

Energy and Poverty Reduction: Opportunities from Cleaner Fossil Fuels

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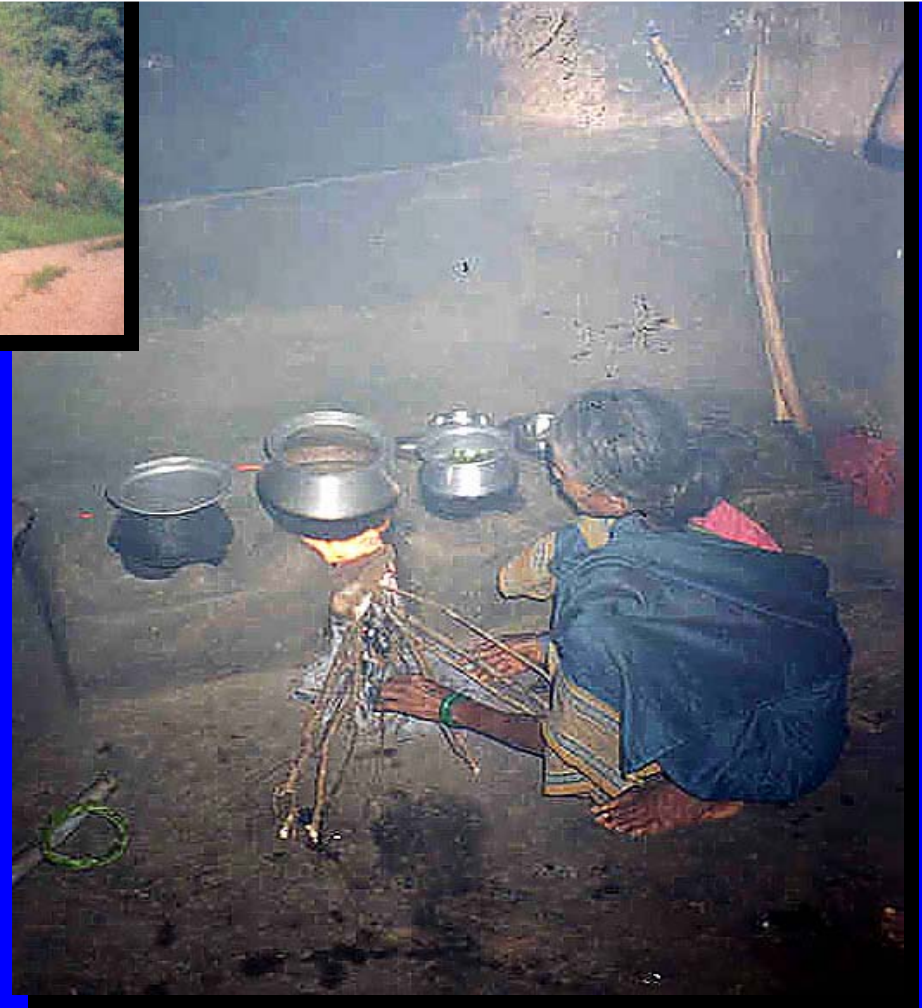
WEC CFFS Roundtable, March 21, 2002

THE ENERGY BURDEN ON WOMEN THE HEALTH DAMAGE



Half of the World's
Population relies on
Traditional Biomass
For Heating &
Cooking

