CASE STUDIES OF CIRCULAR ECONOMY PRACTICES

CIRCULAR ECONOMY POLICIES FOR STEEL DECARBONISATION

Green Deal, Circular economy and Industrial ecology – 6th December 2024

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OECD
BETTER POLICIES FOR BETTER LIVES

OECD: Supporting the global steel agenda

Global Forum on Steel Excess Capacity

- A multilateral platform to address global **excess-capacity**
- Established by the G20, facilitated by the OECD
- Brings together more than 30 major steel-producing economies
- Ministerial meeting 8 October 2024

www.steelforum.org

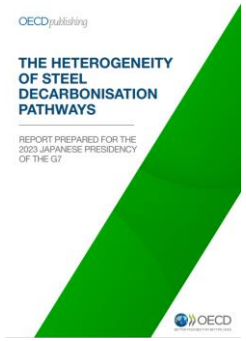
OECD Steel Committee

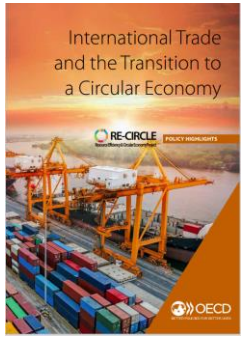
- A unique forum for governments to address the **evolving challenges** facing the steel industry
- 30 Members & 7 Participants, strong engagement with steel associations
- Areas of work: steel market developments, steelmaking capacity, trade policies, decarbonisation…

Steel Committee - OECD

Steel and the circular economy

- Steel-producing countries are increasingly transitioning to a more resource efficient and circular economy
- Strong attention on the needs for ferrous scrap to support steel recycling (EAF-route highly intensive in scrap)
- Complexity of the steel industry structure: through different production routes, assets characteristics, inputs for production, innovation
- Supportive policies are key to implement circular solutions widely and accelerate steel decarbonisation

