

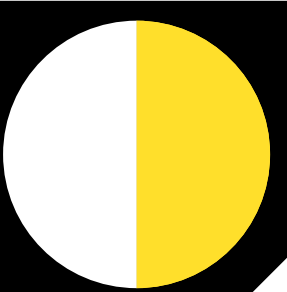


Ana Brochado  
DRCA - Portuguese Economic Association  
[ana.brochado@ordemeconomistas.pt](mailto:ana.brochado@ordemeconomistas.pt)

st INTERNATIONAL CONFERENCE ON THE  
**2 EUROPEAN ENERGY MARKET**  
Lisbon, 27-29 May 2025 | Portugal

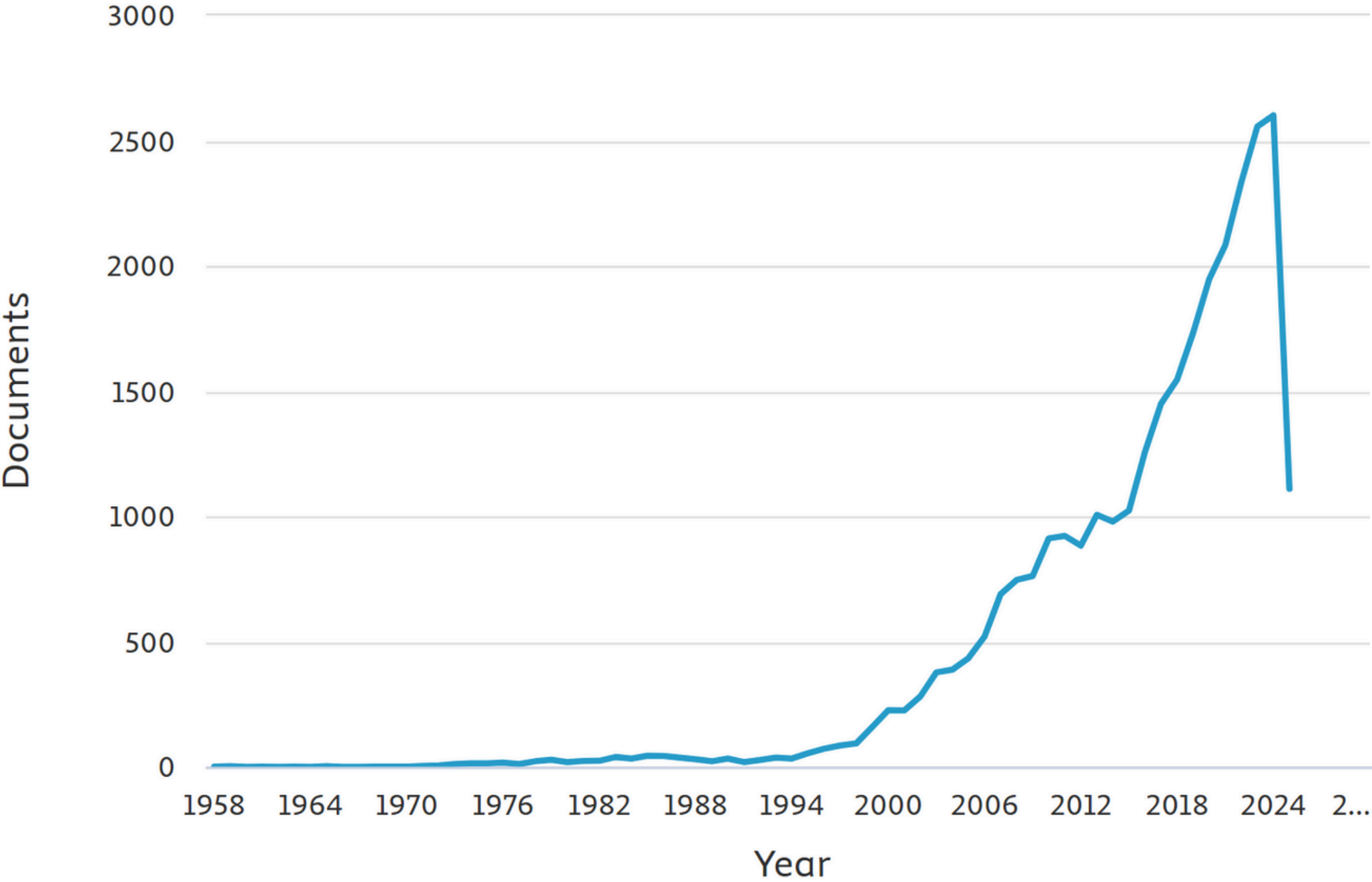
# ENERGY AS AN ECONOMIC AND SOCIAL DRIVER



