



Energy Efficiency in Industry: Highlights from the IEA Energy Efficiency Report 2022

Hugo Salamanca and Emma Mooney

EnR- Decarbonising Industry and Businesses, 9 March 2023

Energy efficiency 2022 overview

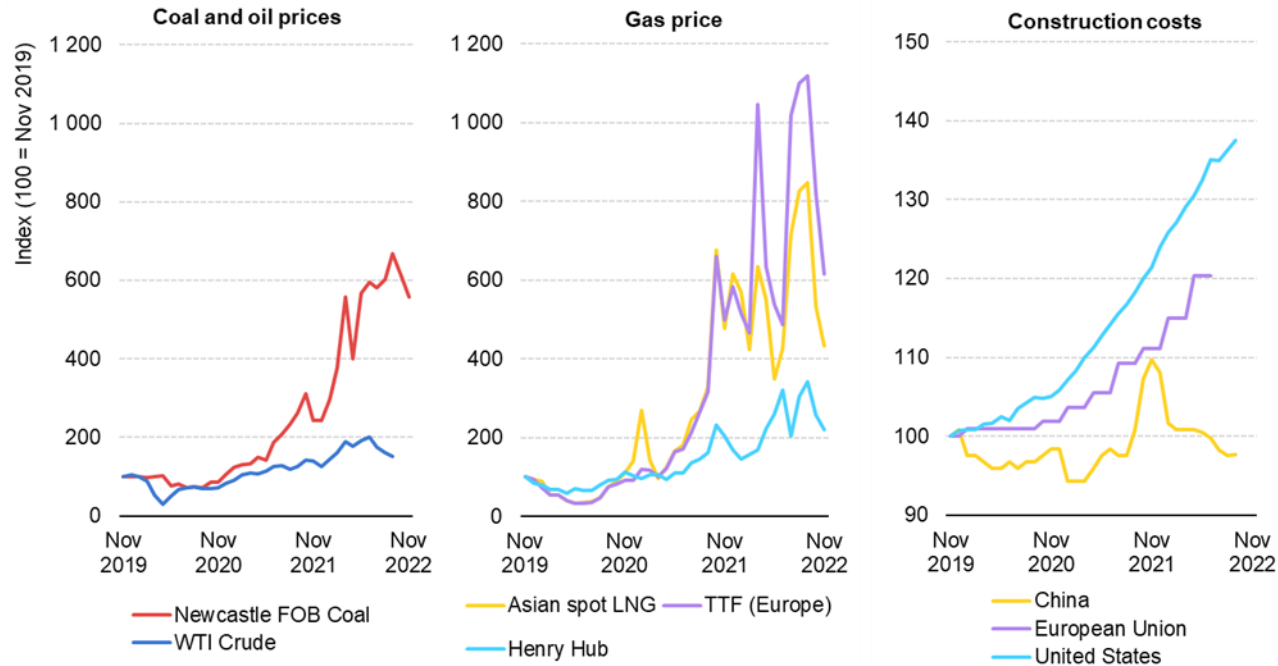
1. Recent trends in energy efficiency markets
2. Role of energy efficiency in addressing the energy crisis
3. Special focus chapter on ASEAN

<https://www.iea.org/reports/energy-efficiency-2022>



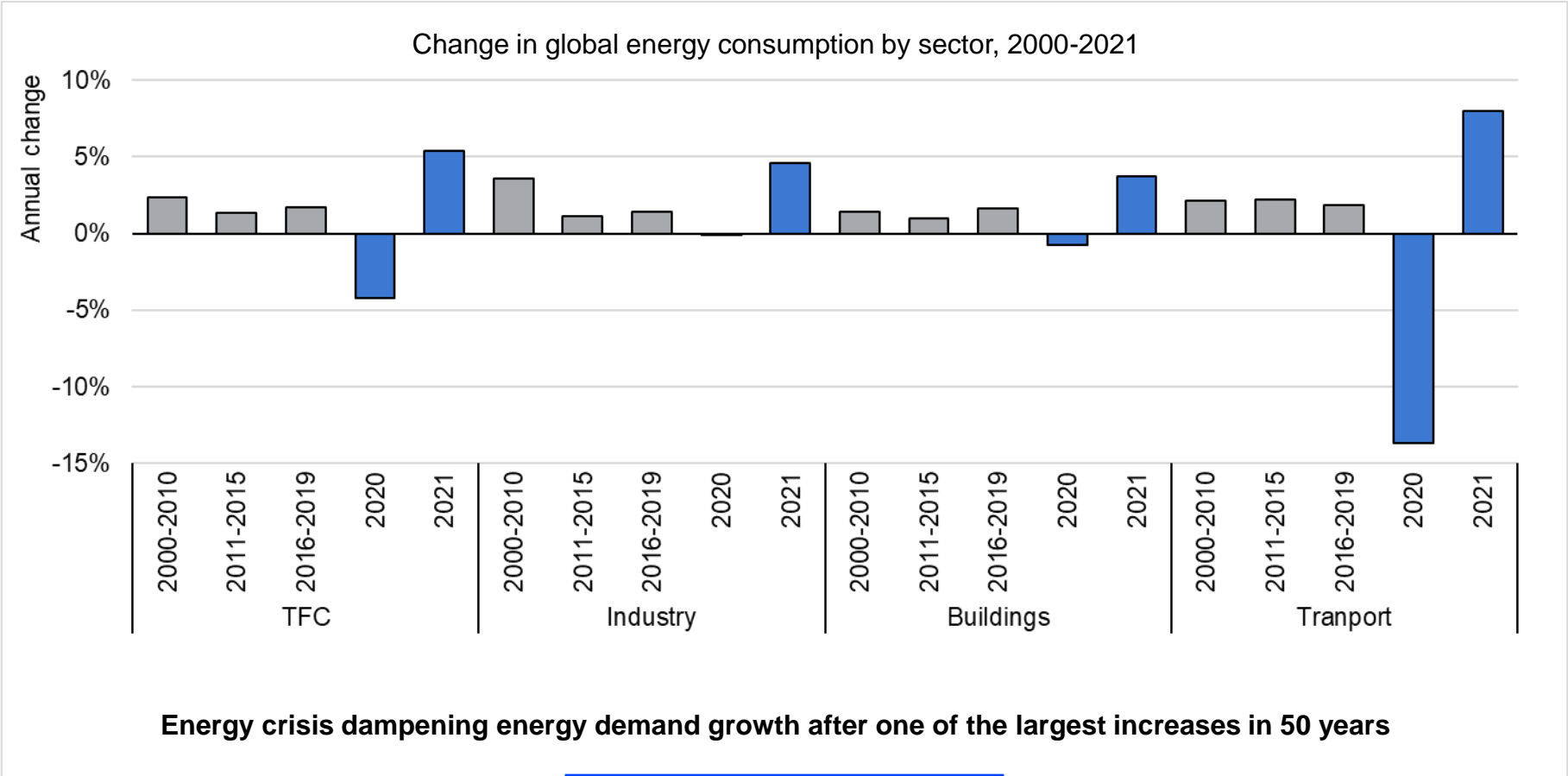
Energy crisis is putting the spotlight on the efficiency agenda

