





## United Nations Industrial Development Organization (UNIDO)

## Accelerate-to-Demonstrate (A2D) Facility

Accelerating the commercialization of transformational climate solutions in developing countries





## 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





# **Opening Remarks**





# **UNIDO and Climate Innovation**





## **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





### **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.





### 🛞 Bilateral: UK, Japan, Korea, EU

### **Climate Innovation**







## **Contribution to UNIDO Priorities**







# **UNIDO in Mexico**







# La ONUDI en México

Johannes Dobinger, Representante

**08 de abril de 2025** 



# La ONUDI en breve



La organización tiene **172** Estados Miembro La ONUDI fue establecida en **1966**  9 INDUSTRIA, INNOVACIÓN E INFRAESTRUCTURA

a ONUDI tiene **646 proyectos en** nplementación con un portafolio de \$1539.34M

La ONUDI promueve el **Desarrollo** Industrial Inclusivo y Sostenbile (ISID)



La ONUDI cuenta con **2,111** empleados y consultores al rededor del mundo



En el campo:

**48** Oficinas **156** países Red de Oficinas ITPO en 8 lugares







## **Nuestras Prioridades**

- Cadenas de globales de suministro sostenibles
- Reducción del cambio climático
- Acabar con el hambre

## Temas transversales

- Economía Circular
- Digitalización
- Promoción de inversiones
- Capacitación y desarrollo de habilidades
- Empoderamiento económico de mujeres
- Transferencia de tecnología y conocimiento



# Funciones de ONUDI

- Cooperación técnica principalmente en el ámbito medioambiental (sustancias que agotan la capa de ozono, productos químicos, economía circular), cadenas de valor sostenibles (por ejemplo, café, cacao, carne) y transición energética (por ejemplo, hidrógeno verde, descarbonización de la industria).
- Asesoramiento sobre política industrial a los Gobiernos estatales (por ejemplo, Tabasco) y federal (por ejemplo, «Atlas»).
- Funciones normativas y de estándares para mejorar la integración comercial
- Función de convocatoria y asociación (conferencias temáticas, por ejemplo, economía circular)





# **Oficina Subregional**

#### <u>Guatemala</u>

#### Actual

- Protocolo de Montreal
- PAGE

#### Futuro:

- Política industrial
- Biodiversidad
- Economía Circular

#### <u>México</u>

#### Actual

- Protocolo de Montreal
- Mercurio (GEF)
- Política industrial
- Economía Circular Futuro:
- Ecoparques industriales
- Biodiversidad
- Transición energética
- PAGE

#### <u>Honduras</u>

#### Actual:

- Protocolo de Montreal
- Acuacultura

Futuro (programa país):

- Política industrial
- Ecoparques industriales
- Transición energética

- <u>Panamá</u>
- Actual:
- Ecosistemas Surf Futuro:
- Hub farmacéutico

#### <u>Costa Rica</u>

#### Actual (programa país):

- Ecosistemas de Surf (GEF)
- Químicos en construcción (GEF)
- Café (GQSP)
- Bioenergía
- Empoderamiento de jóvenes con tecnología ambiental

#### Futuro:

- Hidrógeno verde
- Semiconductores
- Movilidad eléctrica
- Bioenergía
- Biodiversidad

#### <u>Belice</u>

Actual:

• Política Industrial





# **Política industrial**

#### Atlas Prospectivo Territorial-Industrial de México

- Actores involucrados: ONUDI, ONUHABITAT, SRE
- Objetivo:
  - Implementar una **estrategia** para **atraer inversión** a regiones del país, las cuales cuentan con un alto potencial para consolidar una industrialización sostenible que reducirá las brechas de desigualdad regional.
  - Identificación de 5 sectores y corredores estratégicos en donde México puede **fortalecer sus cadenas de valor** locales y nacionales para integrarlas al mercado internacional.
  - Potencializar el desarrollo económico, social, ambiental y urbano.
  - Crear un nuevo paradigma de desarrollo industrial.







