

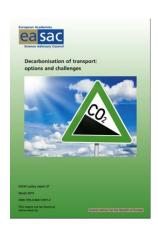


EASAC - who we are

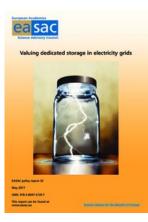
- Network of 29 National Science Academies from EU Member States, Norway, Switzerland and UK, set up in 2001 to provide advice to EU policy makers
- Affiliated network for Europe of the IAP Global Network of Science Academies
- Science-based, peer-reviewed analysis and policyadvice, endorsed by all EASAC member academies
- Free download from www.easac.eu



Forests



Transport



Storage



Buildings



Background to EASAC project



- Started work December 2021, launched report May 2023
- Aim to advise policy makers, investors, stakeholders
- Working Group 20 from National Science Academies
- **Expert inputs** from workshops, discussions, publications European Commission, industry, researchers, stakeholders
- Independent peer review (14 reviewers)
- Endorsement by EASAC Member Academies



EU policy background

Paris targets, Green Deal

EU Climate Law: reduce carbon emissions to net-zero by 2050.

- Natural gas accounted for nearly 25% of CO₂ emissions from EU energy sector in 2021.
- Transition away from fossil fuels. LNG has high carbon footprint.

Global Methane Pledge: 30% reduction by 2030 (150 countries)

• Methane emissions/leaks of natural gas are substantial, especially for shale gas, but not adequately monitored. Agreement in Nov 2023 on EU Methane Regulation.

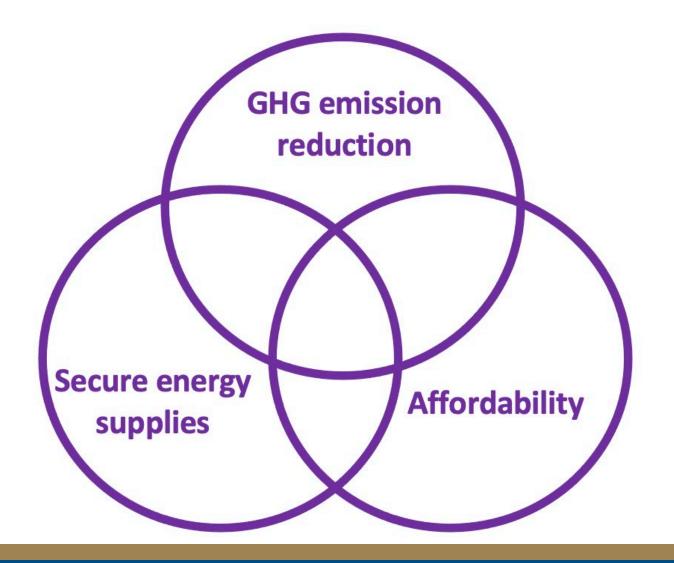
EU Funding - reduce energy poverty in vulnerable groups & support strategic businesses

Russia invaded Ukraine (Feb 2022)