Wholesale energy price and construction cost indices 2019-2022

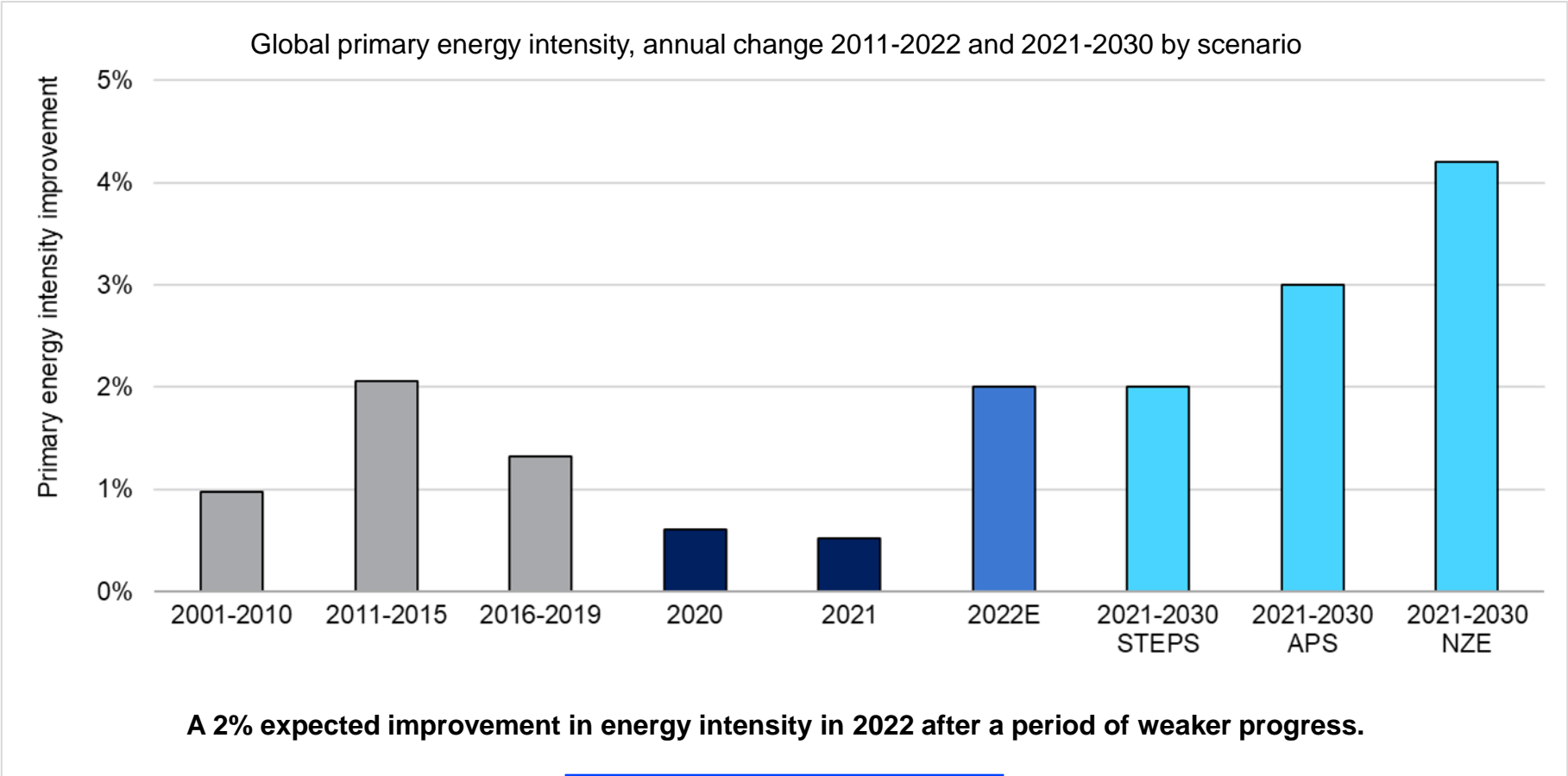


Governments are turning to efficiency as it can simultaneously meet affordability, security and climate goals

