Policy Study on Regional Mapping of Options to Promote Private Investments in Alternative Energy Sources for the Poor

REP-PoR Studies

Winrock International
August 10th, 2006
Bangkok

Study objectives

- Identify and characterize renewable energy policies, programs and initiatives in the Asia Pacific region
- Catalogue key policies, programs and initiatives to promote private investment in renewable energy development, and reasons for success/failure
- Assess the impacts renewable energy programs/projects involving private investment in meeting the energy needs of the poor
- Recommend policy options

Study Approach

- Review existing literature on
  - Trends in development of market for renewables in the Asia Pacific region
  - Major policy developments at the national and regional levels,
  - Major projects, programs and initiatives on renewable energy
  - Emerging thinking and experience on linkages between renewable energy, poverty reduction and the MDGs

- Analysis of the existing energy policies, renewable energy sector policies and legislation relating to the policy-making processes in the region;

- Qualitative interviews and consultations with policy makers, researchers, manufacturers and final end users of renewable energy technologies.

Study Approach (continued)

- **Four levels of analyses**
  - Global Assessment
  - Regional Assessment
  - National Assessments, covering countries Bangladesh, Cambodia, Indonesia, Nepal, Philippines and Solomon Islands

    Criteria for selection of countries:
    - » Prevalence of poverty and potential role for RETs in its mitigation
    - » The investment climate conducive to private sector participation
    - » Regional balance among Asia Pacific countries

  - Micro level case studies
    - » community surveys to assess local impacts of specific private sector-led renewable energy programs/projects on the poor within the context of MDGs;
    - » analysis of technical, economic, institutional, social and cultural factors behind the success or failure of the case study programs/projects;
    - » integrating the findings into the national assessments to reach policy conclusions

