# SOUTH AFRICA'S PATH TO INDUSTRIAL DECARBONISATION: INSIGHTS FROM THE OECD NET ZERO INDUSTRY FRAMEWORK

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22 January 2026

BETTER POLICIES FOR BETTER LIVES

# 4 Key Messages from “Decarbonising the iron and steel sector – the case of South Africa”

The **iron and steel sector is vital to South Africa’s economy but must transition** to reduce its emissions

Industry transformation requires **economic support**

Stronger **enabling conditions** are needed to accelerate industry action and attract investment

South Africa has the **potential to be a key player in green iron and steel production**

# OECD Framework for Industry's net-zero Transition: Implementation steps

## Framework for industry's net-zero transition

The Framework is a **step-by-step** approach **tailored** to the specific needs of countries, offering **replicable** solutions to decarbonise industry sectors

| | ***Methodology*** | ***Analytical tools*** |
|---|---|---|
| Pillar 1 Focus Area | Step 1 - Stakeholder engagement and Focus Area<br>Step 2 - Background research | (1) Data collection and analysis<br>(2) Mapping relevant policies covering industrial decarbonisation |
| Pillar 2 Implementation outcomes | Step 3 - Investment needs and economic assessment of technologies<br>Step 4 - Identifying market and financing solutions | (1) Economic assessment of individual technologies<br>(2) Matchmaking of projects and effective enabling conditions and financing instruments |
| Pillar 3 Framework benefits | Step 5 - Dissemination of results | (1) Country report on solutions + pipeline of projects<br>(2) User Guide to facilitate the implementation of solutions |

# Implementation of the Framework: Where do we stand?

**STEP 1**
*2022 - 2023*

**Stakeholder engagement**

**STEP 2**
*2023 - 2024*

**Kick off meeting**
**Background research**
**Selection of low-carbon options**

**STEP 3**
*2024 - 2025*

**Assessment of Business cases**

**STEP 4**
*2025*

**Market & Financing Solutions, Enabling conditions**

**STEP 5**

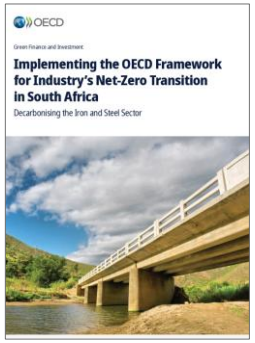
**Country Reports**

*Q4 2025*

*Q1 2026*

**Implementing the OECD Framework for Industry's Net-Zero Transition in South Africa: Decarbonising the Iron and Steel Sector** (link)

*Published on 9 October 2025*



# Implementation of the Framework: What do we cover?

| | | CCUS | Hydrogen | Biomass | Electrification | Energy Efficiency |
|---|---|---|---|---|---|---|
| **Egypt** | *Clean Hydrogen for industrial uses* | ✓ | ✓ | | | |
| **Indonesia** | *Iron & steel* | ✓ | ✓ | | ✓ | |
| **Indonesia** | *Textile* | | | | ✓ | ✓ |
| **South Africa** | *Iron & steel* | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Thailand** | *Petrochemicals Plastics* | ✓ | | ✓ | | |

# Stakeholder engagement

## Steering Committee

**Chair: the dtic / Members: DFFE, National Treasury, DSI, SAISI, BASA / Secretariat: OECD**

*Governance, Coordination, Decision-Making.*

## Technical Advisory Committee (TAC)

***15 to 20** organisations representing policy makers, industry stakeholders, finance institutions, think tanks and international organisations*

*Participation on voluntary basis and at own cost, thus not requiring any formal commitment*

*Provides expert review and inputs to OECD analyses*

## Extended stakeholder list

*150 representatives from Private banks, other steelmakers, international development finance institutions, international organisations, academics…*

*Share insights during bilateral consultation calls; Participate in workshops and dissemination events*

# Overall report structure

**1 Overview and country context**

- Purpose and structure of the report
- OECD Framework for industry's net-zero transition
- Overview of the manufacturing industry in South Africa
- The steel sector in South Africa

**2 Economic assessment of selected low-carbon technologies**

- Net-zero pathways and low-carbon technologies for the iron and steel sector
- Economic assessment of selected low-carbon technologies

