

Technology cooperation in the greenhouse

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Non-Annex-I countries accounted for about 46% of the world's total primary energy supply (TPES) (with about 80% of the world's population).

- Non-Annex-I countries rely heavily on fossil fuels (especially coal and petroleum) and this dependency is increasing.
- Poorer countries generally have less efficient energy economies and systems.
- Non-Annex-I countries still obtain almost 18% of their energy supply from combustible renewables and biomass.

The energy challenges facing developing countries can broadly be categorized into three inter-related areas:

- Expansion of energy supply and services ('adequacy')
- Improving the efficiency of conversion of energy supply into energy services ('efficiency')
- Replacing traditional energy technologies by modern, clean energy technologies ('modernity')

How to meet these challenges while advancing the climate change and sustainable development agendas?

Broad categorization of technology needs in developing countries pertain to:

- Technologies with unfavorable economics, e.g., advanced coal-power (*'adequacy'; 'efficiency'*)
- Technologies with favorable economics but limited deployment, e.g., building technologies (*'adequacy' ; 'efficiency'*)
- 'Local' technologies, e.g., improved cookstoves, small-scale biomass gasifiers, solar lanterns, etc. (*'adequacy' ; 'modernity'*)

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1. Joint energy innovation: This involves a cooperative technical program that is driven by technology needs of developing countries rather than the technology agenda of industrialized countries.

» Adaptation of commercially-mature technologies

» R&D, adaptation, and demonstration for emerging technologies

» Development of technologies and products for provision of energy services for the energy poor and for rural areas; innovative delivery models

Global energy innovation centers jointly funded by Annex-II countries and host developing country

2. Financial assistance for 'uneconomic' technologies:

Graduated financial assistance, where the portion of the incremental costs that would be covered by Annex-II countries would depend on the per-capita GDP of the recipient country.

Scale the assistance to the GDP gap between poorest Annex-II country and recipient country?

3. Accelerate technology deployment in Annex I countries:

Targeted policies aimed at key technologies (e.g., IGCC) need to be implemented sooner rather than later to reduce costs and technical risks

4. Knowledge sharing for enhancing deployment, where non-economic barriers hinder the deployment of technology that otherwise make sense from the economic, climate and/or SD point of view. Explore exploration of innovative approaches such as social marketing.

5. Explore innovative models to promote energy innovation:

Alternative ways of enhancing and accelerating innovation such as innovation challenges/prizes, the creation of guaranteed markets, and providing free or low-cost licenses of key technologies to developing countries (lesson from other areas, including global health)

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	Key issue for developing countries	Examples	AREA OF ACTIVITY							
			Basic Science	Applied R&D	Product Devt/Tech Adaptation	Demo/Early Deployment	Large-scale deployment	Financial subsidy	Knowledge sharing	
Commercial technology	Cost; adaptation	Ultrasupercritical power plants; hybrid cars; solar-PV-systems			✓				✓	
Commercial technology	market organization, information, finance	Advanced space conditioning; CFLs			✓					✓
Emerging/ pre-commercial technology	Technology risk; cost; adaptation	IGCC; Fuel cells; LEDs; 2 nd /3 rd generation biofuels		✓	✓	✓	✓	✓	✓	
Enabling technologies	Leveraging local capabilities for participating in value-chains	Materials	✓	✓						
“Local” technology/product	Limited technology/product development	Cookstoves; biomass gasifiers; solar lanterns		✓	✓	✓		✓		