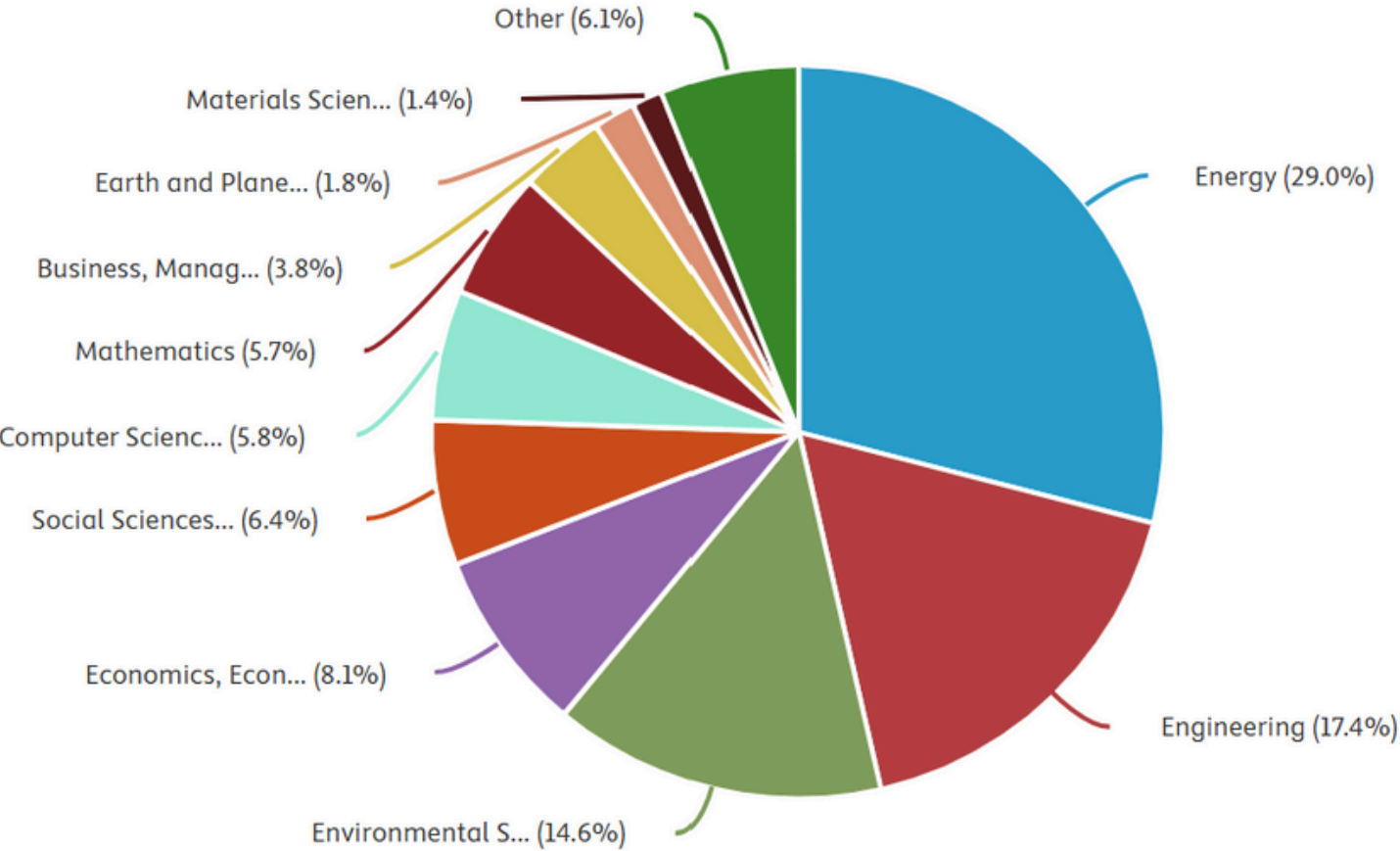


# Research in energy markets is growing rapidly and follows a multidisciplinary approach

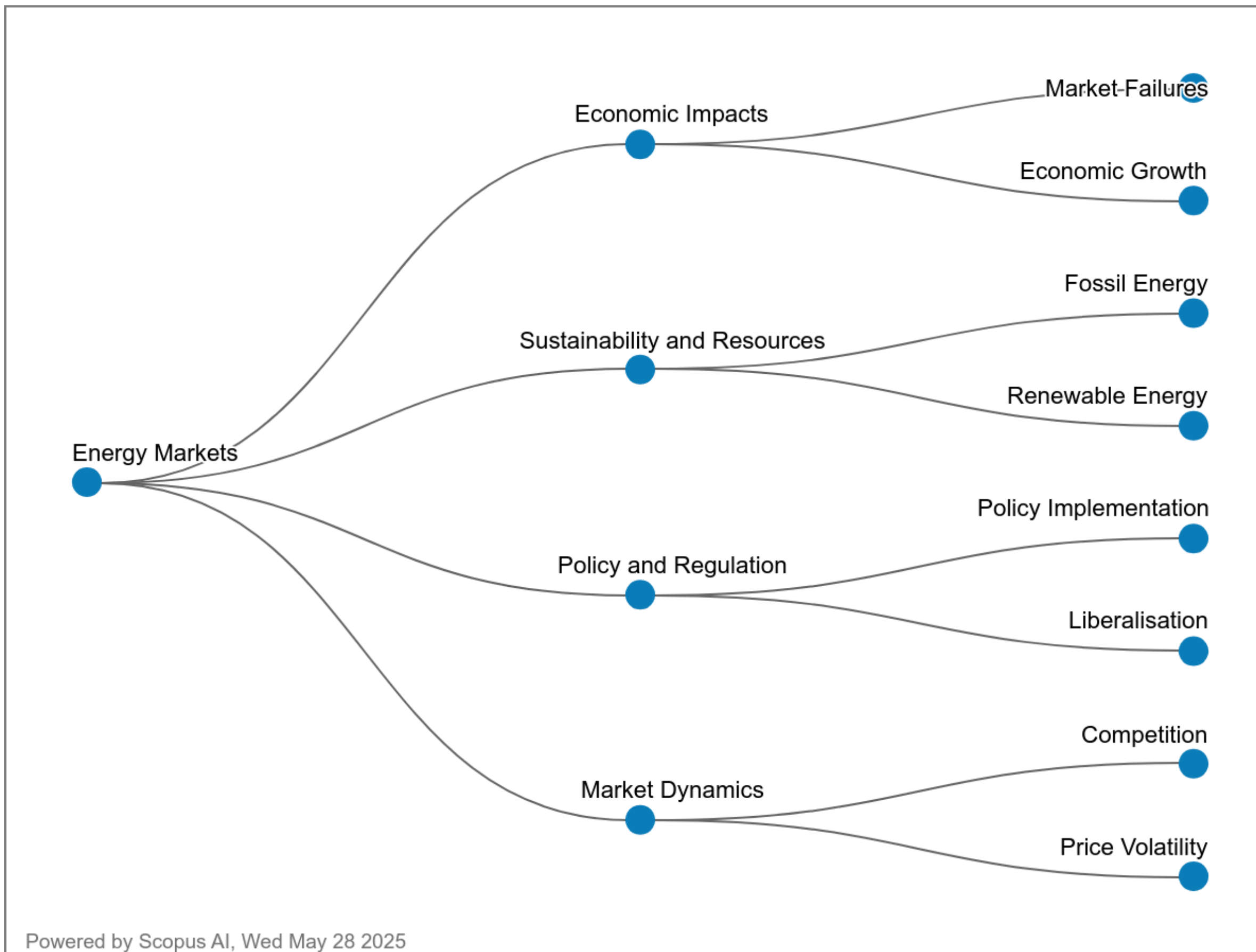
Documents by year



Documents by subject area



SCOPUS SEARCH  
TITLE-ABS-KEY ( "energy markets" )  
30 051 document results



SCOPUS AI question: “What are the main research themes in energy market studies?”



