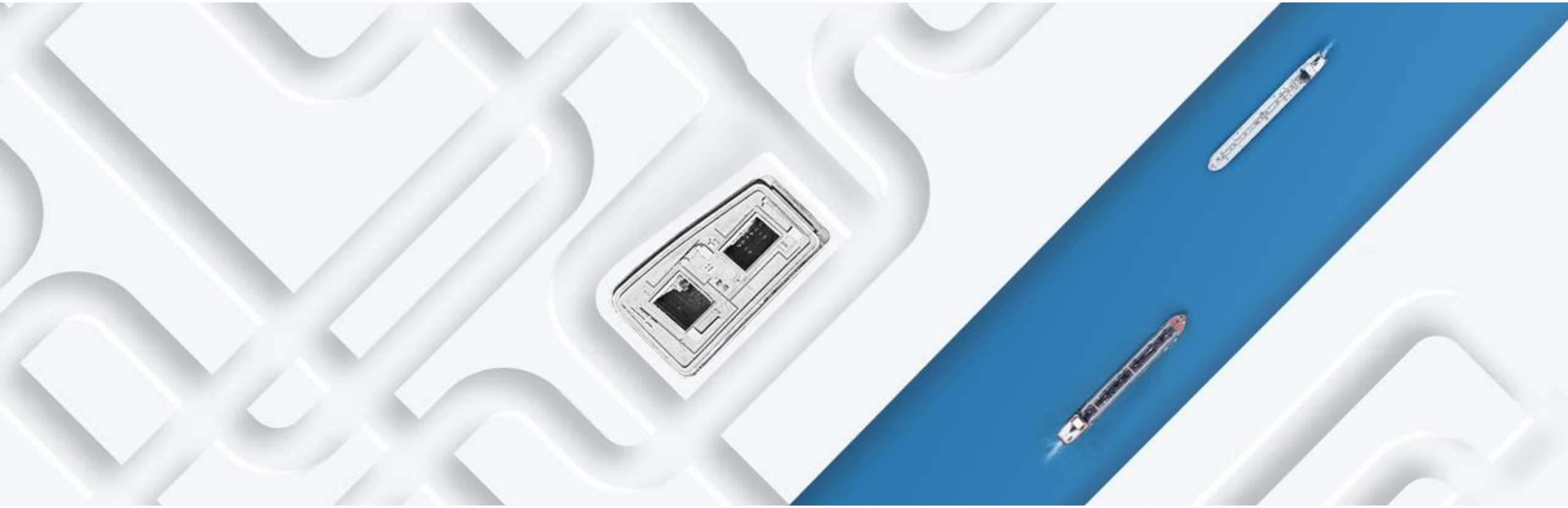
How to Alleviate Financial Burdens for Low-income Households and Energy Intensive Industry

10th German-Brazilian Dialogue on Science, Research and Innovation



INSTITUT DER DEUTSCHEN WIRTSCHAFT

All generalizations are false including this one

attributed to Mark Twain

The views and opinions expressed in this presentation are those of the presenter and do not necessarily reflect the official position of IW

German Economic Institut (IW) in Cologne

Who we are, how we work and our part in the Ariade project

IW is the largest private economic research institute in Germany. We are

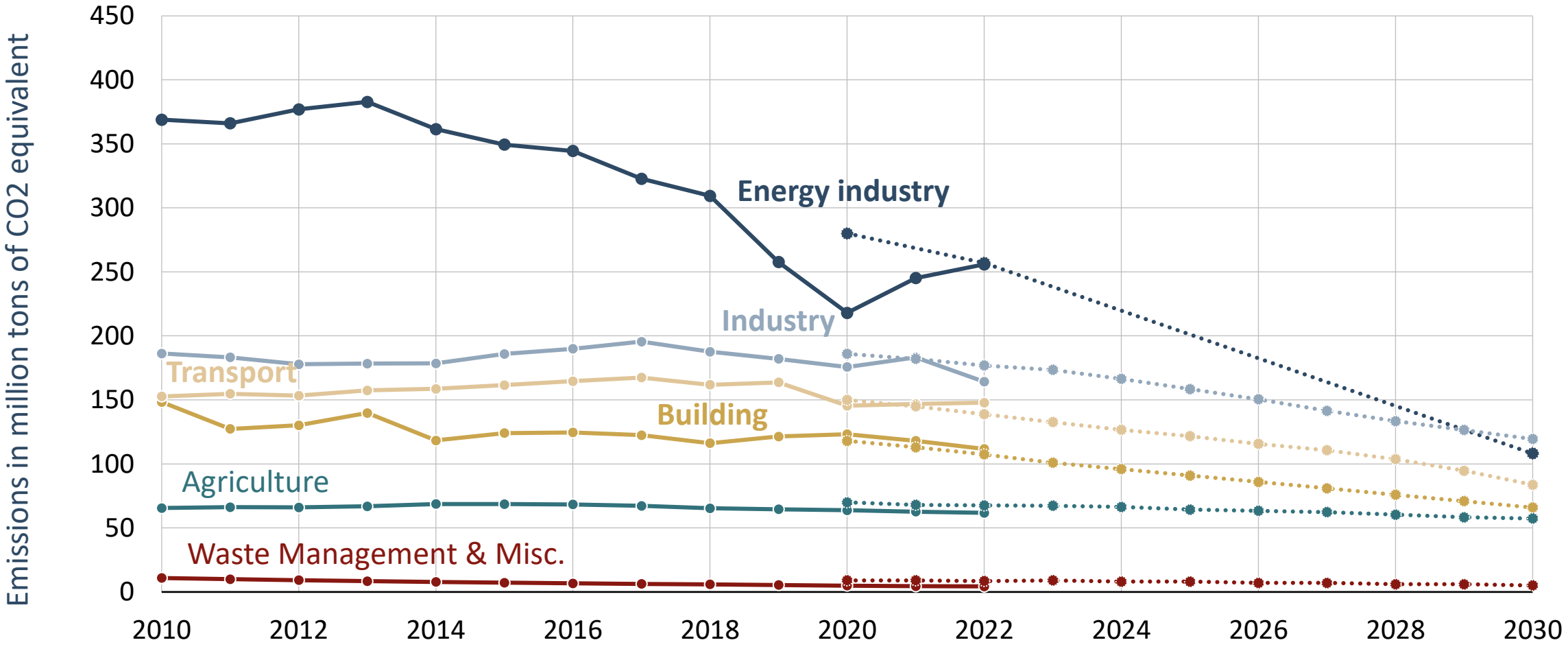
- an advocate of the social market economy and committed to a free economic and social order
- improving the understanding of economic and social interrelationships in politics and among the general public
- in exchange with science, business and politics; our studies, projects and recommendations are methodologically and empirically sound, socially relevant and up-to-date

Among others, we are part of the Copernicus Project Ariadne (=> heat and housing household panel)

- Our motivation: insufficient investments in building to achieve climate goals, including the unsolved landlord-tenant investment dilemma
- Search for investment stimulating and socially balanced solutions
- Funding and regulatory law alone cannot be the solution (costs, misguided incentives).