Indoor Air pollution
Kills more people than
Malaria & Tuberculosis



Energy is key for Poverty Eradication: many dimensions

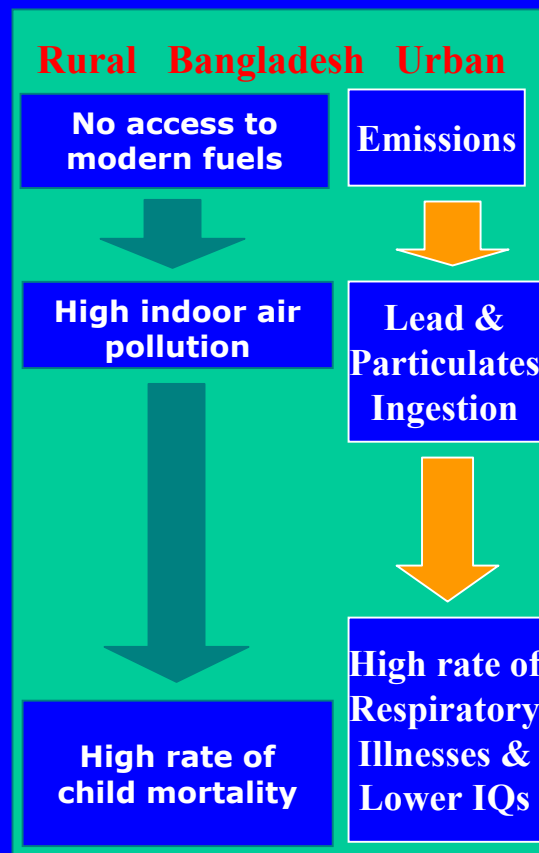
*Enterprise
Productivity/
