
Demand Side Management - Regulatory Approach in Maharashtra

*Presentation by
Palaniappan M.,
Director, ABPS Infra*

*Presented at
BEE – Workshop on ‘Using Demand Side Management to Support Electricity Grid’
March 26, 2008, Mumbai*



Agenda

- DSM and Regulatory Framework
- Maharashtra Power Supply Situation
- EE/DSM Initiatives of MERC
- Key Challenges



DSM & Regulatory Framework



4/10/2008

Promotion of EE by MERC

- Unlike grid connected renewable energy, EE has no direct backing of:
 - Electricity Act, 2003, or
 - National Electricity Policy (NEP)
 - National Tariff Policy (NTP)
- However, EA 2003 and NEP do mandate need to foster energy efficiency & efficient use of resources
- Considering large benefits and prevalent shortage situation in the State, MERC, under Section 23 of EA, has directed implementation of several initiatives to promote adoption of EC through utility demand side management (DSM) programmes



Maharashtra Power Supply Situation



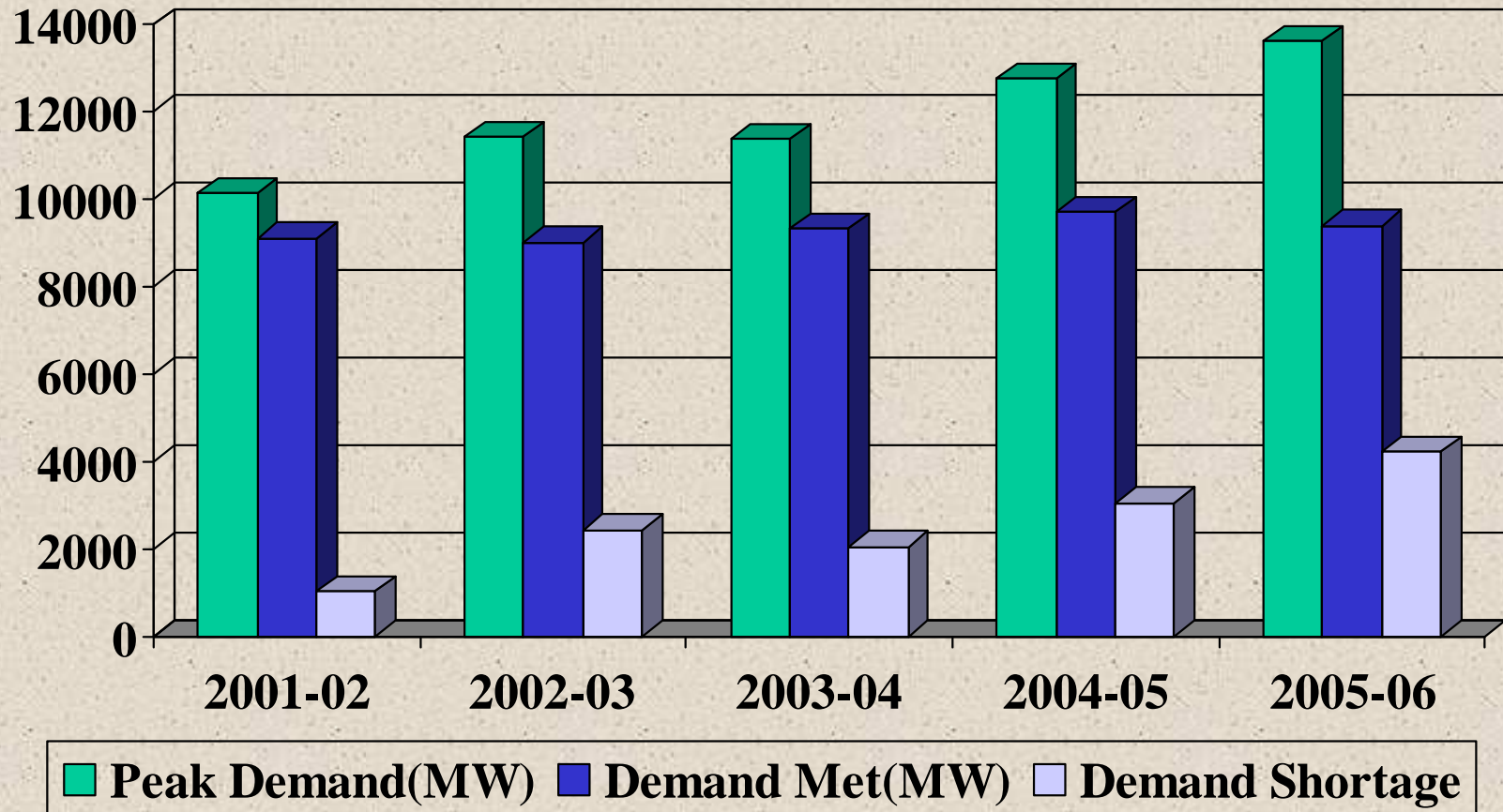
4/10/2008

Maharashtra – A snapshot

- Three-Member MERC fully constituted in September 1999
- Erstwhile MSEB unbundled in June 2005 into
 - Maha GENCO
 - Maha TRANSCO
 - Maha DISCOM – supplies power to the entire State of Maharashtra except a large part of the State capital – Mumbai
 - MSEB Holding Company.
- Mumbai licensees:
 - Brihan-Mumbai Electricity Supply and Transport Undertaking (BEST)
 - Reliance Energy Ltd. (REL),
 - The Tata Power Company Ltd (TPC) &
- Mula-Pravara Electric Co-operative Society (MPECS) in Ahmednagar district.