➢ **Link: www.iwkoeln.de/en/ & www.kopernikus-projekte.de/en/projects/ariadne**

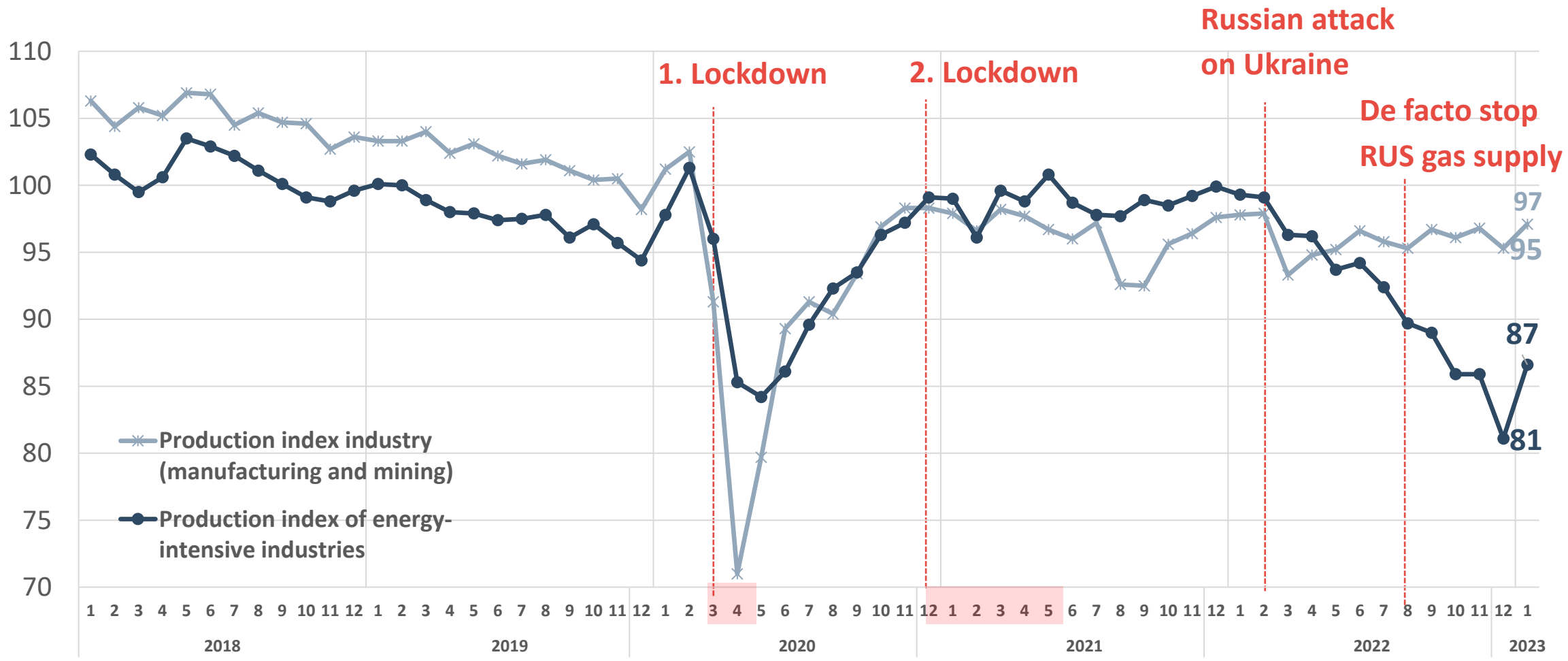
Where are we?



Source: UBA, 2023: see also Presse-Information 11/2023 vom 15.03.2023 - UBA forecast: 2022 greenhouse gas emissions down by 1.9 percent Increase in coal and fuel consumption – more renewables and overall lower energy use curb the effects); environmental Indikators in English here

Challenge: Slump in energy-intensive productions

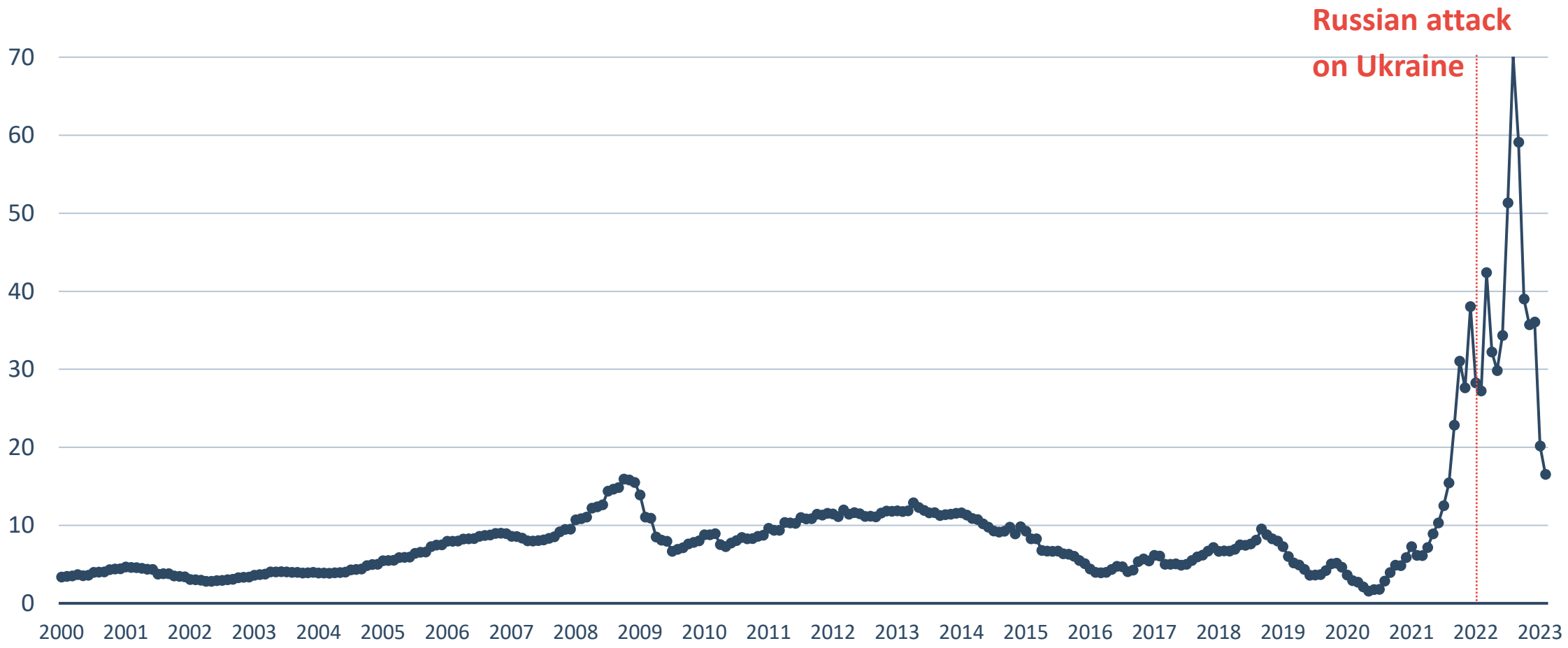
Index 2015 = 100



See also: Küper, Malte / Obst, Thomas, 2023, Energieintensive Produktion bricht stärker als während der Pandemie ein, IW-Kurzbericht, Nr. 19 (in German)

