisation** with around €3 billion of frontloaded projects under the Innovation Fund
- **New legislation and recommendations for faster permitting of renewables** especially in dedicated 'go-to areas' with low environmental risk
- **Investments in an integrated and adapted gas and electricity infrastructure network**
- Increased ambition on **energy savings by raising the EU-wide target on efficiency for 2030 from 9% to 13%**

- **Increase the European renewables target for 2030 from 40% to 45%**
- **New EU proposals** to ensure industry has access to critical raw materials
- Regulatory measures to **increase energy efficiency in the transport sector**
- **A hydrogen accelerator** to build 17.5 GW by 2025 of electrolysers to fuel EU industry with homegrown production of 10 million tonnes renewable hydrogen
- **A modern regulatory framework for hydrogen**

Source European Commission https://ec.europa.eu/

6.2 REPowerEU: Clean Energy

Over 20% of EU's energy currently comes from renewables. Since the beginning of 2022, an estimated additional 20 GW of renewable energy capacity have been added. This is the equivalent of more than 4 bcm of natural gas.

Renewables are the cheapest and cleanest energy available, and can be generated domestically, reducing our need for energy imports. The Commission is proposing **to increase the EU's 2030 target for renewables from the current 40% to 45%**. The REPowerEU Plan would bring the total renewable energy generation capacities to 1236 GW by 2030, in comparison to 1067 GW by 2030 envisaged under Fit for 55 for 2030.

GOING FASTER AND FURTHER WITH CLEAN ENERGY PROJECTS

- New EU legislation will **speed up permitting procedures** for wind farms and solar panels: renewable energy becomes an overriding public interest, with 'go-to' areas introduced at Member State level in zones with low environmental risk, and more regulatory incentives created for innovative technologies
- **A Commission Recommendation and guidance** to Member States on permits for renewable energy and corporate power purchase agreements.
- **Country Specific Recommendations** on energy policy in line with REPowerEU objectives issued to Member States as part of the European Spring Semester
- New **eco-design and energy labelling** requirements for solar panels and heat pumps

SOLAR ENERGY TO REPOWER EUROPE

The **EU Solar Energy Strategy** will boost the roll-out of photovoltaic energy. As part of the REPowerEU plan, this strategy aims to bring online **over 320 GW of solar photovoltaic newly installed by 2025**, over twice today's level, and almost 600 GW by 2030. These frontloaded additional capacities displace the consumption of 9 bcm of natural gas annually by 2027:

- **A European Solar Rooftops initiative**: a gradual obligation to install solar rooftop panels in certain buildings, combined with renovations, while promoting self-consumption and energy communities
- An **EU Solar PV Industry Alliance** for an innovative and resilient photovoltaic value chain in the EU
- **EU large-scale skills partnership**: to ensure that the deployment of renewables happens smoothly and creates local jobs across the EU

RENEWABLE GASES: HYDROGEN AND BIOMETHANE

A new Hydrogen Accelerator to ensure 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of renewable hydrogen imports by 2030 including:

- New **financing** for renewable hydrogen projects under Horizon Europe worth 200 million euros and swift approval of projects under the Important Projects of Common European Interest framework
- Two new **legal acts** to complete the regulatory framework and boost the production, consumption and market developments of renewable and low-carbon hydrogen
- Accelerate work on technical **hydrogen standards**, in particular for hydrogen production, infrastructure and end-use appliances.
- The establishment of a **Global European Hydrogen Facility** and **Green Hydrogen Partnerships** to incentivize European and global renewable hydrogen production and trade

A dedicated action plan to boost biomethane production to 35 bcm by 2030 including:

- €37 billion investment needs eligible for co-financing by the **Common Agricultural Policy, Connecting Europe Facility, Cohesion Policy and Recovery and Resilience Facility**
- Establishment of an **industrial biogas and bio-methane partnership** to stimulate the renewable gases value chain

Source European Commission https://ec.europa.eu/

6.3 REPowerEU: Financing

Delivering the REPowerEU objectives requires an additional investment of €210 billion between now and 2027.

