# ESTABLISHMENT OF
# A STATE ENERGY CONSERVATION FUND
# IN MAHARASHTRA

## Report

*Prepared by*

IIEC

*International Institute for Energy Conservation*

**Under**

**USAID ECO II Program**

USAID | INDIA
FROM THE AMERICAN PEOPLE

**October 2005**

# TABLE OF CONTENTS

**SECTION 1 - INTRODUCTION ..... 1**

1.1 THE NEED FOR ENERGY EFFICIENCY ..... 1
1.2 THE ENERGY CONSERVATION ACT, 2001 ..... 1
1.3 FINANCING BARRIERS TO ENERGY EFFICIENCY ..... 2
1.4 OBJECTIVE OF THIS REPORT ..... 3
1.5 APPROACH ..... 3
1.6 POTENTIAL ECONOMIC AND FISCAL BENEFITS OF ENERGY EFFICIENCY ..... 6
1.7 OUTLINE OF THIS REPORT ..... 6

**SECTION 2 – FISCAL AND ECONOMIC ISSUES RELATED OF ELECTRICITY SALES AND SHORTAGES ..... 1**

2.1 BACKGROUND ..... 1
2.2 MAHARASHTRA – FISCAL AND ECONOMIC OVERVIEW ..... 1
2.3 THE POWER SECTOR AND ITS EFFECTS ON FISCAL DEFICITS ..... 5
2.4 TARIFF SUBSIDIES ..... 6
2.5 CAPITAL NEEDS FOR NEW CAPACITY ..... 9
2.6 IMPACT OF ELECTRICITY SHORTAGES ..... 10
2.7 POTENTIAL FISCAL AND ECONOMIC BENEFITS OF ENERTGY CONSERVATION ... 12

**SECTION 3 – ESTIMATING THE ECONOMIC AND FISCAL BENEFITS OF ENERGY CONSERVATION ..... 1**

3.1 INTRODUCTION ..... 1
3.2 SCENARIOS FOR ALTERNATIVE LEVELS OF ENERGY CONSERVATION IMPLEMENTATION ..... 2
3.3 ENERGY SAVINGS ..... 2
3.4 CUSTOMER BENEFITS ..... 3
3.5 UTILITY BENEFITS ..... 3
3.6 REDUCTION OF STATE SUBSIDIES TO THE UTILITIES ..... 4
3.7 THE NEED FOR AN ENERGY CONSERVATION FUND ..... 5

**SECTION 4 - REVIEW OF ENERGY CONSERVATION FUNDS ..... 1**

4.1. INTRODUCTION ..... 1
4.2. U.S. EXPERIENCE ..... 1
*4.2.1 Changing Structure of Energy Efficiency Financing in the U.S. ..... 1*
*4.2.2 Energy Efficiency Spending as Percent of Utility Revenue ..... 2*
*4.2.3 Energy Savings Achieved ..... 3*
*4.2.4 Examples of Selected States ..... 3*
*4.2.5 New York Energy $mart$^{SM}$ Program ..... 4*
*4.2.6 Maryland Energy Loan Programs (MELP) ..... 6*
*4.2.7 Oregon Energy Loan Program (OELP) ..... 8*
4.2.8 *TENNESSEE SMALL BUSINESS ENERGY LOAN PROGRAM AND LOCAL GOVERNMENT ENERGY* LOAN PROGRAM ..... 10
*4.2.9 PENNSYLVANIA PUBLIC BENEFITS PROGRAMS* ..... 11
*4.2.9 Connecticut Clean Energy Fund (CCEF) ..... 17*
*4.2.10 Nebraska State Energy Loan Program (NSELP) ..... 19*
4.3. OTHER INTERNATIONAL EXPERIENCE ..... 24
*4.3.1 New South Wales Sustainable Energy Fund (NSW SEF) ..... 24*
*4.3.2 New Zealand Sustainable Management Fund (NZ SMF) ..... 26*
*4.3.3 Thailand Energy Conservation Fund (ENCON Fund) ..... 29*
*4.3.4 Romania Energy Efficiency Fund (FREE) ..... 31*

4.4. SUMMARY OF FINANCING MECHANISMS ..... 34
*4.4.1 Commercial Loans ..... 34*
*4.4.2 "Soft" Loans ..... 34*
*4.4.3 Subordinated Debts ..... 34*
*4.4.4 Equity Investments ..... 34*
*4.4.5 Other Equity Type Financing ..... 34*
*4.4.6 Interest Buy-Down ..... 34*
*4.4.7 Royalty Financing ..... 35*
*4.4.8 Grants ..... 35*
*4.4.9 Subsidies ..... 35*
*4.4.10 Cash Rebates ..... 35*
4.5. FUND MANAGEMENT AND OPERATIONS ..... 45
*4.5.1 Management and Operation by Government Organizations ..... 45*
*4.5.2 Management and Operation by Non Government Organizations ..... 47*

**SECTION 5 - URBAN DEVELOPMENT FUNDS ..... 1**

5.1 INTRODUCTION ..... 1
5.2 KEY DRIVERS FOR URBAN INFRASTRUCTURE FUNDS ..... 2
5.3 EXAMPLES OF URBAN DEVELOPMENT FUNDS ..... 3
*5.3.1 Tamil Nadu Urban Development Fund ..... 4*
*5.3.2 Karnataka Urban Infrastructure Finance Development Corporation (KUIDFC) ..... 5*
*5.3.3 Infrastructure Development Corporation (Karnataka) Limited ..... 5*
*5.3.4 Gujarat Infrastructure Development Fund (Proposed) ..... 6*
*5.3.5 PDCOR ..... 6*
*5.3.6 Kerala Sustainable Urban Development Project ..... 7*
*5.3.7 The Proposed Maharashtra Urban Infrastructure Fund ..... 8*
5.4 IMPLICATIONS FOR ENERGY CONSERVATION INVESTMENTS ..... 9

**SECTION 6 - OPTIONS FOR AN ENERGY CONSERVATION FUND FOR MAHARASHTRA ..... 1**

6.1 INTRODUCTION ..... 1
6.2 OBJECTIVES ..... 1
6.3 POTENTIAL FUNDING SOURCES ..... 2
6.4 MECHANISMS FOR FINANCING ENERGY CONSERVATION PROJECTS ..... 3
6.5 FUND MANAGEMENT AND ADMINISTRATION ..... 3
6.6 CRITERIA FOR PROJECT FINANCING ..... 4

**SECTION 7 - SUMMARY AND NEXT STEPS ..... 1**

**SECTION 8 - REFERENCES ..... 2**

# SECTION 1 - INTRODUCTION

## 1.1 THE NEED FOR ENERGY EFFICIENCY

The recent increases in world energy prices have brought energy issues again to the forefront of the policy discussions. The impact of rising energy prices, coupled with the chronic problems of power shortages and poor quality and reliability of electricity supply in most of the Indian States, have led to a resurgence of interest in improving energy efficiency to reduce energy costs and power shortages, thereby contributing to the reduction of new generating capacity needs and related capital requirements. Recent work on the benefits of energy efficiency has also pointed out the potential positive impacts of energy efficiency implementation on state fiscal deficits (LBNL, 2005 and Padmanaban, 2005).

Maharashtra, the leading industrial state in India and consumer of about 15% of the total electricity in the country, shares these problems. Current electricity shortages in Maharashtra are estimated to be 20% for capacity and 15% for energy. These shortages are especially detrimental to industry and commerce that have been the main engines powering economic growth and development since the liberalization in 1991. While it will be very difficult to solve the chronic inadequacies in electricity supply, it is likely that a major contribution can be made to reducing the supply-demand imbalance through the improvement of energy efficiency. The Government of Maharashtra (GOM) has initiated a major energy conservation effort and has designated the Maharashtra Energy Development Authority (MEDA) as the nodal agency for energy conservation with responsibility to coordinate, regulate and enforce the provisions of the EC Act in Maharashtra. In addition, GOM has established an Energy Conservation Advisory Committee to assist in this effort. MEDA has developed, with the assistance of the International Institute for Energy Conservation (IIEC) under the Energy Conservation Commercialization (ECO II) Program (USAID, 2003) of the U.S. Agency for International Development, India Mission (USAID/India), a Strategic Energy Conservation Plan (IIEC, 2005). This Plan has identified the need for the establishment of an Energy Conservation Fund to help finance the implementation of energy conservation programs identified in the Strategic Energy Conservation Plan. This report has been prepared by IIEC under the same USAID/India ECO II program to identify the options for the establishment of the Maharashtra State Energy Conservation Fund.

## 1.2 THE ENERGY CONSERVATION ACT, 2001

The Energy Conservation Act, 2001 (EC Act 2001) is by far the most important legislative initiative related to energy efficiency in India's history. The purpose of the Act is to "provide for efficient use of energy and its conservation and for matters connected therewith or incidental thereto."

One of the most important provisions of the Act is the establishment of the Bureau of Energy Efficiency (BEE), which is designated as the responsible agency to perform a range of functions related to energy efficiency and to co-ordinate with designated consumers, designated agencies

and other agencies the activities related to these functions. The Act also assigns and empowers the Central Government, State Governments and the BEE with certain powers and functions.

While centralized planning and design of energy efficiency (EE) programs is being undertaken by BEE, it must be supported by a strong and vigorous decentralized program at the state level. Anticipating such a need, the Energy Conservation Act provided for the establishment of state energy conservation agencies to plan and execute programs. In Maharashtra, MEDA is designated agency for the implementation of the state level provisions of the EC Act.

A key element of the Energy Conservation Act is the establishment of energy conservation funds at the state level. The Act states:

> *"The State Government shall constitute a fund to be called the State Energy Conservation Fund for the purposes of promotion of efficient use of energy and its conservation within the state.*
> *To the fund shall be credited all grants and loans that may be made by the state government or, Central Government or any other organisation or individual for the purposes of this act.*
>
> *The fund shall be applied for meeting the expenses incurred for implementing the provisions of this act.*
>
> *The fund created under sub-section (1) shall be administered by such persons or any authority and in such manner as may be specified in the rules made by the state government."*

## 1.3 FINANCING BARRIERS TO ENERGY EFFICIENCY

While a number of studies have pointed out the tremendous potential for improvement of energy efficiency, it is apparent that the actual implementation of energy efficiency projects falls far below the potential. Many of India's leading industrial companies have made major strides in improving energy efficiency (EE), but there have been very limited EE efforts by second-tier industries (SMEs), commercial organizations and municipalities due to a number of technical, institutional and financial barriers (Limaye, 2003). Of these the financial barriers have been cited as the most important constraints to EE implementation in the SME, commercial and municipal sectors (CRA, 2003).

The major financial barriers to EE project implementation include the following:

- Most organizations in the SME, commercial and municipal market segments have limited capital resources
- Financial institutions have limited experience in lending to EE projects
- Project financing for EE projects is perceived to be highly risky by financial institutions
- The development and transaction costs for preparing and financing of mostly relatively small, "investment grade" or "bankable" projects are relatively high
- Most energy service providers such as ESCOs are undercapitalized and have limited capability to raise the needed project equity funds

- Many of the customers targeted by ESCOs are considered to be not "creditworthy" from the perspective of financial institutions.

Recent efforts to identify and address these barriers have concluded that there is a need for an Energy Efficiency Fund that will help energy consumers develop and implement cost-effective EE projects and facilitate the development and growth of an energy efficiency (EE) infrastructure that includes energy service providers such as ESCOs or energy services performance contractors (ESPCs). The EC Act specifies that such funds be established at the State level.

## 1.4 OBJECTIVE OF THIS REPORT

This report has been prepared by IIEC as a part of the technical assistance being provided by USAID/India to MEDA. The principal objective of this report was to review, assess and document the options for the establishment of an Energy Conservation Fund in Maharashtra. To accomplish this objective, IIEC:

- Identified the potential state level economic and fiscal benefits form the creation of an Energy Conservation Fund.
- Reviewed the features and characteristics of state-level energy conservation funds established in the U.S. and several other countries.
- Defined the options for creating and Energy Conservation Fund in Maharashtra.
- Reviewed the options for financing energy efficiency projects using the Fund
- Identified options for Fund management and administration

## 1.5 APPROACH

The following activities were carried out to meet the above objective:

### *Task 1 - Identification of Economic and Fiscal Benefits*

While much work has been completed and published on the subject of the benefits of energy efficiency to customers and utilities, and the related beneficial environmental impacts, there appears to be relatively little research on the macro-economic and fiscal impacts at the state level. IIEC reviewed the relevant literature of the relationship of the power sector to the state economy, the subsidies provided by the state to the power industry and the rising fiscal deficits and debt at the state level. This information was then analyzed in the context of the possible benefits of energy conservation programs that led to significant reductions of energy consumption and costs. The benefits identified include the reduction of subsidies, reduced capital needs for new electricity generation (and related transmission and distribution) capacity, reduced power shortages and curtailments, potential increases in economic activity due reduced shortages, benefits of such increased economic activity to the state, and the reduced state deficits and debt resulting from the lower subsidies to the power sector and reduced need for capital investment in power infrastructure.

### *Task 2 - Review of EC Funds*

IIEC identified and reviewed state energy conservation funds established in other countries. Examples include state level funds in the U.S., including Pennsylvania, New York and Connecticut, The Sustainable Energy Fund in New South Wales, Australia, and national funds in Thailand and New Zealand. Specific activities included:

- Identify relevant funds at state and national levels
- Select funds most relevant to Maharashtra
- Obtain relevant documentation on each Fund
- For each Fund, define
    - Background
    - Rationale
    - Objectives
    - Goals
    - Functions
    - Funding sources
    - Financing mechanisms
    - Results

### *Task 3 - Definition of Options for Creating an EC Fund in Maharashtra*

In cooperation with the Project Advisory Panel and MEDA, IIEC defined the various options for establishing an EC Fund in Maharashtra. This included:

- Definition of the need for an EC Fund
- Identification of potential funding sources (levy on energy sales, special tariffs or taxes, general tax revenues, fees from certification, donor funds, funds from public and private financial institutions, etc.)
- Discussion of the feasibility of creating an EC Fund from these sources
- Selection of the most reasonable funding options
- Definition of key features and benefits of each option

### *Task 4 - Definition of Options for Financing EC Programs*

In cooperation with the Project Advisory Panel and MEDA, IIEC defined and assessed the various options for developing financing mechanisms using the EC Fund. Examples of financing mechanisms include:

- Grants
- Loans
- Subsidies
- Loan guarantees
- Credit guarantees
- Competitive bidding
- Cooperative advertising and promotion of EC products

Specific activities included:

- Define funding mechanisms
- Identify suitability, limitations, advantages and disadvantages of each funding mechanism for different types of EC activities
- Map funding mechanisms against program options
- Develop preliminary definitions of funding mechanisms for the EC Action Plan
- Review with Advisory Panel and MEDA
- Finalize funding mechanisms

***Task 5 - Definition of Options for Fund Management and Administration***

In cooperation with the Project Advisory Panel and MEDA, IIEC identifies and reviewed the various options for fund management and administration. Specific activities included:

- Review alternative fund management options from other countries. Examples include:
  - Management by MEDA
  - Setting up of a special fund manager
  - Establishing a new organization for fund management and administration
- Review options for Fund supervision including the possible roles and responsibilities of MEDA, State EC Committee, private sector appointees, etc.
- Develop a set of applicable options for Maharashtra
- Identify advantages, disadvantages and limitations of each option
- Review with Advisory Panel and MEDA
- Recommend options for Fund management and administration

***Task 6 - Prepare Report on EC Fund***

- IIEC prepared this report on the EC Fund defining the objectives, structure, funding sources, financing mechanisms, and fund management and administration.

