## AGENDA

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UNIDO’s mandate

UNIDO fosters Inclusive and Sustainable Industrial Development (ISID) by providing technical cooperation, analytical and policy advisory services, standard setting and compliance, and by convening for knowledge transfer, partnerships and networking.

UNIDO services are delivered across three strategic pillars:

- **Advancing Economic Competitiveness**
- **Inclusive and Sustainable Industrial Development**
- **Safeguarding the Environment**

Creating Shared Prosperity
Department of energy

Energy Systems & Infrastructure
sustainable energy solutions FOR and IN industry

Climate Technology & Innovation
empowering and catalyzing entrepreneurial ecosystems for climate innovation in developing countries

Climate Policy & Partnerships
climate technology network centers & global network of regional sustainable energy centers
Mini Grids: Where we stand

Globally

- Nº of mini grids project in UNIDO portfolio: 37
- Total amount of budget allocated: > 50 billion US$
- Technology: biomass, small hydro, solar PV, wind power
- Region covered: Africa, Asia, Eastern Europe, South America
- Nº of countries covered: 27
China
* Under Sustainable City Development

Country Project Period
- Technology
- Actual size of installed mini-grids (w/ Total Installed Capacity)
- Ownership
- Key UNIDO’s function

Cambodia
2012-
- Solar based
- 2 sites / 250 kW
- Community & Private Sector
- TC

India
2013-2016
- Ultra low head Micro Hydro
- 3 sites / 30 kW
- Public and Community
- Investment Grant & TC

Sri Lanka
2005-2014
- Small Hydro/ Biomass
- 1 site
- Community
- Investment Grant & TC
Cote d'Ivoire 2013-2015
- Solar PV
- 7 sites / 1.4 MW
- Community
- Investment Grant & TC

Nigeria 2012-2020
- Biomass
- 5MW
- Private Companies
- TC

Zambia 2006-2012
- Solar PV/Small Hydro/ Bio
- 3sites / 1.5MW
- Public entity
- Soft Loan

Madagascar 2015-2022
- Small Hydro
- 6-7 sites / 20 MW
- Private companies
- TC&Grant

Tanzania 2012-2018
- Small Hydro
- 8sites/ 4.8 MW
- Private Companies
- Investment Grant & TC

Kenya 2013-2016
- ULH-MHP
- 2 sites/ 20kW
- Communities
- TC & Grant

Ethiopia 2013-2016
- ULH-MHP and PV
- 1 site/ 10 kW
- Communities
- TC & Grant

Guinea Bissau 2012-2019
- Solar PV
- 2 sites/812kW
- Community Based
- Investment Grant & TC

Chad 2012-2015
- Solar PV
- 3 sites / 111 kW
- Private Companies
- Investment Grant & TC

Ethiopia 2013-2016
- ULH-MHP and PV
- 1 site/ 10 kW
- Communities
- TC & Grant
Promoting Renewable Energy for Productive Uses
The Gambia
2015 - 2019

Objective:
Support the greening of productive sectors in rural areas

Type of mini-grids:
Solar PV, gasoil hybrid

Outcomes:
- Local workforce used for civil engineering
- Productive activities supported: Milling machines, tailor and welding shops
- Reduction cost of energy: none
- Greenhouse gas reduction: 2,206.3 tCO2eq/year
- Ongoing process to review energy policy, including creation of a regulatory agency for the sector
Success stories - India

Objective:
Increase the access of rural communities to renewable electricity in the State of Uttarakhand

Type of mini-grids:
Ultra-low head micro hydro

Outcomes:
- 27 permanent jobs created
- Productive activities supported: Agro-food, eco-tourism, energy services including local manufacture
- Reduction cost of energy: Savings of USD 4,500/year from 1st site
- Greenhouse gas reduction: 286 tCO2eq/year
- New policy guidelines for micro hydro, state policy on the development of hydro up to 2MW, specific grants
Success stories - Zambia

Objective:
Increase electrification and economic development in rural areas and deliver RE for productive uses