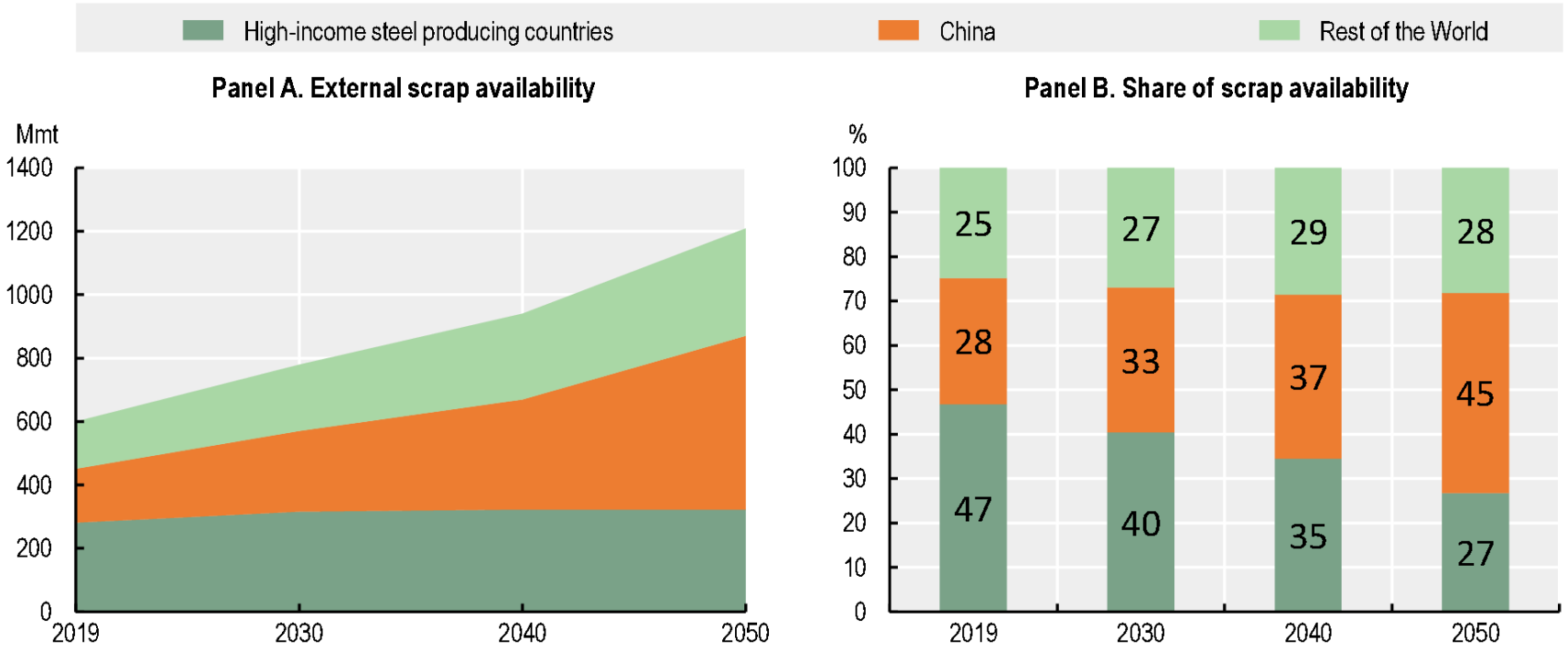




SCRAP METAL RECYCLING MUST INCREASE SIGNIFICANTLY TO SUPPORT GLOBAL DECARBONISATION EFFORTS

The future of scrap availability

Scrap availability is rising until 2050, but significantly differs across steel-producing countries



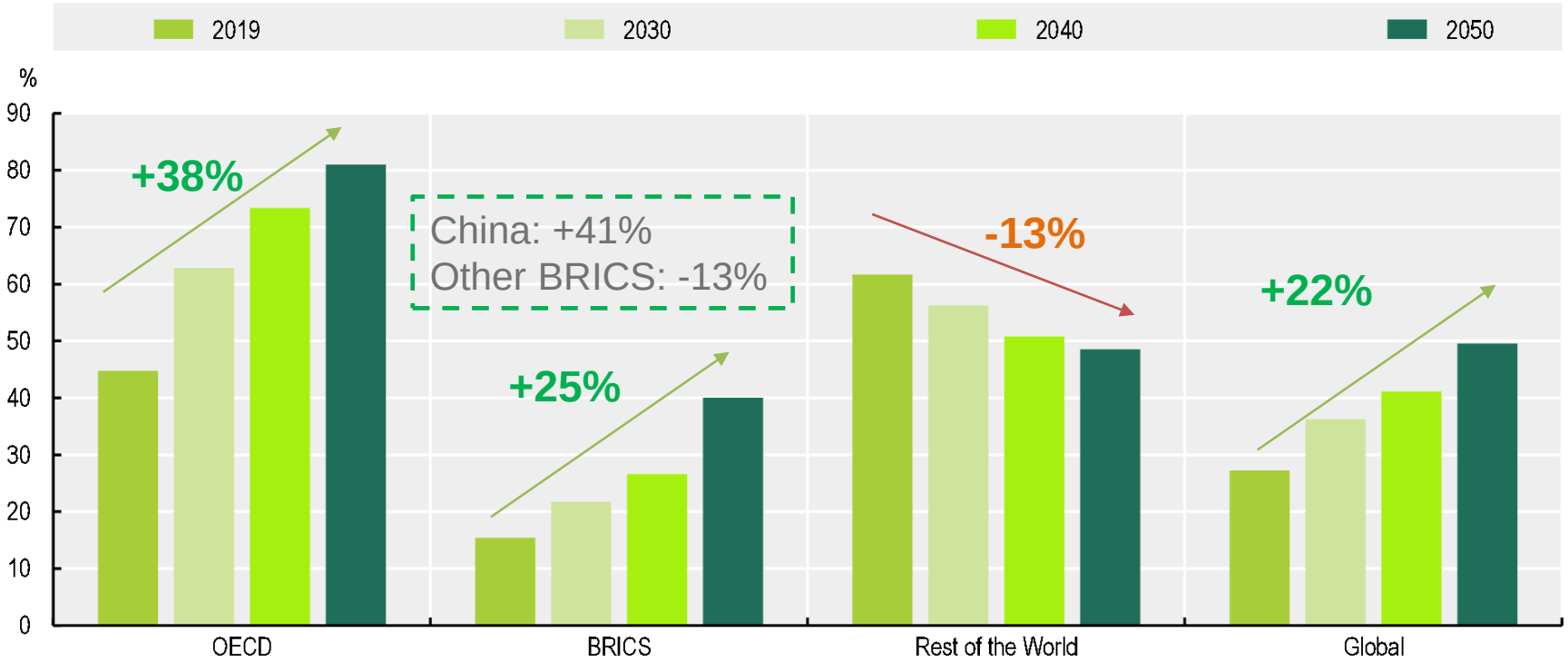
In 2050

- **1200 mmt** of external available scrap
- About **45%** of available scrap in China
- Drivers:
  - Historical recoverable rates
  - Growing steel consumption
  - Construction and automobile sectors

Note: High-income steel producing countries=EU27 countries, Canada, Japan, Korea, Mexico, Chinese Taipei, United States.
Source: World Steel Dynamics (WSD) model.