## 1.6 POTENTIAL ECONOMIC AND FISCAL BENEFITS OF ENERGY EFFICIENCY

This study has identified the following potential benefits of energy efficiency:

- The implementation of cost-effective energy efficiency projects (where the cost of conserved energy is less than the electricity tariff), leads to a reduced cost of energy to the consumer.
- Reducing the electricity costs increases the consumers' disposable income which may be spent on pother goods and services thereby benefiting the state economy.
- Reducing energy consumption in "subsidized sectors" where the electricity tariff is less than the utility's cost of producing and delivering electricity to the consumers (such as the agricultural and lower tier residential customers) leads to a reduction in revenue losses to the utility.
- If the electricity saved is sold to consumers whose tariffs are higher than the utility's cost of producing and delivering electricity (such as the industrial and commercial sectors) leads to increased utility revenues.
- The selling of such electricity to the industrial and commercial sectors reduces the "load-shedding" thereby providing the industrial and commercial customers to increase their economic output, thereby providing a benefit to the state economy (increased employment and income), and directly providing increased tax revenues to the state.
- Reducing the energy consumption in the subsidized sectors leads to a reduction in state subsidies to the power sector.
- The reduction of electricity consumption from energy efficiency programs in all sectors leads to a reduction in the need for new generation, transmission and distribution capacity. This in turn means reduced capital requirements for the utility sector.
- Reduction in utility capital investment requirement means that the state has to provide lesser guarantees for utility debt, thereby providing a beneficial effect on the state's debt position and ability to raise capital for other purposes.
- While it is difficult to fully quantify all of these benefits, it is important to note that the resulting effects can be very significant for debt-constrained states such as Maharashtra.

## 1.7 OUTLINE OF THIS REPORT

Section 2 of this report addresses the economic and fiscal issues related to electricity sales, subsidies, and shortages.

Section 3 discusses the various benefits of energy efficiency improvement.

Section 4 provides a review of energy conservation funds in the U.S. and selected other countries.

Section 5 discusses Urban Infrastructure Funds that provide interesting models for energy conservation funds.

Section 6 outlines the options for an Energy Conservation Fund for Maharashtra.

Section 7 discusses the needed next steps to establish an Energy Conservation Fund for Maharashtra.

# SECTION 2 – FISCAL AND ECONOMIC ISSUES RELATED OF ELECTRICITY SALES AND SHORTAGES

## 2.1 BACKGROUND

State Governments in India have been experiencing significant stresses due to chronic fiscal and revenue deficits. The Reserve Bank of India (RBI 2004) has pointed out that since the mid-1990s the Gross Fiscal Deficit in many Indian States has been increasing rapidly, primarily due to rising revenue deficits, which result in a substantial amount of borrowings to be used to meet the shortfall between revenues and expenditures. The result is increased accumulation of debt and debt service obligations, with reduced capability to devote additional funds to economic and social development activities. Some activities have been undertaken to rectify this vicious cycle of increased revenue deficits, increased debt, increased fiscal deficits, and reduced availability of funds for services, which in turn lead to increased revenue deficits. For example, many States have implemented policy measures to augment revenues, contain expenditures, and initiate public sector reforms. Nevertheless, the fiscal performance of most States is deteriorating (Rao 2003).

Major factors contributing to the fiscal deficits are the subsidies provided by the State Government to the power sector and the guarantees provided by the State government for the funds borrowed by the power sector for the capital requirements for new power supply infrastructure (including generation, transmission and distribution capacity) to meet the ever-creasing demand for power (Srinivasan 2000). Therefore, reduction of the subsidies to the power sector and lowering the requirements for new power supply capacity can be significant contributors to improvement of the fiscal deficits at the State level. An aggressive energy conservation program, properly targeted at the major consuming sectors, can lead to substantial reductions in the subsidies to certain consuming sectors and also reduce the overall requirements for power that will therefore mean lesser requirements for capital for growth in the power supply infrastructure. The establishment of the Maharashtra Energy Conservation Fund will be a major step in launching an aggressive energy conservation program.

This section points out the key fiscal and economic issues in Maharashtra and reviews the role of the power sector in the fiscal deficits.

## 2.2 MAHARASHTRA – FISCAL AND ECONOMIC OVERVIEW

*"A crisis is brewing in Maharashtra. A state known for prudent fiscal management has seen a steep deterioration in its performance since the mid-1990s. It is experiencing liquidity problems of an unprecedented magnitude, and is finding it increasingly difficult to meet its obligations".*

This characterization of the fiscal situation in Maharashtra by the World Bank (2002), while appearing to be somewhat drastic, points out the serious fiscal problem faced by the State.

The World Bank report outlines the following key related issues:

- After experiencing rapid and sustained growth for nearly a decade, the State economy has noticeably slowed down in recent years, probably due to deteriorating fiscal performance.
- A considerable amount of taxpayers' money is being spent on public services. Production inefficiencies such as systems losses in the power are contributors to the citizens of Maharashtra are not getting value for their money.
- Despite significant progress, poverty in Maharashtra continues to be relatively high, and there is evidence that in many sectors the benefits of public spending are not reaching the poor due to inadequate targeting and/or governance problems.
- Tax and non-tax receipts have fallen, total government expenditure has increased, and public borrowing has reached distressing levels.

Until the mid-1990s, Maharashtra had been one of the best managed states in India, with low revenue and fiscal deficits as well as a low debt level. According to the World Bank, the State Government's "net worth" as measured by the difference between its assets and liabilities was positive and increasing. However, since the mid-1990seconomic growth in Maharashtra has slackened and the fiscal situation has substantially deteriorated. The results have been:

- Maharashtra has experienced the sharpest decline in economic growth among the 14 largest Indian States.
- There has been a reduction in the approval of Foreign Direct Investment (FDI) to the State
- The State's key fiscal ratios have demonstrated clearly the worsening fiscal situation(see table 2-1):
    - The Fiscal Deficit has increased from 2,265 crores in 1993-94 to 15,474 crores in 2003-04.
    - The ratio of Fiscal Deficit to Gross State Domestic Product (GSDP) has increased from 2.0% in 1993-1994 to 4.6% in 2003-2004
    - The revenue deficit was 122 crores (0.1% of GSDP) in 1993-94 and has increased to 8,310 crores (2.5% of GSDP) in 2003-04.
    - The Primary Deficit has increased from 755 crores (0.7% of GSDP) in 1993-94 to 7,139 crores (2.1% of GSDP) in 2003-04.
    - The total State debt has increased from 15.3564 crores in 1993-94 to 784,257 crores in 2003-04.
- The composition of government funding has changed significantly with cuts in developmental budgets and social sector spending. The State has increasingly borrowed funds to finance its "current consumption".
- Managing the State budget has been increasingly difficult and there has been a limited ability to fund important social and economic programs.

**TABLE 2-1**

**FISCAL INDICATORS IN MAHARASHTRA**

| ITEM | 1993-94 | 2003-04 | % CHANGE |
|---|---|---|---|
| Gross State Domestic Product (at Current Prices) | 113,320 | 333,145 | 194.0% |
| Revenue Deficit | 122 | 8,310 | 6,811% |
| Fiscal Deficit | 2,265 | 15,474 | 683.2% |
| Primary Deficit | 755 | 7,139 | 945.6% |
| Total debt | 15,354 | 84,257 | 548.8% |
| Revenue Deficit as % of GSDP | 0.1% | 2.5% | 2,500% |
| Fiscal Deficit as % of GSDP | 2.0% | 4.6% | 230% |
| Primary Deficit % of GSDP | 0.7% | 2.1% | 300% |
| Total debt as % of GSDP | 13.5% | 25.3% | 187.4% |

*Source: Government of Maharashtra, Budget in Brief, 2005-2006. Finance Department, Mumbai 2005. (Figures do not include face values of guarantees and contingent liabilities of the State.)*

**FIGURE 2-1**

**REVENUE AND FISCAL DEFICITS IN MAHARASHTRA[1]**

Persistently large fiscal deficits can present major challenges and threats to economic growth (World Bank 1990). The experience in many developing countries indicates that, while fiscal policies sometimes have stimulating effects on the economy in the short-run, large public sector fiscal deficits crowd out productive private investment, lead to domestic borrowing that raises interest rates, and invariably lead to a lower growth rate in the long-run. A study by the World Bank (World Bank 2000) suggest that in India, during the late 1980s and 1990s, an increase in the central government's fiscal deficit by one percent of GDP was associated with a reduction in private corporate investment by one percent of GDP.

At the sub-national level, as in the case of Indian States, large and persistently high fiscal deficits, when financed by external sources, have the same effect on the State economy. The negative correlation between deficit and growth is even stronger if much of the deficit is used for current consumption, as is the case in Maharashtra. The situation in Maharashtra is similar to that in many other Indian States, and factors contributing to the chronic fiscal deficits include the

[1] Source: Maharashtra Government – Budget in Brief (2005-06)

inability of States to tax land, agricultural income, and the expanding service sector; failure to reduce large-scale tax exemptions, evasions, and avoidance; poor cost recovery from public services; the large size of the civil service; pay and pension revisions, proliferation of Centrally Sponsored Schemes; and a weak budget formulation, monitoring, and financial management system. It should be noted that additional factors contributing to the growing fiscal deficits are the subsidies from the State to the power sector and the debt guarantees provided by the State for capital needed for power sector capacity expansion.

The World Bank also points out that the underlying fiscal position is actually worse than the budget numbers suggest. The traditional measure of fiscal deficit, the difference between total expenditure and revenue, underestimates the true fiscal position of Maharashtra for at least two reasons (World Bank 2002):

- First, to circumvent central government controls on state borrowings, several States including Maharashtra have resorted to significant off-budget borrowings through the creation of new public corporations called Special Purpose Vehicles (SPVs).[20] In Maharashtra, several SPVs have been created in recent years.[21] Debt charges (interest and principal) of these SPV borrowings are paid directly from the state budget; therefore, these are really part of government's own borrowings.
- Second, the traditional measure of fiscal deficit does not include the full operating losses and capital outlays of all the State PSUs. For example, in Maharashtra, while the fiscal deficit includes the power sector subsidy, equity contribution, and loans (net of recovery) from GoM to Maharashtra State Electricity Board (MSEB), it does not include those parts of operating losses and capital outlay of MSEB, which are financed by market borrowings with government guarantees.

The World Bank report estimates that the "Consolidated Deficit" which is defined as the sum of the Primary deficit, Interest Payments, Off-Budget Borrowings and Power Sector Financing Needs) is considerably higher than the fiscal deficit shown in the State budget. The report concludes that if the trend of increasing deficits continues, Maharashtra could potentially face the threat of insolvency.

Like some other States, the fiscal deficit in Maharashtra is exacerbated by its low tax buoyancy, or the revenue generating capability of the State (Moitra, 2005), making it (and Andhra Pradesh) one of the most unsustainable behind other large States (West Bengal and Uttar Pradesh) in an even more precarious debt position.

The Government of Maharashtra has recognized the problems of fiscal deficits and has developed the Medium Term Fiscal Reform Program (MTFRP) which defines a set of comprehensive measures targeted at ending the recent fiscal deterioration. The MTFRP is includes the definition of a "path towards fiscal sustainability" and establishes targets for the major fiscal indicators. However, the implementation of the reform agenda remains a big challenge. A few simple reforms have been implemented, but most of the difficult actions that will have a lasting impact lie ahead.

One key element of the MTFRP is the restructuring of the power sector. The relationship of the power sector to fiscal deficits is discussed below.

## 2.3 THE POWER SECTOR AND ITS EFFECTS ON FISCAL DEFICITS

While many different factors have contributed to the fiscal deterioration in Maharashtra, a major responsible factor is the performance of the power sector in Maharashtra. The Maharashtra State Electricity Board (MSEB) has suffered from many financial and governance problems (similar to other SEBs), including subsidized tariffs to certain consuming sectors, high transmission and distribution losses, and large capital requirements for additions to power generation, transmission and distribution capacity to meet increasing power demands. MSEB's financial performance was also significantly negatively influenced by the high charges paid by MSEB for electricity from the controversial Dabhol Power Plant, until its closure in 2001.

In the 2002-03 Budget, the Government of Maharashtra pointed out that the unsatisfactory financial performance of MSEB had placed the State in a position of "grave risk" and that the State had been converting outstanding loans to MSEB into equity (thereby relieving MSEB of the burden of servicing the loans). The report characterized the continuing budget support for MSEB as "untenable."(GOM 2002)

Various government committees analyzed the financial issues and problems of MSEB (see, for example, Rajyadhyaksha 1996, Upasani 2000, and Godbole 2001), made a number of recommendations for improving the financial performance of MSEB, including the recommendation that the power sector in Maharashtra should be restructured and possibly privatized. In 1998, the Electricity regulatory Commissions Act was enacted by the Indian Parliament. This Act established the Central Electricity Regulatory Commission (CERC) and required the Sates to establish State Electricity Regulatory Commissions. Maharashtra established the Maharashtra Electricity regulatory Commission (MERC) in 1999.

While the reform and restructuring of the power sector in Maharashtra is underway, and the MERC is playing an increasing role in trying to rationalize tariffs, reduce transmission and distribution losses, and balance MSEB's revenues and expenses, the State Government is still responsible for providing some funding to MSEB and guarantee the debt incurred by MSEB for capacity expansion of the power system. These have continuing impacts on the State fiscal deficits.

Another important power sector issue is the chronic power shortages and load shedding for commercial and industrial customers. The growth in power demand in Maharashtra is very high and, even with a potential solution to the Dabhol Power Plant issue, it is very likely that the State will continue to experience load shedding. Such load shedding has an impact on the economic activity in these important sectors, and continuing power shortages are likely to limit economic growth in the State.