Challenge: immediate problem gas prices

US-Dollar je Million British Thermal Units, Europa

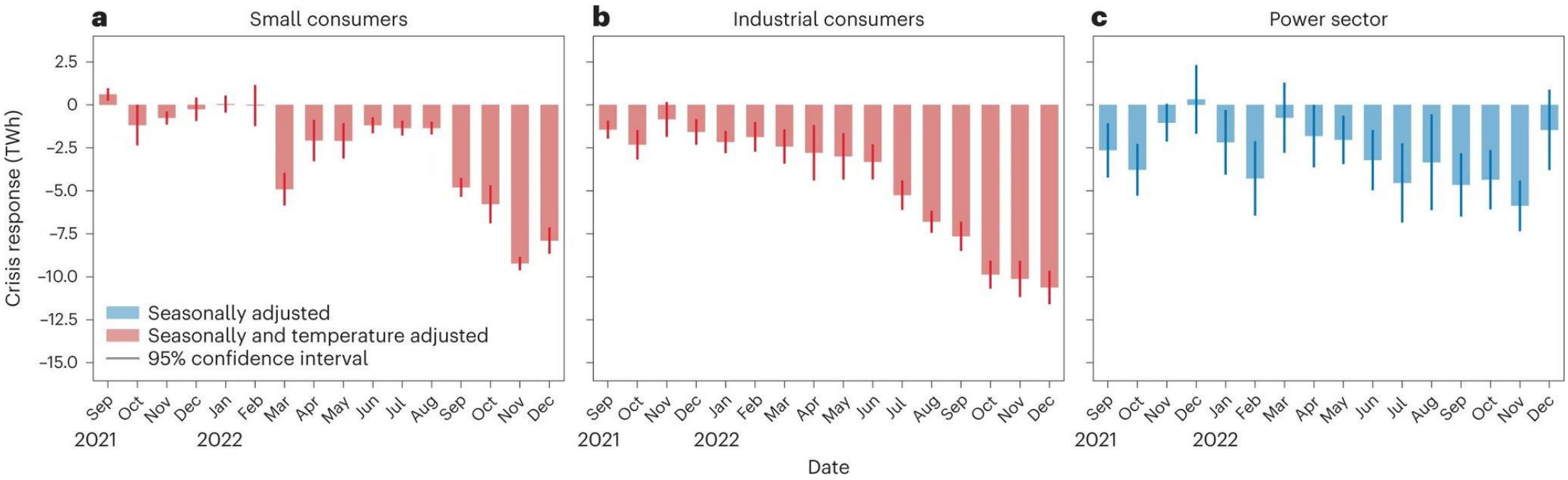


Source: World Bank; IW, based on presentation by Bardt H (2023): *Was bedeutet die Dekarbonisierung für die Industrie*? (What does decarbonization mean for industry?), March 30, 2023

Gas savings in Germany during the 2022 energy crisis

New study by Ruhnau et al. (2023)

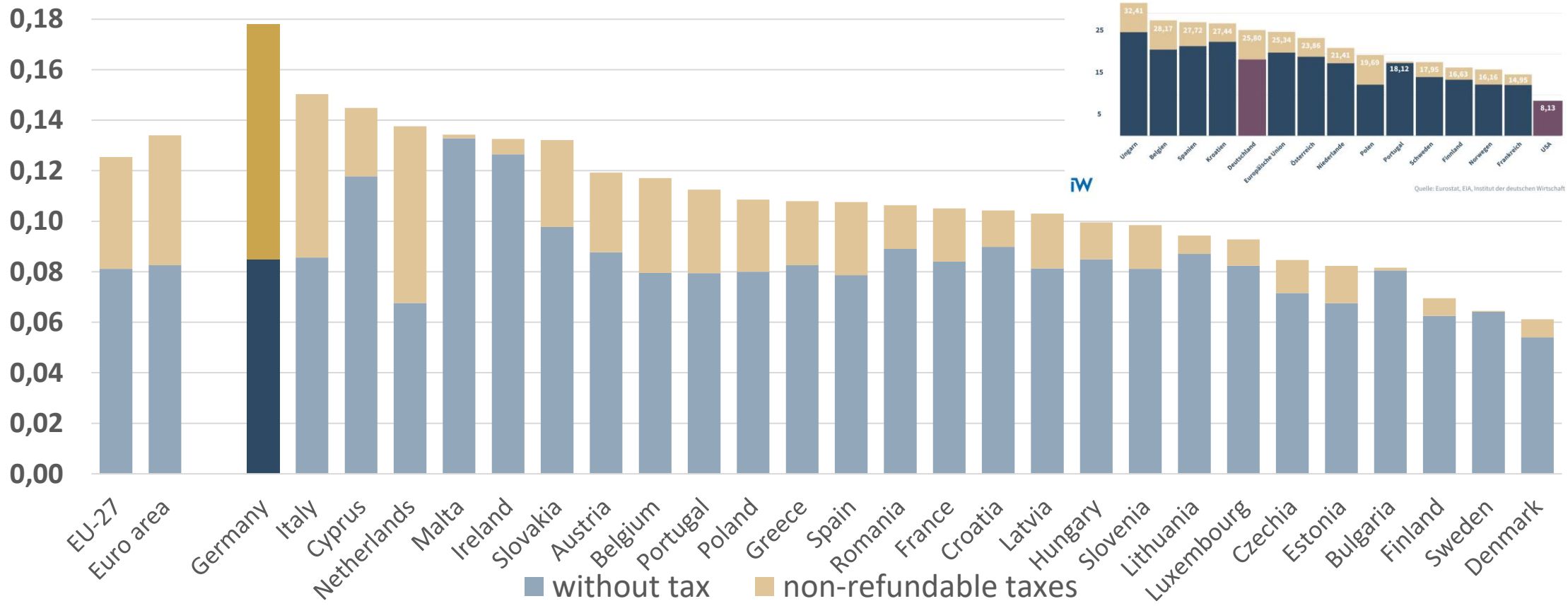
- Market prices are effective means of coordinating and incentivizing savings—avoiding price dilution through subsidies is important to reduce gas consumption
- Support policies are needed to cushion hardship but should be designed to keep saving incentives

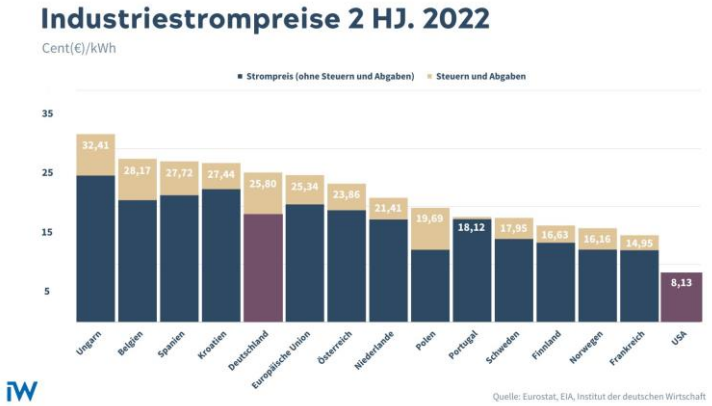


Ruhnau, O., Stiewe, C., Muessel, J. *et al.* Natural gas savings in Germany during the 2022 energy crisis. *Nat Energy* (2023). https://doi.org/10.1038/s41560-023-01260-5