Major changes in scrap usage

Growth of recycled steel will support regional steel production at a different pace



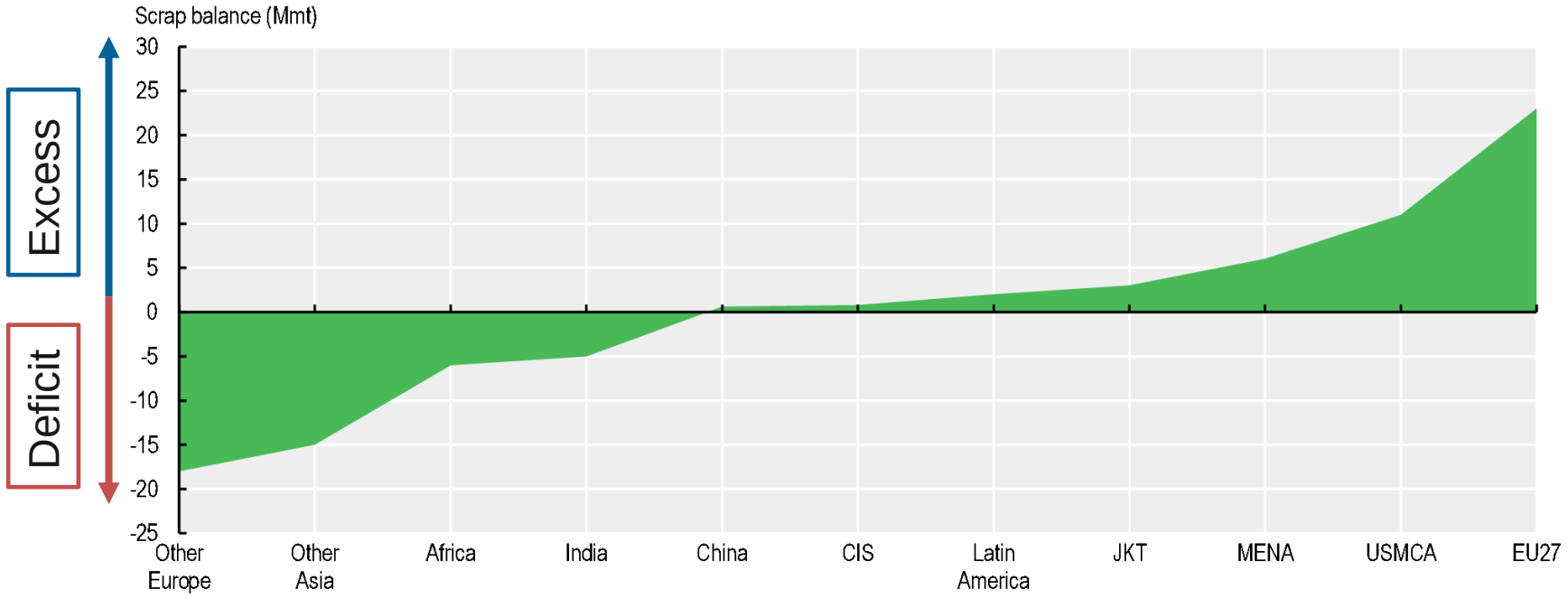
In 2050

- **50%** of EAF production share:
  - 81% in OECD countries
  - 41% in BRICs countries
  - 49% in the RoW
- Drivers:
  - Rising scrap availability
  - Potential for EAF-DRI production (**260 mmt**)
  - Increasing scrap use in BOF production

Source: World Steel Dynamics (WSD) model.

Identifying potential imbalances in scrap supply-demand

More scrap will still lack in certain region despite a global excess



Source: World Steel Dynamics (WSD) model.