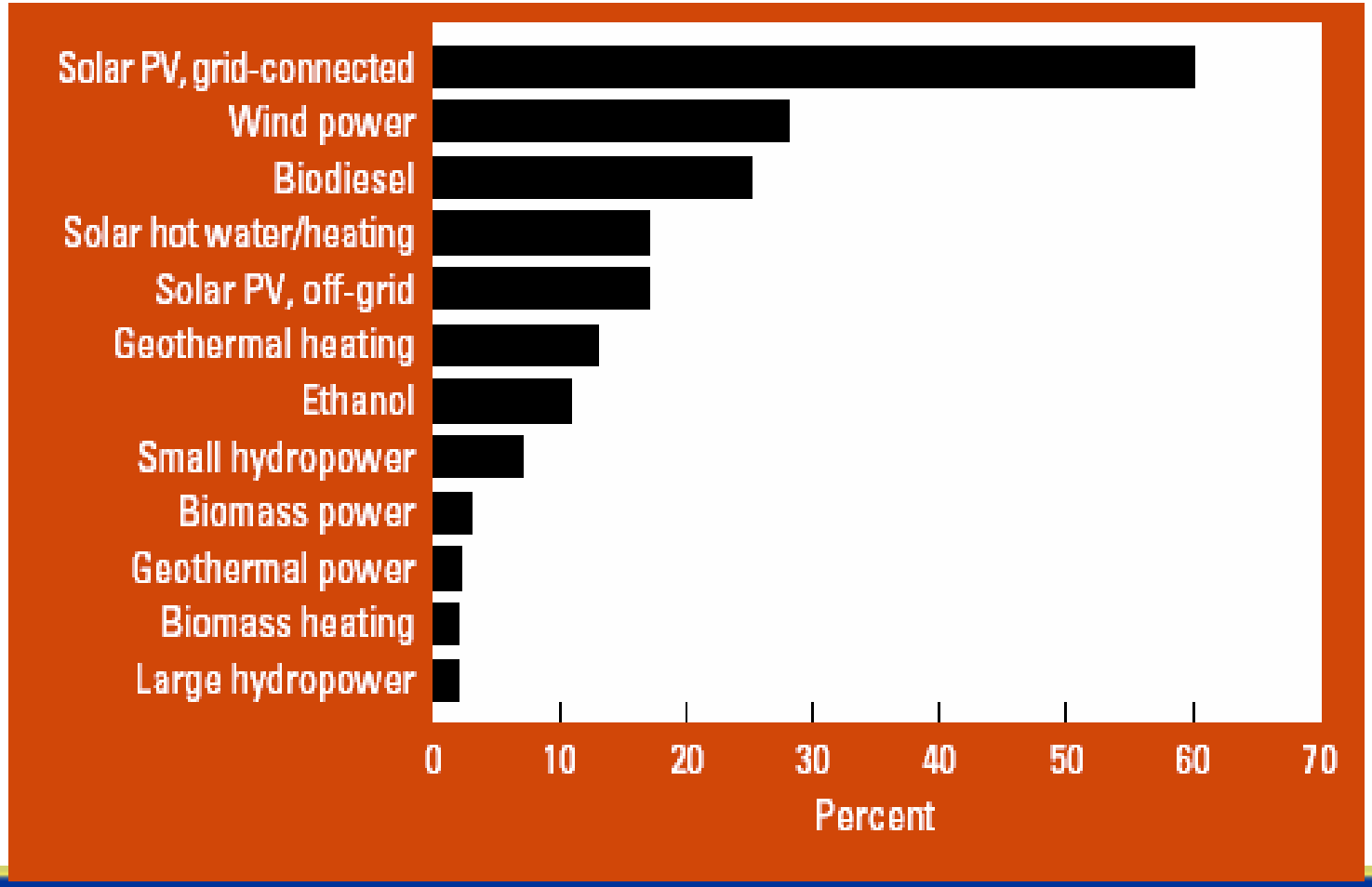
Renewable energy policy landscape

- ~50 countries have some type of renewable energy policy, including 14 developing countries. These include:
  - » Renewable energy targets and time tables
  - » Direct capital investment subsidies or rebates,
  - » Tax incentives and credits, sales tax and VAT exemptions, direct production payments or tax credits, Direct public investment or financing
  - » Independent power producers (IPPs) to generate and sell power to utilities under standard power purchase agreements (“Standard PPAs”).

Global renewable energy market trends

- Annual investment in RE sector: ~ US$ 38 billion in 2005 (from $6 billion in 1995)
  - » ~20–25 percent of global power sector investment.
  - » *1 $ in 4 in the power sector is invested in a renewables project.*
- Cumulative investment since 1995: More than $100 billion.
- Renewable electricity capacity worldwide totaled 182 GW in 2005, excluding large hydro.
- Wind power accounts for the highest share of annual investment ($9.5 billion), SPV at $7 billion, small hydro power at $4.5 billion, solar hot water/heating at $4 billion, and $5 billion for geothermal and biomass power and heat.

Global renewable energy market growth trends 2004 (continued)



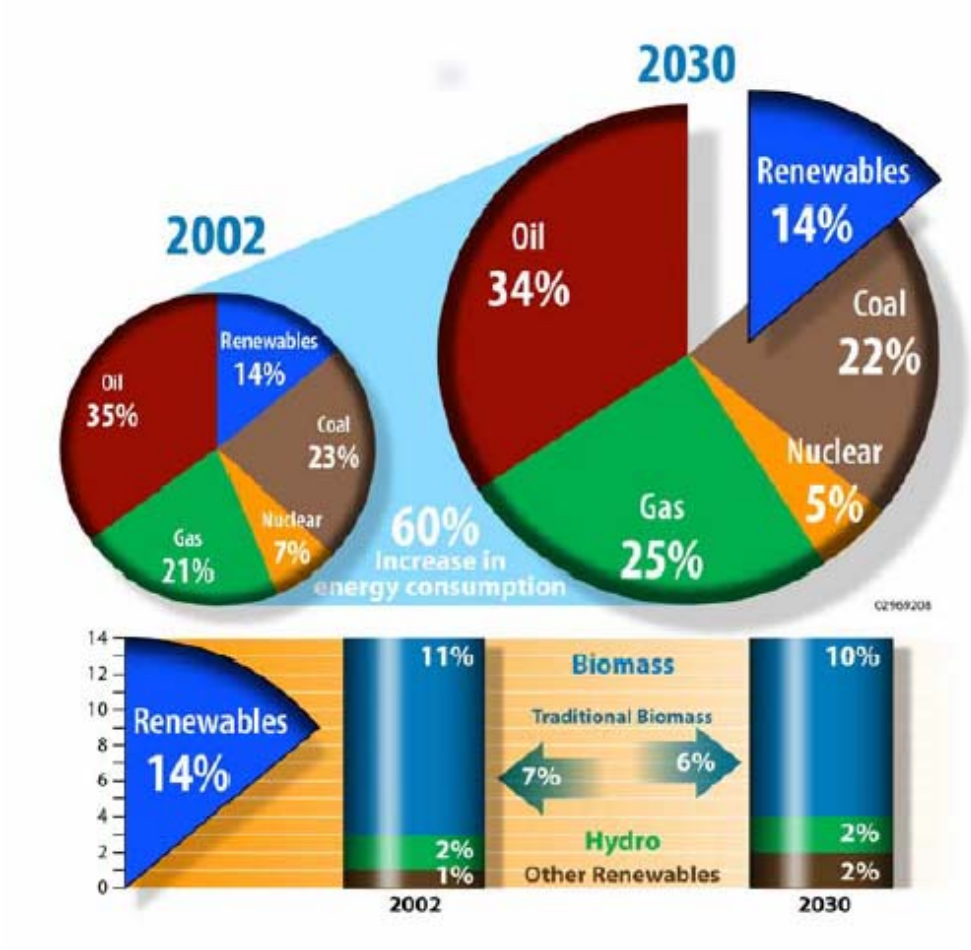
Global renewable energy market trends (continued)