Type of mini-grids:
Solar PV, biomass, small hydro

Outcomes:
- 500 jobs created
- Productive activities supported: lodge, shops, storing frozen food, (fisheries)
- Reduction cost of energy: Savings of USD 320 (diesel) to USD 40/month
- Greenhouse gas reduction: 6,088 tCO2eq/year
- Revised national energy policy in May 2008
## What we have learned – Assessment

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<th>Critical criteria</th>
<th>Assessment</th>
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| Revenue to support the mini-grid          | ▪ Sites selected with potential future customers in mind (business connected)  
▪ Productive activities able to operate more efficiently with reliable electricity supply  
▪ Cost of operator covered by tariffs and grants; co-finance by the communities  
▪ Encourage new users to connect to the grid |
| Willingness & ability of consumers to pay bills | ▪ High level of national ownership  
▪ Set tariffs for all consumers; tariff should not changed as a result of the project.  
▪ High willingness to pay: consumers benefit from higher reliability and availability of electricity |
| Community participation                   | ▪ Community and leading actors involved in project identification from the start  
▪ Population understands the benefits of mini-grids in terms of green energy generation and local business development  |
| Regulatory framework                      | ▪ Clear regulatory framework favorable for mini grids  
▪ Investment plan in place  
▪ Sufficient finance, powers and training of lead actors to supervise, manage mini grids development and stimulate the market  
▪ Regulatory measures designed to structure/standardize tariff setting and reduce financial risk perception by private actors |
| Local capacity building                   | ▪ Capacity building activities  
▪ Awareness-raising to help shape new policy development and interest from private sector  
▪ Creation of local jobs and local manufactures  
▪ Capacity to expand the skillset outside the project.  
▪ Good collaboration between all partners and local stakeholders |
What we have learned – Challenges

- Technology choices and technical capacities
- Policy and regulatory framework
- Business models utilized for rural mini-grids
- System financing and risk management

Source: Renewable energy-based mini-grids: The UNIDO experience, 2017
What we have learned – Success criteria

Five critical criteria identified for the long-term success of mini-grids

- C1. Sufficient revenue
- C2. Willingness and ability of to pay
- C3. Community participation
- C4. Regulatory/financial capacity
- C5. Local manufacturing capacity

Source: Renewable energy-based mini-grids: The UNIDO experience, 2017
Where we are heading - Outlook

Further strengthen our engagement and assistance towards:

- Cross-sectoral development
- Promote technology and business models innovations
- Private sector support
- Financial institutions involvement
- Policy and legislative development
- Civil society partnership
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- Private sector support
- Financial institutions involvement
Where we are heading - Outlook

Policy and legislative development

- Promote and facilitate decentralized energy planning
- Define consumer protection principles
- Develop regulatory toolkit
- Encourage policy intervention towards financial institutions
Where we are heading - Outlook

Private sector support

Increase private sector engagement in collaboration with organizations such as:
- Alliance for Rural Electrification (ARE)
- Africa Mini-grid Developers Association (AMDA)
- Renewable Energy for Africa (RES4Africa)
- Cleantech Group

Promote the creation of RE associations and technology clusters at:
- national level
- regional level

Build the capacity of promising energy access start-ups

Support promising energy access start-ups to access financial instruments and mechanisms
Where we are heading - Outlook

Financial institutions

- Increase financial institutions involvement to scale up investment in new technologies and promising energy access start ups
- Establish a standardized financial risk management procedure
- Find solutions to improve access to loan
Where we are heading - Outlook

Civil society partnership

Professionalize energy access associations to raise community awareness

Create new prospects through productive uses

Activate decentralized RE market by facilitating the establishment of and/or alignment of market ecosystem
Where we are heading - Opportunities

Cross-sectoral development

Identification and development of potential clusters:

- Food-energy nexus
- Technology (transfer and scale up)
- Mobility / Transport

Explore new collaboration schemes

Establish a multi-stakeholders taskforce
Policy Guidance and Tool-kit

• MoU between UNIDO and the Alliance for Rural Electrification signed in January 2019

• Plan to jointly develop a toolkit to raise awareness of regulators on the impacts of various options for structuring markets as well as different options for electrification.

• Evaluation of different models
  • Government driven
  • Private sector driven
  • Hybrid driven markets
Thank you!

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