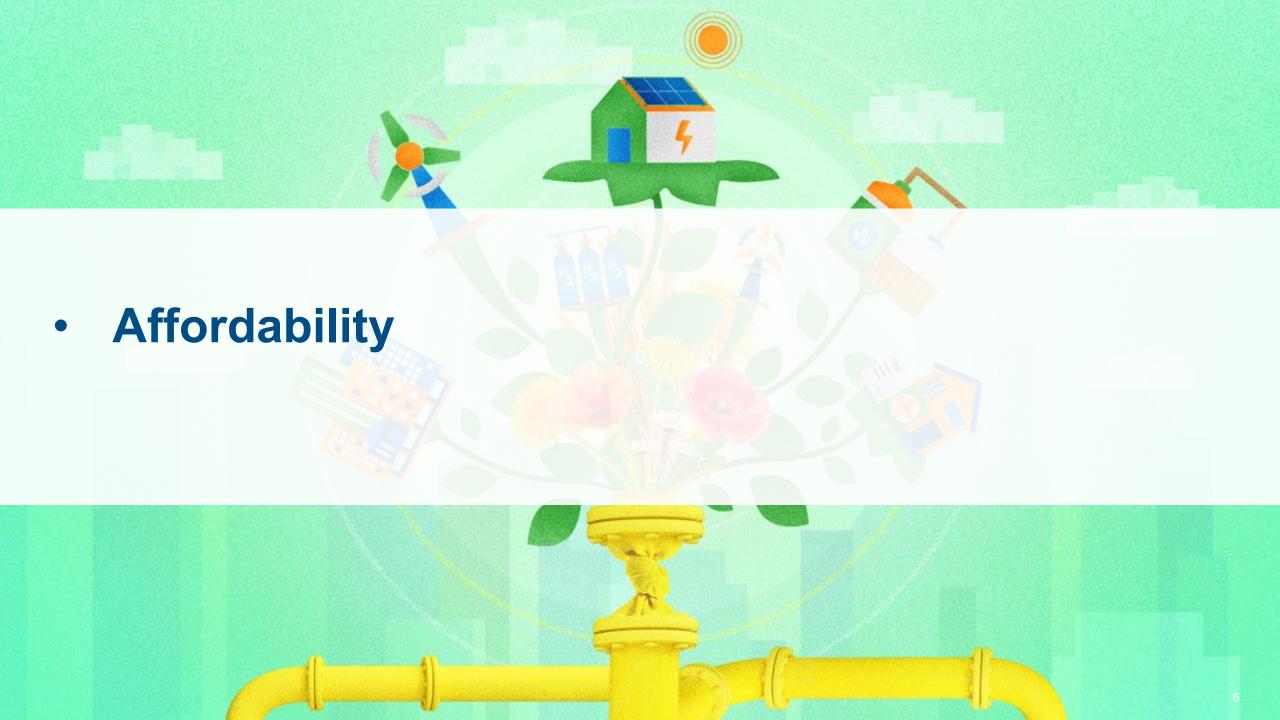
RePowerEU: stop using Russian gas, more renewables, more energy efficiency, cut energy use, accelerate the energy transition



EASAC Future of Gas Report addressed 3 interlinked goals







Affordability Heat or Eat?

Eurostat survey (2020): 8% of EU population unable to keep homes adequately warm

Energy efficiency directive:
Member State NECPs must
address and report on energy
poverty reduction



Record gas prices in 2022 Contributed to a major **Cost of living crisis** and **increasing energy poverty**



Affordability EU Social Climate Fund (SCF)



- redistribute ETS revenues via SCF and Member State schemes to vulnerable groups and businesses.
- size SCF based on ETS revenues.

EASAC advice – allocate enough funds to stop energy poverty

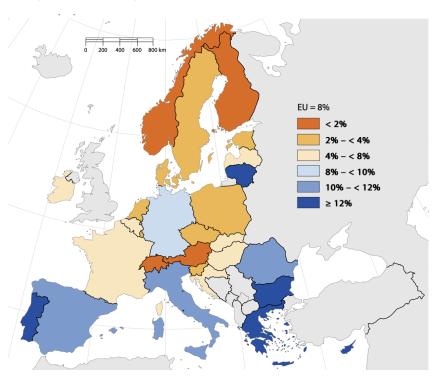
- Determine size of SCF by poverty reduction needs, not ETS revenues.
- ETS revenues will fall as EU approaches net zero, so other funds will be needed in future for energy poverty reduction.
- Energy poverty reduction budgets for each MS in SCF and other EU



Affordability

EASAC advice – act to reduce energy poverty

Homes too cold (% in 2020) (Eurostat)



High prices (carbon tax or ETS) incentivise energy saving, but vulnerable groups need support for:

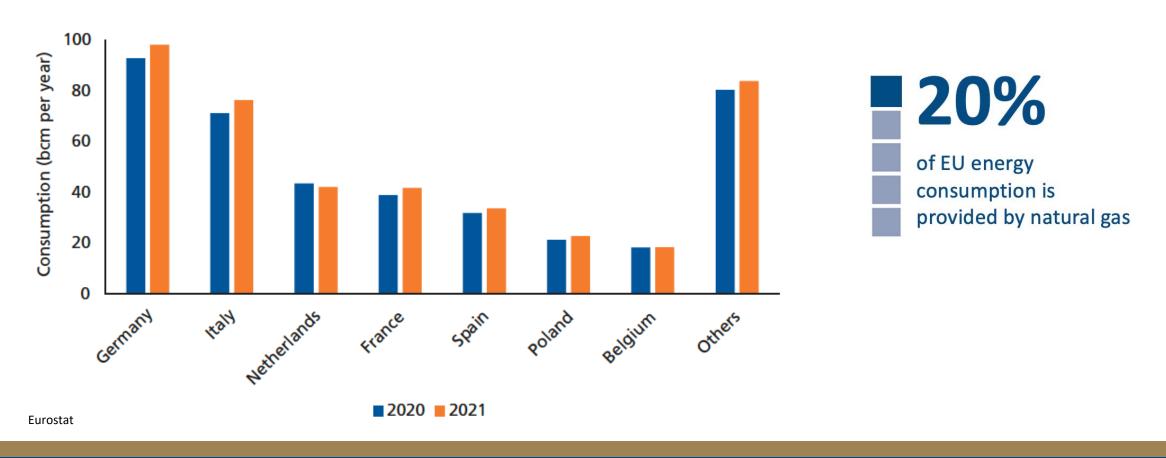
- (i) Investments in building renovation, EE & RES
- (ii) Payment of energy bills (after capital investments)
- Coordinate policies on energy poverty with policies for climate, energy, and social care. *Energy poverty definition was published in recast EE Directive (Sept 2023)*
- Put energy poverty reduction data and maps in EU-SILC reports (Statistics on Income & Living Conditions)
- Energy poverty maps are needed for heat planning





