Energy Efficiency and Carbon Trading

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Outline of Presentation

- Introduction and brief overview – energy conservation potential
- MERC Initiatives : Energy Conservation (EC) and Demand Side Management (DSM)
- Introduction to CDM and market overview
- Qualification and project development
- Observations and role of MERC

Benefits of Energy Conservation Need No Emphasis

- Most of us here are aware of the benefits of Energy Conservation (EC):
  - Cost reduction, competitive advantage & increased profits
  - Higher productivity
  - Reduced GHG emissions
  - Increased energy security
  - Cheaper and better quality power availability
  - Better operational efficiency and reliability of utilities leading to Better financial health of utilities
  - Mitigation of power shortages

Energy Conservation potential is Huge

National

- ADB Study:
  - 54.5 Billion units
  - 9240 MW [Existing Capacity : 120,000 MW]
- CII study puts the financial value of conservation potential at Rs. 12000 crores per year
- Planning Commission: Integrated Energy Policy: 15 % of consumption of electricity

State

- Maharashtra State: 2000-2300 MW
- Mumbai City: 225-250 MW

Energy Conservation: High Potential-Low Adoption Paradox

- Despite awareness, high potential and more than three decades of efforts, actual adoption of energy conservation has been very moderate
- Most of the potential remains unrealised
- Time to think: How can we overcome this High potential- low adoption paradox? How can we capture this huge potential?

Energy Conservation: High Potential-Low Adoption Paradox

- Steps and actions initiated by a Regulatory Organization like MERC provide a Very Good Learning Experience about How Potential can be converted into Actual Adoption in an accelerated and widespread manner
  - Create Awareness, and demand for EC
  - Convert Awareness into intent or inclination for EC
  - Convert intent/inclination into actual adoption of EC

Promotion of EC by MERC

- Unlike grid connected renewable energy, EC has no direct backing of:
  - The Electricity Regulatory Commission's Act 1998, or
  - Electricity Act 2003, or
  - National Electricity Policy
  - National Tariff Policy

- Considering large benefits and prevalent shortage situation in the State, MERC, under Section 23 of EA, has directed undertaking of several initiatives to promote adoption of EC through utility demand side management (DSM) programmes

Promotion of EC by MERC: Tariff Initiatives

- Two Part Tariff Order of May 2000: Introduced a regime for recovery of full fixed costs of MSEB
- Time of Day (TOD) Tariff
  - Tariff Order of May 2000:MSEB
    - Rebates for “off-peak” and higher tariffs for “peak” period consumption for HT industrial and LT-General Motive
  - Tariff Order of January 2002:MSEB
    - Differential between “peak” and “Off-peak” tariffs – Rs. 0.8 to Rs. 1.4 per unit
    - Expanded the scope of TOD tariffs to more HT and LT categories

Promotion of EC by MERC: Tariff Initiatives

- TOD Continued
  - Tariff Order of March 2004: MSEDCL
    - Differential between “peak” and “Off-peak” tariffs – Rs. 1.25 to Rs. 1.85 per unit
    - Expanded the scope of TOD tariffs to all whose load is > 20kW
  - Tariff Order of October 2006: MSEDCL
    - Differential between “peak” and “Off-peak” tariffs – Rs. 1.65 to Rs. 1.95 per unit
  - Tariff Orders of October 2006 : REL & TPC
    - TOD Introduced for first time in Mumbai
    - No incentive for “off-peak” period [Energy supplied to MSEDCL]
    - Higher tariff for “Peak” period consumption: Differential = Rs. 0.6 per unit

Promotion of EC by MERC: Tariff Initiatives

- Power Factor (Various tariff orders for MSEB/MSEDCL, TPC, REL/BSES)
  - Incentive for PF > 0.95
  - Penalty for PF < 0.9
- RkVAh charges: BEST
  - For non-domestic consumers consuming > 3000 units per month

Promotion of EC by MERC: Tariff Initiatives

- Energy Conservation Fund: MSEB/MSEDCL
  - Tariff Order of January 2002
    - Introduced a ‘cess’ (2% of electricity charges billed for agriculture, public water works and street lights) for funding energy conservation activities in these three sectors
    - ‘cess’ to be pass through in tariff - Implicit

Promotion of EC by MERC: Regulatory Measurers

- Load Management
  - Tariff Order of October 2006: REL & TPC
    - Load management charge (LMC) & Load management incentives for residential and commercial >300 units/per month and all industrial
  - Order of March 2006: REL, TPC and BEST
    - Reduce consumption by 20% or face temporary dis-connection
  - Order of January 2006: MSEB/MSEDCL
    - HT non-continuous to restrict to 80%
    - HT continuous to restrict to 90%
  - Order of May 2005: BEST, TPC and REL
    - Load management charge & Load management incentives for residential and commercial >500 units/per month and all industrial users

Promotion of EC by MERC: Regulatory Measurers

- Funds for EC and DSM programmes / projects
  - MERC has authorised, through its various Orders, the use of LMC for funding EC/DSM projects/activities (About Rs. 65 crores available)
  - MERC has ruled, through its various Orders, that expenses incurred for EC/DSM projects/activities will be allowed as “pass through” in ARR

