

Regaining Europe's Energy Sovereignty

15 Priority Actions for RePowerEU

24 March 2022



Key findings

1

The escalation of Russia's war against Ukraine has created a fossil energy crisis and has exposed the EU's dependency on fossil gas imports. If the EU fully mobilises all available means to reduce energy demand and switch to renewable energy, Europe can regain its energy sovereignty by 2027. Energy efficiency in buildings and industry as well as a fast ramp up of wind and solar PV can permanently reduce fossil gas demand by 1200 terawatt hours in the next five years, allowing to avoid 80% of today's Russian gas imports and enabling a 100% displacement when combined with alternative supplies such as LNG.

2

Climate protection and energy security go hand in hand, as actions to meet the EU climate targets also reduce fossil gas consumption. Until 2027, energy efficiency, district heating and a heat pump revolution can save 480 TWh in buildings; efficiency and electrification in low and medium temperature heat processes can provide for 223 TWh savings in industry, and a ramp up of wind & solar PV combined with more system flexibility will contribute 500 TWh in the power sector.

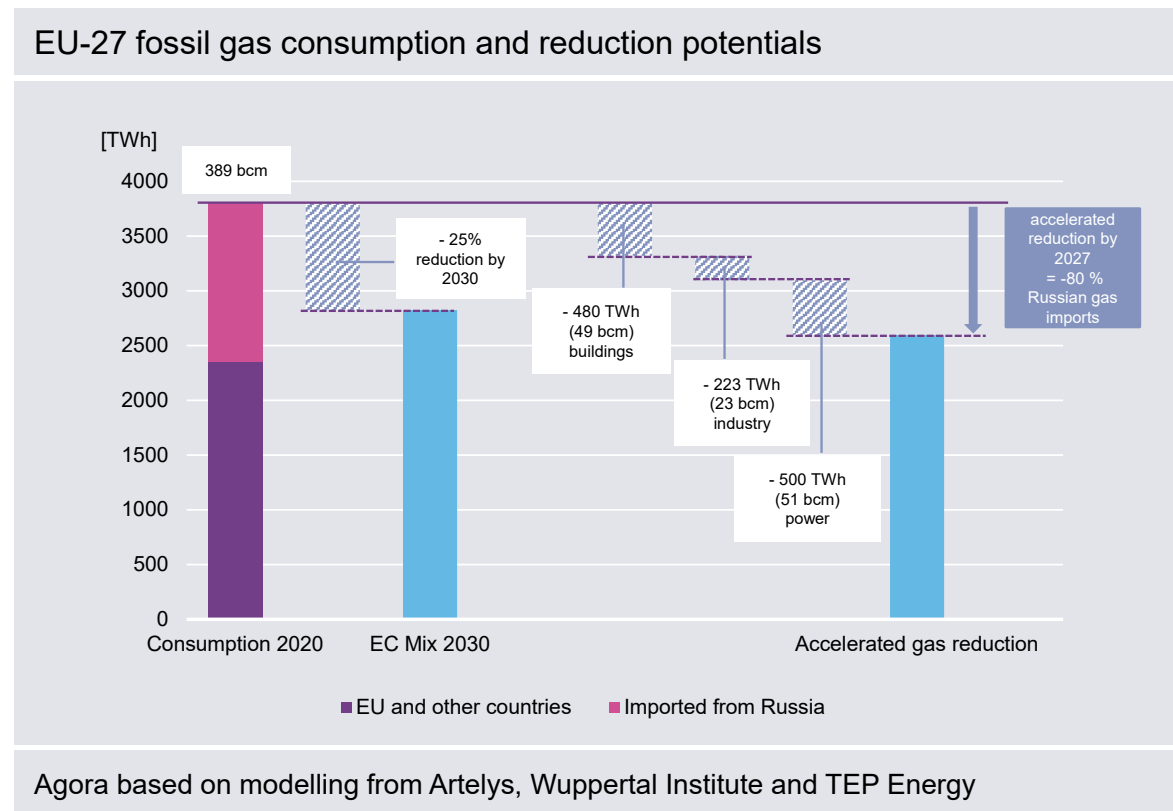
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Regaining Europe's energy sovereignty by 2027 requires a collective European effort based on joint commitments and solidarity. The RePowerEU plan needs to mobilize the reductions identified in this study. Similar to the COVID recovery efforts, the plan must be embedded in a strong political framework overseen by the European Council to ensure its swift and full implementation. Helping Ukraine build back better after the war should be part of the efforts.