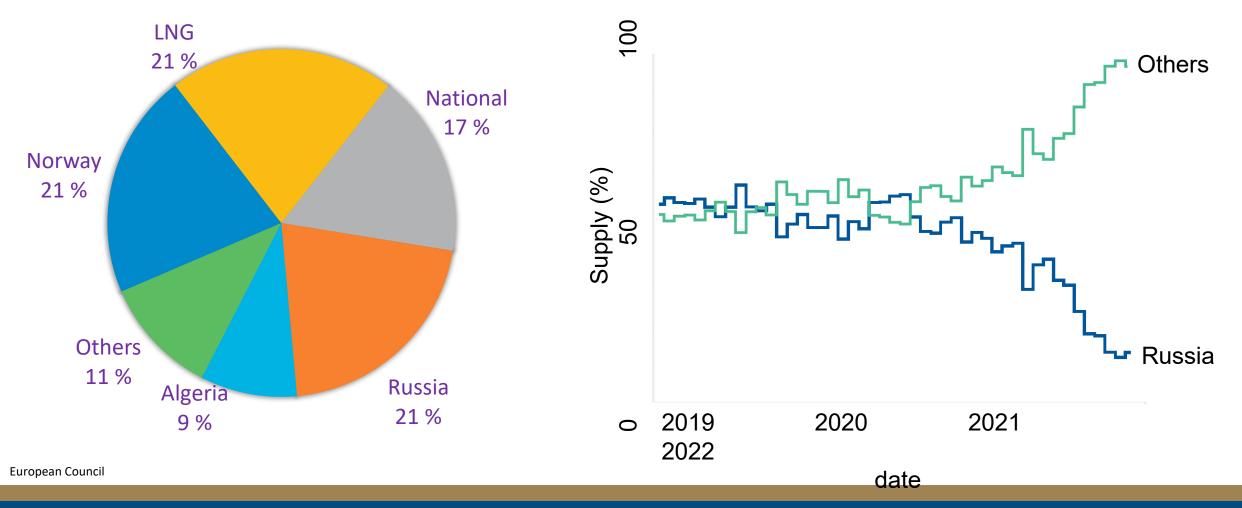
EU consumption of natural gas (2020 and 2021)

7 Member States consumed almost 80% of EU gas (2020/21)



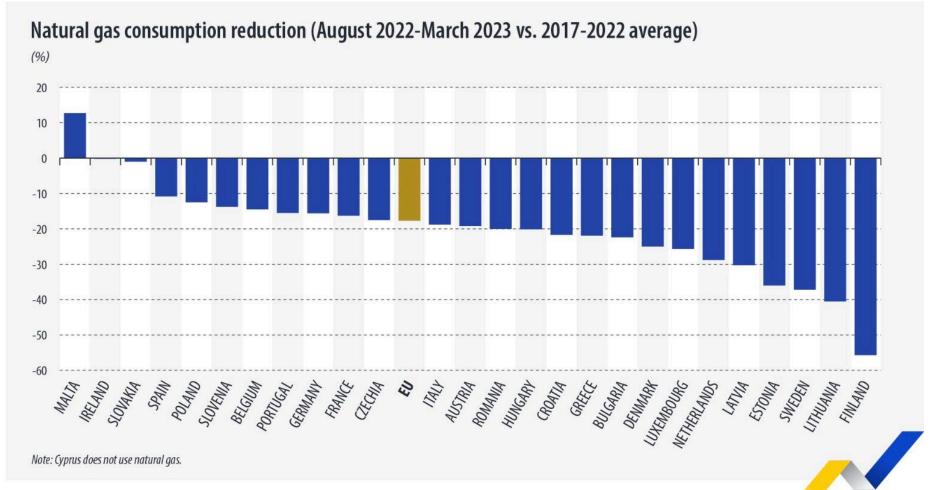


EU reduced imports of Russian natural gas in 2022





EU consumption of natural gas dropped (winter 2022/23)