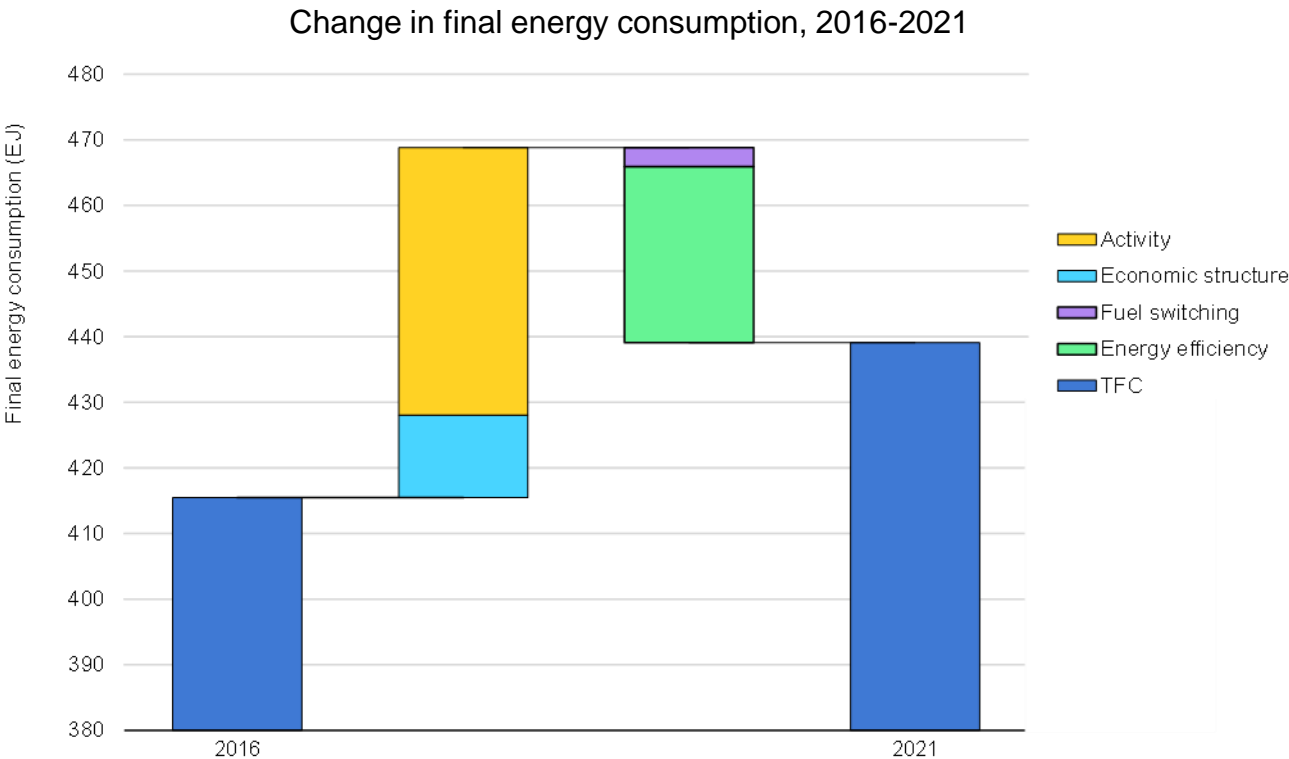
Energy demand growth slower after Covid-recovery year



Emerging signs of a turning point in energy efficiency in 2022?