**3 Policy and financing instruments to support the decarbonisation of the iron and steel sector**

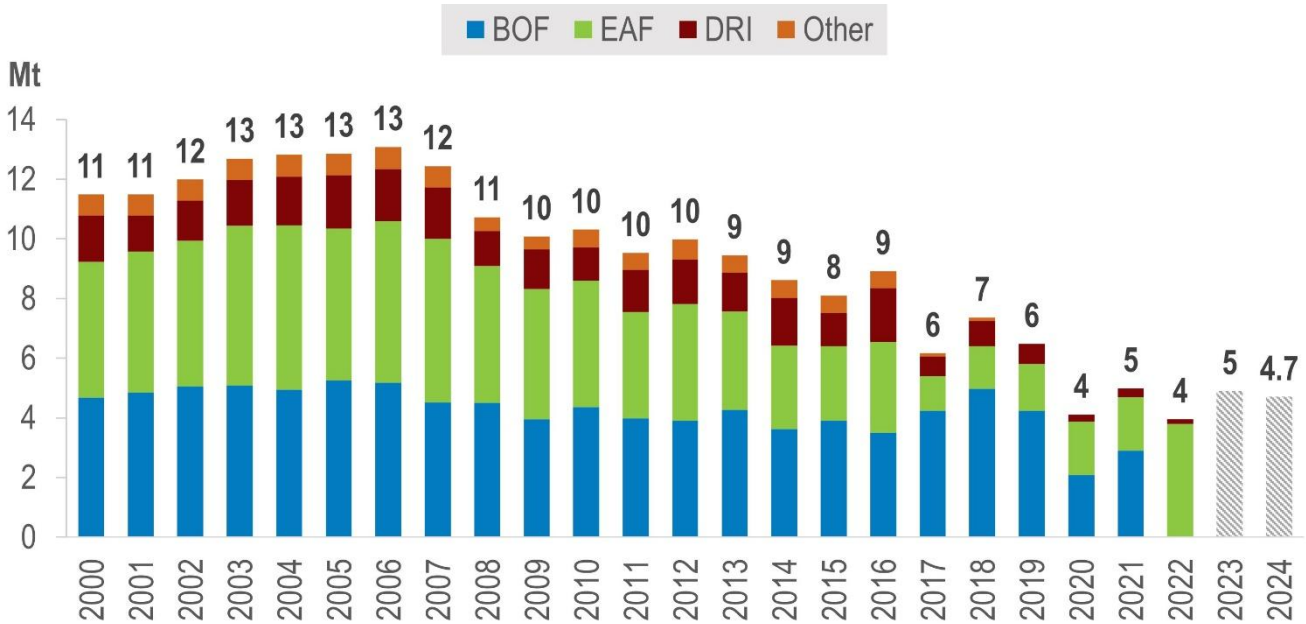
- Impact of selected measures on selected low-carbon technologies
- Key challenges to implement the selected low-carbon technologies
- Levers and solutions

**4 Recommendations, next steps and conclusion**

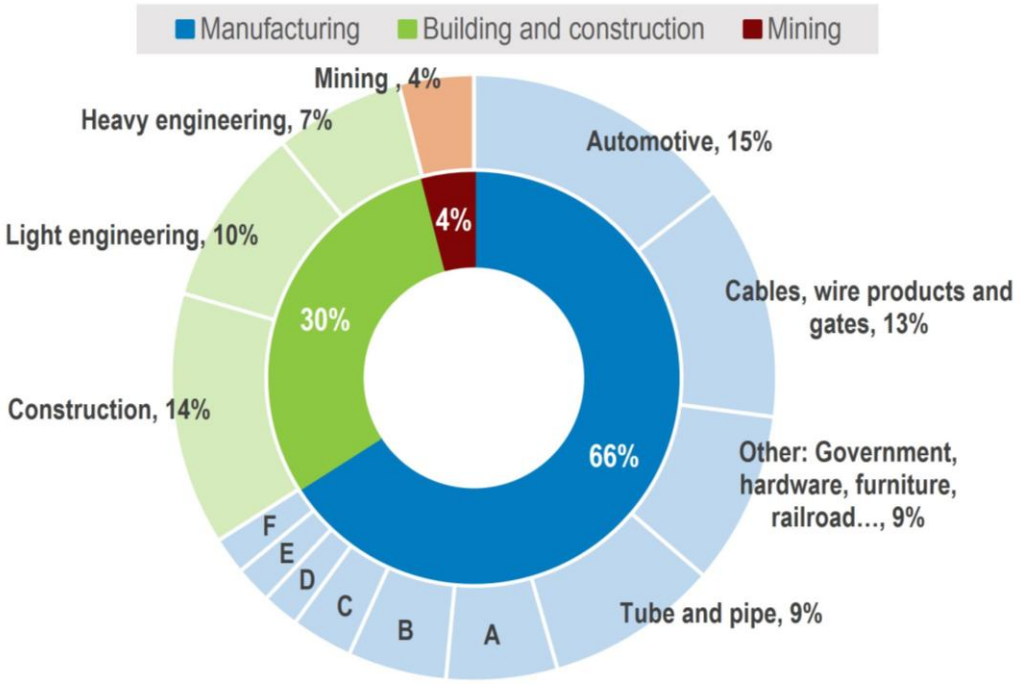
- Recommendations to accelerate the decarbonisation of the iron and steel sector in South Africa
- Next steps
- Conclusion

# Steel production and demand in South Africa

## Steel production in South Africa by route




## Demand of steel in South Africa by sector



# Selection of studied technologies

**1 Selection covers only a subset of technologies**

- Analyse how to improve the viability of critical technologies to realise emissions reductions through policy and financing solutions.