EU gas
consumption
was 18% less
in winter
2022/23
compared
with previous
5 yrs

eurostat 0



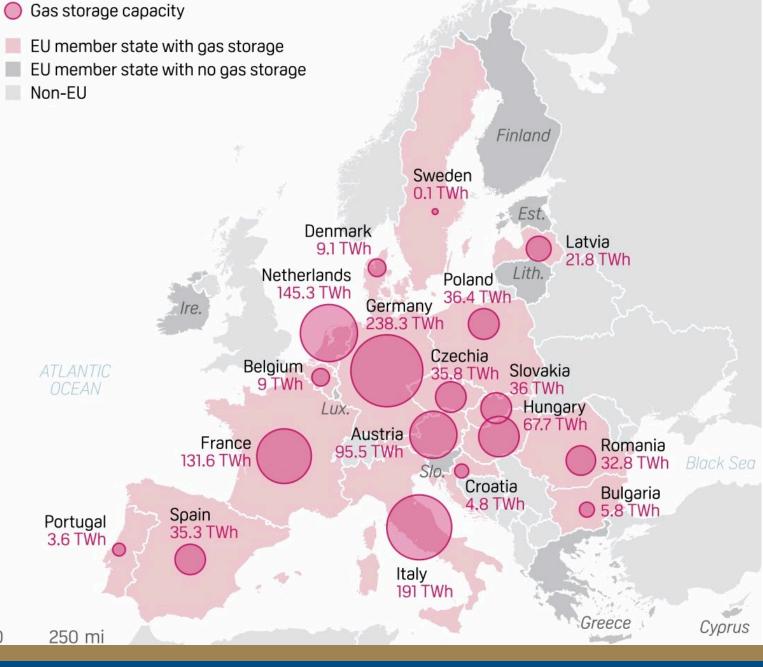
European LNG regasification terminals (Feb 2022)



- EU increased LNG imports in 2022 to replace piped supplies of natural gas from Russia
- USA was EU's largest source of LNG in 2021 and increased its contribution during 2022/23
- EU has secured more floating storage and regasification units (FSRUs) since the invasion of Ukraine

European Commission

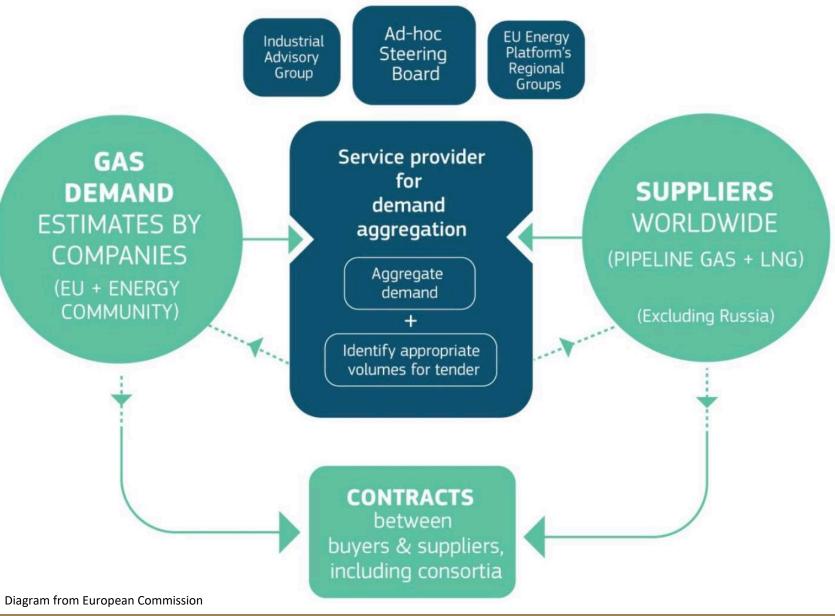




EU Member States have very different natural gas storage capacities

based on GIE data





EU energy platform for demand aggregation and joint purchasing of gas (2022)

Platform focus - purchase non-Russian natural gas and LNG to fill storage and provide supplies for the next few winters