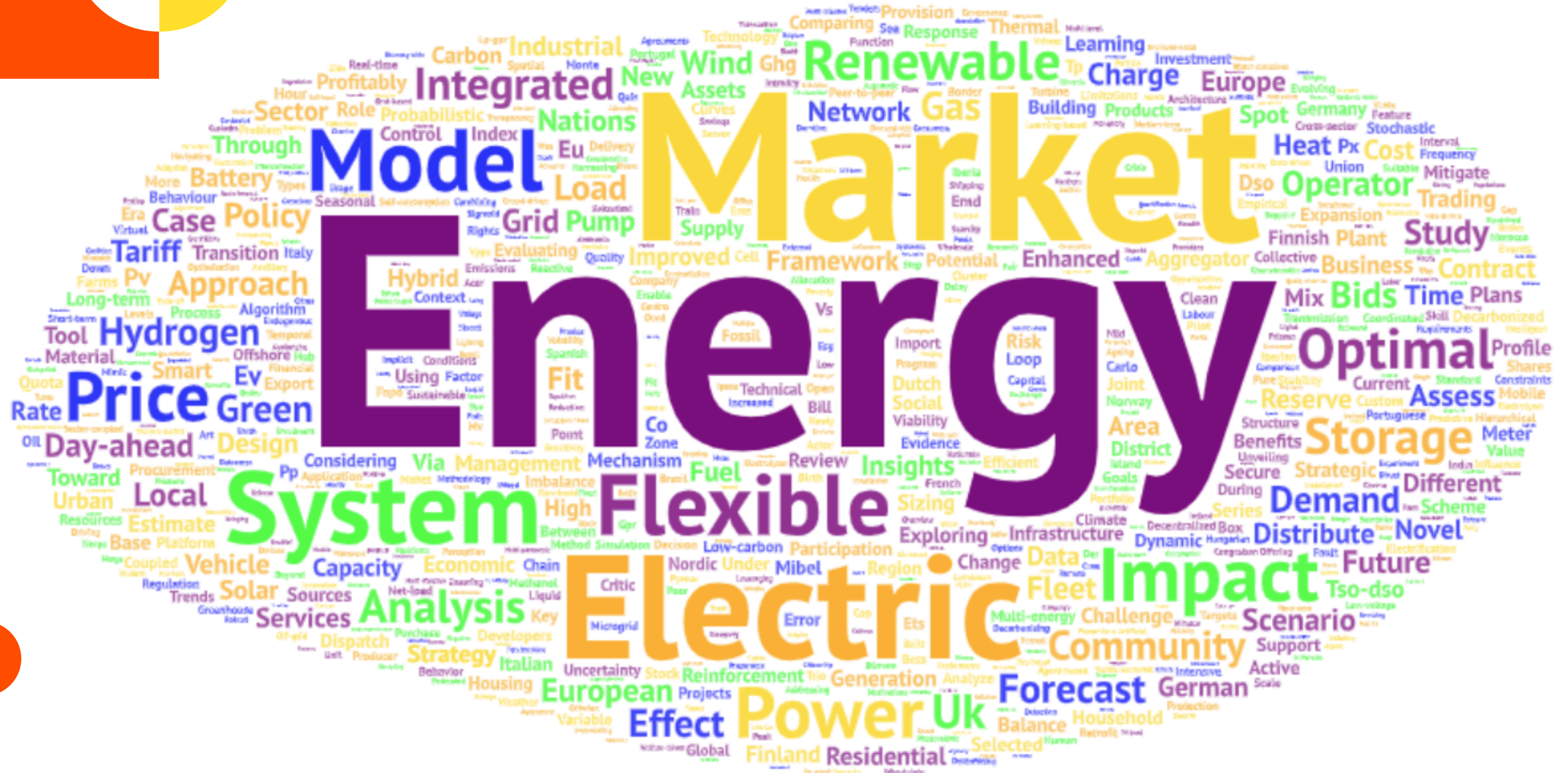


**EEM 25 SNAPSHOT**

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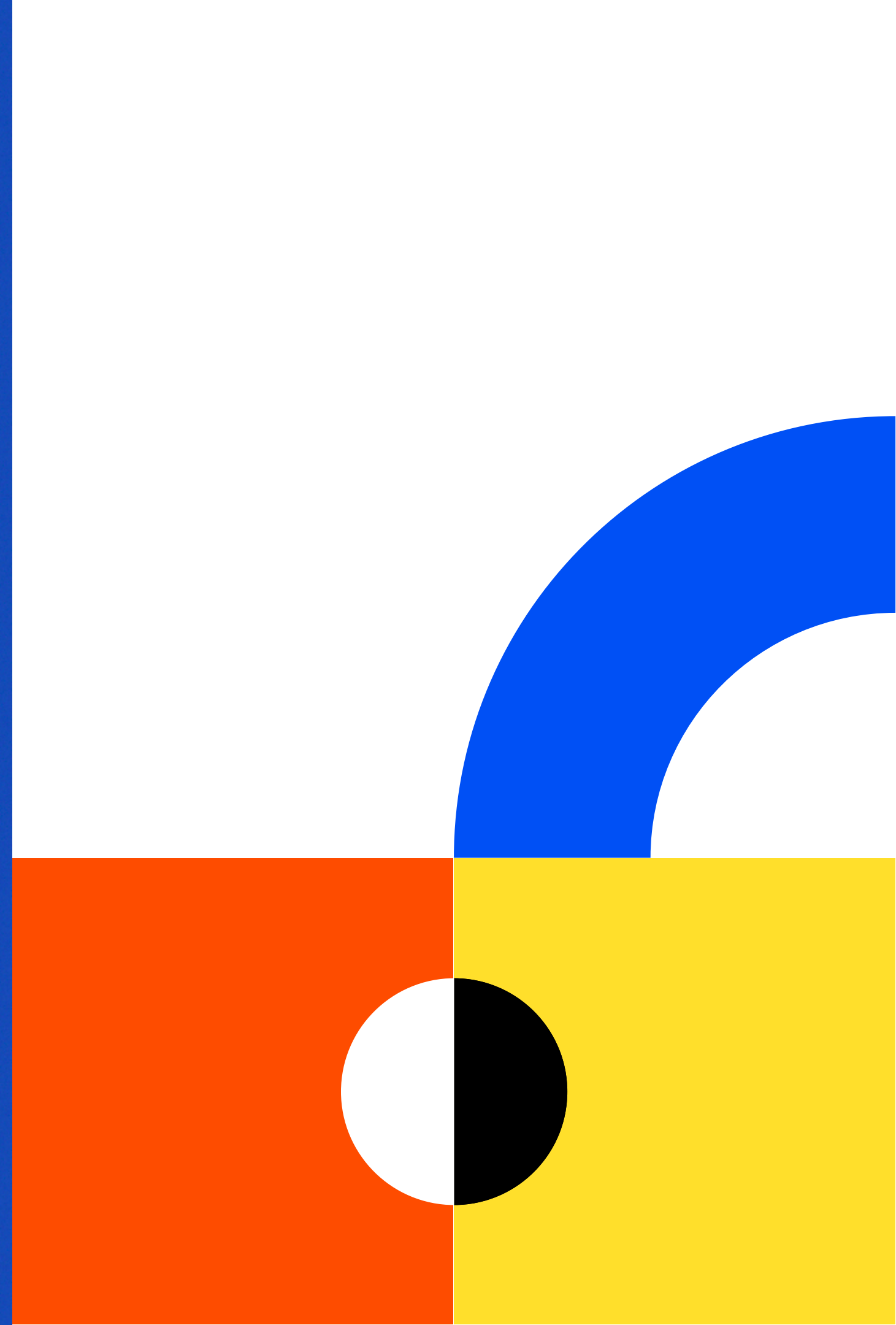
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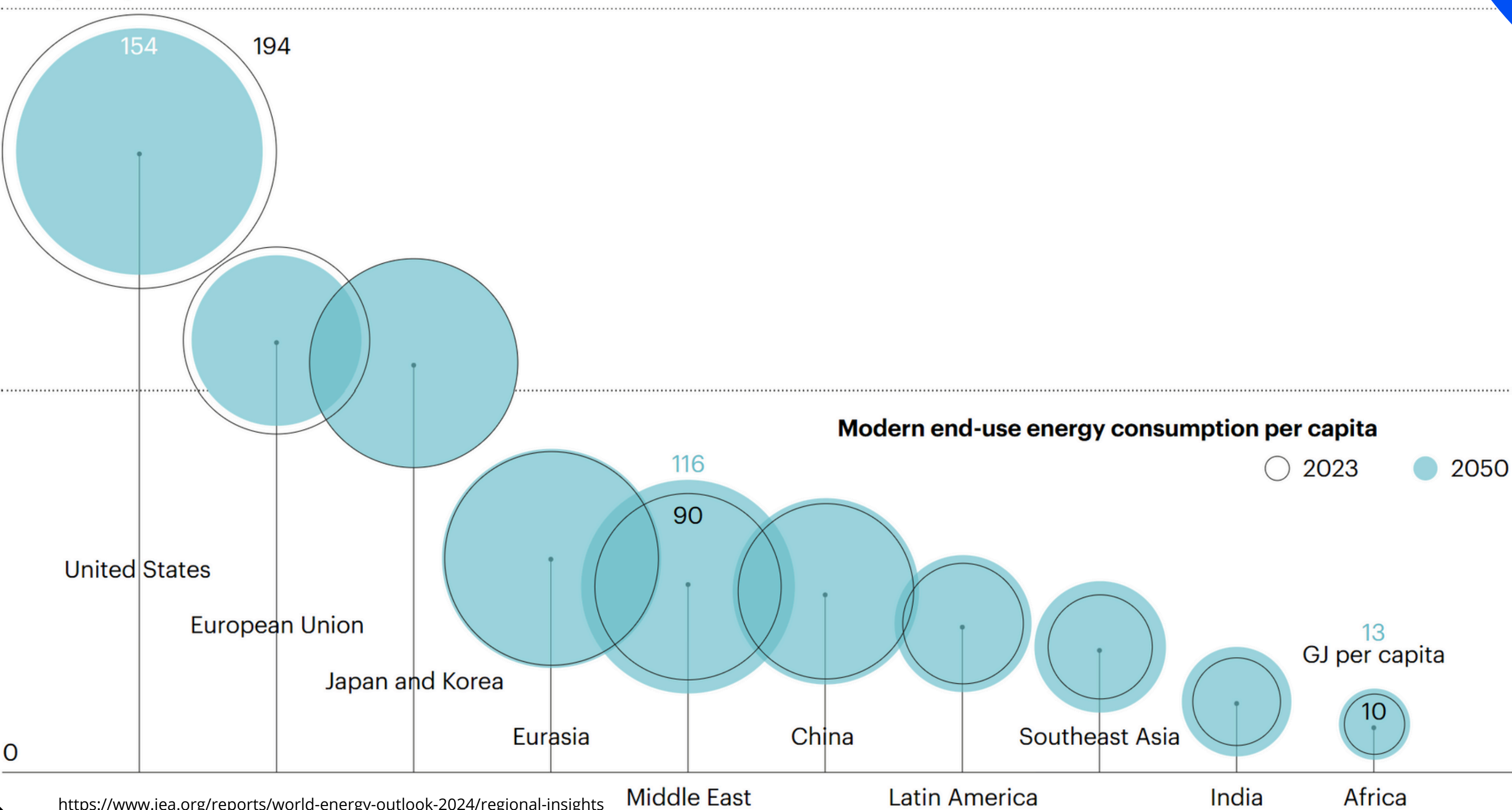
# SOCIAL EQUITY IN ENERGY CONSUMPTION



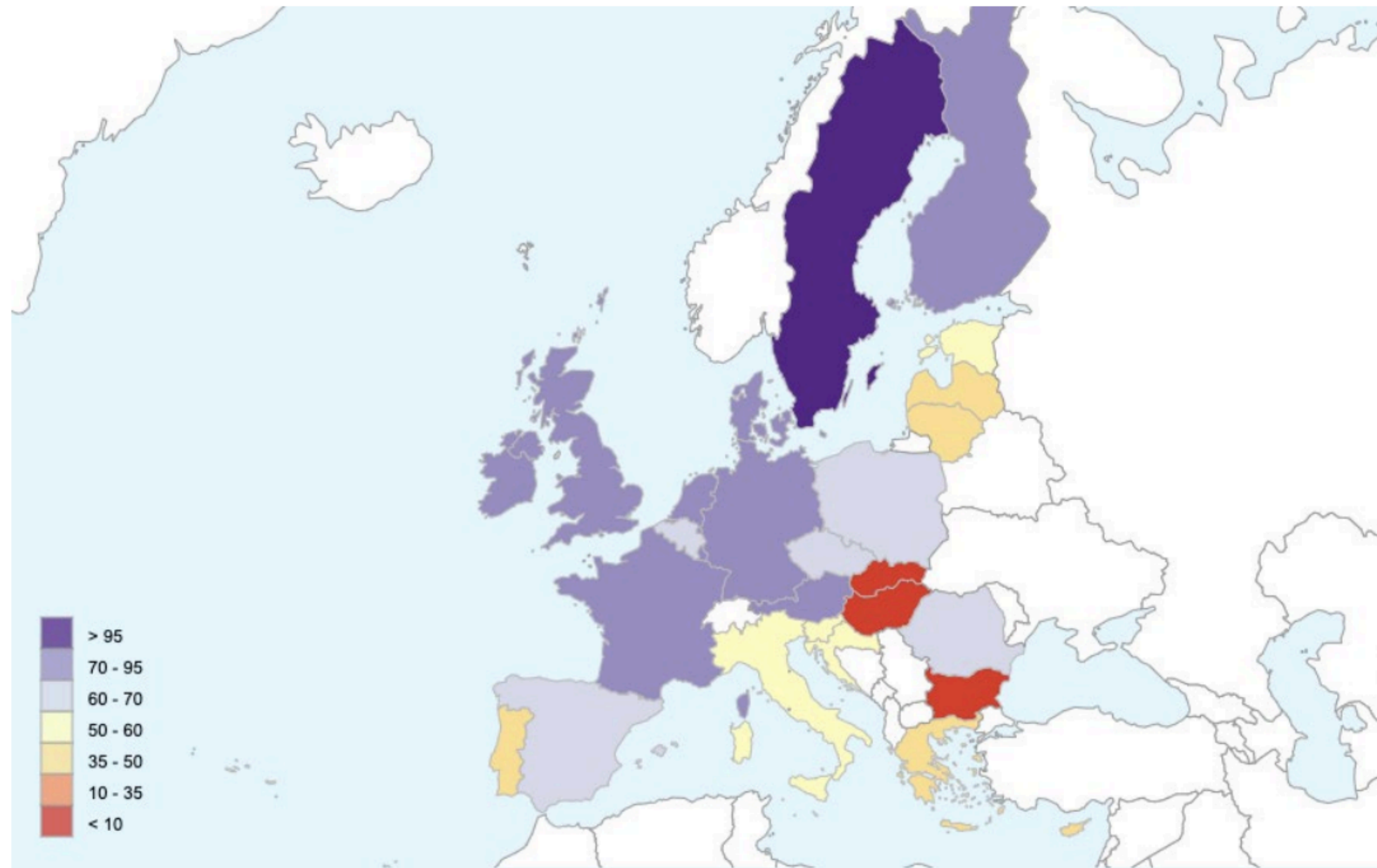


# Global inequalities

GDP per capita 100 000 USD (2023, MER)



# Energy Poverty



## Paper Snapshots

“Integrating Multi-Energy Microgrid Systems to Mitigate Energy Poverty in Remote Areas”

“Unveiling the Association Between Health, Poor Housing, and Energy Affordability”

Source: [EDEPI](https://www.europei.eu/RegData/etudes/BRIE/2022/733583/EPRS_BRI(2022)733583_EN.pdf), 2022.

