UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

A2D
Accelerate to Demonstrate Facility

United Nations Industrial Development Organization (UNIDO)

Accelerate-to-Demonstrate (A2D) Facility

Accelerating the commercialization of transformational climate solutions in developing countries

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Workshop Agenda

Time	Activity
08:30 – 09:30	*Breakfast Networking and Registration*
09:30 – 10:00	Opening Remarks
10:00 – 10:45	UNIDO and Climate Innovation
10:45 – 11:15	*Coffee Break*
11:15 – 12:00	Current A2D Facility-Supported Demonstration Projects
12:00 – 13:00	Designing and Implementing Demonstration Projects: Monitoring, Reporting and Dissemination
13:00 – 14:30	*Lunch Break*
14:30 – 15:30	Market Assessments: Landscape of Innovators, Technologies, Existing Projects and Financing Mechanisms for Climate Innovation
15:30 - 16:00	*Coffee Break*
16:00 – 17:00	Gender Equality, Social Inclusion and Safeguards
17:00 – 17:30	Feedback Form, Workshop Wrap-Up and Questions and Answers
17:30 – 20:00	*Networking Reception*

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Opening Remarks

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Ms Gail Warrander

Lead – South Africa Just Energy Transition Partnership, UK High Commission

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Dr Rebecca Maserumule,

Programme Director Just Energy Transition, Implementation Plan Green Hydrogen, Industry Planning Unit, Industrial Development Corporation, South Africa

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Mr Diego Masera

UNIDO Representative, UNIDO Southern Africa Regional Office

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UNIDO and Climate Innovation

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United Nations Industrial Development Organization (UNIDO)

- UNIDO is the UN Agency for the promotion of inclusive and sustainable industrial development in developing countries.
- UNIDO focuses on three main priorities:

Supporting sustainable supply chains so that developing country producers get a fair deal and scarce resources are preserved.

Limiting climate breakdown by using renewable energy and energy efficiency to reduce industrial greenhouse gas emissions.

Ending hunger by cutting post-harvest losses and developing agribusiness value chains.

UNIDO's expertise:

- Technical assistance and capacity building
- Investment and innovation funding
- Partnerships and collaboration
- Policy dialogues

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Climate Innovation

- Adopt **systems innovation** approach to sustainable and inclusive industrial development, and to address climate change.
- Drive innovation across **key levers of change** (technologies, policies, financing, regulations, society and integrated solutions for climate mitigation and/or adaptation, nature, ozone protection, land and all sectors).

- UNIDO provides **support and expertise across the innovation chain** (earlier-stage to later-stage).

Areas-of-Focus:

- Support governments to **create ecosystems** (set policies, regulations and institutional capacity) to meet international obligations and create market for integrated climate solutions.

- **Enable industry** (start-ups, SMES, corporates and project developers) to drive innovation in the emergence, demonstration and large-scale adoption of integrated climate solutions.

- **Unlock the role of the private sector** in the transition to low-carbon and climate resilient development pathways.

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Multilateral Fund for the Implementation of the Montreal Protocol

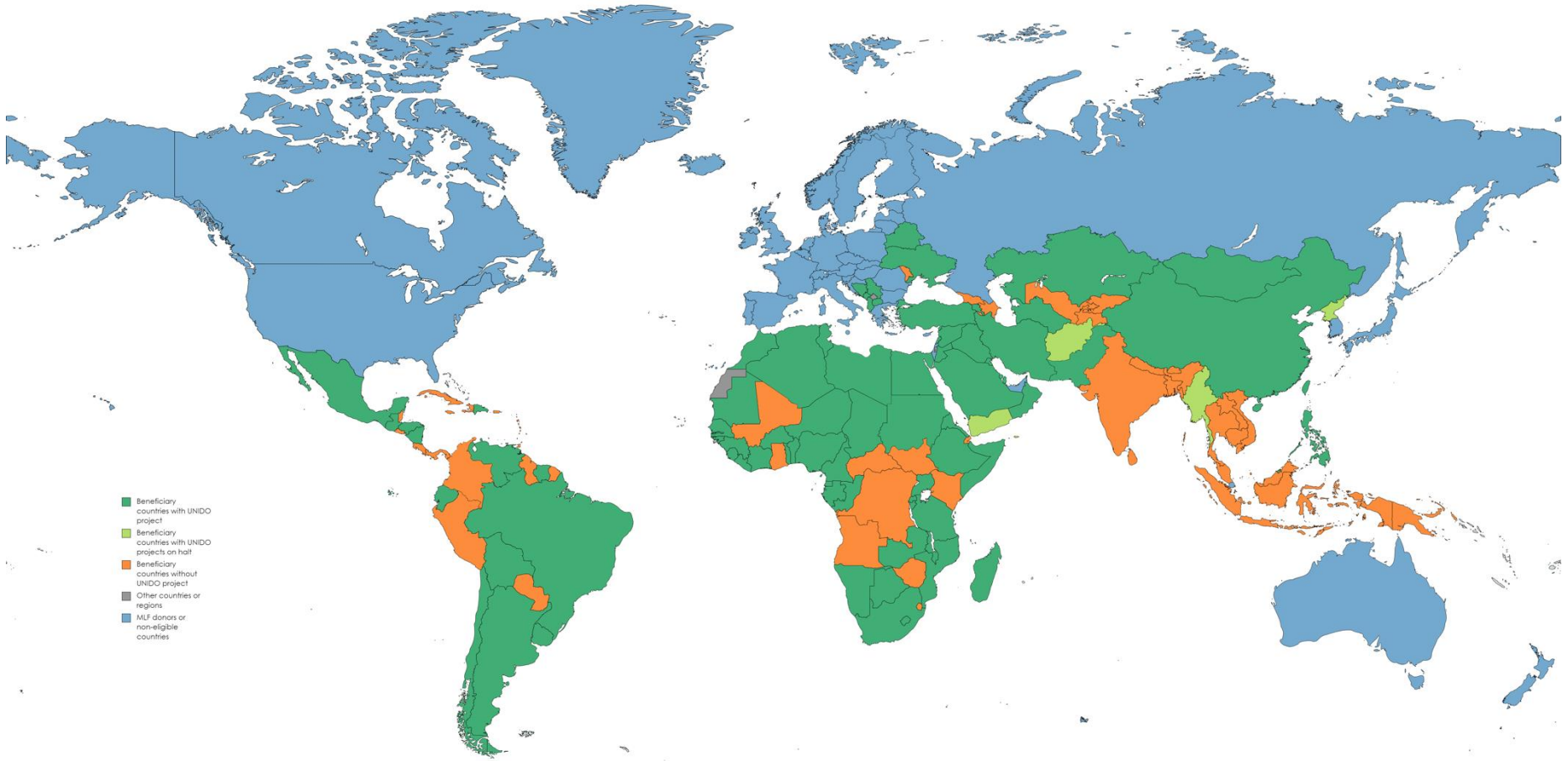
gef

GREEN CLIMATE FUND

ADAPTATION FUND

Climate Innovation

Bilateral: UK, Japan, Korea, EU



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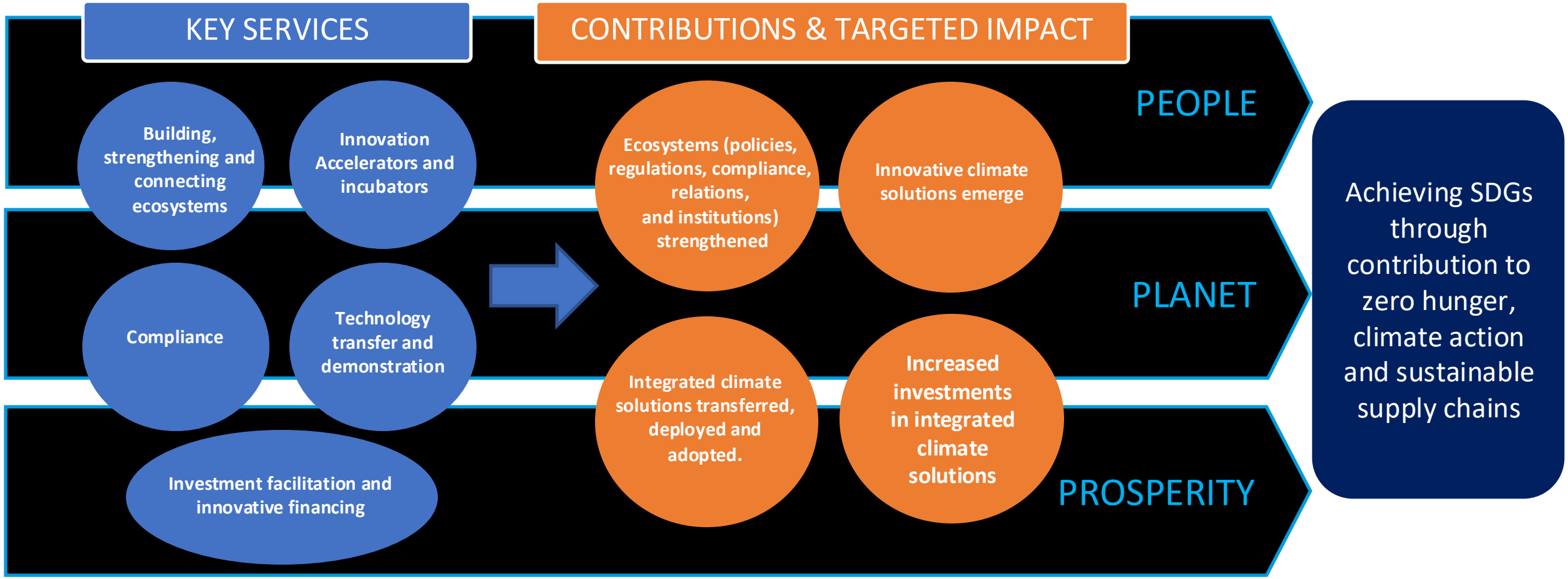
Contribution to UNIDO Priorities



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UNIDO in South Africa

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Accelerating the commercialization of transformational climate solutions in developing countries

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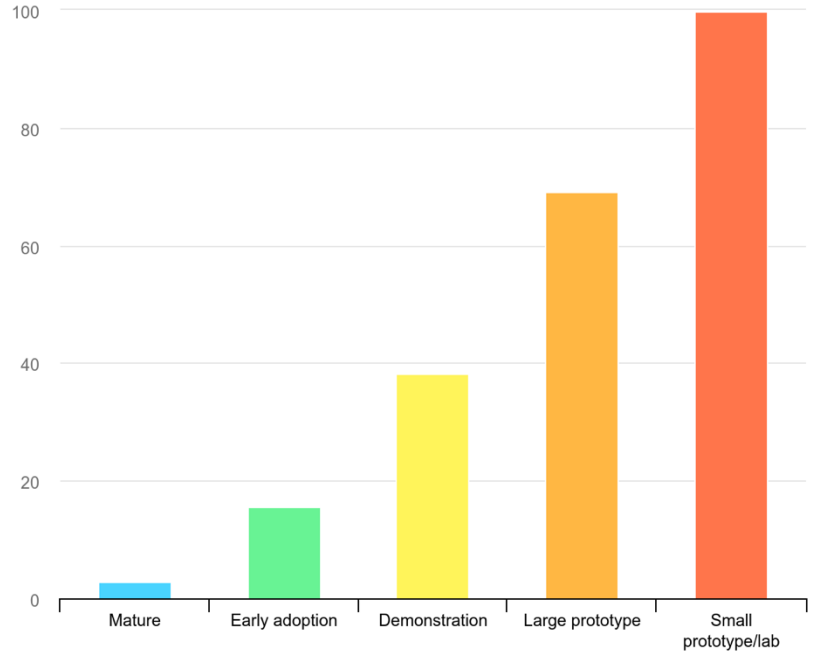
Deep Dive: Importance of Demonstration Projects

- Accelerating clean energy innovation is increasingly recognized as vital in global efforts to **combat climate change and to meet the Sustainable Development Goals** (SDGs).
- The International Energy Agency (IEA) highlights that almost 35% of the emissions reductions necessary for achieving a global **net-zero scenario by 2050 will come from technologies that are still in the demonstration** or prototype phase.
- Alongside the important need for leveraging private sector finance, at least USD 90 billion in public funding is needed globally by 2026 for clean energy demonstration projects to be commercially ready by 2030.
- The A2D Facility contributes to filling this important gap in support to developing countries by **targeting the demonstration phase of the innovation chain**, bridging earlier-stage and commercial-scale projects.