EU policies for promoting more renewables

- Revision of RED permitting rules to accelerate deployment of renewable electricity generators and grid infrastructure. The revised Directive EU/2023/2413 entered into force on 20 November 2023.
- **Net-Zero Industry Act** to increase EU manufacture of wind, solar, heat pumps, district heating, geothermal (reduce technology imports). Political agreement was reached on 6 February 2024.
- Critical Raw Materials Act to strengthen EU and international supply chains for maintaining old and building new RE systems. Trilogue agreement in Nov 2023. Entry into Force of Regulation expected in Q2 2024 (tbc)



EASAC – improve short term energy security

- Limit duration of 2022 emergency electricity supply measures with high GHG emissions, such as extended lifetimes of fossil fuel generation
- Build sufficient temporary gas and LNG import infrastructure to deliver secure supplies of non-Russian gas, but minimise future stranded assets
- Adapt electricity market rules to stimulate deployment of grid flexibility management and other tools needed with more renewable electricity (demand response, storage, sustainable back-up generation)
- Urgently strengthen electricity grid capacities to facilitate massive growth in the use of variable renewable electricity



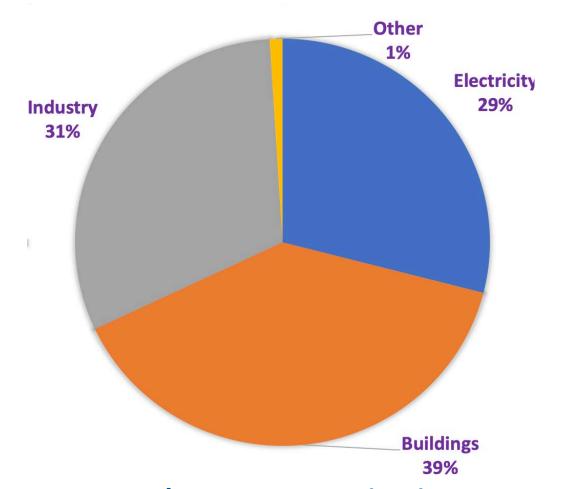
EASAC advice – work urgently on actions with long lead times

- Accelerate supplies of low carbon footprint fuels for hard-to-electrify applications in industry and transport
- Manage competition in renewable electricity markets between buildings, industry, and transport sectors
- **Hydrogen** commit to share risks and costs of long-distance pipelines to supply industries and heavy-duty transport fleets.
- Invest in re-skilling and expanding EU workforce to produce and install sustainable technologies and fuels for buildings, transport, and industry.





EASAC advice - reduce GHG emissions from all natural gas supplies



- Monitor methane leaks along natural gas supply chains
- Certify carbon footprints of LNG and piped gas supplies

Global Warming Potential of methane (20 year) is 84 -87, ie: > 80 times GWP of CO_2 .

(Note: 100 year GWP of methane is 28-36)

EU Natural Gas consumption in 2020 (US EIA)



EU energy policies for buildings

Buildings are the biggest users (39%) of natural gas in EU

- EU heating and cooling strategy (2016) is becoming "dated".
- **EU renovation wave** for buildings (2020) should give more attention to embodied GHG emissions
- Energy Performance of Buildings Directive (EPBD) (2021) informal agreement on proposed revisions reached in Trilogue in December 2023
- EU Emission Trading System Directive was published in May 2023. It includes ETS 2 (to begin in 2027) for building heating and transport fuels



EU policies on gas boilers

6

1. U.K.

Ban on gas and oil boilers in new homes from 2025.

2. BELGIUM

Ban on fossil heating systems in newbuilds from 2025 in Flanders.

3. NETHERLANDS

Ban on new natural gas connections since 2018.

4. FRANCE

De-facto ban on gas boilers in new homes from 2022 due to introduction of emissions limits.

5. GERMANY

De-facto ban on new fossil-powered heating system via a requirement of 65% renewables input from 2024.

6. AUSTRIA

Sale of new gas boilers, and repair of old ones, banned from 2023.