Promotion of EC by MERC: Regulatory Measurers

- EC through DSM programmes
  - Tariff Order of January 2002: MSEB/MSEDCL
    - Directed MSEB to come up with concrete schemes to implement DSM in the State using the ‘cess’
  - Tariff order of March 2004: MSEB/MSEDCL
    - Directed MSEB to prepare a detailed DSM plan submit it to MERC in 3 months time
  - Order of March 2005
    - Directed MSEB to submit detailed first phase plan of EC within one month
  - May 2005: Commission directive to BEST, REL and TPC to undertake DSM programmes

Promotion of EC by MERC: DSM Programmes

- On – going DSM projects/ pilot projects
  - Nashik CFL pilot project where more than 350000 CFL bulbs have been purchased by residential consumers under the pilot project, resulting in load reduction of about 7-9 MW
  - Nashik Agricultural Pumps capacitor project
  - MEDA water pumps and street lighting project in rural areas
  - REL CFL pilot project where more than 550000 CFL bulbs have been purchased by residential consumers under the pilot project, resulting in load reduction of about 14-16 MW

Promotion of EC by MERC: DSM Programmes

- Demand Side Management Projects in Pipeline
  - MSEDCL pilot project for penetration of 1 crore electronic ballasts in Nashik division for getting 50MW load relief
  - MSEDCL State wide CFL project for penetration of 3 crore CFL lamps for getting 900 MW load relief
  - BEST & REL Pilot Projects for promotion of electronic ballasts and promotion of EC in high-rise building water pumping systems
  - TPC project for capturing EC potential in six units (very large commercial buildings, industrial units, hotels)
  - Feeder /Distribution transformer based DSM projects on 10 feeders in the State through DSM bidding mechanism

Promotion of DSM & EE: MERC Initiatives

- Guidance to utilities through MERC appointed advisors and expert organizations:
  - Guidance for development and implementation of total communication package on benefits of EC for Mumbai consumers
  - Guidance for design, development and planning for DSM projects in pipeline by BEST, REL, TPC and MSEDCL

Some of these projects could qualify under CDM

Clean Development Mechanism

- CDM is one of the flexible mechanisms introduced under Kyoto Protocol
- CDM is the only mechanism that involves developing countries
- CDM delivers commodity – GHG emission reductions (certified emission reductions – CERs)

CDM Principal Characteristics

- Participation is voluntary and CDM investments - market driven. Public and private organisations eligible to participate.
- CDM - must lead to measurable reductions in emissions,
- The reduction in emissions must be additional to any that would occur in the absence of the approved project activity. CERs - quantified and certified by a third party.
- Sustainable Development: Primary Aim of CDM projects.

Global Carbon Market Overview

- Global aggregated carbon markets – Over US$ 10 billion in 2005
- Indicative estimates for carbon markets in 2006 – About US$ 25 – 30 billion
- China: Dominant supplier
- In 2005 about 374 million tons of CO_2 equivalent Certified Emission Reductions (CERs): Value US$ 2.7 billion
- Market share of CDM credits from developing countries was about 49.2% of overall volume.

Market Correction in EU-ETS in later April 2006 wiped out half of its market value.

CDM Qualifying requirements

- Compliance with the normal project approval process and sustainability development criteria;
- Project validation and registration process (incl. additionality requirements);
- Monitoring requirements;
- Verification and certification requirements; and
- Rules governing the issuance of CERs

Who can develop CDM projects?

- Governmental bodies
- Municipalities
- Foundations
- Financial institutions
- Private sector companies
- NGOs

Investments in CDM Projects are likely to be private sector driven

Global Warming Potential

Green House Gas	Global Warming Potential (Comparative Ratio)
Carbon dioxide	1
Methane	21
Nitrous oxide	310
Hydrofluorocarbons (HFCs) [HFC-23, HFC-12, HFC-134a and HFC 152a]	11,700, 2800, 1300 and 140 respectively
Perfluorocarbons (PFCs)	6,500 forCF4 to 9,200 for C2F6
Sulphur hexafluoride (SF)	23,900

Types of Small Scale Projects under CDM

- Type (i): **Renewable energy project activities** with a maximum output capacity equivalent to up to 15 MW (or an appropriate equivalent)
- Type (ii): **Energy efficiency improvement project activities** which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 GWh/year
- Type (iii): **Other project activities** that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually

Observations

- Broad methodology for small scale CDM projects in the area of Energy Efficiency Improvement projects (Demand-side efficiency programmes for specific technologies – Type II.C Projects).
- DSM and EE projects: Benefit from CDM – sale of CERs
- Considerable potential in India to develop CDM Projects (However, EE projects complex to develop and structure under CDM)

Likely areas under DSM and EE Projects

- Use of efficient distribution transformers
- Efficient Street lighting projects in municipalities
- Large scale CFL distribution and use in households
- SF6 circuit breakers

Role of MERC

- Primarily facilitator
- Sharing of revenues from sale of CERs: Equitable principle (MERC has not received any petition in this area; would welcome)
- Spin off: (Utility based projects)
  - Better monitoring of projects
  - Promotes improved and reliable database

THANK YOU