Plan to Accelerate Electrification Solutions

Axis: 1. Transitioning Energy, Industry and Transport

Key objective: 1. Tripling renewables and doubling energy efficiency

Solution: Electrification

Host Initiative: Utilities for Net Zero Alliance (UNEZA) and Alliance for Industry Decarbonization (AFID)

Scope: Power, Industries, Transportation, Aviation, Maritime, Homes and Buildings

Description

The cost-competitiveness of renewables paves the way for energy transition towards global climate goals, providing clean and affordable electricity. In combination with energy efficiency, electrification is expected to be the promising pathway to underpin the decarbonisation of energy systems globally. Due to widespread electrification across end-use sectors, electricity generation would need to grow substantially by 2050, expanding 3-fold compared to 2023, with renewables providing around 90% of total electricity supply.

Dual benefit of energy savings and emission reductions underscores the critical role of electrification in achieving both efficiency and sustainability goals. The electrification of end-use sectors reflects the shift towards electricity as a key energy carrier, essential for decarbonizing sectors. Moreover, achieving a 4% energy intensity improvement rate under the UAE Consensus will require urgent actions and increasing electrification across multiple sectors.

Levers assessment:

- **Risk-informed decision-making:** Medium maturity
  - *Rationale: There are a number of risk evaluation tools and frameworks that can be applied to electrification and support decision making. The tools range from climate risk, energy transition planning, industrial decarbonization and others have to be adapted and used in combination for evaluating electrification-related risks in specific industries.*
- **Technology shifts:** Medium maturity
  - *Rationale: Technological pathways for future electrification are increasingly well known across sectors (for example electromobility, electric heating, electrochemical synthesis, and electrified production of hydrogen and synthetic fuels, integration of renewables & flexible loads in electrification of industrial processes, …) are all viable and have high potential but they are at various stages of development. Within few industrial processes with higher temperatures, electrification technologies do not yet exist or are at a very early stage.*
- **Knowledge & Capacity building:** High maturity
  - *Rationale: There is a strong knowledge base to drive electrification, but some gaps still exist. Even with smart electrification strategies, there are trade-offs between direct and indirect electrification pathways at the system-wide level. More studies with clear insights are needed to the sensible extent of different pathways across sector.*
- **Inclusive decision-making governance & design:** Medium maturity
  - *Rationale: Inclusive governance in electrification requires widening the circle of decision-making, ensuring proper consultations and fairly sharing both costs and benefits across design choices, and embedding accountability and participation in the transition.*
- **Standards & Taxonomies:** Medium maturity
  - *Rationale: As new technologies on electrification continue to develop, harmonization of standards and taxonomies is needed to cover various aspects of technology performance and safety, sustainability classification & carbon accounting, integration of end use and grids, finance eligibility, disclosure, and social safeguards. Lack of global standardization in equipment and carbon accounting slows scaling.*
- **Supply:** Low maturity

- *Rationale: Components for key infrastructure (cables, large transformers, specialized power electronics) are facing long lead times, raw material bottlenecks and & geographic concentration. Supply chains will need to scale dramatically to meet demand, or else electrification targets (for industry, grids, transport) risk being delayed. Integrating circular economy principles is important as well for a more resilient energy future.*

- **Demand:** Medium maturity
  - *Rationale: Demand for electrification-related assets (heat pumps, renewable generation, electric motors, etc.) is rising. Demand signals from green procurement policies (steel, cement, chemicals) are emerging but still fragmented. Electrified assets are very clear pathways for decarbonization that need further acceleration. In certain countries (e.g. Germany) some of the demand is mitigated by improving efficiency of existing infrastructure through digital tools.*
- **Public/private finance:** Medium maturity
  - *Rationale: Industrial electrification (for example new electric furnaces, hydrogen-ready infrastructure, grid reinforcements) often require large upfront investments. Public finance is often used to de-risk, subsidize early adoption, and support infrastructure and ensure social fairness. Private finance is key to scale investment, foster innovative financing models, and drive efficiency.*
- **Partnerships and collaboration:** Medium maturity
  - *Rationale: Many sectorial and cross-sector partnerships exist and are central to accelerating electrification, because the challenge spans multiple sectors, technologies, and stakeholders. Partnerships help to engage stakeholders, share experiences and align on pathways forward. On the other hand, the partnerships to foster electrification face many challenges because they cut across sectors with very different priorities, solutions, risks and time horizons. Collaboration across the value chain is essential, especially among the upstream and midstream segments to ensure connection for new renewable generation projects.*
- **Policy & regulatory:** Low maturity
  - *Rationale: Policy and regulatory frameworks are critical levers for scaling electrification and have varied maturity across countries. Balanced policies are needed to have long term signals, planning, appropriate market design, incentives to develop grid and energy storage, reskills workforce and advance technologies to electrify various economy sectors.*
- **Public opinion:** Low maturity
  - *Rationale: public awareness of aspects of electrification is growing in consumer / residential sectors (EVs, heat pumps, renewables) but in many places awareness of industrial electrification remains very limited.*