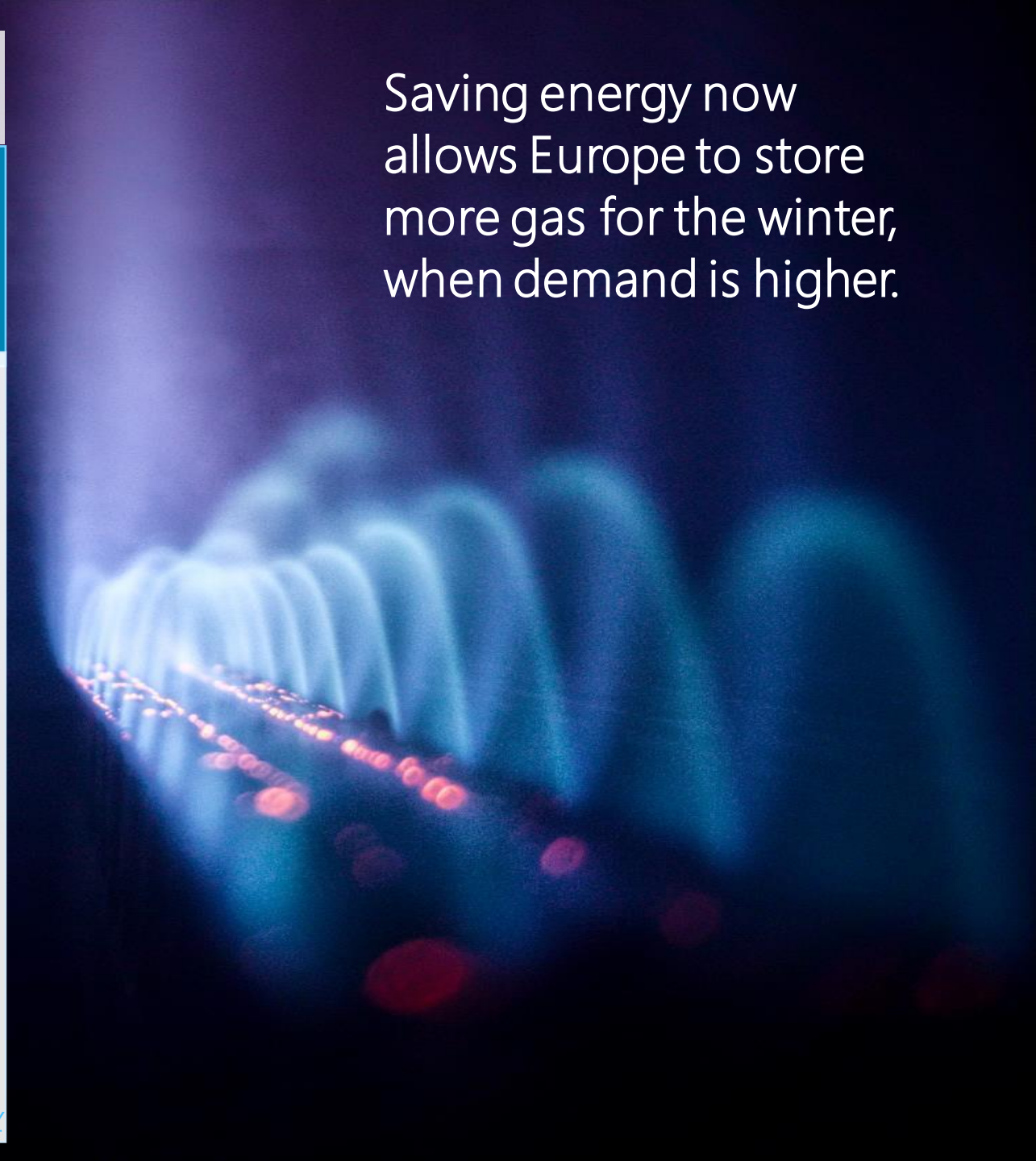
Source European Commission https://ec.europa.eu/

6.4 EU Gas Demand Reduction

On 20 July 2022, the European Commission presented its "Winter Preparedness Package", which includes:

- Communication "Save gas for a safe winter" proposes that all EU Countries reduce gas demand by 15% from 1 August 2022 to 31 March 2023 (voluntary at first)
- New Regulation proposal on Coordinated Gas Demand Reduction Measures that creates the possibility to call a 'EU-Alert' and impose mandatory gas demand reductions on all EU countries in case of gas shortage.
- EU Gas-Demand Reduction Plan which sets out measures, principles and criteria for coordinated demand reduction to achieve the target. It aims to safeguard supply to households, and essential users and industries. Based on three pillars of action:
  - Switching from gas to alternative fuels to minimize industry curtailment
  - Incentivizing consumption reduction from industries with market tools
  - Saving on heating and cooling

Source European Commission https://ec.europa.eu/



Saving energy now allows Europe to store more gas for the winter, when demand is higher.

6.5 EU Gas Storage Regulation

Gas storage facilities are critical infrastructure to ensure EU security of supply as they provide back-up volumes in case of strong demand or supply disruptions.

- EU gas storage capacity is ~25%-30% of the gas consumed in winter.
- In 2021, the EU experienced a period of volatile and high energy prices, due to, among others, lower than usual storage filling levels.
- In 2022, geopolitical tensions increased the threat of gas supply disruptions by Russia and consequently the need for well-filled gas storages for future winters.

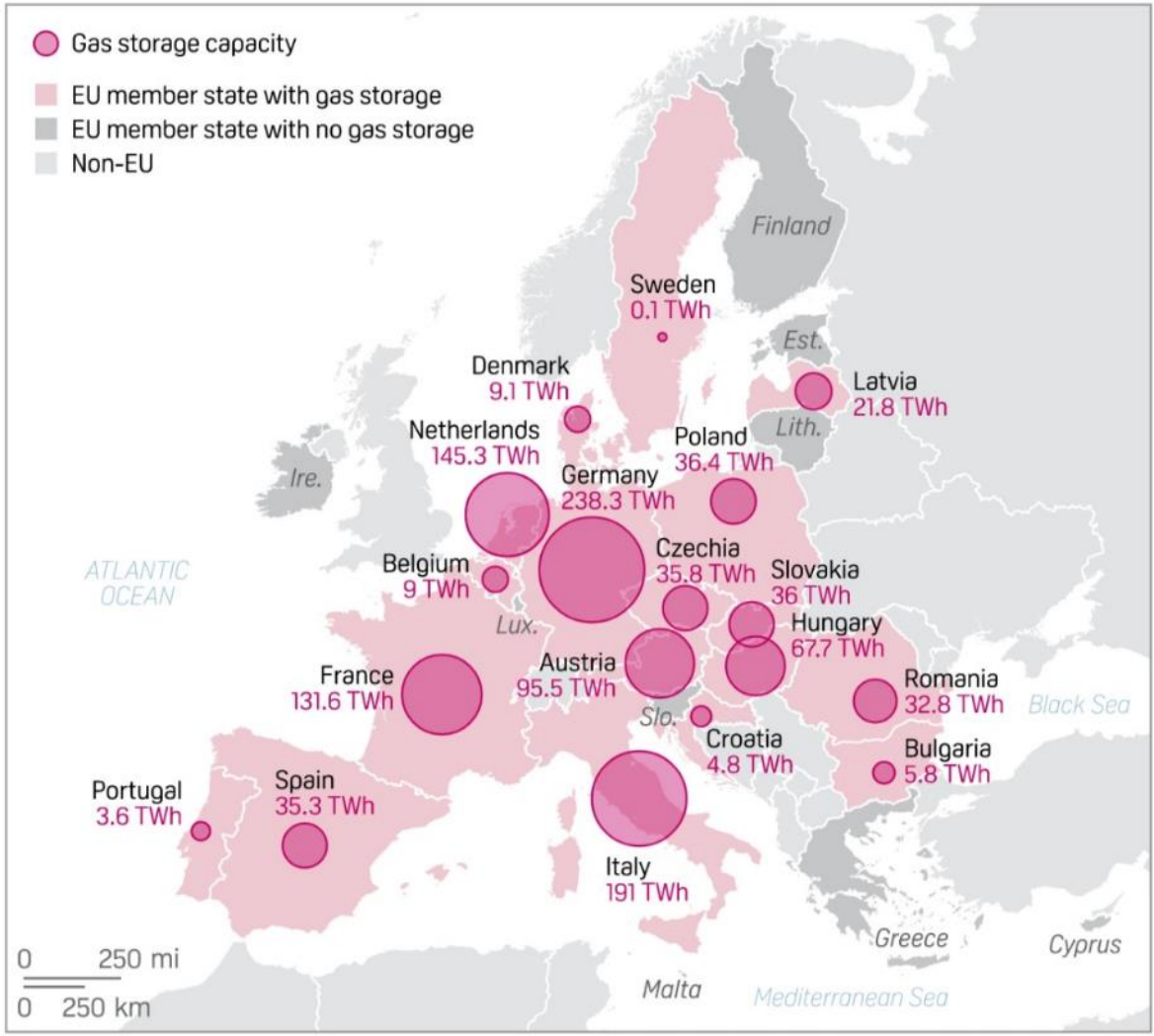
On 23 March 2022 the European Commission published a legislative proposal on minimum gas storage obligations. **On 27 June 2022, the new legislation "Gas Storage Regulation" was adopted:**