Relative increase in carbon dioxide emissions savings in 2050 by current technology maturity category:



Energy Technology Perspectives 2020. IEA, 2020.

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Overview of A2D Facility

The Solution

The A2D Facility aims to accelerate the commercialization of innovative clean energy solutions in developing countries by supporting catalytic and scalable demonstration projects in:

- **Clean hydrogen**
- **Critical minerals**
- **Smart energy**
- **Industrial decarbonization**

Initial Funding and Timescales

- **Initial contribution of ~USD 80 million** from the UK Government
- Initially operates from **April 2023 to March 2029**
- Projects supported through **calls-for-proposals** (first call in July 2024)
- Global (**developing country-focused**) programme
- **Grants of USD 1-5 million** per project.
- Main Sustainable Development Goals (**SDGs**)-of-focus:

Activities bringing **transformational solutions** to the market at scale.

Providing grant support for transformational demonstration projects with strong scalability potential.

Creating and **disseminating knowledge and experiences** to foster collaboration, learning and scalability.

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Thematic area: Critical Minerals

➢ **Challenge:**

- Critical minerals, vital for the clean energy transition across different sectors, such as industry, transport, power and buildings, face limited supply and availability concerns, and escalating demand.

➢ **Solution (A2D Facility's focus):**

- Supporting demonstration projects of innovative and transformational solutions to decarbonize re-fining, processing, recycling and re-use of critical minerals (exploration and extraction are out-of-scope).

Market Assessment on Accelerating Innovation in Critical Minerals

Programmes, Projects and Initiatives:

- A2D Facility
- Global Alliance and Partnership for Responsible and Green Minerals
- UN Framework on Just Transitions for Critical Energy Transition Minerals
- Artisanal Small-scale Gold Mining
- Global Electronics Management (GEM) Programme

UNIDO's expertise in Critical Minerals

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Thematic area: Clean Hydrogen

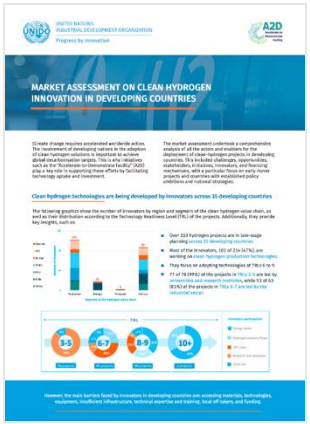
➢ **Challenge:**

Whilst an increasing number of countries are developing clean hydrogen strategies and projects, the urgency to tackle emissions necessitates a diffusion of support and capabilities, especially countries with abundant low-cost clean resources.

➢ **Solution (A2D Facility's focus):**

Supporting demonstration projects of innovative and transformational solutions to decarbonize across the clean hydrogen value chain across different sectors, such as industry, power, buildings and transport.

Market Assessment on Accelerating Innovation in Clean Hydrogen



Programmes, Projects and Initiatives:

- A2D Facility
- Global Programme for Hydrogen in Industry
- GEF-8 Global Clean Hydrogen Programme (GCHP)
- Net Zero Partnership

The focus areas for UNIDO's interventions are:

- Policies
- Standards
- Financial instruments
- Skills and knowledge
- Innovation
- Coordination & convening

UNIDO's expertise in Clean Hydrogen

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Thematic area: Smart Energy

➢ **Challenge:**

Industries in developing countries, such as manufacturing, power, transport and buildings, often face inefficiencies in energy use, emissions and access.

➢ **Solution (A2D Facility's focus):**

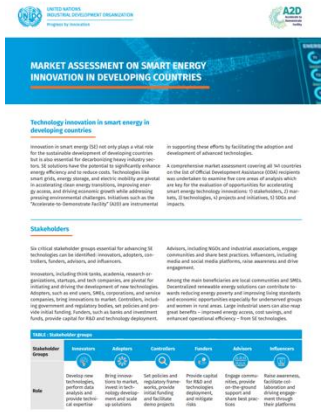
Supporting demonstration projects of smart energy technologies, such as machine learning, blockchain, digital twins, Artificial Intelligence (AI) and smart grid-enabling solutions, to optimize and digitalize energy management across different sectors, such as transport, industry, power and buildings.

Programme, Projects and Initiatives:

- A2D Facility
- Global Alliance on AI for Industry and Manufacturing
- UNIDO 4IR Strategic Framework to accelerate the attainment of inclusive and sustainable industrial development by 2030

UNIDO's expertise in Smart Energy

Market Assessment on Accelerating Innovation in Critical Minerals


MARKET ASSESSMENT ON SMART ENERGY INNOVATION IN DEVELOPING COUNTRIES

Technology innovation in smart energy in developing countries

Stakeholders

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Thematic area: Industrial Decarbonization

➢ **Challenge:**

Forecasted growth in industrial emissions in developing countries due to rapid urbanization and an increase in middle-class consumers, poses a challenge for global efforts to combat climate change.

➢ **Solution (A2D Facility's focus):**

Supporting demonstration projects of innovative and transformational solutions in different industries in developing countries, such as manufacturing, processing and energy-intensive industries.

Programmes, Projects and Initiatives:

- A2D Facility
- Industrial Deep Decarbonisation Initiative (IDDI)
- Net Zero Partnership
- Circular Economy programme
- Persistent organic pollutants (POPs) management

UNIDO's expertise in Industrial Decarbonization

Market Assessment on Accelerating Innovation in Industrial Decarbonization

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A2D Facility Year 1 and 2 Key Milestones

COP27 SHARM EL-SHEIKH EGYPT 2022

Initial announcement

7 November 2022

Initial announcement of the new clean energy innovation facility at COP 27.

Official launch

15 May 2023

Official launch of the A2D Facility by UNIDO's DG and UK Ambassador.

Participation in Asia Clean Energy Forum

3 - 6 June 2024

Organization of three events at the Asia Clean Energy Forum.

Call-for-Proposals annuncement event

18 July 2024

Announcement event to launch the first Call-for-Proposals, led by UNIDO Director General Gerd Müller. Launch of the A2D Facility Year 1 Annual Report and A2D Facility website.

Launch of Market Assessments at COP29

14 - 16 November 2024

Launch of 3 market assessments on Critical Minerals, Clean Hydrogen, and Smart Energy & Industrial Decarbonization at COP29.

First demonstration projects begin

January 2025

Selection of the first five supported demonstration projects, with at least one project per thematic area.

Completion of GESI-ESS project

31 March 2025

GESI-ESS Action Plans developed.

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Upcoming Events: A2D Facility Annual Event (19 – 22 May 2025)

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Upcoming Events: A2D Facility Annual Event (19 – 22 May 2025)

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Upcoming Events: A2D Facility Annual Event (19 – 22 May 2025)

Monday, 19 May	Tuesday, 20 May			Wednesday, 21 May		Thursday, 22 May
	Check-in			*Check-in*		**Site visits** Two options: - Kiru Tea Factory - Olkaria Geo-thermal Power Plant
	Plenary session 1: Opening (9:00-10.30 am)			**Impacts session 2: Environmental and social safeguards** (9.00-10.30am)	**Thematic session 4.1: Industrial decarbonization** (09.00-10.30am)	
	Coffee break: 10.30 - 11.00 am					
Arrival of participants	**Thematic session 1.1: Smart energy** (11.00-12.30pm)	**Thematic session 2.1: Clean hydrogen** (11.00-12.30pm)	**Thematic session 3.1: Critical minerals** (11.00 – 12.30 pm)	**Impacts session 3: Gender equality and social inclusion** (11.00-12.30pm)	**Thematic session 4.2: Industrial decarbonization** (11.00 – 12.30 pm)	
	Lunch break 12.30 – 02.00 pm					
Registration and bilaterial meetings	**Thematic session 1.2: Smart energy** (2.00-03.30 pm)	**Thematic session 2.2: Clean hydrogen** (02.00 – 3.30 pm)	**Thematic session 3.2: Critical minerals** (2.00-3.30pm)	**Finance session 2: by UNIDO procurement** (2.00-3.30pm)		
	Coffee break: 3.30-4.00 pm					
	Impacts session 1: Monitoring, evaluation and dissemination (4.00-5.30pm)	**Finance session 1: Innovative financing mechanisms** (4.00-5.30pm)	*Free slot*	**Plenary Session 2: Closing** (4.00-5.30pm)		
Evening reception	**Evening reception (6.30-9.30pm)**			**Evening activity (6.30-9.30pm)**		

Location: Hyatt Regency Nairobi Westlands

Registration:

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Questions & Answers

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Coffee Break

10:45 – 11:15

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What is Innovation?

Menti.com

Use Code: 8549 5495

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Current A2D Facility-Supported Demonstration Projects

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Supporting Catalytic Projects to Transform Sectors

- **“Lighthouse” demonstration projects** in critical minerals, clean hydrogen, industrial decarbonization and smart energy.
- **Impacts on SDGs** 13 (climate action), 1 (no poverty) and 9 (industry, innovation and infrastructure) in supportive enabling environments that foster scalability.
- Projects at the demonstration phase and at the **implementation and operation stages of project development** *(earlier-stage pilot-testing or planning-related activities are out-of-scope)*.
- Strong focus on **sharing lessons-learned, dissemination and monitoring** (supported projects facilitating training and capacity building, regular high-quality monitoring and reporting, risk management, hosting study tours, and presenting in international events and workshops, alongside the construction and equipment implementation activities).

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Current A2D Facility-Supported Demonstration Projects

Smart Energy

Smart solar and storage microgrid for industrial-scale deployment at Laxmi Steel factory in Sunwal

Location: ***Nepal***

Peer-to-peer energy-sharing system to convert wasted renewables into community power

Location: ***Nigeria***

Industrial Decarbonization

Biomass gasification plant to power a Kenyan tea factory using local agricultural waste and biomass

Location: ***Kenya***

Clean Hydrogen

Ammonium sulphate fertilizer production facility powered by solar and clean hydrogen

Location: ***Namibia***

Critical Minerals

Local manufacturing of lithium-ion batteries for electric two-/three-wheeler motorcycles, and installation of charging infrastructure in urban and rural areas.

Location: ***Tanzania***

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Clean Hydrogen: Ammonium Sulfate Fertilizers from Renewable Hydrogen in Namibia

Objectives

- Produce green fertilizers, hydrogen, and ammonia to support carbon-free agriculture and reduce greenhouse gas emissions.
- Enhance local agriculture by improving fertilizer availability, affordability, and increasing productivity for farmers.
- Empower communities through job creation and capacity building in clean technology.

Transformational Project

- At the core is the **use of green hydrogen, generated via electrolysis powered by solar energy**. This clean hydrogen is used to synthesize ammonia, a key component of ammonium sulfate fertilizer.
- By replacing traditional fossil fuel-based production processes with green hydrogen, the project significantly reduces greenhouse gas emissions, improves energy efficiency, and promotes circular economy principles.
    - *Example of how clean energy can transform agriculture.*

PROJECT KEY INFORMATION

LEAD ORGANIZATION
The Daures Green Hydrogen Village

CONSORTIUM PARTNERS
- Enersense Energy Namibia
- Mondjila Project Advisory and Management
- Windhoek Consulting Engineers (WCE)
- Fichtner GmbH

DURATION
01 Feb 2025 - 31 Dec 2027

LOCATION
Namibia

THEMATIC AREA
CLEAN HYDROGEN

STAGE
Initiated

WEBSITE
www.daures.green

CALL
1st Call for Proposals

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Clean Hydrogen: Ammonium Sulfate Fertilizers from Renewable Hydrogen in Namibia

Expected Impacts

- **Environmental:**
  - Produces fertilizers using **renewable green hydrogen**, reducing greenhouse gas emissions.
  - Decreases dependence on **carbon-intensive fertilizer imports**, supporting sustainability.
  - Promotes **cleaner agriculture**, improving soil health and boosting biodiversity.
- **Social:**
  - **Involves local communities** with opportunities for ownership and direct benefits.
  - Improves **food security** and strengthens **local livelihoods** through better farming practices.
- **Economic:**
  - **Creates jobs** in construction, operations, and agriculture, boosting the local economy.
  - Lowers **fertilizer costs** for farmers, reducing the need for imports.
  - Stimulates growth in the **agricultural sector**, improving **economic resilience** in Namibia and meeting both local and international fertilizer demand.