Income Gen.*



*Human
Productivity*



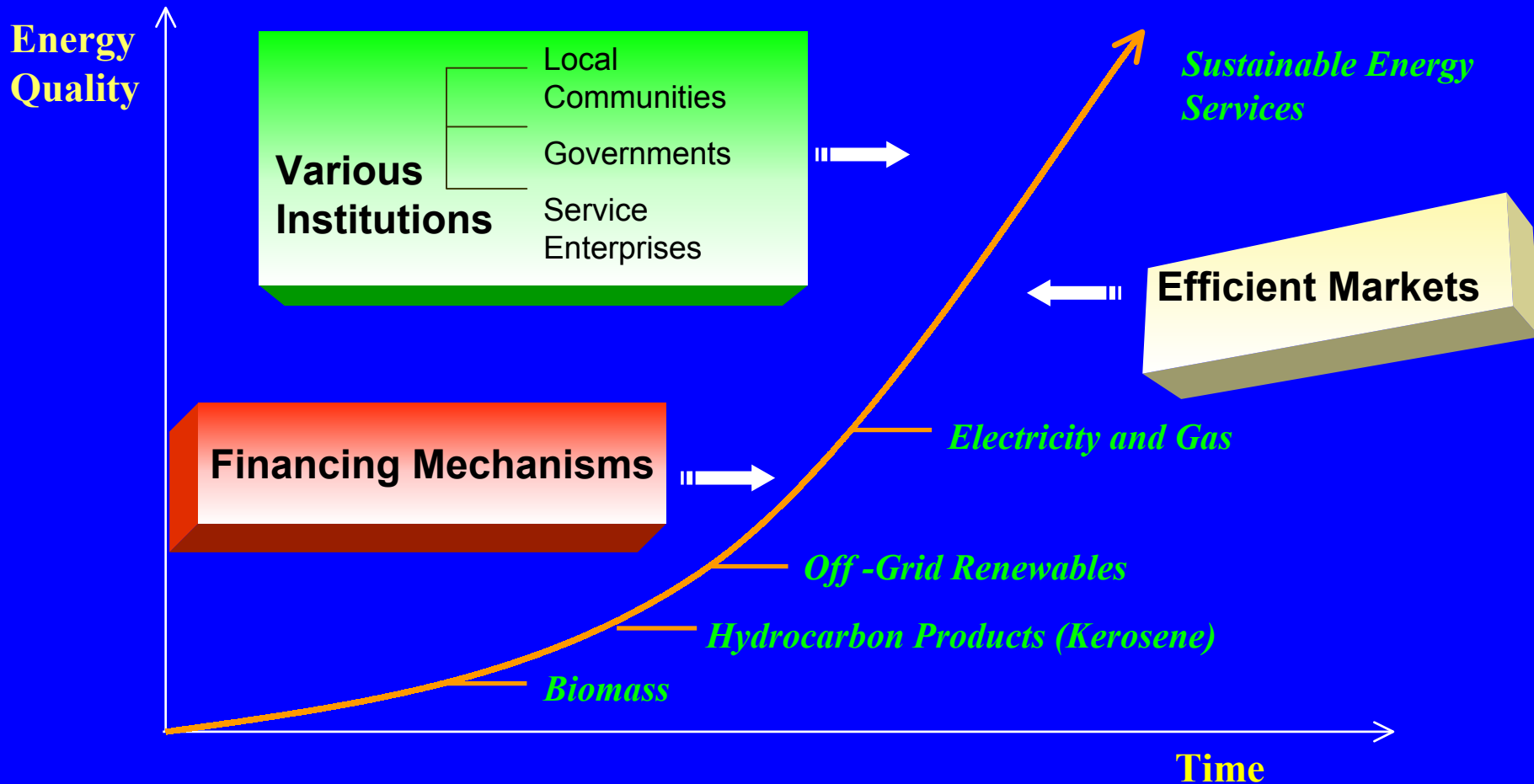
Health



Education



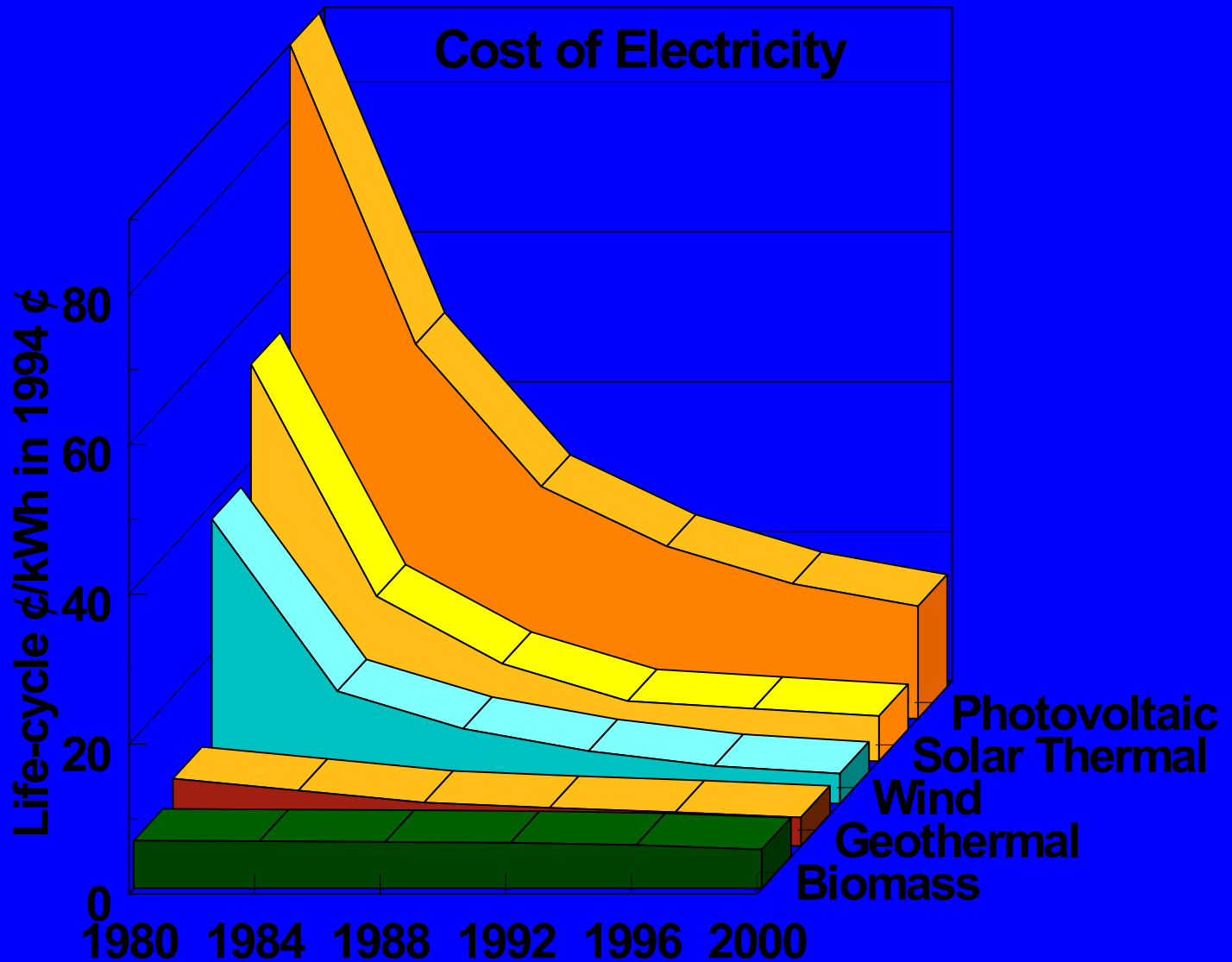
The Global Challenge: delivering energy services to the poor



