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**Unlocking Value: Opportunities and Challenges in Africa's Critical Energy Transition Minerals Sector**

By

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The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.



# Rapid Assessment of Value Addition and Diversification Capacity

## Unlocking Value: Opportunities and Challenges in Africa's Critical Energy Transition Minerals Sector

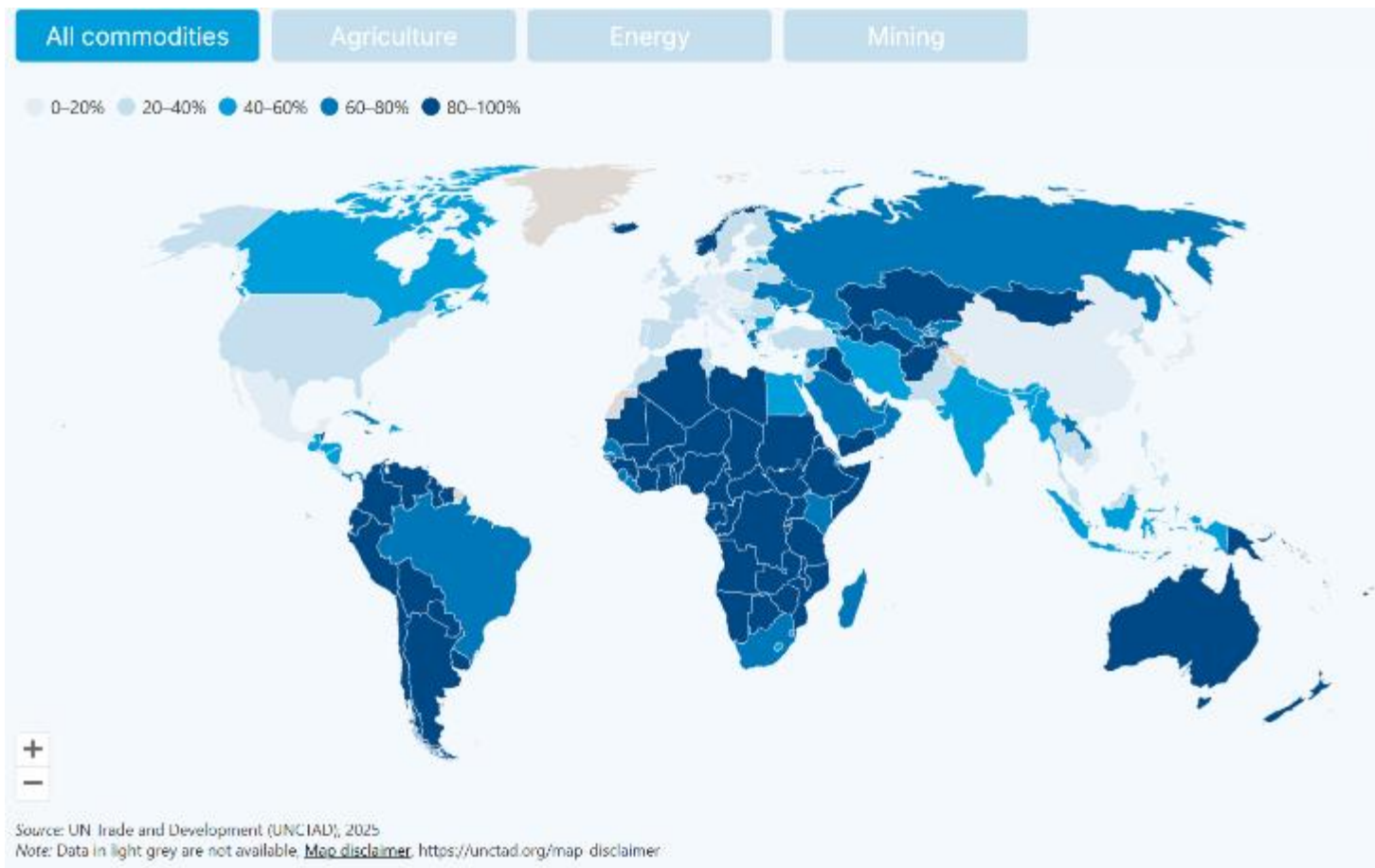


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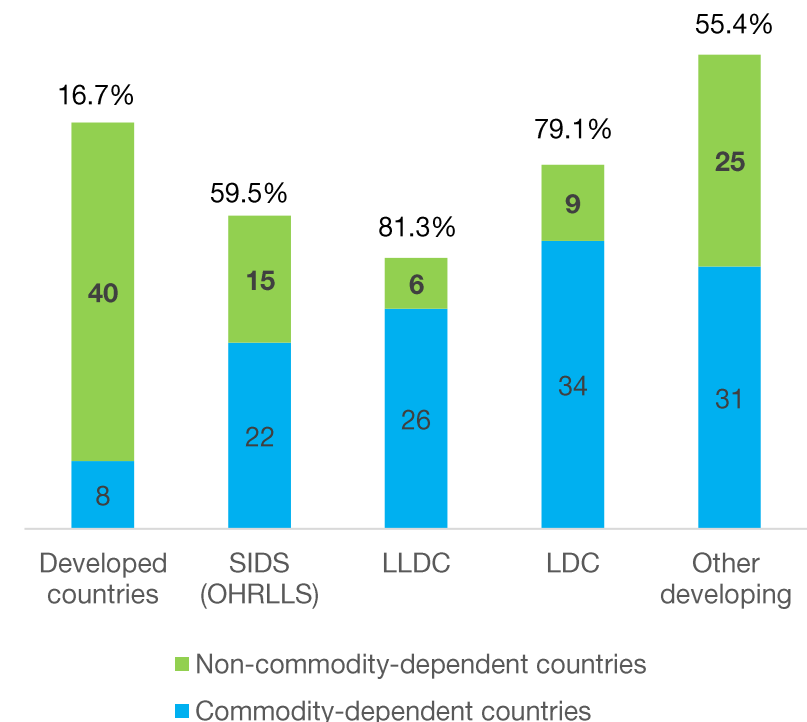
# Commodity dependence remains a critical issue in developing countries

Export of commodities as a percentage of the total exports, 2021-2023



Note: The boundaries and names shown, and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Commodity dependence by development group, 2021-2023 (per cent share by development level; and number of countries in each group)