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Industrial Decarbonization: "Green" Tea: Clean Heat and Power with Biomass Residues in Kenya

Objectives

- Operate a 500kW **gasifier using waste biomass to reduce emissions from tea production** by 30% and demonstrate reliable, cost-effective performance.
- Create 50 new jobs in biomass management, gasifier operation, and monitoring, with **a focus on women and youth, while linking energy use to climate and community results**.
- Develop a governance framework for environmental and social safeguards and create a **pipeline for scaling the project to more tea factories** and other industries.

Transformational Project

- The MicroHub gasifier converts local biomass into power and heat, **reducing fuel wood use and enabling tea factories to use 20% energy from prunings**, crop residues, and bamboo.
- Produces biochar (10-15%) to **improve soil fertility, increase tea yields, and sequester carbon**, promoting long-term environmental benefits.
- Supports green jobs, empowers women in energy, and promotes circular economy principles while strengthening value chains and sustainable land management.

PROJECT KEY INFORMATION

LEAD ORGANIZATION
Compact Syngas Solutions

CONSORTIUM PARTNERS
- Supivaa
- IITA

DURATION
01 Feb 2025 - 01 Mar 2028

LOCATION
Kenya

THEMATIC AREA
INDUSTRIAL DECARBONIZATION

STAGE
Initiated

WEBSITE
www.syngas-solutions.co.uk

CALL
1st Call for Proposals

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Industrial Decarbonization: "Green" Tea: Clean Heat and Power with Biomass Residues in Kenya

Expected Impacts

- **Environmental:**
  - **Improved soil health** enhances water quality, reduces erosion, and contributes to a more resilient local water cycle.
  - **Cleaner energy** from gasification replaces fuelwood, expanding biodiverse tree cover and restoring native forests, aiding carbon sequestration.
- **Economic:**
  - **Energy neutrality** through gasification reduces reliance on fossil fuels, lowers energy and fertilizer costs, improving factory margins and reducing vulnerability to price fluctuations.
- **Social:**
  - **Job creation and empowerment**: Supports green jobs and empowers local communities, particularly women, while fostering sustainable land management and improving livelihoods.

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Critical Minerals: Lithium-Ion Transport Solutions in Tanzania

Objective

To accelerate the commercialization of innovative clean energy technology in transportation sector using **locally manufactured** Electric Charged Lithium-Ion Batteries in Tanzania.

Transformational Project

The project's business model is based on three main pillars:

- **Local Lithium Battery Manufacturing:** Reducing reliance on expensive imports by producing cost-effective, high-quality lithium batteries within Tanzania.
- **Chassis Production and Assembly:** Producing durable, locally assembled chassis for electric two- and three-wheelers suited to the country's unique road conditions.
- **Charging and Battery Swapping Infrastructure:** Establishing a network of clean, affordable, and accessible fast charging and battery swapping stations to serve both urban and rural populations.

PROJECT KEY INFORMATION

LEAD ORGANIZATION
Oasis Financial Services Limited

CONSORTIUM PARTNERS
- Payless Energy Limited

DURATION
01 Feb 2025 - 29 Feb 2028

LOCATION
Tanzania

THEMATIC AREA
CRITICAL MINERALS

STAGE
Initiated

WEBSITE
www.oasisgroup.co.tz

CALL
1st Call for Proposals

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Critical Minerals: Lithium-Ion Transport Solutions in Tanzania

Expected Impacts

- **Environmental Impacts:**
  - 50,000 electric motorcycles produced each year
  - Reduces 65,000 tons of fossil fuel use annually
  - Lower CO_2 emissions from each bike, helping fight climate change
- **Social Impacts:**
  - 50% savings on fuel costs compared to gas-powered bikes
  - Less maintenance needed, so more time on the road
  - More charging stations and battery swap stations to keep bikes running smoothly
  - Creates jobs for both skilled and unskilled workers, especially for young people in Tanzania
- **Economic Impacts:**
  - Increased government revenue through taxes
  - Saves money by using fewer imported fuels and motorcycles
  - Lower transport costs and improved logistics

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Smart Energy: Grid Resilience through Intelligent PV and Storage in Nepal

Objectives

- The project will scale up from 100 kW to 2 MW, demonstrating the potential of smart solar storage microgrids to replace diesel generators and coal-based electricity in the industrial sector, supporting Nepal's clean energy goals.
- It will provide a concrete demonstration of the cost-effectiveness and reliability of smart solar and storage systems, paving the way for larger-scale deployments in Nepal and beyond.

Transformational Project

- Deployment of Nepal's largest battery-based microgrid (2 MW / 4 MWh battery, 1 MWp solar PV) at Laxmi Steel Factory, providing 100% generator-free backup for critical systems.
- The Microgrid Management System (MMS) will optimize battery and solar performance, ensuring reliable power without diesel and preparing the site for future grid services.
- Showcasing the viability of smart solar storage microgrids, setting the stage for wider adoption in Nepal and South Asia's industrial sectors.

PROJECT KEY INFORMATION

LEAD ORGANIZATION
Practical Action

CONSORTIUM PARTNERS
- Gham Power Private Limited Nepal
- Swanbarton Private Limited UK

DURATION
01 Feb 2025 - 01 Mar 2028

LOCATION
Nepal

THEMATIC AREA
SMART ENERGY

STAGE
Initiated

WEBSITE

CALL
1st Call for Proposals

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A2D Accelerate to Demonstrate Facility

Smart Energy: Grid Resilience through Intelligent PV and Storage in Nepal

Expected Impacts

- **Environmental:**
  - The microgrid will cut industrial emissions by displacing diesel, reducing CO_2, and improving local air quality.
- **Social:**
  - The provision of clean, stable energy improves workplace safety and community health. Solar training and safety protocols support workforce development and career advancement.
- **Economic:**
  - Clean energy lowers operational costs and stabilises energy supply. The ESS plan supports sustainability through risk mitigation, monitoring, and CSR activities such as biodiversity conservation, waste management, and community engagement.
- **Inclusion:**
  - The GESI plan supports inclusive employment by assessing workforce dynamics and establishing a policy framework. A dedicated steering committee will oversee implementation, track KPIs, and ensure active community participation – especially for women and marginalised groups.

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Smart Energy: Smart Grid Scale-Up in Nigeria

Objectives

- The project will distribute power from an anchor site to up to 20 consumers, electrifying 10,000 to 40,000 homes and businesses, especially in underserved rural and urban areas.
- It will reduce diesel consumption and carbon emissions while improving energy access and supporting livelihoods, with a focus on marginalized women and children.
- The model transforms solar PV owners into prosumers, encouraging clean energy investment, while data collected will help inform policy and infrastructure planning for scalable electrification.

Transformational Project

- Deployment of smart distribution hardware, low-loss AC grids, and energy trading software to automate energy distribution and enable remote monitoring and control.
- The system allows independent solar PV owners to trade energy with their communities, reducing payback time and attracting private investment in solar energy.
- Electrification of up to 40,000 households and businesses, using machine learning for generation and demand prediction, to democratize power generation and drive mass electrification in Africa.

PROJECT KEY INFORMATION

LEAD ORGANIZATION
Greenage Technologies Power Systems Ltd.

CONSORTIUM PARTNERS
- Nithio Inc
- SolarGis
- Eauxwell Nigeria Ltd

DURATION
01 Feb 2025 - 01 Mar 2028

LOCATION
Nigeria

THEMATIC AREA
SMART ENERGY

STAGE
Initiated

WEBSITE

CALL
1st Call for Proposals

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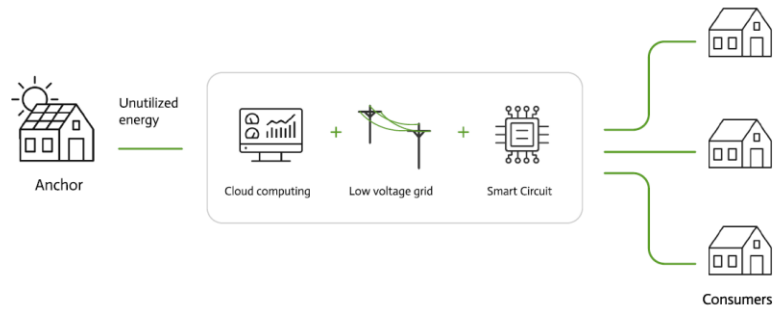
Smart Energy: Smart Grid Scale-Up in Nigeria

Expected Impacts

- **Environmental:**
  - Diesel generators will be replaced, and emissions reduced, by scaling solar PV utilization. This is especially important as Nigeria's population is projected to reach 500 million by the end of the century, driving energy demand that must be met sustainably.
- **Social:**
  - Small businesses, many of them run by women, face challenges in accessing reliable energy. Clean energy alternatives will empower these communities. In addition, improved electricity access supports access to information and education.
- **Economic:**
  - Replacing costly diesel with solar energy will lead to direct cost savings and reduce energy expenses for underserved communities.
- **Technological:**
  - The deployment of new technologies will contribute to continued innovation in Africa's energy landscape.



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Questions & Answers

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Designing and Implementing Demonstration Projects: Monitoring, Reporting and Dissemination

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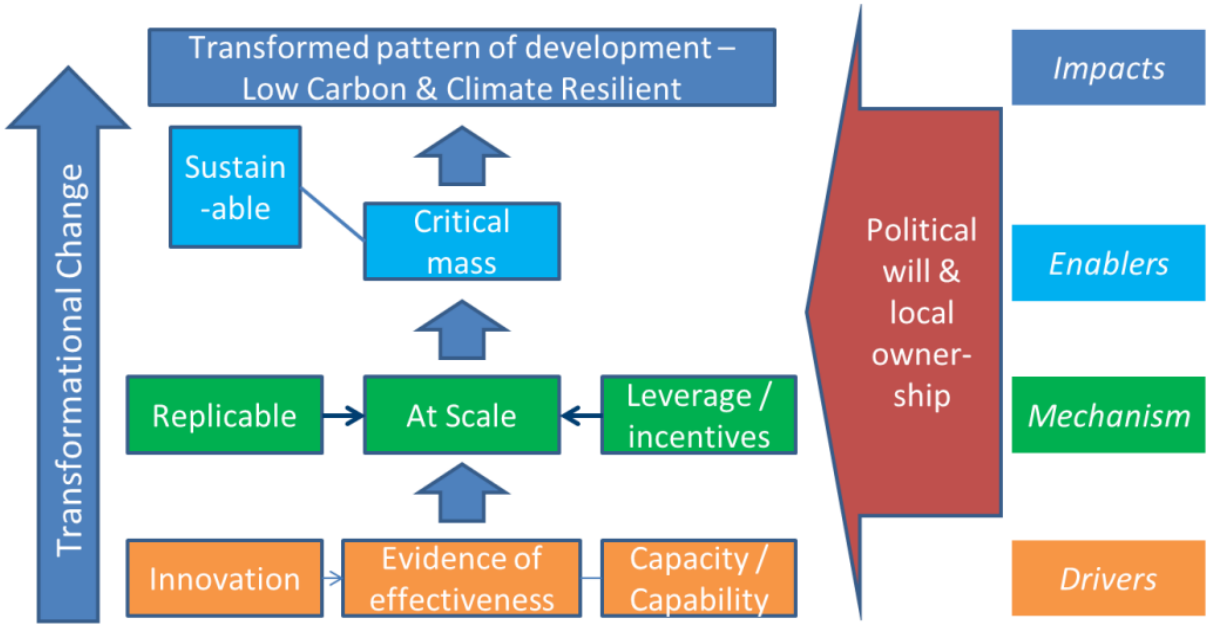
Discussion Questions

- If you are currently working on an innovative project, what are you doing to facilitate a catalytic and transformational impact?
- How are you overcoming any barriers faced?

Definition:
The transformational impact (*KPI-15*) indicator tracks early signs of transformation in projects, or the extent to which key activities either are being, or have a good likelihood of being, transformational.