An aggressive energy conservation program can be of substantial benefit to the power sector and can provide the following benefits:

- Reduce the growth in power demands
- Decrease the power shortages and thereby reduce load shedding
- Reduce the losses incurred by MSEB in supplying power to subsidized consuming sectors
- Reduce the needs for power sector capacity expansion
- Decrease the need for capital for power sector expansion

- By reducing load shedding, facilitate additional economic activity by using the "saved electricity" for productive uses.

These power sector benefits in turn lead to beneficial impacts on the fiscal deficits by:

- Reducing power sector subsidies
- Reducing the amount of debt guarantees from the State to the power sector for capacity expansion
- Increased economic activity leading to revenue enhancement

MERC has recognized the importance of these benefits and has initiated efforts to get the utilities in Maharashtra to embark upon energy conservation programs.

The sections below provide additional discussion of the power sector issues.

## 2.4 TARIFF SUBSIDIES

Until the establishment of MERC, the financial performance of MSEB was guaranteed by the State with a 4.5% guaranteed return on assets. Effective the functioning of MERC in 2000, the electricity tariffs are established by MERC based on tariff filings submitted by MSEB. MERC has set strict performance targets for MSEB, and has issued tariff orders predicated on efficiency improvements together with tariff adjustments such that the State will no longer have to subsidize the utility. However, if the State Government decides to charge a lower tariff to certain consumers than the tariff established by MERC, then the State has to compensate MSEB for the difference through a tariff subsidy.

Despite the tariff reforms initiated by MERC, the current tariff structure is heavily distorted. A number of consuming sectors (particularly the residential and agricultural sectors) pay tariffs that are substantially less than the cost of providing power to them, while other sectors (particularly industrial and commercial) pay tariffs that are substantially higher than the cost of providing power to them. A comparison between the average cost of power supply and the average tariff revenue per unit is shown in Table 2-2 below and illustrated in Figure 2-2.

**TABLE 2-2**

**AVERAGE TARIFF VS, COST OF SUPPLY**

**(Rs. per Unit)**

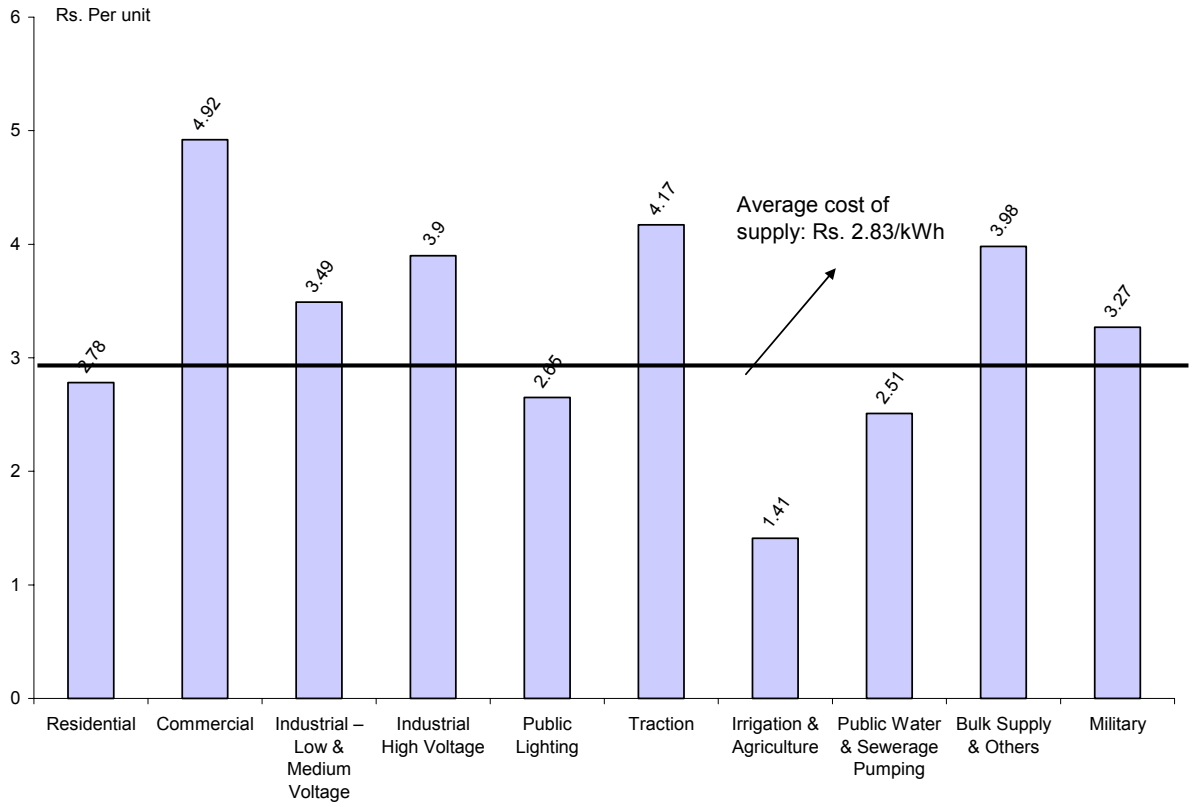
| **AVERAGE COST OF SUPPLY PER UNIT** | | **2.83**[2] |
|---|---|---|
| **CONSUMING SECTOR** | **% OF SALES** | **AVERAGE TARIFF** |
| Residential | 17.5 | 2.78 |
| Commercial | 4.1 | 4.92 |
| Industrial – Low & Medium Voltage | 7.7 | 3.49 |
| Industrial High Voltage | 31.9 | 3.90 |
| Public Lighting | 1.2 | 2.65 |
| Traction | 2.3 | 4.17 |
| Irrigation & Agriculture | 23.3 | 1.41 |
| Public Water & Sewerage Pumping | 3.4 | 2.51 |
| Bulk Supply & Others | 8.0 | 3.98 |
| Military | 0.6 | 3.27 |
| **Total** | **100.0** | **3.07** |

Source: MSEB, Statement of Accounts 2003-2004

[2] Data from MERC Tariff Order for MSEB – FY 2003-04 (order dated 10 March 2004)

**FIGURE 2-2**

**AVERAGE TARIFF VS, COST OF SUPPLY**




The Government of Maharashtra has adopted a policy of subsidized power to the farmers, and is reimbursing MSEB for the losses incurred by MSEB in providing such free power. The State also provided MSEB other subsidies as shown in Table 2-3 below:

**TABLE 2-3**

**STATE SUBSIDIES TO MSEB**

| PURPOSE | AMOUNT | COMMENTS |
|---|---|---|
| Free Power to farmers | Rs. 261.41 Crores | Cost of power provided to farmers |
| Improved distribution system under Accelerated Power Development and Reforms Program (APDRP) | Rs. 35.59 Crores | Contribution of State Government as matching fund |

## 2.5 CAPITAL NEEDS FOR NEW CAPACITY

Maharashtra is experiencing a high growth in electricity demands to meet its economic growth. Table 2-4 below shows the electricity sales (after load shedding) for the last several years (MSEB 2005).

**TABLE 2-4**

**MSEB ELECTRICITY SALES AND PEAK LOADS**

| YEAR | MSEB SALES (Million Units) | % GROWTH | MAHARASHTRA PEAK LOAD | % GROWTH |
|---|---|---|---|---|
| 2001-02 | | | | |
| 2002-03 | 38.735 | | | |
| 2003-04 | 41,900 | 8.2% | 11,357 | |
| 2004-05 | 43,575 | 4.0% | 12,749 | 12.2% |

Since the State has experienced major load shedding due to inadequate generation capacity, the actual demand for power is growing at a higher rate than shown in Table 2-4.

MSEB estimates that the peak load will increase by about 9% per year or about 6,000 to 6,500 MW by the year 2010 (MSEB 2005). Without capacity additions this will lead to a capacity shortfall of 10,000 MW by the year 2010-11. MSEB has therefore outlined an ambitious plan to add over 17,000 MW of generation capacity (and related transmission and distribution capacity) in the next seven years. While it is expected that some of these capacity additions may come from independent power producers (IPPs), Inter-State Power, and revival of Dabhol (through the new Ratnagiri Gas and Power Pvt. Ltd.), a substantial amount of capacity additions (over 7,500 MW) will be the responsibility of the new MAHAGENCO, the generation company formed after the restructuring of MSEB. Also all of the needed transmission and distribution investments are expected to be made by the newly formed transmission and distribution companies.

The capital investments needed to meet these capacity additions are enormous (see Table 2-5 below) and, since they have to be guaranteed by the State, will create very significant impacts on the fiscal deficits and total State debt.

**TABLE 2-5**

**CAPITAL REQUIREMENTS FOR POWER SECTOR EXPANSION**

**2006-2013**

| CAPACITY EXPANSION | QUANTITY (MW) | CAPITAL NEEDS (Crores Per MW) | TOTAL CAPITAL NEEDS (Crores) |
|---|---|---|---|
| Generation | 7,500 | 4.0 | 30,000 |
| Transmission | 17,000 | 0.5 | 8,500 |
| Distribution | 17,000 | 0.5 | 8,500 |
| Total | - | - | 47,000 |

It is doubtful whether the State will be able to generate this magnitude of investment for the power sector and any strategies to reduce the growth in power demand and thereby reduce the capital requirements will be highly beneficial. (In 2003-04, Government of Maharashtra provided Rs. 1050.50 Crores as loans to new power projects.)

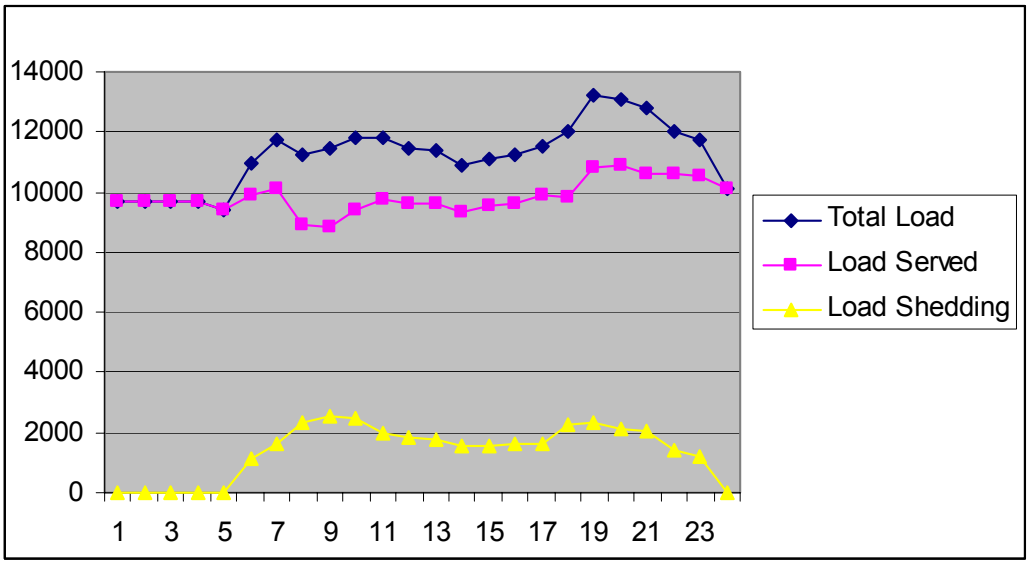
## 2.6 IMPACT OF ELECTRICITY SHORTAGES

Due to capacity shortages, Maharashtra has been experiencing significant load shedding. The Regional Load Dispatch Center (RLDC) at Kalwa (Thane) is the main authority for implementing the load shedding plan in Maharashtra. RLDC estimates future electricity demand and supply for one year and prepares a load shedding plan. This plan allocates the load to be shed by urban and rural regions. On a given day, RLDC instructs operators of main substations to shed load based on this plan with certain modifications that are based on specific conditions of demand and supply prevailing on that day. Operators at main substations then plan and implement feeder-wise load shedding programs.

For illustrative purposes, the Figure 2-3 is provided below showing the load shedding on a typical day in October 2005. The Figure shows the estimated total demand, the demand actually served and the amount of load shedding.

**FIGURE 2-3**

**MAHARASHTRA LOAD SHEDDING – OCTOBER 21, 2005**




According to the load shedding plan, load shedding is avoided for high tariff industrial and commercial consumers of MSEB. As the Maharashtra Industrial Development Corporation (MIDC) areas have high concentration of industry, load is rarely shed in these areas. Load shedding is also generally avoided for high tension (HT) consumers as most of these are large industrial or commercial consumers. Load shedding is generally avoided in major cities such as Pune, Nagpur, and Aurangabad since these cities have high concentration of commercial consumers. Although commercial consumers pay a high tariff, load shedding for these consumers is difficult to avoid since they are often on the same feeders as residential consumers. Hence, when load is shed for residential consumers, commercial consumers on that feeder are also affected. A majority of the load shedding is done in rural areas where the load mainly consists of agricultural pumping.

A recent study sponsored by USAID and conducted by the Lawrence Berkeley national Laboratory (LBNL 2005) estimated that in 2002-2003, the load shedding in the commercial and industrial sectors amounted to about 1,922 GWH. Load shedding results in lost economic output, which reduces the sales, excise, and corporate income taxes paid by businesses to government. Energy savings during the shortage hours can reduce the lost output. Any electricity savings in the residential and agricultural sectors, if resold to commercial and industrial customers, will lead to increases in output, thereby increasing tax revenues. Further, because the affected

businesses buy from and sell goods to other sectors of the economy, their output will also increase. This secondary or indirect impact will add to the taxes paid to the government.

The LBNL report estimates that every GWH saved due to energy conservation in the domestic and agriculture sectors, and resold tom the commercial and industrial sectors, will generate about Rs. 3.50 to Rs. 7.00 in increased tax revenues to the State due tom the increased output (depending on the level of existing on-site generation in these sectors), and an additional Rs. 3.50 to Rs. 7.00 in indirect economic benefits due to the "multiplier effect" of the increased production.

## 2.7 POTENTIAL FISCAL AND ECONOMIC BENEFITS OF ENERTGY CONSERVATION

The above discussion has pointed out the various potential economic and fiscal benefits of energy conservation. The analysis is relevant because the precarious deficit and debt position of the State of Maharashtra (and other states) is not sustainable and will evoke a negative reaction from the capital markets in the near future. The benefits are summarized below:

1. Energy savings due to conservation programs targeted at consuming sectors that are subsidized by the State directly reduce the losses incurred by the power sector in supplying subsidized electricity and lead to direct reduction of subsidy payments from the State to the power sector.
2. Energy savings due to conservation programs reduce the need for additional capacity for power systems expansion thereby reducing capital requirements. The reduced capital requirements lead to a reduction in the amount of debt guarantees provided by the State to the power sector.
3. Energy conservation leads to reduction in customer energy costs. These reductions in turn provide additional disposable income to consumers. To the extent that such income is used to purchase goods and services, there is a beneficial effect on the economy and resulting tax revenues to the State.
4. If the electricity saved by energy conservation programs is sold to the commercial and industrial sectors that are being subject to load shedding, such electricity sales will reduce the amount of load shedding and allow these sectors to contribute to increased economic output.
5. The increased economic output provides a direct increase in the tax revenue to the State.
6. The increased economic out also, through the multiplier effect, provides indirect economic benefits to the State economy.
7. The reduced subsidies in (1) reduce the revenue deficit and the fiscal deficit.
8. The reduced debt from (2) leads to a reduction in interest payments which means a reduction in the primary deficit.
9. The reduced capital requirements in (2) reduce the gross fiscal deficit and the total State debt.

