



ODYSSEE-MURE Fit-4-55
1st regional meeting April 24th 2023

Recent trends in energy consumption 2022 in Germany

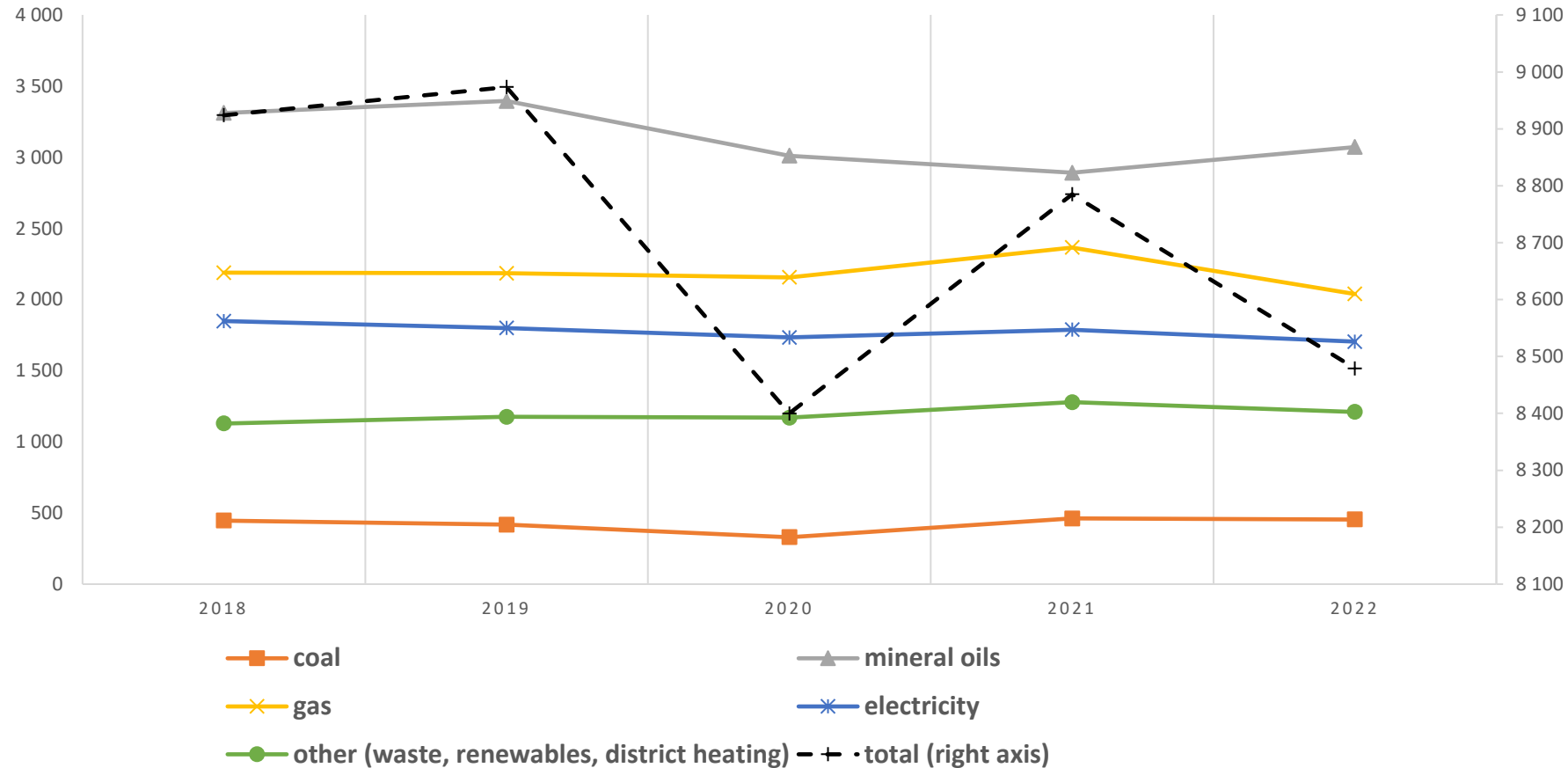
Iska Brunzema, Niklas Reinfandt, Fraunhofer ISI

1. Energy consumption trends
 1. General trends and energy sector
 2. Industry
 3. Households
 4. Transport
2. Recent relevant policies
3. Summary



Final energy consumption until 2022

General trends final energy consumption Germany [PJ]

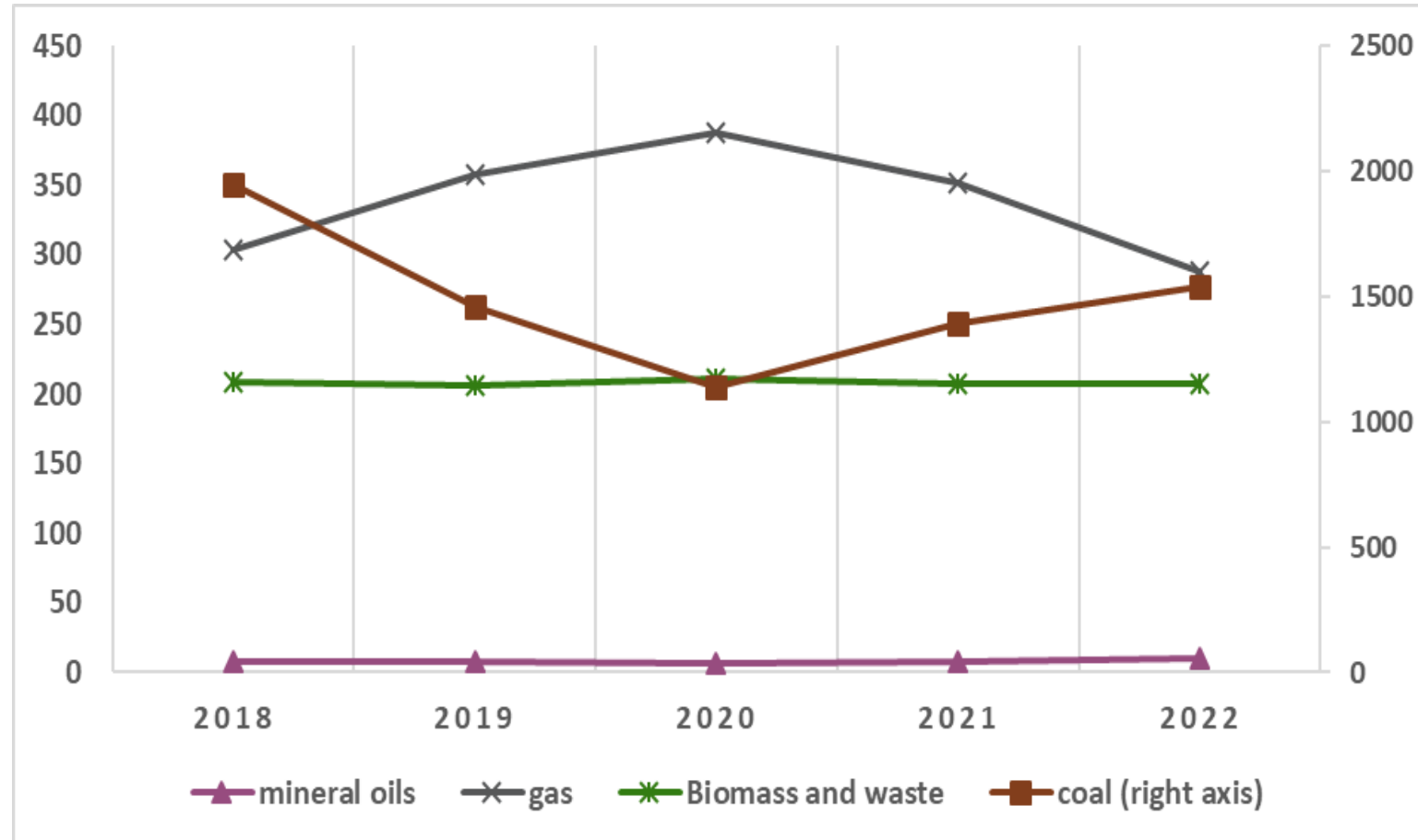


AGEB 2022: Evaluation Tables on the Energy Balance for the Federal Republic of Germany 1990 to 2021.
AGEB 2023: Early Estimate of the Energy Balance for 2022.