# **Política industrial**

#### Estrategia de Política Industrial en Tabasco

#### Actores involucrados:

- ONUDI, financiamiento del Gobierno de Italia
- Secretaria de Desarrollo Económico y Competitividad de Tabasco
- Otras Secretarías
- Amplias consultas con sector privado, sector académico

#### **Objetivo:**

- Fomentar la **diversificación** de la estructura productiva.
- Reconocer las vocaciones productivas.
- Contribuir a cerrar brechas de desarrollo sociales, económicas y territoriales.
- Impulsar la **atracción de inversiones**.
- Dinamizar las exportaciones.
- Generación de **nuevas oportunidades** de **empleo**.
- Promover la innovación tecnológica y los emprendimientos en negocios de alto valor agregado.



Plan Estratégico de Desarrollo Industrial del Estado de Tabasco 2024-2044



UNIVERSITY OF Cambridge Industria CAMBRIDGE Convertion Policy





# Economía Circular

Acción por el clima y la biodiversidad mediante soluciones de economía circular

#### Componentes

- 1. Elaboración y aplicación de políticas
- 2. Desarrollo de capacidades y gestión del conocimiento
- 3. Cooperación técnica con las empresas
- 4. Mecanismos financieros y fomento de la inversión

### Temas transversales

- Mitigación del cambio climático
- Conservación de la biodiversidad
- Igualdad de género e inclusión social
- Transformación digital
- Cadenas mundiales de suministro y cumplimiento de la normativa medioambiental (especialmente de la UE)

### Países

- India
- Brasil
- México
- Sudáfrica

### Sectores potenciales (a confirmar)

- Equipos eléctricos y electrónicos
- Vehículos
- Calzado y confección
- Agricultura y procesamiento de alimentos
- Construcción
- Productos químicos
- Otros sectores industriales







# Parques Eco-Industriales: Tula

## Switch to Circular Economy (Unión Europea – ONUDI)

- Actores involucrados: ONUDI
- Objetivo:
  - Mejores instalaciones compartidas para reciclaje.
  - Incremento en la creación de empleos de calidad.
  - Mayor acceso a nuevas tecnologías y finanzas.
  - Uso reducido de materiales, agua, energía y químicos (tóxicos).
  - Reducción de residuos a través de la circularidad de recursos.
  - Minimización de las emisiones de gases de efecto invernadero y contaminantes.
  - Reducción de riesgos económicos, sociales, ambientales.







# MEA: Protocolo de Montreal (Ozono)

## Eliminación progresivamente las sustancias que agotan la capa de ozono y reduce las emisiones de gases de efecto invernadero.

#### Actores involucrados:

- ONUDI, Agencia ejecutora
- Ministerio de Medio Ambiente y Recursos Naturales (SEMARNAT)
- Sector privado (Grupo CYDSA, IMBERA, PYMEs, etc.)

#### Objetivo:

- Eliminar la producción de sustancias que agotan la capa de ozono, en particular los refrigerantes.
- Detener la liberación de sustancias existentes en la atmósfera.
- Aumentar la eficiencia energética en refrigeración y aire acondicionado mediante el uso de refrigerantes y equipos adecuados (Enmienda de Kigali).
- Volumen financiero de cooperación: Aproximadamente 20 millones de euros.









# MEA: Minamata (Hg)

#### Eliminación y gestión de residuos de mercurio en el sector cloroalcalino (FMAM)

#### Actores:

- PNUMA, implementador
- ONUDI, ejecutor
- Ministerio de Medio Ambiente y Recursos Naturales (SEMARNAT)
- Sector privado (Grupo CYDSA)

#### **Objetivo:**

- Reducir los impactos negativos del mercurio y los desechos de mercurio del sector cloroalcalino en la salud humana y el medio ambiente en México
- Componente 1: Mejorar la capacidad nacional en la gestión de instalaciones químicas peligrosas y sitios contaminados con mercurio
- Componente 2: Introducir las mejores tecnologías disponibles durante y después del desmantelamiento/conversión y buscar inversiones para la gestión ambiental
- Componente 3: Estabilización, tratamiento y eliminación del exceso de mercurio y materiales contaminados de las dos plantas desmanteladas y reconvertidas
- Presupuesto de 12 millones de USD y cofinanciación de 125 millones de USD









# **Biodiversidad**

#### Uso sostenible de los productos de la biodiversida

#### Foco:

- Comunidades locales y pueblos indígenas ٠
- Valor añadido y trabajo con organizaciones ٠ asociativas
- Infraestructura de calidad: normas y ٠ estándares para el acceso al mercado