7. DENMARK

Ban on new gas boilers since 2013. Plan to move 50% of households using gas heating to district



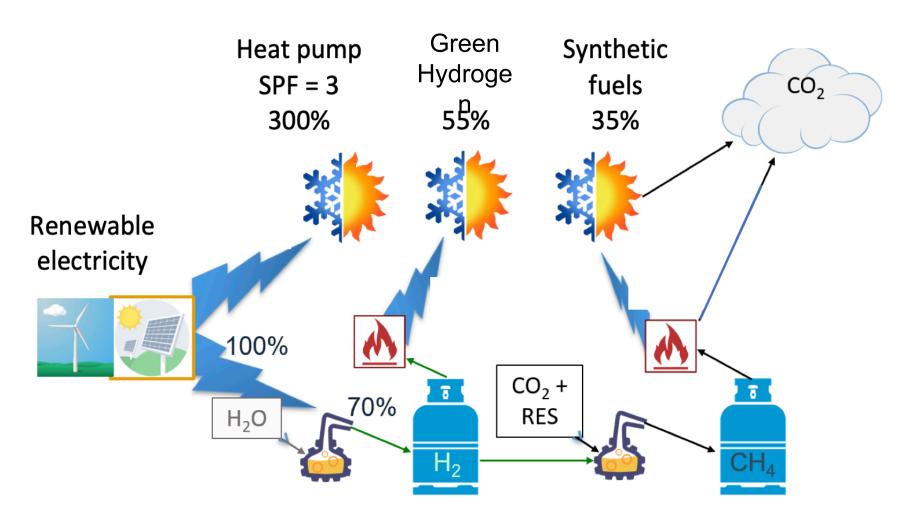
EU has 65 million gas boilers







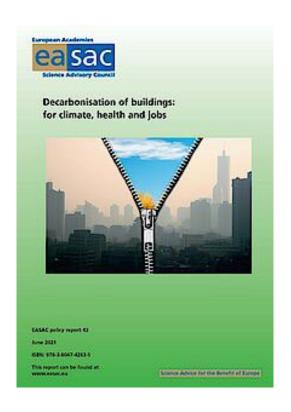
Efficiencies of renewable electricity use options for heating



Use renewable electricity wisely for heating:

- 1. Heat pump (300%)
- 2. Green hydrogen (55%)
- 3. Synthetic fuels (35%)

EASAC report – key decarbonisation policies for build



- Energy efficiency first reduce heat demand by renovation, digital controls, building regulations
- Renovate don't demolish buildings
- Ban installation of new gas boilers in buildings.
 Switch to heat pumps or district heating.
- Publish local heat maps.
- Update EU heating/cooling strategy for RePowerEU.
 More local heat planning, phase out gas boilers,
 phase in heat pumps or district heating
- Accelerate steps of ETS (2) for heating fuels.



EU electricity policy

Almost 30% of natural gas in EU is used for electricity generation

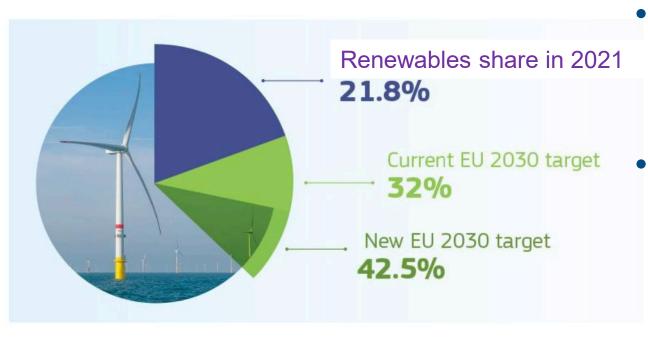
- Taxonomy natural gas is defined as a clean transition option for replacing coal in power generation
- Renewable electricity generation and grid infrastructure accelerate deployment by speeding up permitting.
- **Electricity market design** revise to allow for more Contracts for Difference and Power Purchase Agreements.
- Renewable electricity supplied to hydrogen electrolysers (special requirements introduced in 2023 by delegated act).



EASAC advice – strengthen EU renewable electricity policy



Natural gas (with its methane emissions) is **no longer a transitional option** for replacing coal. Taxonomy update needed.



- Increase renewable electricity supplies urgently to limit global warming to <1.5°C
 - RES target in RED 3 is lower than REPowerEU (45%). Targets, not "aspirations" drive markets!