Challenge: deferred problem of energy prices in General

Electricity prices industry, first half 2020, EUR per kWh



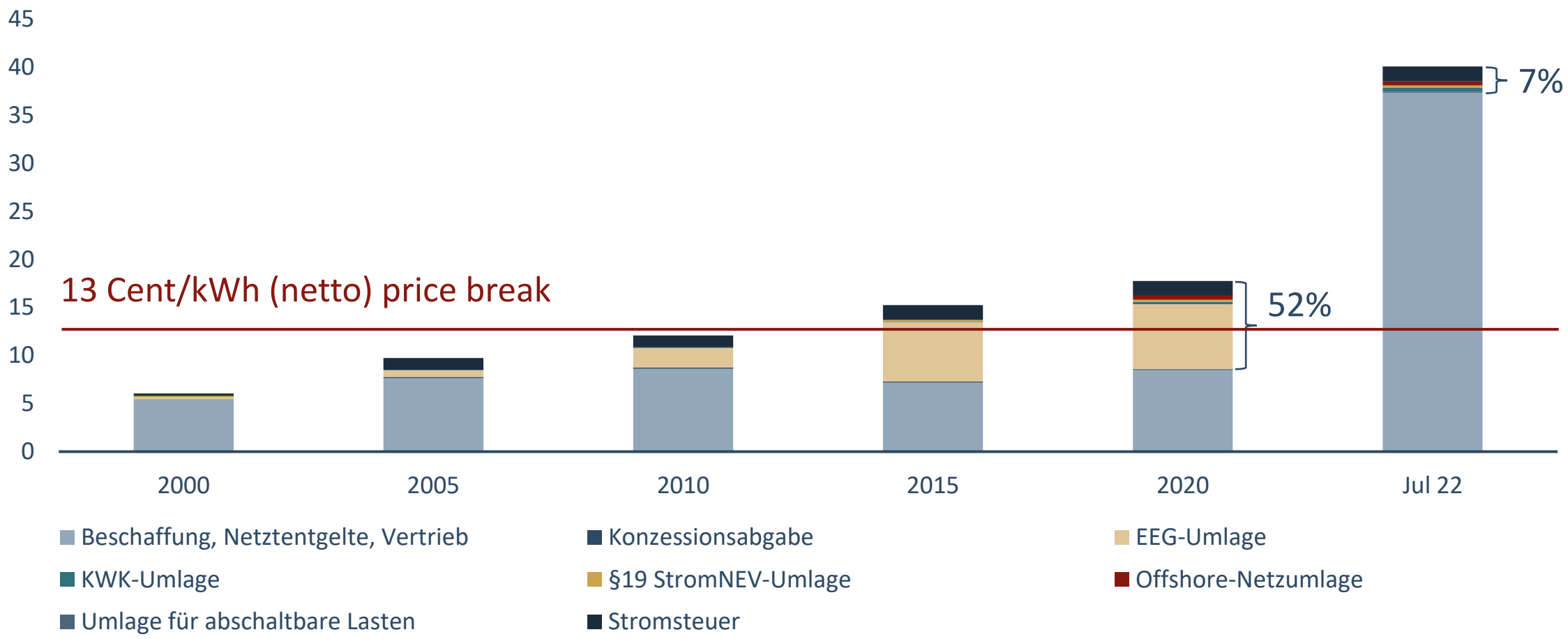


➢ **high electricity prices reduce the competitiveness of Germany as industrial location**

Quelle: Eurostat, 2020, based on presentation by Bardt H (2023): *Was bedeutet die Dekarbonisierung für die Industrie*? (What does decarbonization mean for industry?), March 30, 2023

Development of electricity prices for industry

in Cent/kWh

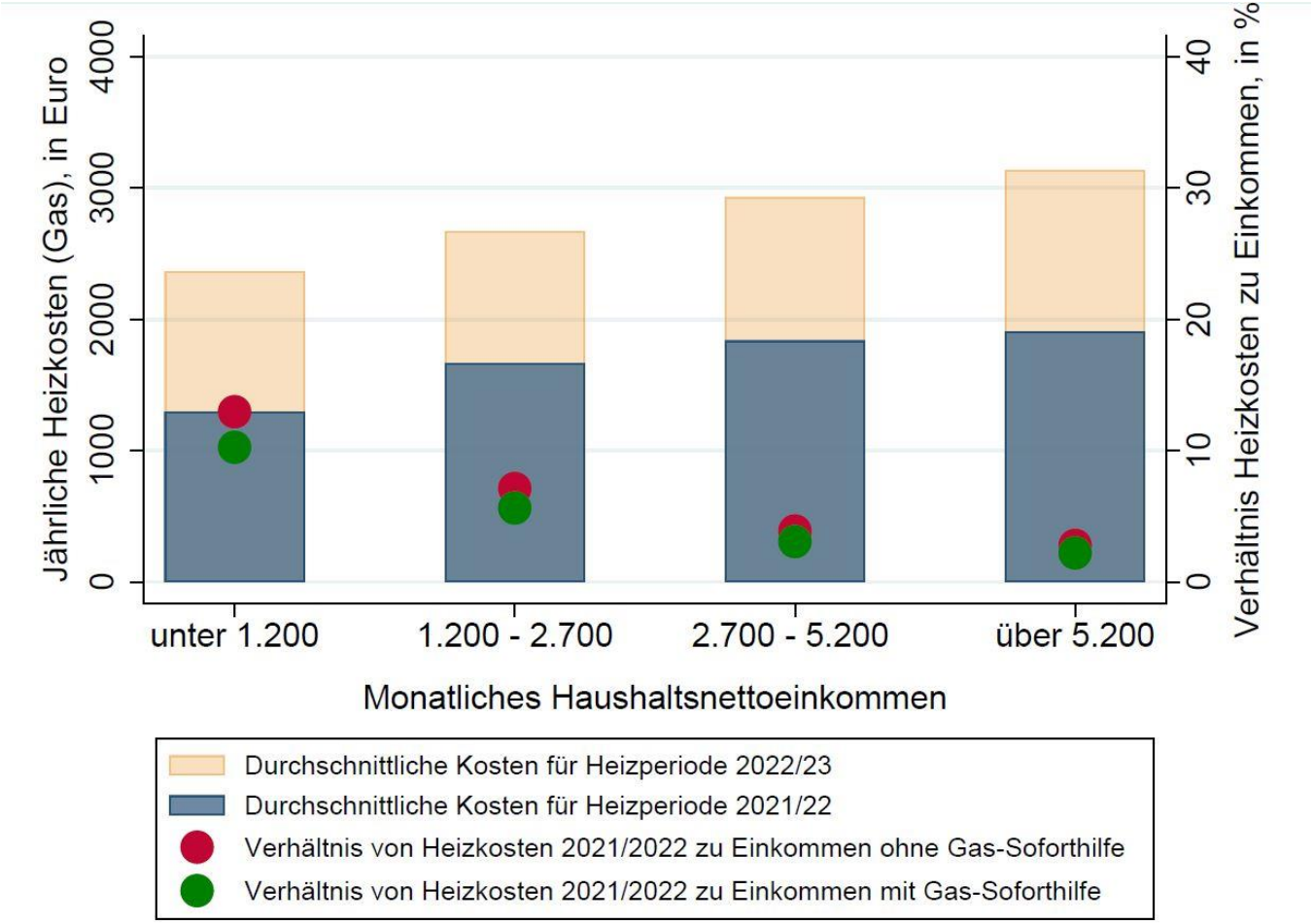


Quelle: BDEW, 2022; Durchschnittlicher Strompreise für Neuabschlüsse in der Industrie in ct/kWh (inkl. Stromsteuer), Jahresverbrauch 160.000 bis 20 Mio. kWh, mittelspannungsseitige Versorgung