#### **Objectivo:**

- Fostering value addition of biodiversity products
- Increasing the competitiveness of ٠ enterprises
- Fostering integration into regional value chains







de ensavo







## **Transformation Pathways Fund (TPF)**

• Bridging the climate financing gap in industry with innovative climate finance along global value chains

LA MISION: Movilizar capital privado para crear vías de transformación en las cadenas de valor globales que

- I. Aumenta el acceso de las empresas industriales al capital de inversión crítico
- II. Reduce las emisiones de carbono y prepara a la industria para el futuro
- III. Crea empleo en sectores industriales productivos

### **OBJECTIVOS**

- i. Entregar 3.000 millones de USD de inversiones
- ii. Reducir las emisiones de GEI en 64 Mtons de CO2eq
- iii. Apoyar 450.000 puestos de trabajo<sup>2</sup>

### CATALYTIC PARTNERSHIP

- UNIDO and Finance in Motion
- Experts in sustainable industrial development and impact investment asset management

### MILESTONES

- Concept note approved by GCF
- GCF submission with approval targeted at October 2025 board meeting
- Fund established Q1 2026









- Bioenergía
- Decarbonisation Hub
- Programa Global de Hidrógeno para la Industria
- Programa de descarbonización profunda en sectores de emisiones importantes (cemento, acero, industria química
- Accelerate to demonstrate A2D









### **@ ONUDI\_MEXICO**







# **A2D Facility**





### **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.



# Acco

## **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:



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

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

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





## **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

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UNIDO's expertise 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





## **Thematic area: Clean Hydrogen**



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









## **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.



Market Assessment on Accelerating Innovation in Critical Minerals



UNIDO's expertise in Smart Energy



- 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





## **Thematic area: Industrial Decarbonization**



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.



Market Assessment on Accelerating Innovation in Industrial Decarbonization



UNIDO's expertise in Industrial Decarbonization







## A2D Facility Year 1 and 2 Key Milestones









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

	Monday, 19 May	Tuesday, 20 May			Wednesday, 21 May		Thursday, 22 May	Location: Hyatt Regency
	Toridy	Check-in			Check-in		Site visits	Nairodi Westlands
		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)	Two options: - Kiru Tea	Registration:
			C	offee break: 10.30 - 1	1.00 am		Factory	E  <i>%</i> %%& E
	Arrival of participan ts	Thematic session 1.1: Smart energy (11.00-12.30pm)	Thematic session <b>2.1: Clean hydrogen</b> (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)	- Olkaria Geo- thermal Power Plant	
		Lunch break 12.30 – 02.00 pm						
Re	Registrati on and	Thematic session 1.2: Smart energy (2.00-03.30 pm)	<b>Thematic session 2.2: Clean hydrogen</b> (02.00 – 3.30 pm)	Thematic session 3.2: Critical minerals (2.00- 3.30pm)	Finance session 2: by U (2.00-3.30pm)	NIDO procurement		
bilaterial		Coffee break: 3.30-4.00 pm						
	meetings	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: Clos	<b>ing</b> (4.00-5.30pm)		Nationals from ODA-eligible countries may be eligible to receive funding to attend
	Evening reception	Evening reception (6.30-9.30pm)			Evening activity (6.30-9.	30pm)		



### UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION



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# **Questions & Answers**





# **Coffee Break**






## What is Innovation?



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# Current A2D Facility-Supported Demonstration Projects





### **Current A2D Facility-Supported Demonstration Projects**

Smart Energy	Industrial	Biomass gasification plant to power a Kenyan tea factory using local agricultural waste and biomass	
Smart solar and storage microgrid for industrial-scale deployment at Laxmi Steel factory in Sunwal	<u>Decarbonizati</u> <u>on</u>	Location: <b>Kenya</b>	
Location: <b>Nepal</b>	<u>Clean</u> <u>Hydrogen</u>	Ammonium sulphate fertilizer production facility powered by solar and clean hydrogen Location: Namibia	
Peer-to-peer energy-sharing system to convert wasted renewables into community power	<u>Critical</u> <u>Minerals</u>	Local manufacturing of lithium-ion batteries for electric two-/three- wheeler motorcycles, and installation of charging infrastructure in urban and rural areas.	
Location: <b>Nigeria</b>		Location: <b>Tanzania</b>	