[https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733583/EPRS\\_BRI\(2022\)733583\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733583/EPRS_BRI(2022)733583_EN.pdf)



# ENERGY PRICES



**& GLOBAL COMPETITIVENESS**

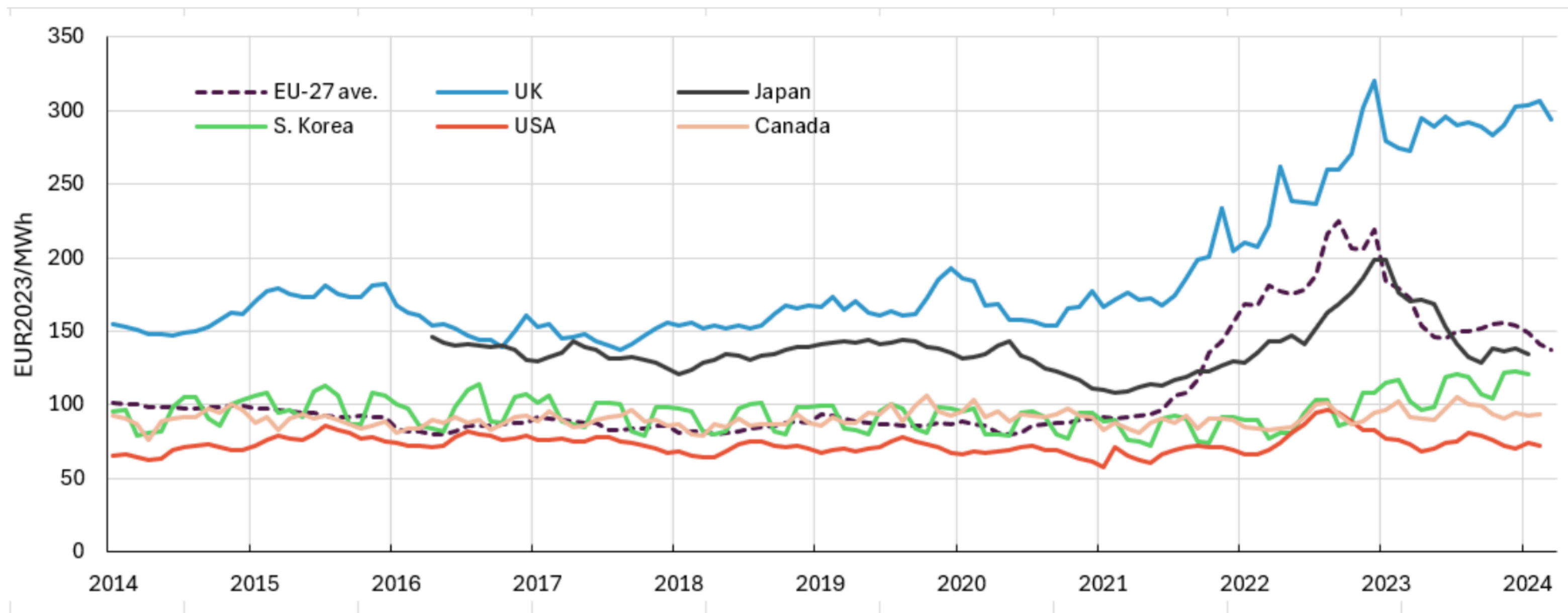


# External Events Driving Oil Price Fluctuations



# Industrial Electricity Prices and Global Competitiveness

Industrial electricity prices in the EU-27, USA, UK, Japan, Canada and South Korea (EUR2023/MWh)



Source: Trinomics et al. (2024), S&P Platts, Eurostat, Enerdata EnerMonthly



<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52025DC0072>

# Paper Snapshots

## Prices & Electricity Markets

"Harnessing AutoML for Electricity Price Forecasting in Germany"

"Spot Market Electricity Price Forecast via Transformer and Ornstein-Uhlenbeck Process"

"Tri-level Calculation Model to Analyze Day-Ahead Electricity Market Clearing Prices in Finland"



## Costs & Economic Impacts

"Cost Estimation for Green Hydrogen Production and Distribution"

"Economic and Environmental Optimization of EV Fleets Charging under MIBEL Day-ahead Spot Prices"

"Techno-economic Impacts of Shipping Liquid Hydrogen, Ammonia or Methanol on Exporting Nations: The Case of Morocco"

"Model-Based Approach to Assess the Future Economic Viability of Power Plants"



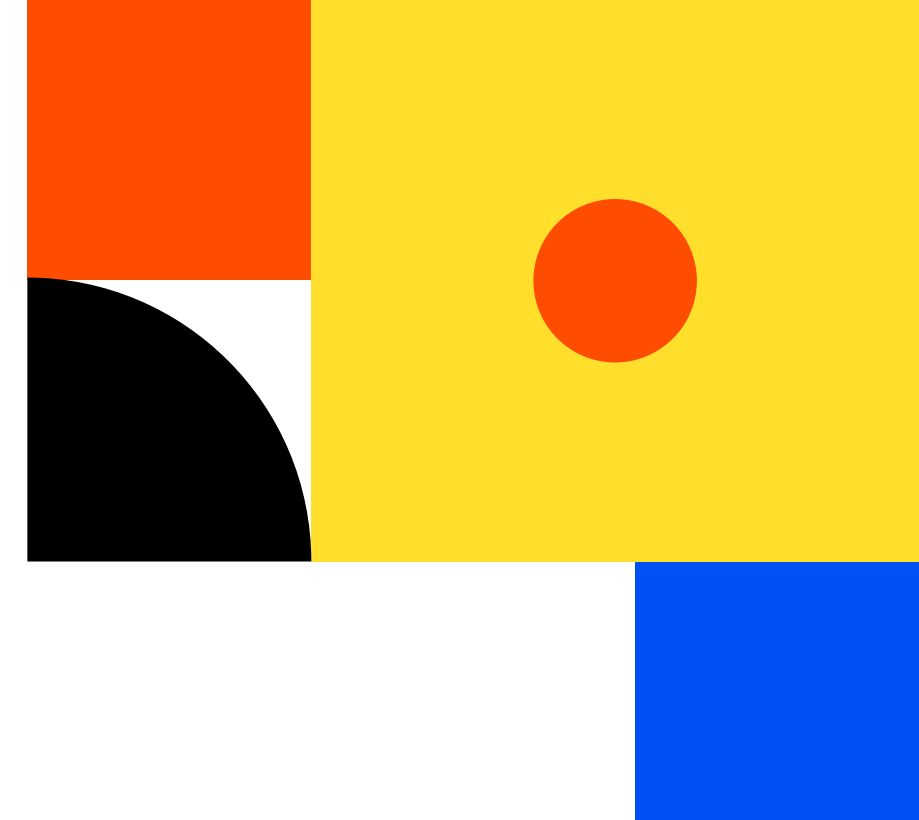
## Tariffs & Billing

"Tariff Design and Pricing in Energy Communities"

"Benefits of Dynamic Electricity Tariffs for Industrial Companies in Germany"

"The Residential Perception of Real-Time Electricity Tariffs"

"The Cost and Geographic Impact of Inflexibility Facing Time-Based Tariff"





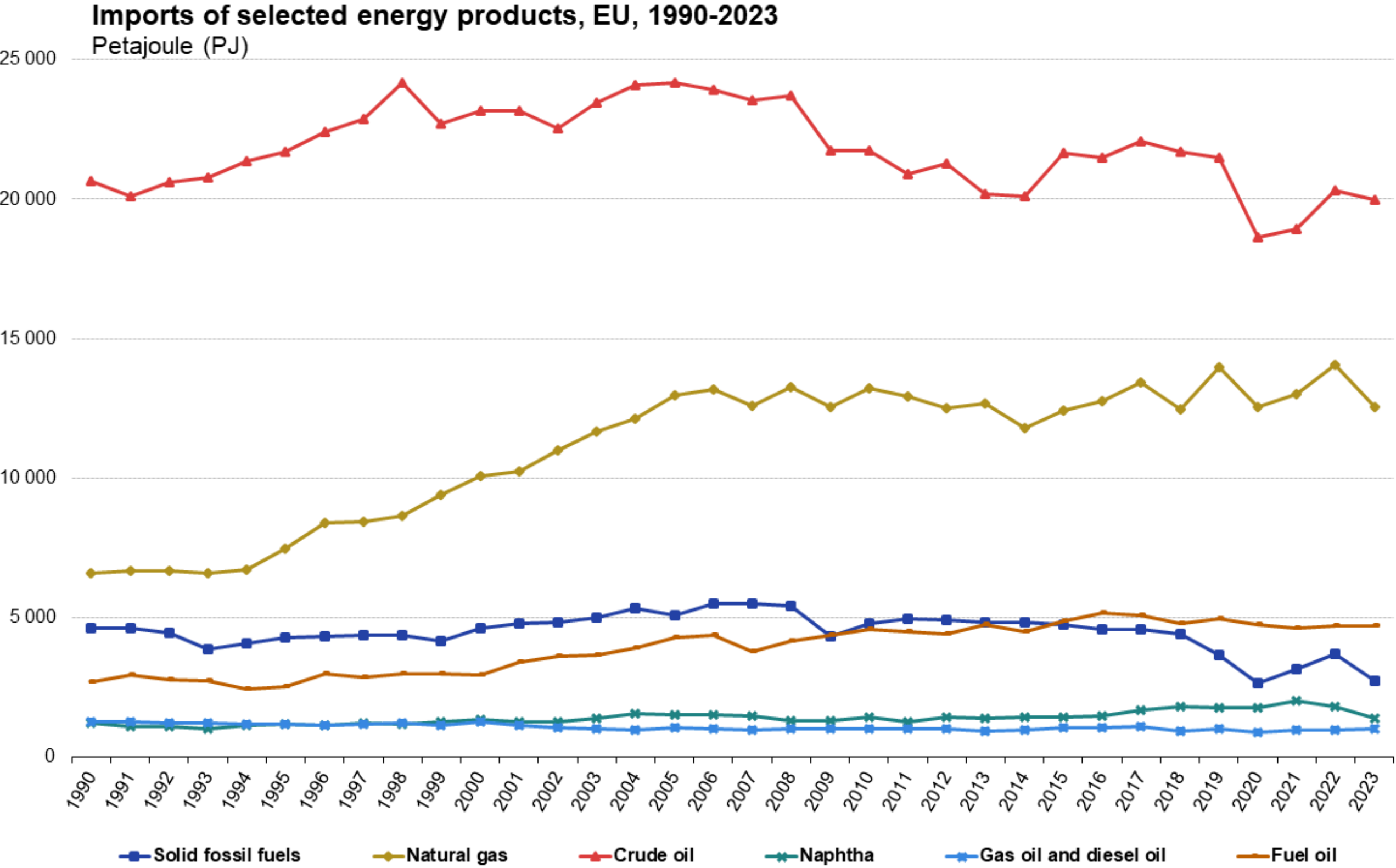
# ENERGY SECURITY

Reducing Dependency and Enhancing Resilience

**#REPowerEU**



REDUCING IMPORT DEPENDENCY AND DIVERSIFYING SOURCES ARE CENTRAL TO STRENGTHENING ENERGY SECURITY.