Heating costs according to net household income

Source: Ariadne household Panel (Fall 2022)

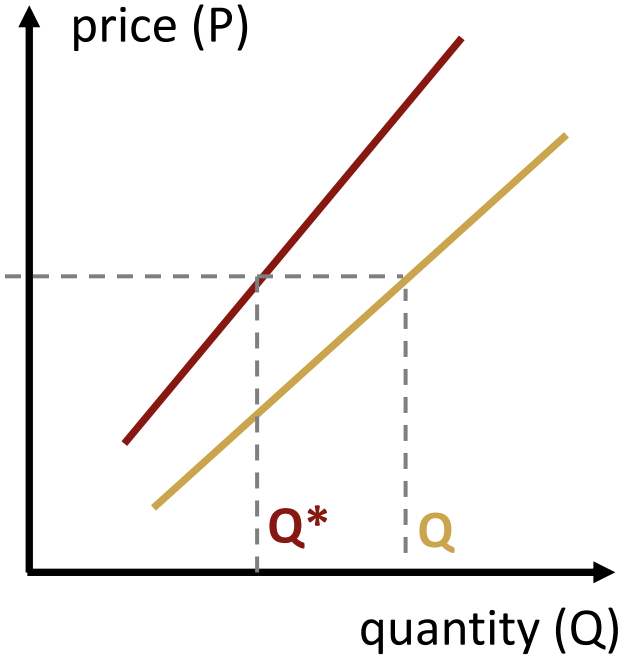
Estimation of future annual heating costs for the 2022/2023 heating period for gas with average prices from 2022 and the ratio of heating costs to household net income, before and after the gas price brake (left axes). Points (right axes): ratio of heating costs to income (red without gas price brake, green with gas price brake).



Quelle: Frondel et al. (2022) Wie sehr belasten Kosten für Heizen und Warmwasser Privathaushalte tatsächlich? (Ariadne-Analyse Vorabfassung – auf Nachfrage verfügbar, siehe Ariadne | Kopernikus-Projekt (ariadneprojekt.de))

Challenges: Trade offs

- **jobs vs climate** (industrial jobs and competitiveness vs climate protection & fast industrial transformation or deindustrialization)
- **to shield vs. to incentive** (how to incentive the reduction of energy consumption and alleviate financial burdens)
- **Climate vs. environmental benefits**
- **affordable housing vs. energy efficient buildings** (e.g. issues with new residential construction & reduction of land use (30 ha per day), fair costs sharing of modernization costs and carbon pricing in buildings (tenant vs. landlord)
- **tenant vs. landlord** (split incentives and divergent preferences (information, incentives, endowment)
- **subsidiarity vs. climate protection as global public good and merit good** (transcending national boundaries, including carbon leakage, and as a common-pool resource with rivalry in consumption, but non-excludable benefits, socially beneficial, but typical under-consumed by society)



Solutions

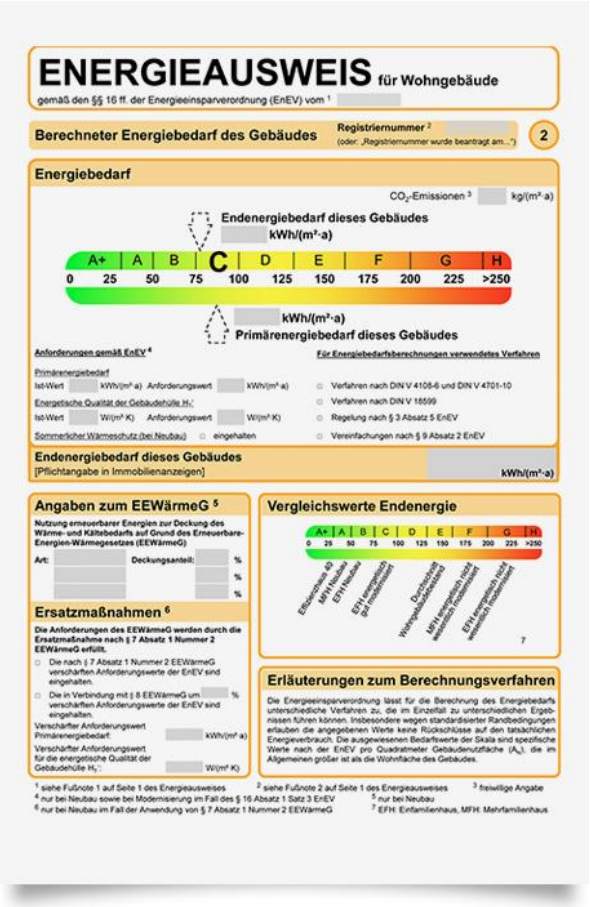
- Temporary price cap that also incentives lower consumption
- Relief packages for overburdened consumers

→ better policies possible if we had appropriate information → next slide

- Reduce uncertainty (e.g. certificates + price framework) & improve transparency
- Increase supply and infrastructure (speed up planning and approval process)
- Perceived fairness important for social acceptance

Solutions: energy performance certificates are important

- **Market transparency** (assessment of buildings)
- **Monitoring** heat transition („*Wärmewende*“)
- **Link for political instruments**: funding, taxing or regulations
  - Extra repayment subsidy of 10 % for „worst performing builidngs“ (H) as part of the "Federal Funding for Efficient Buildings" (BEG)
  - However, energy certificates exclusively provide information and are intended to enable an approximate comparison (§ 79 GEG)
  - ➢ 2023 housing benefit reform (*Wohngeld*): a less accurate/efficient flat-rate solution had to be chosen for the climate component (see Henger et al 2022)
  - ➢ 2023 CO2 cost level model (*Stufenmodell*): level of apportionability of CO2 costs is differentiated according to building energy classes; accordingly, tenants are relieved of the (additional) heating costs if they live in buildings with poor energy performance (see Henger et al. 2023)
  - ➢ future: Identification of existing buildings requiring renovation and definition of minimum standards (MEPS - minimum energy performance standards) when implementing the EU building directive



Analogy industry?