### **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).



### **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.

LEAD ORGANIZATION Oasis Financial Services Limited

#### **CONSORTIUM PARTNERS**

Payless Energy Limited

**DURATION** 01 Feb 2025 - 29 Feb 2028

LOCATION Tanzania

THEMATIC AREA

RITICAL MINERALS

STAGE Initiated

WEBSITE www.oasisgroup.co.tz

CALL 1st Call for Proposals



### **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<sub>2</sub> 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
  - $\circ$   $\,$  Lower transport costs and improved logistics  $\,$







### **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.

#### 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

O CLEAN HYDROGEN

STAGE Initiated

WEBSITE www.daures.green

**CALL** 1st Call for Proposals



### 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:
  - o 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.









### 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.

LEAD ORGANIZATION Compact Syngas Solutions

#### **CONSORTIUM PARTNERS**

• Supivaa

IITA

**DURATION** 01 Feb 2025 - 01 Mar 2028

LOCATION Kenya

THEMATIC AREA

Registrial Decarbonization

STAGE Initiated

WEBSITE www.syngas-solutions.co.uk

CALL 1st Call for Proposals





### 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.









### 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





# 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<sub>2</sub>, 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.



### 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.

#### 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





### 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.









# **Questions & Answers**





# Designing and Implementing Demonstration Projects: Monitoring, Reporting and Dissemination





### **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?



#### Theory of Change for Transformational Change:

#### **Definition:**

The transformational impact (<u>KPI-15</u>) 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.





### 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)





### A2D Facility Logframe

IMPACT	OUTCOMES	OUTPUTS
Shaping a <b>sustainable shift</b> <b>in local markets</b> by enabling clean energy technology solutions that are ready for wider uptake, catalysing increased climate ambition and transformational change	Innovative clean energy technology <b>solutions</b> <b>are ready for wider uptake</b> , 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 <b>projects successfully</b> <b>demonstrate the benefits and feasibility of</b> <b>alternative clean energy technology</b> solutions, generating high quality learning and creating a 'lighthouse' effect.	<b>Increased knowledge</b> 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.





### A2D Facility Logframe

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





## 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.





# **Questions & Answers**





# Lunch







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





## **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: <u>Access the reports here</u>





### 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.







### 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.





### 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

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.







### 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.





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.





### **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.





### 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.





### 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.







### 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 onthe-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).





### Landscape of Initiatives

#### **Critical Minerals:**

TABLE. Landscape of initiatives (Phase 1)						
Initiative	Туре	Key technologies involved	Key stakeholders involved	Geographic focus		
World Economic Forum's UpLink	Platform for innovators to present their solutions to global challenges	<ul> <li>Waste management systems</li> <li>Greenhouse gas emission reduction innovations</li> <li>Resource efficiency technologies</li> </ul>	<ul> <li>Startups</li> <li>Academic institutions</li> <li>Industry</li> </ul>	• Global		
Prospect Innovation	Accelerator for technological innovation in the mining sector	<ul> <li>Energy generation and storage</li> <li>Recycling and recovery</li> <li>Robotics, mobility, and hardware</li> <li>Data capture, analytics, and AI</li> <li>Carbon capture</li> <li>Synthetic Biology</li> </ul>	<ul> <li>Research institutions</li> <li>Mining companies</li> <li>Venture capital firms</li> </ul>	• Americas • ASP • Europe		
Global Battery Alliance (GBA)	Public-private partnership that promotes sustainable battery value chains	<ul> <li>Battery recycling</li> <li>Tracking methods for batteries in the value chain ("Battery Passport")</li> </ul>	• 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	<ul> <li>Critical minerals recycling</li> <li>Reusing and repurposing EOL materials</li> </ul>	<ul> <li>Government</li> <li>International organizations</li> <li>Local communities</li> </ul>	Developing countries		
Activate.org	Fellowship that supports entrepreneurial scientists and engineers in developing technologies for global challenges	<ul> <li>Broad; supports original ideas of its fellows</li> </ul>	<ul> <li>Academia</li> <li>Government</li> <li>Corporations</li> <li>Philanthropic foundations</li> </ul>	United States		