Source: Eurostat (online data code: nrg\_bal\_c)

# Paper Snapshots

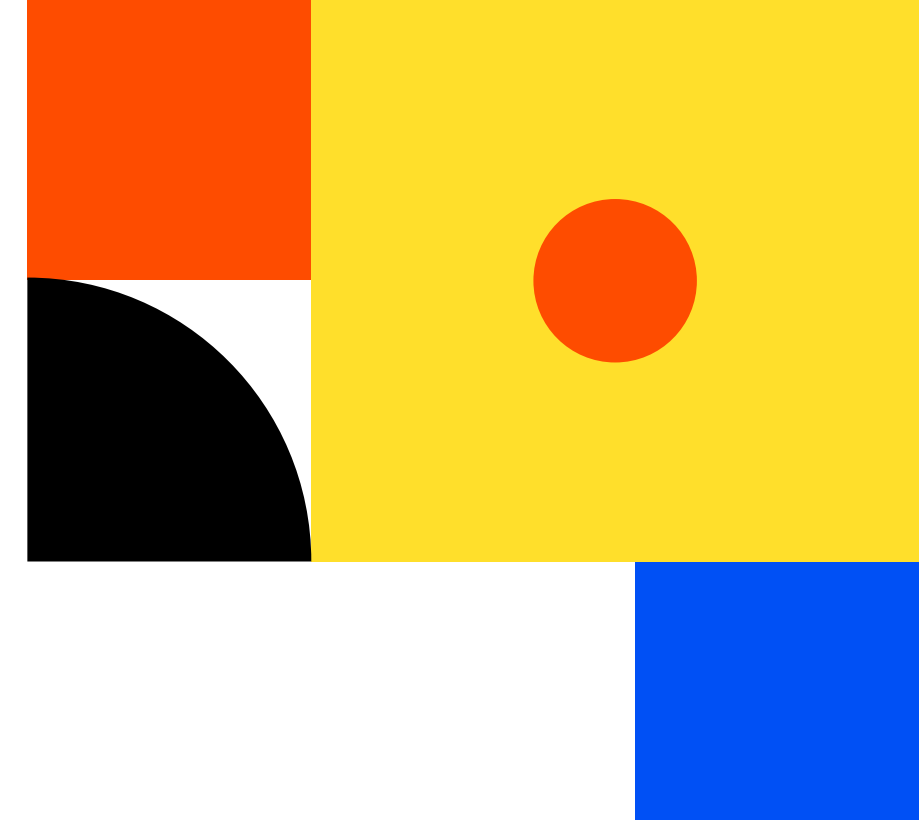
"Post-Fossil Fuel Energy Security: Integrating Critical Materials in Europe's Single Energy Market"

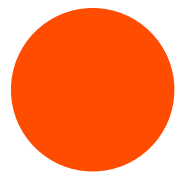
"Offshore Wind and Rare Earth Elements: Trade-off for Environment, Energy Security and Policies"

"Securing EU Clean Technology Supply Chains: Learning Rates in Material Recycling and Strategic Stockpiling"

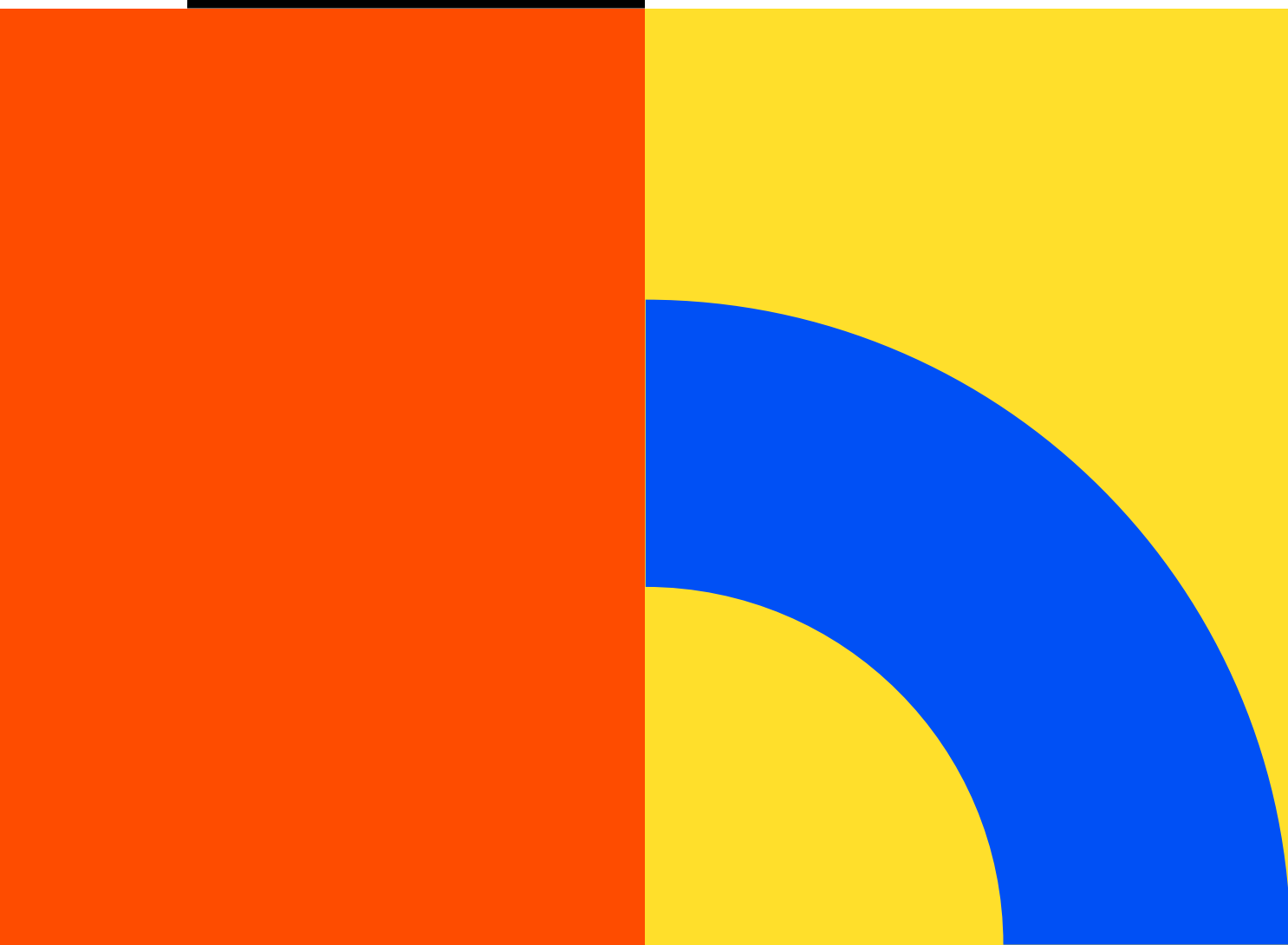
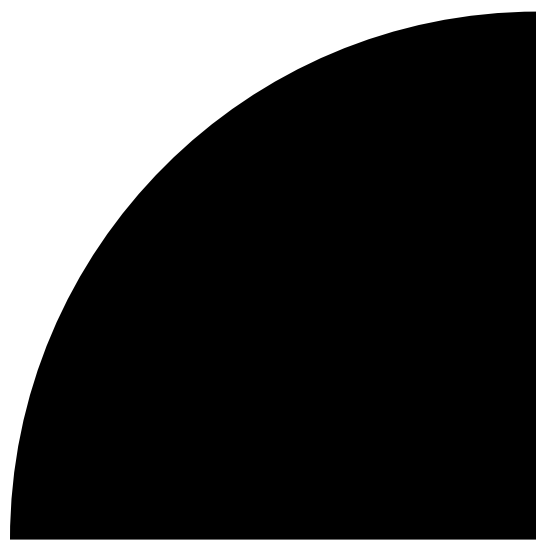
"Priority Index to Distribute Power More Fairly During Energy Crises"

"An Offshore Hybrid Interconnector in the Coupled Day-Ahead Market of Europe – A Case Study for the Baltic Sea"