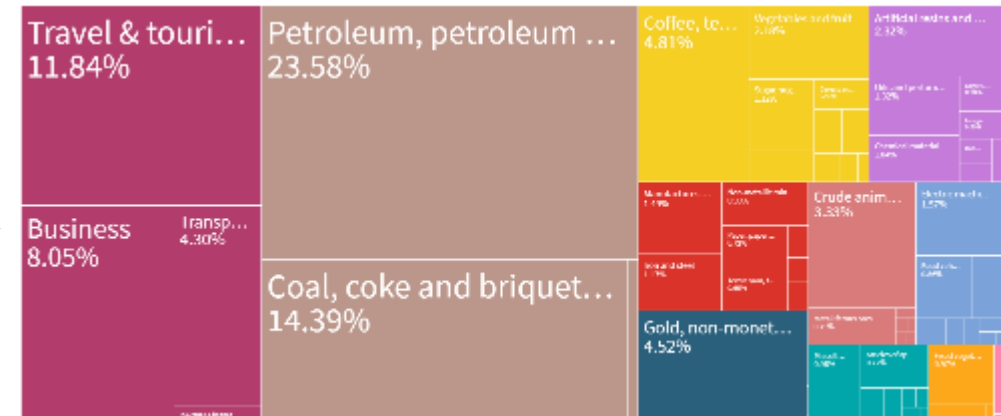
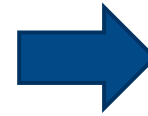
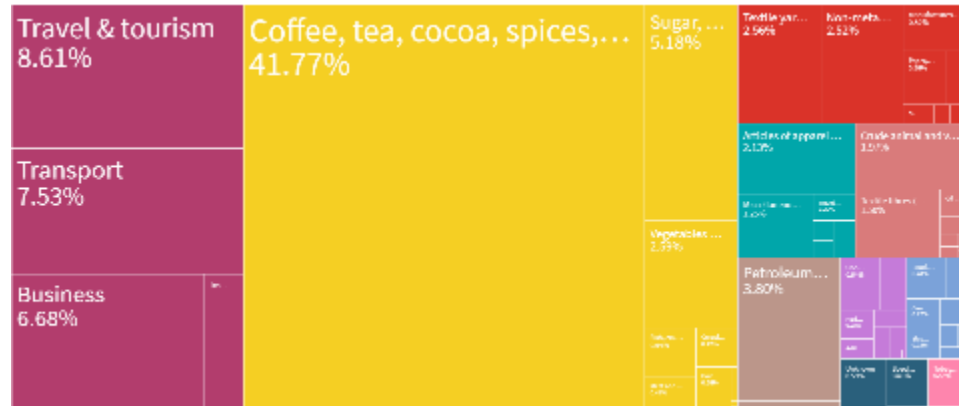
Source: UNCTAD calculations.

# Diversification and international trade

Country 1

1980, \$ 5.5 Billion

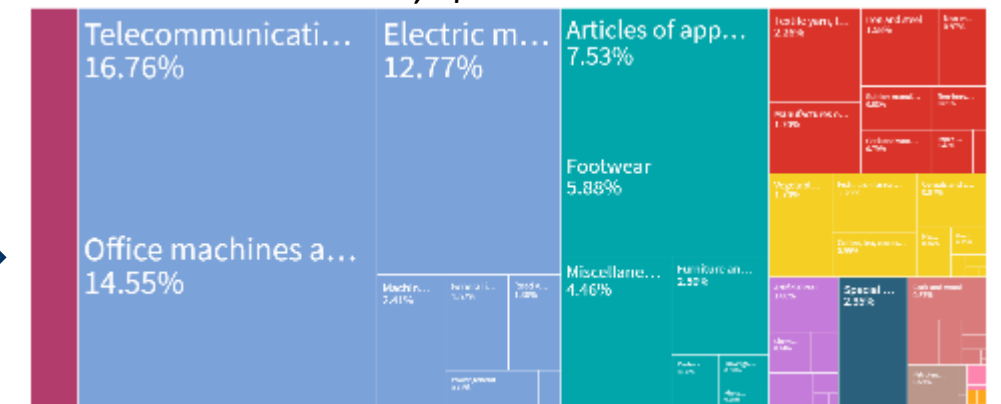
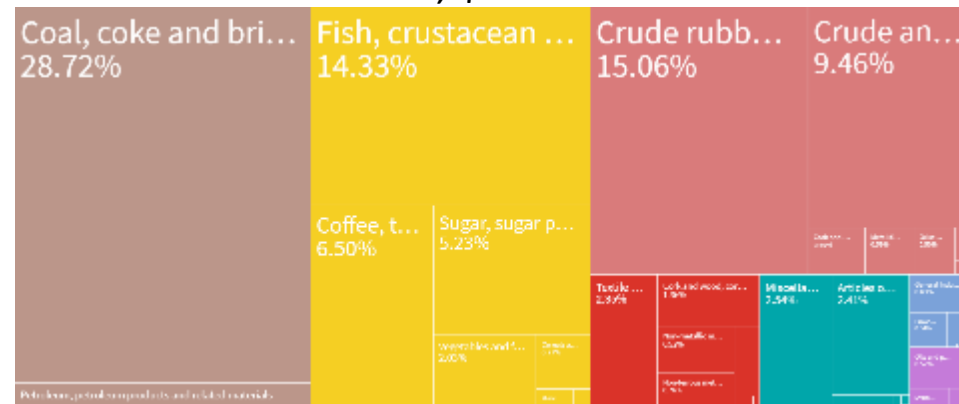
2023, \$ 64 billion