Theory of Change for Transformational Change:



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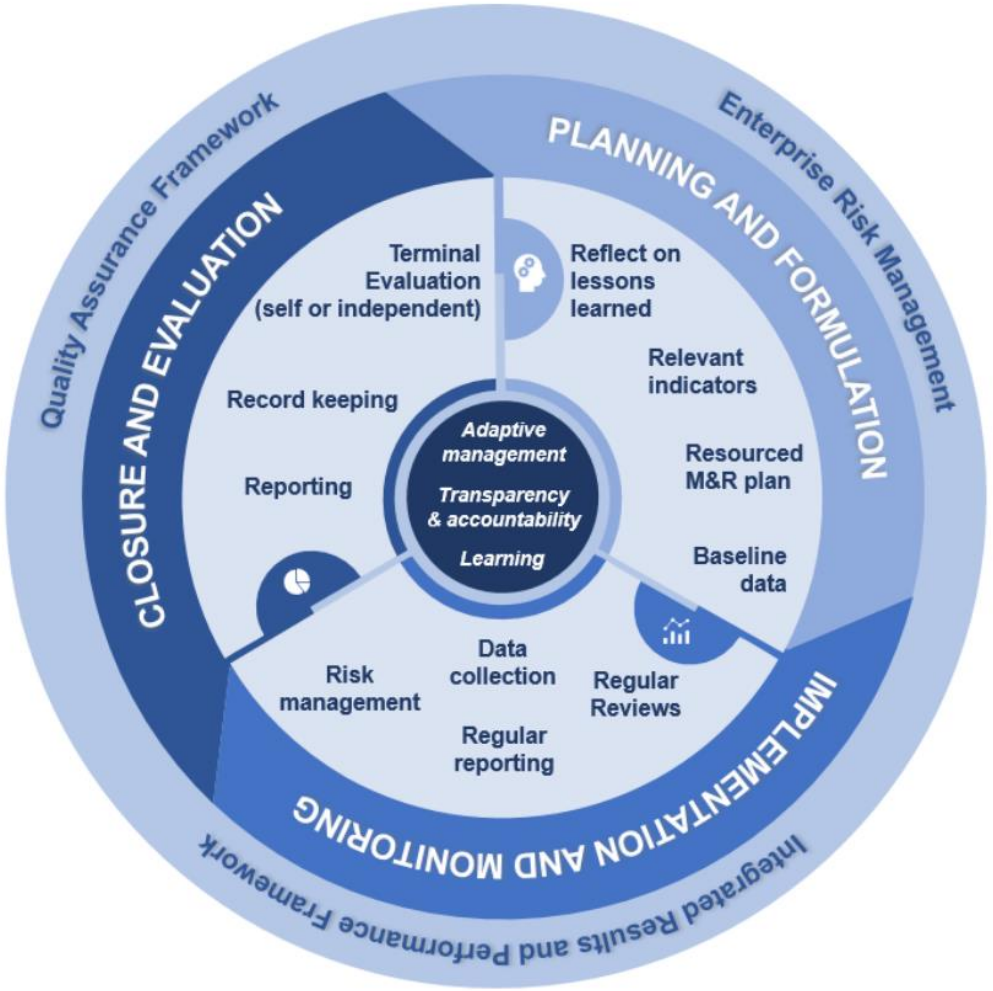
Monitoring

- Continuous examination of progress achieved during the implementation of a project to track compliance with the plan and to take necessary decisions to improve performance.
- UNIDO monitors all projects through a Logical Framework ("Logframe").
- Performance and payments linked to meeting agreed milestones, deliverables and results.



Reference: UNIDO (2021) "UNIDO Monitoring and Reporting Policy" (document DGB/2021/14)

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A2D Facility Logframe

IMPACT	OUTCOMES	OUTPUTS
Shaping a **sustainable shift in local markets** by enabling clean energy technology solutions that are ready for wider uptake, catalysing increased climate ambition and transformational change	Innovative clean energy technology **solutions are ready for wider uptake**, while creating confidence in wider stakeholders and market players to adopt, replicate and scale clean technology solutions.	Innovative clean energy **technology solutions show signs of progression** towards real world application.
	Demonstration **projects successfully demonstrate the benefits and feasibility of alternative clean energy technology** solutions, generating high quality learning and creating a 'lighthouse' effect.	**Increased knowledge** of, and demand for, innovative clean energy technologies.
	Enhanced knowledge, understanding, data and networks.	**Enhanced capacity, capability, resources and infrastructure** that enable clean energy innovation for sustainable long-term development.

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A2D Facility Logframe

IMPACT indicators	OUTCOMES indicators	OUTPUTS indicators
• Estimated greenhouse gas emissions reduced or avoided.	• Domestic and/or international attention. • Solutions increased in maturity and operational capability. • Public and private finance leveraged.	• Barriers addressed in the adoption of innovative technology solutions. • Relationships formed to accelerate market readiness of innovative clean technologies. • Knowledge sharing and dissemination activities. • Capacity building activities. • Contribution to SDGs achievement. • Demonstration project meets the criteria in the OECD DAC Gender marker.

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Enhancing Transformational Potential through Dissemination and Knowledge-Sharing

- Study tours and site visits to build the capacity of stakeholders that would enable the scalability and replicability of the demonstration project.

- Capacity building activities to share learnings, knowledge and skills from the supported demonstration project, such as in the planning, implementation and/or operation of the demonstration project.

- Knowledge-sharing and dissemination activities in local, regional and international events, workshops or equivalent on learnings and impacts from the supported demonstration project.

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Questions & Answers

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Lunch

13:00 – 14:30

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Market Assessments: Landscape of Innovators, Technologies, Existing Projects and Financing Mechanisms for Climate Innovation

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Outcomes from the Market Assessments

- x3 market assessments commissioned and completed in 2024 and published at COP29: Clean Hydrogen, Critical Minerals, and Smart Energy and Industrial Decarbonization.

- Focused on the landscape of technologies, stakeholders, innovators, initiatives, existing projects and delivery mechanisms in developing countries.

A2D Facility Market Assessments: Access the reports here

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Landscape of Innovators

Critical Minerals: A key takeaway from the assessment is that technological innovation in the mid- and downstream segments of the value chain in developing countries relies primarily on technology transfer from developed countries. With that said, homegrown technological innovation in the mid- and downstream segments of the critical minerals sector is slowly emerging in developing countries.

LAC

- Tech for extracting and refining lithium from salar brines and producing battery-grade lithium carbonate (M)
- Tech for extracting and refining lithium from clay deposits and producing battery-grade lithium carbonate (M)
- Tech for producing lithium-ion batteries using lithium carbonate (D)

AFRICA

- Modular tech for recycling lithium-ion batteries using safer chemicals and environmentally sound processes (D)

ASP

- Tech for processing nickel laterites (U/M)
  Tech for producing battery raw materials and battery-grade products (M)
- Tech for producing high-purity silicon ingot for silicon wafers, and solar cells, for solar panel manufacturing (D)
- Tech for recovering energy-critical metals (e.g. nickel hydroxide) from recycled lithium-ion batteries (D)

U = upstream	M = midstream	D = downstream

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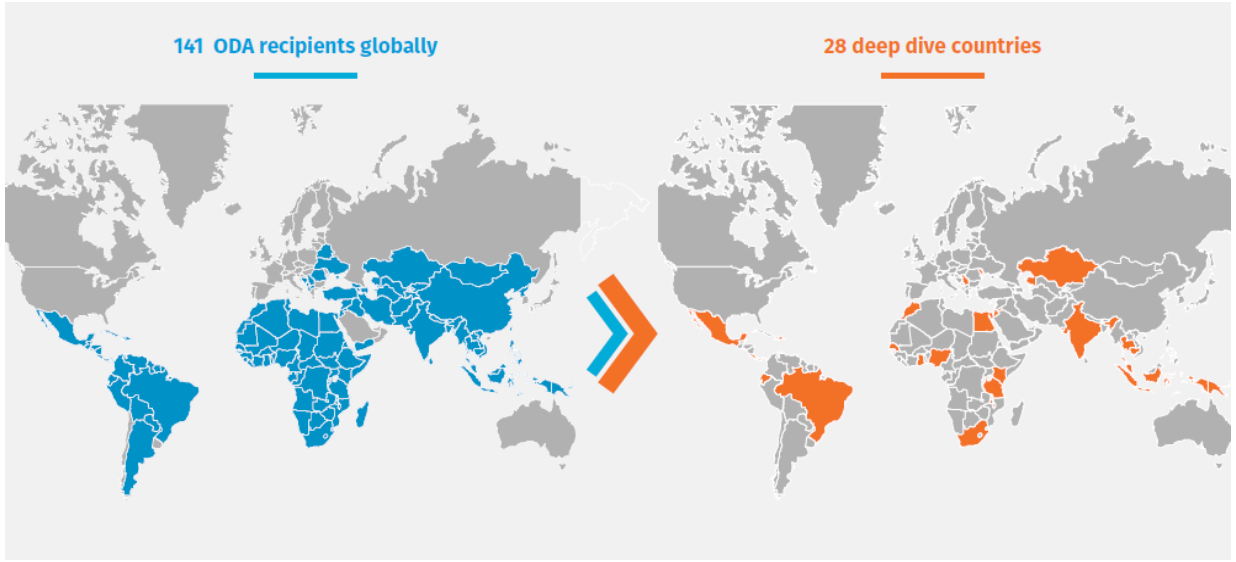
Landscape of Innovators

Clean Hydrogen: Over 200 innovators were identified in developing countries, with 69 of them in China (27.6%) and 43 of them in India (17.4%), both countries leading the way, largely due to strong governmental support. 75 of these innovators are universities (33.9%), 29 are research institutions (13.4%), 20 pure-play clean hydrogen developers (8.9%), and 16 energy companies (8.0%). Despite the presence of innovators, they are currently found in 42 of the 141 developing countries (29.7%). In regions such as Africa, where industrialization is generally still in earlier stages, clean hydrogen innovation remains limited as energy generation and electricity access take priority.



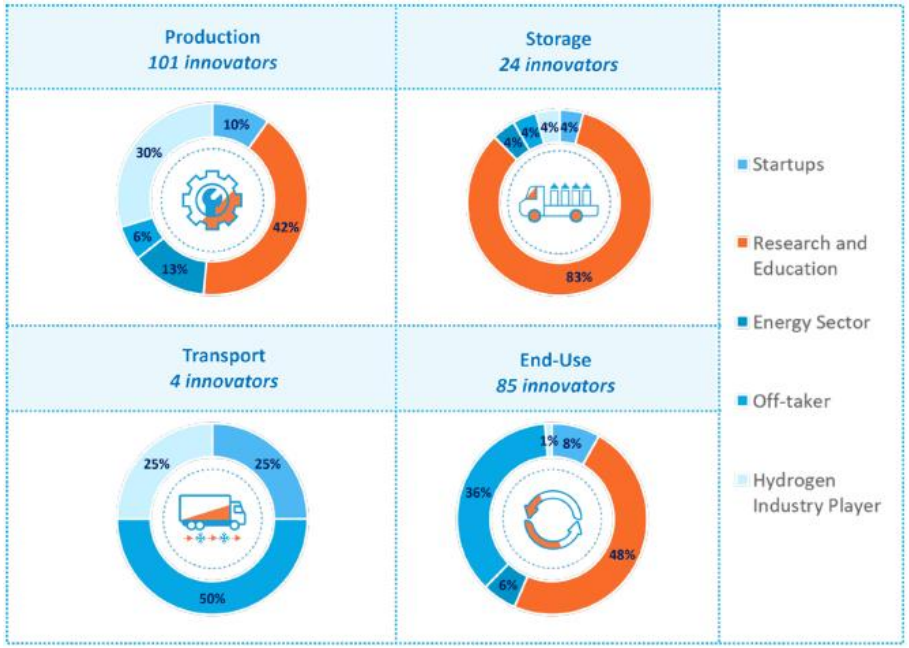


Figure 4. Number of innovators by segment of the clean hydrogen value chain.

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Landscape of Innovators

Smart Energy and Industrial Decarbonization:

The assessment found high-potential markets to include India, Brazil, Thailand, South Africa and Mexico due to stronger enabling environments and policy frameworks, which advance the continued reduction in the costs of renewable energy technologies, making them more accessible.

Table 4-1. Categories and sub-categories of Innovators

Research and Education	Energy Sector	Hydrogen Start-ups	Hydrogen Industry Players	Off-takers
Universities	Renewable energy companies	Start-ups	Pure-play clean hydrogen developers	Oil & gas companies
Research institutions	Electric power utilities and generators		Hydrogen technology equipment or component manufacturers	Automotive and transport companies
			Industrial gas companies	Chemical and fertiliser companies
				Other companies in hydrogen end-use applications

Adoption of innovative technologies in both smart energy and industrial decarbonization fall into four main categories: 1) political and legal, 2) economic, 3) technological and environmental, and 4) social.

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Landscape of Technologies

Critical Minerals:

- **Midstream:** encompasses the processing and refining of critical minerals into usable forms as well as the recovery of resources from mining by-products such as process tailings, electrorefining sludge, and pyrometallurgical slag.
- **Downstream**: extends beyond the manufacturing, assembly, and distribution of final products, and also covers the recovery, repurposing, and recycling of valuable materials from secondary resources, such as end-of-life manufactured goods.