The investment needs for energy supply in developing countries over the next 20 years will be enormous

- Over the next 20 years, at the current rate of connection to electricity, another 450 million people will join the 2.0 billion who today lack sustainable access to modern energy.
- To meet the minimum needs of these 2 billion people, 100 million people need to be connected each year for the next 20 years—compared with 40 million a year over the past 20.
- Developing countries will have to add hundreds of thousands of megawatts of new electrical capacity.
- The financing requirements are enormousThe United Nations Development Programme and World Energy Council estimate the costs (in 1990 dollars) at \$6–8 trillion.

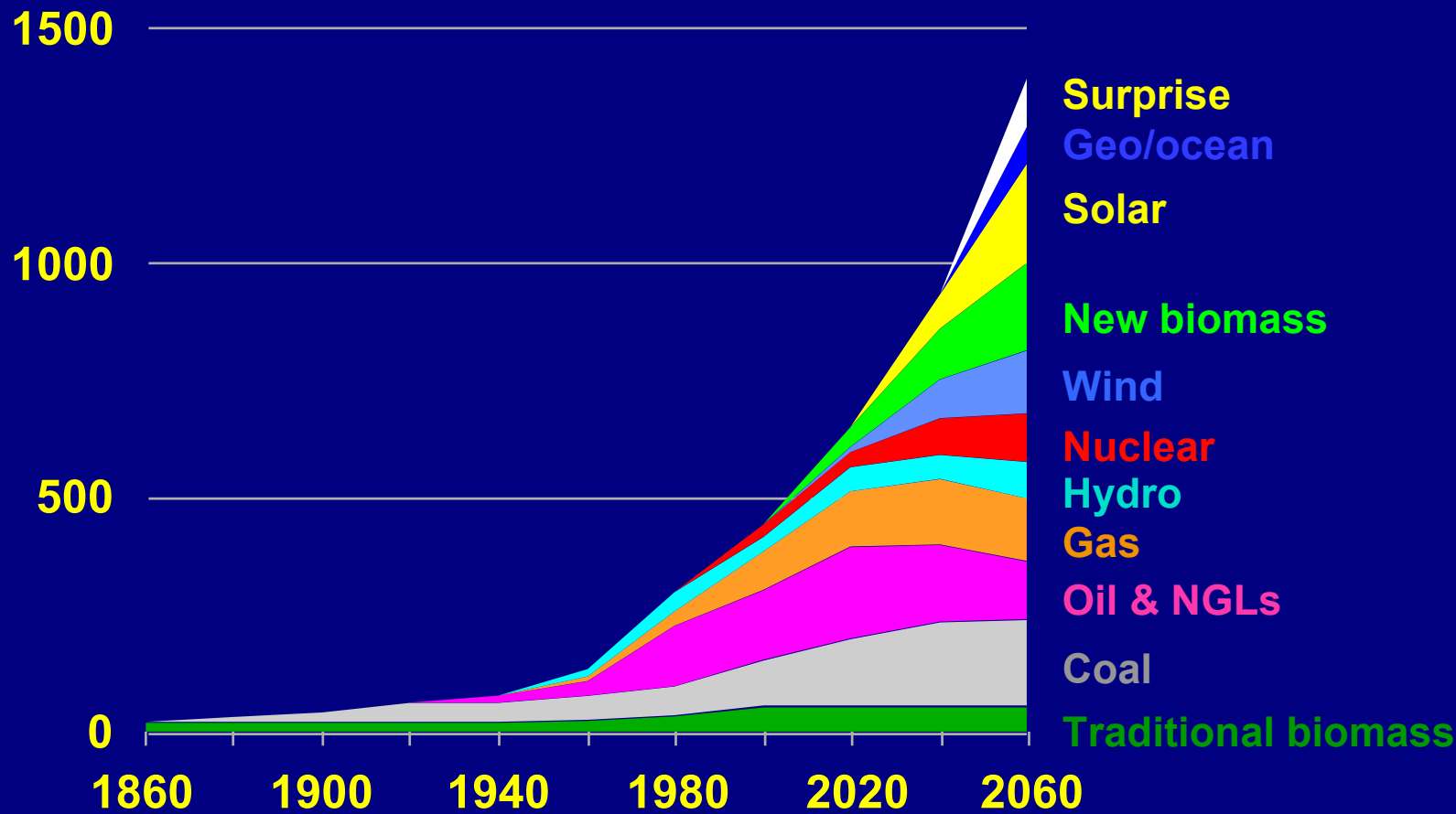
Cost reductions in micro-power and renewables are opening new opportunities