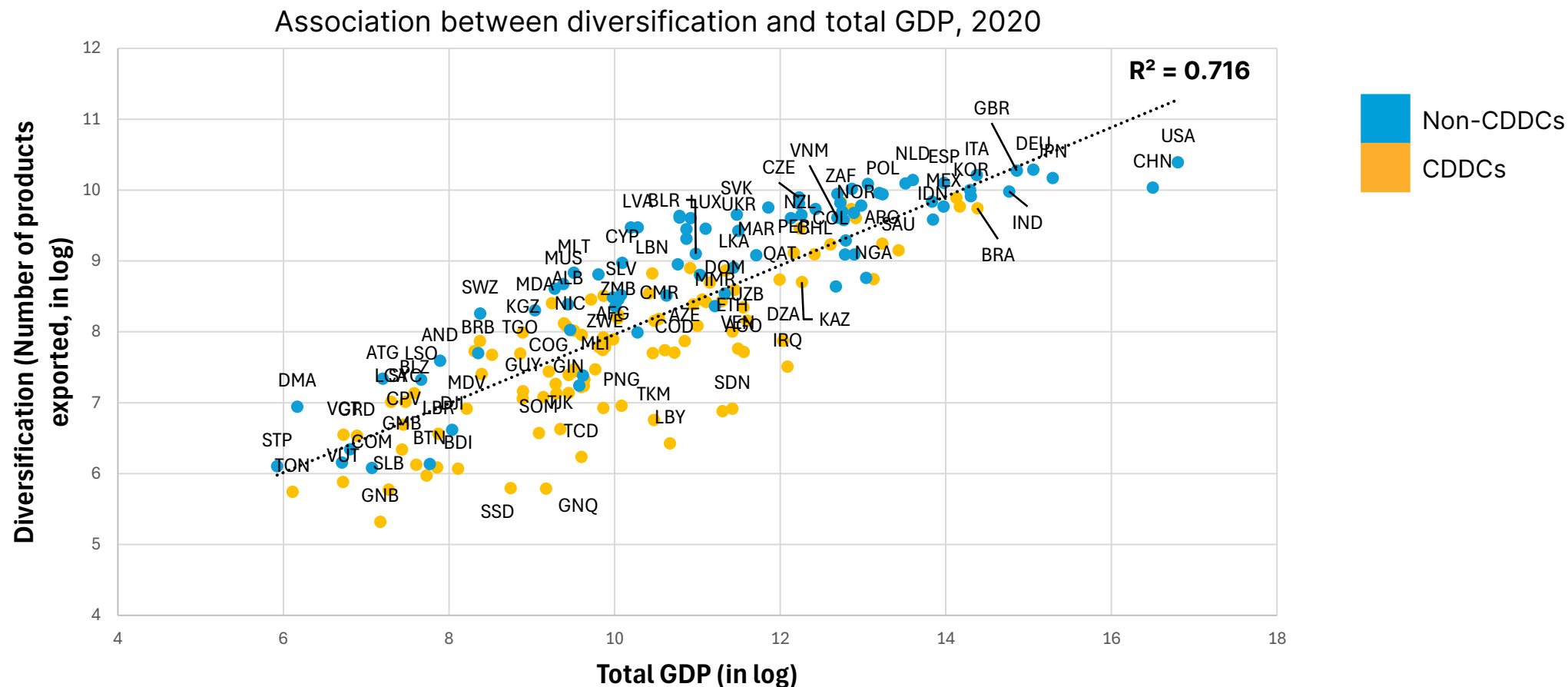
Country 2

1980, \$ 0.1 Billion

2023, \$ 404 billion



# ➤ Higher total GDP is associated with diversification



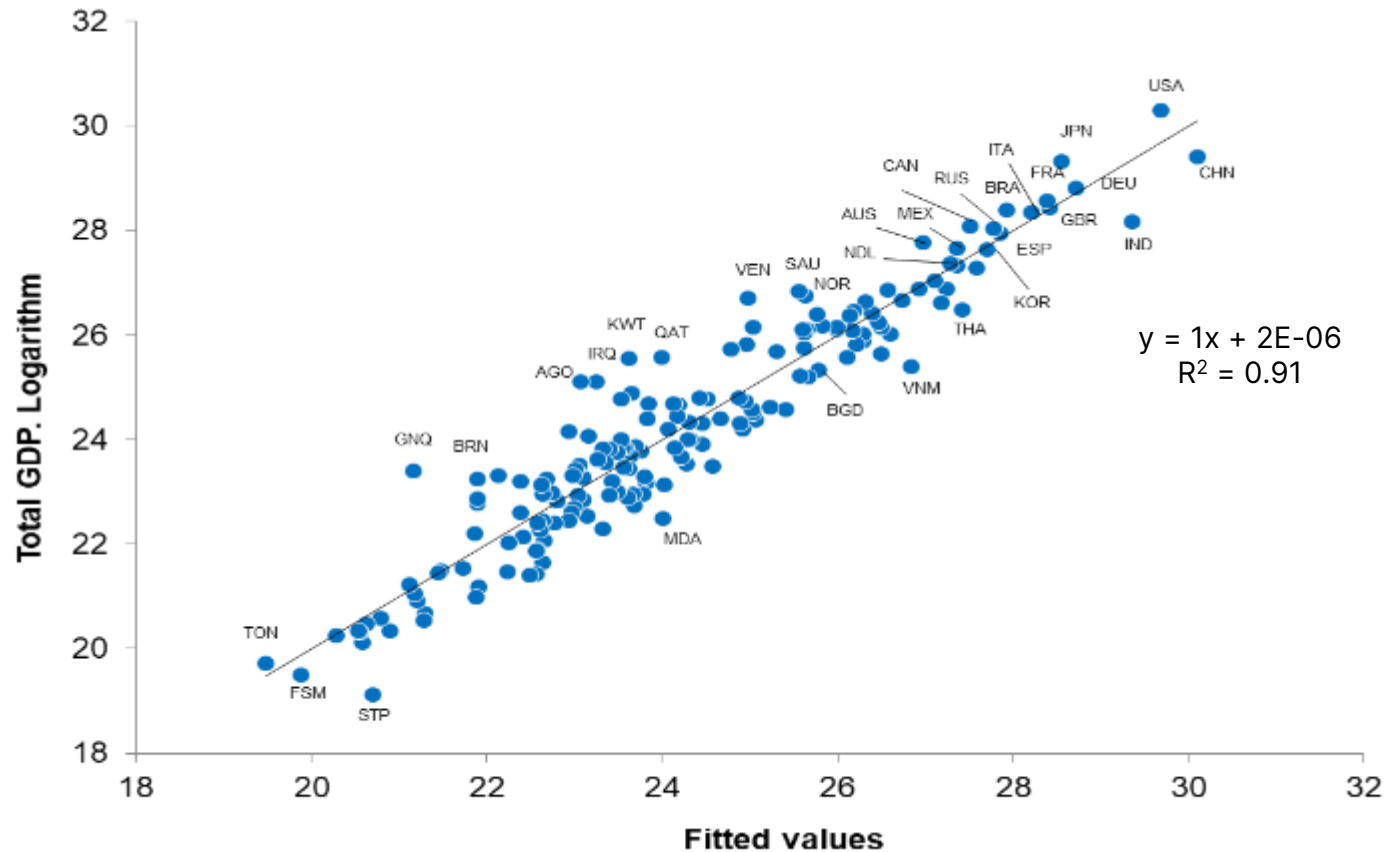
Note: 2020 data, Number of products is based on HS codes at the 6-digit level, disaggregated by unit value.

Source: UNCTAD based on Freire (2019) and data from UN COMTRADE.

# Diversify but how? The need for **strategic** diversification

# ➤ The imperative of diversification

Association between diversification and total GDP, 2020



Diversification + Average complexity  
+ Labor force size explain **91%** of  
**total GDP differences between  
countries**

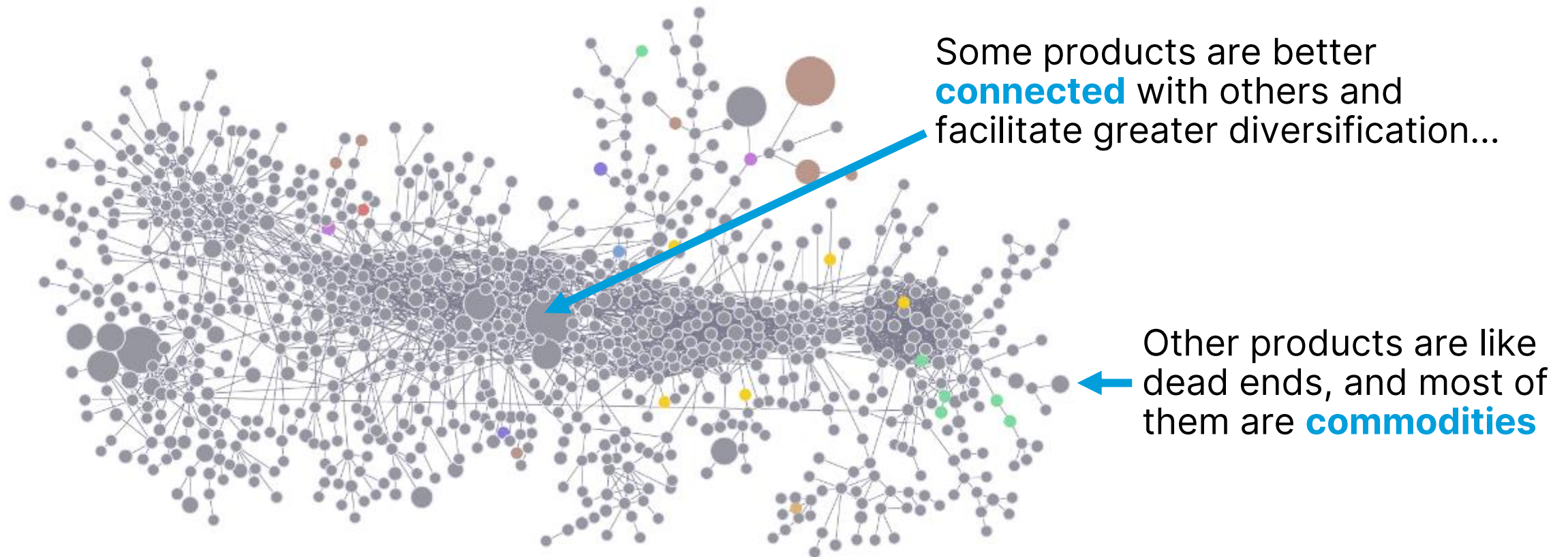
Structural Transformation that  
generates economic growth  
requires

**diversification +  
complexity**

*Note:* 2019 data, Number of products is based on SITC rev 3 5-digit data disaggregated by unit value as presented in Annex B – Data and methodology.

