CLIMATE CHANGE AND SUSTAINABLE ENERGY DEVELOPMENT: OPPORTUNITIES AND CHALLENGES IN ASIA AND THE PACIFIC

(Trends, policy issues and options)

By
P. C. Saha
Chief, Energy Resources Section
Environment and Natural Resources Development Division
United Nations ESCAP

Goals and Objectives of ESCAP's Energy Initiatives

- **To foster regional and sub-regional cooperation in promoting sustainable energy development**
- **To strengthen national capacities in sustainable energy development**

Areas of Focus

- Energy-Environment Policies & Planning
- **Efficiency and Conservation**
- New and Renewable Sources of Energy (NRSE)

Introduction to the presentation

- ENERGY DEMAND AND SUPPLY TRENDS
- ENVIRONMENTAL CHALLENGES
- REGIONAL PERSPECTIVES ON sustainable energy development
- POLICY OPTIONS

Historical growth trends (Developing Asia)

• 1970s	6.5 %
• 1980s	6.2 %
• Early 90s	5.5 %
• 1997	?
• 1997-00	-0.5 %
• 1995-2000	1.1

Per capita energy supplies (1999)

- OECD 4,680 kgoe
- World Average 1,650
- Asia (Excl China) 550
- India 480
- China 870
- Bangladesh 140

ENERGY DEMAND AND SUPPLY OUTLOOK

Despite on-going economic set-back growth in energy/electricity demand to resume its past trend?

- Low energy/elec. Supply/consumption base (Asian DCs – much below world per capita)
- Poor access of population to electricity and other commercial energy (some below 25 %)
- Energy input critical to economic recovery and social development
- High population growth

PROJECTED ENERGY DEMAND (1997-2020, TPES)

- WORLD 8,740 to 13,700 Mtoe or 2 % p.a.
- Asian DCs
  - 1,770 to 4,060 Mtoe (x2.3) or 3.7 % p.a.
  - China and India 66 % of the regional DC total
  - China 3.4 % p.a.
  - India 4.4 % p.a.

Energy Supply Mix (TPES, %)

	World		Developing Asia	
	(1997)	(2020)	(1997)	(2020)
Oil	40.5	40.1	35.4	37.2
Coal	25.8	24.4	52.0	43.3
Gas	21.9	25.9	8.2	13.8
RE	4.7	5.1	2.4	3.1
Hydro	2.5	2.5	1.9	2.2
Non- Hydro	2.2	2.6	0.5	0.9

Power Sector Outlook (1997-2020)

- World 14,000 TWh to 25,800 TWh (2.7%) (3,221 GW to 5,155 GW)
- Developing Asia
  - 560 GW to 1560 GW (4.6 % p.a.)
  - Or 2,460 TWh to 7470 TWh (5.0 % p.a.)

Energy Supply Mix (Power Sector, %)

- Consumed over 30 % of TPES in 1997
  - Over 65 % fuel intake was fossil fuel
  - Of which coal accounted for 38 %
  - 63 % coal-based in South Asia
  - 74 % in China
- Fossil fuel dominance in TPES to continue
- Coal dominance to drop by only 4-5 % by 2020
- Has significant environmental implications

Energy reserves

- **Reserve/Production ratio (end 2000)**
  - **Coal: 227 years**
  - **Gas: 61**
  - **Oil: 39.9**
- **Middle East : Home for 65.3 % of oil reserves**

ENVIRONMENTAL CHALLENGES

- The main challenge: paradigm shift from the current pattern of energy production, conversion and use to a sustainable path, taking into account economic, social and environmental dimensions in the energy policy.
- Mitigate immediate and long-term impacts: local, regional and global levels
- Impacts on human health, air quality and eco-system

Environmental insults related to energy

- Occur in energy harvesting, processing, transport, conversion/burning and disposal
- Mid 1990s: commercial energy activities were responsible for:
  - 85 % of sulphur emissions
  - 75 % of CO_2
  - 44 % of oil spill to oceans
  - 41 % of lead
  - 35 % of the particulates
  - 35 % of non-methane HC emissions
  - 30 % of Nitrogen fixation

Focus of environmental concerns

- Asian DCs : local and regional
- Global: Climate change – GHG
- Clean energy and Clean fuel technologies can address other issues than CO_2
- Long-term issue is to contain CO_2

CO2 emission status and outlook

- Developing Asia
  - 1997 responsible for 25 %
  - China 14 %
  - India 4 %
  - 2020 Outlook 34.2 %
  - China 17.8 %
  - India 6.2 %

Per capita CO2 emission status (1999)