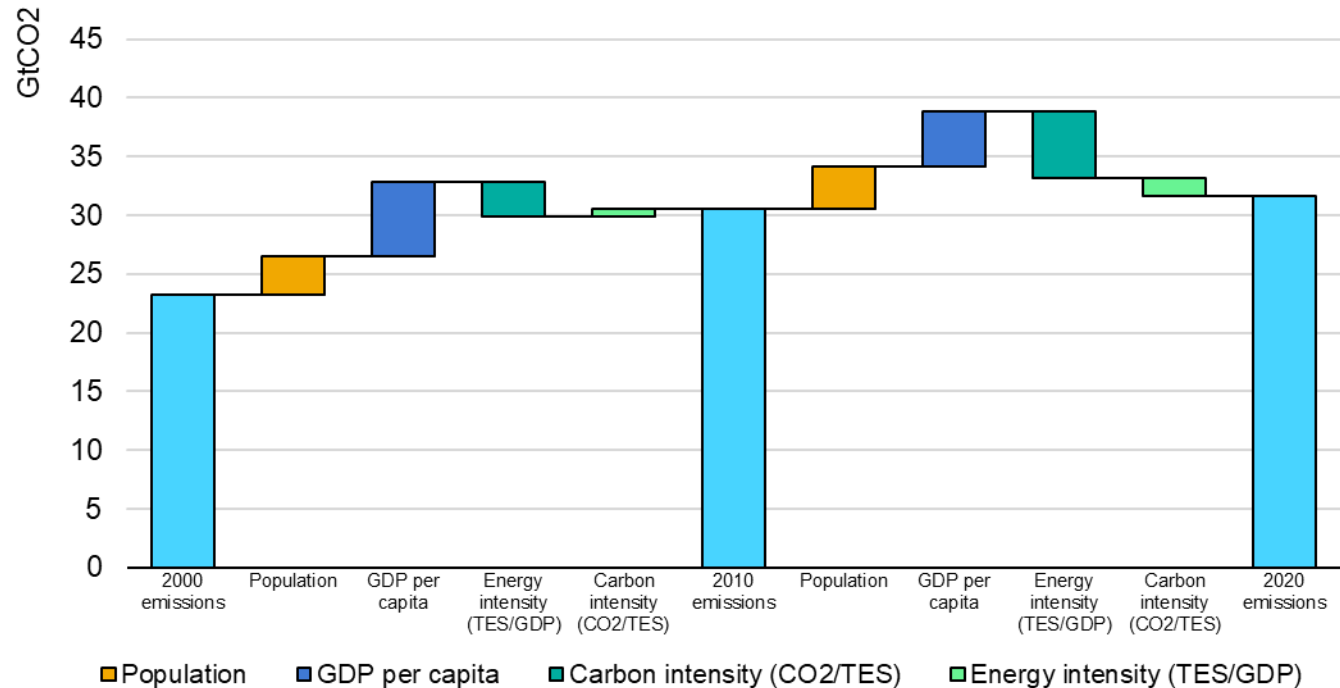
Efficiency playing a key role in delivering energy security



Efficiency gains have halved the potential growth in global energy demand over the last six years

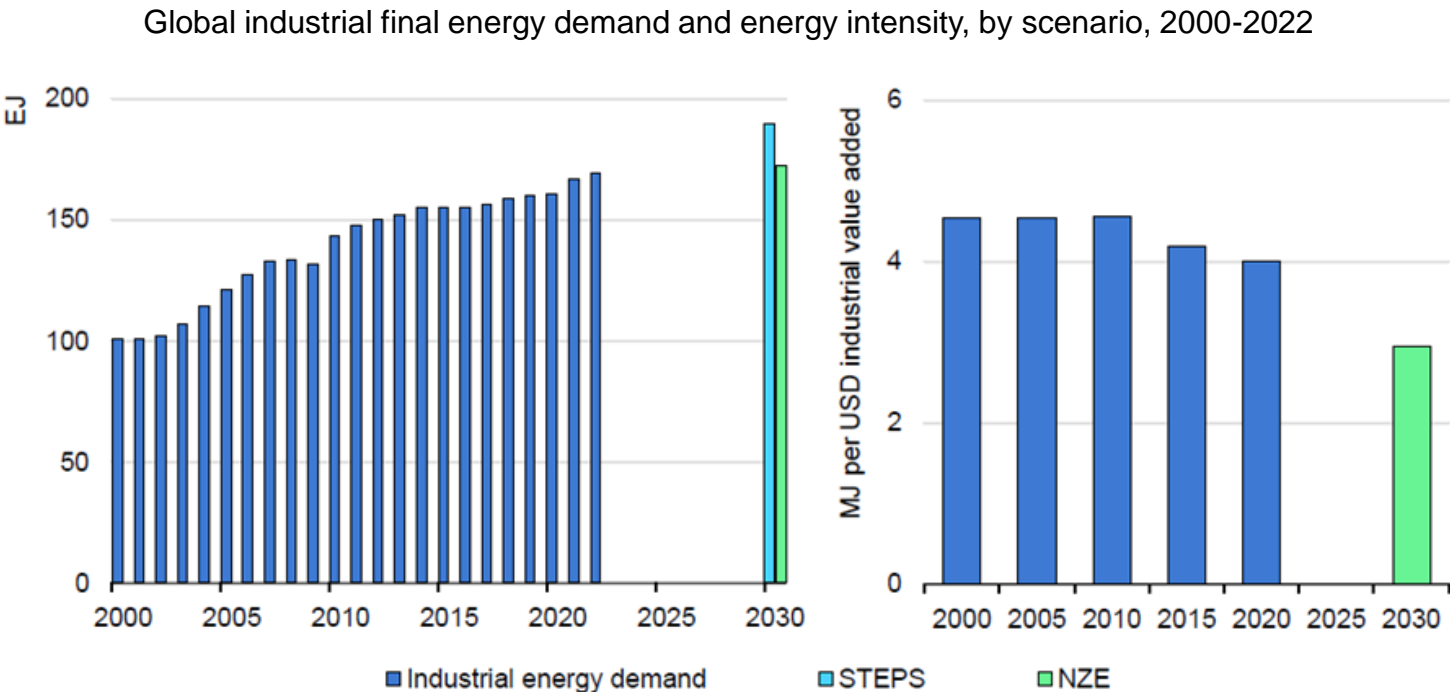
Without efficiency gains CO₂ emissions would be 30% higher

Global CO₂ emissions from fuel combustion and drivers, 2000-2020



Improvements to energy intensity have offset half the emissions growth from higher incomes and population

