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GLOBAL NETWORK  
ON ENERGY FOR  
SUSTAINABLE  
DEVELOPMENT

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# Global Network on Energy for Sustainable Development

## Overview of Analytical Activities and Results

*Prof. Ogunlade Davidson*

**GNESD**

**Co-Chair**



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# The Thematic Working Groups

## **Africa:**

- Energy Research Centre (South Africa)
- Environment and Development in the Third World (Senegal)
- African Energy Policy Research Network (Kenya)

## **Middle-East:**

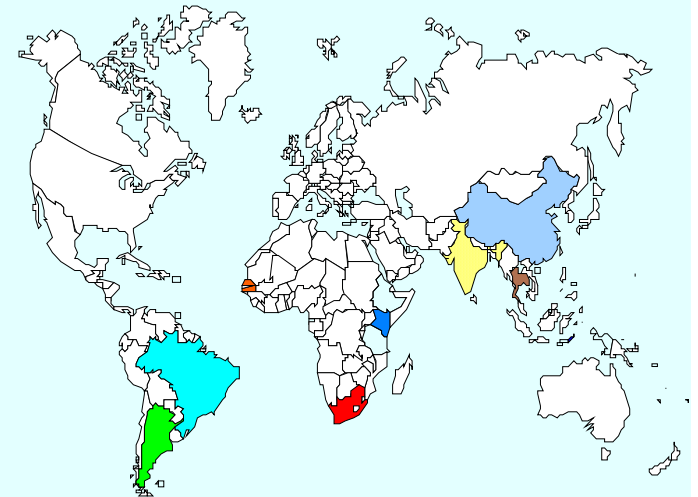
- American University in Beirut (Lebanon)
- MEDREC, Tunisia

## **Asia:**

- Asia Institute of Technology (Thailand)
- The Energy Research Institute (India)
- Energy Research Institute (China)

## **Latin America & Caribbean:**

- Federal University of Rio de Janeiro & University of Sao Paulo (Brazil)
- Bariloche Foundation (Argentina)