- Geographical imbalance in RET markets
  - » Top five countries in investments (2004): China (37 GW), Germany (20 GW), the United States (20 GW), Spain (10 GW), and Japan (6 GW).
  - » Six countries—Denmark, Germany, India, Japan, Spain, and the United States—account for 80 percent of global photovoltaic (PV) and wind power capacity.
  - » Industrialized countries account for 92% of wind power installed capacity, 88% of the PV cell production. Developing countries, including China, have 70 GW (44%) of the 160 GW total, primarily biomass and small hydro power.
- "New renewables" still represent a modest 2-percent share of global energy use – although growth rates are high

Global renewable energy market trends (continued)

- Wind and solar PV sectors are the fastest-growing energy sources in the world.
- Global PV market expanding at 20-35 per cent per year. Japan market leader (accounts for >50% annual PV production). Costs dropped to between one-third and one-fifth of 1980 levels.
- Global ethanol production more than doubled between 2000 and 2005 Brazil (45.2% of world's total) and the United States market leaders.
- The share of renewables projected to remain relatively constant, global energy demand increases by 60 percent between 2002 and 2030.

Global renewable energy market trends (continued)



Typologies of Initiatives in linking renewable energy and poverty

- Commercial Marketing of Renewable Energy Products and Services
  - » Examples: Nepal Biogas Support Program (BSP), RERED in Sri Lanka, IDCOL in Bangladesh
- Community-Based Renewable Energy Systems
  - » Small village based hydro power plants
  - » PV-based micro grids and decentralized biomass gasifier-based power plants
  - » Common feature: mediating agency, normally an NGO
  - » Examples: UNDP-GEF Small Grants Programs (SGP) in many countries; REDP, Nepal:
- Integrating Renewable Energy in Rural Development
  - » Example: China rural energy development programs
- Enterprise assistance and market development support for expanding rural energy markets
  - » Focus on providing technical assistance and market development support to masons and stove entrepreneurs.
  - » Cambodia Fuelwood Savings Project (CFSP), Nepal and Indian cookstoves programs

RE market development, private investment and poverty reduction in Asia-Pacific region

- China and India emerging as big players in RE market development
- SPV and wind sectors high growth sectors.
- The Progress with other RET markets has been slow, as indicated by their modest to fractional shares of national and rural energy supplies.
- Biofuels being promoted in China, India, Japan, Malaysia, the Philippines, and Thailand.
- More than half of the world's small hydropower capacity exists in China. Also India, Nepal, Sri Lanka and Vietnam showing growth.
- Standard power purchase agreements and tax incentives in India, China, Nepal, and Sri Lanka. Net metering in Thailand.
- Commercialization models for solar home systems in Sri Lanka, India, Bangladesh.
  - » A national program providing market development, quality control and subsidy support, private sector or NGO partners supply systems under a certain warranty and quality guidelines.
  - » Strategy successful in expanding markets, but less effective in increasing energy access to the poor. Ownership of SHSs and biogas concentrated among the better off.

RE market development, private investment and poverty reduction in Asia-Pacific region (continued)

- Large ICS programs in China, India, Mongolia, Nepal, Sri Lanka, Cambodia, & Viet Nam
- Biogas commercialization: 12 million in China and 3.7 million households in India using biogas plants. Popular approach: government/ NGO supported commercialization through private companies
  - » Nepal (Biogas Support Program), with more than 150,000 units installed and 57 biogas companies.
  - » Countries for replication Vietnam, Cambodia, Laos and Bangladesh.
- Small-scale biomass gasification a growing commercial technology, China, India, Indonesia, Thailand, and Sri Lanka.

Impact of RETs on improving energy access and energy security for the poor

Evidence from case studies:

- Micro/ Small hydro systems have improved electricity access to the poor
  - Poor participate through 'sweat equity'
  - Low tariffs, comparable to the cost of kerosene.
  - 'Inclusive' cost sharing mechanisms by villagers
- Solar home systems are being accessed only by the relatively better-off segments (REREDP, Bangladesh). Economic gains from SPV lighting is extension of working hours, lack of concrete data available.
- Incomes among biogas users was found to be almost three times higher than non-user households (Madi, Nepal).
- ICS being accessed by the relatively better off-segments (Cambodia Fuelwood Savings project).
- RETs do lead to a lowering of dependence on fossil fuels, especially kerosene. Particularly significant in the PICs
- ICS and biogas stoves bring about time savings largely for women. Not sufficient data on how this time saved is used and whether this time translated into income gains.
- Social benefits and quality of life, rather than income and economic benefits, seem to be the key drivers in rural areas.
- Direct economic gains are most evident in small hydro – power for rural industry and productive uses.
- Experience with productive uses of renewable energy is in infancy.