- EU gas storage sites must be filled to at least 80% of their capacity by Nov.1, 2022. In the coming years, the target will be 90%.
- Overall, the EU will attempt collectively to fill 85% of the total underground gas storage capacity in the EU in 2022
- EU countries with no storage capacity, required to store 15% of their annual domestic gas consumption in stocks located in other countries
- Gas storage facilities will now be considered critical infrastructure and all storage operators in the EU will have to go through a new certification process to reduce the risks of outside interference.

On 28 July 2022, EU gas storage levels are at ~67% full of capacity

Source European Commission https://ec.europa.eu/

GAS STORAGE CAPACITIES AMONG EU MEMBER STATES



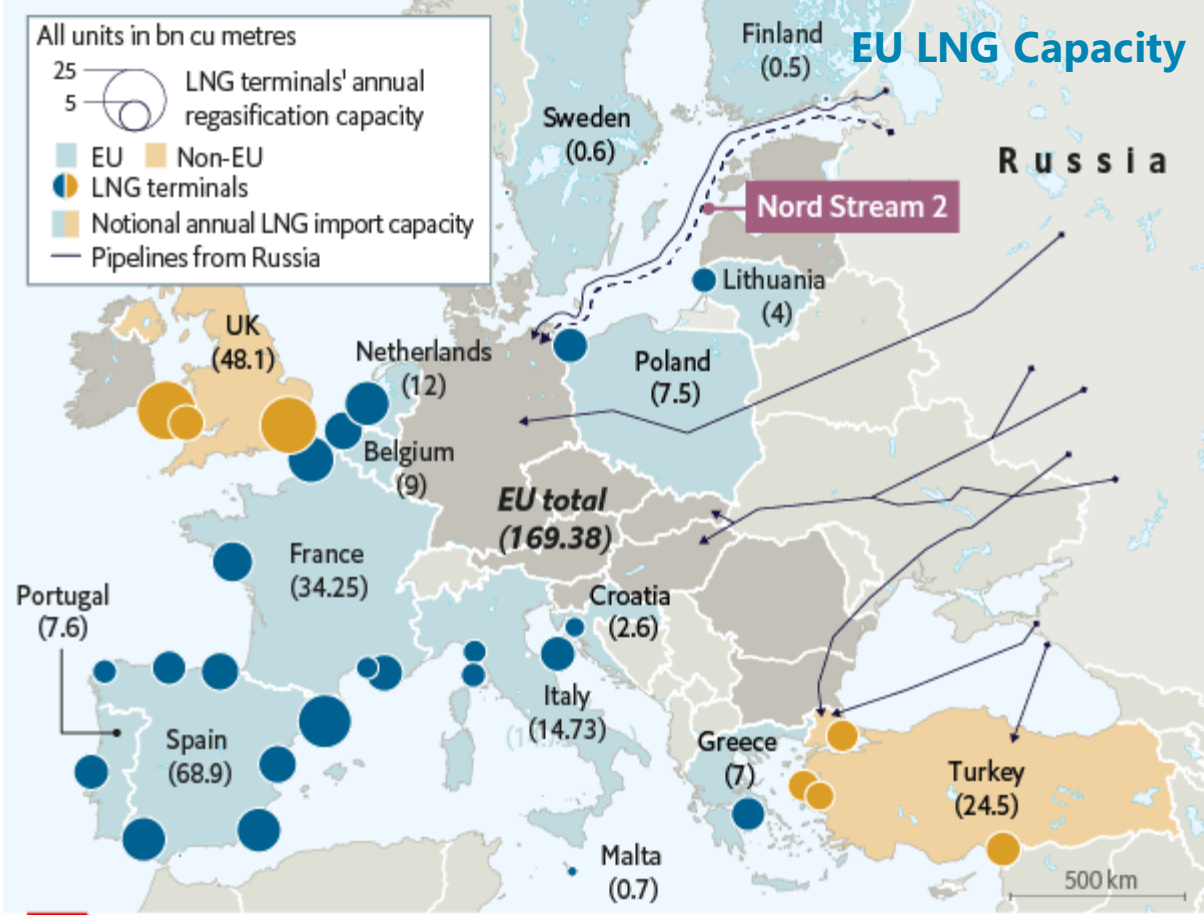
Source: S&P Global Commodity Insights, GIE