Supported by input and reviews from 10 Centres in developed countries

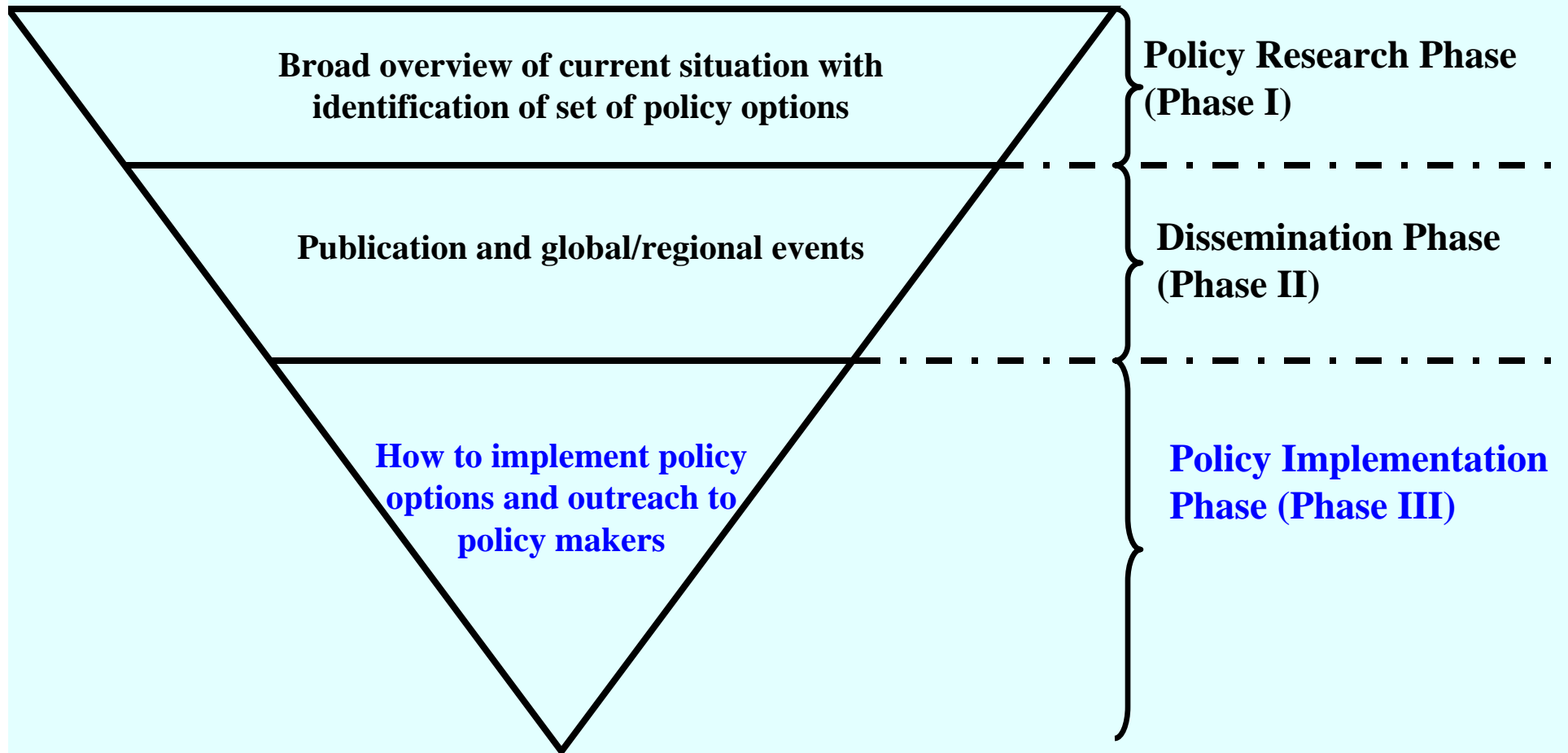


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# Progressive Focus



# Energy and the Poor

- Close to 50% of the world's population is poor (> US\$ 2.00 per day)
- Bulk of poor rely on traditional biomass (estimated global total = 2.4 billion)
- About 1.6 billion of the poor without electricity & clean/modern energy





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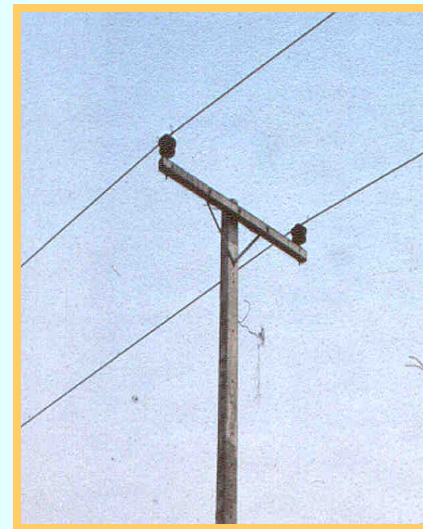
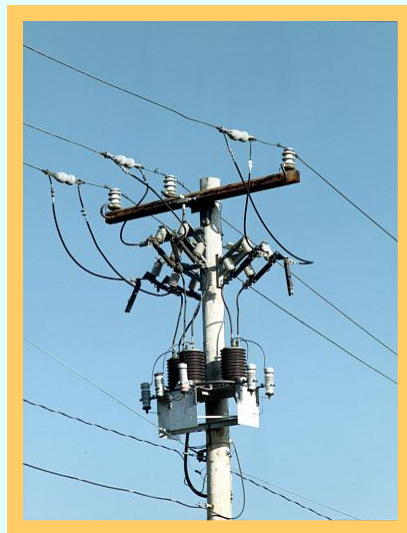
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# Two Thematic Studies

- Power Sector Reforms and the Impacts on the Poor
- Possible Contribution of Renewable Energy in poverty alleviation

# Has power sector reforms expanded access among the poor?

- Empirical assessments of the impact of the power sector reforms on the poor
- Policy options for improving the poor's access to electricity