EASAC advice – use our limited bioenergy resources wisely

Recycle

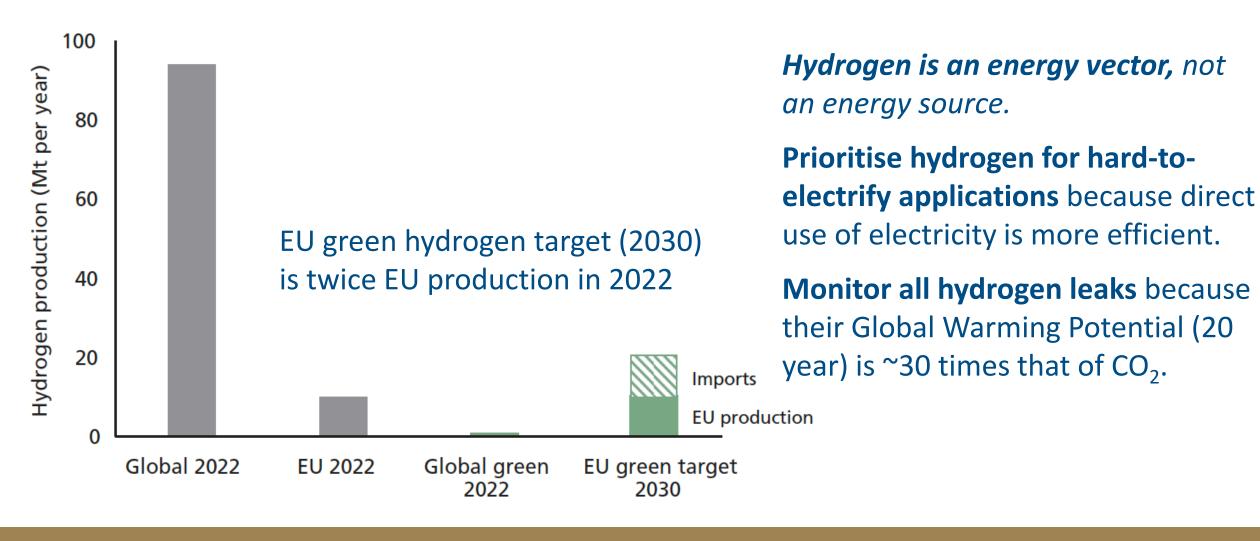
- EU Forestry strategy: do not burn whole trees
 - EU Forestry biomass cascade: use forest biomass first for applications with highest economic and environmental values
 - Do not replace gas boilers with biomass boilers unless they burn biomass wastes