10 The direct and indirect benefits from (3) lead to increased revenues and therefore reduced revenue deficit and fiscal deficit.

11 The increased economic output from (4) similarly leads to increased revenues and therefore reduced revenue deficit and fiscal deficit.

12 Also, the indirect effects from (5) provide increased revenues and therefore reduced revenue deficit and fiscal deficit.

13 The net result is the reduction of the revenue deficit, fiscal deficit, primary deficit and debt levels.

14 All of the above lead to an improvement in the State's fiscal situation and ability to borrow additional funds.

15 These effects may also lead to a decrease in the State's borrowing rate which will further reduce interest payments and thereby reduce the primary and fiscal deficits.

All of these effects are complex and difficult to quantify. In addition, the analysis does not take into account the share of the energy-debt nexus, or the State's portion of the impacts borne from external borrowings at the Central Government for an ever increasing bill for imported fuels (Reddy, et al., 1992). Neither does it take into account the impact of exogenous receipts, such as the State's share in Central taxes. However, the next section attempts to develop preliminary estimates of some of these benefits for selected energy conservation scenarios at the sub-national state level.

# SECTION 3 – ESTIMATING THE ECONOMIC AND FISCAL BENEFITS OF ENERGY CONSERVATION

## 3.1 INTRODUCTION

As indicated in Section 2, energy conservation programs can have a number of beneficial effects on customers, utilities and the State economy. This section develops preliminary estimates of some of the beneficial effects using a set of three energy conservation scenarios. The scenarios have been adapted from the Strategic Energy Conservation Plan prepared for the Maharashtra Energy Development Agency (MEDA) by the International Institute for Energy Conservation (IIEC) under the USAID Energy Conservation Commercialization Program (IIEC 2005).

This Strategic Plan identified a set of 11 energy conservation programs:

***PROGRAMS TO BE IMPLEMENTED IN 2005***

1. **HOME BRIGHT** – Residential High-Efficiency Lighting Program
2. **PUBLIC BUILDINGS PARTNERSHIP PROGRAM** – Energy efficiency implementation in public buildings using ESCOs as the implementing mechanism
3. **SOLAR/LPG WATER HEATING –** Integrated Solar/LPG Water Heating Program

***PROGRAMS TO BE IMPLEMENTED IN 2006***

4. **SME PROGRAM** – Energy efficiency improvement in small and medium enterprises
5. **WORK BRIGHT PROGRAM** – Commercial High-Efficiency Lighting Program
6. **MOTOR RE-POWER** – High Efficiency Motor Rewinding Program
7. **EE FINANCING** – Financing of energy efficiency improvement using the Energy Conservation Fund
8. **AGRICULTURAL EFFICIENCY** – Energy efficiency improvement in agriculture
9. **BRIGHT STREETS** – Municipal Street Lighting Program Using advanced technology
10. **GREEN BUILDINGS PROGRAM** – Green Buildings Program - Cooperate with existing Green Buildings Center; Construct one or two new Green Buildings in Maharashtra
11. **MUNICIPAL ENERGY EFFICIENCY PROGRAM –** Improvement of energy efficiency in municipal water pumping and street lighting

Three alternative scenarios have been postulated for this report.

## 3.2 SCENARIOS FOR ALTERNATIVE LEVELS OF ENERGY CONSERVATION IMPLEMENTATION

The first scenario assumes that only the three programs implemented in 2005 are continued and no further programs are initiated. This is referred to as the "Low" Energy Conservation Scenario.

The second scenario assumes that the additional 8 programs are implemented in 2006. This is referred to as the "Moderate" Energy Conservation Scenario. This scenario includes the establishment of the Maharashtra Energy Conservation Fund by the State Government to implement the Energy Efficiency Financing Program.

The final scenario assumes a moiré aggressive implementation of all 11 programs plus a major effort to expand the Maharashtra Energy Conservation Fund by supplementing the State funding with substantial additional funding from donor agencies and the private sector. It is anticipated that this "Aggressive" Energy Conservation Scenario will produce twice the savings of the "Moderate" scenario.

The savings have been estimated over a period of 10 years.

## 3.3 ENERGY SAVINGS

The estimated energy and capacity savings from the 3 Scenarios are summarized in Table 3-1 below.

**TABLE 3-1**

**ESTIMATED ENERGY AND CAPACITY SAVINGS**

| PROGRAM | "LOW" SCENARIO | | "MODERATE" SCENARIO | | "AGGRESSIVE" SCENARIO | |
|---|---|---|---|---|---|---|
| | Energy GWH | Capacity MW | Energy GWH | Capacity MW | Energy GWH | Capacity MW |
| Home Bright | 5,804 | 636 | 5,804 | 636 | 11,607 | 1,272 |
| Integrated SWH/LPG | 650 | 60 | 650 | 60 | 1,300 | 120 |
| Public Buildings | 600 | 12 | 600 | 12 | 1,200 | 24 |
| SME Program | - | - | 250 | 20 | 500 | 40 |
| Green Buildings Program | - | - | 150 | 7 | 300 | 14 |
| Work Bright Program | - | - | 8,213 | 225 | 16,425 | 450 |
| Motor Re-power | - | - | 1,125 | 17 | 2,250 | 34 |
| Agriculture EE Program | - | - | 1,369 | 25 | 2,738 | 50 |
| Bright Streets | - | - | 639 | 35 | 1,278 | 70 |
| Municipal EE Program | - | - | 1,500 | 80 | 3,000 | 160 |
| EE Financing Program | Supports all other programs | | | | | |
| Total | 7,054 | 708 | 20,299 | 1,117 | 40,597 | 2,234 |

## 3.4 CUSTOMER BENEFITS

The customer benefits are the energy savings resulting from the energy conservation program less the implementation and operation/maintenance cost of the program measures to the customer. Since the electricity tariffs are different for each class of customer and the capital investment and operating and maintenance costs are specific to each technology, specific program by program calculations have to e conducted to estimate the customer savings. The details of these calculations are not shown here. A summary of the net customer benefits is shown in Table 3-2 below:

**TABLE 3-2**

**CUSTOMER BENEFITS**

| | **"LOW" SCENARIO** | **"MODERATE" SCENARIO** | **"AGGRESSIVE" SCENARIO** |
|---|---|---|---|
| **Energy Savings (GWH)** | 7,054 | 20,299 | 40,597 |
| **Customer Benefits (Rs. Crores)** | | | |

## 3.5 UTILITY BENEFITS

Utility benefits include reduced capital requirements for future generation, transmission and distribution capacity expansion. These benefits are summarized in Table 3-3 below. The utility also gets reduced losses due to decreased sales to the subsidized sectors. Since these losses for sales to subsidized sectors are reimbursed by the State, they are shown in Section 3.6 below.

**TABLE 3-3**

**UTILITY BENEFITS**

| | **"LOW" SCENARIO** | **"MODERATE" SCENARIO** | **"AGGRESSIVE" SCENARIO** |
|---|---|---|---|
| **Capacity Savings – Customer Level (MW)** | 708 | 1,117 | 2,234 |
| **Capacity Savings – Customer Level (MW)** | 1,180 | 1862 | 3724 |
| **Capital Savings – Generation (Rs. Crores)** | 4,720 | 7,448 | 14,896 |
| **Capital Savings – T&D (Rs. Crores)** | 1,180 | 1862 | 3724 |
| **Total Capital Savings (Rs. Crores)** | 5,900 | 9,310 | 18,626 |
| **Increased Revenue from Sale of Saved electricity to Higher Tariff Sectors (Rs. Crores)** | | | |

## 3.6 REDUCTION OF STATE SUBSIDIES TO THE UTILITIES

The direct benefits of the reduced sales to the subsidized sectors to the State are equal to the reduced subsidies provided by the State to the power sector. These are estimated in Table 3.4 below.

**TABLE 3-4**

**REDUCTION IN STATE SUBSIDIES**

| | **"LOW" SCENARIO** | **"MODERATE" SCENARIO** | **"AGGRESSIVE" SCENARIO** |
|---|---|---|---|
| **Energy Savings – Subsidized (GWH)** | | | |
| **Reduced Losses (Rs. Crores)** | | | |

## 3.7 THE NEED FOR AN ENERGY CONSERVATION FUND

The fiscal and economic benefits of energy conservation to the State estimated above (although preliminary) point out the need to immediately initiate an energy conservation program. While energy conservation provides considerable benefits to customers, it has been demonstrated in prior research that there are many critical financial barriers to customer implementation of energy conservation measures. A potential solution for many of these financial barriers is the establishment of a Maharashtra Energy Conservation Fund. The economic and fiscal benefits of energy conservation justify the State's investment in such a fund.

While the amount of funding required for the implementation of the programs designed as part of the MEDA Strategic Energy Conservation Plan will depend on the number of programs implemented and the intensity of the programs, it is estimated that a fund of the order of magnitude of Rs. 50 crores will be sufficient to implement the "Moderate" Scenario outlined above. If the Maharashtra Government establishes such a Fund, it is possible to augment the Fund's resources by obtaining additional supplemental funds from bilateral and multilateral donor agencies, international lending institutions, private sector financial institutions and others to fund the "Aggressive" Scenario.

How the Energy Conservation Fund can be designed in order to enable the State of Maharashtra to capture the net benefits from conservation and help alleviate its fiscal situation is an open question. It is related to the macro-economic reforms that have to be undertaken by the State to control its worsening deficits and debt situation. At this time (2005), Maharashtra has agreed to related policy reforms by:

- Joining the Consolidated Sinking Fund created by the Tenth Finance Commission, which can be used to amortize the redemption of open market loans;
- Enacting fiscal responsibility legislation that may assist in raising its own tax buoyancy and in restraining its non-interest revenue expenditures.

However, Maharashtra has neither established a guarantee ceiling nor has it joined the Guarantee Redemption Fund (GRF) that now has the membership of the states of Andhra Pradesh, Goa, Gujrat, Haryana, Karnataka, Orissa, and Rajasthan. The GRF will enable the State to set up a contingency fund or make some provisions for discharging the devolvement of guarantees provided by them, with guarantee fees collected and credited to the fund.

As such, reduction of deficits and debt to a sustainable level (e.g., the Maastricht Treaty recommends a 3 percent limit on fiscal deficit as a percent of the gross State Domestic Product for EU member countries) can create more debt capacity for the State which can be used toward more efficiently meeting the demand-supply gap and for economic development.

The remainder of this report discusses the energy conservation funds established in various other states in the U.S. and several other countries, examines the structure and potential application of urban infrastructure funds for energy conservation, and identifies various options for the State to establish the Maharashtra Energy Conservation Fund.

# SECTION 4 - REVIEW OF ENERGY CONSERVATION FUNDS

## 4.1. INTRODUCTION

This section identifies and reviews the mechanisms used to create energy conservation funds and the key characteristics of these funds. First a review of U.S. state-level energy conservation funds (EC Funds) is presented using examples from leading U.S. states New York, Pennsylvania, Connecticut, Maryland, etc. Summary tables showing the level of funding and the results in terms of energy savings are also presented, followed by brief descriptions of selected funds.

The summary of U.S. experience is followed by examples of EC Funds from other countries, including Australia, New Zealand and Romania.

Following the discussion of the characteristics of U.S. and other international funds, a summary of the financing mechanisms used in these funds is provided as well as a discussion of the management and operation of these funds.

## 4.2. U.S. EXPERIENCE

### *4.2.1 Changing Structure of Energy Efficiency Financing in the U.S.*

As the U.S. energy industries have undergone restructuring during the 1990s, the nature of energy efficiency funds (note that in the U.S. the term "energy efficiency" is preferred to "energy conservation") has also changed significantly. Prior to restructuring, utility regulators required most electric and many gas utilities to implement a large number of demand-side management (DSM) programs that were funded by the utilities with the costs of these programs recovered form the utility ratepayers through tariffs. . However, as deregulation and restructuring occurred in the U.S. electric utility industry, most utilities and regulators believed that the traditional DSM programs of the 1980s and early 1990s would place utilities at a competitive disadvantage and therefore were not compatible with competitive retail electricity markets. It was assumed that price signals in the marketplace would provide sufficient incentives to energy users to utilize energy efficiently. As a result, the funding of energy efficiency programs was reduced drastically – from $1.8 billion in 1993 to less than $900 million in 1998 (York and Kushler, 2005).

However, the market response in terms of energy efficiency project implementation after restructuring did not validate the assumption that cost-effective efficiency implementation would occur without substantial utility funding. Therefore, many U.S. states re-examined the level of funding for energy efficiency (EE) programs and established funding mechanisms that, while somewhat different from the DSM program funding approaches, provided substantial funding for EE projects. The energy shortages faced by California and other Western U.S. states in 2000-2001 further emphasized the need for energy efficiency and provided additional impetus to the creation of EE funds.

Many of the larger U.S. states (as well as some of the smaller ones) have developed what are known as "public benefits programs". Under these programs a "public benefits charge" is included in the electricity tariff and is collected by the utilities. The funds collected by the utilities are then provided to an agency designated by the regulatory authorities and these funds are then used for financing EE programs and projects. Information on the various public benefits programs is available from recent reports by the Energy Information administration (EIA 2005) and a report (York and Kushler, 2005) compiled by the American Council for an Energy Efficient Economy (ACEEE).

Illustrative information for selected U.S. states is provided below.

### *4.2.2 Energy Efficiency Spending as Percent of Utility Revenue*

The average U.S. spending on energy efficiency was 0.55 of utility revenue. However, many states had substantially higher percentages. The top ten are shown in table 4-1 below:

***Energy Efficiency Spending as % of Utility Revenue, 2003***

| STATE | EE Spending as % of Annual Utility Revenues |
|---|---|
| Vermont | 3.0% |
| Massachusetts | 2.4% |
| Washington | 2.0% |
| Rhode Island | 1.9% |
| New Hampshire | 1.8% |
| Oregon | 1.7% |
| Wisconsin | 1.4% |
| New Jersey | 1.4% |
| Montana | 1.3% |
| California | 1.2% |
| *U.S. Average* | *0.5%* |

Source: *York and Kushler, 2005*

### *4.2.3 Energy Savings Achieved*

The cumulative reductions in energy use for some of the leading states resulting from these EE funds are summarized below.