# ➤ Diversification is path-dependent

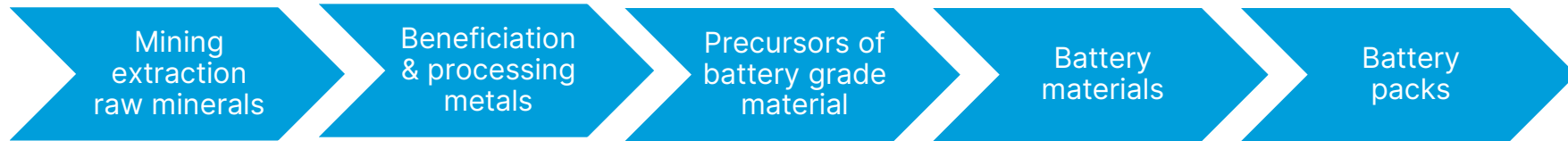
The **product space** displays the products connected to each other based on the likelihood that they will be exported together.



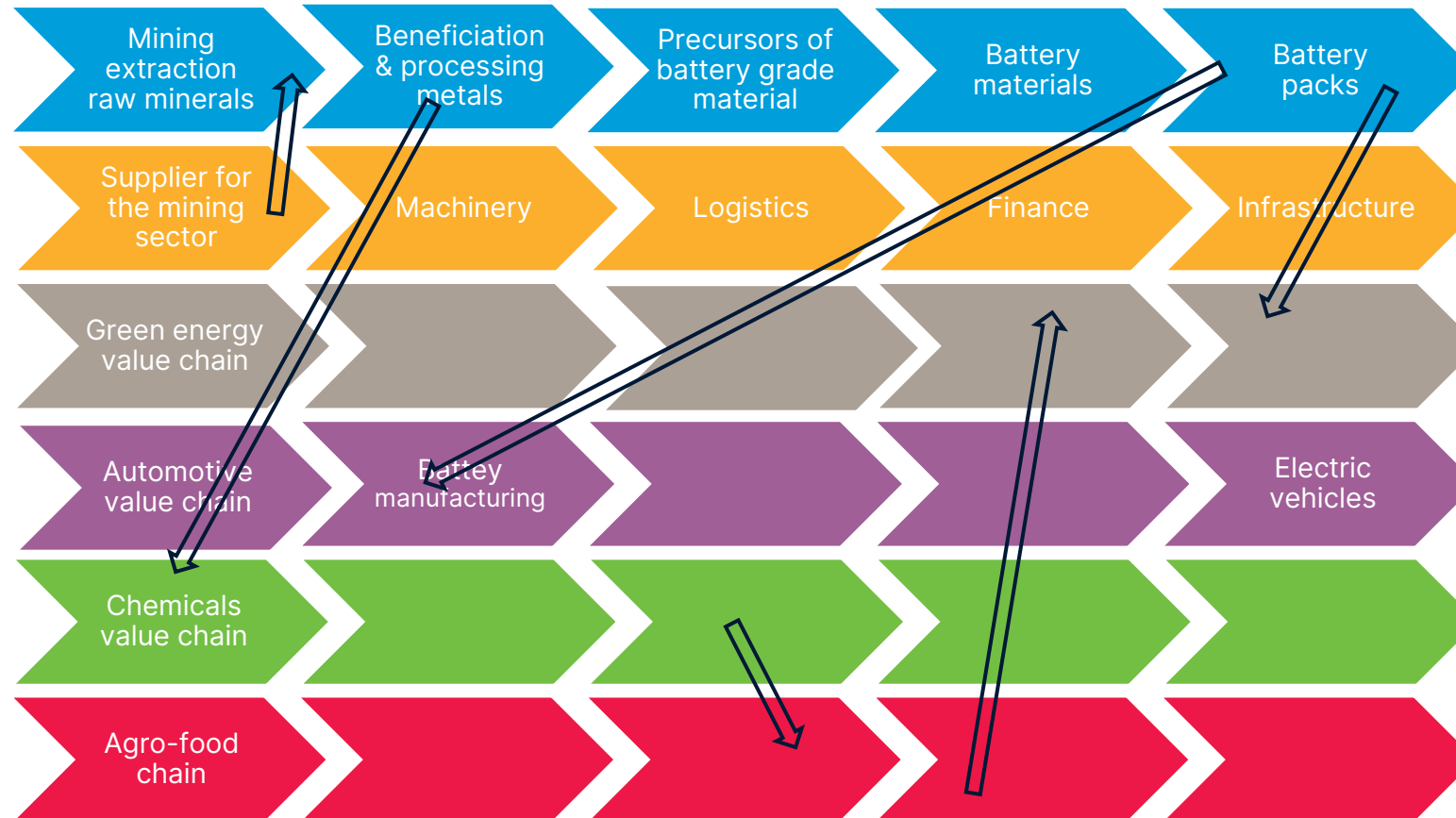


# Critical Energy Transition Minerals: Rapid Assessment of Value Addition and Diversification Capacity in Southern Africa

# ➤ **Value addition and diversification: Structural transformation perspective**



# ➤ Value addition and diversification: Structural transformation perspective



Source: UNCTAD based on Andreoni A and Avenyo E (2023). Critical Minerals and Routes to Diversification in Africa: Linkages, Pulling Dynamics and Opportunities in Medium-High Tech Supply Chains. Background paper commissioned by the UNCTAD secretariat for the 2023 edition of the Economic Development in Africa Report ([https://unctad.org/system/files/non-official-document/edar2023\\_BP1\\_en.pdf](https://unctad.org/system/files/non-official-document/edar2023_BP1_en.pdf)).

# **Objective**

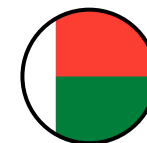
**Improve institutional capacity of selected Southern African governments in leveraging CETM value chains and identifying opportunities for value addition and broader diversification**

**Outcome 1:** Improved understanding of each country's strategic positioning within CETM value chains through stakeholder mapping and economic opportunities analysis