4

A new EU Energy Sovereignty Fund, modelled on NextGenEU and equipped with 100 bn EUR until 2027, should be set up as part of a dedicated investment framework to deliver RePowerEU. The framework also needs to ensure that existing EU funds are re-purposed wherever possible and governments smartly combine price signals and protection for poor households and industry.

Energy efficiency measures and fast renewables ramp up can permanently displace 1200 terawatt hours of gas demand by 2027, allowing to avoid 80% of current Russian imports



- The buildings sector can save 480 TWh through energy efficiency, district heating and a heat pump revolution.
- The industry sector can reduce at least 223 TWh through heat pumps, fuel switch and reduction of fossil gas as a feedstock.
- Pulling all stops to scaling renewables, investing into flexible assets and into enhanced power system flexibility will displace around 500 TWh fossil gas in the power sector.

Buildings can save 480 TWh by improving boiler efficiency, renovating buildings, replacing gas boilers with heat pumps, district heating, and biomass as well as switching fuels

Estimated saving potentials in the buildings sector (TWh)

Sector	Minimum potential (TWh)
Improve energy efficiency of existing gas boilers	72
Renovate buildings	72
Replace gas boilers with heat pumps	140
Replace gas boilers with district heating	125
Replace gas boilers with biomass	47
Switch fuels for existing boilers	24

Agora based on modelling from Artelys, Wuppertal Institute and TEP Energy

Priority actions:

1. Introduce an EU-wide Check & Act campaign and mobilize a Civilian Energy Corps.
2. Make the training of skilled professionals for the energy transition a key priority.
3. Stop installing new gas boilers.
4. Rapidly scale up the production and installation of heat pumps.
5. Rapidly scale up building renovation.
6. Connect more homes to district heating networks and make them greener and more efficient.

Industry can save 223 TWh by installing heat pumps, switching fuels, and reducing & replacing gas as feed-stock

Estimated saving potentials in industry sector (TWh)

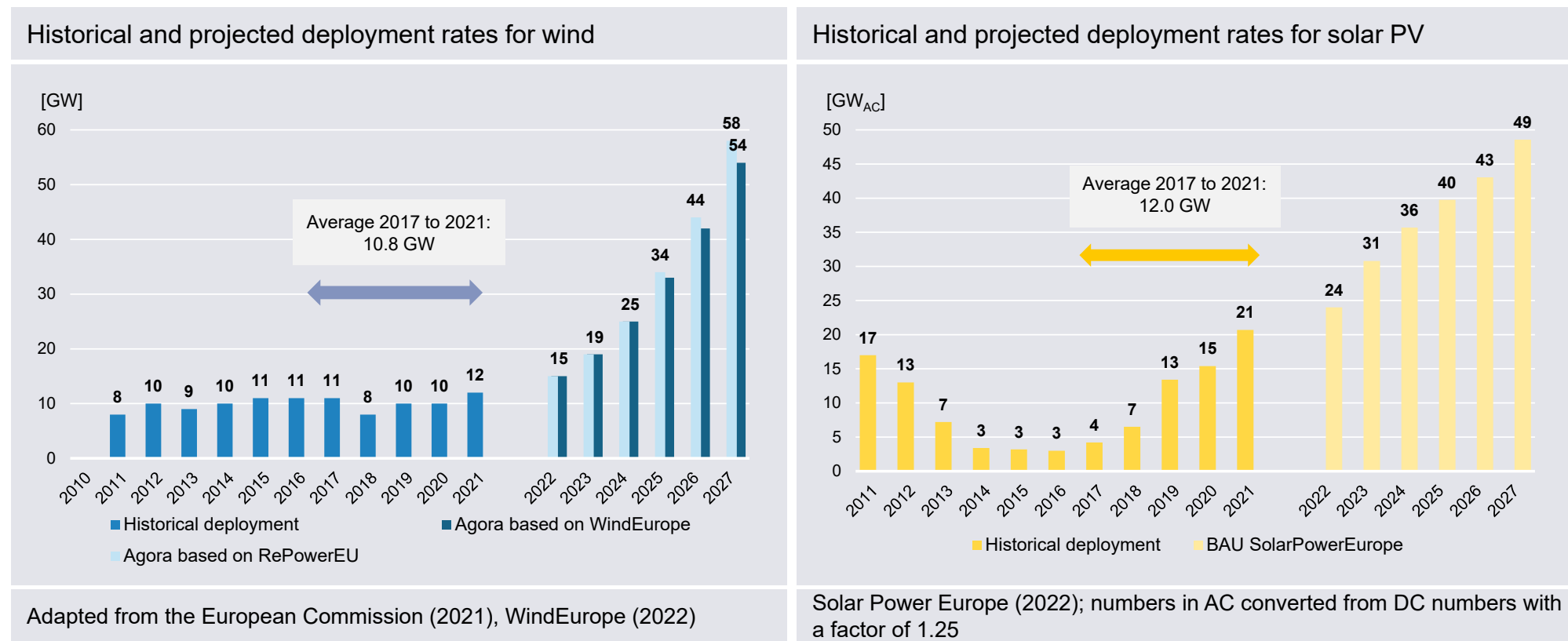
Sector	Minimum Potential (TWh)
Install heat pumps for low temperature heat (<150°C)	170
Install hybrid electricity/fuel systems for medium temperature heat (150-500°C)	30
Switch fuels for high temperature heat processes (>500°C)	3
Reduce and replace natural gas as feedstock in fertilisers and plastics	20