Heating costs according to energy efficiency

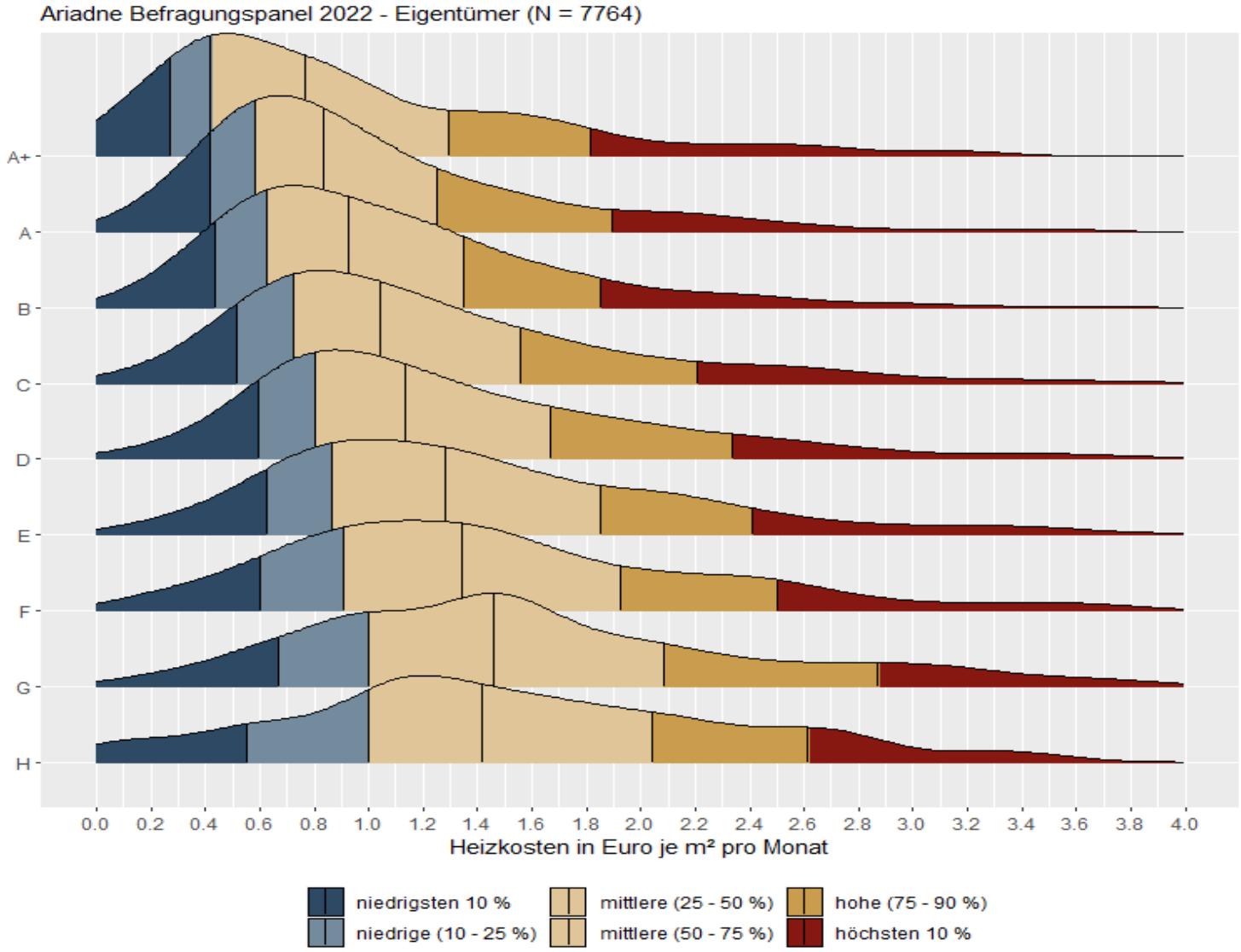
Euro per sq meter, monthly

A proxy (but not a good one)

→ more determinants

Would be important for:

- Targeted needs-based measures such as emergency gas aid
- Investment and housing decisions



Quelle: Ariadne Wärme- und Wohnen-Panel 2022

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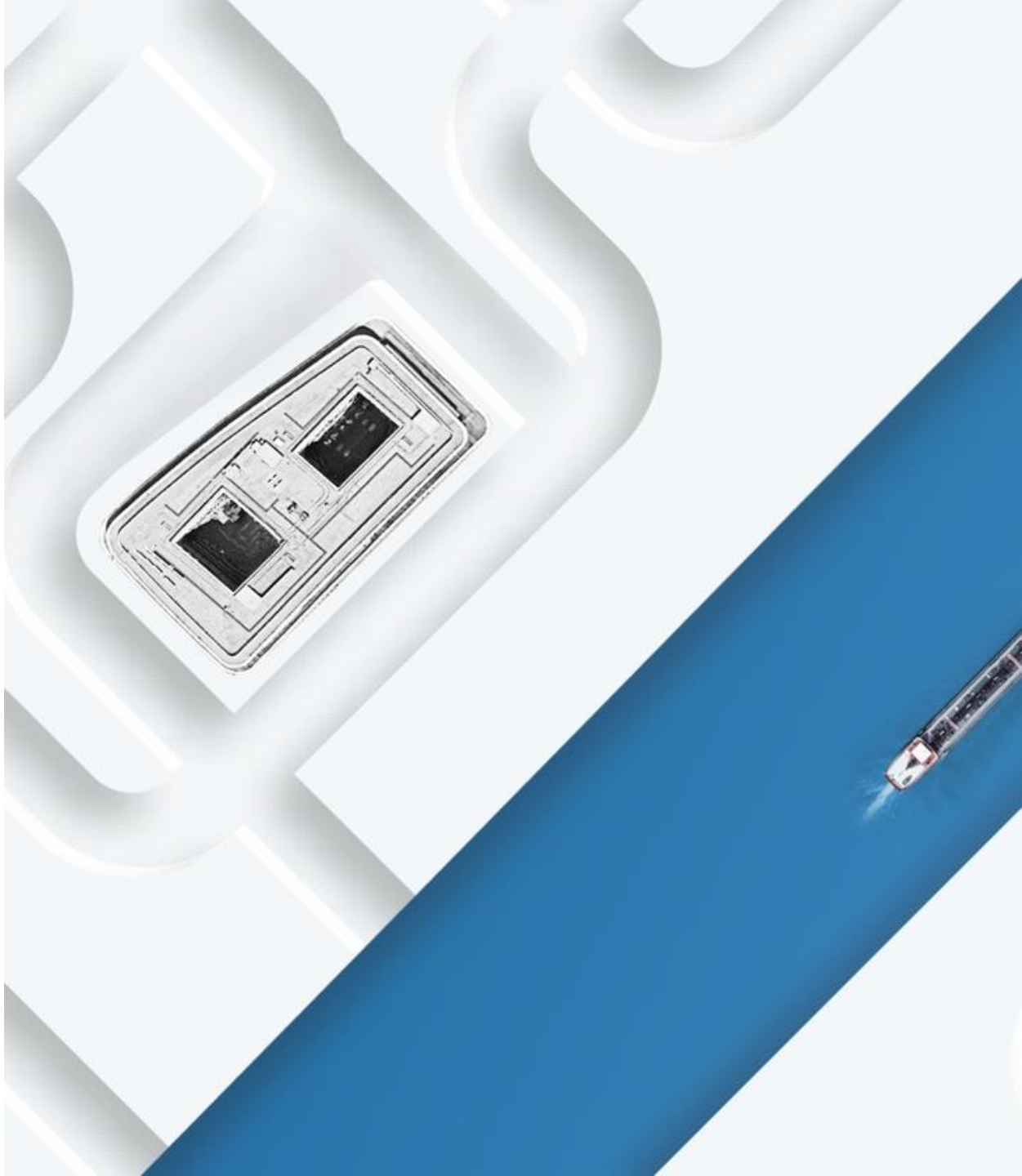

Selected literature

Corbeau and Merz, 2023, Understanding Germany's Gas Price Brake: Balancing Fast Relief and Complex Politics, Commentary, Center on Global Energy Policy at Columbia|SIPA, February 2023

Frondel et al., 2023, Erste Einblicke in den Wärme- & Wohnen-Panel 2022, Ariadne-Analyse, in engl. ~ First insights into the heat & living panel, forthcoming May/June 2023

Küper and Obst, 2023, Energieintensive Produktion bricht stärker als während der Pandemie ein, in engl. ~ *Energy-intensive production collapses more than during the pandemic, March 2023*