In 2040

- Global excess of scrap supply by **5mmt**
- 4 regions at risks of shortages (between **-5 mmt** and **-18 mmt**)
- 6 regions in excess (between **2 mmt** to **23 mmt**)
- Large potential for global recycling market

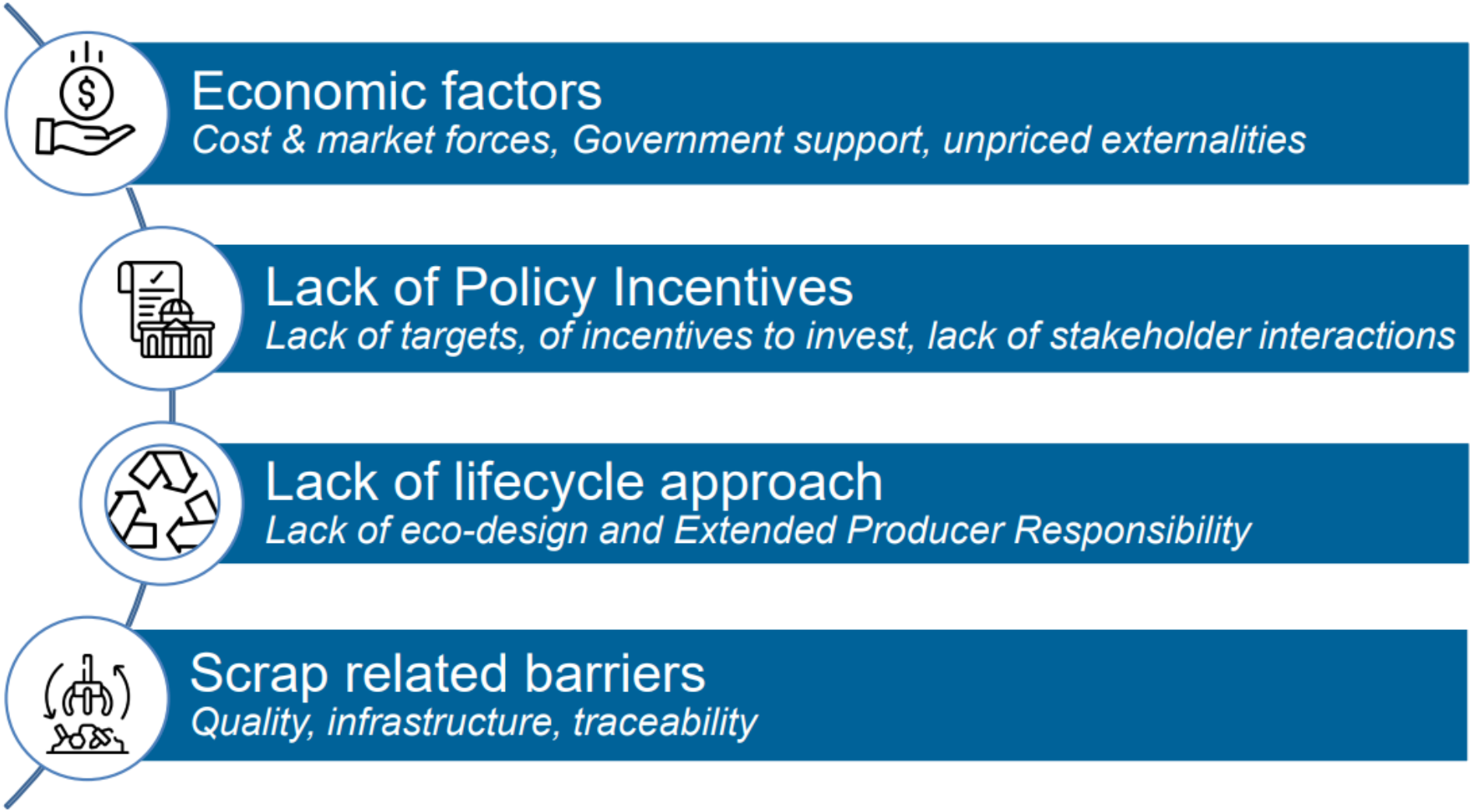
ACCELERATING CIRCULAR TRANSFORMATIONS IS A POLICY PRIORITY FOR MAJOR STEEL-PRODUCING COUNTRIES

What is steel circularity?

The circular economy business model goes beyond just the recycling aspect.