**2 Relevance for South Africa's industrial decarbonisation**

- Directly impact the manufacturing process
- Have a significant emission reduction potential
- Be consistent with Indonesia's strategy to reach net-zero emissions

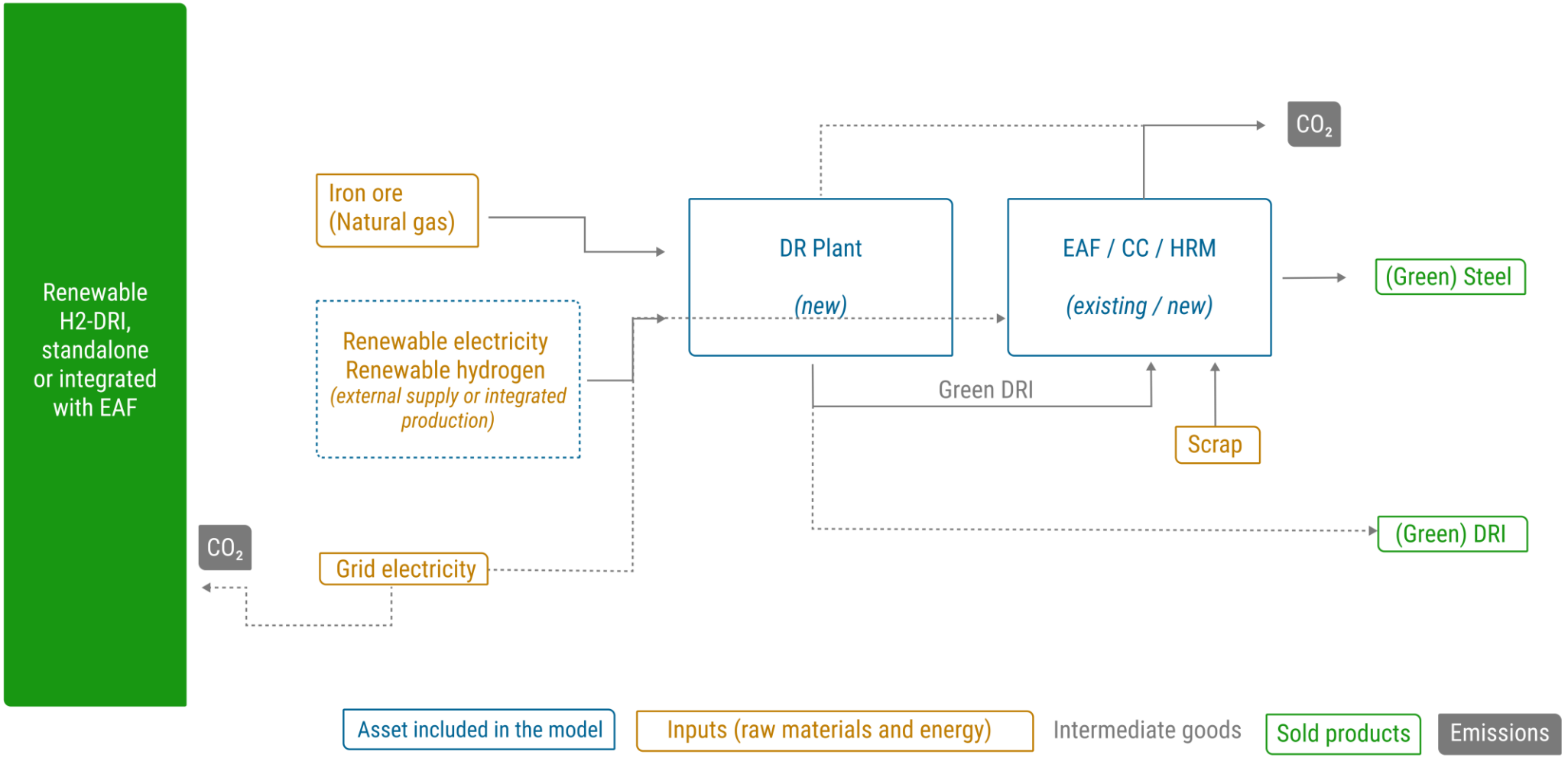
**3 Technically implementable in the short to medium-term (10 years)**

- Technology Readiness Level (TRL) of at least 6-7, and/or with examples of industrial deployment at international level, are considered.

**4 Not mainstreamed yet**

- The cases should benefit from the policy and financing solutions analysed in the OECD Framework.
- Technologies that are already technically and economically viable and widely implemented are less relevant in the context of this project.

# Boundaries – example of H2-DRI-EAF



# Structure of the techno-economic assessment

## Inputs (examples)

### Technical parameters
- Plant size
- Plant lifetime
- Raw materials consumption
- Energy consumption
- Construction and ramp-up time
- $CO_2$ emissions of production processes

### Economic Parameters
- Asset CAPEX
- Energy (natural gas, electricity, hydrogen), raw materials (iron ore, coal, scrap…) prices
- Labour costs
- Prices of sold products (DRI, steel, e-fuels) - domestic and exports

### Financial parameters
- Equity IRR
- Exchange rate
- Financing structure (debt/equity)
- Debt rates and repayment period
- Tax rate (Corporate Income Tax and Export Tax)

### Policy and financial levers
- Accelerated depreciation
- CAPEX Subsidies
- Carbon pricing
- CfD or Electricity/Hydrogen subsidies
- Concessional Debt
- Corporate Income Tax reduction
- Green Premium (price and qty)

- Values to be shared with TAC members for verification and feedback
- Key parameters will be used for sensitivity or scenario analysis