# Policy Research Phase - Methodology

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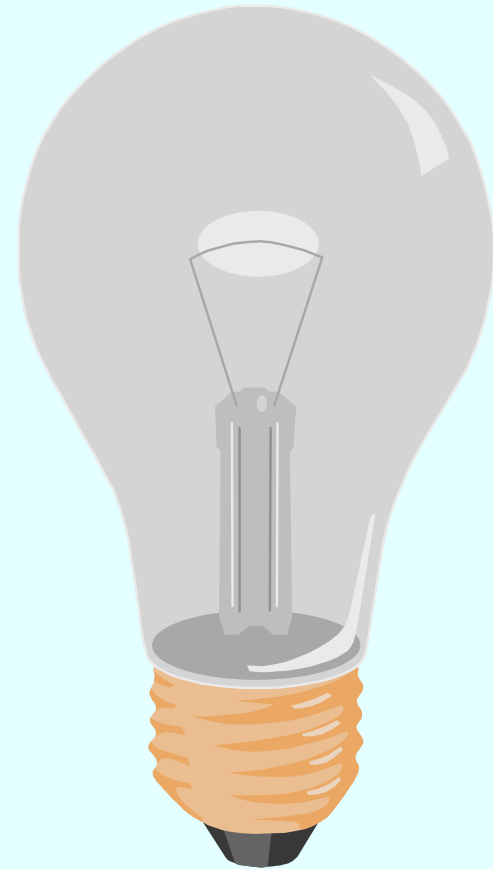
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- Sub-regional perspective (2 – 3 countries)
- Pre- and post-reform assessment
- Reliance on empirical data (by income groups)
- **Access**
  - *Electrification levels – physical access*
  - *Electrification rates – pace of electrification*
  - *Electricity consumption*
- **Affordability**
  - *Electricity tariffs*
  - *Electricity expenditure*

# Findings - Policy Research Phase

- Lack of reliable trend data sets on electricity use among the poor - indication of **past limited policy interest** (used proxies & analysis of primary data)
- Market-oriented reforms have had **neutral or adverse impacts** on the poor
- Power sector reforms need an **explicit pro-poor dimension** otherwise electrification of the poor is forgotten





# Findings - Policy Research

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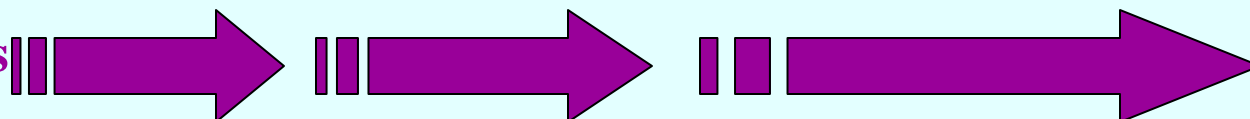
## Phase

- Need to **protect (ring-fence)** financing for electrification of the poor
- **Sequencing of reforms:** Preferably electrify the poor first, then privatize (or in parallel)
- If possible, ensure that the **poor are represented** in key decision making bodies
- Findings dovetail results of parallel & broader assessments on public benefits of reforms

**Electrifying the poor**



**Other reforms**





# Policy Implementation Phase - Methodology

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- Built on both Policy Research and Dissemination Phases
- Selection of policy options successfully implemented in at least 2 developing countries (or 2 provinces/states from India, Brazil and China)
- Preparation of detailed case studies demonstrating effectiveness of selected policies in reaching the poor
- Describe how the policies could be implemented:
  - Legal pre-requisites
  - Regulatory measures
  - Institutional requirements
  - Skills and capacity needs
  - Financing requirements



# Policy Options Addressed

	AFREPREN	ERC	ENDA	AIT	TERI	FB	COPPE/UFRJ - CENBIO/USP	ERI	AUB
Explicit focus on the poor	√	√√√	√√	√	√	√√	√√	√√	√√
Participation of local communities	√	√	√	√√√	√√√	√√	√	√√	
“Ring-fencing” of funds	√√√								
Low-cost technical options for electrification <sup>[1]</sup>	√	√	√						