### 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.





### **Landscape of Financial Delivery Mechanisms**



**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.






## 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.

:	Funding mechanism			
	Multiple 3%			
ll 2	Public-Private Partnership 3%			
	Subsidies 6%			
	Incentives 16%			
	Equity 28%			
	Grants 44%			





# Market Assessment Findings: Mexico





# Clean Hydrogen – Country Landscape

**Region:** LAC | **Population:** 127.5 M | **Electricity mix:** 22.3% renewables

**Clean Hydrogen Landscape:** Mexico has announced several clean hydrogen projects, supported by the favourable geographical location, sea access, and proximity to key markets and is exploring various innovative hydrogen solutions, including salt caverns for storage, clean ammonia production, and mobility pilot projects.

#### **KEY FINDINGS**

- **Competitive advantages:** High potential for renewable electricity, potential local end-users, close proximity to premium off-take markets (US & Canada), universities highly involved in R&D, and existing oil & gas and manufacturing capacities.
- **Barriers:** Lack of national clean hydrogen policies and regulations, financing barriers, lack of human resources, oil & gas reliance, and insufficient port infrastructure.
- Strategies: Regional government initiatives, cooperation with international partners and investors, and revising NDC for 30% GHG emissions reduction by 2030.
- Financing mechanisms: The Helax Istmo project, being developed by Copenhagen Infrastructure Partners in collaboration with Mexican authorities, is expected to secure \$10 billion in funding by 2029-2030.





Argentina

Brazil

Mexico

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### **Critical Minerals – Regional Landscape**

#### STRENGTHS

- Financial incentives for companies in mid- and downstream segments (e.g. tax rebates and exemptions)
   Solution
- State-owned company for lithium value chain
- R&D frameworks and initiatives \_\_\_\_
- Industry-led initiatives to coordinate stakeholders: Mining Hub
- Multilateral development bank (MDB) support (e.g. International Finance Corporation [IFC] loans and Inter-American Development Bank [IDB] programmes)
- Policies advancing SDGs



#### AREAS FOR IMPROVEMENT

- Stringent circular economy policies on critical minerals
   Second Sec
- Policies governing mid- and downstream activities are fragmented across different ministries and minerals, lacking cohesive national frameworks



- Regional cooperation and initiatives
- Policies advancing SDGs



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# Although Mexico has well defined policy and regulations , it lacks key incentives for smart energy deployment

**Key Policies and Regulations** 



Policy	Incentives	Smart Grid Implementation • Developed by the technologies acro	Ministry of Energy, this plan outlines the priorities and strategies for deploying smart grid
Mexico has strong policy	<ul> <li>Country currently lacks any key incentives for smart grid deployment</li> </ul>	Plan integration of ren	integration of renewable energy.
support for smart grid deployment in the country which exists both in terms of policy		• This program focumeasures to impro	uses on the deployment of smart grid technologies to meet Mexico's clean energy goals. It includes ove grid management, enhance cybersecurity, and increase consumer participation.
and law		Electricity Industry Law (2014)     This law reformed projects. It support	I Mexico's electricity sector, promoting competition and enabling private investment in smart grid rts the development of a more efficient and resilient grid infrastructure.
		Key Initiatives and collaborations	
Infrastructure	Financing		
Most of the current     effort is focussed on	<ul> <li>Direct financing from government is not well</li> </ul>	This non-government of the sectors to address of the sectors to a	ficiency. It fosters collaboration between research institutions, industry, and public and private s economic, social, and environmental challenges.
deploying smart meters	defined and country		
and other supporting infrastructure for smart grids, which forms	overall has limited financial availability. Lack of presence of any multilateral organisation also impacts financing	21st Century Power     • In collaboration w       Partnership     • In collaboration w	vith various Mexican energy authorities, this initiative accelerates next-generation power system orts grid integration, distributed generation, and smart grid technologies.
important part of new smart grid development			



UNITED NATIONS

INDUSTRIAL DEVELOPMENT ORGANIZATION

In Mexico, the smart energy ecosystem is mainly supported by strong policy support and a well-defined roadmap for smart grid deployment.