***Cumulative Energy Efficiency Savings % of Retail Electric Sales, 2003***

| STATE | Cumulative annual Energy savings as % of Annual Retail Sales |
|---|---|
| Connecticut | 7.8% |
| California | 7.5% |
| Washington | 7.2% |
| Minnesota | 6.7% |
| Rhode Island | 6.2% |
| Oregon | 6.0% |
| Massachusetts | 5.8% |
| Vermont | 4.8% |
| Wisconsin | 4.4% |
| Montana | 3.9% |
| *U.S. Average* | *1.9%* |

*Source: York and Kushler, 2005*

### *4.2.4 Examples of Selected States*

The structure of some of the state energy efficiency funding programs is described below. The states include:

- New York
- Connecticut
- Maryland
- Pennsylvania

For each of these, the following type of information is presented:

- Program Funding Area
- History/Background
- Rationale
- Objectives
- Goals
- Functions
- Funding Sources
- Financing Mechanisms
- Funding Application Process
- Fund Management and Administration
- Results
- Sources of Data

### *4.2.5 New York Energy $mart$^{SM}$ Program*

**Program Funding Area:**

State of New York

**History/Background:**

The program was created in 1975 by the New York State Legislature

**Rationale:**

To help lower the money spent by distribution costumers (residential, commercial, institutional and industrial) on electricity by encouraging energy efficiency as the state undergoes transition to a more competitive electricity market.

**Objectives:**

**Goals:**

**Functions:**

Provides energy efficiency services, including those directed at the low-income sector, research and development, and environmental protection activities

**Funding Sources:**

The program is funded as a part of the comprehensive public benefits funding (administered by the New York State Energy Research and development Authority or NYSERDA) from the charge on electricity transmitted and distributed by the State's investor-owned electric utilities.

The program has an 8 year budget of $ 942M of which 84% has been committed as of September 2004.

**Financing Mechanisms:**

Interest buy down of up to 4% (400 basis points) off a lender's normal loan interest rate for a term not exceeding 10 years.

To assist in the rebuilding efforts in Lower Manhattan, the program offers interest buy-down of up to 6.5% for energy efficiency improvements and other measures for buildings located in the Liberty Zone

Grants are provided in the form of technical assistance in identifying and implementing EE projects. The technical assistance includes:

- For residential buildings
  - Comprehensive home assessment
  - Financial packaging assistance
  - Construction oversight
  - Cost sharing of up 50% but not exceeding $ 5,000 per household or $ 10,000 for 2-4 family building, for the cost of implementing EE measures. This is for families with annual income not exceeding the specified limit.
- For commercial and industrial establishments
  - Free low cost walk-through audit for buildings with annual electricity bills of less than $ 100,000
  - 50% cost sharing for energy feasibility studies, energy operations management, rate analysis and aggregation and combined heat and RE generation studies
  - Off set of up to 80% on the incremental costs to purchase and install EE equipment

**Funding Application Process:**

Facilities applying for the loan program must first be assessed by the Systems Benefits Charge in one of the New York State investor-owned utilities territories contributing to the program. The borrower must be approved for financing by a lending institution or leasing company that participates in the Program.

Custom and renewable projects must meet payback and other criteria and must submit required technical documentation. The New York State Energy Research and Development Authority has technical assistance programs to assist in the technical documentation such as feasibility studies for capital improvements, energy operations management, rate analysis and aggregation, services to provide energy audits and customized assistance for small medium commercial customers.

Funding is available on a first-come, first-serve basis.

**Fund Management and Administration:**

The New York State Energy Research and Development Authority (NYSERDA), a public benefit corporation, was created in 1975 by the New York State Legislature to administer the New York Energy $mart[SM] program.

**Results:** As of September 2004

| *Item* | *Value* |
|---|---|
| Annual Savings from EE | 1,340 GWH |
| Peak Demand Reduction | 1, 135 MW |
| Permanent measures | 365 MW |
| Annual Energy Bill Savings | $ 185 M |
| Renewable Annual Energy Generation | 101 GWH |

**Sources of Data:**

- www.nyserda.org
- New York Energy $mart Program Quarterly Evaluation & Status Report September 2004

### *4.2.6 Maryland Energy Loan Programs (MELP)*

**Program Funding Area:**

State of Maryland

**History/Background:**

The State of Maryland has several energy efficiency related programs funded and operated by the Maryland Energy Administration. Among these are

- Community Energy Loan Program (CELP)- created in 1989 by the General Assembly of Maryland
- Stage Agency Loan Program (SALP)- created in 1991

**Rationale:**

**Objectives:**

The objective of the Community Energy Loan Program (CELP) is to reduce the operating expenses of non-profits and local government agencies by identifying and installing energy conservation improvements

The objective of the Stage Agency Loan Program (SALP) is to provide a financing mechanism useful to state agencies in meeting the requirements of the State Executive Order on Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency.

**Goals:**

**Functions:**

**Funding Sources:**

- The Community Energy Loan Program had seed money of US$ 3.2 million from the Oil Overcharge Fund
- The State Agency Loan Program was funded from the Energy Overcharge Restitution Trust Fund

**Financing Mechanisms:**

- The Community Energy Loan Program is a revolving fund providing loans to eligible nonprofits, including hospitals and private schools, and local government entities, including public school systems and community colleges. The projects funded must have a payback period of not more than 7 years. Loan size ranges from a minimum of $ 30,000 to $ 400,000. Interest rate is negotiated but always below market rate. Current average interest rate is 3.5% pa. Loan repayment is semiannual beginning in the second year of the loan. The first year is deferred to allow the applicant time to complete the energy project and to begin to realize savings. The maximum repayment term on any loan is the simple payback of the project, plus the one year of deferral. Borrower must pay a non refundable application fee of 1% of loan applied but not more than $ 250 and a closing fee of 1% of loan awarded but not more than $ 1,000 less application fee paid.
- The State Agency Loan Program is also a revolving fund providing loans to State agencies for cost-effective energy efficiency improvements in their facilities. This loan program has also been used to finance state projects under the Energy Performance Contracting Program of the Maryland Energy Administration. State agencies pay zero interest with a one percent administration fee. Their repayments are made from the agency's fuel and utility budget, based on the avoided energy costs of the project.

**Funding Application Process:**

**Fund Management and Administration:**

Both loan programs are administered by the Maryland Energy Administration (MEA), an entity created in 1991 by the General Assembly of Maryland to develop state energy policy and promote energy efficiency. Aside from the twp energy loan programs, MEA administers other state programs such as the Green Buildings Tax Credit, launched in November 2003, the Energy Efficiency Standards Act (EESA), which became law in January 2004 and the Energy Performance Contracting.

**Results:**

For Community Energy Loan Program- To date, 47 loans have been made, providing more than $10.7 million for energy efficiency improvements.

For the State Energy Loan Program- Approximately $1 million in new loans are awarded each fiscal year

**Sources of Data:**

- www.energy.state.md.us/programs/government

### *4.2.7 Oregon Energy Loan Program (OELP)*

**Program Funding Area:**

State of Oregon

**History/Background:**

The Oregon legislature created the Oregon Energy Loan Program (OELP) in 1979. It made its first loan in 1981. In 1984, the US Department of Energy awarded the Oregon Department of Energy a Special Award for Energy Innovation for creating the Energy Loan Program.

**Rationale:**

To promote energy conservation and development of renewable energy resource, alternative fuels and creation of products from recycled materials.

**Objectives:**

To provide financing assistance to individuals, businesses, schools, cities, counties, special districts, state and federal agencies, public corporation, cooperatives, tribes and non profit organizations proposing to undertake projects that:

- Save energy
- Produce energy form renewable resources as water, wind, geothermal, solar, biomass, waste materials or waste heat
- Use recycled materials to create products
- Use alternative fuels

**Goals:**

- To meet significant portion of Oregon's incremental energy needs with conservation and renewable resources
- To reduce carbon dioxide emissions from burning fossil fuels
- To prepare the state and counties within 50 miles of an operating commercial nuclear power for nuclear emergencies

**Functions:**

**Funding Sources:**

Loans are funded from general obligations bonds, which could be sold at low rates since they are backed up by the State of Oregon. The bond interest is usually tax-exempt. The program is self-supporting and does not use any tax money. Loan payment covers the payment for the bonds and the program cost.

**Financing Mechanisms:**

- Secured, low interest, fixed rate, long-term loans
- Grants in the form of free energy audits- for public agency facility using more than $ 10,000 energy per year
- Cash rebates

**Funding Application Process:**

Applications forms are downloaded, filled up, and submitted to the Oregon Department of Energy together with the requirements. Loan officers and technical staff are available to meet with the potential borrowers to ensure a complete and sound application. The program staff reviews and evaluates the loan application together with project engineers and designers. The engineers review project reports and other documents to identify ways to save energy, suggesting ideas or technologies that might have been overlooked. Free preliminary on site energy audit may be availed by public facilities. If the initial results are positive then the project warrants an investment grade audit, which can also be financed by the loan.

Loans can cover energy related project cost, engineering and design, permits, loan fees, project management, building commissioning and general project construction. Loans can also be used to match funds from grants. Loan terms vary from 5 to 20 years depending on the type of project. Loans are structured so that repayment is made from energy savings or income generated by the project.

For public agencies,

- Loans not exceeding $ 100,000 are processed within two to three weeks
- Loans over $ 100,000 are processed within two months
- Large loans are reviewed and approved by the program's citizen advisory committee

- Loans are secured by collateral on equipment financed and borrower's pledge to pay

For commercial borrowers,

- Loans up to $ 100,000 are processed within 3 weeks while larger loans are processed longer.
- Large loans qualifying for tax exempt rates may require additional 3 months to allow time to sell bonds to be used for funding
- Large loans are reviewed and approved by program's citizen advisory committee.
- Loans are fully secured by either 1st or 2nd mortgage on the project's assets or other assets.

**Fund Management and Administration:**

The OELP is administered by the Oregon Department of Energy. The program administering group is headed by the Department's assistant director supported by a fiscal assistant, a fiscal coordinator and a finance officer. Loan origination or loan development is handled by a loan manager, 4 loan officers and one staff engineer.

**Results:**

The program has funded a total of about 530 projects amounting to $ 292 M. Financed projects have generated energy savings equivalent to heating more than 110,000 homes in Oregon each year.

**Sources of Data:**

- www.egov./ENERGY/LOANS/indexshtml,
- www.energy.state.or.us/loan

### 4.2.8 *Tennessee Small Business Energy Loan Program and Local Government Energy* Loan Program

**Program Funding Area:**

Tennessee area

**History/Background:**

**Rationale:**

To assist in the identification, acquisition and installation of approved energy measures in existing Tennessee located facilities.

**Objectives:**

To help upgrade the level of energy efficiency in buildings, plant and manufacturing processes in Tennessee

**Goals:**

**Functions:**

**Funding Sources:**

Grants from the US Department of Energy and the Petroleum Violation Escrow Funds

**Financing Mechanisms:**

- Small Business Loan Program to small business enterprises amounting to $ 100,000 at a low interest of 3% payable monthly at a maximum term of 7 years
- Local Energy Loan Program to municipal and county government amounting to $500,000 at a low interest of 3% payable annually for a term of up to 7 years.
- Grants in the form of free Energy audits and technical assistance are available.

**Funding Application Process:**

**Fund Management and Administration:**

Both the Small Business Energy Loan Program and the Local Government Loan Program are managed by the Energy Division of the Tennessee Department of Economics and Community Development, a state agency providing leadership and direction in promoting the most efficient and economical uses of energy.

**Results:**

For Small Business Energy Loan Program, a total of $ 9.2M has already been released from program inception till June 30, 2004

**Sources of Data:**

- www.state.tn.us/ecd/energy

### *4.2.9 Pennsylvania Public Benefits Programs*

The State of Pennsylvania has established energy efficiency financing programs through a public benefits charge on electricity sales in each of the major utility service areas. Two of these programs are summarized below.

**1. West Penn Power Sustainable Energy Fund Inc. (WPPSEF)**

**Program Funding Areas:**

The West Penn Power Sustainable Energy Fund (WPPSEF) is earmarked for the 23 county service region of the West Penn Power Company.

**History/Background:**

The fund was established by West Penn Power Company, an electric utility in Pennsylvania. It is one of the several funds created in 1996 in Pennsylvania when the utilities in that state submitted their restructuring plans to the Pennsylvania Public Utility Commission.

**Rationale:**

The fund was established as a part of the settlement process during the deregulation and restructuring of the electric utilities in Pennsylvania.

**Objectives:**

The fund was created with the following objectives:

- To promote the development and use of renewable energy and advanced clean energy technologies
- To promote energy conservation and energy efficiency; and
- To promote the start-up, attraction, expansion and retention of sustainable energy businesses

**Goals:**

**Functions:**

**Funding Sources:**

WPPSEF receives 0.05 cents per kWh of the distribution charges on electricity consumption. The fund is expected to receive a total of $ 11.4 M over 7 years from 1999 to 2005. After 2005, funds will be collected annually at 0.01 cent / kWh

**Financing Mechanisms:**

WPPSEF uses the following funding mechanisms:

- Commercial loans
- Equity investments
- Subordinated debt
- Royalty financing
- Grants

**Funding Application Process:**

For Commercial Loans, Equity Investments, Subordinated Debt, and Royalty Financing:

- Submission of application- An application form can be downloaded from the website of the Fund. Upon receipt of the application form, the Fund issues an acknowledgement letter.
- Initial Evaluation - The Fund assists in getting the necessary background data to begin a formal technical and financial due diligence. A checklist of information requirement is provided
- Business Plan or equivalent is requested. The applicant is asked to make a formal presentation to the WWPSEF Investment Committee. Additional clarification and supporting documentation may be requested to complete the due diligence process
- Term Sheet- Upon completion of the due diligence process, the WWPSEF Investment Committee works with applicant to draft a preliminary term sheet and conditions for presentation to the WWPSEF Board
- The applicant is notified in writing after their review. The decision of the WWPSEF is final and is not subject to reconsideration.

**Grant Applications:**

In 2005 the grant will have two funding cycles. A request for proposal was issued in January and one in July. Program funding areas are adjusted during each funding cycle to meet the Fund program needs. For the 1st cycle of 2005 the Fund is seeking proposals in two broad areas: 1) Development of energy efficiency toolkits and 2) clean energy technology deployment within the service region of West Penn Power Company.