Detailed view energy industry

Conversion input in thermal power plants for general supply [PJ]

- Rise in coal since 2020
- Decline in gas since 2020 (higher prices in the 3rd quarter of 2021 and in 2022)

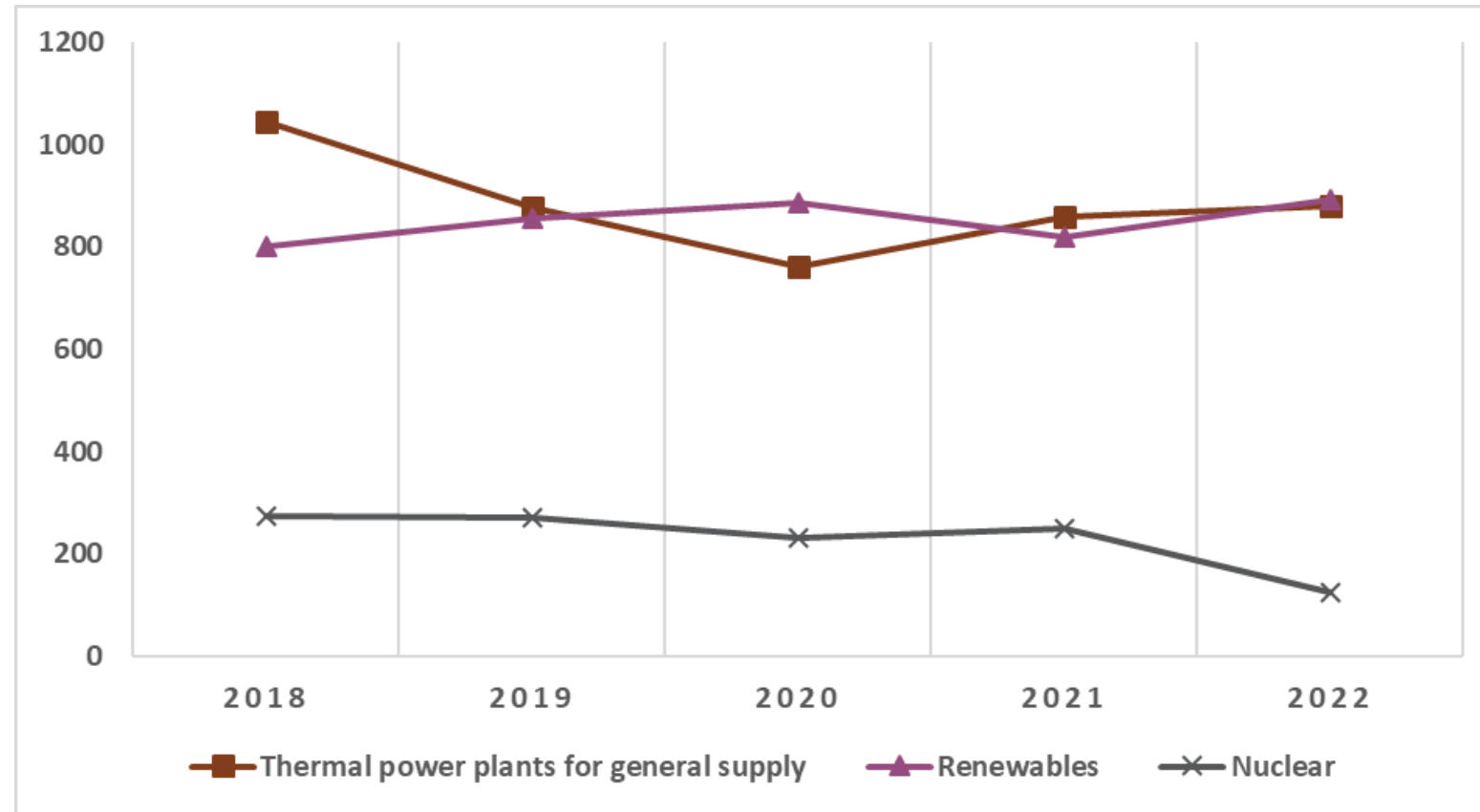


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Detailed view energy industry

Conversion output (electricity) [PJ]

- 13.8% less wind energy in 2021 compared to 2020
- Only slow increase in renewable electricity generation overall

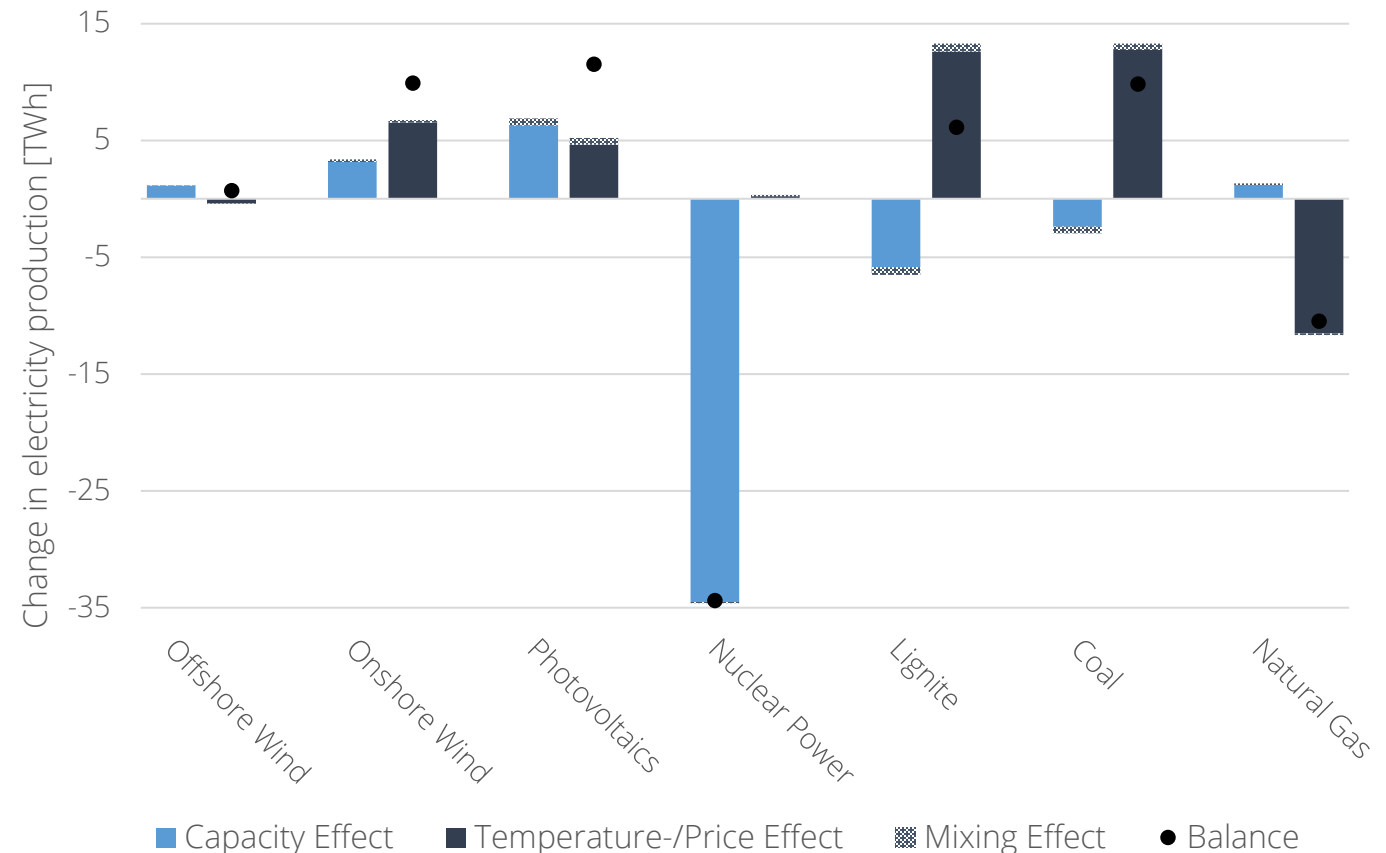


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Detailed view energy industry

Influence of capacity and weather/price effect on the change in realized generation of fossil and renewable energy sources 2022 vs. 2021.

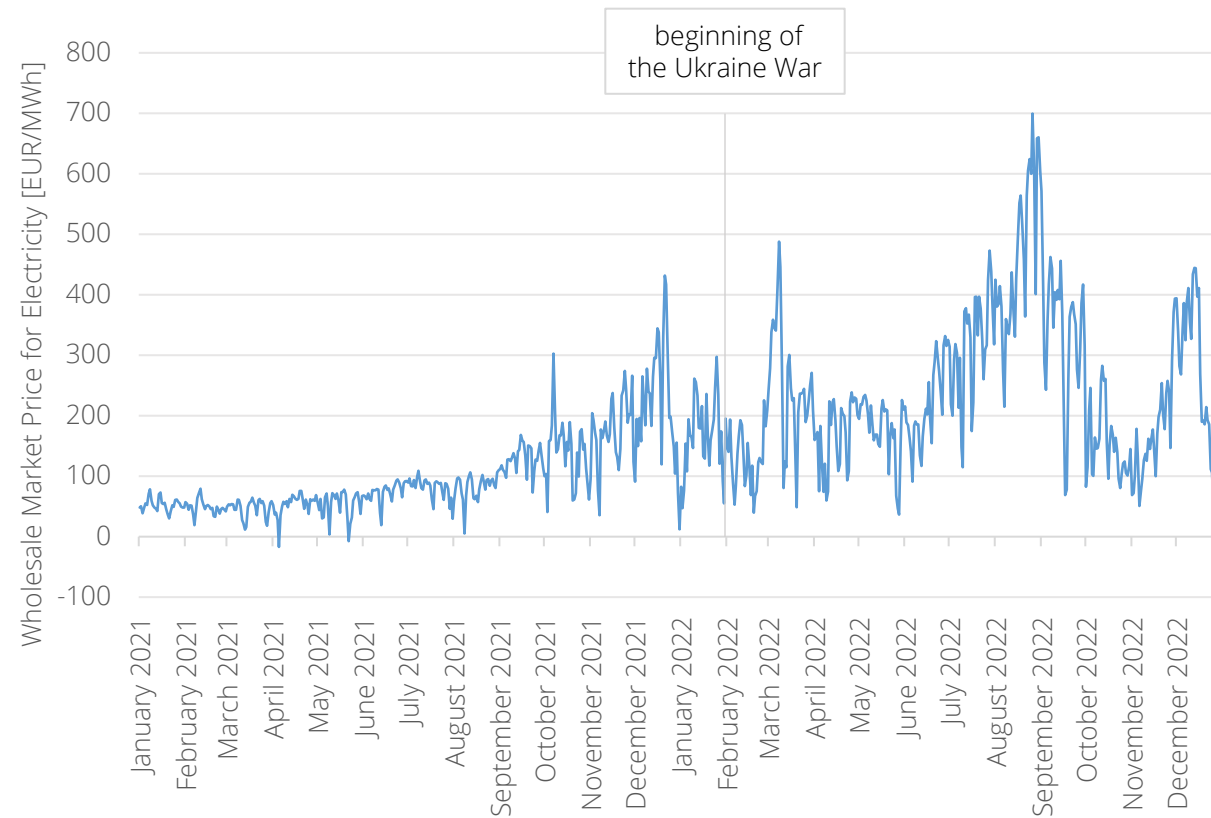
- nuclear power – three of six nuclear power plants were shut down in December 2021, reducing capacity in 2022
- price effect visible in lignite, coal and natural gas consumption
- temperature effect relevant e.g. for PV and Wind



