Promoting International Technology Transfer for Renewable Energy in ACP Group of States

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Outline of Presentation

• Introduction
• Transfer of technology: Case of Solar energy
• Potential RET transfer
• Promoting RET transfer at the international level
• Conclusion
Technology and innovation policies are the key drivers that can promote and facilitate the development, acquisition, adaptation and deployment of RET to support sustainable development and poverty reduction in developing countries and LDCs

TIR 2011, UNCTAD
Key Questions?

How to transfer reliable and appropriate RET to developing countries and LDC to ensure sustainable development?

Where do companies in ACP countries search and inform themselves of appropriate RETs for technological acquisition?
1. Introduction

- Technology transfer of RET is a key component in improving energy consumption and productivity of ACP countries.

- Energy access is directly to income and poverty and development.

- Lack of educational and testing centres to validate the appropriateness of technologies in renewable energy to ACP countries.

- Lack of skills in transfer of renewable energy technologies to ACP countries.

- Linking funding organizations, NGOs, etc to testing and education centres to ensure that appropriate technologies are transferred to ACP countries.
Links between access to energy and human development index \(^1\).

- **the big picture**
- **GDP/cap Vs Poverty ratio**
- **Life expectancy of each cluster**
- **Labour productivity Vs Energy**
- **Energy productivity Vs Prosperity**

The Big Picture

GDP/capita vs. kW/capita graph showing countries like Japan, USA, Canada, and others plotted along the graph. Key points include the world average, China, Brazil, Argentina, South Africa, Russia, and others.
Links between access to energy and human development index.

- **the big picture**
- **GDP/cap Vs Poverty ratio**
- **Life expectancy of each cluster**
- **Labour productivity Vs Energy**
- **Energy productivity Vs Prosperity**
GDP/cap vs poverty ratio: GPR-curve

There is one planet, but there are five different worlds:

\[ \rho_i(t) = \left( \frac{G_i(t)}{G_0} \right)^{-1} \quad \text{for} \quad i = 1, 2, 3, 4, 5 \]

The big gap

<table>
<thead>
<tr>
<th>GDP/Capita (in $/day)</th>
<th>% poor of the population</th>
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<tbody>
<tr>
<td>$1.1/day</td>
<td>100%</td>
</tr>
<tr>
<td>$2.8/day</td>
<td>80%</td>
</tr>
<tr>
<td>$9.4/day</td>
<td>50%</td>
</tr>
<tr>
<td>$19.2/day</td>
<td>20%</td>
</tr>
<tr>
<td>$120/day</td>
<td>0%</td>
</tr>
</tbody>
</table>

Cluster 1
Cluster 2
Cluster 3
Cluster 4
Cluster 5
Links between access to energy and human development index.

- the big picture
- GDP/cap Vs Poverty ratio
- Life expectancy of each cluster
- Labour productivity Vs Energy
- Energy productivity Vs Prosperity
Life expectancy of each cluster

There is one planet, but there are five different worlds

$$\rho_i(t) = \left( \frac{G_i(t)}{G_0} \right)^{-1}$$

for \( i = 1, 2, 3, 4, 5 \)

- 53 year
- 63 yr
- 72 yr
- 70 yr
- 80 yr
Links between access to energy and human development index.

- the big picture
- GDP/cap Vs Poverty ratio
- Life expectancy of each cluster
- Labour productivity Vs Energy
- Energy productivity Vs Prosperity
For higher labour productivity we need much more energy
Links between access to energy and human development index.

• the big picture
• GDP/cap Vs Poverty ratio
• Life expectancy of each cluster
• Labour productivity Vs Energy
• Energy productivity Vs Prosperity
More energy productivity leads to more prosperity

\[ G_i = bP_{e,i}^β \quad \text{for} \quad i = 1,2,3,4,5 \]
2. Transfer of Technology: Case of Solar Energy

- Pilot solar assembly plant in Ghana.
- Potential to replicate in other ACP countries.
- Video presentation
2.1 CASE Solar Panel Component Works in Ghana
2.2 Assembling of Solar street light
2.3 Demo - Solar street light
3. Potential RET projects for transfer of technology
3.1 Potential bioenergy technology transfer

- 50 kW to 150 GASEK product for community based electrification.
- Bioenergy entrepreneurship (bioenergy education and testing centre).
BIOMASS GASIFICATION TECHNOLOGY

The 150kW wood gas container and wood chip storage

Fuel: wood chips

Gas cleaning systems

Gen-set
3.2 Potential Wind Energy Technology Transfer: 2 kW for rural and peri-urban areas

Technical data (preliminary)
- Wind turbine type: Downwind HAWT, off-grid battery connected
- Output power: 1.9 kW @ 10.7 m/s (estimated)
- Rotor diameter: 4.3 m
- Blade material: Glass fiber reinforced wood
- Number of blades: 3
- Generator type: Permanent magnet generator
- Generator output: 400 V / 3.2 A, 20.5 Hz
- Maximum allowed rotation speed: 300 rpm
- Tower type: Guy-wired tilting tower
- Tower height: 10.6 m (1.2 + 6 + 3.6 m, latter can be altered from 3.6 to 6 m)
- Braking of turbine: Passive control with electrical brake

Estimated wind speed to power curve.
4. Promoting RET Transfer at the International level (TIR 2011)

• An international innovation network for ACP countries with a RET focus.

• Global and regional funds for RET deployment

• An international technology transfer fund for RETs

• An international training platform for RET
4.1 ACIC-ACP Framework

Companies & Institutions in ACP countries

ACIC / Centre for transfer of renewable energy technology

Co-financing investments - projects

ACP SECRETARIAT - Funds & Information

Pilot project demonstration
Advices
Technology transfer

Funds for Research, studies (Platform information centre)
4.2 ACIC-ACP Center of Technology Transfer for Renewable Energy

• ACIC-ACP partnership can promote projects, technologies, and business models that will focus on RET that can contribute to improving energy access and development in ACP countries.

• ACP can be the vehicle for securing international technology transfer fund for RET for ACP countries and their regional bodies.
4.3 Components of Technology Transfer

The ACIC-ACP partnership will create a sustainable transfer of technology in the field of renewable energy;

- promoting reliable technologies
- disseminating information,
- building capacities
- developing and supporting businesses in ACP Group of States
- facilitation of appropriate financing solutions
5. Conclusion

• Potential cooperation with ACP secretariat in technology transfer in renewable energy in member countries (e.g., renewable energy innovation centre with ACP secretariat)

• Potential cooperation with ACP secretariat in piloting demo-projects in renewable energy production and technologies in member countries

• Partnership with ACP secretariat in capacity building in renewable energy production and technologies in member countries.

• Partnership with ACP secretariat in assisting in innovative funding mechanism for the development of renewable energy.
THANK YOU FOR YOUR ATTENTION
Q & A