Henger, Ralph / Kaestner, Kathrin / Oberst, Christian / Sommer, Stephan, 2022, CO2-Kosten-Stufenmodell – richtige Logik, aber falsche Bemessung, in engl ~ *CO2 cost level model, right logic but wrong assessment,* May 2022

Ruhnau, O., Stiewe, C., Muessel, J. et al. Natural gas savings in Germany during the 2022 energy crisis. Nat Energy (2023). https://doi.org/10.1038/s41560-023-01260-5

Backup

Short Speaker Introduction

Dr. Christian A. Oberst

- Senior Economist for Housing Policy and Real Estate Economics at the German Economic (IW). The IW in Cologne is the largest private economic research institute in Germany.
- Topics: quality adjusted price indicators on housing & commercial real estate development; housing and regional policy, household preferences (e.g., heat transition or residential locations), experimental approaches in surveys, spatial data analysis
- Vice-Chair International Network for Economic Research - INFER e. V.
- Studies of Economics in Münster & Rotterdam (2004 – 2008), doctoral degree from the University of Münster (Institute of Spatial and Housing Economics, 2009 – 2012), Post-Doc E.ON Energy Research Center, RWTH Aachen (2012 – 2018), since 2018 at IW
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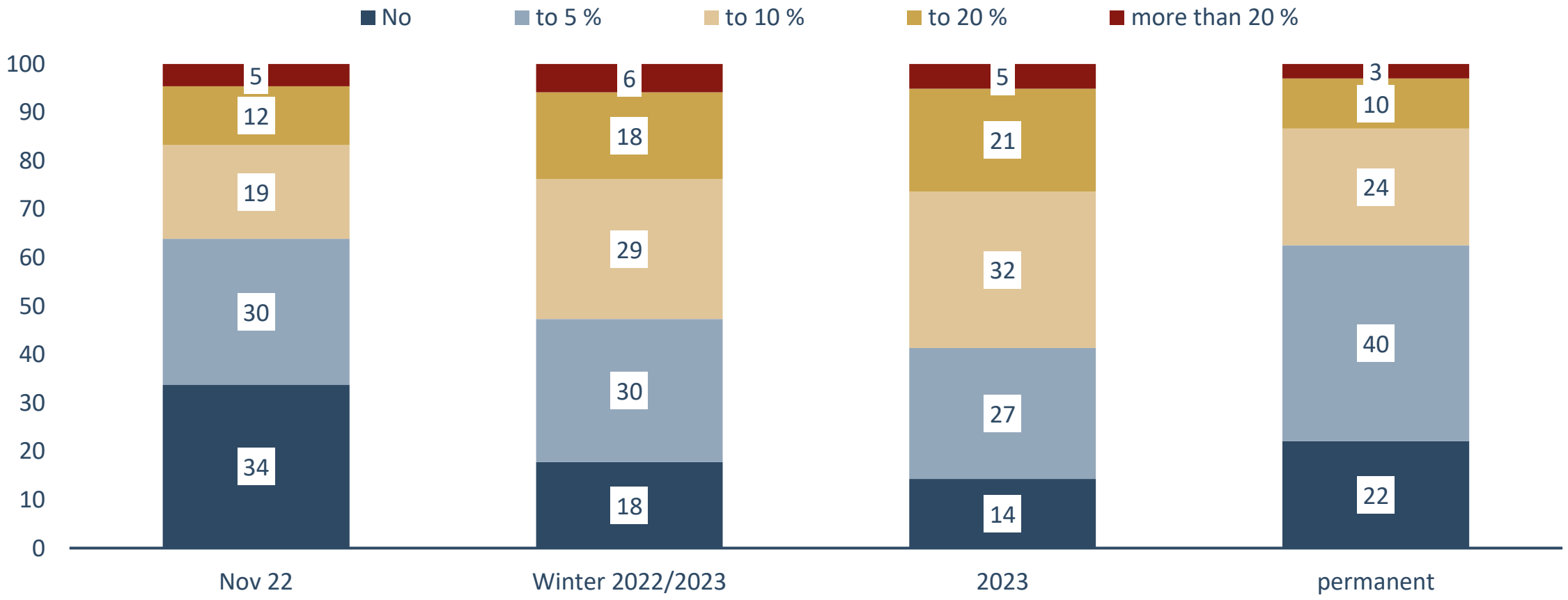
Extent and duration of production disruptions