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By 2030, this plan aims to unlock measurable progress:

For UNEZA members and partners, the Plan Solutions to Accelerate Electrification Solutions will foster actions on electrification, co-operation within the power and utilities sector, to address and overcome the common barriers hindering the achievement of emissions reduction targets and the realization of global net zero ambitions. The plan will guide maintaining and further shaping dynamic new partnerships in the sector and forge effective channels for dialogue with key public and private stakeholders. This Alliance unites leading global utilities and power companies with the aim of spearheading the development of grids that are ready for renewable energy, promoting clean energy solutions, and advancing electrification efforts. Members and Partners work proactively to address the barriers through global cooperation, knowledge development and public-private consultations facilitated by IRENA, and the UN Climate Change High-Level Champions and Ecosystem Partners.

For AFID members and partners, the Plan Solutions to Accelerate Electrification Solutions will advance actions, dialogue and increase cooperation to help companies to develop solid decarbonization strategies, electrification solutions and implementation plans, aligned with their countries' net-zero and decarbonization commitments. The Alliance, coordinated by IRENA, will serve as a global platform for enhancing dialogue through exchange of insights, experiences and best practices. The Plan Alliance will (i) support industrial partners who set aspirational goals aligned with global and national decarbonisation ambitions; (ii) support interested industrial partners in the development and implementation of decarbonisation strategies; (iii) stimulate exchange of knowledge and best practices among practitioners; and (iv) engage with global and regional energy and climate platforms to foster action for end-use decarbonisation of end-use sectors, particularly, industry. Through common goals, willingness to change, and strong collaboration, industrial emissions will stop rising. Ultimately, only collective efforts of the industrial sector will accelerate the achievement of a net-zero future.

Expected contributions to global processes:

- **2030 Climate Solutions targets**: supports the renewable energy scale-up through electrification
- **SDGs**: Electrification is effectively a cross-cutting enabler: it supports clean energy access, industrial innovation, climate action, and sustainable growth. It contributes directly to SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 – Responsible Consumption and Production.

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Output	Action Scope	Action	Type of action	Implementation Lever	Responsible	Time horizon	Stakeholder engagement	Committed Stakeholders
Invest 88 bln USD/year in RE projects	Electrification	Further enhance the joint target Reach FID	Existing	Public and private finance	UNEZA members	2023-2030	Companies	Members of UNEZA
Increase from 351 GW to 1,074 GW of new RE generation capacities	Electrification	Further enhance the joint target Deliver projects Establish a dashboard to track progress	Existing	Public and private finance	UNEZA members	2023-2030	Companies	Members of UNEZA
Increase from 502 GWh to 2,425 GWh of new energy storage capacities	Electrification	Further enhance the joint target Deliver projects Establish a dashboard to track progress	Existing	Public and private finance	UNEZA members	2024-2030	Companies	Members of UNEZA
Accelerated energy transition through stronger international collaboration in power sector	Electrification	Identify the future energy system needs 2030 - 2050 and highlight key challenges and bottlenecks hindering the sustainable build-out of a resilient future energy system (focus on capital, supply chain and policy) Prepare and publish report Transforming power: 2030 and beyond	Existing	Partnerships and collaboration	UNEZA	2025 -2030	Multi-stakeholders	Members and ecosystem partners of UNEZA
Reach Net Zero emissions by 2050 at the latest	Electrification	Members reach net zero and scale successful initiatives beyond UNEZA	Existing	Technologies	UNEZA	2025-2030	Companies	Members of UNEZA