Source AGSI https://agsi.gie.eu

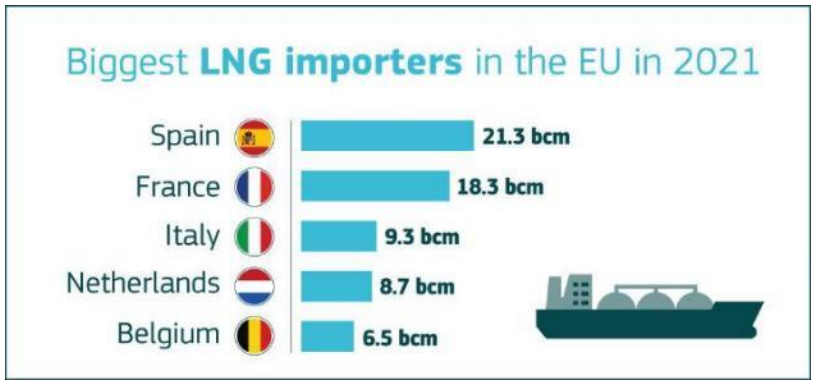
6.6 EU LNG Infrastructure

In 2021, 13 EU countries imported total LNG of 80 bcm (gas equiv.)

- EU has strongly developed LNG import infrastructure with available overall capacity ~160bcm/year, enough to meet ~40% of total EU's current gas demand
- Further accelerating the upgrade and extension of LNG infrastructure and diversifying sources are a priority to make the EU energy system more resilient
- The EU LNG strategy includes a list of key infrastructure projects which are essential to ensure that all EU countries can benefit from LNG
- Over the last decade, the EU has invested significant amounts in LNG infrastructure, with more than 20 large-scale terminals now in operation and connected to the grid, and more under construction.
- In March 2022 the US committed to increasing its LNG export volumes for the EU market with additional 15 bcm this year, and up to 50 bcm annually by 2030.
- The EU is closely working with energy partners such as USA, Norway, Japan, South Korea and Qatar to address the current global energy challenges and to further develop their cooperation on LNG.