Agora based on modelling from Artelys, Wuppertal Institute and TEP Energy

Priority actions:

7. Don't regulate industrial gas and energy prices, let the demand signal work.
8. Take emergency measures to avoid irreversible reduction in EU industrial and agriculture production capacities.
9. Accelerate the uptake of heat pumps, direct electrification and hybrid RES-fossil fuel systems for low and medium-temperature industrial heat.
10. Regulate industry to ensure all cost-effective energy savings measures are taken.
11. Rapidly scale material efficiency and enhanced recycling of energy-intensive materials.

Pulling all stops to scaling renewables, investing into flexible assets and enhancing power system flexibility will displace around 500 TWh fossil gas in the power sector



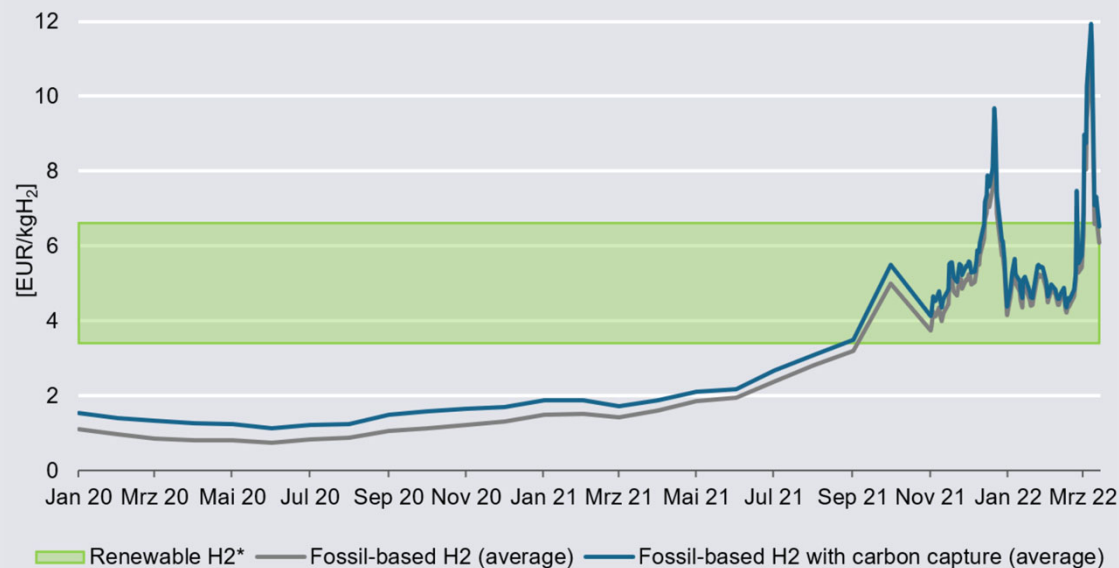
Pulling all stops to scaling renewables, investing into flexible assets and enhancing power system flexibility will displace around 500 TWh fossil gas in the power sector

Priority actions:

12. Pull all stops for renewables deployment and manufacturing in Europe
13. Mandate solar rooftops, solar on the built environment and maximize PV self-consumption
14. Fully and ambitiously implement existing electricity market rules to enhance power system flexibility
15. Strike a smart balance between direct electrification and green hydrogen production

The changing economics and geopolitics of blue hydrogen put even higher pressure on green hydrogen to emerge

Costs of renewable H₂ and fossil based H₂ with carbon capture 2020-2021



*Renewable H₂ production based on RES direct connection / RES PPA. Agora Energiewende and Guidehouse (2022)

- Fossil-gas based blue hydrogen plays a prominent role in net-zero scenarios in a transition phase.
- Due to the fossil energy crisis, blue hydrogen can no longer be considered part of the solution.
- Current gas prices have undermined the business case compared to green hydrogen.
- Renewable hydrogen and additional renewable electricity generation must be accelerated.
- Renewable hydrogen needs to be prioritized for no regret applications.
- No regret applications are steelmaking, basic chemicals, long haul aviation, maritime shipping and back-up power plants.