Detailed view energy industry

Wholesale Market Prices for Electricity 2021–2022.

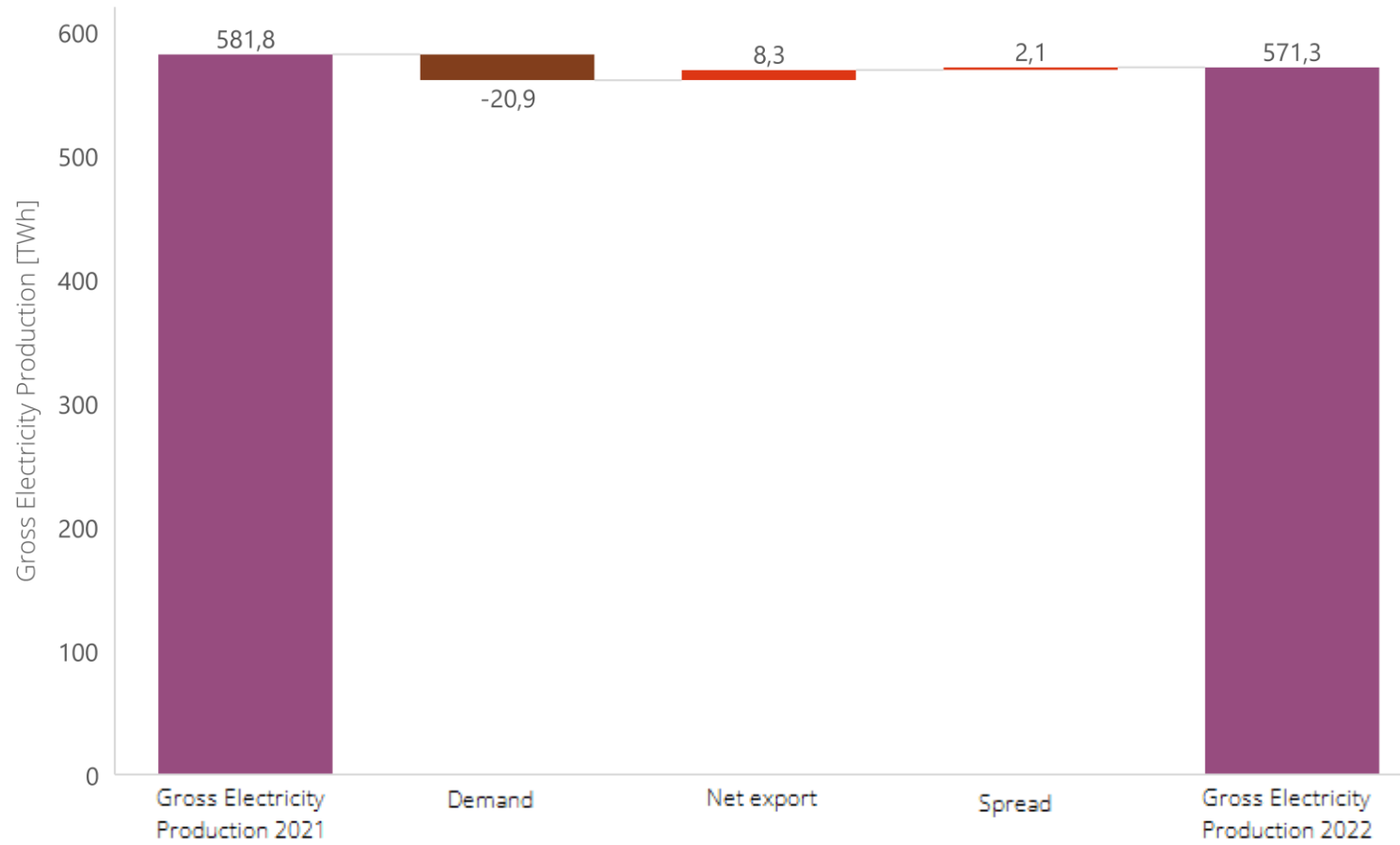
- raised energy/electricity prices
- impact on the electricity demand



ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view energy industry

Change in gross electricity generation, demand and net exports



- Decline in domestic electricity demand
- compensated by a strong increase in electricity exports to other European countries, so that gross electricity generation only fell slightly overall (-1.8 %)

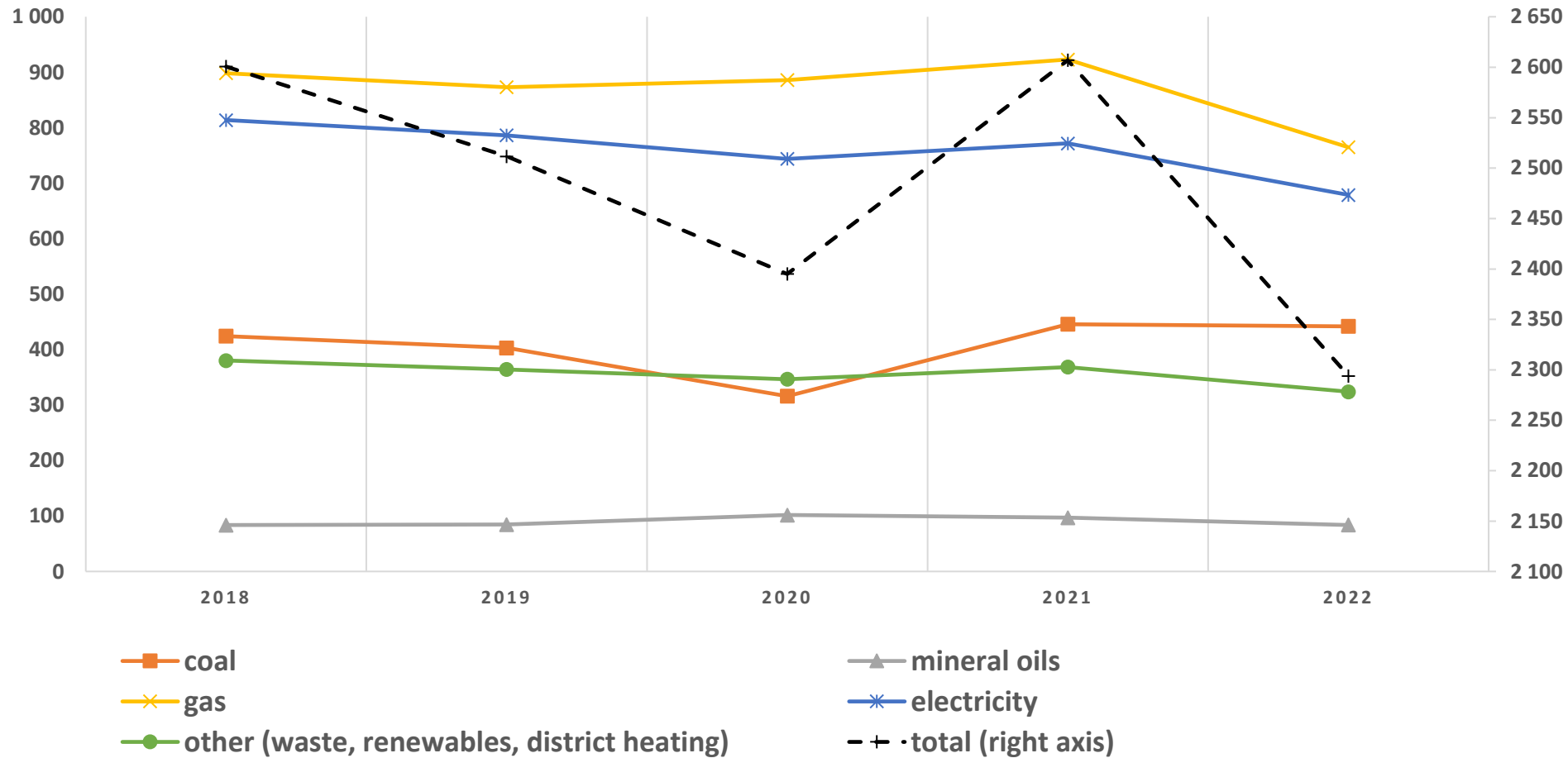
ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

AGEB 2022: Energy Balance for 2021.