List of
Critical minerals analysed

- Lithium
- Nickel
- Manganese
- Cobalt
- Graphite
- Rare Earth Elements (REEs)
- Copper
- Platinum Group Metals (PGMs)

The technologies analysed in the assessment can be grouped into five major categories:

Physical-mechanical

- Sorting, flotation, magnetic separation, gravity separation, electrostatic, triboelectric, eddy current separation

Hydrometallurgy

- Leaching: Inorganic acids, organic acids, inorganic bases, oxidising and reducing agents, inorganic compounds, complexing agents, water, microbes
- Leach solution concentration and metal extraction

Pyrometallurgy

- Roasting, calcining, sintering, pelleting and briquetting, smelting, volatilisation (retorting), refining, segregation

Electrometallurgy

- Electrowinning, electrorefining, molten salt electrolysis, electrochemical separations

Bio-based

- Biomining (biometallurgy), bioleaching, biosorption, phytomining.

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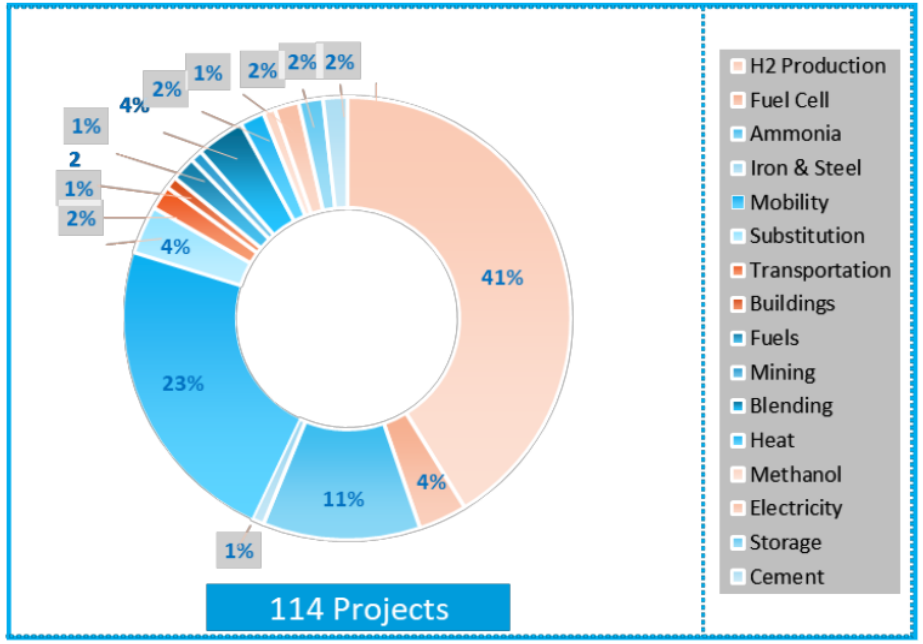
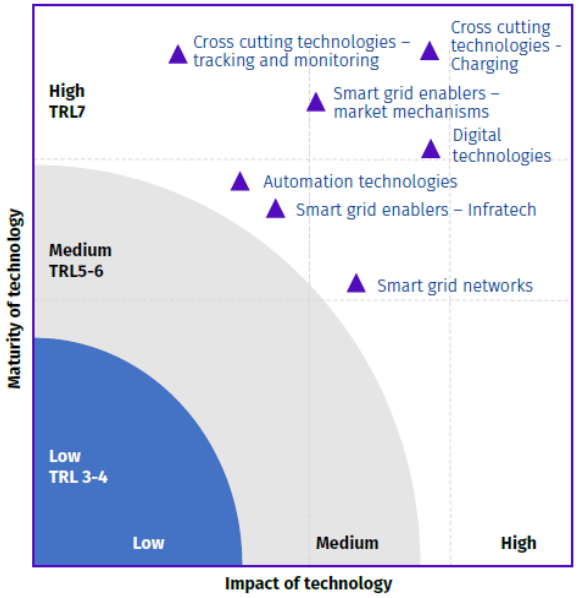
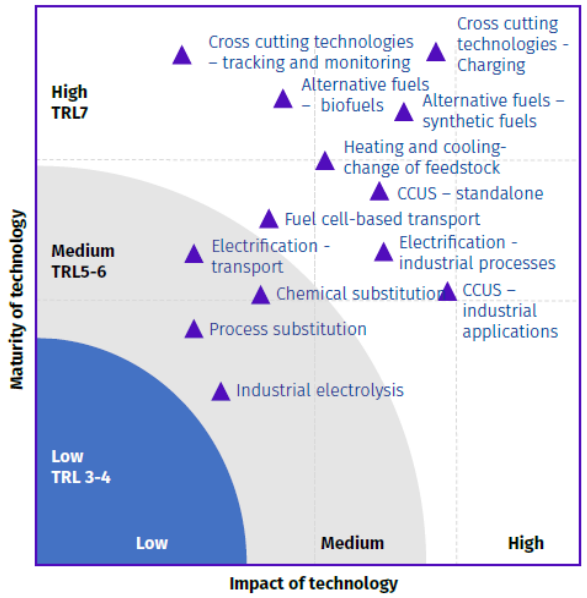
Landscape of Technologies



Clean Hydrogen: 110 hydrogen projects with technologies in TRLs 6 to 9, in late-stage planning, were mapped across over 40 developing countries. Out of this 41% of the projects focus on hydrogen production, followed by 23% on mobility. For regional context: LAC hosts 41 projects, Africa has 28 and in Asia, India and China are more dominant in this regard.

Smart Energy: Approximately 50 relevant smart energy technologies within the Technology Readiness Level (TRL) range 3 to 7 were identified and assessed. Most of these technologies are currently in the post-conception phase, with nearly 50% at the prototype or pilot testing stages.





Industrial Decarbonization: In the area of industrial decarbonization approximately 200 technologies across TRLs 3-7 were identified and assessed. Most of these technologies are in the post-conception phase, with nearly 50% at the prototype or pilot testing stages.

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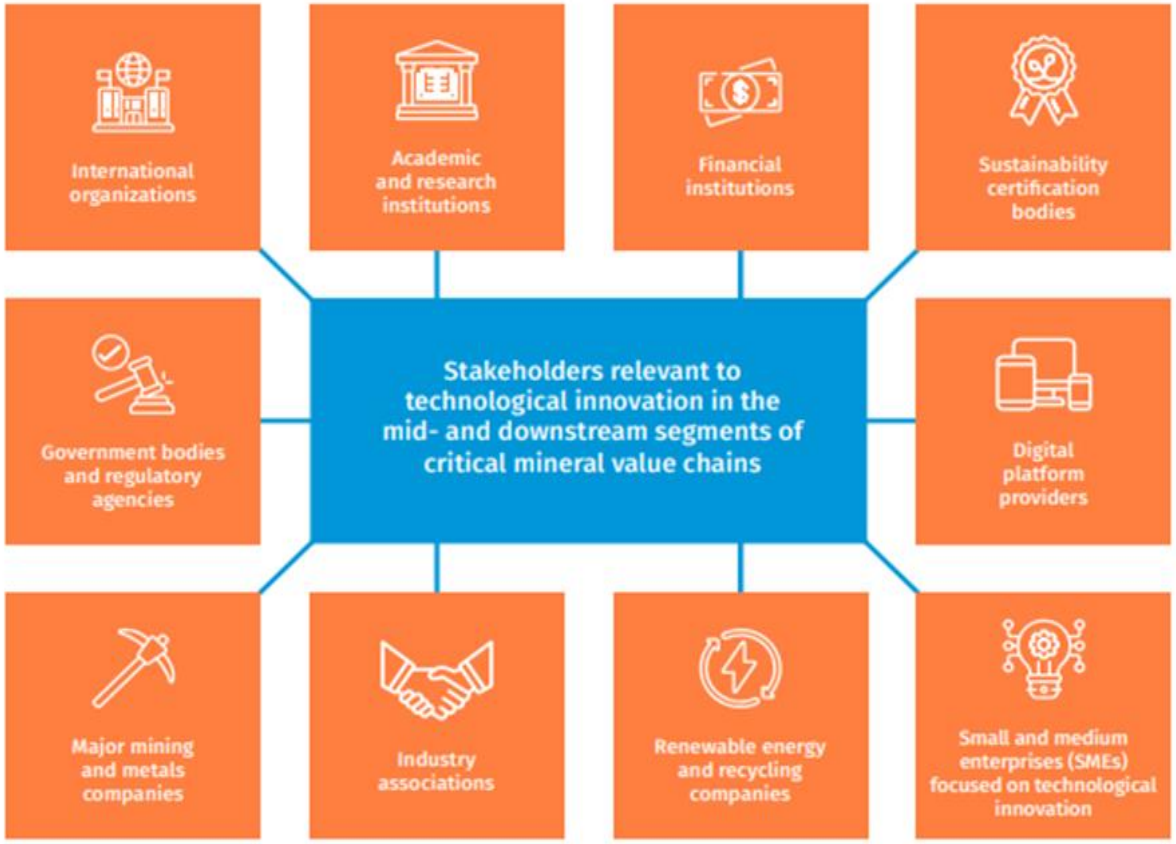
Landscape of Stakeholders

Critical Minerals:



The role of industry associations is a more high-level version of the mining companies that they represent. Organizations such as ICMM (an industry association of mining companies with the objective of improving sustainable development outcomes in the mining and metals industry) influence the direction that sustainable development in mining and mineral value chains may take.

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Landscape of Stakeholders

Smart Energy and Industrial Decarbonization:

Six critical stakeholder groups have been identified, including innovators, adopters, controllers, funders, advisors and influencers, all of whom play essential roles in advancing technology innovation in both the two thematic areas of smart energy and industrial decarbonization.

TABLE 3: Stakeholder groups

Stakeholder Groups	Innovators	Adopters	Controllers	Funders	Advisors	Influencers
Role	Develop new technologies, perform data analysis and provide technical expertise	Bring innovations to market, invest in technology development and scale up solutions	Set policies and regulatory frameworks, provide initial funding and facilitate demo projects	Provide capital for R&D and technologies deployment, and mitigate risks	Engage communities, provide on-the-ground support and share best practices	Raise awareness, facilitate collaboration and driving engagement through their platforms
TRL 3-4	High	Low	Limited	High	High	Low
TRL 5-6	High	Limited	Limited	High	High	Limited
TRL 7-8	High	High	High	High	High	High

High Limited Low

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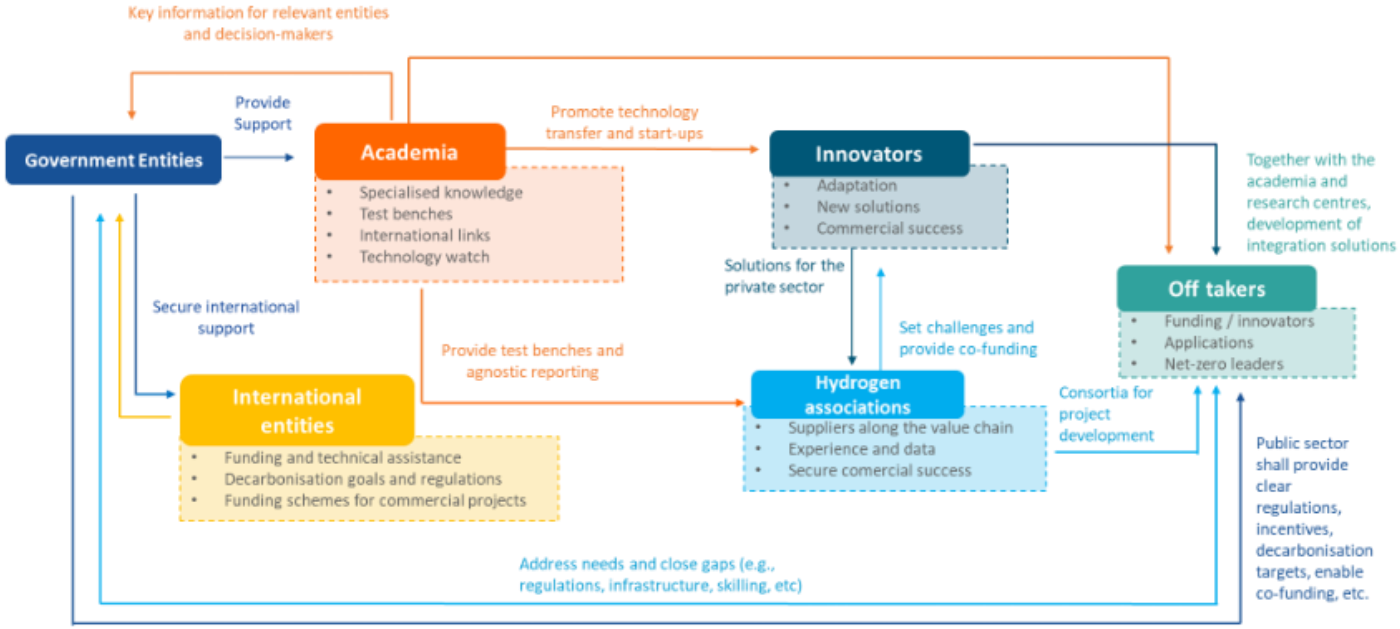
Landscape of Stakeholders:

Clean Hydrogen:

Each stakeholder group contributes in different ways to the innovation process:

- **Innovators** such as think tanks, academia, research organizations, startups, and tech companies are pivotal in developing new technologies, performing data analysis, and providing technical expertise.
- **Adopters**, including end users, SMEs, large users, service companies, and the private sector, are responsible for bringing innovations to market, investing in technology development, and scaling up solutions.
- **Controllers**, such as government bodies, regulatory bodies, and certification bodies, set policies and regulatory frameworks, provide initial funding, and facilitate demonstration projects.
- **Funders**, including banks, donors, financial bodies, and investment funds, provide capital for R&D and technology deployment and mitigate risks.
- **Advisors**, such as NGOs, energy associations, industrial associations, and consultants, engage communities, provide on-the-ground support, and share best practices.
- **Influencers**, including media, social media influencers, and associations, raise awareness, facilitate collaboration, and drive engagement through their platforms.