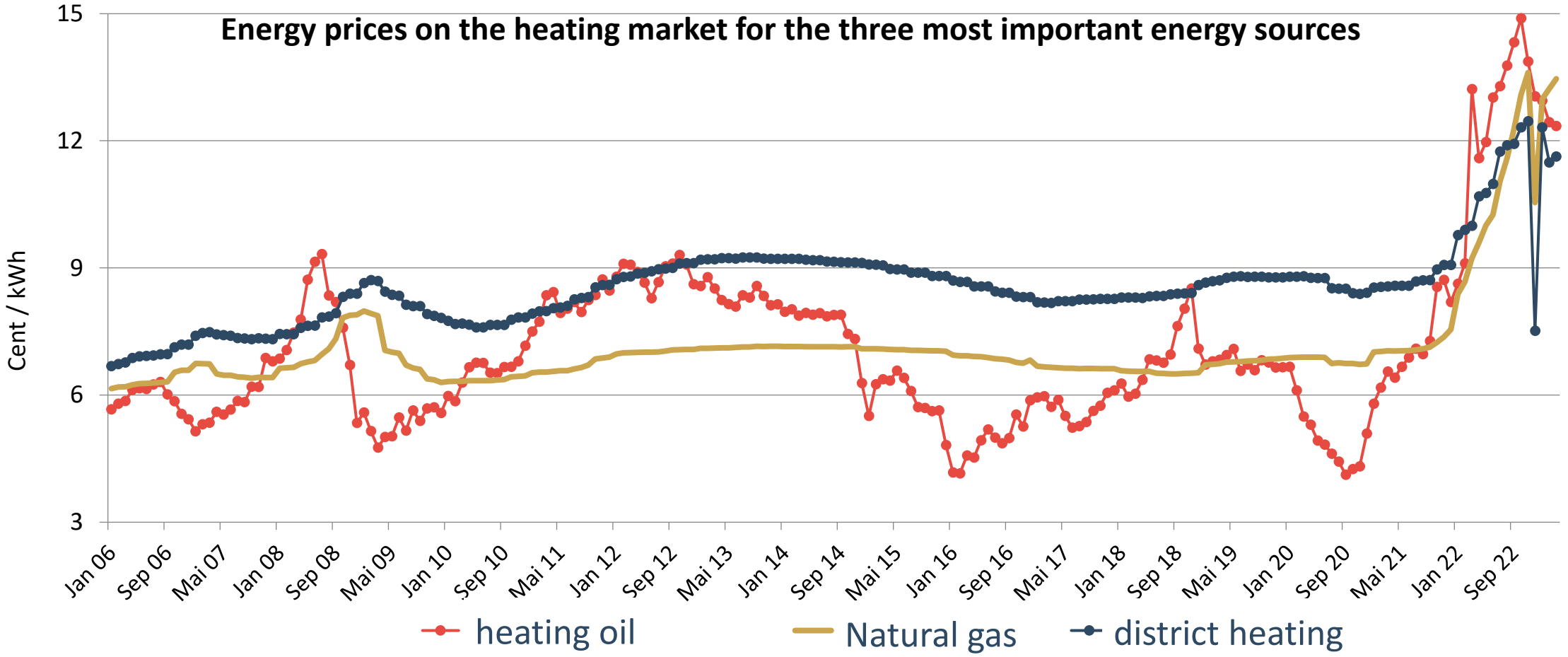
proportion of companies



Source: IW-Konjunkturumfrage Herbst 2022

Rising energy prices are changing the framework

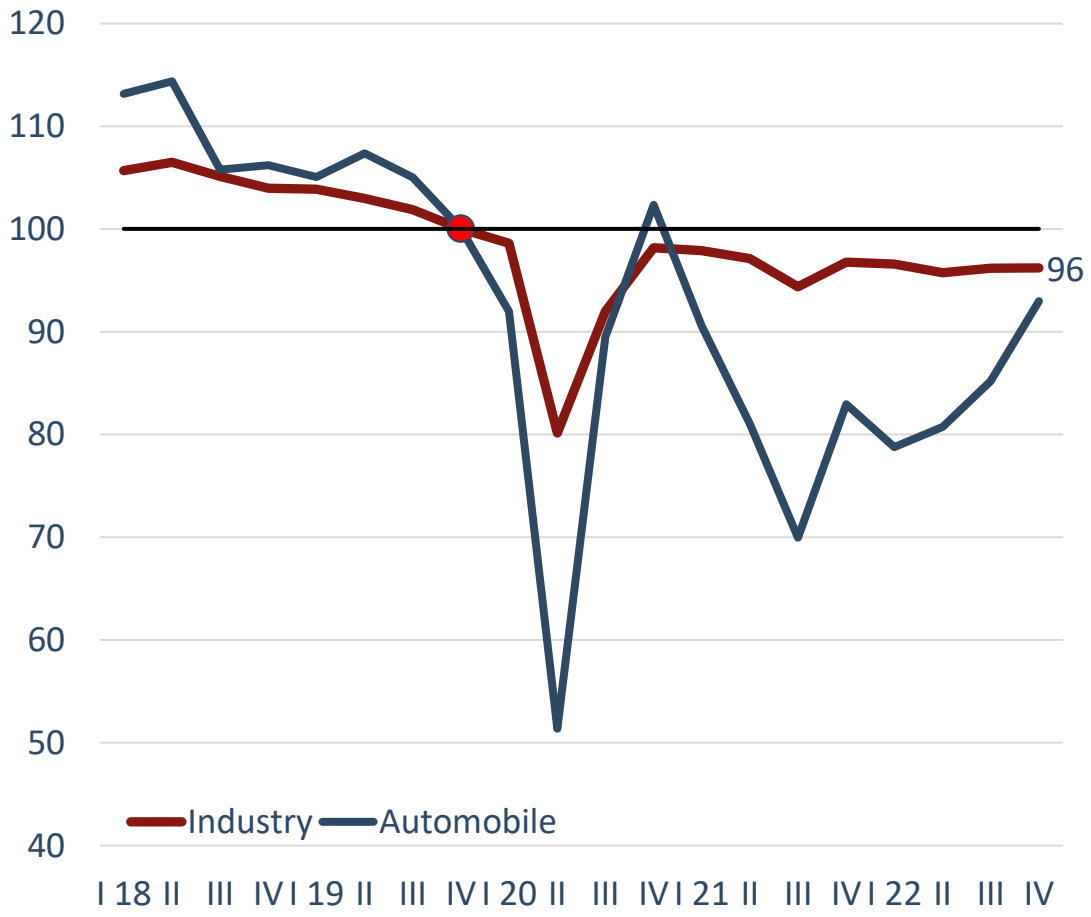
Shares: natural gas (49,5 %), heating oil (Anteil 24,8 %) district heating (14,1 %) (Stand 2021, BDEW, 2022)

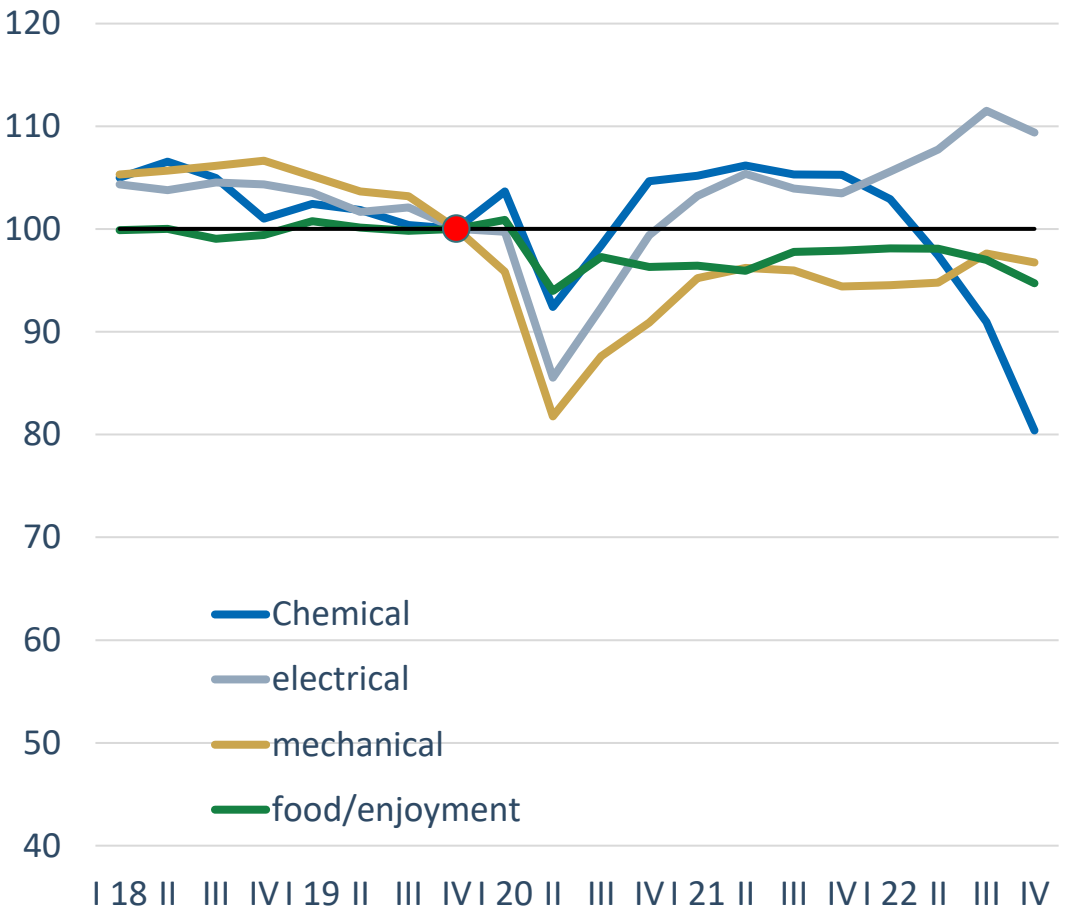


Quelle: BMWK 2022, Statistisches Bundesamt, 2022 (Fortschreibung mit VPI-Indizes ab Jan. 2022); Leichtes Heizöl: 1 Liter = 10 kWh; Fernwärme: 1 GJ = 278 kWh; alle Preise inkl. MwSt.

Split development in German industry

Seasonally adjusted industrial production index 4th quarter 2019 = 100





Quellen: Deutsche Bundesbank; Institut der deutschen Wirtschaft