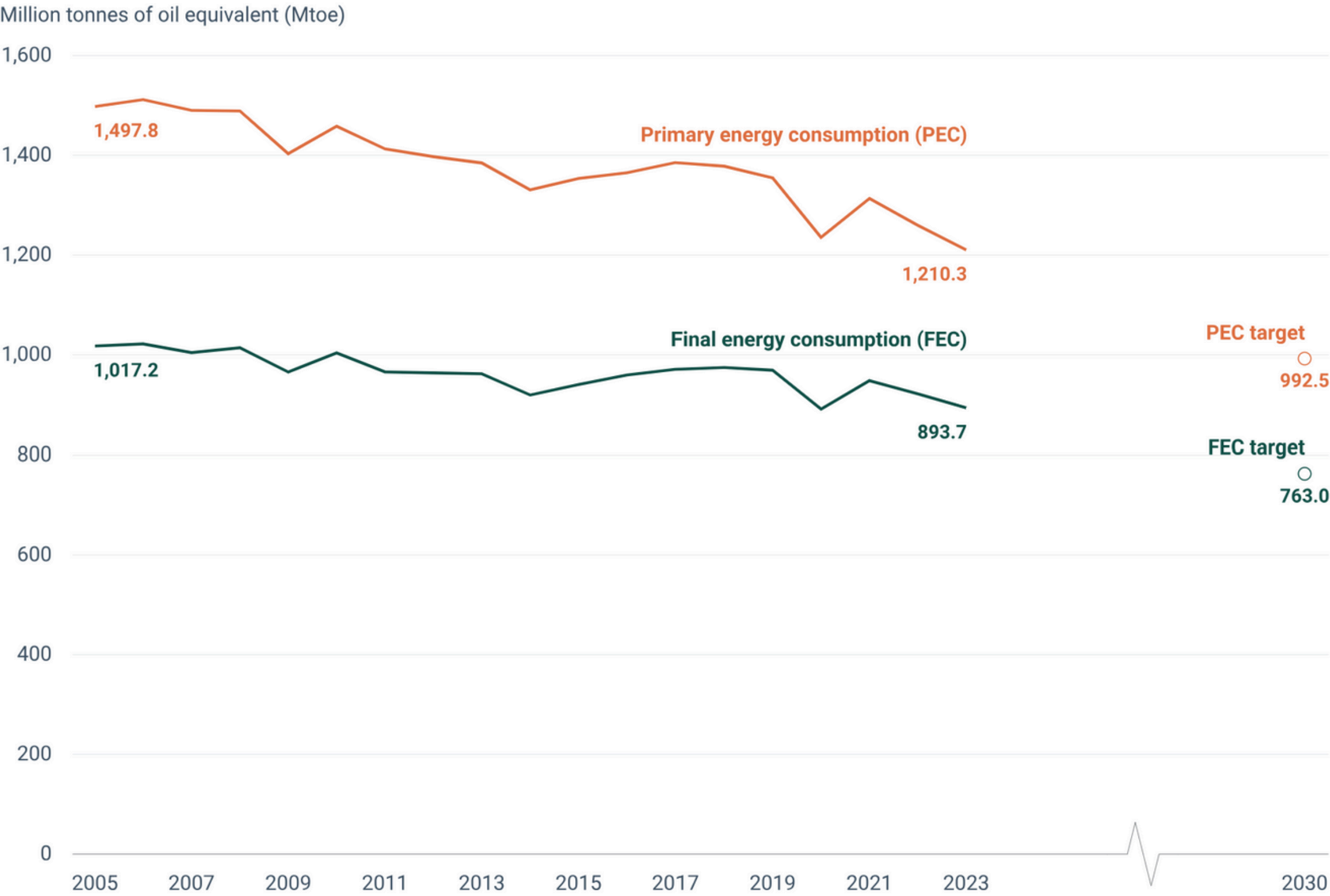


# ENERGY EFFICIENCY



# Energy Efficiency

## Primary and final energy consumption in the European Union



# Paper Snapshots



RK

"Evaluating the impact of the district heating resolution on renewable heat production in Germany: A Sensitivity Analysis"

"Office Heating Modeling using an HVAC Power Step Response Experiment"

"Post-Fossil Fuel Energy Security: Integrating Critical Materials in Europe's Single Energy Market"

"Offshore Wind and Rare Earth Elements: Trade-off for Environment, Energy Security and Policies"

"Securing EU Clean Technology Supply Chains: Learning Rates in Material Recycling and Strategic Stockpiling"

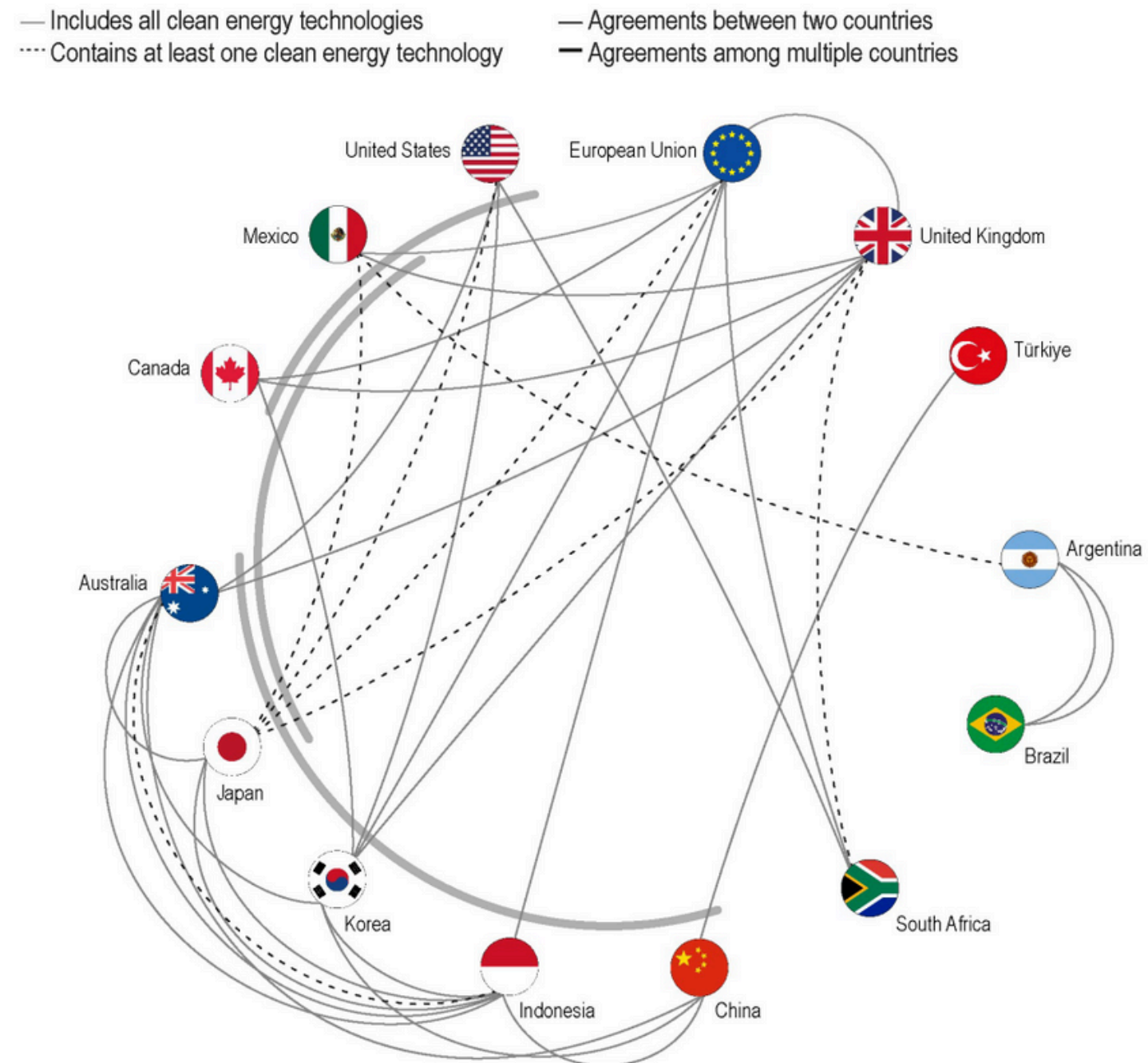
"An Offshore Hybrid Interconnector in the Coupled Day-Ahead Market of Europe – A Case Study for the Baltic Sea"



# ENERGY COOPERATION

## International cooperation

Free trade agreements established among G20 that include clean energy technologies





# Paper Snapshots

"An Offshore Hybrid Interconnector in the Coupled Day-Ahead Market of Europe – A Case Study for the Baltic Sea"