Important lessons on RETs and their impact on the poor

- Renewables offer important social and 'quality of life' benefits.
  - From lighting, TV, and radio powered by solar home systems, mini-grids, and biogas.
  - Improved lighting for children's education, adult study, evening cottage industry.
  - Biogas and improved cookstoves reduce women's workload.
- Commercialization and enterprise models implemented by private sector vendors show the most promise for scaling up
- However: Most RET private sector programs do not have explicit poverty goals, strategies to support them and monitoring systems to track poverty impacts.
- Communities have a key role to play in enabling access to energy services for the poor. These can be scaled up with addition investment in social capital: e.g. REDP Nepal.
- High cost of PV remains the primary barrier to affordability for the poor.
- ***UNDP Role to weave in poverty aspects into successful RET scale-up models?***

Recommendations and next steps

- **Key focus area 1: *Feeding in renewable electricity to the grid***
  - Private sector can be easily encourage to make investment in small renewables based electricity – small hydro, biomass, wind..
  - Facilitate experience sharing on positive experiences with 'Standard PPAs', feed-in tariff, net metering etc to other countries where the regulations and policy environment is not in place and where the economic and energy security implications of escalating petroleum prices are enormous.
  - Build capability and awareness of both utility officials and prospective IPPs.
  - Poverty impacts unclear.

- ***Key focus area 2: Sustainable development implications of biofuels***
  - Biofuels show promise as a way for rural areas to "sell" energy to urban users and meet their own needs.
  - Study the implications of increasing biofuel production on food security and other issues for local communities
  - Increase awareness of technologies to produce biofuels on a small scale at the community level and
  - Work with communities to establish models for small holder farming of oil producing crops and local processing and marketing.

Recommendations and next steps..

- ***Key focus area 3: Commercialization of household energy technologies***
  - Exchange information and knowledge on the enterprise model used for RET dissemination in Sri Lanka, Bangladesh (solar home systems), and Nepal (Biogas)
  - Pilots in Indonesia, Vietnam and other countries in Asia as well as to the Pacific Island Countries.
  - Encourage present and future commercialization successes to include a pro-poor strategy, which would include the following elements:
    - » Creation of effective market networks that include workshops, wholesalers, retailers, repair capability.
    - » Encourage microfinance institutions (MFIs) to consider RETs a loan product.
    - » Encourage national programs to include in their program systems below a certain size that may be more affordable to the poor.
    - » Generate experience in linking energy with productive uses. A possible entry-point for UNDP would be to promote RET usage in women operated small and micro enterprises.

Recommendations and next steps

- ***Key focus area 4: Community-based energy projects***
  - Encourage replication of the Nepal community managed micro hydro and the REDP model,
  - Establish micro hydropower as a standard technology for providing communities with low cost reliable power that can be used as a multi-function platform.
- ***Key focus area 5: Renewable energy for high value public services***
  - Promote the use of high value public services powered by RETs (solar powered refrigeration, solar PV or micro-hydro for telecommunication, distance learning and internet connectivity) for reaching large numbers of people including the poor using small amounts of power.

Recommendations and next steps

- ***Key focus area 6: Financing***
  - Provide long term financing for the private sector to invest in grid connected RETs.
  - Build capacities of micro-finance institutions in the Asia Pacific and making funds available to lend through them to prospective consumers of RETs.
  - Expand the role of micro-finance for productive and income generating activities linked with RETs is another loan product that MFIs can be introduced to.

- ***Key focus area 7: CDM financing for RETs***
  - UNDP can play a proactive role through advocacy at the UNFCCC to bring to its attention the challenges faced by RETs in competing as CDM projects.
    - Highlighting the sustainable benefits of RETs especially the small-scale projects that provide benefits to rural communities that don't have access to energy services can result in the development of simplified methodologies for these systems.
    - Renewable energy projects that substitute unsustainable use of biomass and have sustainable development benefits need a simpler and more generous methodology
    - Campaigning with buyers of carbon credits to give higher preference to credits that also have substantial social benefits could also increase the price available to these credits and provide a further boost to RET investments.

Recommendations and next steps

- ***Key focus area 8: Project planning procedures***
  - Develop poverty and gender sensitive project planning protocols, test them and encourage their widespread usage in energy projects.