Industrial demand - pushing global energy consumption higher

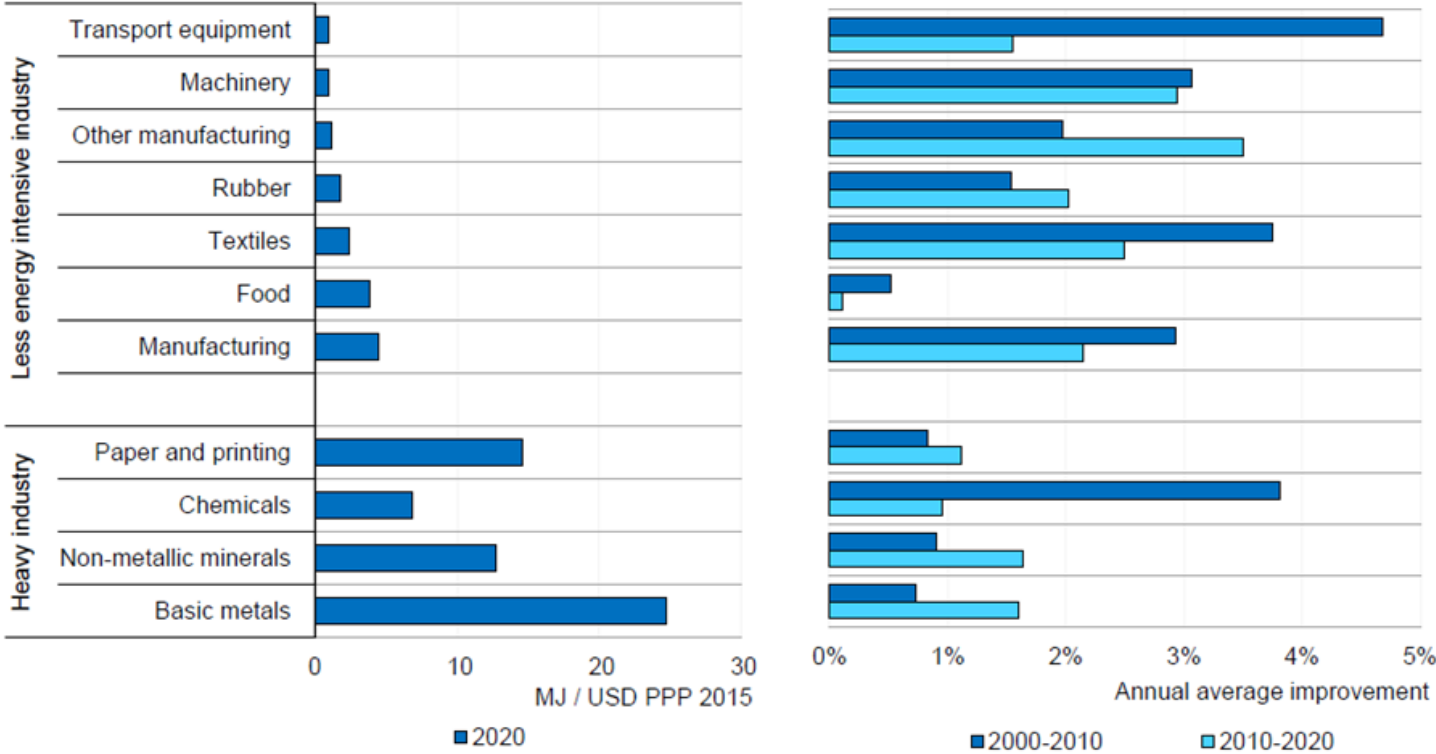


IEA. CC BY 4.0.

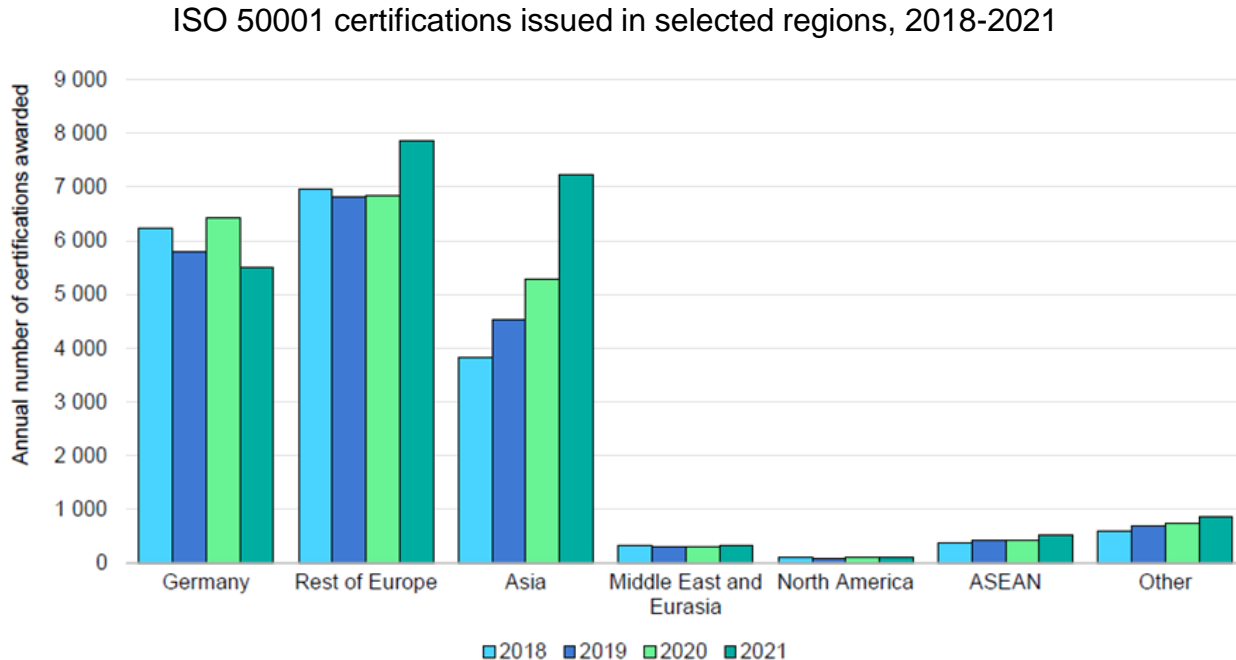
Global industrial energy consumption has experienced strong growth since the beginning of the pandemic, rising 4% from 2019 to about 165 EJ in 2021