**Fund Management and Administration:**

The Fund is incorporated as a non-profit organization. The Board of Directors oversees the management of the Fund and approves all funding requests. The membership of the Board is nominated by the West Penn Power Company and is approved by the Pennsylvania Public Utility Commission. The 7-member Board of Directors consists of representatives from West Penn industrials, environmental, consumer and RE clean energy industry groups. The Economic Growth Connection of Westmoreland acts as its central repository for Fund records, to disburse the funds and to perform financial due diligence to incoming funding requests. The Energy Institute of Penn State University acts as the Fund Administrator. The Institute has teamed up with Energetics, Inc to broaden its technical and business capabilities. PNC Bank acts as the Fund Manager to manage the non-invested assets.

**Results:**

$ 390,000 was set aside for a PV program in 1999 and $ 220,000 for a solar water-heating program in year 2000.

**Sources of Data:**

- www.wppsef.org;
- www.energetics.com/coalition/pa.html

### 2. Southeastern Pennsylvania Sustainable Development Fund (SP SDF)

**Program Funding Areas:**

The fund is intended for the energy service territory of PECO Energy Company, which is in Southeastern Pennsylvania. This covers Bucks, Chester, Delaware, Montgomery and Philadelphia counties

**History/Background:**

The SP SDF was established by PECO Energy Company, an electric utility servicing the Southeastern portion of Pennsylvania. The fund was established in 1999 after the utilities in state of Pennsylvania submitted their restructuring plans to the Pennsylvania Public Utility Commission. The need to submit a utility restructuring plan was the result of the Electricity Generation Customer Choice and Competition Act.

**Rationale:**

**Objectives:**

To promote renewable energy, energy conservation and sustainable energy businesses

**Goal:**

A sustainable energy future for Southeastern Pennsylvania

**Functions:**

**Funding Sources:**

The SP SDF is funded from the distribution charges collected by PECO Energy Company from its client. SP SDF's capitalization amounts to $ 32M to be collected from 1999 to 2006. In 2000 the merger of PECO and Unicom brought additional funding of $ 12 M for wind energy development, $ 4M for photovoltaic program, $ 2.5 M for public education on renewable energy. Starting 2007 funding will continue at $ 0.02/kWh.

As of fiscal year 2004, total assets of SP SDF stood at $ 27.5 M

**Financing Mechanisms:**

Low interest flexible financing for renewable energy, clean energy technologies and energy efficiency/conservation projects through

- Commercial loans
- Subordinated debt-
- Royalty financing-

- Equity investments-through the creation of a venture capital firm funded at $ 2.2 M. The venture capital firm is intended to leverage SP SDF's existing resources.
- Grants- this includes production incentives on new wind power projects, for business planning, building energy simulation modeling, demonstration of new sustainable energy products, technologies and installations and for other initiatives that strongly advances the Fund's mission.

Eligible Customers and projects are manufacturers, wholesalers/distributors, retailers and service companies.

Loan size is about $ 25,000 to $ 250,000 although loan size can be lower or higher on a case-to-case basis. Loan is given at a fixed interest rate with no repayment penalties. Loan terms are:

- Up to 10 years for machinery and equipment loans
- Up to 15 years for real estate loans
- Up to 25 years for SBA guaranteed real estate loans
- With application fees of $ 100 and 1% commitment fee upon approval.

Grants average to about $ 25,000 each. Funding is up to 75% of the total costs. Not more than 40% of the grant award will be used to cover time and services of applicant's staff.

**Funding Application Process:**

- Submission of application
- Project/proposal review by the SP SDF staff
- Project/proposal review by the SP SDF Committee
- SP SDF Committee makes a recommendation to the full SP SDF Board
- SP SDF Board approves the project/proposal
- Negotiation and execution of the agreement

**Fund Management and Administration:**

SP SDF is managed by the TRF Reinvestment Fund, a community development finance institution which has been existing since 1985 to build wealth and opportunity for low wealth communities and low to moderate income individuals by promoting socially and environmentally responsible development. As of end of fiscal year 2004, TRF manages a total of six funds amounting to $ 216.5 M of which $ 27.5 M is accounted for by SP SDF.

TRF is governed by an 18 member Board of Directors. The SP SDF is governed by a separate set of 7-member Board of Directors. PECO Energy Company and the US Department of Energy are both represented in the SP SDF Board.

SP SDF has a permanent seat in the venture capital firm's investment committee and has veto power over all investments proposal offered to the venture capital firm.

**Results:**

Over the past two fiscal years 2002-2004:

- Conserved 3.2 M kWh
- Created 32M kWh clean renewable energy

**Sources of Data:**

- www.trfund.com
- PECO Energy semi annual report for the period Jan-June 2002

### 4.2.9 *Connecticut Clean Energy Fund (CCEF)*

**Program Funding Area:**

State of Connecticut

**History/Background:**

In 1998, the Connecticut General Assembly created the Connecticut Clean Energy Fund as part of the legislation deregulating the state's electric utility industry. The CCEF started formal operation in January 2000.

**Rationale:**

- To foster growth, development and commercialization of renewable energy technologies
- To stimulate the state's consumer demand for renewable energy
- To promote deployment of renewable energy sources

**Objectives:**

- To introduce renewable energy to the state
- To educate consumers on the importance of clean energy
- To establish a renewable industry and market

**Goal:**

To invest in enterprises and other initiatives that promote and develop sustainable markets for energy form renewable resources for the benefit of Connecticut Ratepayers

**Functions:**

Invest in enterprise and initiatives aimed at:

- Developing a vibrant market for clean power
- Educating consumers on the benefits and availability of clean power
- Building a base of RE technologies and infrastructure

**Funding Sources:**

Funding comes from the surcharge on electricity ratepayers of the State of Connecticut. The CCEF is expected to reach over $ 100 M in 5 years

**Financing Mechanisms:**

- For Technology Investments
  - Equity Investments in commercial enterprises-
  - Debt and debt-like (equity like) financing
- For Education & Outreach
  - Grants
  - Sponsorships

- For Project Development
  - Equity in project company or special purpose entity during the project development period.
- For Demonstration Projects
  - Combined subsidy and equity and debt based on product commercialization

The CCEF is entitled to all RE and all other green power credits, market premiums and similar rights resulting or related to the project funded.

**Funding Application Process**:

Proposed projects go through the following process.

- Initial Screening- An investment manager evaluates the applicant company's strategic fit with CCEF
- Initial Review- An investment manager reviews the company's profile and business plan
- In depth Analysis- Meeting with the senior executives of the applicant company, review of business plan, discussions with customers, technology and market review by experts and evaluation of intellectual property
- Presentation- Oral presentation of the business and financial strategies by the applicant's management team
- Decision- Investment manager evaluates the risk and benefits and determines the level of financing structures. Then the proposal is presented to the CCEF's Advisory Board for review and recommendation. The Clean Energy Sub committee of the Board of Directors of Connecticut Innovations Inc. gives the final approval.
- Terms and Closing- Upon approval, the terms of the agreement are discussed and legal documents are prepared
- Continued Support- Provision of continued support through attendance of board meeting, advice on business and financial strategies and introduction to other potential investors.

CCEF has a special program for demonstration projects for solar PV installations and fuel cells. Awarding is done through competitive biddings conducted three times a year.

Solar PV installations are given subsidies at a rate of $5/watt installed capacity. An additional incentive of $ 0.75 per watt is given for systems that have electrical storage capacity that exceed 6 kWh for every 1 kW installed PV capacity.

Financial structures applied to fuel cells demonstration projects are:

- Debt
- Equity and equity like warrants
- Royalties
- Combination structures

**Fund Management and Administration:**

The Connecticut Innovations Inc. administers the CCEF. It is a semi-government agency of the State of Connecticut that has been in existence for 12 years charged with making equity and other investments to expand Connecticut's high technology sector. An advisory board composing of leaders from business, education, finance and other key sectors has also been formed to review and recommend approval of projects for funding. A sub-committee of the Board of Directors of the Connecticut Innovations Inc. gives the final approval for funding request.

**Results:**

The management team is composed of a chief operating officer, secretary, managing director for marketing, two project managers, and a project associate.

**Sources of Data:**

- www.ctcleanenergy.com

### *4.2.10 Nebraska State Energy Loan Program (NSELP)*

**Program Funding Area:**

The program covers all of the 93 counties of Nebraska

**History/Background:**

In the 1980's the State of Nebraska started to accumulate considerable amount of money from the oil overcharge settlements. The state wanted to do something different with the one time financial windfall that would benefit as many consumers in Nebraska as possible by revolving the oil overcharge.

The Dollar and Energy Savings Loan Program was approved by the U.S. Department of Energy in March 1990, pilot tested, and announced to the general public by the Nebraska Energy Office in July 1990.

**Rationale:**

To use the financial windfall realized from the oil overcharge settlement for the benefit of the consumers.

**Objectives:**

To provide low-interest loans to Nebraskans to finance home, building and system energy improvements. Loans are available for homes, multi-family dwellings, small businesses and non-profit organizations, farms and ranches, subdivisions of local government, and rural nursing homes.

**Goals:**

**Functions:**

**Funding Sources:**

The loan program was originally funded 12 years ago with oil overcharge dollars amounting to $ 23.6 M. It has been replenished with loan repayments.

**Financing Mechanisms:**

The program is a revolving fund that reduces the interest payments for energy-related projects that meet minimum efficiency standards. The energy office purchases half the loan at zero interest and a commercial lender provides the other half at market rates, usually at an interest rate between 10% and 12%. The net interest cost to the borrower is a blend of the two halves, and averages between 5% and 6%.

The total amount that can be borrowed for any project is limited:

Residential

- Single-family homes (Including townhouses & condominiums).....$35,000
- Multi-family buildings.....$75,000

Nebraska Businesses and non-profit limits..... .....$100,000

ENERGY STAR ® and Rebuild Nebraska.....$150,000

Farms and ranch limits (producing at least $1,000 of agricultural products during a calendar year)..... .....$75,000

Government limits (All political subdivisions, except public schools, school districts & state government)..... ..... $175,000

Telecommunications project limits ..... .....$150,000

Alternate fuel project limits ..... .....$150,000

A technical audit may be financed through a no-interest loan, repayable directly to the Energy Office.

**Funding Application Process:**

Lenders screen potential borrowers for credit worthiness, secure project information, and submit the loan application to the Nebraska Energy Office. When applying for a loan, each borrower is required to sign a release granting the energy office access to their utility and/or fuel bills. With this data access, and with the cooperation and hard work of staff of the state's electric and gas utilities and other fuel suppliers, loan program analysis is possible. Borrowers are responsible for securing one or more bids from contractors. The energy office reviews the winning bid to verify that efficiency standards are included and then notifies the lender for loan approval. Projects may not be started until Energy Office approves the project and notifies the Lender.

Energy office staff also monitors a portion of the projects to make sure that inspections are performed and sub-standard equipment is not substituted after loan approval. If such equipment

is found during an inspection, the borrower and contractor must replace it or pay off the loan immediately.

The application steps are as follows:

- Get the application form- There are different types of application forms depending on the type of EE project being proposed. There are different forms for each of the following:
  - Appliance replacement for refrigerator, freezer, dishwasher and clothes washer
  - Replacement of door, window, wall or ceiling
  - Heating, cooling and water heating projects
  - Lighting
  - Alternate fuel vehicles
  - Loan to pay for a professional energy auditor
  - Form for a simple do it yourself audit

Application forms can be downloaded. All improvements must meet efficiency standards which are listed on specific forms.

- Get some price quotes or project bids**.** Only one bid is required. However, borrower is encouraged to compare several bids and some lenders may require more than one bid. If there is a minimum efficiency requirement for a particular project, such as a heating or cooling unit the bidder should be aware of the requirements and ask the bidder to mark the performance factor on the bid form.

  If more than one project is included on a bid form, or if there is additional work which does not qualify for low-interest financing, costs of each project must be itemized.
- Complete the information requested on each form and attach the price quotes or bids. Borrower may install projects themselves, but value of the borrower's labor may not be included in the project cost. If the project will result in a rebate, the amount of that rebate must be deducted from the project cost.
- Take the completed forms to a participating lender. Most financial institutions in Nebraska offer Dollar and Energy Saving Loans. If borrower's present financial institution does not, names of participating lenders can be obtained from the Energy Office. Borrower fills out the lender's loan application in addition to the Energy and Dollar Saving Loan application. Lenders are encouraged to make these loans for the maximum term. If your lender does not, or if borrower is not satisfied with fees or other details of the loan, borrower may contact another participating lender.
- After approval, the lender will submit borrower's EE home improvement to the Energy Office for review. After the Energy Office approves the project and reserves funds for the loan, the lender notifies the borrower to proceed with the improvements. The waiting period for approval varies with availability of funds.

- All qualifying work should be completed within 120 days after Energy Office approval. When completed, borrower must notify the lender to finalize any remaining details.

**Fund Management and Administration:**

The Nebraska Energy Office is responsible for the direct supervision and management of the fund.

**Results:**

In the 12 years since Nebraska started the fund with $23.6 million, those initial funds have revolved more than three times, representing $73.8 million in loan funding from the energy office. Add to this some $82.9 million in loan funding from banks, savings and loans, and credit unions. In addition, borrowers spent $19.3 million from their own funds on home improvements that did not qualify for energy loans. Altogether, the Dollar and Energy Savings Loan Program has provided $156.7 million in financing for energy projects.

As of September 2002, the energy office had financed 20,708 projects. More than 19,000 of these were typical home improvements such as replacing furnaces and adding insulations.

While the bulk of the projects are residential, the energy office has financed other types of projects as well:

- 550 agricultural projects totaling nearly $10.1 million
- 47 government projects totaling $2.7 million
- 147 new homes totaling $19.8 million
- 834 small business projects totaling $13.1 million.

More than 265 lenders, operating at 667 locations across Nebraska, offer Dollar and Energy Savings loans.

**Sources of Data:**

- **www.nol.org/home/NEO**

## 4.3. OTHER INTERNATIONAL EXPERIENCE

While the U.S. has by far the greatest number of examples of energy efficiency funds, several other countries provide excellent examples of energy efficiency financing. The following examples are provided in this section, using the same format as the descriptions above.

### *4.3.1 New South Wales Sustainable Energy Fund (NSW SEF)*

**Program Funding Area:**

State of New South Wales, Australia

**History/Background:**

The Fund was established by virtue of the New South Wales Sustainable Energy Development Act 1995. At the same time a statutory body named the NSW Sustainable Energy Development Authority (NSW SEDA) was created by the Act to carry out functions on energy development assistance, which includes the provision of grants, subsidies and loans. Thus NSW SEDA was tasked to administer to the Fund. The Act also created the Sustainable Energy Advisory Council to provide advice to the Minister for Energy and NSW SEDA. The Act was part of the package of the State electricity industry reforms. Since its inception in 1996, NSW SEDA's operation was originally under the direct jurisdiction of one of the Ministry of Energy. Then after 8 years, NSW SEDA was abolished by the Sustainable Energy Development Repeal Act 2004. In July 2004, NSW SEDA's operations have been incorporated into the newly formed Department of Energy, Utilities and Sustainability that reports to the Ministry of Energy and Utilities. A new division was formed to carry on the functions of NSW SEDA, which is now known as the Sustainable Energy Division of the Department of Energy, Utilities and Sustainability.