AGEB 2023: Early Estimate of the Energy Balance for 2022.

Detailed view industry

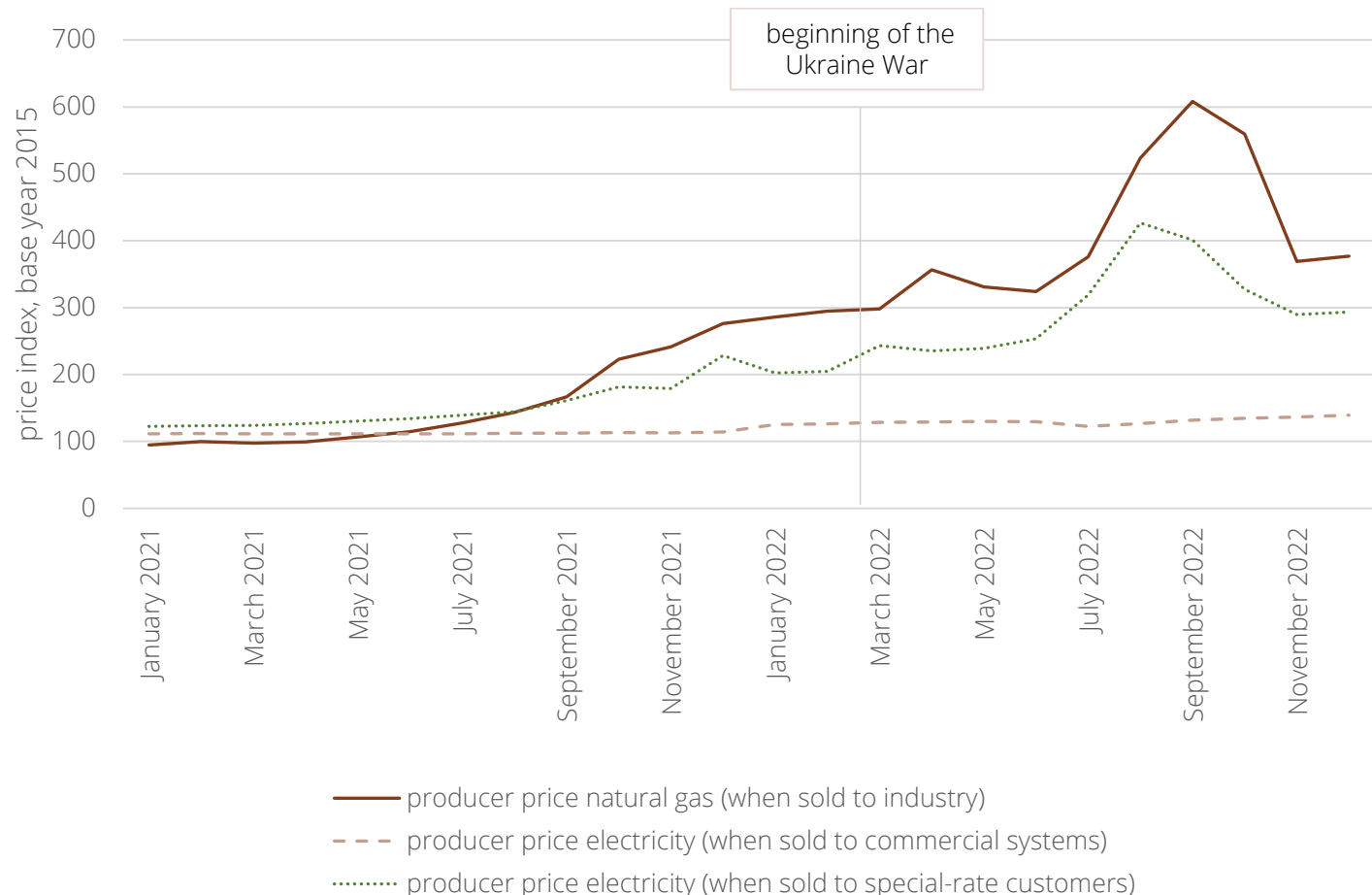
Final energy consumption until 2022 [PJ]



AGEB 2022: Evaluation Tables on the Energy Balance for the Federal Republic of Germany 1990 to 2021.
AGEB 2023: Early Estimate of the Energy Balance for 2022.

Detailed view industry

Energy prices (gas/electricity) 2021–2022

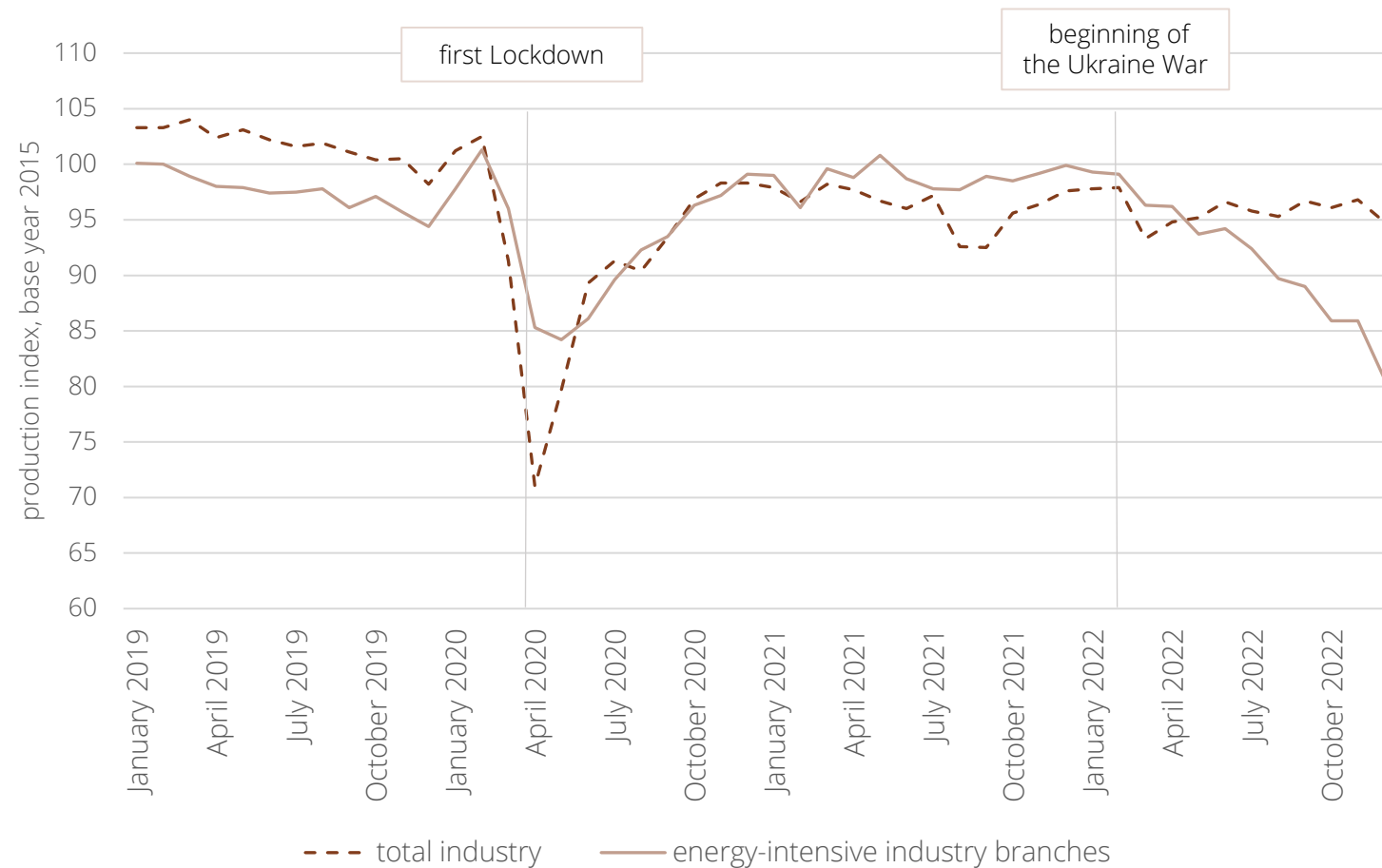


- strong increase in energy prices
- increased prices have only been partially passed on to the end consumers of industry (long term contracts etc.)

ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view industry

Production in the German industry sector 2019–2022

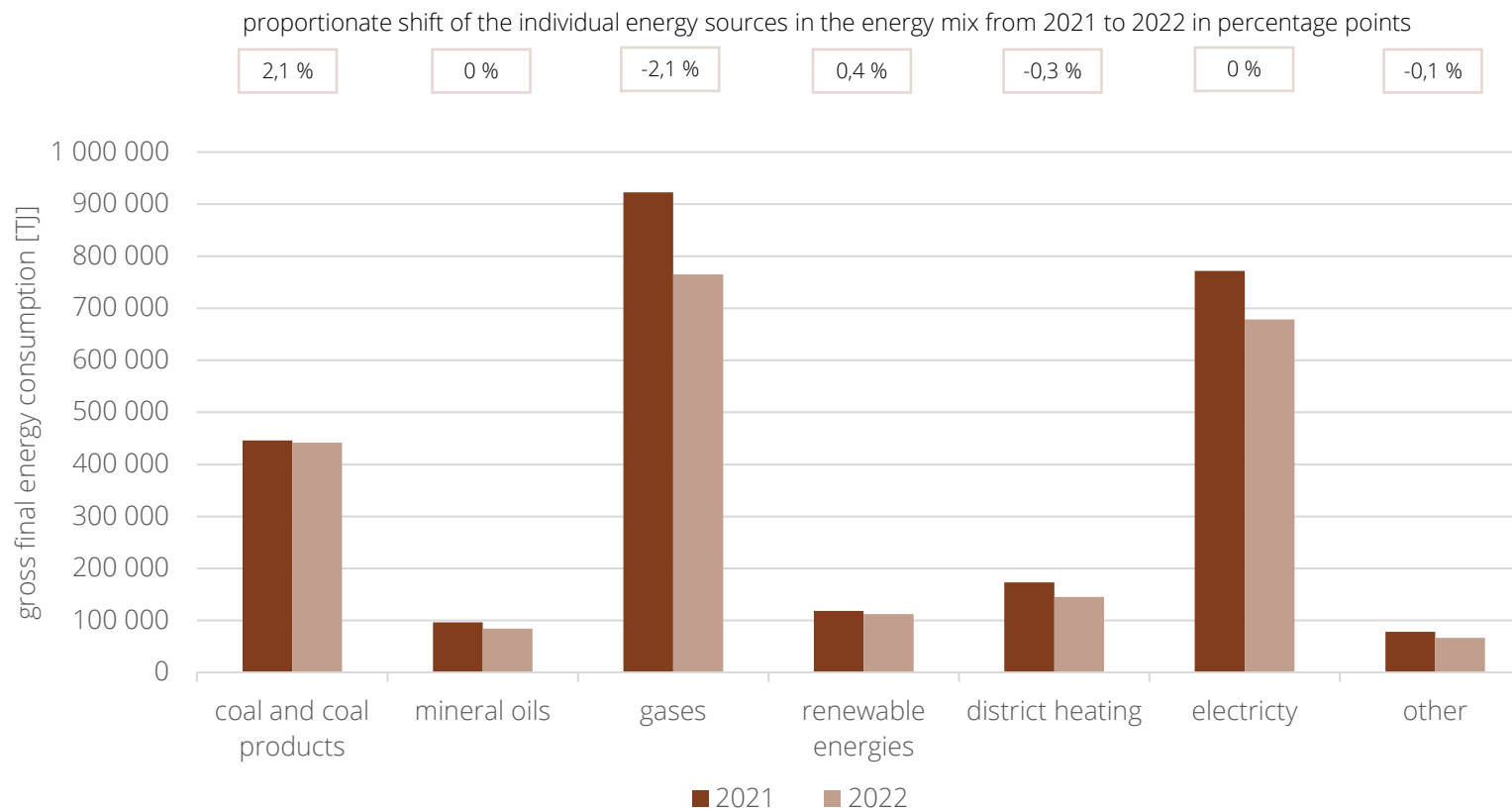


- Crude steel production fell by 8 % compared to the previous year (around 36.8 Mt, similar to 2020)
- VCI-survey:
 - Domestic production cutbacks (25 % implemented, 14% planned)
 - Production shifts abroad (8 % implemented, 15 % planned)

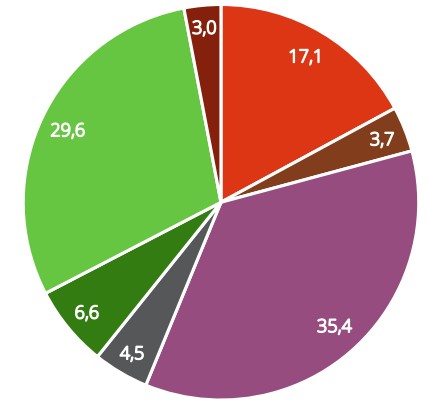
ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view industry

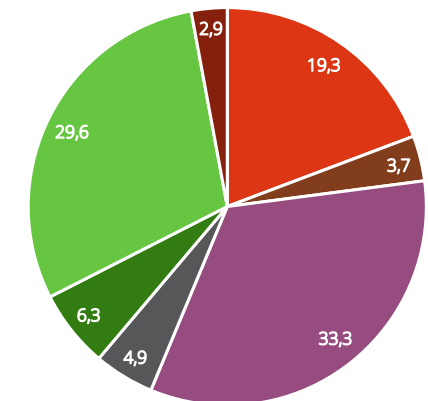
Shift in the energy mix in the industry sector from 2021 to 2022



2021 [%]



2022 [%]



ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

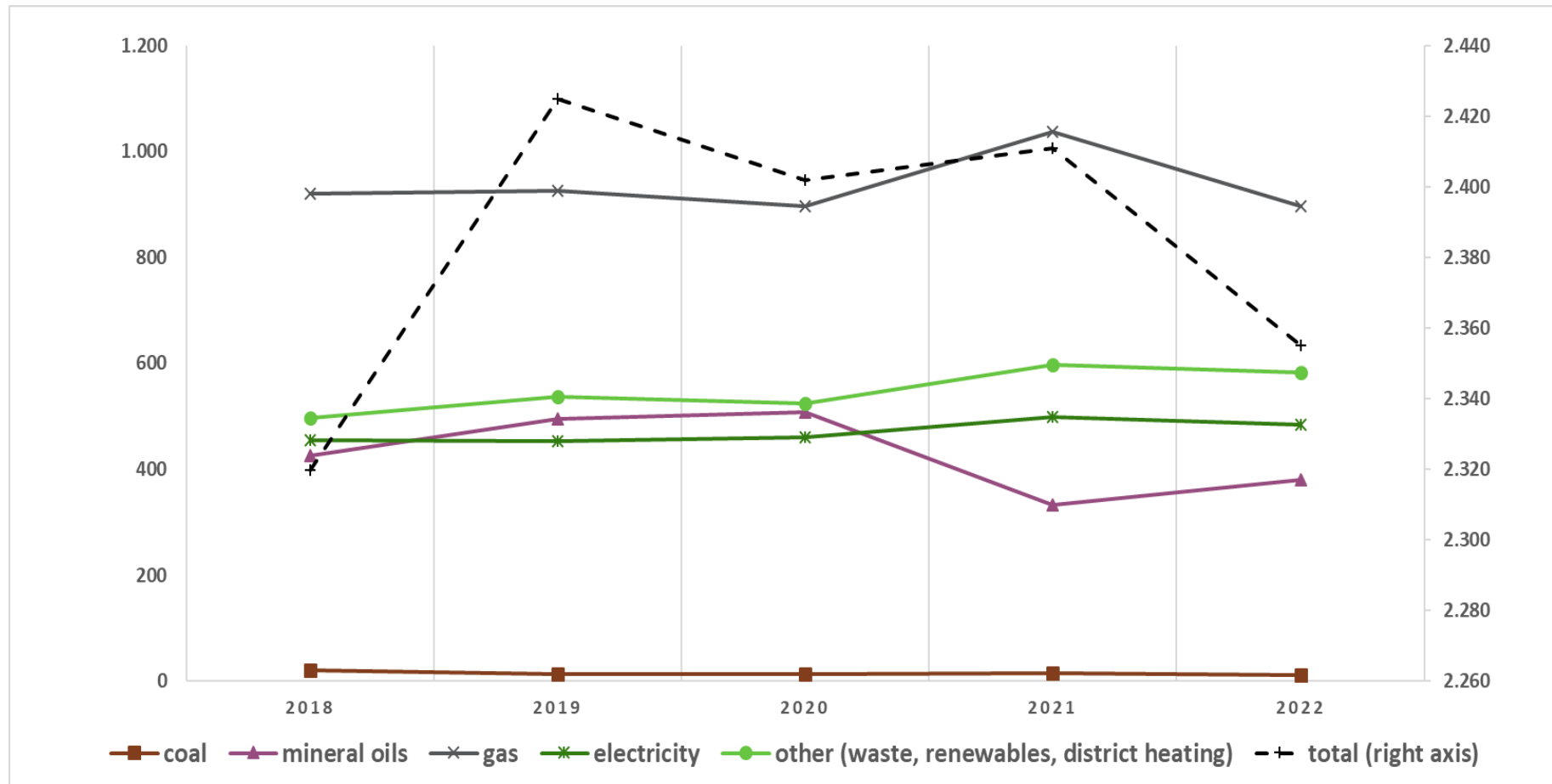
AGEB 2022: Energy Balance for 2021.

AGEB 2023: Early Estimate of the Energy Balance for 2022.