Power Supply Scenario in Maharashtra



Power Situation in Maharashtra

- Between 2001- 2006: Capacity addition at – 0.071%
- Rise in peak demand during the same period was 7.5% per annum
- Rise in energy consumption during the same period was 4.7% per annum
- Rise in energy consumption during 2003-2006 was 6.6 % per annum



Power Situation in Maharashtra

As a Result:

- Demand shortfall of nearly 4500 MW during evening peak and nearly 4200 MW during morning peak or nearly 30% of the peak demand
- Energy shortage of as much as 20%
- Demand shortfall during mid day “off-peak” of nearly 2900-3400 MW
- Demand shortfall of nearly 500-1300 MW during night “off-peak”
- Load shedding for 3-12 hours in all areas of Maharashtra excluding Mumbai Metro Region.



Power Situation in Maharashtra

- Capacity Addition
 - In pipeline = 750MW + RGPPL (erstwhile Dabhol) = 2144 MW (around 1200 MW is already operational) + 350 MW by Tata Power Company
 - Planned by State's generating companies = 7540 MW (by MAHAGENCO)
 - State's share in Central Sector = 3800 MW
 - MOUs with private sector = 12500 MW
- Except 3250 MW, balance of capacity will take 2-8 years to come on stream
- Limited scope for getting power from sources outside the State (Network congestion, limited surplus generation)



Power Situation in Maharashtra

- Power demand rising by more than 1200 MW per year (200 MW in Mumbai and around 1000 MW in MSEDCL area)
- Given this scenario, the shortages are expected to last for at least 3-5 years
- Energy efficiency and Demand Side Management (DSM) emerge as an immediate power shortage mitigation alternative



Energy Efficiency Potential is Huge

National

- ADB Study:
 - 54.5 Billion units
 - 9240 MW [Existing Capacity : 127,600 MW]
- CII study puts the financial value of conservation potential at USD 2.7 billion per year
- Planning Commission: Integrated Energy Policy: 15% of consumption of electricity

State

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



EE: High Potential-Low Adoption Paradox

- Despite awareness, high potential and more than three decades of efforts, actual adoption of energy efficiency 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?



EE: High Potential-Low Adoption Paradox

- Steps and actions initiated by a Regulatory Commission 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



MERC Initiatives in EE & DSM



MERC Initiatives in EE & DSM

- Some of the initiatives undertaken by MERC are:
 - Regulatory Directives to Utilities
 - Load Management Directives
 - Tariff Initiatives
 - Capacity Building within MERC and also within Utilities



Regulatory Directives to Utilities



4/10/2008

17

Regulatory Directives to Utilities

- **Order of Jan 2002**
 - MSEB was directed to set aside 2% of the billed revenue from agriculture (HT & LT), PWW and street lighting category
- **Order of March 2005**
 - Directed MSEB to submit detailed first phase plan of EC within one month
- **April/May 2005**
 - Directive to BEST, REL and TPC to undertake DSM programmes
 - Supply to hoardings and floodlights banned
 - All the cost incurred on implementation of DSM initiatives will be allowed as pass through in ARR



Regulatory Directives to Utilities

- **Tariff Orders of April 2007**

- Long Term power procurement plan of Distribution Utilities to have proposals on energy conservation (EC) and energy efficiency (EE)
- Directed to take up Load research on a sustained basis and as an integral part of operations
- Directed to take up EC and EE through appropriate DSM initiatives on a sustained basis as an integral part of operations
- **Reiterated that all the costs incurred on implementation of DSM initiatives will be allowed as pass through in ARR**



Load Management Directives



4/10/2008

20

Load Management Directives of MERC

- Load management directives to curb demand in view of worsening power shortages (could not increase load shedding beyond what was being resorted to) and possibility of load shedding in Mumbai: [basic philosophy: voluntary load curbing is better than forced load shedding]
- Order of May 2005: BEST, TPC, MSEDCL and REL
 - Load management charge of Rs. 1 (2.5 cents) per kWh if consumption above prescribed limit; and load management rebate of Rs. 0.5 (1.25 cents) per kWh if consumption below prescribed limit – in place for two peak months – April & May 2005
 - Net amount collected as load management charge to be used for promotion and implementation of EE, EC, DSM
 - Collected about Rs. 700 million (US \$ 17.5 million). This is being used to run DSM activities to date
 - Possibility of disconnection in case consumption not curtailed