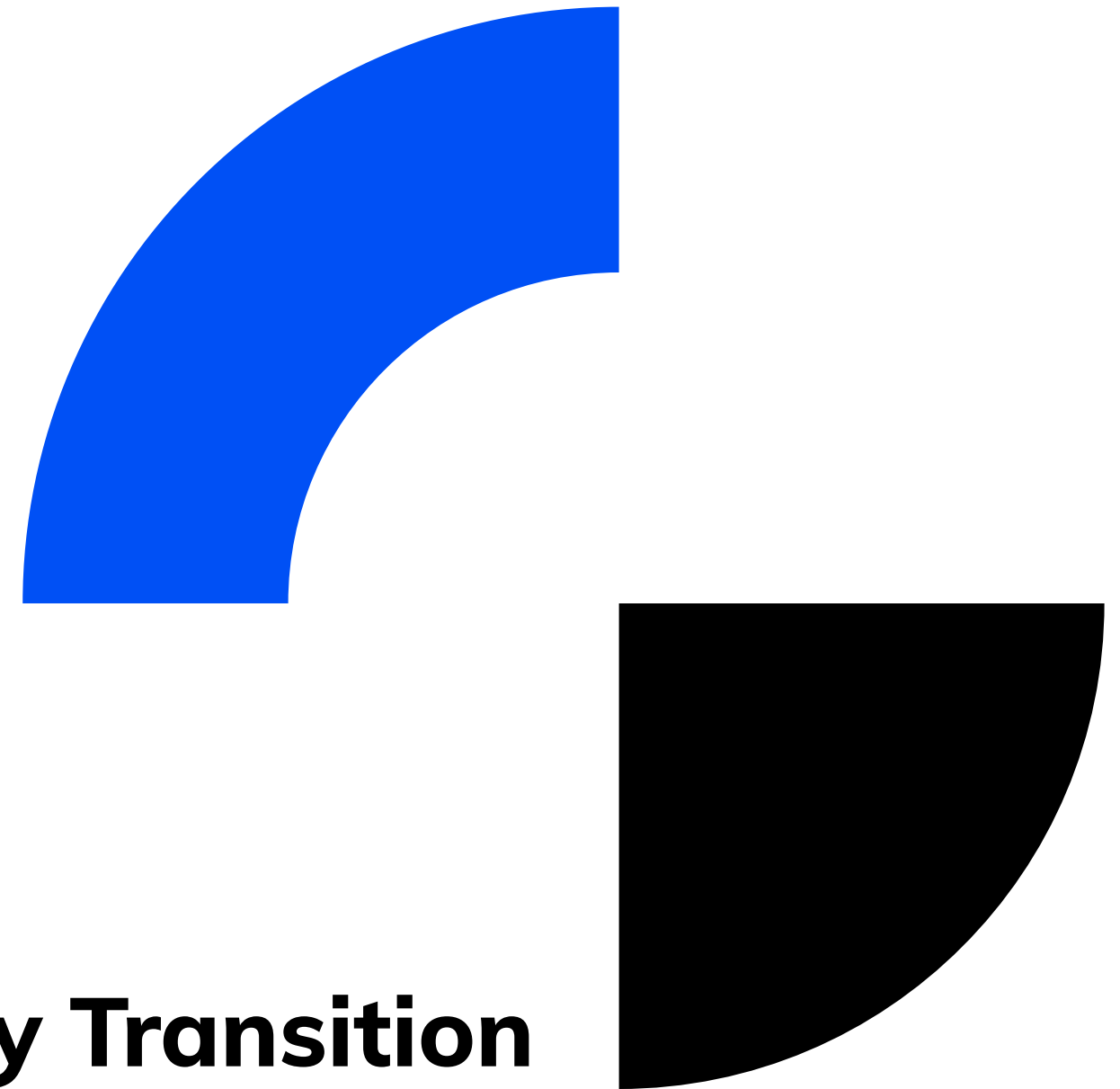
"When Markets Merge: Evidence from Ireland's Integration with the European Wholesale Electricity Market"

"Joint TSO-DSO Flexibility Market for Congestion Management"

"Local Flexibility Markets in Europe: Review of Flexibility Products and Cooperation Frameworks"

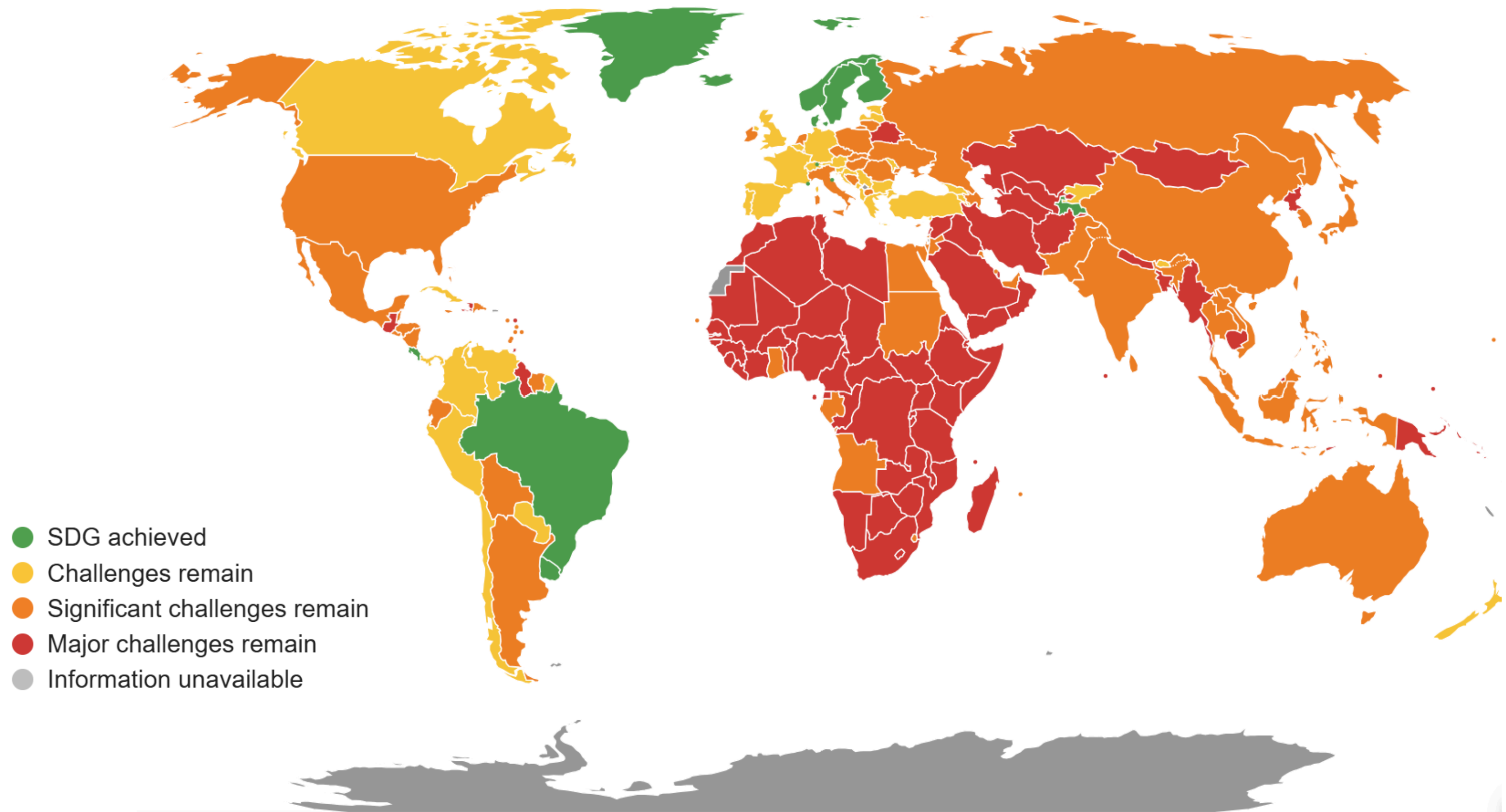
"Regional Market Integration and Risk Sharing in European Capacity Mechanisms"

# **SUSTAINABILITY**



**Towards a Fair and Clean Energy Transition**

# SDG 7 - Affordable and clean energy 2024



# Paper Snapshots



RK

## Clean Energy & Renewable Integration

"Permanent Magnets in Offshore Wind: State of the Art, Future Trends and Risk"

"Flow-Based Market Coupling and Renewable Energy in Nordic Market"

"Steady-State Operation of Islanded Distribution Network with PV and Wind Generation"

"The Analysis of the Novel Renewable Energy Sources Support Schemes – Case of Slovenia"

"Exploring the impact of weather variability on bioenergy and variable renewable energy"

"Evaluating the impact of the district heating resolution on renewable heat production in Germany: A Sensitivity Analysis"

"Integration of Solar PV and Battery Energy Storage Systems Towards a Sustainable Street Lighting"

## Energy Communities & Distributed Energy

"Planning Energy Communities with Flexibility Provision and Energy and Cross-Sector Flexible Assets"

"Sizing Distributed Energy Resources for Energy Communities"

"Optimal Bidding by Aggregator of Energy Community in the DSO Flexibility Market"

"Evaluating allocation methods for collective self-consumption in Nordic multi-dwelling buildings"



# Paper Snapshots

## ESG and Green Finance

"The impact of ESG factors on financial performance in the European Energy Sector"

"Do Fossil Fuel Subsidies Delay the Low-Carbon Transition? Evidence from the OECD"

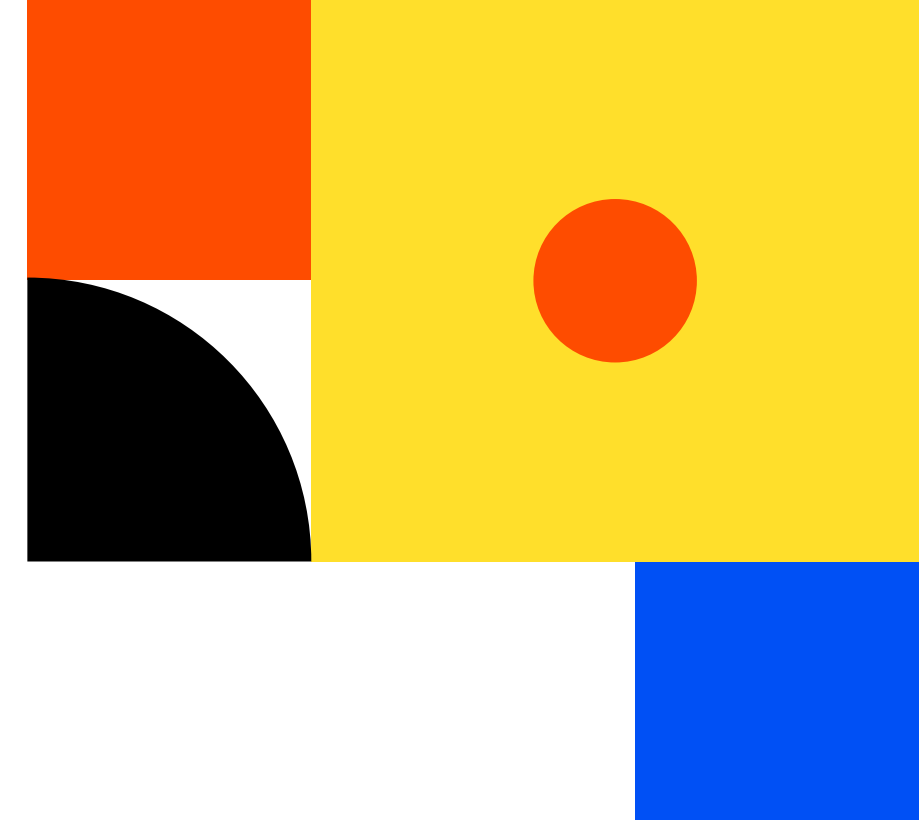
## Clean Tech & Critical Materials

"Securing EU Clean Technology Supply Chains: Learning Rates in Material Recycling and Strategic Stockpiling"