The steel market should also adapt practices such as reducing, reusing and remanufacturing.

Implementation challenges for the Circular Economy in the steel sector



Methodology

1. Country under the radar

Major steel-producting & scrap-dependent countries

- Brazil
- China
- Germany
- India
- Indonesia
- Japan
- Korea
- Türkiye
- United states

2. Scope for CE policies

Mapping of over 40 policies and 250 instruments

- Mandatory/Voluntary/ Strategic
- Horizontal/sectoral/pr product level
- Types of instruments (taxes, subsdies, extended producer responsibility)

3. Links to steel decarbonisation strategies

Circular Economy components:

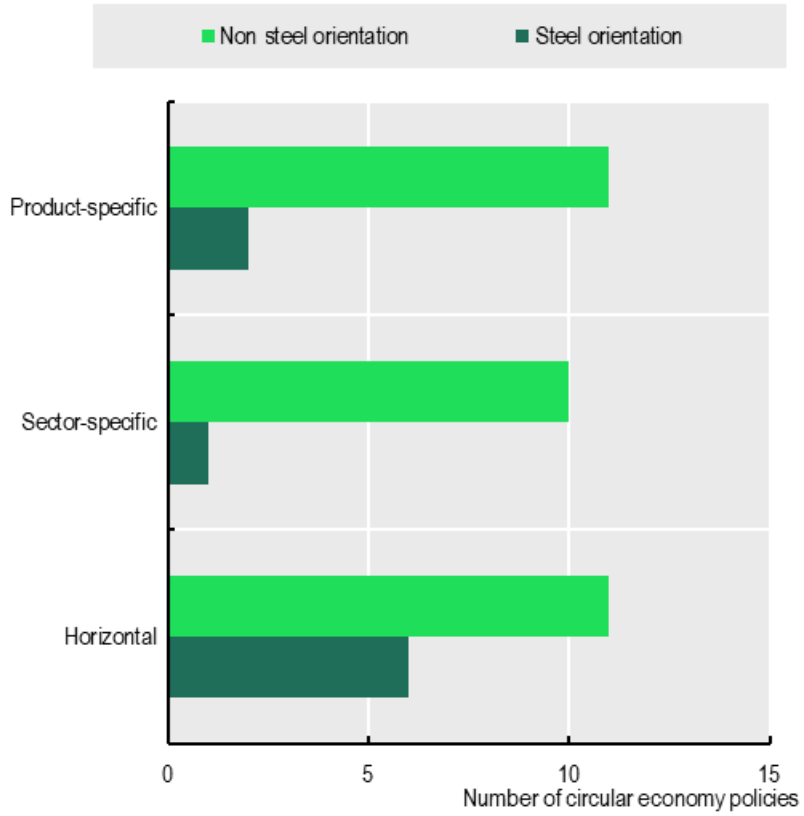
- Resource efficiency
- Reduce
- Recycle
- Reuse
- Remanufacture

4. Implementation and policy challenges

✓ Data mining to identify key challenges addressed by the type of policy in various domains (climate change mitigation, resource efficiency, resource security, innovation, ...).

Policy developments can expand 4Rs priorities to multiple sectors…

	Rethink	Reduce	Reuse	Recycle	Recover	Remanufacture	Refurbish	Repair	Redesign
Brazil				✓	✓				
Canada		✓	✓	✓	✓	✓	✓	✓	
China		✓	✓	✓		✓			
Germany	✓	✓	✓	✓	✓	✓	✓	✓	✓
India	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indonesia			✓	✓					
Japan		✓	✓	✓					
Korea		✓	✓	✓		✓			
Türkiye		✓	✓	✓	✓	✓	✓	✓	✓
United States		✓	✓	✓	✓	✓			✓



Source: Authors' compilation based on Steel Decarbonisation Policy dataset (OECD, 2024).