Since the new division is newly formed this paper will mostly report the how the NSW SEDA was structured, its operation and its results.

**Rationale:**

**Objectives:**

- To improve efficiency in the use of energy
- To facilitate the production of energy from renewable energy reserves
- To facilitate the production of energy in ways that minimize levels of greenhouse gas emissions and other adverse environmental impacts
- To enable energy-using activities to use forms of energy that minimize levels of greenhouse gas emissions and other adverse environmental impacts

**Goals:**

- To reduce green house gas emissions and other adverse by-products of the production and use of energy, and
- To encourage the development, commercialization, promotion and use of sustainable energy technology, in accordance with the principles of ecologically sustainable development contained in the Protection of the Environment Administration Act 1991.

**Functions:**

- To provide financial assistance to persons undertaking the development, commercialization, use and promotion of sustainable energy technology

**Funding Sources:**

- Capital appropriation from the government
- Recurring appropriation from the government
- Interest Income from loans
- Revenue from services rendered and product sales
- License Fees
- Program contribution

The principal source of funding was from the government of the North South Wales through budgetary allocations based on the established process of 3 year rolling funding. Program control of NSW SEDA was through the use of one budget program called "Reduce Adverse Environmental Impact of Energy Use". In its first year of operation the fund had a funding allocation of $ 39M for three years.

**Financing Mechanisms:**

- Loans
- Grants
- Subsidies
- Convertible Redeemable Preferred Shares-payable over 8 years with interest of 3% calculated daily and payable semi annually
- Ordinary Shares

**Funding Application Process:**

**Fund Management and Administration:**

The Fund was administered by NSW SEDA, which was headed by an executive director. The governor of New South Wales appointed the executive director of NSW SEDA. A business

service team provided an overall corporate support services consisting of- finances team, executive assistant, two administrative officers closely aligned with the program areas and a receptionist.

The Sustainable Energy Advisory Council that provided advice to NSW SEDA was composed of the executive director and at least two but not more than six members. The minister appointed the members of the council for a period not exceeding 3 years but can be re-appointed. The members came from the sectors on sustainable energy or related services, consumer or community interests, environmental protection and financial management.

**Results:**

From 1996 to 2004, NSW SEDA has managed the delivery of several programs. NSW SEDA programs have attracted over $ 539 M of investment in New South Wales, delivered reductions of more that 35M lifetime tonnes of green house gas, saved $ 1.3 B in lifetime energy cost to the energy users of New South Wales.

In addition to this, the Green Power Accreditation Program administered by NSW SEDA on behalf of a national steering group has generated $ 191M investment and 20M tonnes of lifetime greenhouse gas reductions in the state.

In 2003- 2004 Grants provided totaled $ 2.295M. Major grants were to:

- Coal Seam Methane Program- $ 0.5 M
- Energy Smart Residential Program-$ 0.6M
- Photovoltaic Program- $ 0.5M
- Renewable Energy Program- $ 0.2M

No loans were given in 2003-2004 per Treasury's instruction

But as of June 30, 2004, total receivables/assets from previous releases are as follows:

- Loans- non interest $ 190,000
- Loans- fixed interest $ 4,842,000 (average interest of 5.1%)
- Loans- variable interest $ 3,666,000 (average interest of 5.6%)
- Shares $ 715,000 (average interest of 3.0%)
- Other receivables $ 1,415,000

**Sources of Data:**

- Financial Statement of NSW SEDA, 2003 2004 NSW SEDA Annual Report
- Final Report of the Sustainable Energy Fund Working Group, Nov 1995
- www.deus.nsw.gov.au
- www.enescap.org/esd/energy/publications/compend/ceccpart4chapter1.htm

### *4.3.2 New Zealand Sustainable Management Fund (NZ SMF)*

**Program Funding Area:**

New Zealand

**History/Background:**

**Rationale:** To support the community, industry, and local government in practical environmental initiatives.

**Objectives:**

To fund projects that:

- Fit under any of the following four topic areas:
  - Freshwater Management Initiatives
  - Adopt A Schemes
  - Urban Sustainability
  - Community – level Climate Change
- Strengthen proactive partnership between the community, industry, and local government
- Involve community in practically focused " action for the environment"

**Goal:**

To make a positive difference to the environment by funding projects

**Functions:**

**Funding Sources:**

**Financing Mechanisms:**

**Funding Application Process:**

To apply for funding the project undergoes two stages of assessment and evaluation:

**Stage 1 - Approval of the project outline**

- The proponent checks if project is suitable for funding using a checklist which can be downloaded from the Fund website
- The proponent prepares a project outline using the guide that can be downloaded from the website
- The proponent submits the project outline
- An assessment panel which has 6 to 8 members evaluates the project outline
- The panel holds a meeting to arrive at a consensus decision on the project outline
- A recommendation for approval is submitted to the CEO for final sign-off
- The proponent is informed of the decision through a letter

**Stage 2- Approval of the project application**

- The proponent submits a funding application
- An assessment panel which has 6 to 8 members evaluates the application
- The panel holds a meeting to arrive at a consensus decision on the application
- A recommendation for approval is submitted to the CEO for final sign-off
- The proponent is informed of the decision through a letter

**Fund Management and Administration:**

The NZ SMF is managed and administered by the Funding Community Initiatives team which also manages other funds such as the: Environment Centre Fund, Environmental Legal Assistance Fund, Contaminated Sites Remediation Fund and the RMA Education and Advisory Fund.

**Results:**

**Sources of Data:**

- www.smf.govt.nz
- www.smf.govt.nz/process/smf-guide.pdf

### *4.3.3 Thailand Energy Conservation Fund (ENCON Fund)*

**Program Funding Area:**

Thailand

**History/Background:**

The Energy Conservation Fund (ENCON) was established as a result of the Energy Conservation Promotion Act. The Act was passed by the Government of Thailand in March 1992.

**Rationale:**

To provide financing support to government agencies, state enterprises, non- government organizations, individuals and businesses that will implement energy efficiency measures

**Objectives:**

To promote

- Energy conservation
- Efficient use of energy
- Sustainable use of natural resources
- Development and use of renewable energy sources
- Development of Energy Conservation (ENCON) technology, and
- Environmental protection

**Goals:**

**Functions:**

The Fund would be used to promote efficient uses of energy, to promote the development and use of renewable energy, to disseminate energy conservation technologies and the environment protection. The Fund could also be used for public awareness and to administer the Act.

The fund will support three main programs: Compulsory Program, Voluntary Program and Complementary Program.

- *The Compulsory Program* pertains to the mandatory implementation of energy conservation activities in designated factories and buildings as stipulated by the Act as well as in selected medium size government buildings. The designated factories and buildings are the ones with an installed electrical demand from 1,000 kW up or installed transformer capacity from 1,175 kVA up or a total consumption of commercial energy including electricity and steam from 20 million MJ/year and up. The facility owners are required to conserve energy, audit and analyze its energy consumption. The owner may request for a grant from the Fund to undertake the required energy conservation measures

- *The Voluntary Program* covers activities concerning new and renewable energy for rural and small industry, research and development and demonstration of technologies and energy conservation business facilitation for private sectors.
- *The Complementary Program* covers activities concerning public relations, human resource development, and administration of the Act as well as monitoring the implementation of the Fund.

**Funding Sources:** Funding comes from the Oil Fund which in turn is sourced from the taxes from the sales of petroleum products.

**Financing Mechanisms:**

- Grants for energy audits to designated factories and buildings
- 30% subsidy for standard energy efficiency measures implemented and customized projects developed and implemented for designated factories and buildings.
- Soft loans (maximum of 4% interest and maximum term of 7 years) for the implementation of energy efficiency projects.

**Funding Application Process:**

**Fund Management and Administration:**

The ENCON Fund is managed by the ENCON Fund Committee chaired by one of the deputy prime ministers.

The Compulsory Program is overseen by the Department of Energy Development and Promotion (DEDP) now currently known as the Department of Alternative Energy Development and Energy Efficiency (DEDE). DEDE is under the Ministry of Energy.

The Voluntary and Complementary Programs are monitored by the National Energy Policy Office (NEPO).

To facilitate the implementation of the energy efficiency (EE) measures, the ENCON Fund Committee has approved the establishment of an EE Revolving Fund of about $ 43M to be used as a funding mechanism in the form of loans to designated factories and buildings. The money provided by the ENCON Fund to the EE Revolving fund is at 0% to be repaid by DEDE in 7 years. The EE Revolving Fund is available for lending by several Thai banks at a maximum interest rate of 4%. The banks assume overall responsibility and manage the marketing of the funds, the technical and economic assessment, credit approval as well as loan repayment in case of default by loan borrowers.

**Results:**

**Sources of Data:**

- http://www.nepo.go.th/encon/encon/Brief/html

### *4.3.4 Romania Energy Efficiency Fund (FREE)*

**Program Funding Areas:**

Romania

**History/Background:**

The Romania Energy Efficiency Fund referred to as (FREE) was established through an ordinance in October 2001 and approved in May 2002 by the Romanian Parliament through a law as an institution of public interest having its own legal personality, independence and financial autonomy.

**Rationale:** FREE was established to manage the financial resources received by the Government of Romania from the Global Environment Facility (GEF)

**Objectives:**

- To stimulate energy efficiency in Romania and achieve economic and environmental benefits
- To create a market for energy efficiency technologies and services
- To make a difference through market driven programs

**Goals:**

To enable companies in industrial sector and other energy consumers to adopt and utilize energy efficiency technologies financed under commercial conditions

**Functions:**

To attract substantial amount of commercial co financing to fund energy efficiency projects

**Funding Sources:**

GEF money used as initial capitalization of the fund. Sustained funding will come from co-financing arrangements to be developed with the other commercial financial institutions in Romania.

The GEF money has a technical assistance component for:

- capacity building on initial project development, workshop, seminars for partners, training of Fund Managers
- Fund management activities which includes retainer fees of the Fund Manager for the 1st 3 years
- FREE administration activities which include its set up and operating cost during the 1st 4 years

**Financing Mechanisms:**

The FREE finances energy efficiency projects in the form of loans between $ 100,000 to $ 1,000,000 with a term of 4 to 5 years. Client or other partners must contribute at least 20% of the total project cost.

FREE offers loans at floating market interest rates plus commission. Investment projects are co financed by other banks.

Fund manager will structure co-financing arrangements with FIs whenever possible.

**Funding Application Process:**

- Project submission to the Fund Manager
- Project review
- Structuring the financing- this includes identification of co financing alternatives
- Preparation of the term sheet and acceptance letter
- Submission to the Investment Committee
- Project approval by the Board of Administration

**Description of Fund Management and Administration:**

The FREE is set up as a public-private partnership independent of the government of Romania. The basic institutional structure is composed of the Board of Administration, the Investment Committee, FREE staff (Implementing Agency) and the Fund Manager.

- The Board of Administration decides on the business strategy of the FREE, approves the business plan prepared by the Fund Manager, appoints the Investment Committee member and makes sure the Fund's strategy and policy is in compliance with the national strategy and policy for energy efficiency and financing policy of the government. The Board is composed of 7 members (2 from the public sector and 7 from the private sector). The 2 members from the public sector come from the Ministry of Industry and Resources and the Ministry of Waters and Environmental Protection designated by their respective ministers. The representative from the Ministry of Industry and Resources was the 1st chairman of the board, which has a mandate for 1year. The chairman of the Board appointed the representatives from the private sector based on the proposals of employer and professional associations. A minimum of two representatives from the private sector are financial experts.
- The Investment Committee, which has a membership of 3-5 persons majority of which are financial experts and a subset of the Board, is tasked to evaluate and review the financing application submitted by the Fund Manager. The Investment Committee recommends to the Board projects for financing. The Investment Committee makes recommendations to the Fund Manager for the completion of data requirement or it may reject the financing application if criteria for evaluation and selection are not fulfilled.
- The FREE staff is headed by the Executive Director, who is appointed by the Board of Administration. The Executive Director manages the daily activities of FREE The Financial Controller manages the finance and administration function of the FREE and is responsible for the financial management and financial reporting, disbursement, accounting and auditing aspects.
- The Fund Manager is responsible for the investment aspects of the Fund and is expected to establish and manage the portfolio of projects, which will make the fund sustainable within 3 years. The Fund Manager is tasked to:

- prepare the business plan for the Fund
- report periodically to the Board of Administration the status of the investment portfolio
- identify target investment projects and prepare recommendations for investments
- negotiate and finalize financing contracts
- manage the portfolio

**Results:**

**Sources of Data:**

- www.ebrd.com/projects/psd/psd2002/27888.htm
- www.free.org.ro/en/fund/agenda.htm

## 4.4. SUMMARY OF FINANCING MECHANISMS

A review of the existing energy efficiency funds reveals the following types of mechanisms used to finance EE projects:

### *4.4.1 Commercial Loans*

These are loans based on market rates and largely employed to remove the perceived credit risk of EE projects.

### *4.4.2 "Soft" Loans*

These are loans given at lower than market interest rates and in some cases at zero interest rates to facilitate financing of EE projects.

### *4.4.3 Subordinated Debts*

These are loans given in tandem with commercial loans, but are subordinated to the commercial loans, so that, in case of default by the borrower, the commercial loans are given priority of payment over that of the loans from the EE or sustainable funds.

### *4.4.4 Equity Investments*

These are investments made by the funds in the form of equity share in the project. Providing additional equity investments gives the project additional leverage to gain access to commercial financing.

### *4.4.5 Other Equity Type Financing*

These are investments made by the funds in the form of convertible redeemable preferred shares. Usually the redemption period is timed after the project is realizing the projected savings from EE improvements.

### *4.4.6 Interest Buy-Down*

These are loans given at a very low or no interest arrangement in tandem with commercial financing which carries a market interest rate. The low interest or no interest portion coming from the fund lowers the effective rate of the total loan.

### *4.4.7 Royalty Financing*

The repayment of the loan comes from the royalty payment received by the borrower undertaking an EE project.

### *4.4.8 Grants*

These are usually in the form of free energy audits. There are some funds that give out pure grants but usually require counterpart financing from the project proponent. One fund provides grant up to a maximum of 75% of the total project cost but puts a limit on the amount to be allotted for salaries and wages. One fund provided grants in the form of production incentives.

### *4.4.9 Subsidies*

This is a financing scheme that effectively lowers the capital cost of the EE project. The subsidy is based on the installed capacity of the equipment.