Challenges:

Is this realistic scenario in the future?

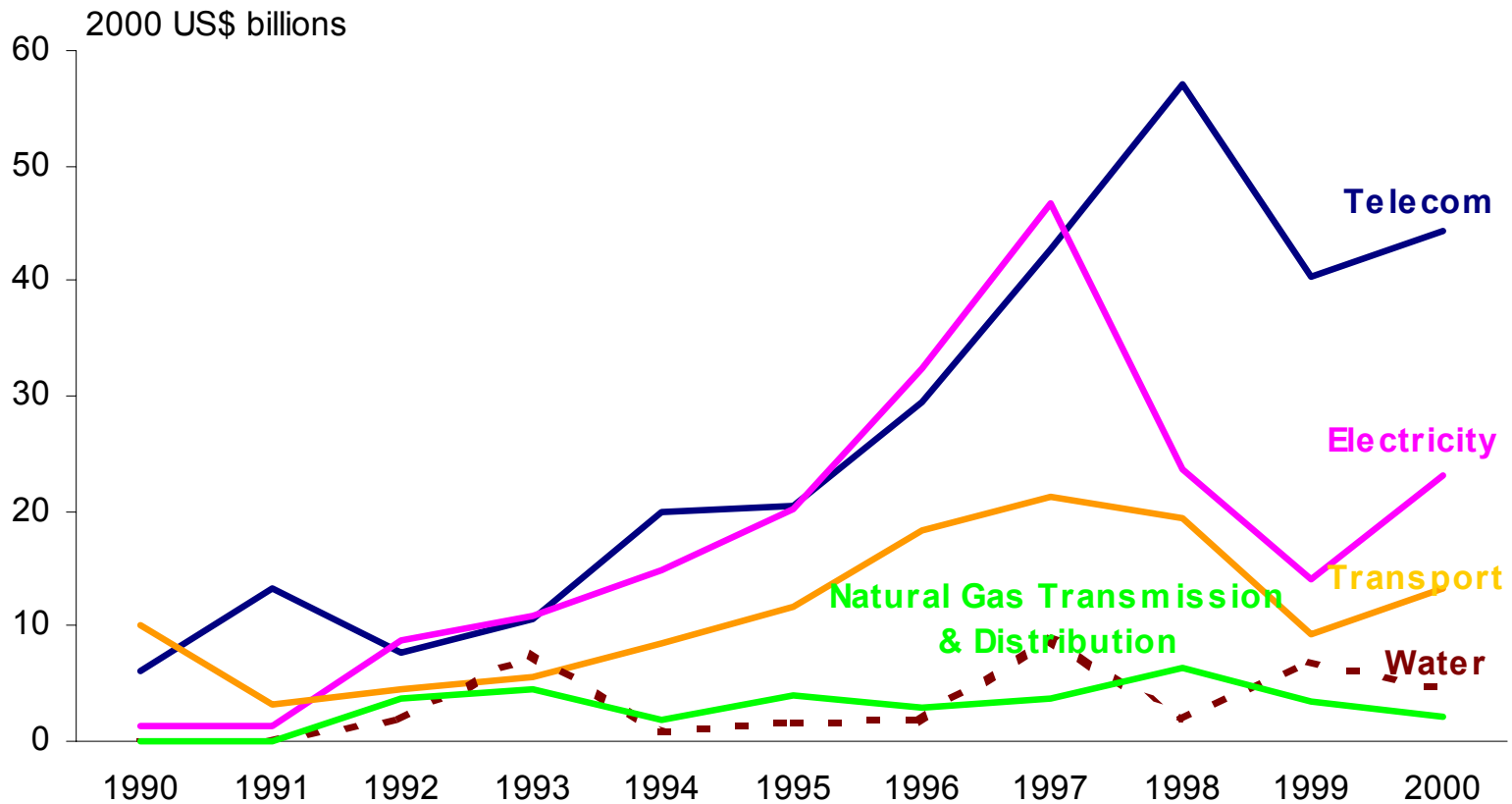
Energy supply, exajoules



Source: Royal Dutch Shell Group

Public Moneys are Scarce, what about Private Sector Participation in infrastructure

Investment in Infrastructure Projects with Private Participation in Developing Countries by Sector, 1990-2000



Source: PPI Project Database

Will the trend continue, especially after Sept 11?

ARE THE RISKS INCREASING

Fossil Fuel remains the prime source of energy

- FF = 77% of Primary energy supply in the world
- Renewable energy options increasing but issues to resolve
 - High initial cost
 - Depending on variable nature: rainfall, wind, sunshine
 - Financing availability, risks, legal/regulatory constraints
- Fossil Fuels will remain, Cleaner Fossil Fuels is a realistic option
 - Energy security, sustainable economic development and commercial energy access to 2 billion people

WBG's Cleaner Fossil Fuel Activities

- Regional Program for Traditional Energy sector (RPTES): policy work, preparation of WB/IFC projects comply with Environmental Guideline
- ESMAP: studies and EER's – e.g. Clean Coal Technology Assessments and Policy Recommendations on Deployment of CCT in China, Energy and Environmental Review in Turkey, Mexico, Sri Lanka etc.
- Global Environmental Facility and Prototype Carbon Fund: Czech Republic Integrated Gasification Combined Cycle (IGCC) project

Integrating Environmental externalities

- Fund and promote “upstream” energy and environmental reviews
- Mitigate emissions through standards and economic incentives, build enforcement capability
- Include environmental costs in analysis
- Create markets (local emissions, global carbon emissions)

China: Clean Coal Program

- Clean Coal Technology Assessment
 - Power and non-power CCT
 - Case studies in Shanghai, Henan and Hunan provinces
- Policy Advice: deployment CCT
 - Environment regulation, monitoring and enforcement
 - Financing CCT projects
- CCT phase II