**Outcome 2:** Strengthened institutional and regulatory framework supporting CETM value addition and diversification

**Implementation** over **1 year** starting in March 2025, funded by the **Government of Japan**

## **Beneficiary countries**



Madagascar



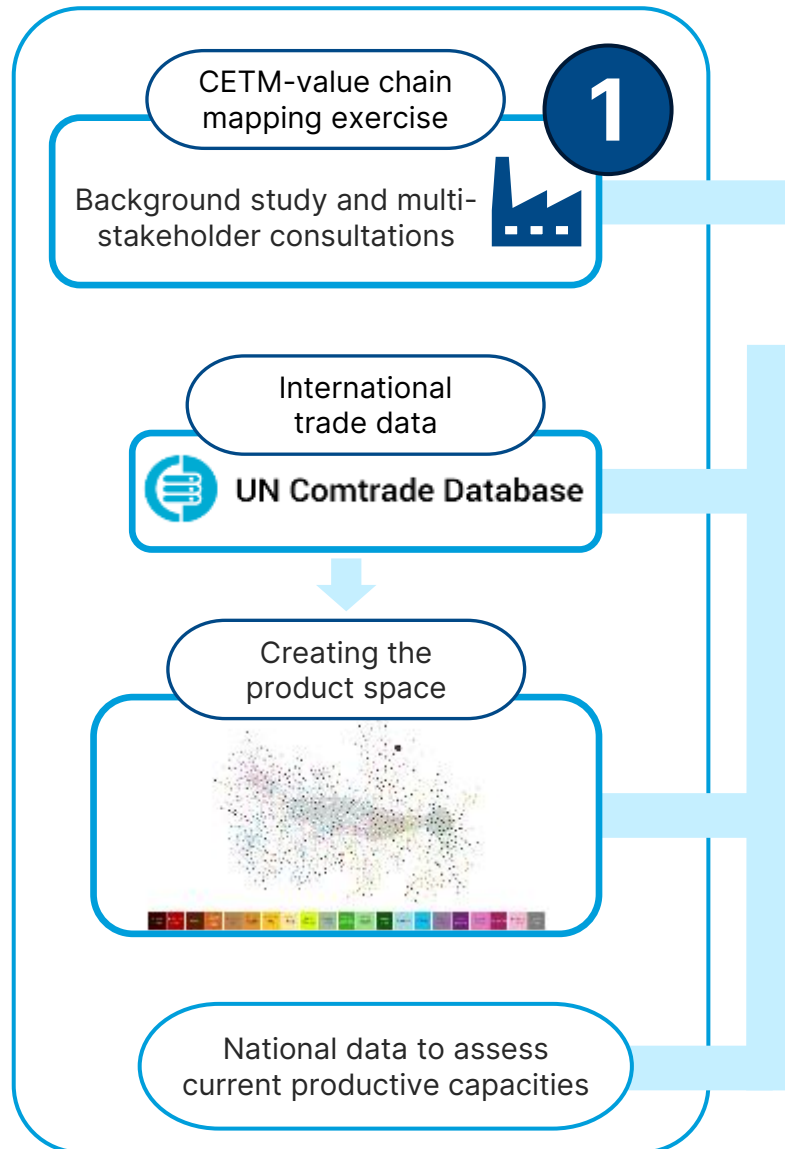
Namibia



Zambia



# Phase 1



Engagement from relevant stakeholders from the Government, businesses, NGOs, and civil society

Disaggregated trade data by province through respective **custodian agencies** to know what the country produces.



# Results using trade data

**Namibia**

# ➤ Opportunities for value addition and diversification

## World

Currently exporting 5,064 products

### Within the CETM value chain

33 products

\$220.8 million

weighed export opportunity

Chemicals



153.4 million

Copper, other  
minerals and  
metals



47.4 million

Electrical  
machinery and  
equipment



7.6 million

Machinery and  
mechanical  
appliances



6.1 million

Plastics



5.7 million

Iron and steel



0.7 million

### Beyond the CETM value chain

167 products

\$590.3 million

weighed export opportunity

Plastics



140.9 million

Iron and steel



114.1 million

Chemicals



103.4 million

Food  
processing



69 million

Machinery and  
mechanical  
appliances



54.4 million

Paper and  
paperboard



44.9 million

Electrical  
machinery and  
equipment



38.1 million

Pharmaceuticals  
and healthcare

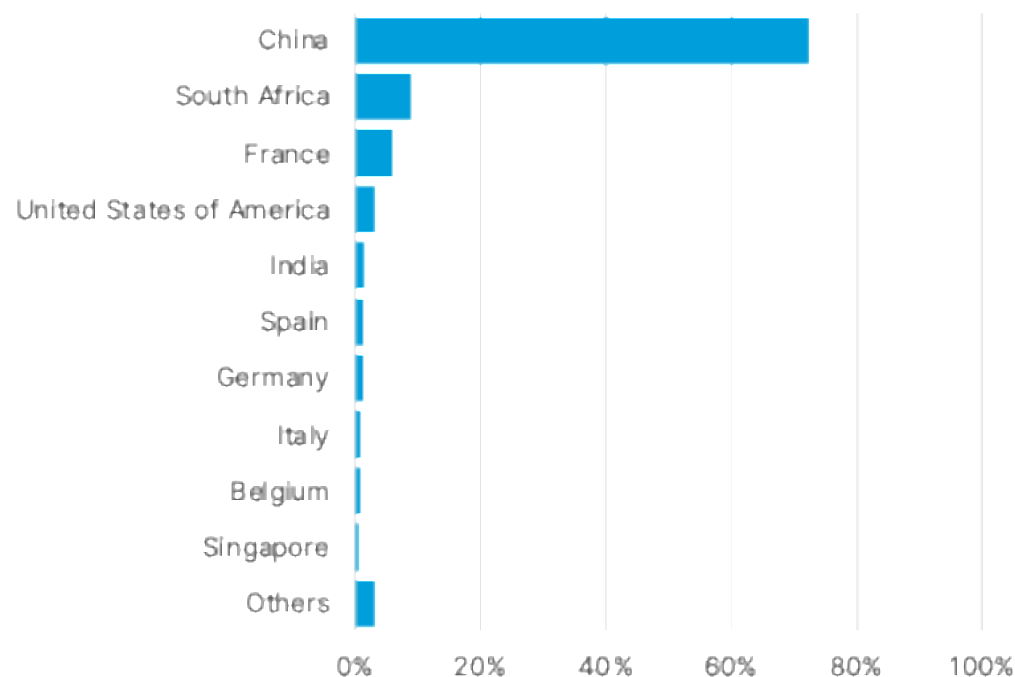


25.5 million

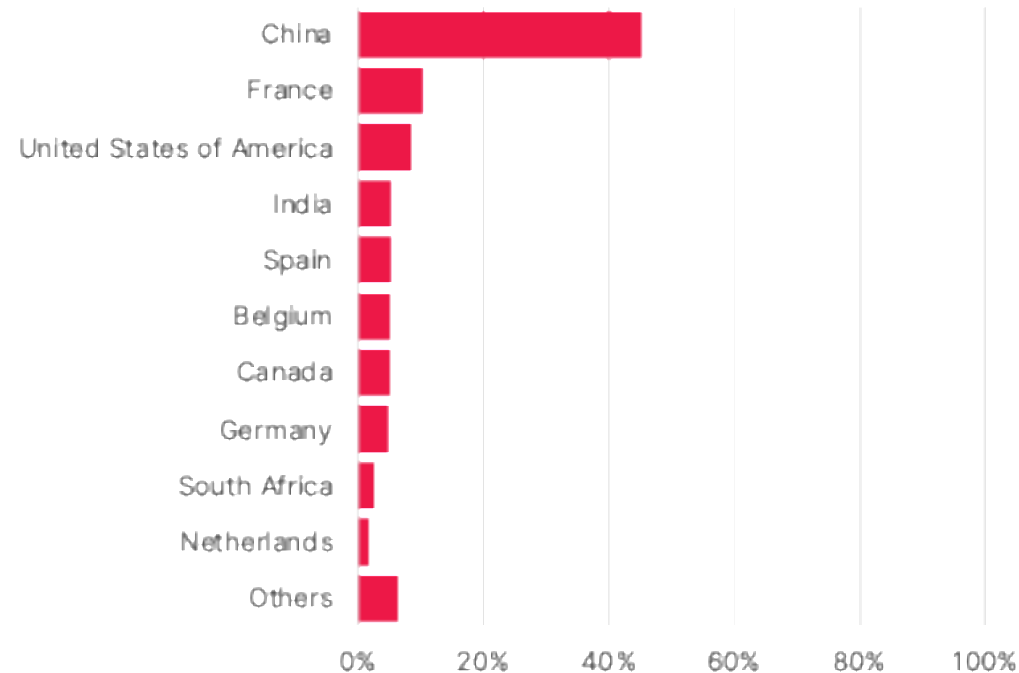
# ➤ Main markets for potential new products