## Calculations

**(Simplified) Income Statement**

**(Simplified) Cash Flows**

- Standard calculation - prepared by the OECD

## Outputs

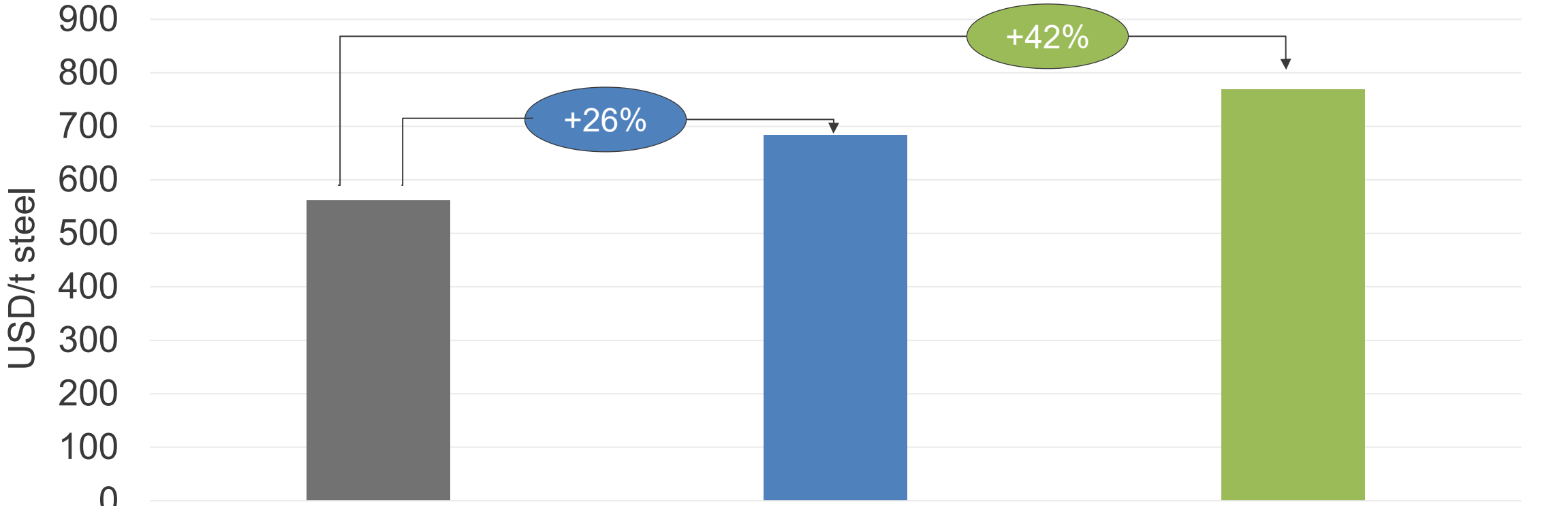
**Levelised cost of products**
**NPV, IRR, Payback period**

**Energy and Emissions intensity (vs. baseline)**

### Sensitivity analyses
- $CO_2$ emissions reduction measures:
  - Electricity consumption
  - Share of renewable vs fossil-fuel based inputs
- Application of policy and financial levers, such as:
  - CAPEX (initial CAPEX minus subsidies)
  - Carbon pricing
  - Electricity and Hydrogen prices

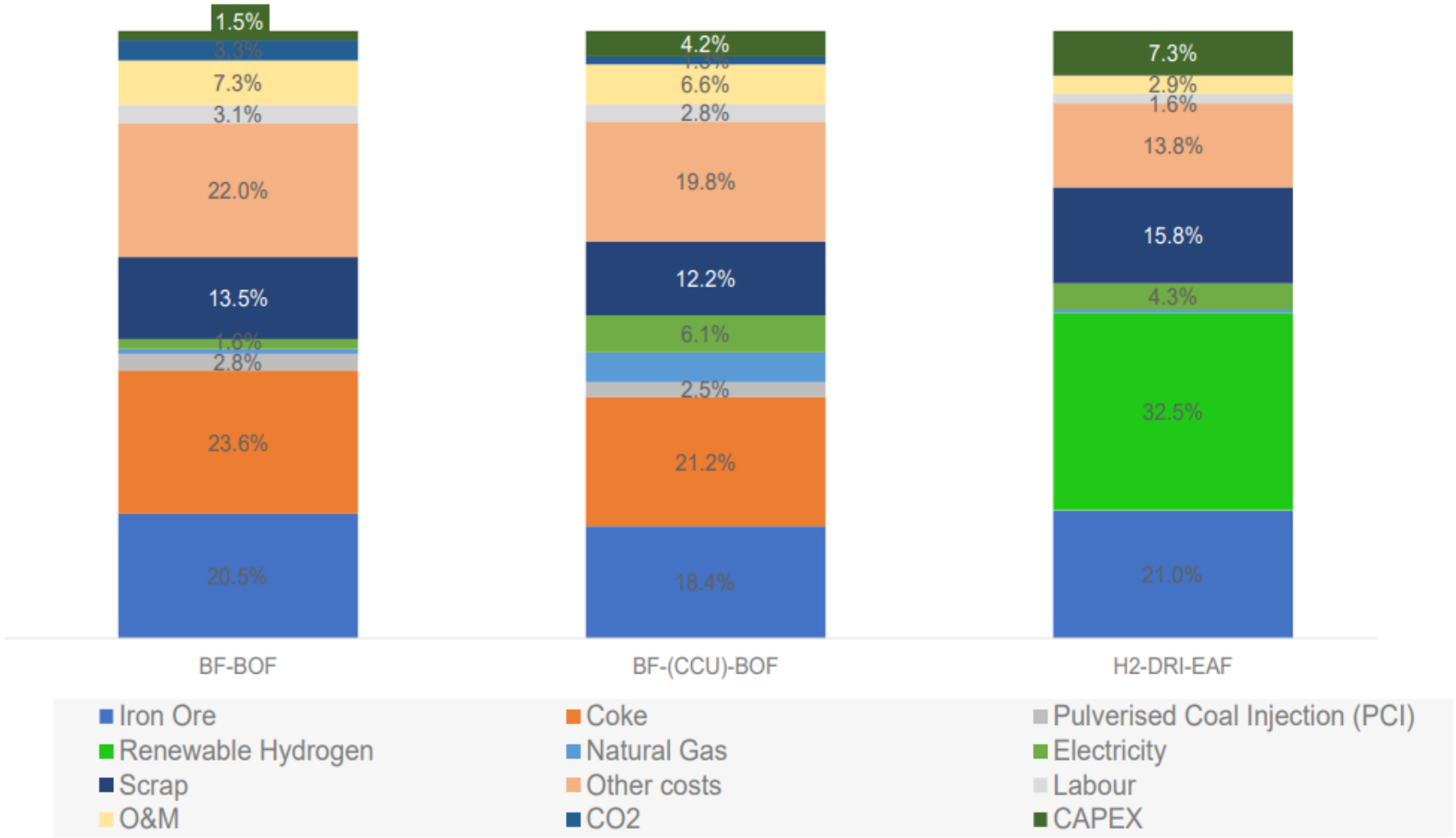
- Results shared in future TAC meetings for discussion
- Sensitivity analysis results will serve as a basis for prioritization of policy levers and recommendations of financial mechanisms