Clean Coal Program

next phase

- Financing IGCC, PFBC, CFB, supercritical PC and rehabilitation
- Coal gasification and liquefaction for multi-production
- Refinery residue based IGCC or CFB
- Biomass co-firing and gasification
- Identifying GEF/ PCF projects
- Coal sector review: regulatory and institutional framework

Turkey: Energy and Environment Review

- Energy Demand
- Clean Coal Technology: mining and utilization
- Co-generation
- Transmission and distribution loss reduction
- Non-power sector emissions
- Petroleum product quality
- Energy Sector Modeling
- Environmental regulatory and institutional review
- Land fill gas utilization

Czech Vresova IGCC Project

- 2x200 MW CC fueled by syn-gas from old gasifiers
- HTW (High Temperature Winkler) gasifiers will replace the old gasifiers
- GHG (CO₂) reductions by higher gasifier efficiency
- 7 Mt CO₂ reduction in 20 years
- Local environmental benefits: tar, benzene and phenol, particulate, Sox and Nox reduction
- Sponsor: Sokolovska Uhelna supported by MoE CR

Long term goal

Zero emissions from coal

- GEF to support cleaner coal technologies and the development of a "zero emission from coal" concept
- Gasification technology for low cost hydrogen production and CO₂ capture
- The Czech IGCC project: a first important step of a "zero emission" coal plant

WHAT'S NEXT?

Global Environment Facility (GEF)

- ☛ **Preparation work/study (PDF-B)**
 - ☛ **Development of financial plan**
 - ☛ **Hydrogen production, CO2 removal and sequestration**
 - ☛ **Biomass co-gasification**
- ☛ **HTW Gasification demonstration**

Prototype Carbon Fund (PCF)

- ☛ **Government endorsed to sell GHG emissions reduction right**
- ☛ **\$3-5/ton of CO₂**
- ☛ **170,000/year CO₂ emissions reduction from unit 2 HTW at current operation mode (peak/intermediate/base)**
- ☛ **\$0.5M/year 2006 – 2015: \$5M total**
- ☛ **More CO₂ reductions by base load operation**
- ☛ **PCF Working on expanding windows**

Opportunities working together with the WBG

- Technical and policy advice
 - National policy of developing countries
 - Operational policies of GEF, PCF and CDM
- CCT projects for GEF, PCF, IFC funding
 - Advanced CCT: IGCC and multi-production
 - Biomass utilization
 - Coal bed methane utilization
 - Financing CCT investment projects

WSSD

- ENERGY will be one of the key items on the AGENDA
- Lot of work done by the Inter-agency Committee, through the Preparatory Meetings
- PRECOM III Next week: 2 Special Events
 - ❑ Rural Energy: March 27, 1:15
 - ❑ Energy Policy: April 3

Global Energy Partnership for Poverty Reduction

- An offspring of Village Power Conference
- Need to bring all the partners towards a common goal: More, Bigger, Faster
- Need to create a multiplier effect through common services to all partners
- Need to provide incentives for investments

Global Energy Partnership for – Poverty Reduction: Value-Added



Outcomes with GEPPR:
Considerably increased
Availability of
Rural and Peri-Urban
Energy Services
Rural Transformation
Urban Sustainability

Existing
Rural & p-urban
Energy/
Transformation
Programs

VPP Services = multiplier

- Catalyze commitment/coord.
- One-stop for Knowledge
- Build-up bridge between customers, market, investors, Governments, financiers
- Design new instruments

Expected Outcomes : Are these still Valid?

- 30 countries with national-scale RE-based rural development programs
- 300 million people previously unserved with access to modern energy services
- Over 50,000 new community systems installed (schools, hospitals, clinics)
- Documented improvements in productivity, income, environment, and quality of life
- Trained, operational local entrepreneurial base

HOW?

- Developing countries: tell us what you need, how we can help
- Donors: let us work together to respond, let's pool our knowledge and financial resources more effectively
- Private Sector: join in with your know-how and your financial resources: INVEST
- Others and all: let's all work on implementation