## World

**Within** the CETM value chain:  
Percentage of total export opportunity



**Beyond** the CETM value chain:  
Percentage of total export opportunity





# ➤ Import substitution opportunities

## Within the CETM value chain

**15** products  
**\$27.6** million  
import opportunity

Iron and steel



14.2 million

Electrical  
machinery and  
equipment



5.1 million

Chemicals



2.5 million

Machinery and  
mechanical  
appliances



2.5 million

Plastics



2.5 million

Copper, other  
minerals and  
metals



0.8 million

## Beyond the CETM value chain

**53** products  
**\$89.2** million  
import opportunity

Plastics



32 million

Paper and  
paperboard



30.4 million

Iron and steel



12.1 million

Chemicals



8.2 million

Machinery and  
mechanical  
appliances






4.7 million

Food  
processing



1.7 million

# ➤ Examples of identified products

	HS Code	Product Description	Unit Price Range (US\$)	Total Export Opportunity (US\$, million)	Market 1 (US\$, million)	Market 2 (US\$, million)
 <b>Inorganic chemicals</b>	2826.90.90	Other products of the chemical industry, not elsewhere specified or included	10-15	100	50 (China)	50 (USA)
 <b>Machinery and mechanical appliances</b>	8483.90.90	Parts of metal-rolling mills	10-15	100	50 (China)	50 (USA)
 <b>Articles of copper</b>	7404.21.00	Refined copper wire of which the maximum cross-sectional dimension exceeds 6mm	10-15	100	50 (China)	50 (USA)

# ➤ Opportunities for value addition and diversification

## SADC

Within the CETM value chain

25 products

\$152.5 million

unweighed export opportunity

Copper, other  
minerals and  
metals



83.5 million

Electrical  
machinery and  
equipment



23.4 million

Plastics



23.1 million

Machinery and  
mechanical  
appliances



9.4 million

Chemicals



7.1 million

Iron and steel



5.9 million

Beyond the CETM value chain

102 products

\$182 million

unweighed export opportunity

Iron and steel



51.4 million

Chemicals



31.8 million

Machinery and  
mechanical  
appliances



28.2 million

Food  
processing



22 million

Electrical  
machinery and  
equipment



14.3 million

Paper and  
paperboard



13.9 million

Plastics



11.7 million

Pharmaceuticals  
and healthcare

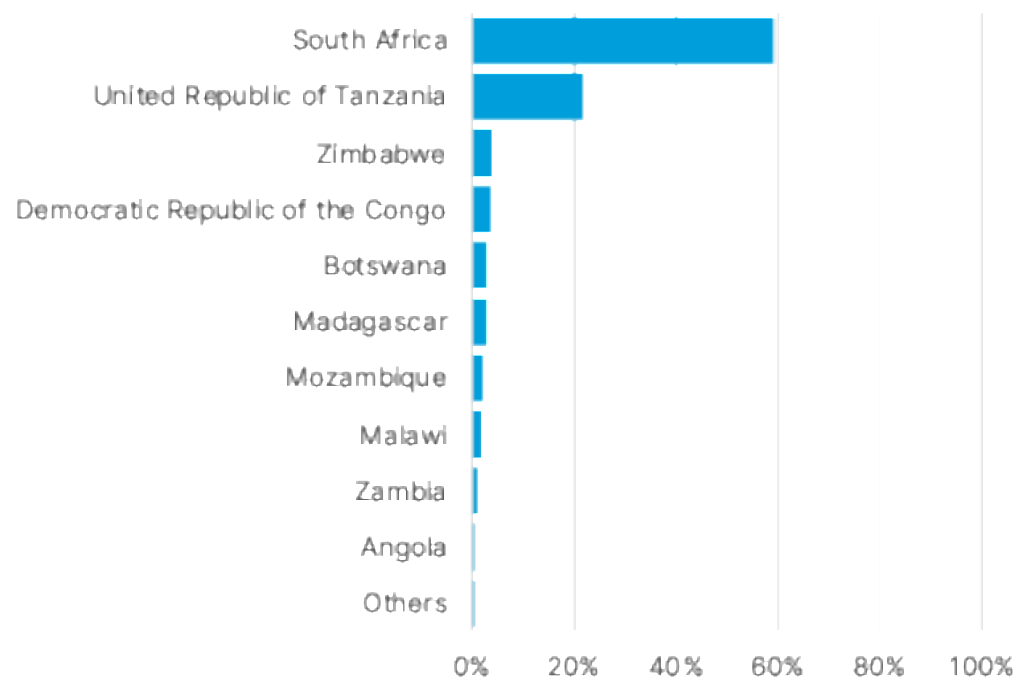


8.7 million

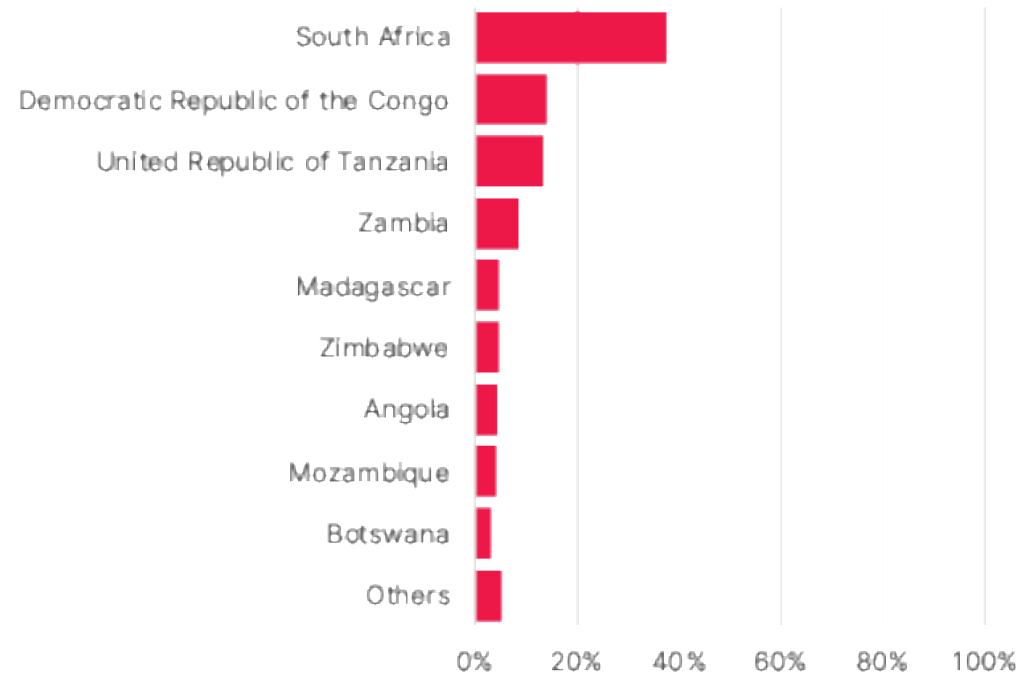
# ➤ Main markets for potential new products