# Production costs and emission intensity of primary steel production pathways in South Africa

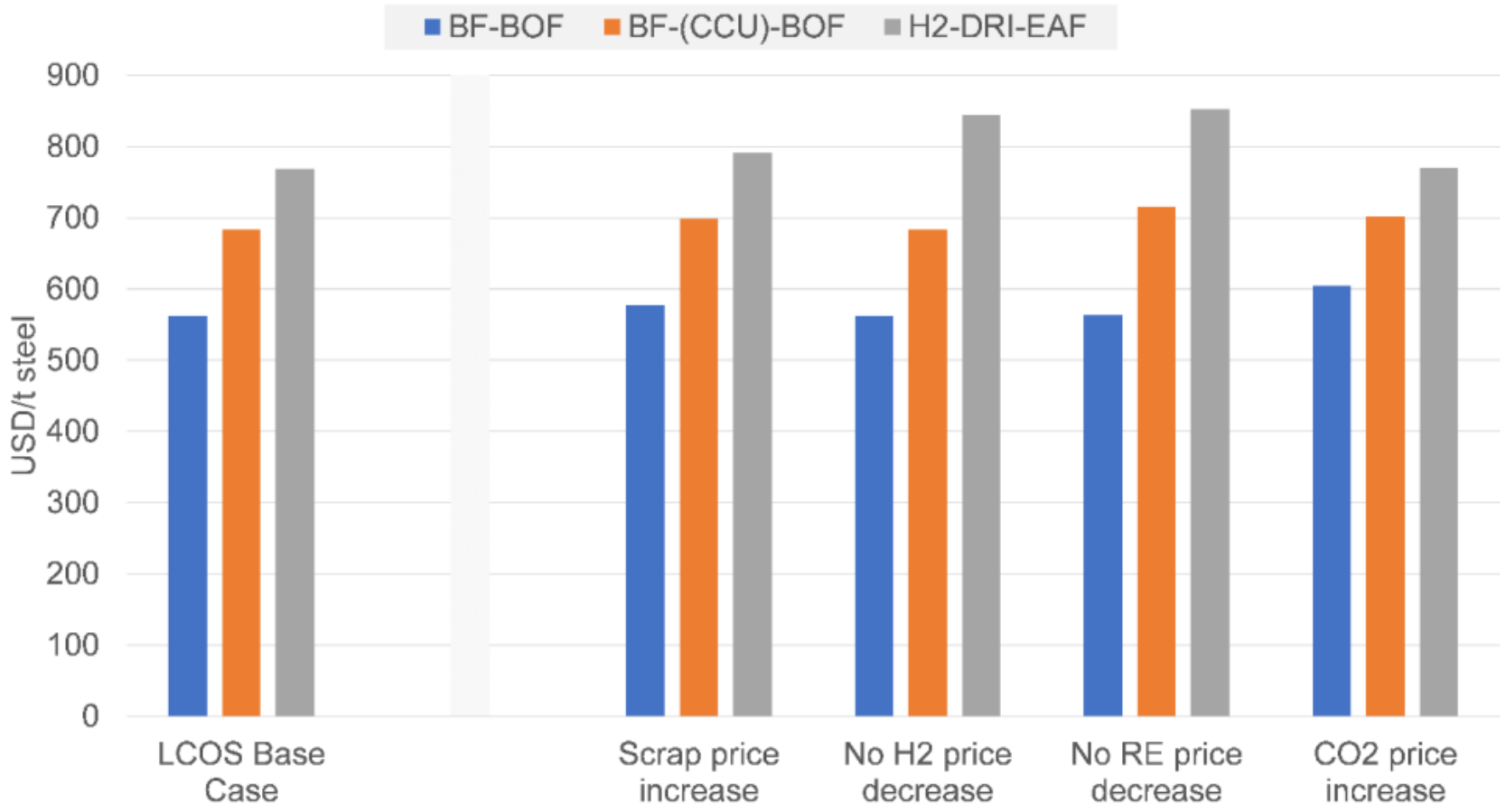



| | Blast Furnace Basic Oxygen Furnace | Blast Furnace (with Carbon Capture) Basic Oxygen Furnace | Hydrogen-based Direct Reduction Electric Arc Furnace |
|---|---|---|---|
| **Emission intensity** | 1.8 t $CO_2$ / t steel | 0.6 t $CO_2$ / t steel | 0.1 t $CO_2$ / t steel |