# Findings - Policy Implementation Phase

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- Findings consistent to those of Policy Research Phase.
- Successful policy implementation requires, among others:
  - Participation of local communities: Ensuring that local people are consulted right from the initial planning phase
  - Promotion of income-enhancing activities
  - Coordination among Government entities at all levels (National and local)



# RE & Poverty Theme Objectives

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- Identification of role of RE options for poverty alleviation
- Identification of the main mistakes and successes in past approaches concerning renewable energies projects and dissemination strategies
- Identification of the main barriers for RETs dissemination and sustainable use
- Provision of policy guidance for the dissemination of RETs



# RE & Poverty

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## ***Renewable Energy Options:***

- Wide range of technologies selected by Centres (both improved traditional and advanced)
- There is no universal technology for answering energy needs of all regions
- There is a diversity of solutions based on local characteristics
- Tendency towards the selection of dependable technologies which represent an improvement over traditional ones
- Technologies which are able to satisfy multiple uses are preferred (residential & productive)
- Urgency for development is uneven among countries (conventional fuels supply issues, % rural population, etc.)



# RE Options Analysed

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- **Kenya, Tanzania:** wind pumps, treadle pumps and hydraulic rams for water supply and irrigation in rural areas
- **Senegal:** improved biomass stoves, solar and wind pumps
- **South Africa:** solar water heaters and improved biomass stoves
- **Thailand:** solar driers and biogas digesters
- **China:** electricity for remote villages based on local available resources (PV. Wind, mini-hydro or hybrid)
- **India, Nepal:** Thermal applications of biomass gasifier in SMiEs: specific focus on rubber drying and textile dyeing
- **Brazil:** biomass for EE production
- **Argentina:** Solar Water Heaters for all uses in urban and rural areas
- **Jordan, Syria, Lebanon:** solar thermal energy for water and space heating and cooling in urban and rural residential sector. Solar thermal energy for drying applications and process heating in the food industry.

# Main Options

Main REIs Niches identified	Africa			Asia			Latin America		Middle East
	Kenya Tanzania	Senegal	South Africa	Thailand	China	India Nepal	Brazil	Argentina	Lebanon Jordan Syria
Wind pump, treadle pump, hydraulic ram pump	a	r, p						a	
Photovoltaic		r			a	a			s
Biofuels (biodiesel, bioethanol, oils)			p, s				a	p	
Solar Water Heaters		r, s	a					a	a
Sustainable firewood / Improved Cookstoves		r	r						
Solar Dryer		p		p					
Charcoal production with biomass residues		r		p					
Biogas		r		p	r			a	
Small-Micro Hydro					a	a	a		
Biomass (Gasifier or steam cycle)						p, s	a	a	
Wind turbine		r, p				p, s	a	a	p

r = residential; p = productive; s = services; a = all

# Key problems by Country

Problems specific to the RE area	Africa			Asia			Latin America		Middle East
	Kenya Tanzania	Senegal	South Africa	Thailand	China	India Nepal	Brazil	Argentina	Lebanon Jordan Syria
1. Lack of adequate R&D and local RE industry	x	x		x	x	x	x	x	x
2. High cost of RETs and lack of affordability by poor population	x		x	x	x			x	x
3. Lack of adequate policies, planning and regulation	x	x			x		x	x	x
4. Lack of adequate O&M infrastructure and project sustainability	x			x	x	x		x	
5. Lack of strong institution coordinating activities and of qualified staff		x		x	x			x	
6. Conventional energies issues and environmental issues			x	x		x	x		
7. Exclusion of poor population and lack of opportunities			x		x	x		x	
8. Lack of coordination of activities and communication between stakeholders		x						x	x
9. Lack of awareness or negative perception	x		x	x			x		
10. Bureaucracy hampers coordination and implementation				x		x			
11. Lack of a genuine market for RETs		x	x						
12. Inadequate RE resource management / lack of access	x		x			x			