## SADC

**Within** the CETM value chain:  
Percentage of total export opportunity



**Beyond** the CETM value chain:  
Percentage of total export opportunity





# ➤ Industry and policy engagement

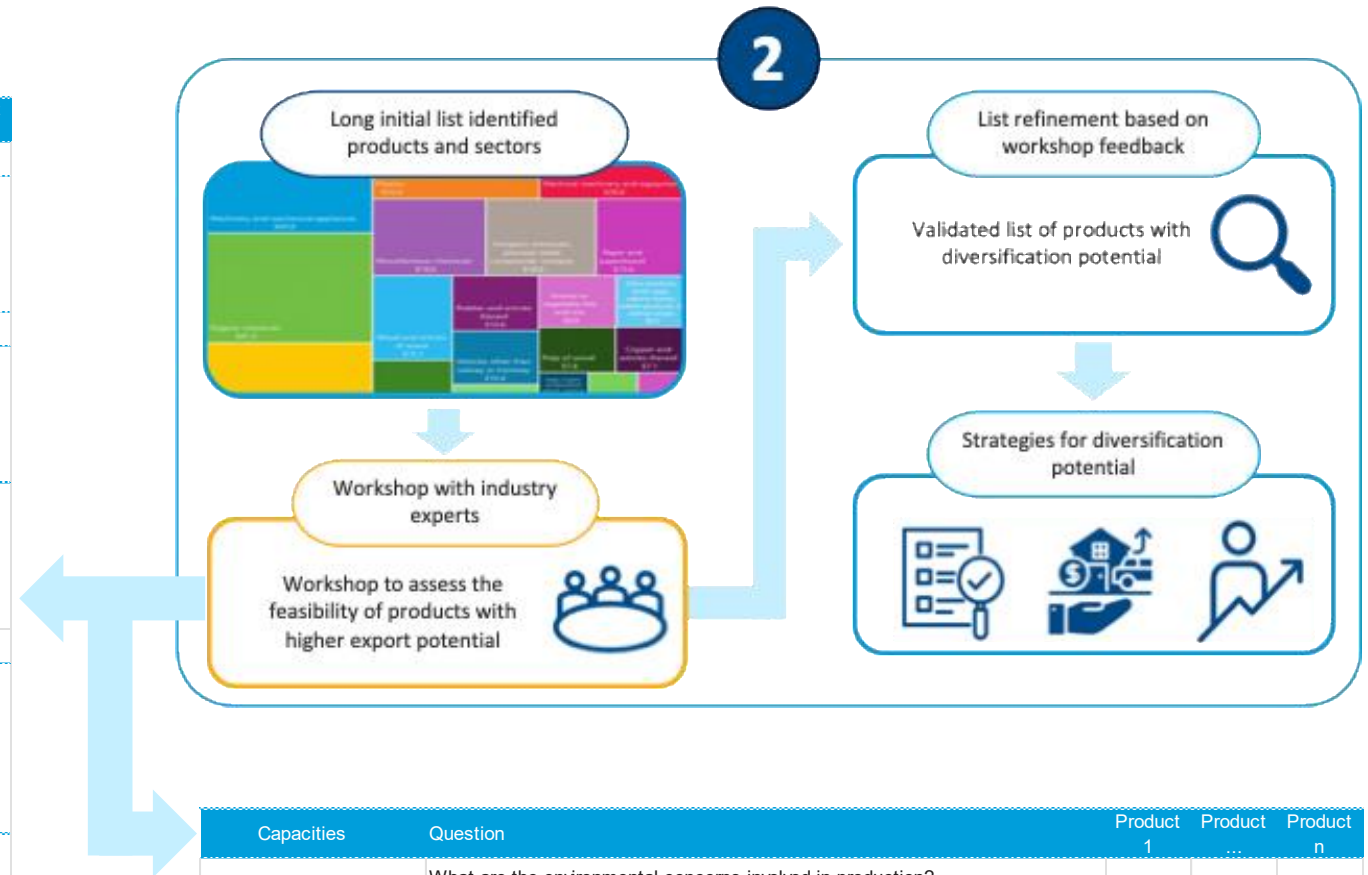
- ▶ Conducted semi-structured interviews for over **150 products** through a **5-day workshop**
- ▶ Discussed **policy instruments** with government



# Phase 2

## Industry workshop

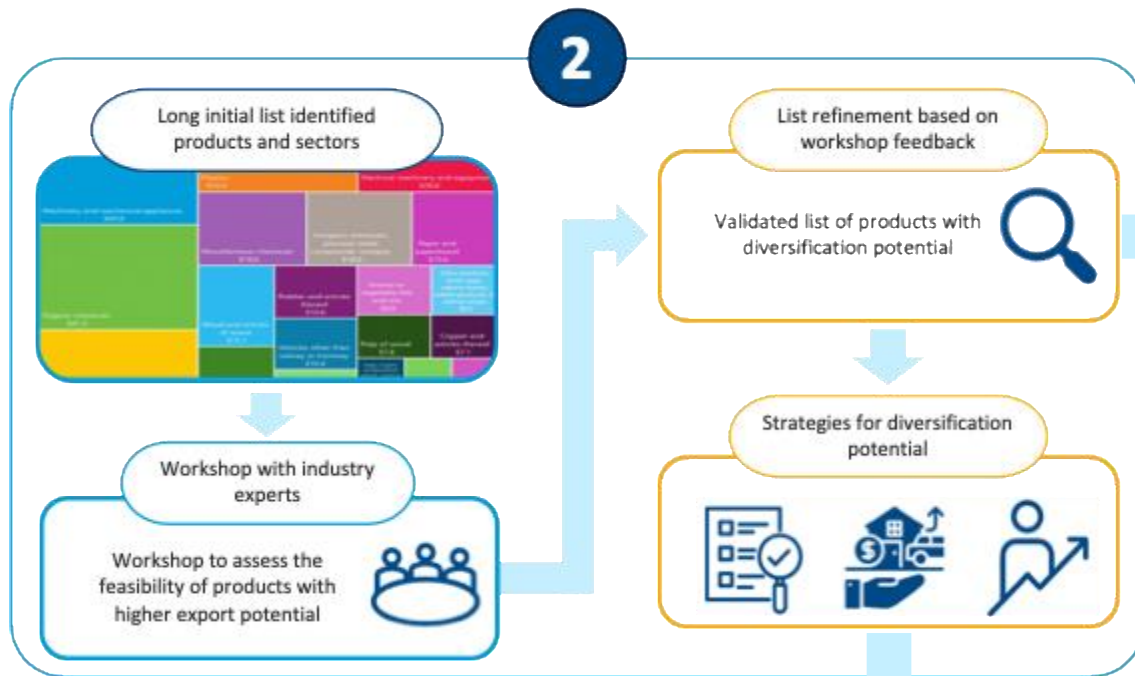
Capacities		Question	Product 1	Product ...	Product n
Production	Core inputs for production	What are the main inputs for production in terms of materials?			
		What is the origin of the main required inputs?			
		State / province			
		Country			
		World (specify)			
	Machinery	What are the critical machinery for production?			
		What is the origin of the main required machines?			
		State / province			
		Country			
		World (specify)			
	Technologies	What are the future-oriented technologies that can be used in production?			
		Artificial Intelligence / Machine Learning			
		3D Printing			
		...			
	Productive scale	What scale is required to make production economically viable?			
	Human resources (formation)	What is the required education level for production?			
		Higher education			
		Location			
		Technical / Technologist level			
		Location			
	Human resources (scale)	How many employees are needed for production?			
	Human resources (gender)	What is the usual gender composition in production?			
		Female			
		Male			
Infrastructure		What is the most important logistical infrastructure for the outflow of production?			
		Port or airport			
		Compared to other industries, how important are these resources for production? Rate as 1 (below), 2 (average), and 3 (above)			
		Water supply			
		Energy			



Capacities		Question	Product 1	Product ...	Product n
Sustainability		What are the environmental concerns involved in production?			
		Carbon emissions			
		Water pollution			
		...			
Utility		Which industries/sectors use this product as an input?			
		Can you name industries/companies that use this input/product in the state / province?			
		Can you name companies that produce this input/product?			