In all thematic areas the relationship between innovators and adopters is marked by a collaborative approach. There is significant collaboration between controllers (government), adopters (private sector), and advisors (NGOs) to implement and scale up clean energy end solutions through public-private partnerships (PPPs).

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Landscape of Initiatives

Critical Minerals:

TABLE. Landscape of initiatives (Phase 1)

Initiative	Type	Key technologies involved	Key stakeholders involved	Geographic focus
World Economic Forum's UpLink	Platform for innovators to present their solutions to global challenges	• Waste management systems • Greenhouse gas emission reduction innovations • Resource efficiency technologies	• Startups • Academic institutions • Industry	• Global
Prospect Innovation	Accelerator for technological innovation in the mining sector	• Energy generation and storage • Recycling and recovery • Robotics, mobility, and hardware • Data capture, analytics, and AI • Carbon capture • Synthetic Biology	• Research institutions • Mining companies • Venture capital firms	• Americas • ASP • Europe
Global Battery Alliance (GBA)	Public–private partnership that promotes sustainable battery value chains	• Battery recycling • Tracking methods for batteries in the value chain ("Battery Passport")	• Government • Civil society • Industry	• Africa • Asia • Europe
World Bank Group's Climate Smart Mining (CSM) Initiative	Initiative to provide guidance and technical support on decarbonisation and sustainability in mineral value chains in developing countries	• Critical minerals recycling • Reusing and repurposing EOL materials	• Government • International organizations • Local communities	• Developing countries
Activate.org	Fellowship that supports entrepreneurial scientists and engineers in developing technologies for global challenges	• Broad; supports original ideas of its fellows	• Academia • Government • Corporations • Philanthropic foundations	• United States

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Landscape of Initiatives

Clean Hydrogen:

- **National initiatives**: Country wide and it was one of the criteria for evaluating the 141 ODA eligible countries (8 in LAC, 8 in Africa and 9 in APAC).
- **Regional initiatives**: Regional initiatives enhance knowledge exchange, shared investments, and infrastructure to accelerate clean hydrogen innovation and reduce costs. They also bring countries together to advance towards a clean hydrogen economy. Such initiatives allow developing countries that have not developed roadmaps or policies. E.g. the LAC Clean Hydrogen Action, Africa Green Hydrogen Alliance and Asia Pacific Green Hydrogen Alliance.
- **International Initiatives**: Only 37 of 141 (26.2%) of developing countries are currently involved in the international initiatives mapped. Brazil, China, India, Morocco, and South Africa are currently the main recipients of international cooperation.

Smart Energy and Industrial Decarbonization:

- **National Initiatives in Americas**: 13 identified with RELAC being the most prominent one "REnovables in Latin America and the Caribbean (RELAC)." In Africa and Europe: 32, such as “African Circular Economy Alliance (ACEA)". Asia and Oceania: 27 initiatives identified, such as “Asia-Pacific Economic Cooperation (APEC) Smart Grid Initiative“.
- **Smart Energy:** Smart grids Sustainable fuels Energy storage systems Circular economy Integrating renewable energy (RE) sources, Energy efficiency, Big Data.
- **Industrial Decarbonization:** Sustainable fuels, Circular economy, Energy efficiency, CCUS.

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Landscape of Financial Delivery Mechanisms

TABLE. Landscape of financial delivery mechanisms (Phase 1)

Public Sources	Private Sources
• Multilateral Development Banks (MDBs)	• Venture Capital
• Multilateral Climate Finance Funds	• Corporate Venture Capital
• National Development Banks	• Private Equity
• Bilateral Development Agencies	• Accelerators and Incubators
• Government Grants and Subsidies	• Private Banks
• Sovereign Wealth Funds (SWFs)	• Impact Investment Funds

Critical minerals: The preliminary mapping categorized them according to the predominant public or private nature of their funding source, to help guide stakeholders in identifying financing opportunities and gaps and evaluating the potential roles of various financing sources and models in supporting technological innovation.

Clean hydrogen: Governments and development organizations providing concessional financing, grants and technical assistance to support the first movers in the industry. At present, funding initiatives and partnerships for R&D projects in developing countries are primarily focused on improving the cost and technical efficiency of clean hydrogen production technologies, particularly electrolysis.

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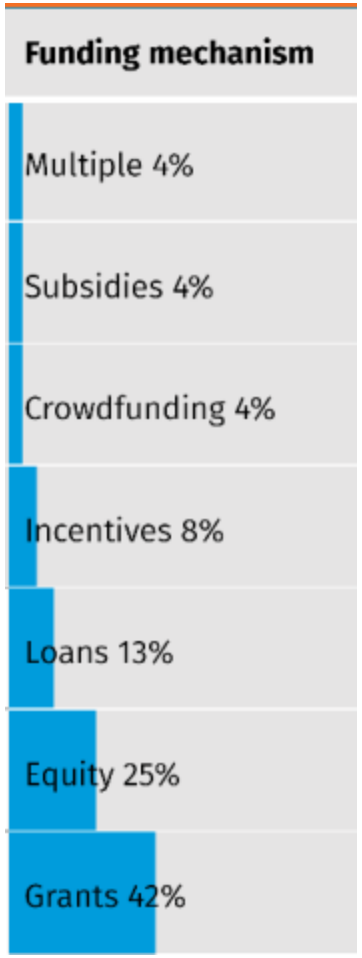
Landscape of Financial Delivery Mechanisms

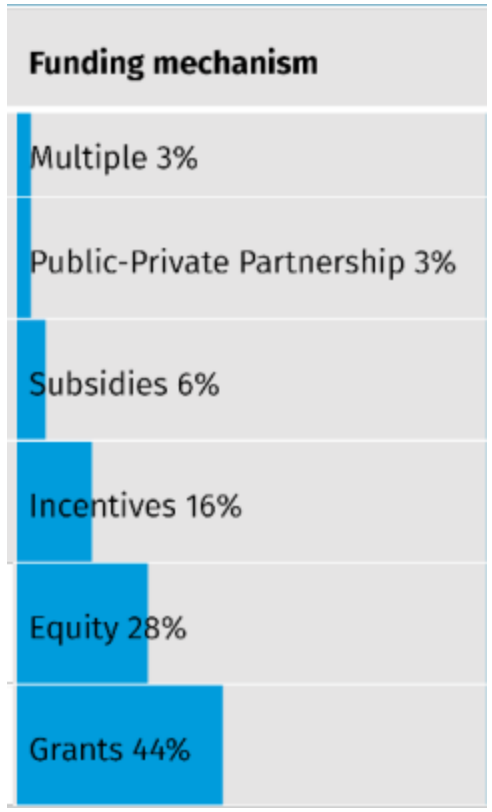
Smart energy:

The majority of smart energy projects are buoyed by government grants, as governments aim to foster projects that will catalyze further interest and investment from various stakeholders.



Industrial decarbonization:

These projects are principally supported by government or multilateral grants that help bridge the financial gaps associated with these advanced technologies.



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Market Assessment Findings: South Africa

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South Africa – Country Landscape

Region: Africa | **Population:** 59.9 M | **Electricity mix:** 10.0% renewables

Due to the robust petrochemicals industry, South Africa is experienced in the hydrogen market and is one of the region's largest hydrogen consumers. Its commitment to decarbonizing the mining industry positions South Africa as a potential regional off-taker for clean hydrogen. The country is a member of several international initiatives focusing on clean hydrogen, and its supply of platinum-group metals benefits innovation in hydrogen technologies.

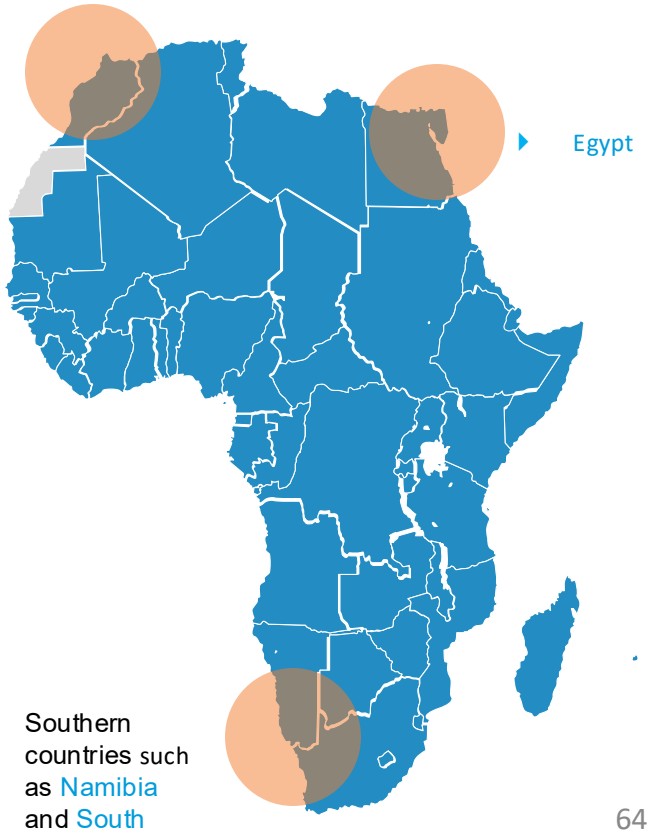
KEY FINDINGS

- **Competitive advantages:** Technical expertise in petrochemicals, domestic platinum-group metal availability potential for electrolysers, potential local off-take industries, such as the mining sector, developed export infrastructure.
- **Barriers:** No domestic adoption mandates, 70% coal energy supply (IEA, 2022), high inequality, poverty and unemployment rates.
- **Strategies:** Local R&D, building on Synergy with existing industries.
- **Financing mechanisms:** KfW Development Bank is providing concessional financing and a $217 million loan for clean hydrogen projects, especially at the pre-feasibility stage. South African Industrial Development Corporation (IDC) to offer $25 million in financing for a program to promote the green hydrogen industry.
- **SDGs:** Improved energy access is expected to enhance local economic development and productivity. By 2040, the sector could create 30,000 jobs annually, with investments in the clean hydrogen ecosystem driving infrastructure development and industrial clusters.