… with some steel value chain aspects included…

		Steel	Automobile	Construction	Shipbuilding	Renewables
China	Circular Economy promotion Law	✓	✓	✓		✓
	Swap the Old for Remanufacturing		✓			
Germany	Circular Economy Act		✓	✓	✓	✓
	Resource efficiency program Phase III	✓	✓	✓		✓
	National program of Sustainable Consumption					✓
India	Steel Scrap Recycling Policy	✓				
	Recycling of Ships Act				✓	
	Vehicle Scrappage Policy		✓			
Japan	Circular Economy Vision 2020	✓		✓		
	Construction recycling act			✓		
	Automobile recycling act		✓			
Korea	Framework Act on Resource Circulation			✓		
	Circular economy 9 Projects	✓	✓	✓		✓

… but are still in their infancy for a wider implementation in steel

Policy type	Count
Horizontal	17
Sectoral	11
Product-level	13
Mandatory	11
Strategic/voluntary	20

Sector coverage	Count
Steel	**5**
Automobile	9
Construction	12
Shipbuilding	3
Renewable sector	6

CE priorities	Count
4Rs	**6**
Reduce	20
Reuse	24
Recycle	27
Remanufacture	9

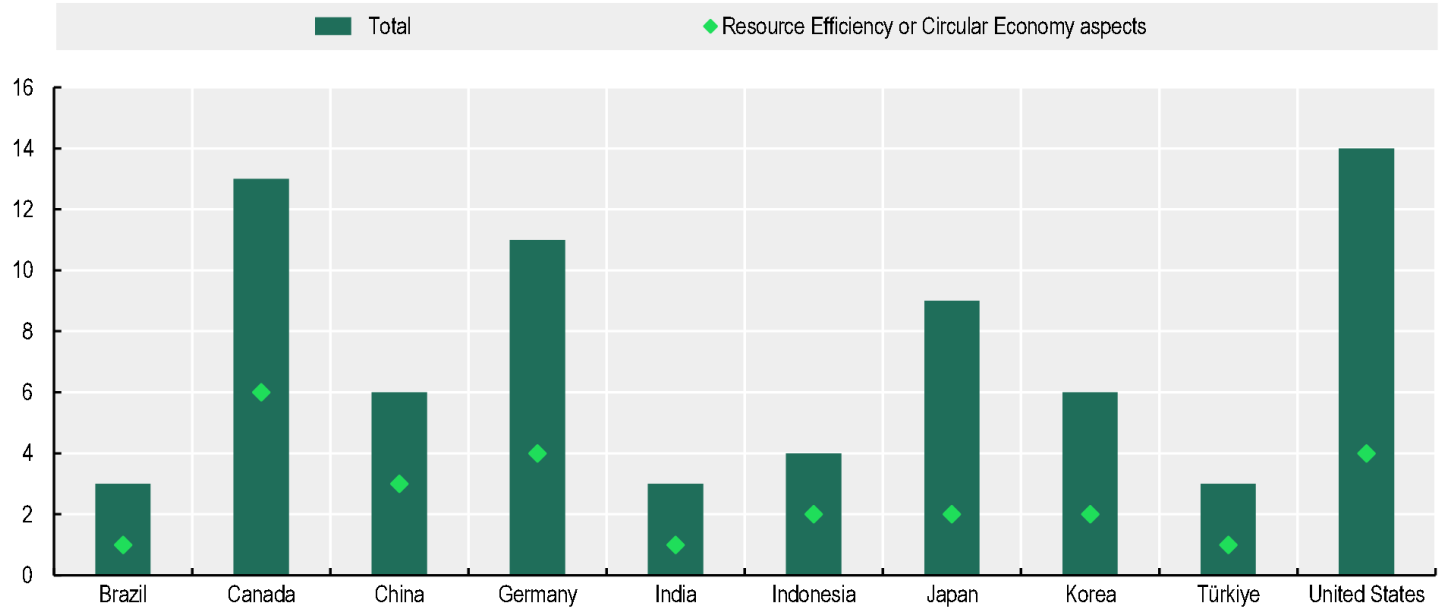
Common features:
- ✓ Circular Economy horizontal approach
- ✓ Recycling is a top-priority
- ✓ Focus on downstream sectors
- ✓ Main instruments in place: taxes

Key differences:
- × Mandatory policies (Germany, Korea, Japan)
- × 9Rs ambitions (Germany and India)
- × Few priorities on remanufacturing
- × Few steel-specific policies (India)

Source: Authors' compilation based on Steel Decarbonisation Policy dataset (OECD, 2024).

IS CIRCULAR ECONOMY PART OF DECARBONISATION STRATEGIES FOR STEEL?

Circular Economy can play a pivotal role to decarbonise hard-to-abate industries



Source: Authors' compilation based on Steel Decarbonisation Policy dataset (OECD, 2024).