Source The Economist Intelligence Unit www.eiu.com



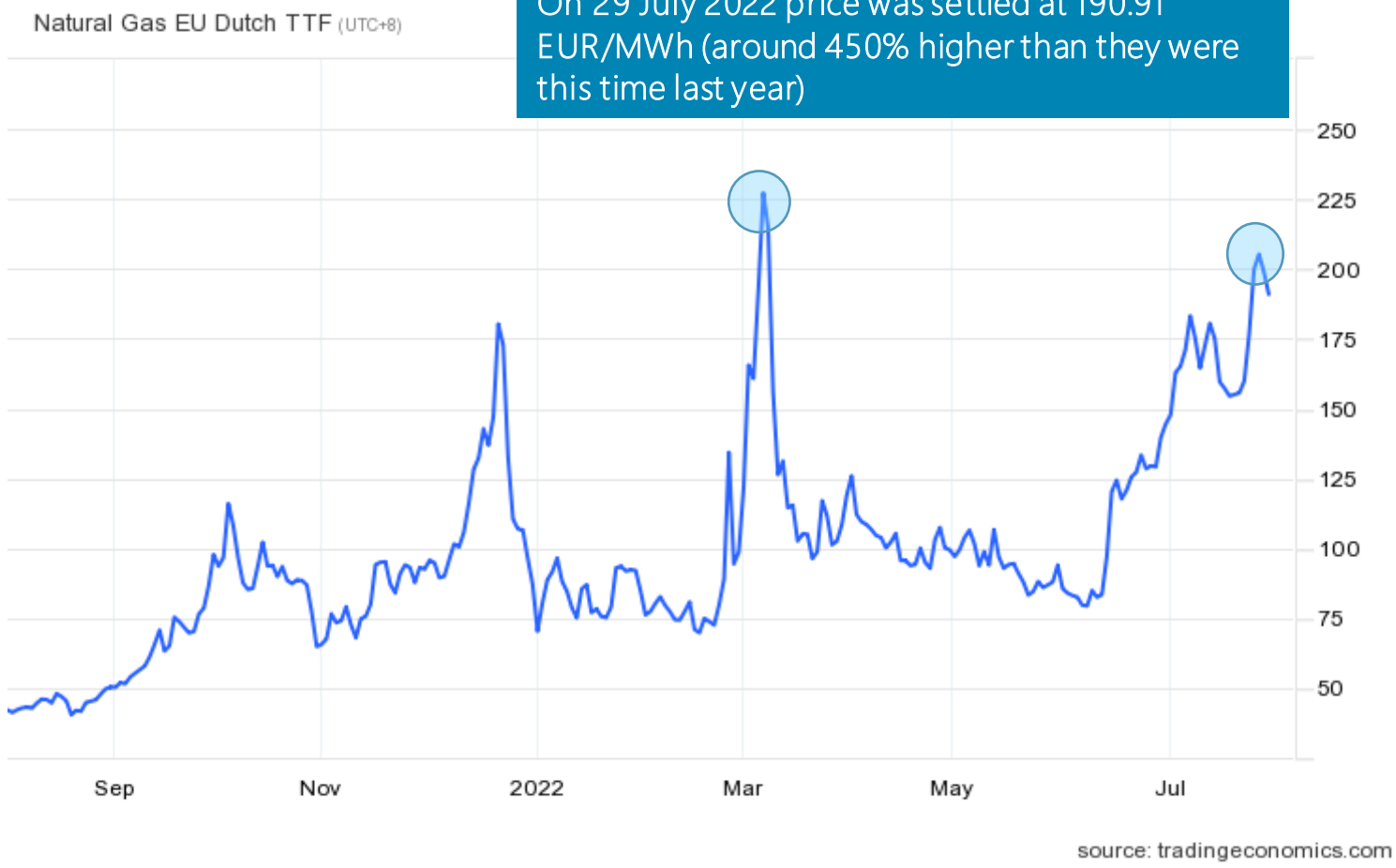
Source European Commission https://ec.europa.eu/

7 Impact of the Gas Price Increase in EU

- **Over the last 12 months, the retail prices of natural gas and electricity have been rising by respectively 65% and 30%.**
- **Russia's invasion of Ukraine followed by gas supply cuts from Russia has exacerbated the price volatility.**
- **High demand together with concerns about filing storage sites this summer contributed to record-high prices across EU**
- **A combination of higher energy, transport and higher food prices are likely to increase poverty. High-energy prices are feeding inflation and hurting Europe's economy and impacting its recovery from the COVID-19 crisis.**
- **As a result of the price increase, since its invasion of Ukraine the amount of revenue that Russia has collected from exporting oil and gas to Europe has doubled compared with the average of recent years – to $95 billion.**

Natural Gas Dutch front-month TTF price, the European benchmark, reached a record 227.20 EUR/MWh on 8 March 2022.