Efficiency rising fastest in less energy-intensive industrial sectors

Average energy intensity of major industrial sub-sectors, IEA countries, 2000-2020



Engagement in energy management systems growing



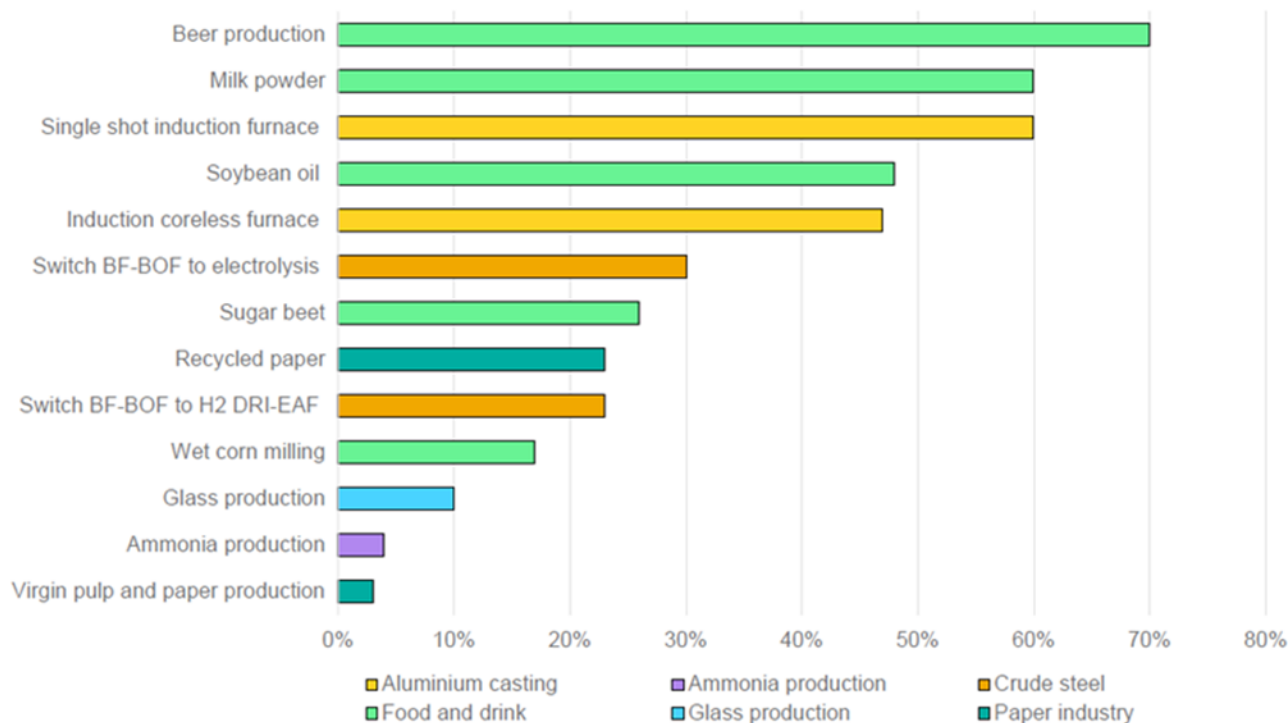
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Sources: IEA based on data from ISO (2022), ISO Survey of Certifications, 2021.

Companies are increasingly turning to energy management systems to achieve critical cost savings