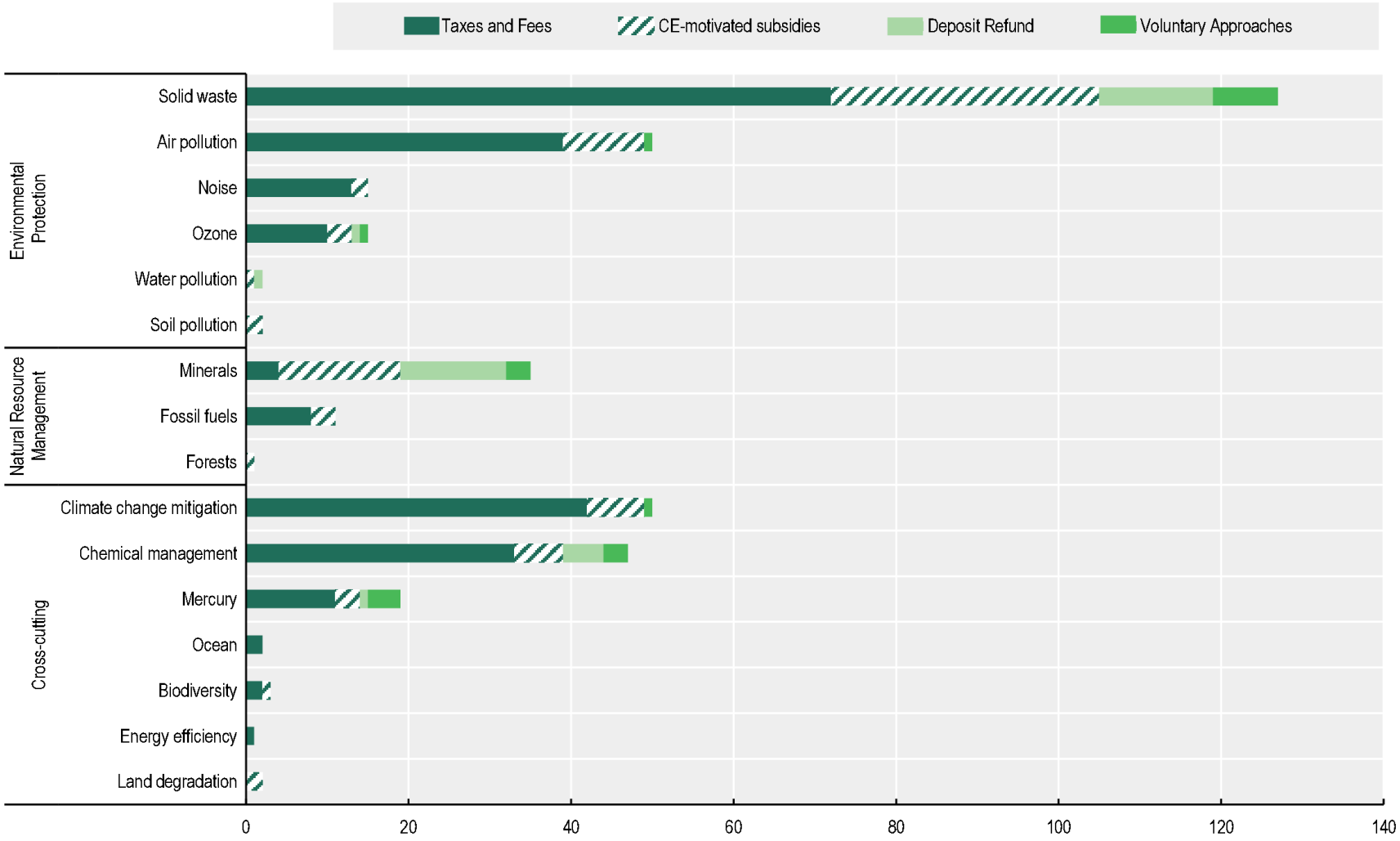
Steel decarbonisation policy

- Main components:
  - Recycling
  - Resource efficiency
  - Waste prevention
- Few considerations for:
  - 4Rs (Reduce-Reuse-Recycle)
  - Life Cycle Assessment