# Breakdown of the Levelised Cost of Steel

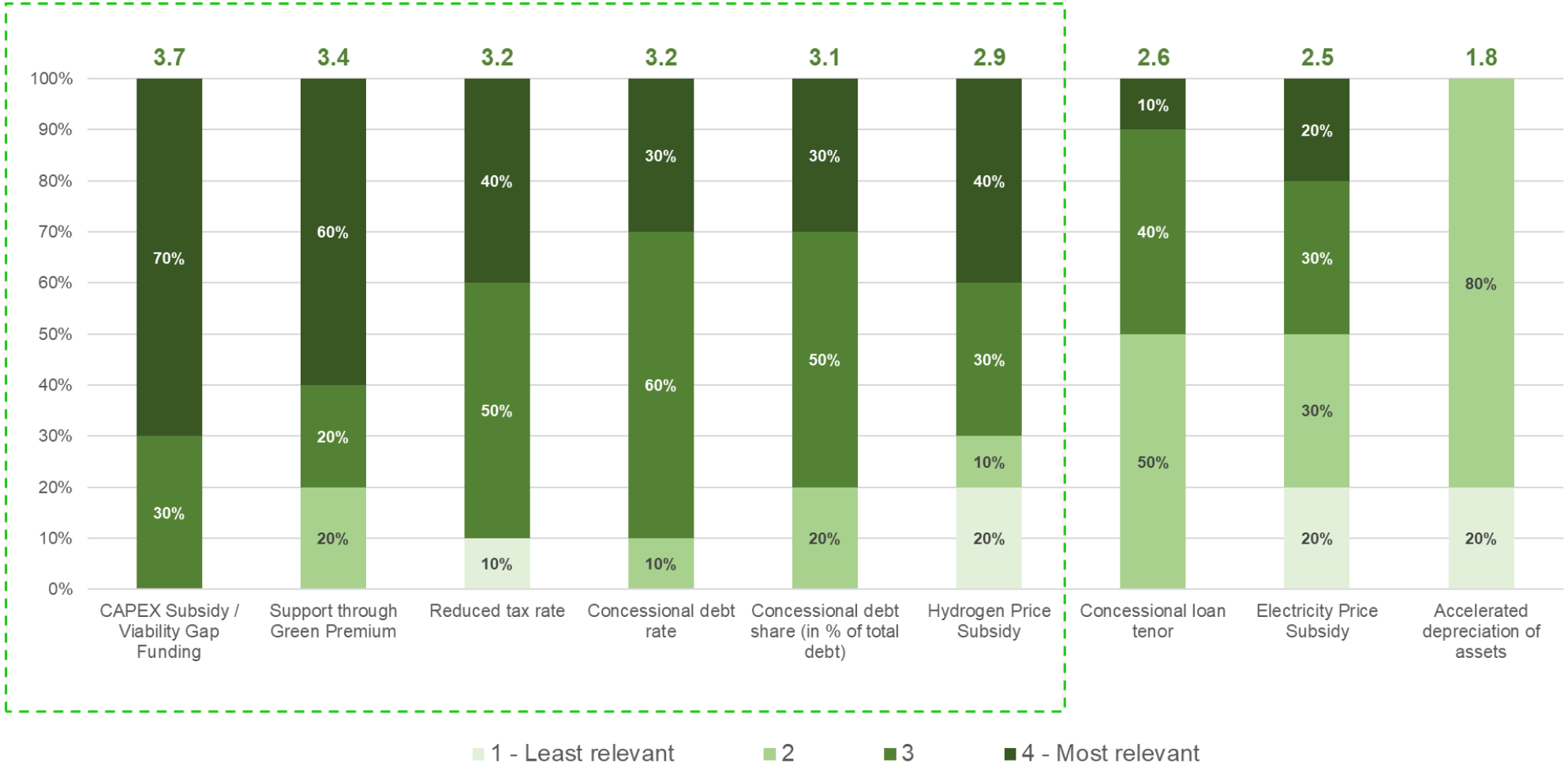


# Alternative scenarios for the calculation of the Levelised Cost of Steel



# Selection of financial instruments with the Technical Advisory Committee

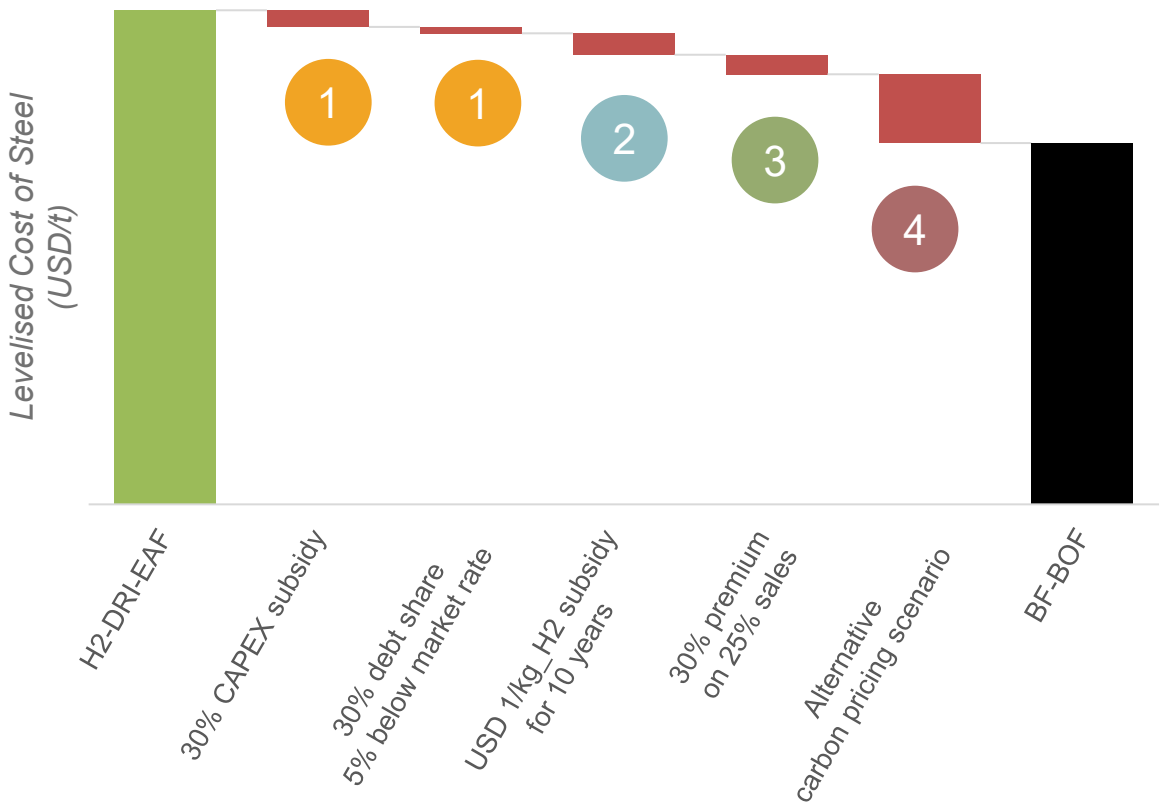