Criteria can be tailored to local and national priorities

# > Phase 2



## Product prioritization

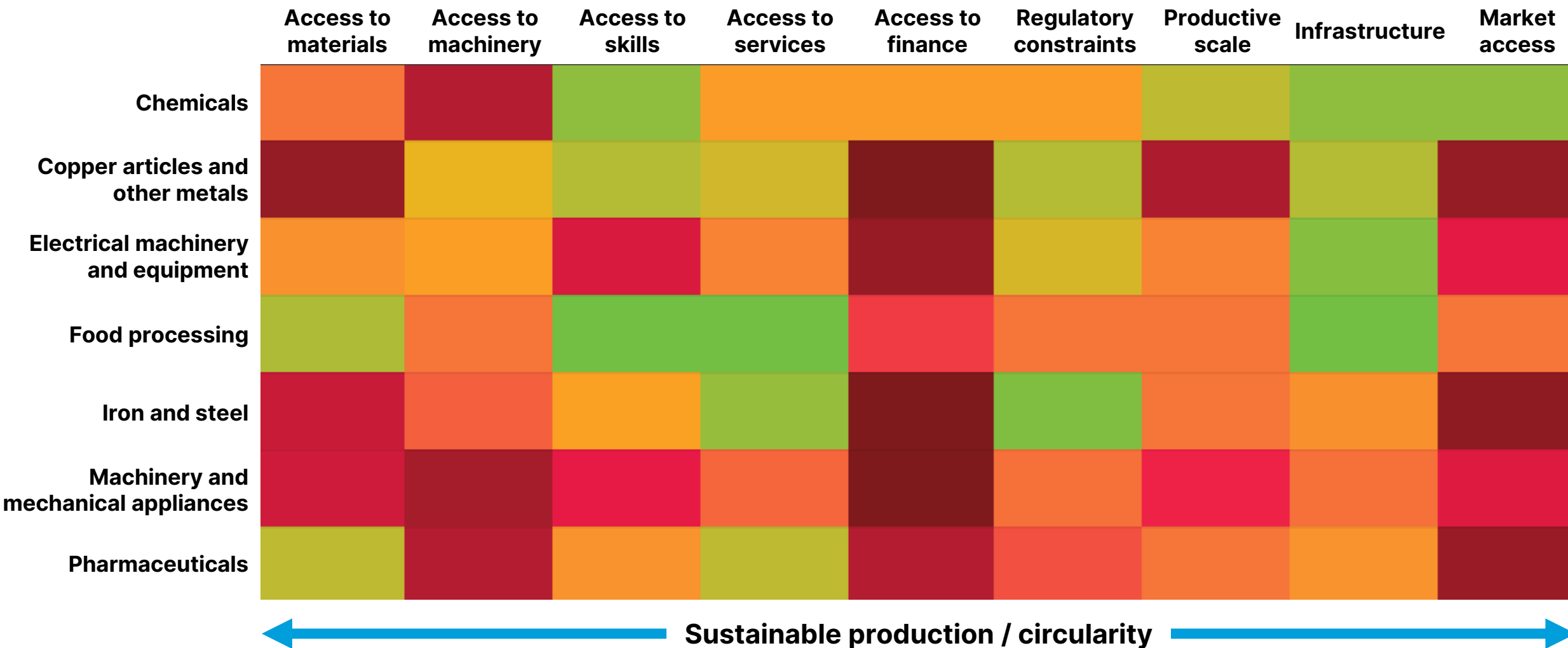
Products are evaluated based on agreed indexes. Scores are combined to determine the final classification and priority list.

Index	Scoring criteria
Inputs / capital	Local access
Employment	Comparison with sectoral median values
Gender	Proportion of female workers in the sector
Investment	Comparison with sectoral median values
Utilities (water and energy)	Comparison with sector references
Sustainability	Comparison with sector references

## Targeted policy instruments

Based on the final selection, a **workshop with policymakers** is conducted to present policy instruments needed to diversify into identified products and sectors.

# ➤ Policy engagement: Intervention areas across sectors





# ➤ Policy Instrument Example | Iron & Steel

- ▶ **Targeted Gap:** Heavy reliance on imported scrap metal, due to weak local collection and incentives.

**Instrument Type:** Regulatory + Institutional + Informational

**Instrument Description:** Implement a National Scrap Management and Recycling Scheme with

- (i) licensing and registration of scrap collection points,
- (ii) differentiated pricing and tax incentives for segregated, high-quality scrap delivered to local mills, and
- (iii) municipal by-laws and public campaigns that channel construction and end-of-life vehicle scrap into formal recycling rather than exports or dumps.

**Delivery Mechanism:** Register and license scrap collectors and yards; introduce differentiated pricing and tax incentives for segregated scrap sold to local mills; adopt municipal by-laws guiding scrap flows; run public awareness campaigns; and monitor material flows through basic reporting requirements.

**Responsible Institutions:** Ministry of Industries, Mines and Energy; municipalities; Ministry of Environment, Forestry and Tourism; scrap dealers; Namibia Revenue Agency; steel mills; transporters.

**Timeframe:**

- Regulatory setup and licensing (1 year, 2026).
- Incentive implementation (1.5 year, 2027).
- Monitoring and refinement (2 years, 2027–2028).

**Enabling Conditions:** Legal authority for new licensing and municipal by-laws; collaboration between municipalities, MEFT and tax authorities; sufficient demand from local steel mills; public awareness on scrap separation; and enforcement capacity to curb illegal exports or dumping.

# ➤ Same rationale for Zambia

## World

Currently exporting 4,312 products

### Within the CETM value chain

43 products

\$528 million

export opportunity

Inorganic chemicals



153.4 million

Machinery and mechanical appliances



47.4 million

Articles of nickel



7.6 million

Synthetic polymers



6.1 million

Articles of copper



5.7 million

### Beyond the CETM value chain

77 products

\$538 million

export opportunity

Synthetic polymers



280 million

Iron and steel



117 million

Paper and paperboard



35 million

Animal fodder



19 million

Miscellaneous chemicals



25 million

Machinery and mechanical appliances



17 million

Cereal, flour and other preparations



5 million

# > ... and Madagascar

## World

Currently exporting 3,869 products

### Within the CETM value chain

23 products

\$165 million

export opportunity

Machinery and  
mechanical  
appliances



71 million

Articles of  
copper



65 million

Mixed  
chemicals



15 million

Inorganic  
chemicals



4 million

Electrical and  
electronic  
equipment



124 million

Machinery and  
mechanical  
appliances



92 million

Optical, photo,  
medical and  
other apparatus



80 million

Iron and steel



63 million

Mixed  
chemicals



63 million

### Beyond the CETM value chain

257 products

\$865 million

export opportunity

Coffee, tea,  
mate and  
spices



36 million

Beverages,  
spirits and  
vinegars



15 million

Cereal, flour,  
starch and milk  
preparations



10 million

Vegetable, fruit,  
nut preparations



6 million

# Thank you