POTENTIAL HYDROGEN APPLICATIONS

- Refining & Petrochemicals
- Clean hydrogen & derivates exports
- Fertilisers
- Mining

Potential Regional Hubs



- Northwestern African countries, including Morocco, Mauritania, Senegal, Tunisia, and Argelia
- Egypt
- Southern countries such as Namibia and South Africa

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Critical Minerals – Regional Landscape

AFRICA

Namibia
South Africa
Zambia

STRENGTHS

- Mineral beneficiation strategies
- Bilateral cooperation with developed countries (e.g. EU-Namibia Strategic Partnership on Raw Materials Value Chains and Renewable Hydrogen [USD 1.1 billion]; South Africa-UK Minerals for Future Clean Energy Technologies Partnership; partnership between Zambia and the Japan Organization for Metals and Energy Security)
- Regional initiatives (e.g. African Green Minerals Strategy and DRC-Zambia Battery Council)
- Industrial development agencies
- Policies advancing SDGs

AREAS FOR IMPROVEMENT

- Circular economy, recycling, and waste management policies
- Power and logistics infrastructure constraints to industrial development
- Government institutional capacity to build up and enforce regulatory frameworks
- Policies advancing SDGs

Reference: UNIDO (2024) Critical Minerals Market Assessment

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Smart Energy – Country Landscape

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South Africa current macroeconomic conditions and ongoing pilot projects makes it an attractive country for smart energy deployment

Policy

- Although South Africa has multiple policies including smart grid and technologies as its component it lacks any key central policy or roadmap for smart grid development

Incentives

- Lacks any specific incentives for smart energy deployment but rather provides incentives based on impact like energy efficiency and renewable projects

Infrastructure

- South Africa is in the early stages of developing its smart grid infrastructure. Initiatives like the South African Smart Grid Initiative (SASGI) and projects by SANEDI are ongoing

Financing

- Financing for smart energy projects is supported by both public and private sectors

Key Policies and Regulations

South Africa's Smart Grid Vision 2030	• This strategic framework outlines the country's goals for developing smart grid infrastructure. It includes modernizing the electricity grid, integrating renewable energy sources, and enhancing grid reliability and efficiency.
Integrated Resource Plan (IRP)	• This plan outlines South Africa's long-term electricity supply strategy, emphasizing the integration of renewable energy sources and smart grid technologies to ensure a sustainable and reliable energy future.
Smart Metering Regulations	• These regulations support the deployment of smart meters across municipalities to improve grid reliability, revenue management, and energy efficiency. They aim to address billing issues and reduce electricity losses.

Key Initiatives and collaborations

South African Smart Grid Initiative (SASGI)	• Launched by SANEDI, this initiative aims to modernize the electricity grid by integrating smart grid technologies. It focuses on improving grid reliability, enabling renewable energy integration, and enhancing customer participation.
Smart Energy Solutions for Africa (SESA)	• This collaborative project between the European Union and nine African countries, including South Africa, aims to provide scalable and replicable energy access technologies. It focuses on decentralized renewables, innovative energy storage systems, and smart microgrids.
Eskom's Smart Grid Initiatives	• Eskom, South Africa's primary electricity supplier, is implementing smart grid technologies to improve grid management and reduce energy losses. These initiatives include advanced metering infrastructure, demand response programs, and grid automation.

Key takeaways

- South Africa has multiple ongoing smart grid initiatives both at national and cities level. This, along with strong policy support and declared ambition create a positive environment to support development of smart energy technologies in the country.

Source: 1. South Africa grid vision; 2. SESA

Reference: UNIDO (2024) Smart Energy and Industrial Decarbonization Market Assessment

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Industrial Decarbonization – Country Landscape

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South Africa has shown strong commitment to achieve industrial decarbonization, with robust policy and incentive structure in place

Policy

- South Africa has implemented ambitious climate policies, including carbon pricing and the JET Implementation Plan, which outlines interventions and investments needed

Incentives

- The government offers various incentives for green technologies and renewable energy projects. These include tax rebates and subsidies aimed at reducing emissions and sustainable practices

Infrastructure

- Significant investments are being made to upgrade infrastructure, particularly in the energy sector, to support decarbonization, including projects for hydrogen and carbon capture etc.

Financing

- Financial support comes from both domestic and international sources. Initiatives like the Green Climate Fund and partnerships with global financial institutions provide funding for sustainable projects

Key Policies and Regulations

Integrated Resource Plan (IRP)	• Launched in 2019, this plan outlines South Africa's strategy for electricity generation, aiming to reduce reliance on coal and increase the share of renewable energy sources.
National Energy Efficiency Strategy (NEES)	• This strategy aims to improve energy efficiency across various sectors, including industry, to reduce overall energy consumption and emissions.
National Climate Change Response Policy (NCCRP	• This policy provides a framework for addressing climate change, including measures to reduce emissions and promote sustainable development.

Key Initiatives and collaborations

South African Industrial Energy Efficiency Project (IEE Project)	• Launched in 2010, this project helps industrial companies improve energy efficiency. It focuses on policy development, skill development, and technical support, and is funded by the Global Environment Facility (GEF) and the South African Department of Trade, Industry and Competition.
IDDRI and NBI Collaboration	• The Institute for Sustainable Development and International Relations (IDDRI) and the National Business Initiative (NBI) are working together to support businesses in exploring deep decarbonization pathways for heavy-emitting industries.
Just Energy Transition Partnership (JETP)	• Announced at COP 26, this USD 8.5 billion deal with France, the US, the UK, Germany, and the EU supports a just transition to a low-carbon economy and a climate-resilient society.

Key takeaways

- Overall, South Africa has one of the best supportive ecosystem among the selected 28 countries, mainly due to strong policy and incentive support focusing on both overarching decarbonization and sector specific goals and strategies

Source: 1. Incentives; 2. IEE Project; 3. JETP

Reference: UNIDO (2024) Smart Energy and Industrial Decarbonization Market Assessment

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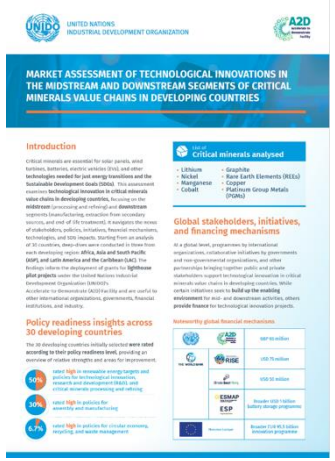
A2D Facility Market Assessments

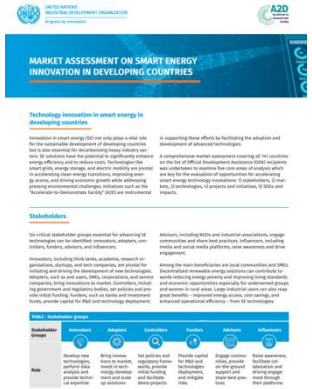
Market Assessment on Accelerating Innovation in Critical Minerals



Market Assessment on Accelerating Innovation in Clean Hydrogen

Market Assessment on Accelerating Innovation in Industrial Decarbonization

Market Assessment on Accelerating Innovation in Smart Energy



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Questions & Answers

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Coffee Break

15:30 - 16:00

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Gender Equality, Social Inclusion and Environmental Safeguards

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Gender Equality and Social Inclusion (GESI)

- **Gender Equality:** Gender equality means **equal rights, responsibilities, and opportunities** for everyone, **regardless of gender**. It values the needs and priorities of all genders equally, aiming to eliminate barriers that uphold unequal power relations.
- **Social Inclusion:** Social inclusion involves **removing barriers** that prevent marginalized groups—based on gender, ethnicity, age, disability, or other factors – from full participation in society. It ensures these groups are not left behind, particularly in economic, social, and political spheres, by **promoting equal access to resources and decision-making**.

Foundations – GESI

- ✓ Do No Harm (DNH)
- ✓ Empowerment
- ✓ Just transition
- ✓ Leave no one behind principle

1. Do No Harm

- A principle recognizing that **no action is neutral**.
- Applies a **"Do No Harm" approach** to ensure projects create **safe, equitable working conditions**.
- Focus on **empowering women** in leadership roles within clean energy transitions.
- Improves outcomes for **vulnerable groups** and supports a **fair, inclusive, and sustainable** shift to a low-carbon future.

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2. Empowerment

- Building **assets and capabilities** so individuals and groups can **participate and engage**.
- Enables them to **influence decisions** and **hold institutions accountable**.
- Happens at both **individual and group level**.
- Strengthens **agency** and **collective power** for action and change.

3. Just and Equitable Transition

- A fair shift to low-carbon economies **must benefit all,** especially the most vulnerable. **Marginalized groups** (e.g. women, Indigenous peoples, low-income communities) face greater energy poverty and climate risks. These groups must be **prioritized and included** to ensure access to clean energy and avoid being left behind.
- **Women's insights** into household and community energy needs are essential, their **leadership and participation** improve energy system design and fairness.

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How much do you know about GESI in the context of demonstration projects?

Menti.com
Code 4488 4043

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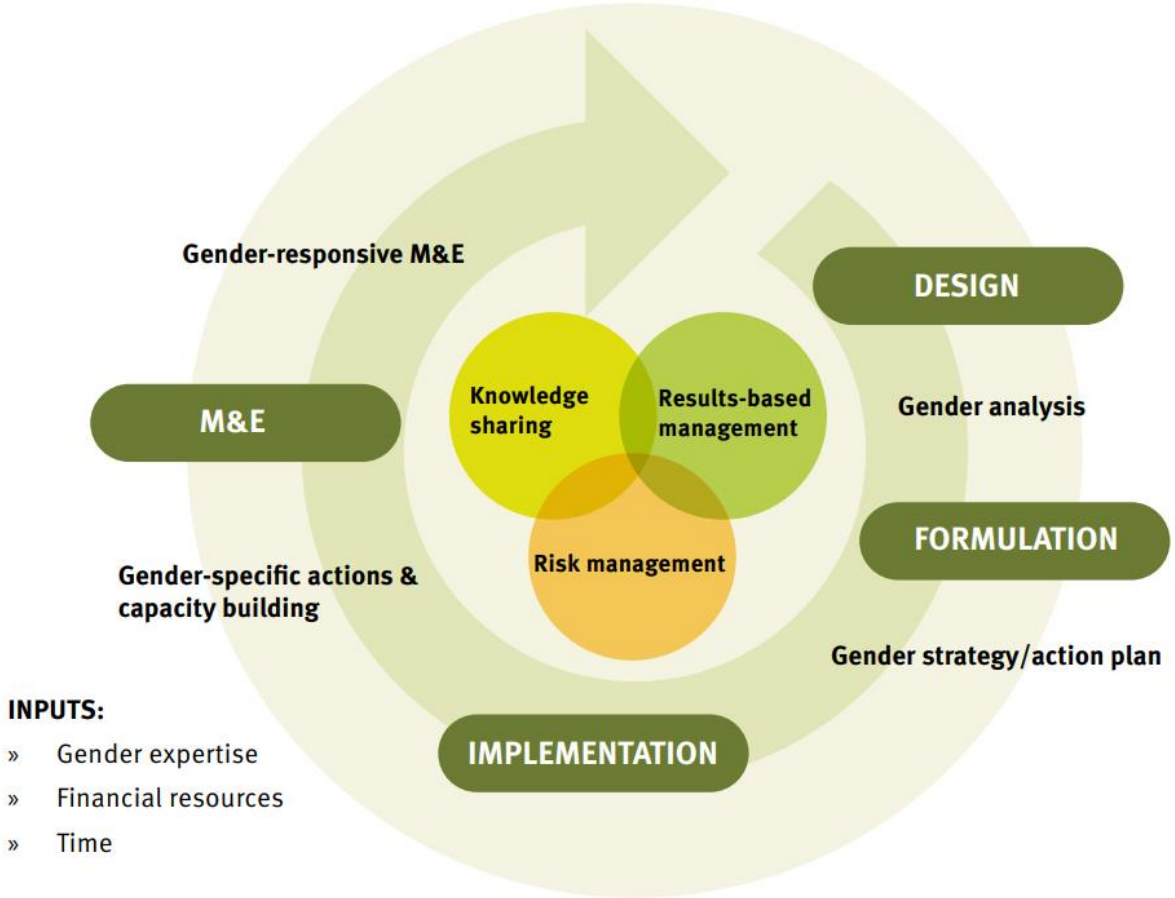
Mainstreaming gender issues at different stages of the project cycle

UNIDO Guide to Gender Analysis and Gender Mainstreaming the Project Cycle

Find Tool Step by Step here

1. **Project Formulation** – Identify gender and inclusion gaps and design gender- and-social responsive activities
2. **Project Implementation** – Ensure equal participation and benefits for everyone
3. **Monitoring & Evaluation** – Track gender and social impacts and adjust strategies as needed



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GESI action plan at the project level

Ensuring that action plans include:

1. **Gender Analysis:** Identifying gender disparities and specific needs within the project context.

2. **Action Plan:** Defining clear activities and timelines to address gender equality and social inclusion goals.

3. **Monitoring & Evaluation:** Setting indicators to measure progress and assessing the impact of GESI interventions.