On 29 July 2022 price was settled at 190.91 EUR/MWh (around 450% higher than they were this time last year)



Source European Commission https://ec.europa.eu/

Source Trading Economics https://tradingeconomics.com/

8 Status & Conclusions

In June 2022, Russian gas supplies were below 30% of the average for the previous years and 12 Member States already had suffered from full or partial disruption of supply.

- Lithuania ceased Russian gas imports at the beginning of April 2022
- During April-June 2022, Gazprom cut gas supplies to Bulgaria, Poland, Finland, Denmark and Netherlands following their refusal to adhere to the rouble payment system introduced by Russia.
- In May 2022, Gazprom closed the Yamal gas pipeline, which delivers gas to Germany and other European nations.
- Since mid-June 2022, Russia has been cutting flows through the Nord Stream 1 pipeline to Germany, with it now operating at less than a fifth of its normal capacity
- End of July 2022, Gazprom suspended gas supplies to Latvia

This supply disruption has already significant impacts on the price of gas, on the price of electricity, on inflation, on the overall EU financial and macroeconomic stability, and on all citizens.

As a response, EU Countries are already moving ahead with phasing out Russian gas.

- The gas supply from non-Russian sources have quite impressively increased since January 2022 by 35 bcm by now (via further agreements with suppliers like USA, Norway, Qatar, UK, the Gulf States, Algeria, Azerbaijan and Egypt)
- Since the beginning of 2022, an estimated additional 20 GW of renewable energy capacity has been added. This is the equivalent of more than 4 bcm of natural gas replaced.
- Increased energy efficiency, energy savings, renewable energy sources and further accelerating the upgrade and extension of LNG infrastructure and diversifying sources and routes of pipeline gas are a priority to make the EU energy system more resilient.
- Besides, by progressively eliminating our dependence on fossil fuel sources and by reducing the EU's overall energy consumption, will contribute to the green transformation of Europe's energy system and will put Europe on a path towards climate neutrality by 2050.

Source European Commission https://ec.europa.eu/

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Notes

- **IEA –** International Energy Agency
- **EC** – European Commission
- **European Green Deal** - The European Green Deal, approved in 2020, is a set of policy initiatives by the European Commission with the overarching aim of making the European Union (EU) climate neutral in 2050
- **Projects of Common Interest (PCI) -** Projects of common interest (PCIs) are key cross border infrastructure projects that link the energy systems of EU countries. They are intended to help the EU achieve its energy policy and climate objectives: affordable, secure and sustainable energy for all citizens, and the long-term decarbonization of the economy in accordance with the Paris Agreement.
- **Europe** – Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus,5,6 Czech Republic, Denmark, Estonia, Finland, the Former Yugoslav Republic of North Macedonia, France, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Kosovo, Latvia, Lithuania, Luxembourg, Malta, the Republic of Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Republic of Türkiye, Ukraine and United Kingdom.
- **EU27/European Union –** Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain and Sweden.
- **LNG** - Liquefied natural gas is natural gas, predominantly methane, converted to liquid form for ease of storage or transport. When it reaches its final destination, LNG is usually re-gasified and distributed through gas networks, just like gas from pipelines
- **bpd** - barrels per day
- **bcm –** billion cubic meters
- **bcmpa -** billion cubic meters of gas per annum
- **Natural Gas EU Dutch TTF** - Dutch TTF Gas is a leading European benchmark price. TTF is the virtual trading point of the Title Transfer Facility or the Netherlands Securities Transfer Fund, which is used as a reference gas market at European level and trades at € / MWh.
- **GW** – Gigawatt (equivalent to 1000 kW – Kilowatts)

THANK YOU

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