# Comparison of proposed Policy Outlines

Problem: Lack of adequate policies, planning and regulation	
Country	Policy Outlines
Kenya Tanzania	<ul style="list-style-type: none"> <li>Increased support by policymakers and other stakeholders for wind pumping technology through demonstration, documentation and wide-scale dissemination of case studies (Promote recognition of the potential role of non-electrical wind pumps amongst stakeholders. To revive existing non-functional schemes)</li> </ul>
Senegal	<ul style="list-style-type: none"> <li>Bolstering rural electrification agencies, giving them responsibility for mastering the use of energy and renewable energies</li> <li>Moving beyond thinking solely in terms of projects and ensuring spreading the use of RETs becomes an integral part of development programmes</li> <li>Implementing information pooling and coherent institutional arrangement</li> </ul>
Lebanon Jordan Syria	<ul style="list-style-type: none"> <li>All personnel involved in energy policies, energy generation, distribution, utilization should get minimum certification and training</li> <li>Involve energy experts in the decision making process, with more professional opinions sought.</li> <li>Prepare an organizational chart for the energy decision making process</li> </ul>
China	<ul style="list-style-type: none"> <li>Strengthen the coordination</li> <li>Approval and completion of the RE promotion law</li> <li>Define responsibility of related governmental bodies through RE law</li> <li>Deliberative and comprehensive RE plan by single authoritative government body</li> </ul>
Argentina	<ul style="list-style-type: none"> <li>Capacitating technical human resources in coordination, and policy and instruments formulation</li> <li>Giving more weight to the RE area within the public administration</li> <li>Strengthening one public institutions so that it can assume the coordinating role</li> <li>Making regulations compatible</li> <li>Creating control systems to guarantee the effectiveness of incentives</li> </ul>



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# Conclusions

- The role of **RETs for poverty alleviation could be very important in all countries** studied, and contrasts with the low level of development and priority assigned to the area. (degree depending on resources, capacities, existing energy infrastructure and population distribution)
- Specific **RE policies should be formulated and implemented** in those countries currently lacking them. RETs should become an integral part of development programs
- Continued **political commitment towards RETs** is an underlying key issue. Need to develop political will, commitment and application of adequate policies and strategies

# Conclusions (II)

- Relevance of **non-electrical technologies for satisfying priority household and productive energy requirements** (cooking, water heating, heating, water pumping)
- **Availability of adequate databases** matching population distribution, energy requirements, income level and energy resources is generally lacking and would be useful for planning
- There is **high potential for local job generation and increased economic activity** through system manufacture and renewable resource extraction and processing





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# Conclusions (III)

- Equipment manufacturing, O&M infrastructure and post sale services are generally weak, though some capacity exists (variable among countries)
- R&D should be coordinated and focus on technologies that correspond to priority energy requirements and local capacities



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# Key Outputs Thematic Activities

- Sub-regional technical reports
- Synthesis and Comparative Analysis Report
- Summary for Policy Makers
- All outputs available on GNESD Website + CD
- Regional Policy Workshops
- National Policy Dialogues
- Journal Publications



# Global Impact of Access Studies

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- Established true south-south partnership
- Effectively excavating relatively new ground
- Special Issue of 'Energy for Sustainable Development'
- Global Events (Bonn, EUEI, IEA, )
- Triggered consultations on various studies from different parts of the world – national governments + donors
- Quoted in UN, IEA, WEC and REN21 publications
- Master and Ph.D. studies and quoted widely



# National Impact of Access Studies

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- Contribution to the national policy documents
  - Electricity tariff policy in Lebanon
  - Pro-poor rural electrification in Kenya
- Establishment of close links with government ministries and other institutions (e.g. Brazil)
- Review of tariffs to ensure explicit subsidies for the poor (e.g. Argentina)
- Access work used by national institutions
  - Energy Secretariat of Argentina
  - Utilities in Argentina