- coal and coal products
- gases
- district heating
- other
- mineral oils
- renewable energies
- electricity

Detailed view households

Final energy consumption until 2022 [PJ]

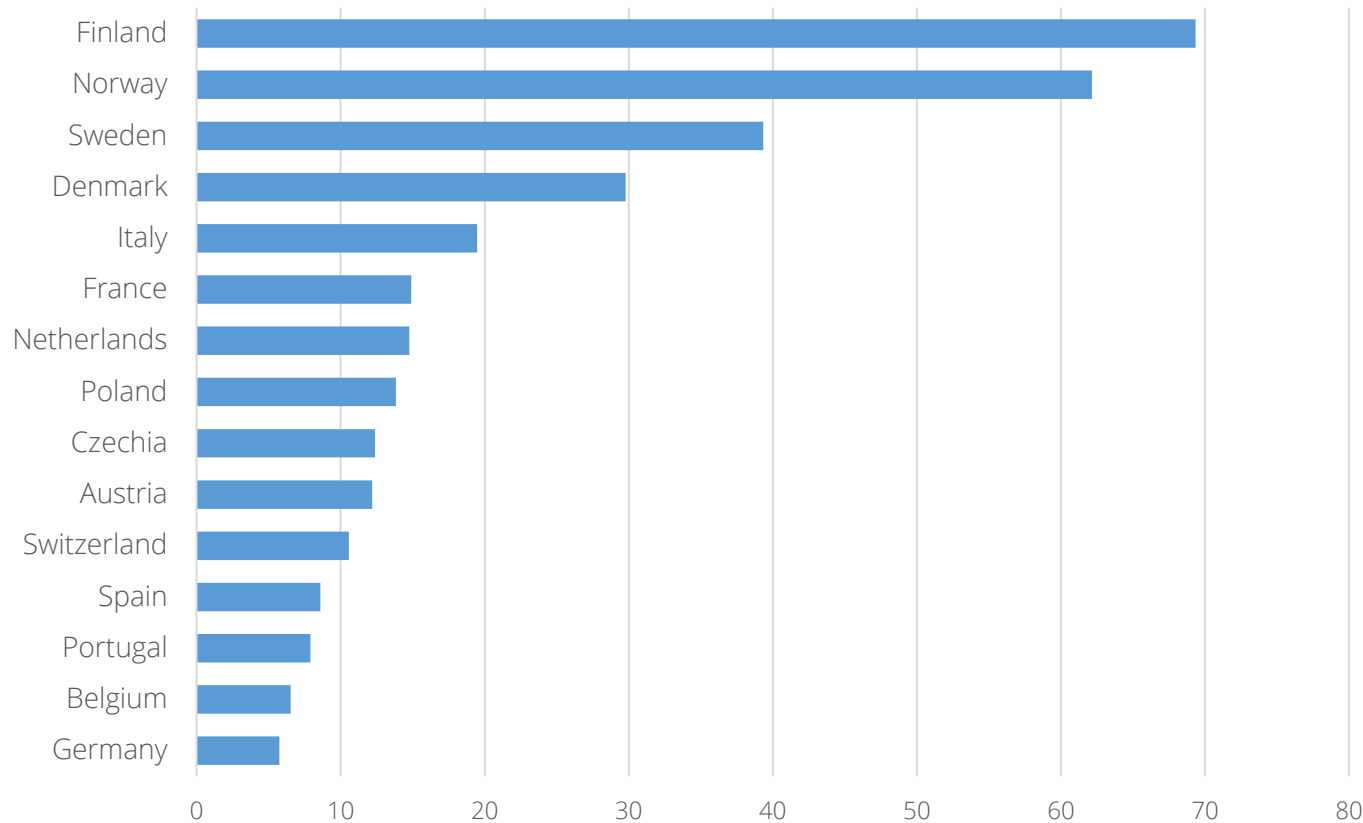


- Temperature-adjusted savings in gas consumption due to heating behaviour of private households and tertiary sector in the course of 2022 are estimated to be between 7 and 11 %.

AGEB 2022: Evaluation Tables on the Energy Balance for the Federal Republic of Germany 1990 to 2021.
AGEB 2023: Early Estimate of the Energy Balance for 2022.

Detailed view households

Heat pumps sold per 1 000 households in 2022 per country



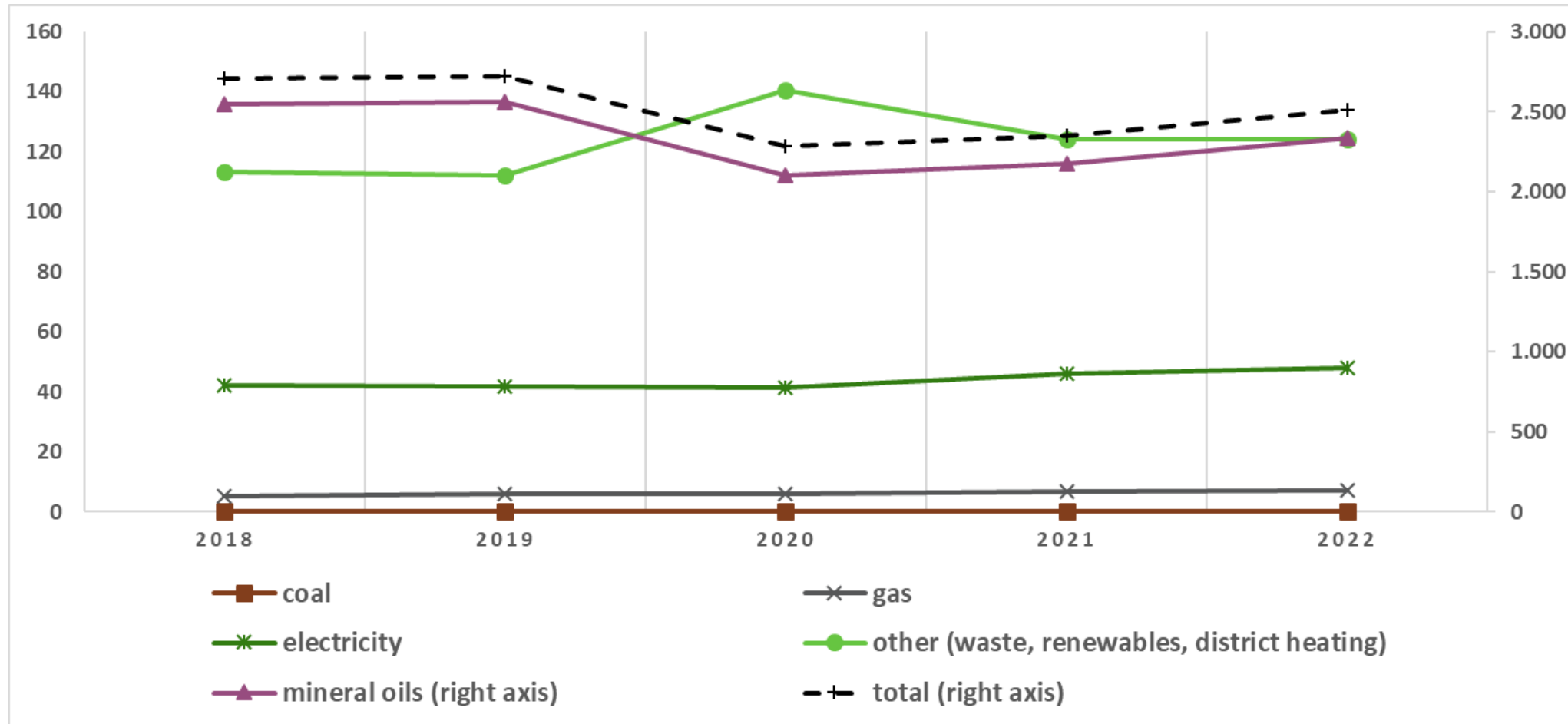
- Germany, 2022: 236 000 heat pumps (aim: 500 000 new installed heat pumps)
- increase in heat pump sales: +53% from 2021 to 2022
- first time 50% heat pumps in heating systems in new buildings

EHPA 2023: Heat pump record: 3 million units sold in 2022, contributing to REPowerEU targets. Hg. v. European Heat Pump Association (EHPA).

ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view transport

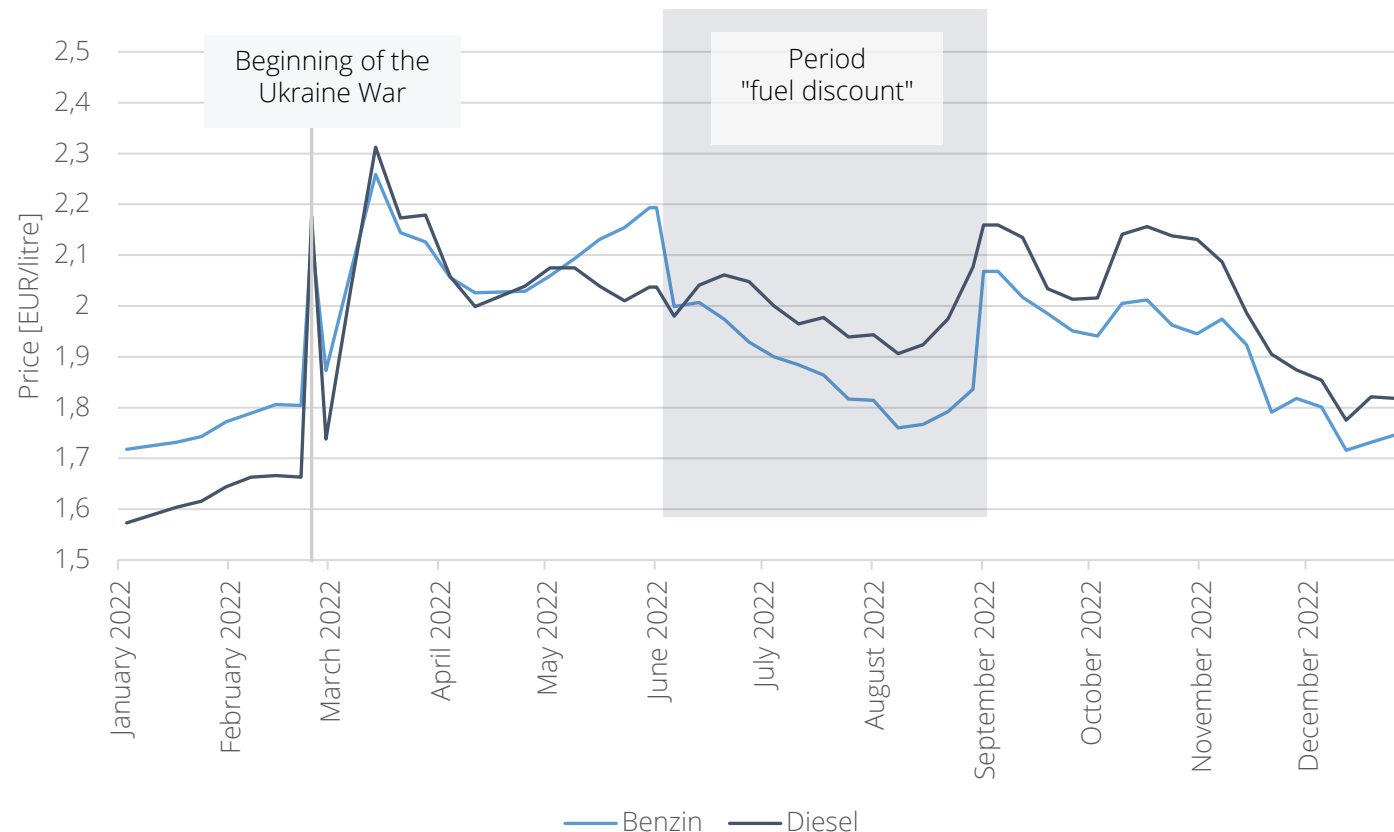
Final energy consumption until 2022 [PJ]



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Detailed view Transport

Prices for gasoline and diesel 2022

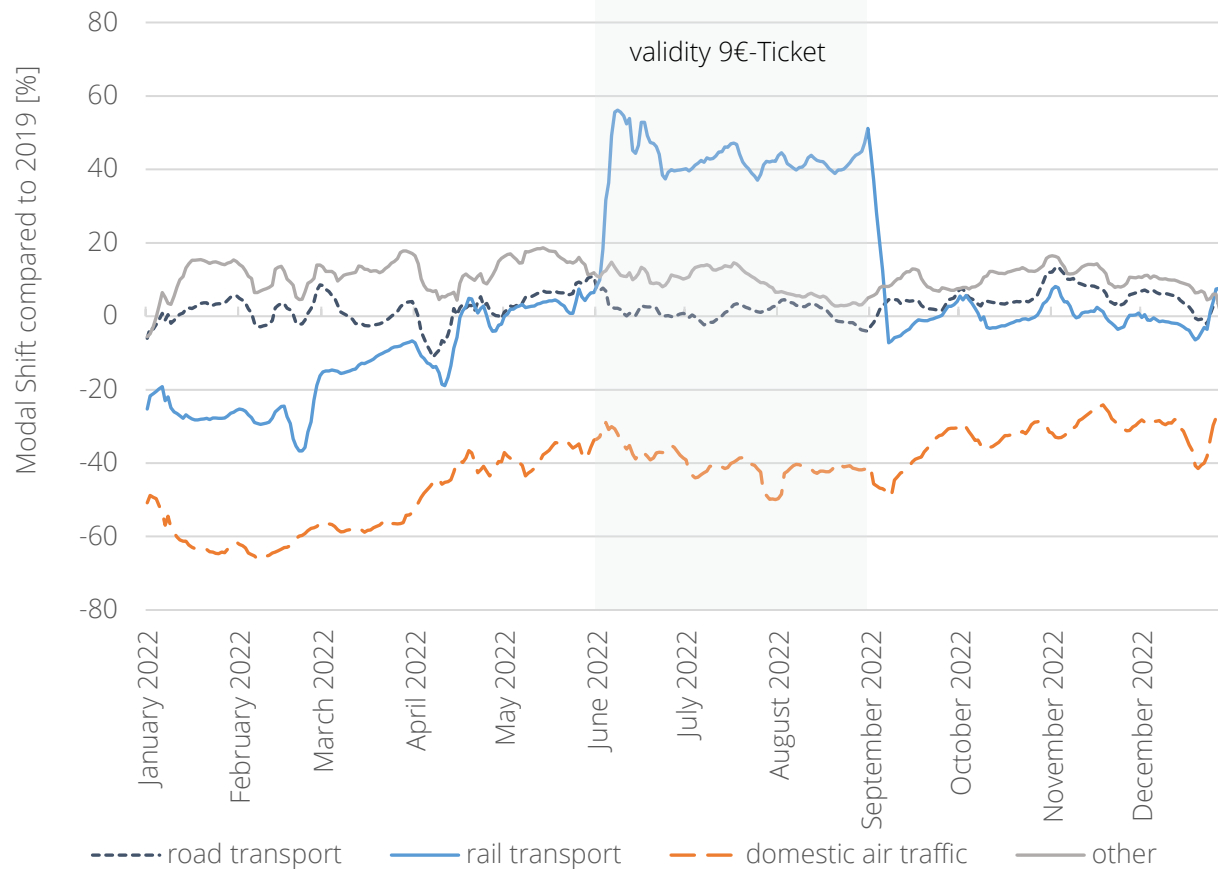


- Gasoline prices returned to pre-war levels at the end of the year, diesel remained at a higher level
- Fuel discount: temporary reduction of 30 ct/l for gasoline and 14 ct/l for diesel
- Overall, an emission-reducing effect would be expected from the increased prices

ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view Transport

Modal shift compared to 2019 (pre-Covid-19-level)

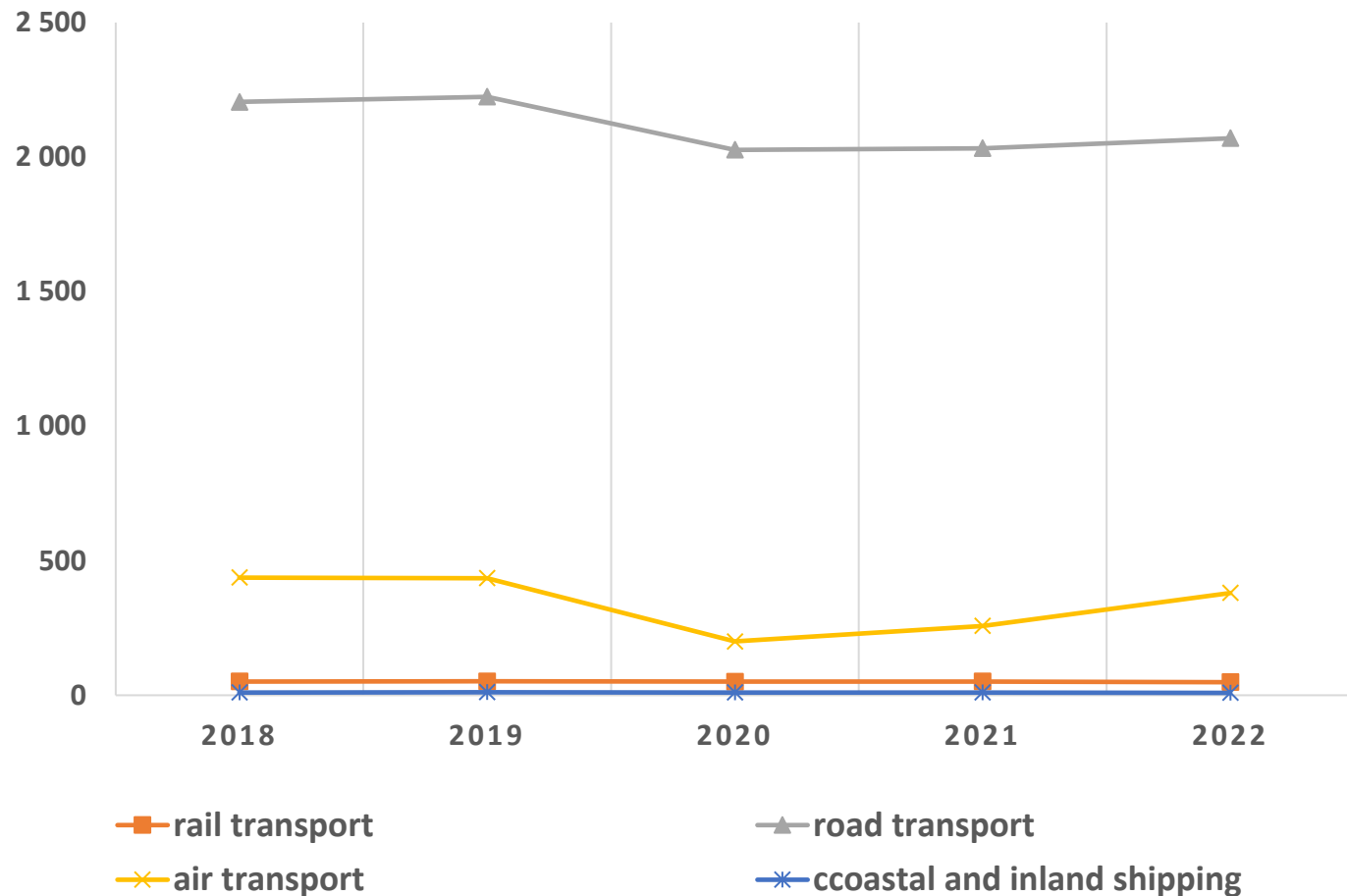


- 9€-Ticket in the months June, July and August in 2022 for all public transport
- only increase in rail transport, no real modal shift

ERK 2023: Verification Report on the Calculation of German Greenhouse Gas Emissions for the Year 2022.