An Investment Framework for RePowerEU based on European Solidarity

Public funding needs of the proposed 15 priority actions

bn EUR (2022–2027)	Public funding needs (total)	Public funding needs (per year)	National budgets	EU funds (EU budget, RRF, other)
Power sector and H2	103	11	31	72
District heating	210	35	176	34
Building and heating renovations	337	56	253	84
Industry	30	5	4	26
TOT	680	113 (0.81% EU GDP)	464	216

Agora Energiewende (2022)

- Just transition considerations and public ownership of key assets require a high share of public financing of the total investment needs.
- The lion's share of public financing will come from national budgets, but the highly gas dependent and fiscally fragile countries need solidarity.
- Our estimates suggest that a new EU Energy Sovereignty Fund should be equipped with 100 bn EUR until 2027; supporting investment needs not covered by existing EU funds with priority on fiscally fragile Member States.
- Commitments around establishing the Fund should ensure existing funds are repurposed where possible and that governments smartly combine price signals and protection for poor households and industry.

Effects of RePowerEU on trade, employment and economic activity

Employment in the gas, clean energy and heating equipment sectors

Sector	EU27 employment, thousands (*)
Natural gas (2018)	
Extraction of gas	15
Manufacture of gas	12
Distribution and trade of gas and gaseous fuels	104
Electricity generation	28
Total natural gas	159
Clean energy (2019)	
Energy efficiency	1,104
Renewables	617
Renewables (direct and indirect employment, 2020)	1300
Of which: solar and wind power	453
Heating equipment manufacturing (2018)	
Manufacture of central heating radiators and boilers	56
Heat pumps (direct and indirect employment, 2020)	319

Eurostat, IRENA, EurObserv'ER and calculations by Agora Energiewende

- Investments required to meet the Fit for 55 targets and additional RePowerEU efforts are significant.
- But the economic benefits are real, large, and they last. This is much preferable to paying many billion euros per year to autocratic regimes to purchase and then burn fossil fuels.
- Gas cost savings worth 130-320 billion EUR should already accrue in 2022-2027, the same amount could finance the full renovation of 3 to 8 million homes.
- Investing into clean energy creates many times more jobs and economic value than continuing our current fossil fuel dependency.
- Adding 418 GW of solar and wind by 2027 means 418.000 new jobs (FTE) in construction of new plants and 46.000 new jobs in O&M.

Agora Energiewende
Rue du Commerce 31
1000 Brussels

www.agora-energiewende.de
info-brussels@agora-energiewende.de

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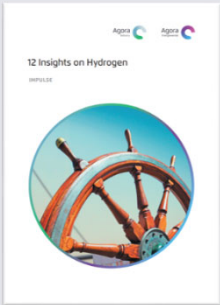


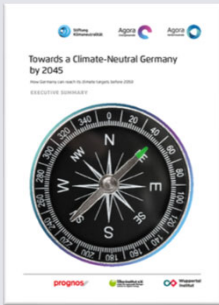

Thank you for your attention!

Questions or comments? Feel free to contact us:

Matthias.Buck@agora-energiewende.de
Alexander.Dusolt@agora-energiewende.de



Publications on climate-neutrality, hydrogen and industry

12 Insights on Hydrogen	Making renewable hydrogen cost-competitive	No-regret hydrogen: Charting early steps for H ₂ infrastructure in Europe	Towards a climate-neutral Germany by 2045	Breakthrough Strategies for Climate-Neutral Industry in Europe
				
<ul style="list-style-type: none"> > <u>impulse</u> 	<ul style="list-style-type: none"> > <u>main study</u> > <u>legal analysis</u> 	<ul style="list-style-type: none"> > <u>full study</u> 	<ul style="list-style-type: none"> > <u>summary (EN)</u> > <u>full study (DE)</u> 	<ul style="list-style-type: none"> > <u>summary</u> > <u>full study</u>
	<ul style="list-style-type: none"> > <u>slide deck</u> > <u>webinar</u> 	<ul style="list-style-type: none"> > <u>data appendix</u> > <u>webinar</u> 	<ul style="list-style-type: none"> > <u>data appendix (DE)</u> 	<ul style="list-style-type: none"> > <u>webinars</u>