Electrification for increased efficiency in industrial heat

Potential energy savings from electrification of industry in the United States

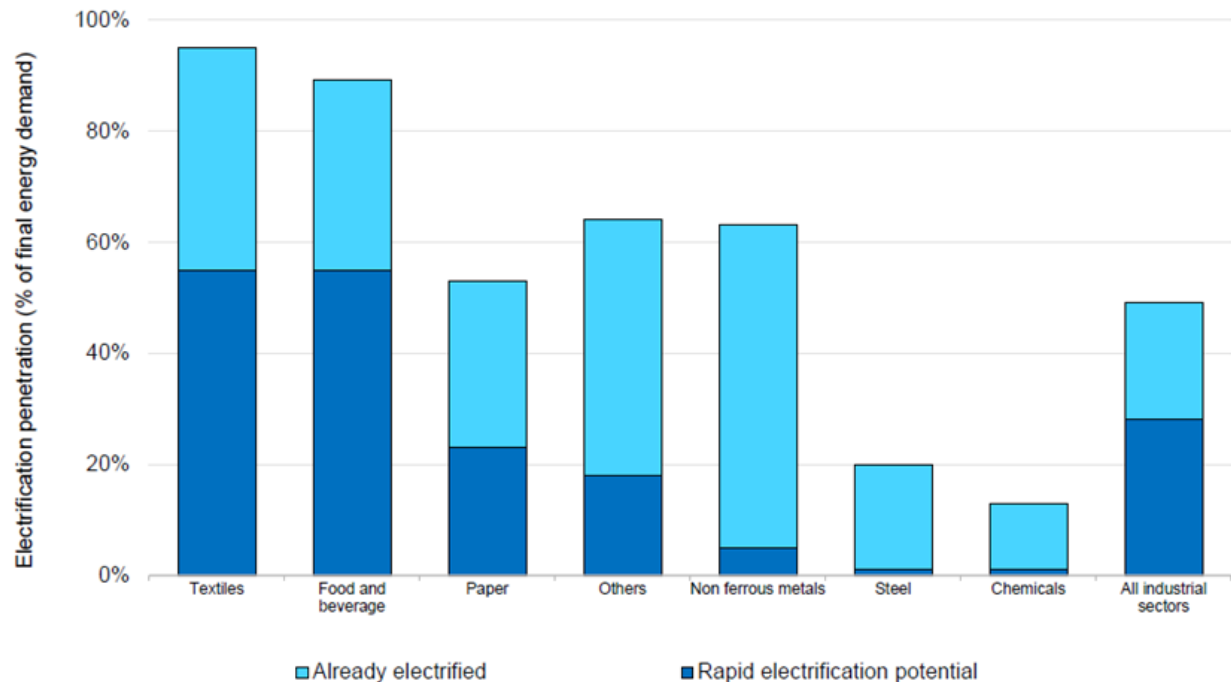


IEA. CC BY 4.0.

Note: Bf-BOF = Conventional blast furnace route in steel production. DRI = Direct reduced iron. EAF = Electric arc furnace

Potential for rapid electrification of industry in Europe

Achieving energy savings is heavily reliant on the successful integration of the electrified element into the process



Source: Schneider Electric Sustainability Research Institute (2022) as modified by the IEA

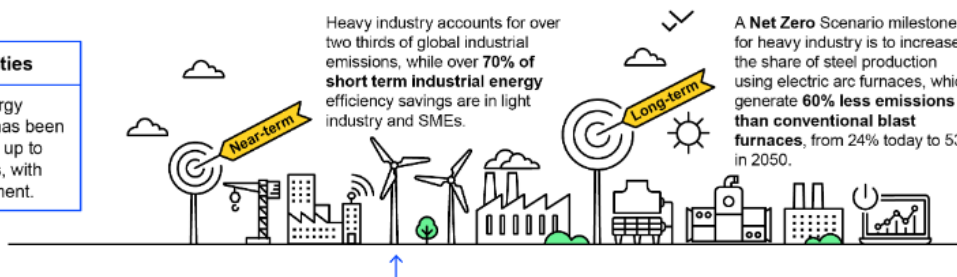
Industry Energy Efficiency Policy Package

Immediate opportunities

Implementing better energy management practices has been shown to deliver savings up to 15% in the first 1-2 years, with little or no capital investment.

Heavy industry accounts for over two thirds of global industrial emissions, while over **70% of short term industrial energy efficiency savings** are in light industry and SMEs.

A **Net Zero** Scenario milestone for heavy industry is to increase the share of steel production using electric arc furnaces, which generate **60% less emissions than conventional blast furnaces**, from 24% today to 53% in 2050.



REGULATION

- **Minimum Energy Performance Standards** for key equipment, such as motors and pumps, can drive up overall industrial efficiency levels.
- **Regulation to reduce energy use** extends beyond technology to target areas such as research and development, energy auditing, mandatory consumption reporting, energy management systems, and upskilling of the workforce.
- **Regulatory Instruments** yield best results when rooted in a good understanding of local context and include ambitious, regularly updated, standards.



INFORMATION

- **Benchmarking, indicators and other forms of detailed data**, allow governments to track the progress and success of policies and allow industries assess their energy performance, compare it to that of their peers and establish key areas for intervention.
- **Digital technologies** enable industries to track energy use in real time and unlock substantial energy and cost saving opportunities.
- **Sharing information on energy efficiency best practice** and industrial energy transition, through industry networks, helps industries raise ambition and improve energy performance.