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Facilitate Policy and regulatory support	Electrification	8 High level dialogs of utilities with regulators and policy makers	Existing	Policy & regulations Public/private	UNEZA	2025-2028	Multi-stakeholders	Members and ecosystem partners of UNEZA, and RETA
De-risk supply chain	Electrification	Publish Supply Chain High Level Statement on energy transition Encourage mandates for the use of harmonized international standards for critical equipment	Existing	Demand Supply	UNEZA	2025	Multi-stakeholders	Members and ecosystem partners of UNEZA
Knowledge and Capacity building	Electrification	Develop Digital Academy Net Zero Solutions Provide 4 capacity building courses to power utilities in Global South	New action	Partnerships and collaboration	UNEZA	2025-2027	Multi-stakeholders	UNEZA, MENALINKS
De-risk supply chain with aggregated demand and pooled procurement	Electrification	Delivery Mechanism to advance harmonisation, demand aggregation and pooled procurement within Supply Chains Mission in Small Island Developing States	New action	Demand Supply	UNEZA, GCPA	2026-2028	Countries Multi-stakeholders	UNEZA, GCPA, SIDS LHI, Small Island Developing States
Advance off grid solutions	Electrification	Implement community electrification by providing reliable, clean electricity through microgrids, off-grid systems. The solutions include standardized, solar home systems, and training programs to empower local communities and entrepreneurs with energy access and the skills to manage it.	New action	Demand Supply	UNEZA members	2026-2028	Companies	UNEZA members

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Increase from 183GW to 534GW of new RE generation capacities	Electrification	Further enhance the joint target Deliver projects Establish a dashboard to track progress	Existing	Demand Supply	Alliance for Industry Decarbonization (AFID) members	2023-2030	Companies	AFID members
Increase Bioenergy with CCUS from 4,005 kT of CO2 to 58,210 kT of CO2	Electrification	Further enhance the joint target Deliver projects Establish a dashboard to track progress	Existing	Demand Supply	AFID members	2023-2030	Companies	AFID members
Reskill human capital from 20% to 99%	Electrification	Further enhance the joint target Establish a dashboard to track progress	Existing	Knowledge	AFID members	2023-2030	Companies	AFID members
Increase investment from 60 bln USD to 124 bln USD in energy transition technologies	Electrification	Further enhance the joint target Reach FID Establish a dashboard to track progress	Existing	Public and private finance	AFID members	2023-2030	Companies	AFID members
Reduce 0,24 Gt GHG in absolute Scope 1 + 2 emissions (54% from baseline year	Electrification	Further enhance the joint target Establish Emission Reduction Portal with a dashboard to track progress	Existing	Technologies	AFID members	2023-2030	Companies	AFID members
Reduce 2 Gt GHG Scope 3 emissions 43%1 from baseline year	Electrification	Further enhance the joint target Establish Emission Reduction Portal with a dashboard to track progress	Existing	Technologies	AFID members	2023-2030	Companies	AFID members
Human Capital / Knowledge	Electrification	Develop and expand Digital Platform MyChange with educational and reskilling materials for members Deliver 6 modules of capacity	Existing	Knowledge	AFID	2025-2026	Multi-stakeholders	AFID WG Human Capital

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		building training programme						
Green Hydrogen	Electrification	Prepare and publish The Building Blocks of Hydrogen Hubs – A case study	Existing	Technologies	AFID	2025-2026	Multi-stakeholders	AFID WG Green Hydrogen
Advance renewables via improve transparency on critical materials	Electrification	Prepare and publish traceability guidelines in raw material usage for main equipment	New action	Policy & regulations Public/private	AFID	2025-2026	Multi-stakeholders	AFID WG renewables
Bioenergy with CCUS	Electrification	Prepare and publish Technology Brief on readily implementable CC technologies that can support electrification and decarbonization Prepare and publish paper on Investment in BECCUS	New action	Public and private finance	AFID	2025-2026	Multi-stakeholders	AFID WG BECCUS, UNIDO
Circularity	Electrification	Prepare and publish Report on Circularity in Aluminum industry with trends and data, highlights on circular economy	New action	Policy & regulations	AFID	2025-2026	Multi-stakeholders	AFID WG Circularity
Finance	Electrification	Prepare and publish Report Green Finance Going Global	New action	Public and private finance	AFID	2025-2026	Multi-stakeholders	AFID WG Finance
Collaboration	Electrification	Prepare annual action plans and conduct bi-monthly cooperation calls on six working groups on Renewables, Green Hydrogen, BECCUS, Circularity, Human Capital and Finance	New action	Partnerships and collaboration	AFID	2026 - 2028	Multi-stakeholders	AFID

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Enterprise Twinning platform	Electrification	Develop online dashboard to connect members with external organisations	New action	Digital	AFID	2025-2026	Multi-stakeholders	AFID WG renewables
Technologies	Electrification	Conduct technology showcase to bring high TRL solutions to industries	New action	Technologies	AFID	2025-2026	Multi-stakeholders	AFID
Energy Storage	Electrification	Prepare and publish Technology Brief on readily implementable thermal storage that can support electrification	New action	Technologies	UNEZA	2025-2026	Multi-stakeholders	LDES

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