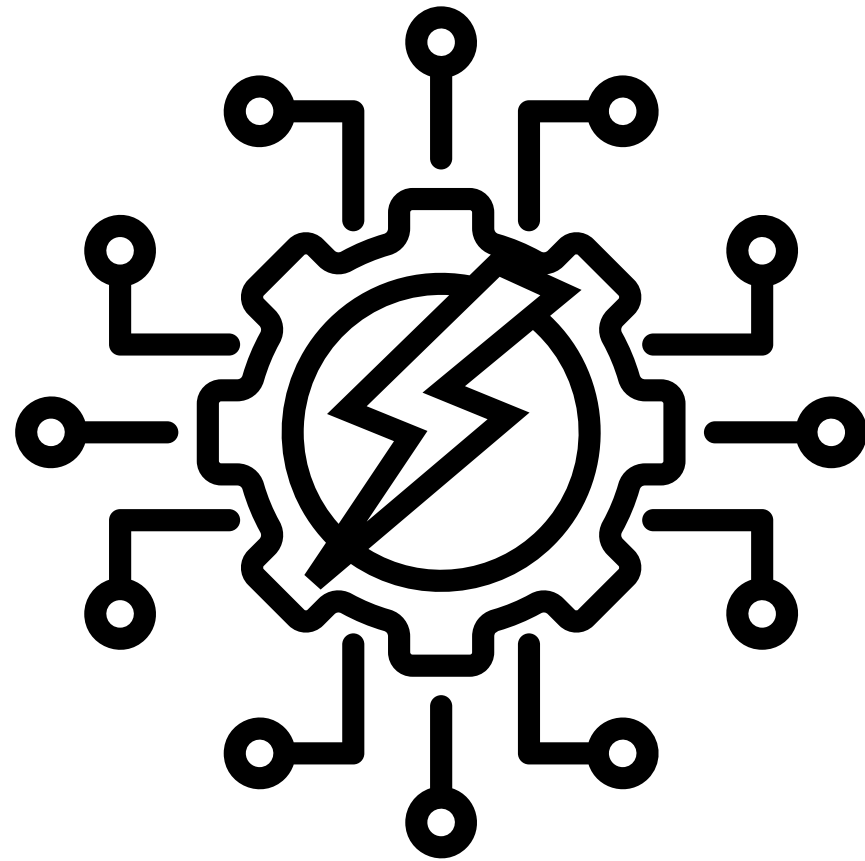
"Offshore Wind and Rare Earth Elements: Trade-off for Environment, Energy Security and Policies"

"Post-Fossil Fuel Energy Security: Integrating Critical Materials in Europe's Single Energy Market"

"Closing the Loop: Integrating Material Needs of Energy Technologies into Energy System Models"



# DIGITALIZATION & INNOVATION



# Paper Snapshots

"Artificial Intelligence for Harnessing Hybrid Renewable Energy Systems for Efficient Electric Vehicle Charging Infrastructure in India"

"A Demand-Responsive Multi-Energy System Framework Integrating Flexible Pricing for Improved Urban Energy Management"

"Joint TSO-DSO Flexibility Market for Congestion Management"

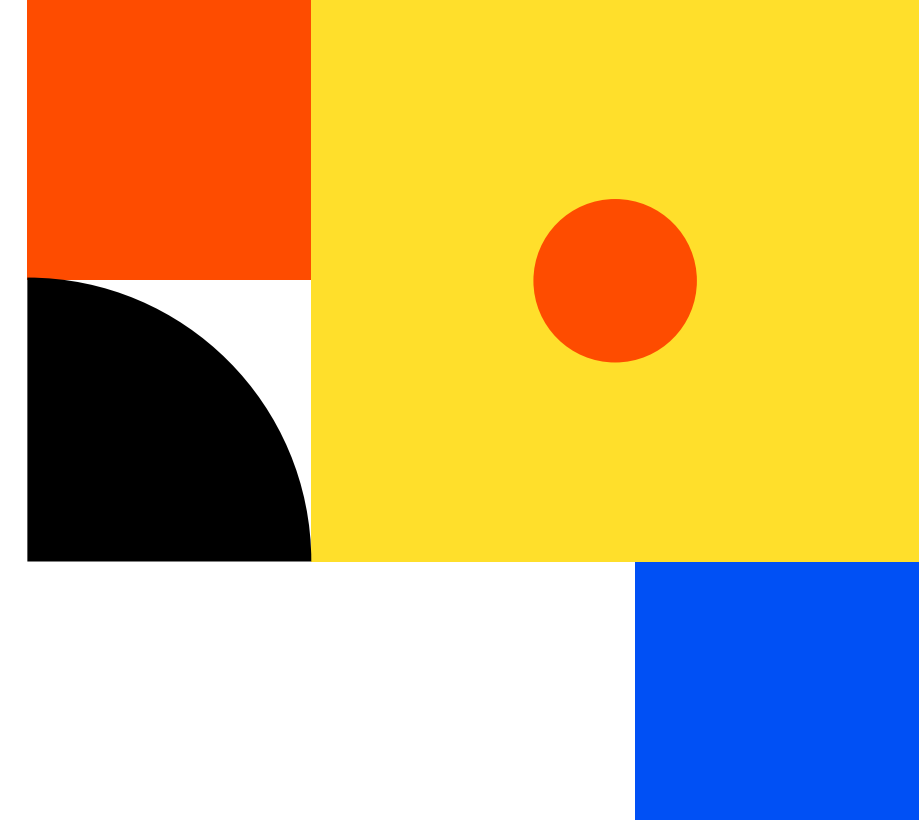
"Local Flexibility Markets in Europe: Review of Flexibility Products and Cooperation Frameworks"

"Optimisation of Electrolyser Operation: Integrating External Heat"

"Digitalisation of Energy System Models for Transition Pathways"

"Digital Twins for Power System Stability Assessment under Uncertainty"

"Co-simulation Framework for Smart Grid Integration of Distributed Resources"



An abstract graphic on the left side of the slide. It features a yellow triangle at the top left, a blue shape below it, and a large orange semi-circle at the bottom. A black circle is positioned in the center, partially overlapping the blue and orange shapes.

# **EMERGING TRENDS IN ENERGY MARKETS RESEARCH**

**Financial innovation and risk management**

**Consumer protection in evolving markets**

**Energy security and critical materials**

**Policy-driven market transformation**

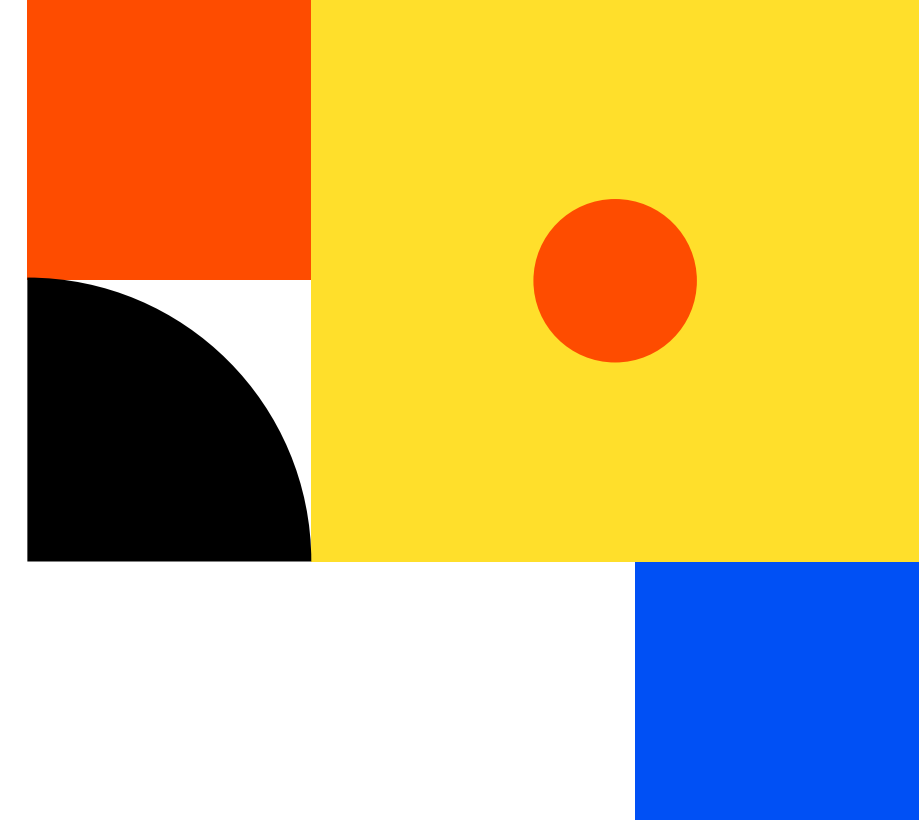
**Advanced modelling and simulation tools**

**Innovation in energy storage and flexibility**

**Integration of renewable energy**

**Decentralized and local energy markets**

**Digitalization and smart energy systems**





**ENERGY IS THE HEART OF  
SOCIETY — EEM 25  
RESEARCH IS ITS  
COMPASS.**



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