CE policy instruments

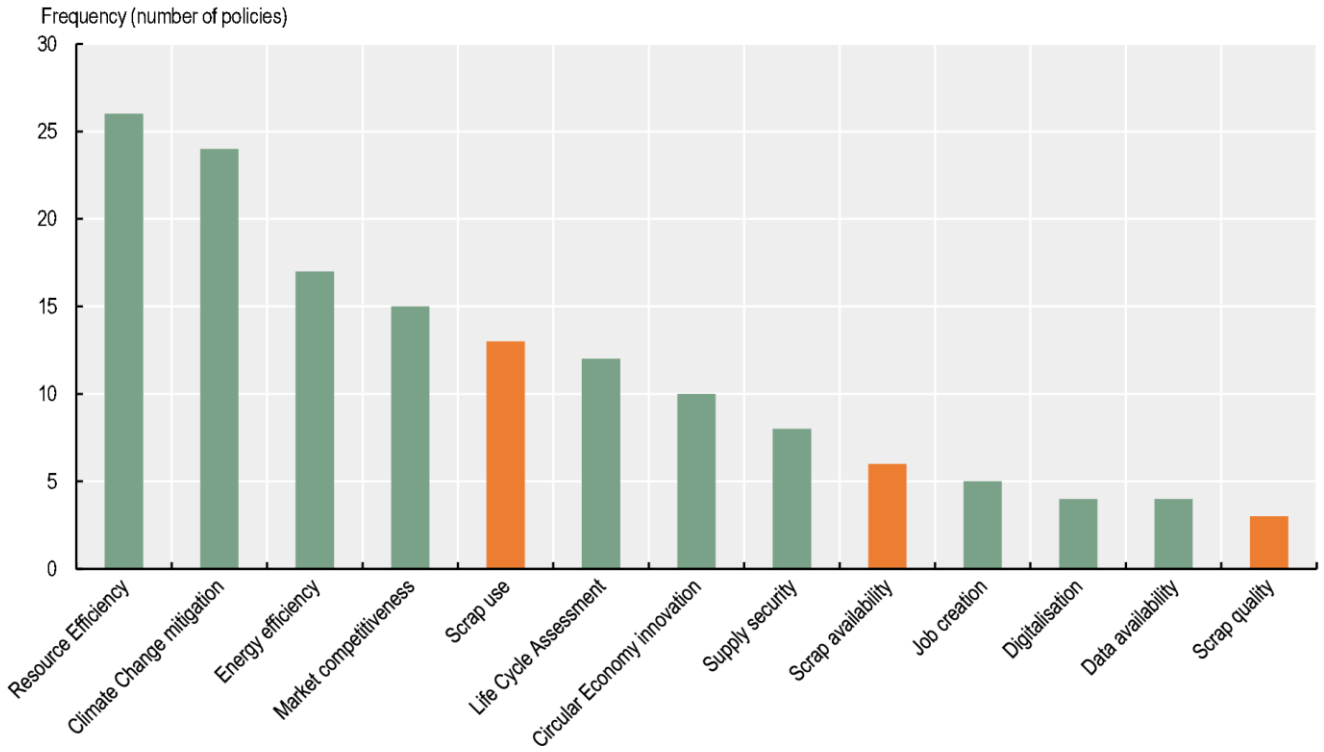
- Taxes: **7.6%** of all environmentally-relevant revenues
- Policy mix (mainly taxes and subsidies) to support decarbonisation objectives

Various instruments support circular economy practices which also help address climate challenges



Source: OECD Policy instruments for the Environment (PINE) database January 2024 extraction.

Few circular economy policies address scrap-specific challenges: availability – accessibility – quality



Source: Authors' compilation based on Steel Decarbonisation Policy dataset (OECD, 2024).

Examples of government's approaches

- Use of Artificial Intelligence in 9 CE project policy (Korea)
- Early adopter of the CE , promoting technological advancements (Japan)
- Steel Scrap Recycling Policy to integrate the informal sector (India)
- Green Public Procurement scheme supporting green markets (United States)
- VAT policy to promote circular economy business model (China)

Concluding remarks

Extending the “4R priorities” (Reduce, Reuse, Remanufacture, and Recycle) of the circular economy is key to achieving near zero emissions in steel production.

From a policy perspective, circular economy approaches tend to be horizontal and focus on recycling aspects.

The development of steel-specific circular economy policies could maximize their decarbonization impact.

Governments and companies can further advance circular economy approaches in steel through technologies like blockchain and artificial intelligence (AI).

New OECD work on steel circularity

Available at the
[OECD steel website]

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