INCENTIVES

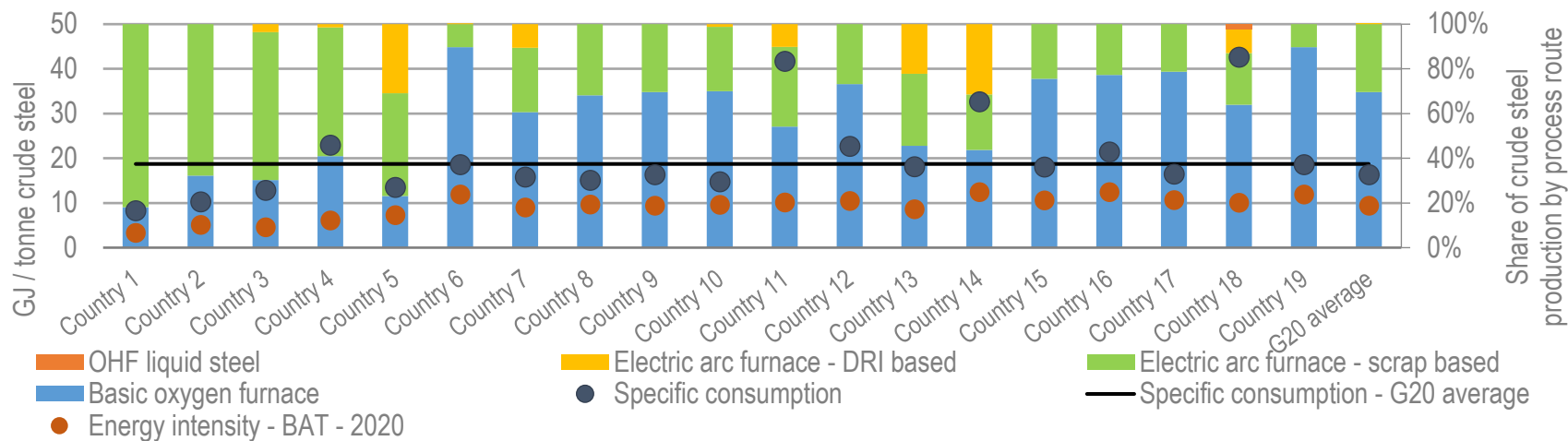
- **Incentives** such as preferential finance, links to carbon trading, obligations and tax based measures can motivate crucial energy efficient decisions at the process design and equipment selection stage, supporting industry transition to near zero emission technologies.
- **Free or subsidised energy audits**, often targeted at SMEs and other sectors of strategic importance, can help rapidly increase energy efficiency.
- **Policies to foster Energy Service Companies** provide industry with access to significant external energy expertise and attractive structured financial packages.

Industry policy package (continued) – Case study

- India's **Perform Achieve and Trade (PAT)** programme has been reducing the energy consumption of India's largest energy using sectors since 2012
- The programme covers every element of the ideal policy package for industry
- Each company that must comply with the scheme has a target to meet over a three year period
- Energy audits, energy management systems and technical improvement to processes are all used to meet the target
- Performance is tracked and companies that over perform can trade their excess savings with companies that under perform providing a strong and effective incentive for energy efficiency improvements
- The first PAT cycle (completed in 2015) exceeded its targets by 30% and saved nearly 9 million toe, avoiding over 30 million tonnes of CO2 emissions
- A new cycle has been launched every year since 2016 increasing the scope and decreasing the energy consumption of companies covered by the scheme.

Example of Information instruments: Benchmarking work

Energy use per tonne per of crude steel and share of crude steel production by process route in 2020, G20 countries



Sources: IEA World Energy Balances; Worldsteel Steel Statistical Yearbook, 2020.

Notes: Reported energy intensity covers iron and steel manufacture, rolling and casting, including energy consumed in blast furnaces and coke ovens. BAT = best available technology. BAT energy intensity is calculated by applying the BAT energy intensity for each process route to the share produced by that route in each region; it covers until the liquid steel stage, i.e. it does not include energy used in casting and rolling, nor energy used by captive thermal utilities (which are included in reported energy intensity). Saudi Arabia was excluded due to a data reporting issue. BAT values are based on ETP estimates using currently available data.

The IEA has been working towards more data sharing in energy intensive sectors to be able to highlight best practices and support international goals.

Will 2022 see a turning point towards faster efficiency progress?

How to Avoid Gas Shortages in the European Union in 2023

A practical set of actions to close a potential supply-demand gap

Fuel report — December 2022



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IEA convenes Special Ministerial on natural gas markets and actions to reinforce supply security



Fuel report

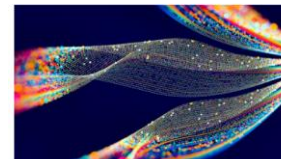
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Executive Director meets with Prime Minister Fumio Kishida of Japan on energy crisis and G7

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LiFE lessons from India

The benefits of advancing the Lifestyle for Environment (LiFE) initiative through the G20

Country report — February 2023



Cost of Capital Observatory

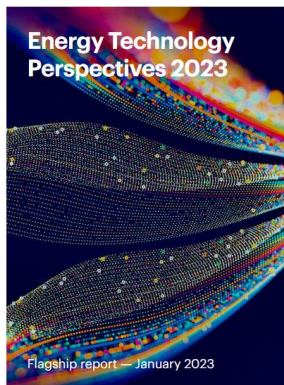
Tracking the cost of capital for clean energy projects in emerging and developing economies

Report — January 2023



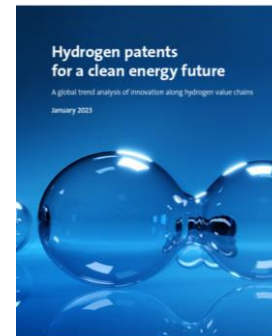
Energy Technology Perspectives 2023

Flagship report — January 2023



Hydrogen patents for a clean energy future

A global trend analysis of innovation along hydrogen value chains
January 2023



News

Executive Director meets with UN Secretary-General to discuss climate change and clean energy financing

27 January 2023



Many hopeful signs through new policy focus, but challenges remain