Load Management Directives of MERC

- **Tariff Order of October 2006: REL & TPC: Steep Rise in load management Charge and load management incentive** - Load management charge at the rate of additional 100% of the highest tariff chargeable to the respective category; load management incentive at the rate of 50% of the normal chargeable rate to the respective category
 - Large scale consumer protests as consumers faced hardships as their bills in some instances more than doubled – primarily domestic consumers
 - Review petitions filed by industries and consumer associations:
 - **Did not have sufficient time to prepare for the directive, it came as a shock**
 - **Lack of knowledge and awareness about why, where and how to reduce consumption**
 - In response to Review Petitions, Load Management Charge Order was withdrawn in December 2006
 - Utilities were asked to design and run a comprehensive consumer awareness campaign (conducted in March-June 2007)



Tariff Initiatives



4/10/2008

23

Tariff Reforms

- Since its inception in August 1999, the Commission has undertaken several initiatives to encourage efficient consumption. Some of these initiatives are:
 - Time of Day tariffs for several categories
 - Power Factor incentives/penalties
 - Additional Supply Charge
 - Utilities asked to reduce costly power purchase cost by 2% through DSM
 - Higher tariffs for certain categories of consumers



Time of Day Tariffs

- **TOD Tariff for MSEB/MSEDCL since May 2000**
- **Expanded scope of TOD tariffs for all load > 20kW for MSEDCL**
- **Gradually raised the difference between peak and off-peak tariff**
 - Presently, differential between “peak” and “Off-peak” tariffs at Rs. 1.95/kWh (+1.10 and – 0.85), which is around 5 cents (Average Tariff for applicable categories – around 10 cents per unit)
- **Introduced TOD for Mumbai city since October 2006**



PF and Reactive Power Charges

- Power Factor (Various tariff orders for MSEB/MSEDCL, TPC, REL/BSES)
 - Incentive for $PF > 0.95$ (max. of 7% rebate in energy charges)
 - Penalty for $PF < 0.9$ (1% increase in energy charges or every 0.01 drop in PF)



Additional Supply Charge

- **Tariff Order of October 2006**

- Additional Supply Charge introduced to compensate expenditure on costly power purchase, which was being utilised to mitigate load shedding for specified categories & regions
- To foster energy efficiency, reduction in Additional Supply Charge allowed to the extent of reduction in consumption over the last year's consumption in corresponding period

- **Tariff Order of April 2007**

- To foster energy efficiency, incentive provided to the extent of reduction in consumption over the reference period of January to December 2005 and in case of increase in consumption, entire increase to be billed at Additional Supply Charge
- **Utilities directed to reduce costly power purchase cost by 2% through DSM**



Higher Tariffs for Certain Categories

- Commission targeted conspicuous consumption categories like shopping malls, floodlighting at stadiums, hoardings, etc., by steeply increasing their tariffs, rather than banning consumption by such consumer categories
- The tariff increase for one of the Mumbai Utilities:
- For Residential consumers consuming:
 - **>300 units per month ~ 24%**
 - **> 500 units per month ~ 28%**
- For Commercial Sector Consumers consuming:
 - **> 500 units per month ~ 49%**
 - **> 1000 units per month ~ 64-68%**
- For Low tension and high tension consumers:
 - **~ 33-84% rise in tariff**



Capacity Building for promotion of EE/EC/DSM



Capacity Building Initiatives

- Established a DSM Cell within MERC: April 2006
- Pending DSM Plan preparation, worked with utilities to plan and implement EE pilot/demonstration projects in lighting and water pumping areas on “ad-hoc” basis
- Commissioned a study to develop and institutionalise DSM bidding mechanism so that ESCOs, equipment vendors, etc. could be contracted by Utilities to implement DSM projects
- MOU with California Energy Commission, California Public Utilities Commission and Lawrence Berkeley National Laboratory to develop MERC and Utility capacity for load research, DSM and integrated resource planning



Key Challenges



Key Challenges

- Immediate challenges:
 - Changing Utility mind set (from supply side orientation to integration of supply and demand side orientation)
 - Building utility competencies – institutionalisation of DSM, Integrated Resource Planning, and load research
 - Developing appropriate incentives for utilities to take up DSM and EE/EC under cost plus regulatory regime within the ambit of EA 2003 (which does not have direct mandate for DSM)
 - Unlike US and European utilities, distribution business in India has many inefficiencies (huge distribution losses, lower collection efficiencies, etc.), & the challenge is to integrate DSM with distribution efficiency improvement strategies.



Key Challenges Contd.....

- Absence of energy efficiency market:
 - How to motivate bankers/financiers to lend for energy efficiency projects
 - Delivery of energy efficiency : there are hardly any ESCOs, consultants, vendors to deliver energy efficiency (to plan as well as to implement DSM/EE/EC programmes and projects)



THANK YOU



4/10/2008

34