**Financial instruments selected for the economic assessment**



# Policy and financial levers can help bridge the competitiveness gap

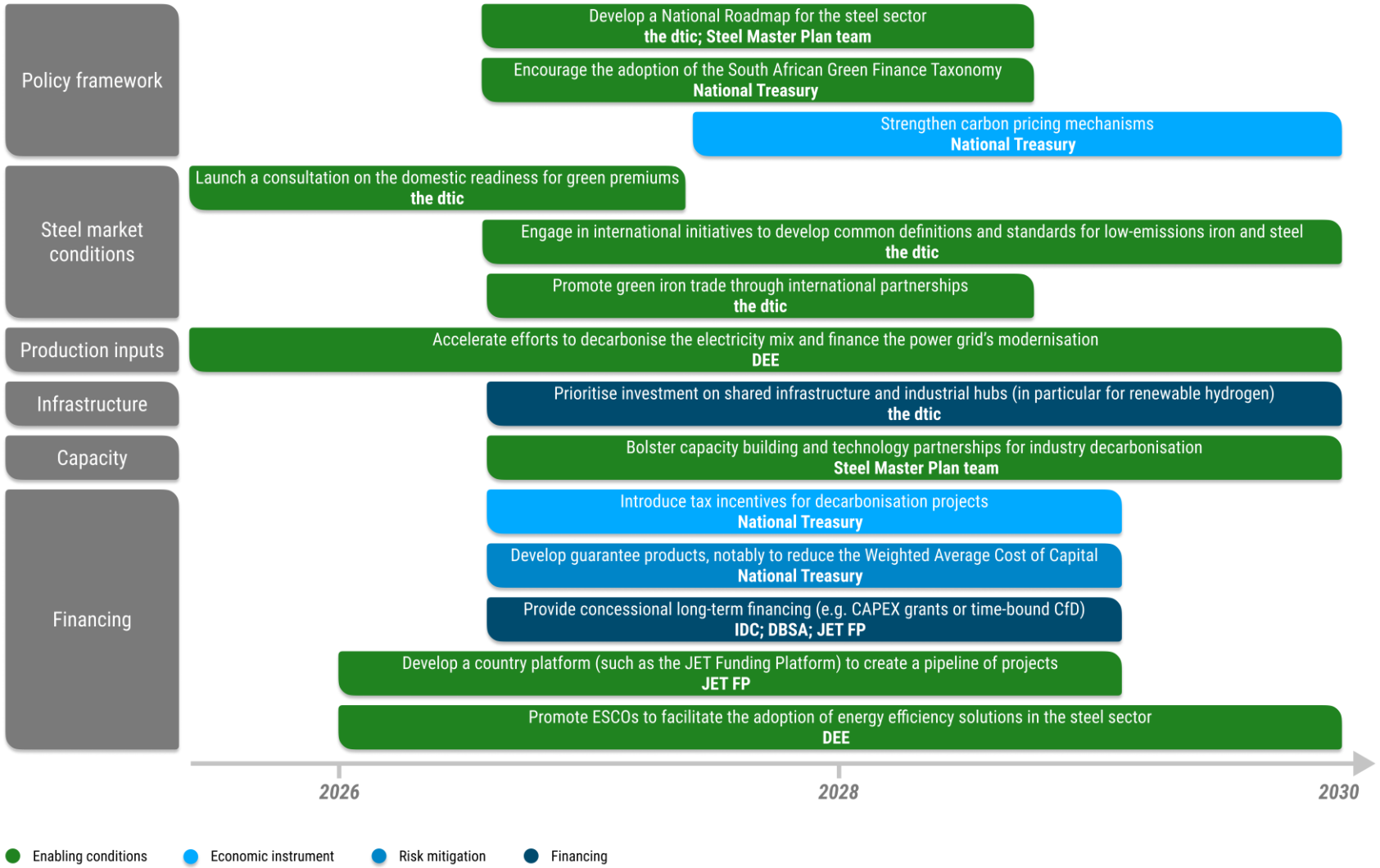
***A combination of instruments is needed:***