- World average: 3.88 t CO_2
- U.S. A.: 20.46
- OECD: 10.96
- Asia (excl. China): 1.04
- China: 2.42
- India: 0.91

Energy sector can play a major role in sustainable development

- Sustainable energy development is well recognized as a measure to address sustainability issues in many global forums, including Agenda 21, UN General Assembly, CSD-9, WSSD Prep-coms
- Regional Perspectives also reflect a clear policy

WSSD and its regional preparation

- Phnom Penh Regional Platform
  - Seven initiatives, including an initiative on sustainable energy
- WSSD negotiating document
- Type II partnership
- WSSD Regional implementation

High-level Regional Meeting

- **Held on 21-24 November 2000, Bali, Indonesia**
- **Agenda to Action**
- **Enhanced Focus on Energy Efficiency**
- **Stakeholders Participation in the Action Programme**
- **Bali Declaration on Asia-pacific Perspectives on Energy and Sustainable Development**
- **Sustainable Energy Development Action Programme, Strategies and Implementation Modalities for the Asian and Pacific Region, 2001-2005**

Major reasons for unsatisfactory situation in SED

- Poverty issues and equity not adequately dealt with
- Attempt to integrate social and environmental dimensions in economic decision making not been successful
- Regulatory measures failed to provide undistorted price signals
- Funding remained grossly inadequate and followed traditional approach
- Institutional changes had been marginal and largely failed securing public participation
- International and regional cooperation inadequate

Action Areas

- **1. Developing policies to promote energy utilization for poverty alleviation by ensuring energy availability at affordable prices**
- **2. Strengthening planning capacity in sustainable energy development by establishing clear linkages to other sectors**
- **3. Promoting implementation of a supply- and demand- side energy efficiency programme in the region**

Action Areas (Cont'd)

- **4. Promoting the application of renewable and clean energy technologies in the region**
- **5. Promoting and assisting a dedicated global project to create 100 per cent renewable energy in the small island developing states of the region**
- **6. Mobilizing financial resource from traditional sources and the private sector**

Energy and poverty

- **60 % of the world's 2 billion population live in Asia and the Pacific**
- **Different kinds of energy deprivation for rural and urban poor**
  - Inability to pay for the access by urban poor
  - Less availability of supply or infrastructure in rural areas: prices are higher
- **Short and long term policies needed to address in widening access** (centralized and decentralized supply options, investments)

Other areas of action

- Resource options and energy mix
- Supply and demand side energy efficiency **(A combination of regulatory and technological options- issues funding and access to technology)**
- RE and other clean energy technologies **(driven by technology push, environmental concern)**
- Mobilizing Financial resources
- **Advanced fossil fuel technologies**

Mobilizing financial resources

- Financing and pricing are critical issues
- Supply side alone
  - US$ 300-500 b per year to 2020
  - Power sector US$ 127 per year
  - Over half in DCs (2/3 in Asia)
  - Asian DCs power sector US$50 per year
- WB and ADB (2000) for all sector lending US$21b
- Private sector funds essential

New windows of opportunities in funding

- GEF expected new mandates from WSSD
- CC/Kyoto
  - CDM
  - PCF
- New Partnerships

Dominance of energy projects to qualify CC/CDM related support

- Renewable energy
- Energy efficiency
- Energy in transport

Capacity building programme

- Understanding
- Skills in project formulation, identification and development
- Consultations/negotiation skills
- Project implementation, monitoring and reporting skills

International and Regional cooperation

- Policy options (advice and dialogue)
- Sharing of information, methods, tools and techniques through TCDC and other means
- Capacity building (Institutional and HR)
- Networking of institutions and experts
- Facilitate transfer of technologies

Policy options

- Adapt strategic planning and management as a process
- Adapt measures to widen access to energy services
- Formulation and implementation of energy efficiency policies
- Adapt policies and measures to raise the share of low-carbon and RE in energy mix
- Review/adapt policies, including market reform and rational pricing policies, to attract larger private sector funding and facilitate technology transfer
- Promote and strengthen international and regional cooperation among all stakeholders to facilitate partnership

Types of ESCAP energy activities

- Ad-hoc policy dialogues and expert group meetings
- Short-term advisory services on request by governments
- Technical assistance projects in partnership with interested agencies and countries
- Short-term training on request
- South-south (TCDC) cooperation
- Follow-up to WSSD

ESCAP's Energy Projects and activities

- Capacity building in Strategic Planning and Management
- Energy managers' training in improvement of energy efficiency and productivity
- Capacity building in renewable energy utilization
- RE database development
- Subregional energy cooperation in North East Asia