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



#### A2D Accelerate to Demonstrate Facility

# Mexico's focus on industrial decarbonization has been mostly towards increasing efficiency in industrial sector

Kev Policies and Regulations



	Policy Mexico lacks strong policy support and any key policy covering promotion of decarbonization technologies in industrial applications	Incentives • Mexico lacks key incentives to promote industrial decarbonization	Energy Efficiency Standards Circular Economy Law	•	Mexico has implemented comprehensive energy efficiency standards, including mandatory efficiency targets and incentives for industries to adopt energy-saving technologies. Passed in November 2021, this law aims to promote efficiency in the use of products, services, materials, secondary raw materials, and by-products through reuse, recycling, and transformation. It introduces instruments for individuals and companies to promote their products and activities in line with circular economy principles.
	Infrastructure	Financing	Key Initiatives and collaboration	ns •	This initiative provides technical assistance, training, and financial support to enhance energy efficiency in Mexico's
•	<ul> <li>Due to lack of good policy support and incentives country has seen slow adoption of decarbonization technologies</li> </ul>	<ul> <li>Direct financing from government is limited . Lack of presence of any multilateral organisation also impacts financing.</li> </ul>	CIF Industry Decarbonization Program		This program, launched by the CIF, aims to help developing countries, including Mexico, decarbonize hard-to-abate industries such as iron and steel, cement, chemicals, and petrochemicals.
			ACT-DDP pilot project	•	This international pilot initiative aims to accelerate the implementation of deep decarbonization strategies in Mexico's power generation, cement production, and urban passenger transport sectors.

#### Key takeaways

Mexico lack critical policy and supporting ecosystem which has resulted in low uptake of industrial decarbonization technologies.

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





# **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









# **Questions & Answers**





# **Coffee Break**







## Gender Equality, Social Inclusion and Environmental Safeguards





### **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.





#### 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.





# To what extent do you think GESI influences the success of transformational demonstration projects?



Menti.com Code **2856 4858** 





## 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

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







### **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 gendermainstreaming
- 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





## **Considerations for a GESI Analysis**

#### O1 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
- O3 Considering of the needs, rights, capabilities and priorities
- O5 Gender Age disaggregation data
- 04 Ensuring participation of diverse social groups in decision-making







## 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.





### **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.	<ul> <li>There is at least one explicit gender equality related output backed by at least one gender-specific indicator.</li> <li>A gender analysis of the project has been conducted and the findings inform project design.</li> <li>Data and indicators are disaggregated by gender, where applicable.</li> <li>The M&amp;E component of the project is designed to report on the expected gender equality results.</li> <li>The logframe/results framework measures progress towards the project's gender-related output(s) through gender-specific indicators to track outcomes/impact.</li> </ul>
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)





### **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.





## **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).





### **UNIDO ESSPP**



The Integrated Safeguard Policy Statement

The Operational Safeguards

- **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





#### **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 S protected areas

to Soil degradation reas and erosion

gradation Contamination erosion from wastewater Occupational health and safety 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

Child labor on

family farms

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





## **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.
and the state of		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.
. nil		Community Displacement	Disruptions due to facility development.
H	Clean Hydrogen	Water Scarcity	High water demand for electrolysis processes.
L1.L		Land Acquisition Issues	Conflicts over land use due to facility development.
And A La	Smart Energy	Cybersecurity & Privacy Risks	Cybersecurity vulnerabilities in smart grids.
E ta		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.





### **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 (<u>ESIA</u>), Environmental and Social Management Plan (<u>ESMP</u>), or Environmental and Social Management Framework (<u>ESMF</u>) 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





### **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         OS6: 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)



#### **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: <u>Land Mark Interactive Online Map</u>
- Free online Biodiversity Risk Filter and Water Risk Filter for project area and sector: <u>WWF</u> <u>Biodiversity & Water Risk Filter</u>
- Online Toolbox for Climate Risk Analysis: FAO Climate Risk Toolbox
- Further guidance on p. 33 of <u>UNIDO ESSPP</u> under 3.1 Project Identification, Screening and Categorization







#### **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





# **Questions & Answers**





## **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 Dem onstration Projects: A2D Facility Workshop - Feedback form







#### Workshop Wrap-Up

#### **Evening Reception**



#### **Further Information**

- A2D Facility Website: <u>Visit the website here</u>
- 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: <u>Access the reports here</u>