Detailed view Transport

Final energy consumption / different modes of transportation [PJ]

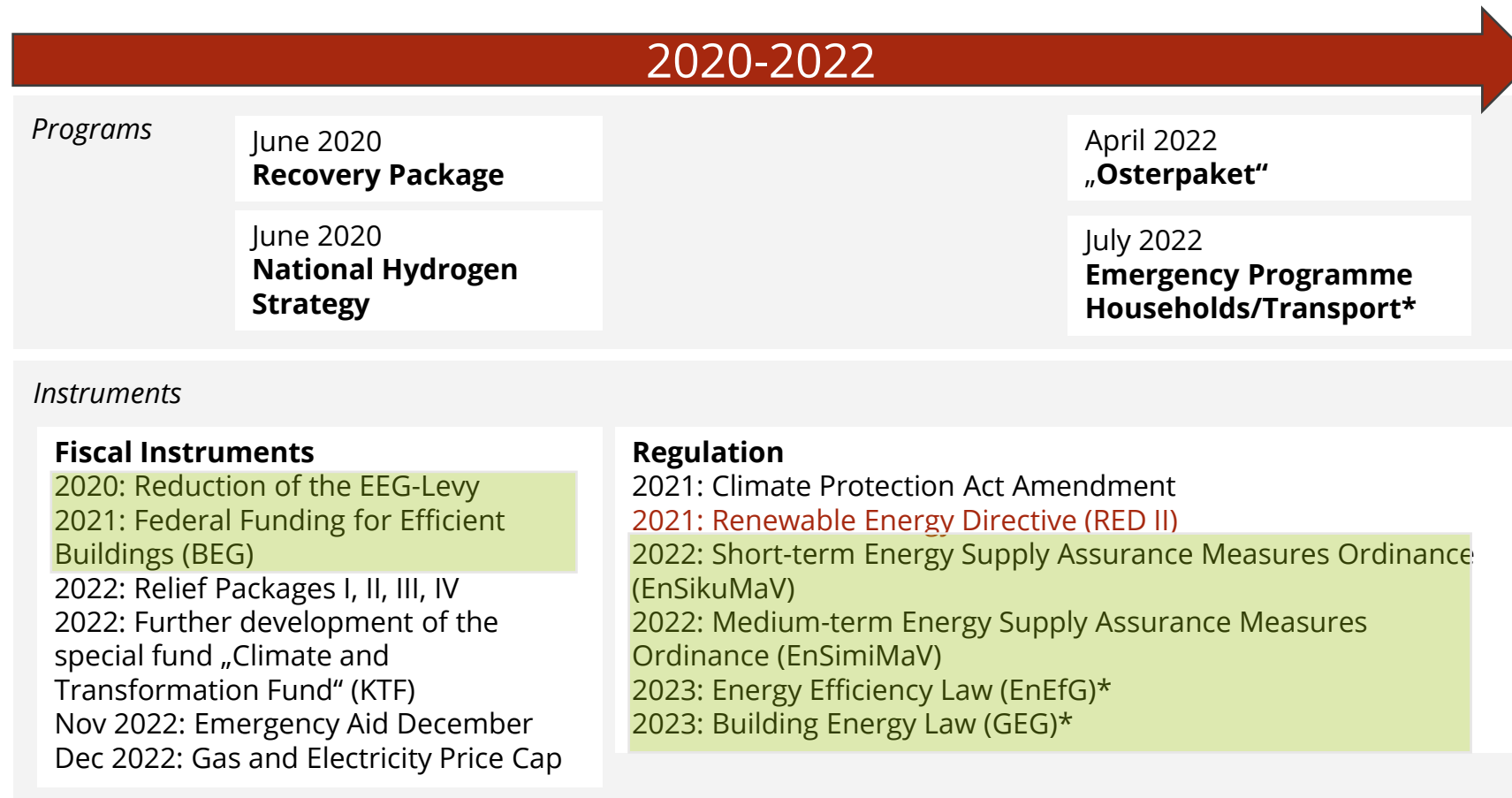


- Rising trend since 2020 (air and road transport) despite high prices and other special effects (e.g. 9 euro ticket)

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Recent relevant policy activities

Overview of relevant policies between 2020 and 2022



EU-Level; *not yet finally agreed on relevant for energy efficiency

Figure adapted, based on ERK (2022): Biennial Report 2022.

General

The Ukraine war and the resulting energy crisis were partly responsible for drastically raised energy prices and the decrease in energy consumption. The impact of energy efficiency increases is not yet clear.

Energy industry

Decreased energy consumption, slightly increased feed-in from renewable energy sources, shift from nuclear energy to gas and coal.

Industry

Decreased energy consumption as a result from reduced and relocated production, mainly in energy-intensive industry branches.

Households

Decrease in energy consumption mostly due to mild weather conditions and changed heating behaviour.

Transport

Continuing trend in road transport, pre-Covid-19-level not yet reached (increased fuel prices, increased number of km travelled, fossil fuel car population remaining constant).



Thank you for your attention!



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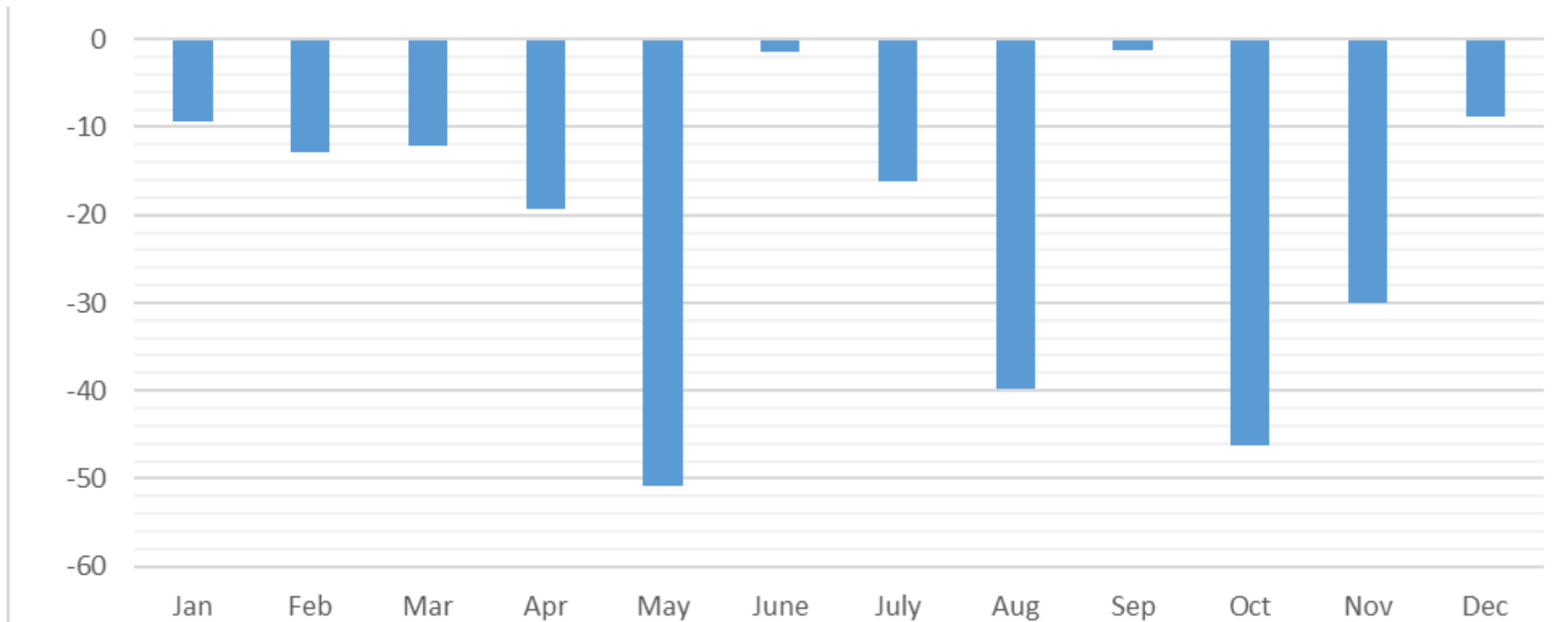


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Detailed view households

Reduction of gas consumption in households and GHD
[in % 2022 vs. 2018–21 average] - 12% less in total



Bundesnetzagentur - Aktuelle Lage Gasversorgung - Gaseinsparung in Deutschland 2022, in Prozent