GESI Action Plan Outline

- **Introduction:** GESI Background, Purpose-Objectives
- Project Background: entry points for gender-mainstreaming
- **Policy, Legal Administrative Framework:** compliance with national and international legal framework and standards, international best practices
- **GESI Tools and Procedures:** screening of projects, action steps , Capacity development planning.
- Communication and Stakeholder Engagement Plan
- GESI Draft Implementation Action Plan and M&E Plan

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Considerations for a GESI Analysis

01 GESI ANALYSIS

A gender analysis should investigate the following questions:

- What are the key gender and social issues in the sector/region?
- How might the project affect women and men differently?
- How are other marginalized communities impacted"?

02 Understanding the Political/Country Context

03 Considering of the needs, rights, capabilities and priorities

05 Gender - Age disaggregation data

04 Ensuring participation of diverse social groups in decision-making

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Why GESI matters?

- It reduces inequalities
- It improves economic growth
- It makes communities stronger

When everyone has a fair chance to succeed, societies become more sustainable and resilient.

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GESI: Monitoring and Reporting

A2D Facility: gender output indicator focused on compliance with **OECD-DAC gender equality policy marker** **score 1** throughout the project cycle.

Code	Value	Explanation	Minimum Criteria (should be met in full)
2A	Significant expected contribution to gender equality	Gender issues are not the main objective of the project or programme but are significantly reflected and integrated (mainstreamed) in all relevant dimensions: results, activities, M&E framework.	There is at least one explicit gender equality related output backed by at least one gender-specific indicator. A gender analysis of the project has been conducted and the findings inform project design. Data and indicators are disaggregated by gender, where applicable. The M&E component of the project is designed to report on the expected gender equality results. The logframe/results framework measures progress towards the project's gender-related output(s) through gender-specific indicators to track outcomes/impact.
3.3	A2D Project Monitoring Tool: Output Indicator 3.3	Demonstration project meets the criteria in the OECD DAC Gender Marker	A positive impact on advancing gender equality and/or the empowerment of women and girls, reducing gender discrimination or inequalities, or meeting gender-specific needs (OECD marker 1)

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Key Points on GESI in Projects

- GESI Mainstreaming makes projects **more inclusive, effective, and impactful.** UNIDO provides **tools and guidance** to help project developers integrate gender and social inclusion considerations.
- **Apply gender and inclusion lens** at **all project phases.**
- Monitoring and Reporting: Ensure **gender-disaggregated data collection.**
- Partner with **gender-social focused organizations** to enhance impact.

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Environmental and Social Safeguards (ESS)

UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP)

- Defines **UNIDO's commitment** to responsible project implementation.
- Ensures **compliance with International Laws and Best Practices**.
- Provides **guidelines for assessing environmental and social risks**.
- Ensures projects contribute to **Inclusive and Sustainable Development (ISID).**

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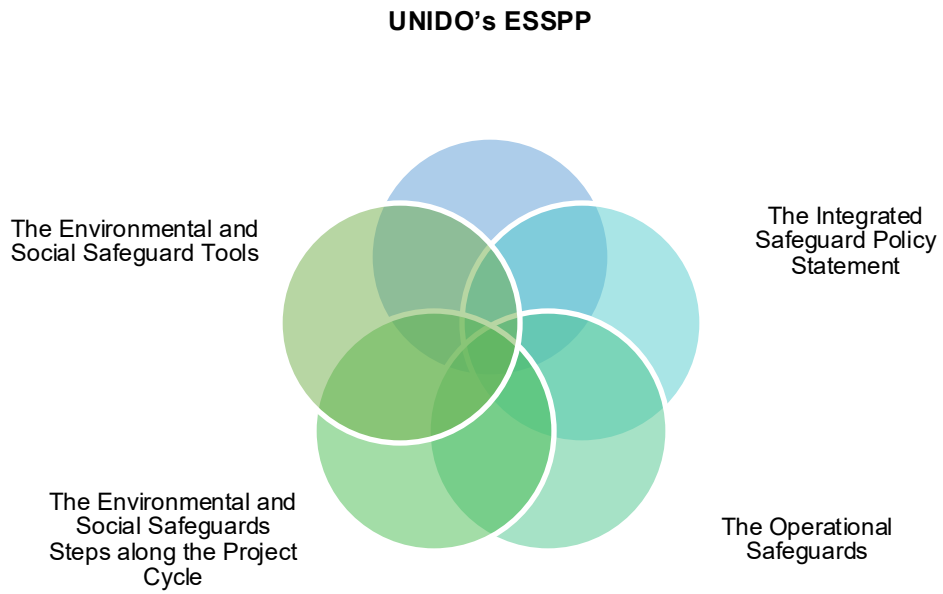
UNIDO ESSPP



UNIDO's Operational Safeguards

- OS 1: Environmental and Social Assessment
- OS 2: Protection of Natural Habitats and Biodiversity
- OS 3: Involuntary Resettlement and Land Acquisition
- OS 4: Indigenous People
- OS 5: Pest Management
- OS 6: Cultural Heritage
- OS 7: Safety of Dams
- OS 8: Labor and Working Conditions
- OS 9: Resource Efficiency and Pollution Prevent and Control
- OS 10: Community, Health, Safety and Security
- OS 11: Information Disclosure and Stakeholder Engagement
- OS12: Accountability and Grievance System

Additional relevant safeguards

- Gender Equality and Prevention of Gender-Based Violence
- Children and People with Disabilities
- Youth groups and constituencies of MEAs/Conventions
- Fragile and Conflict-Affected Situations

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Example of ESSPP Application in UNIDO Projects

PROCACAO II: helps cocoa producers and cooperatives comply with quality standards and implement good agricultural practice to increase their productivity by promoting the cultivation of cocoa under agroforestry systems in Nicaragua.

Potential ESS risks

Proximity to protected areas | Soil degradation and erosion | Contamination from wastewater | Occupational health and safety | Child labor on family farms | Indiscriminate crop expansion

ESS measures undertaken to maximize the overall positive impact of the project

Two national experts were hired to develop an E&S study (ESMP) and a validation process was undertaken with the project team and the ESS Unit.

Measures outlined in the ESMP were included in the budget and work plan, and implemented in collaboration with national counterparts and stakeholders.

Mitigation strategies included:

- Capacity-building for the project team, cooperatives and producers on agroforestry, biodiversity conservation and agrochemical use
- Handout of personal protective equipment
- Production of an easy-to-use checklist for farmers on conservation

Lessons learned were incorporated into the design of the project's next phase - NICACAO.

ESS-related lessons learned during ESMP development and implementation

Continued engagement with ESS experts facilitated the implementation of effective mitigation measures and capacitation of project counterparts and beneficiaries.

The ESMP validation process and additional stakeholder engagement addressed key ESS risks using available project resources and enhanced the project team's understanding and ownership of the document.

This process generated further insights on site selection, climate change impacts, legal protection, communication strategies and resource allocation.

ESS measures do not need to be costly, many measures can be easily implemented within the existing action zone of the project

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Potential Risks related to Demonstration Projects

Sector	Risk	Description
Critical Minerals	Biodiversity Loss & Land Degradation	Loss of vegetation and land degradation from midstream and downstream processing.
	Soil Contamination	Industrial discharge affecting soil fertility and agricultural productivity.
	Climate Change Impact	High GHG emissions from processing and transportation.
	Waste Management Issues	Improper disposal of industrial waste leading to contamination.
	Labor Conditions	Poor working conditions and unsafe practices.
	Community Displacement	Disruptions due to facility development.
Clean Hydrogen	Water Scarcity	High water demand for electrolysis processes.
	Land Acquisition Issues	Conflicts over land use due to facility development.
Smart Energy	Cybersecurity & Privacy Risks	Cybersecurity vulnerabilities in smart grids.
	Land Use Conflicts	Infrastructure projects impacting local communities.
Industrial Decarbonization	Job Displacement	Increased automation reducing traditional labor needs.
	CCUS Site Leakage	Potential CO2 leakage affecting groundwater quality.

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ESS Steps required along the Project Cycle

1. **Screening of projects for Potential E&S risks**

   - Policies, standards and operational procedures that seek to **prevent and mitigate unintended harm** to People and Environment
   - Identify and manage **E&S risks**, maximizing **positive outcomes and co-benefits** for ecosystems and local communities.
   - Going beyond a **"do no harm"** approach, including key **human rights-based** approach which prioritizes the protection of both the environment and the well-being of communities

2. **Preparing E&S Assessments** depending on Categorization received.
   - Either Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), or Environmental and Social Management Framework (ESMF) to be submitted **after project implementation starts**.

3. **Monitoring, Reporting and Evaluation on E&S issues** throughout the project cycle.
   - Ensuring ESS management commitments and the materialization of E&S risks reflected upon in: Quarterly reporting, Annual Reporting, Mid-Term Evaluation.
   1. Compliance Verification System

Screening of projects with a **"Screening Template"'**

→ **Category A:** likely to induce significant/irreversible adverse E&S impacts. Projects are required to prepare an ESIA and an ESMP or ESMF

→ **Category B:** less adverse effects and reversible. Projects do not require an ESIA but an ESMP or ESMF needs to be developed.

→ **Category C:** minimal or no adverse effects .Projects usually require no further assessments. Additional requirements may, however, still apply.

→ **Category NO PROJECT:** non-compliant with OS2-8

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ESS Monitoring and Reporting

All supported projects report against an ESS output indicator in the project's Logframe, which complies with **UNIDO'S Environmental and Social Safeguards Policies and Procedures** throughout the project cycle

Code	Value	Explanation	Minimum Criteria (should be met in full)
3.4	A2D Project Monitoring Tool: Output Indicator 3.4	Demonstration project aligns with UNIDO's ESSPP and its Operational Safeguards (9) meeting as well criteria outline in GEF-GCF ESS Indicators	A positive impact on environmental sustainability and social inclusion, including the protection of biodiversity, sustainable land and water management, climate change mitigation and pollution reduction: **Programmatic OS** OS 1: Environmental and Social Assessment OS2: Protection of Natural Habitats OS3: Involuntary Resettlement OS4: Indigenous People OS5: Pest Management 0S6: Physical Cultural Resources OS7: Safety of Dams **Framework Operational Safeguards** OS8: Information Disclosure OS9: Accountability and Grievance Systems The project ensures equitable benefits, particularly for marginalized groups such as women and indigenous peoples and local communities (ILPs), and adheres to the criteria outlined in both UNIDO's Operational Safeguards in addition to GCF and GEF's Environmental and Social Indicators (particularly on social inclusion 68th GEF Council Meeting)

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Further Resources

- Interactive map to screen for presence of Indigenous People, protected areas, information on land cover and environmental pressures (e.g. mining and forest concessions, major dams, etc.) in the project area: **Land Mark Interactive Online Map**
- Free online Biodiversity Risk Filter and Water Risk Filter for project area and sector: **WWF Biodiversity & Water Risk Filter**
- Online Toolbox for Climate Risk Analysis: **FAO Climate Risk Toolbox**
- Further guidance on p. 33 of **UNIDO ESSPP** under *3.1 Project Identification, Screening and Categorization*

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UNIDO Policy Frameworks

- UNIDO Policy on Gender Equality and the Empowerment of Women (2019)
- UNIDO Strategy for Gender Equality and Empowerment of Women (GEEW) (2020-2023)
- UNIDO Guide to Gender Analysis and Gender Mainstreaming the Project Cycle
- UNIDO's Medium-term Programme Framework 2022-2025 highlights that achieving gender equality and empowering women yields substantial positive effects on sustainable economic growth and inclusive industrial development.

- **UNIDO's Environmental and Social Safeguards Policies and Procedures (ESSPP)**

- **The Operational Safeguards (OSs)** consists of a set of seven programmatic and two framework safeguards requirements for each project when addressing social and environmental impacts and risks.

- **+ International frameworks: WB, GCF, GEF, FAO**

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A2D Facility Workshop Feedback Form

📝 Your Feedback Matters!

🗞️ Please take a few minutes to fill out the A2D Facility Workshop Feedback Form.
Your input will help us improve future events, workshops and training sessions.
📌 Time to complete: ~5- minutes

💡 Your responses will remain confidential and will be used to enhance future engagements.

Thank you for your valuable feedback.

Scaling Innovation Through Demonstration Projects: A2D Facility Workshop - Feedback form

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Questions & Answers

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Workshop Wrap-Up

Evening Reception

Further Information

- **A2D Facility Website:** Visit the website here
- **A2D Facility LinkedIn Account:** Follow the LinkedIn page here
- **A2D Facility Mailing List:** Join the mailing list here
- **A2D Facility Year 1 Annual Report:** Access the Annual Report here
- **A2D Facility Market Assessments:** Access the reports here