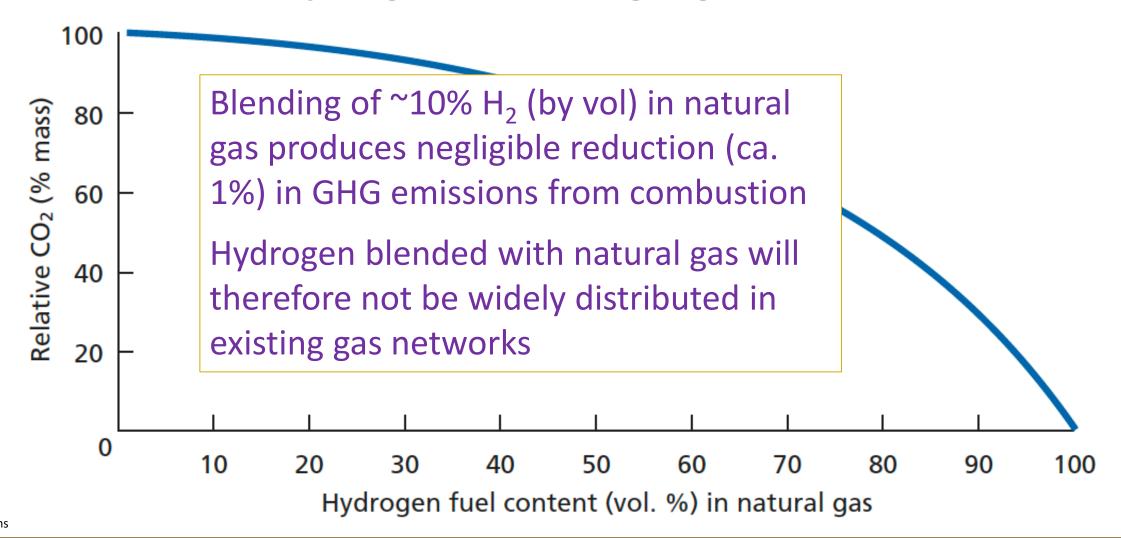
Diagram from European Commission

EASAC advice – green hydrogen is costly – use it wisely

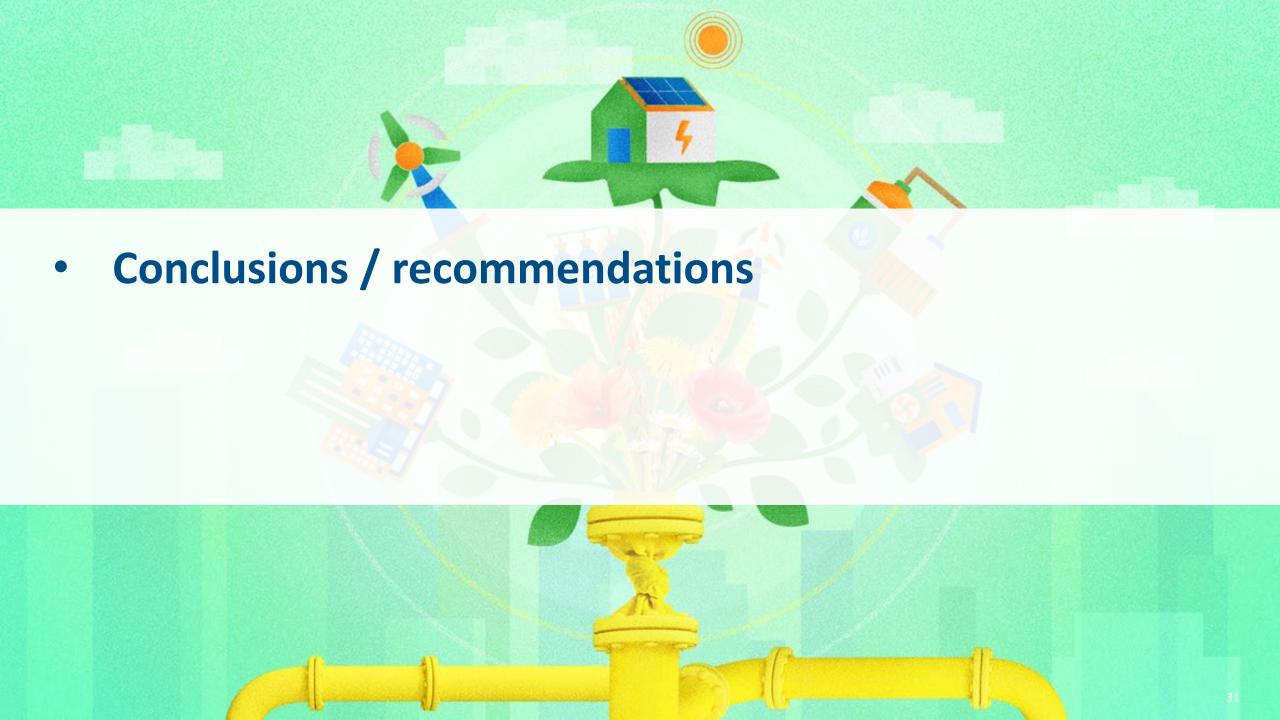




EASAC advice - hydrogen blends in gas grids offer few GHG benefits







General EASAC recommendations for EU policy makers

- Communicate and engage with citizens, communities, business
- Build investor confidence with stable policies for transition to net zero by 2050
- Prioritise proven, low-cost options energy efficiency and renewables,
- limit risks of emerging options, eg: CCS, Hydrogen
- Prioritise public funds for vulnerable groups (energy poverty) and strategic industries



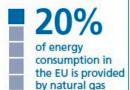
Specific EASAC recommendations for energy policy makers

- Urgently reduce methane leakage, flaring & venting (20 year GWP = 87)
- Prioritise renewables with low operating + embodied GHG emissions
 - Wind and Solar PV use them together with demand response, heat storage, and sustainable back-up generation
 - Hydro power can be dispatchable, so optimise contribution at EU level. Monitor impacts of climate change on water flows / resources
 - Biogas and biomethane produce them only from wastes. Limited resources, so use only for high value, hard-to-electrify applications. Minimise leakage.





Record gas prices in 2022 contributed to a major cost of living crisis and increasing energy poverty



A quarter of EU energy sector emissions in 2021 came from natural gas

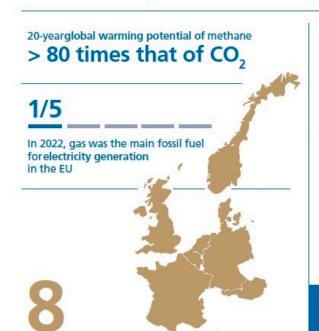
729 Mt, =







65 MILLION Gas boilers in buildings



countries have policies in place for banning new natural gas boilers or requiring high levels of renewables in buildings

10% 1%







reduction

Heat pumps and district heating are efficient alternatives

Europe must take action to massively ramp-up: energy efficiency renewable heat renewable electricity

Thank you!