1. ***CAPEX*** *instruments are useful but* ***not sufficient*** *to close the gap*
   *Grants, tax rebates, concessional loans*
2. *Instruments for* ***OPEX*** *are* ***crucial***
   *Price cap, targeted support for energy & raw materials, CfDs*
3. ***Demand-side*** *mechanisms are important to create a sustainable market*
   *Green premium*
4. *Mechanisms that* ***give a value to the $CO_2$*** *(emitted or avoided) are key*
   *ETS, carbon tax, carbon credits*



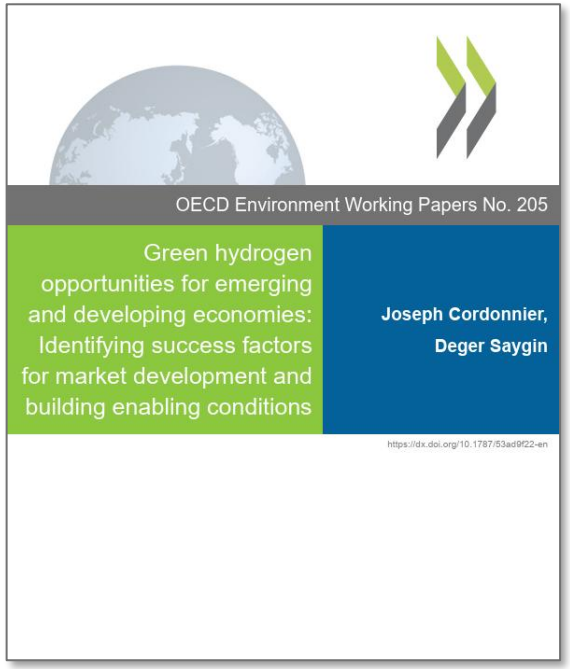

H2-DRI-EAF: steel produced via hydrogen-base direct reduced iron and electric arc furnace
BF-BOF: steel produced via blast furnaces and basic oxygen furnace (benchmark case)
CfD: Contracts for Difference

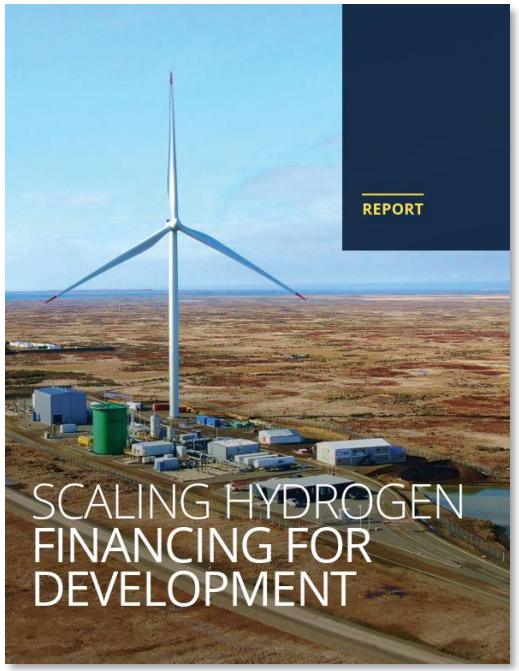
# OECD recommendations to stimulate investment in low-emissions steel in South Africa




- Implementation of the OECD Framework for industry's net-zero transition
- **Consultative process** over 2023-2025
- Supported by **techno-economic analyses**

# Our broader work on hydrogen





# THANK YOU