### *4.4.10 Cash Rebates*

This is cash refund upon implementation of the EE project. On the fund reviewed the cash rebate is in the form of tax credits.

Table 4-1 on the next page presents a summary of the different financing schemes used by the funds reviewed.

Table 4-2 on the following page shows the details of the financing mechanism of each fund.

| Fund | Commercial Loans | Soft Loans | Subordinated Debt | Equity | Equity Like | Interest Buy Down | Royalty Financing | Grants | Subsidies | Cash Rebates |
|---|---|---|---|---|---|---|---|---|---|---|
| WPP SEF | Yes | | Yes | Yes | | | Yes | Yes | | |
| SP SDF | Yes | | Yes | Yes | | | Yes | Yes | | |
| CCEF | | Yes | | Yes | Yes | | Yes | | Yes | |
| NY Energy $mart Program | | | | | | Yes | | Yes | | Yes |
| MELP | | Yes | | | | | | | | |
| OELP | | Yes | | | | | | Yes | | Yes |
| Tennessee Small Business Energy Loan Program | | Yes | | | | | | Yes | | |
| NSELP | | | | | | Yes | | | | |
| NSW SEF | Yes | Yes | | Yes | Yes | | | Yes | Yes | |
| Thailand ENCON Fund | | Yes | | | | | | Yes | Yes | |
| NZ SMF | | | | | | | | | | |
| FREE | Yes | | | | | | | | | |

## Table 2 - Details of the Fund Mechanisms

| Funding Mechanism | WPP SEF | SP SDF | NSW SEF | FREE |
|---|---|---|---|---|
| **Commercial Loans** | **n.d.** | Loan size: $ 25,000 to $ 250,000, can be lower or higher on a case-to-case basis; fixed interest rate; no repayment penalties.<br><br>Loan terms are:<br><br>-Up to 10 years for machinery & equipment<br>-Up to 15 years for real estate loans<br>-Up to 25 years for SBA guaranteed real estate loans<br><br>-Application fees of $ 100 commitment fee 1% upon approval. | Loans interest rates can be fixed or variable usually within 5.1% to 5.6% pa | Loan sizes between $ 100,000 and $ 1.0M with a term of 4-5 years. Client or other partners to contribute at least 20% of the total project cost. |

| Funding Mechanism | CCEF | MELP | OELP | Tennessee Energy Loan | NSW SEF | Thailand ENCON |
|---|---|---|---|---|---|---|
| **Soft Loans** | **n.d.** | CELP is a revolving fund providing loans to nonprofits, hospitals private schools, and local government entities, including public schools & community colleges. The projects must have a payback period not more than 7 years. Loan size ranges from a minimum of $ 30,000 to $ 400,000. Interest rate is negotiable but below market rate. Loan is payable semiannual beginning in the second year of the loan. Borrower pays a non refundable application fee of 1% of loan applied but not more than $ 250 and a closing fee of 1% of loan awarded but not more than $ 1,000 less application fee paid.<br><br>SALP is a revolving fund financing State agencies' EE projects. It used to finance state | Secured low interest ,fixed rate & long term<br><br>Accepts 1st or 2nd mortgage | Loan size:<br>For SME's up to $ 100,000 at a low interest of 3%; payable monthly at a maximum term of 7 years<br><br>For municipal & county government up to<br>$ 500,000 at a low interest of<br><br>3% payable annually for up to 7 years | No interest bearing loans | Soft loans (maximum of 4% interest % up to 7 years) for EE projects |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | projects under MEA's Energy Performance Contracting Program. Borrowers pay zero interest with 1% administration fee. Payments are made from the agency's fuel and utility budget, based on the project's avoided energy costs. | | | | |

| **Funding Mechanism** | **WPP SEF** | **SP SDF** |
|---|---|---|
| **Subordinated Loans** | n.d. | Loan size: $ 25,000 to $ 250,000, can be lower or higher on a case-to-case basis; fixed interest rate; no repayment penalties.<br>Loan terms are:<br>Up to 10 years for machinery & equipment loans<br>Up to 15 years for real estate loans<br>Up to 25 years for SBA guaranteed real estate loans<br><br>Application fees of $ 100 and commitment fee 1% upon approval. |

| **Funding Mechanism** | **WPP SEF** | **SP SDF** | **CCEF** | **NSW SEF** |
|---|---|---|---|---|
| **Equity** | **n.n.** | **n.d.** | **n.d.** | Common shares of stock |

| **Funding Mechanism** | **CCEF** | **NSW SEF** |
|---|---|---|

| | | |
|---|---|---|
| **Equity Like** | **n.d.** | Convertible Redeemable Preferred Shares-payable over 8 years with interest of 3% calculated daily & payable semi annually |

| **Funding Mechanism** | **NY Energy $mart** | **NSELP** |
|---|---|---|
| **Interest Buy Down** | Interest buy down up to 4% (400 basis points) for a term not exceeding 10 years.<br><br>For Lower Manhattan- interest buy-down of up to 6.5% for EE improvements& other measures for buildings located in the Liberty Zone | The program is a revolving fund that reduces the interest payments for energy-related projects that meet minimum efficiency standards. The energy office purchases half the loan at zero interest and a commercial lender provides the other half at market rates. |

| **Funding Mechanism** | **WPP SEF** | **SP SDF** | **CCEF** |
|---|---|---|---|
| **Royalty Financing** | **n.d.** | Syndication services provided are paid from the royalty payments to be received by client | **n.d.** |

| **Funding Mechanism** | **WPP SEF** | **SP SDF** | **NY Energy $mart** | **OELP** | **Tennessee Energy Loan** | **NSW SEF** | **Thailand ENCON** |
|---|---|---|---|---|---|---|---|
| **Grants** | **n.d.** | Grants average to about $ 25,000 each. Funding 75% of the total costs. Not more than 40% of the grant award will be | For residential buildings<br>-Free energy home assessment | Free energy audits- for public | Free Energy audits and technical | **n.d.** | Free energy audits to designated factories and buildings |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | used to cover time and services of applicant's staff.<br><br>Some grants are given as production incentives on new wind power projects, for business planning, building energy simulation modeling, demonstration of new sustainable energy products, technologies and installations and for other initiatives that strongly advances the Fund's mission | -Financial packaging assistance<br><br>-Construction oversight<br><br>-Cost sharing of up 50% of implementation cost for low- income families<br><br>For commercial & industrial establishments<br><br>-Free low cost walk-through audit for buildings with annual electricity bills of less than $ 100,000<br><br>-50% cost sharing for energy feasibility studies, energy operations management, rate analysis & aggregation; & combined heat & RE generation studies<br><br>-Off set of up to 80% on the incremental costs to purchase & install EE equipment | agency facility using more than $ 10,000 energy per year | assistance | | |

| **Funding Mechanism** | **CCEF** | **NSW SEF** | **Thailand ENCON** |
|---|---|---|---|
| **Subsidies** | Solar PV installations given subsidies of $5/watt installed capacity. An additional incentive of $ 0.75 per watt for systems that have electrical storage capacity that exceed 6 kWh for every 1 kW installed PV capacity | **n.d.** | 30% subsidy for standard EE measures implemented & customized projects developed & implemented for designated factories & buildings |

| **Funding Mechanism** | **NY Energy $mart** | **OELP** |
|---|---|---|
| **Cash Rebates** | **n.d.** | Tax credit |
| | | |

## OPTIONS FOR FUND APPLICATION

| Option | Description | Barriers Addressed | Pre condition | Leverage Potential | Reflow Potential |
|---|---|---|---|---|---|
| **1.** Grants of Equity to EE projects | Provide equity for EE project finance in the form of grant; returns retained by the project | (i) Need for start-up and project equity for EE projects<br>(ii) equity can leverage senior debt;<br>(iii) stimulate matching equity | Should be matched with equity from other sponsors at a ratio of at least 1:1 or greater | Yes; grant equity can support project debt | None |
| **2.** Subsidies or grants for project preparation and transaction cost | Provide grants for detailed and investment grade energy audit including preparation of full feasibility studies | (i) Need for start-up and project equity for EE projects | Will be considered as loan but will be a grant if project is viable and facility owner implements the project | Yes | Minimal if most projects are viable and implemented. Yes if most projects are not viable and not implemented |
| **3.** Concessional Equity Investment in EE projects | Equity investments in EE projects corporately or on below-market terms | same as above | | Yes, same as above | Yes, using variety of structures |
| **4.** Senior Debt Co-financing to FIs | Provide senior debt facilities to FIs for on-lending to EE projects | (i) lack of available long-term funds;<br>(ii) high interest rates;<br>(iii) to a lesser degree, credit risk | An FI is willing to finance EE projects but does not have enough resources/liquidity | Low | Yes |

| | | | | | |
|---|---|---|---|---|---|
| **5.** Subordinated Debt Co-Finance | Loans to FIs for on-lending to EE projects in combination with FI senior debt; subordination leverages and improves security for senior lender | (i) credit risk barriers, via subordination;<br>(ii) lack of available financing | - An FI is willing to finance an RE project but does not have enough resources/liquidity.<br>-Providing subordinated debt improves risk position of senior lender : confirm that this will address the lender's requirements | Medium | Yes |
| **6.** Interest Rate Subsidies | Buy-down interest rates on funds provided by commercial FIs | high interest rates; induce interest of FIs to lend to EE projects and end-users & project developers | An FI is willing to finance an EE project, has the liquidity; confirm that the lower rate will motivate project sponsors to borrow and make project economics work for all parties | Low | No |
| **7.** Partial Guarantees on Parity | FI makes EE loans with its own resources; EE funds used as reserves for guarantees sharing in portion of credit risk of FI lending; can charge guarantee fee | (i) credit risk barrier;<br>(ii) can also structure guarantee to lengthen FI loan term;<br>(iii) stimulate FI interest in EE market | An FI has the resources and is willing to finance an EE project but perceives EE projects as high credit risk. FI willing to share recovered monies | Low | Yes, from unused guarantee reserves; |

| | | | | | |
|---|---|---|---|---|---|
| | | | collected from borrowers who defaulted based on an agreed proportion | | |
| **8.** Subordinated Recovery Guarantees | Same as #6, except that FI has first claim on all recovered monies in default events | (i) credit risk barrier;<br>(ii) can also structure guarantee to lengthen FI loan term | An FI has the resources and is willing to finance an EE project but perceives EE projects as high credit risk. FI would like to be paid first on recovered monies collected from borrowers who defaulted | Medium | Yes, as above |
| **9.** Loss Reserves | EE funds reserves to cover losses on portfolio of FI EE loans; ratio of reserves to portfolio principal = ~10-20% | credit risk barrier | An FI willing to finance small EE projects and has the resources/ liquidity but perceives financing small EE systems as credit risk.<br>-EE projects to be financed are small and therefore will likely entail many small loans | High | Yes, but EE funds at greater risk |

| | | | | | |
|---|---|---|---|---|---|
| **10.** Equity for FIs as Reserves | EE funds deposited with FIs as bank reserves supporting EE lending; bank regulation research required | Credit risk; lack of available bank equity resources; can stimulate FI interest | An FI willing to finance EE projects but does not have the required resources/ liquidity and perceives financing EE systems as credit risk | High | Yes; but research required |

## 4.5. FUND MANAGEMENT AND OPERATIONS

From among the funds reviewed, there are basically two options used in managing and administering the funds for energy efficiency and renewable energy programs. These are by:

- Government agencies
- Non government agencies

The fund administrators were either already existing or created specifically with the mandate to manage and operate the funds.

For government agencies, government control is instituted through the following options:

- All seats in Board of Directors are government appointed. The board is supported by an advisory council whose members are also all appointed by the government.
- A government officer or assistant director of a state department agency heads the administration of the fund. The state agency is the one providing the leadership in promoting energy efficiency.

Funds generated from government revenues or government bonds, generally opt to have the funds managed by government agencies. While funds generated from surcharges collected by utilities from electric rate payers opted for management by a non government agency or by a development finance institute. Utilities retain control by having the authority to appoint the members of the board of directors subject to the approval of a state agency.

Among the funds reviewed none is directly managed by a utility. This could be because most of the funds, which were created as a result of the deregulation and capitalized by surcharges on rate payers, have chosen to focus their goals on sustainability which would include not only promotion of energy efficiency but more importantly promotion and development of renewable resources.

Shown below are the different funds classified according to the type of organization managing and operating the funds:

### *4.5.1 Management and Operation by Government Organizations*

**Entities already existing when the Fund was created**

***Connecticut Clean Energy Fund-***

The Fund is administered by a semi-government agency of the State that has been in existence for 12 years charged with making equity and other investments in high technology sector. An advisory board composing of leaders from business, education, finance and other key sectors has also been formed to review and recommend approval of projects for funding. A sub-committee of the Board of Directors semi-government agency gives the final approval for funding request.

***Maryland Energy Loan Programs***

The programs are administered by the Maryland Energy Administration which reports to the Governor's office

***Oregon Energy Loan Program***

The Program is administered by the State DOE. The administering group is headed by the Department's assistant director supported by a fiscal assistant, a fiscal coordinator and a finance officer. Loan origination or loan development is handled by a loan manager, 4 loan officers and one staff engineer.

***Tennessee Energy Loan Program-***

Program is managed by the Energy Division of the State Department of Economics & Community Development, a state agency providing leadership & direction in promoting the most efficient and economical uses of energy.

***Nebraska State Loan Energy Program-***

The program is managed by the Nebraska Energy Office.

**Entities were created to manage and operate the Funds**

***New York Energy $mart Program-***

A public benefit corporation (NYSERDA – the New York State Energy Research and Development Authority) created in 1975 by the New York State Legislature to administer the program.

***New South Wales Sustainable Energy Fund***

During its first 8 years of operation, the Fund was administered by a newly created statutory agency headed by an executive director who is appointed by the Governor of New South Wales. A business service team provided an overall corporate support services consisting of- finances team, executive assistant, two administrative officers closely aligned with the program areas and a receptionist.

The Sustainable Energy Advisory Council was also created to provide advice to the agency. The council was composed of the executive director and at least two but not more than six members. The minister appointed the members of the council for a period not exceeding 3 years but can be re-appointed. The members came from the sectors on sustainable energy or related services, consumer or community interests, environmental protection and financial management.

Recently the function of the agency was incorporated to the newly formed Department of Energy, Utilities and Sustainability that reports to the Ministry of Energy and Utilities. The agency is now known as the Sustainable Energy Division.

### *4.5.2 Management and Operation by Non Government Organizations*

***West Penn Power Sustainable Energy Fund***

The Fund is incorporated as a non-profit organization. The Board of Directors oversees the management of the Fund and approves all funding requests. The membership of the Board is nominated by the West Penn Power Company and is approved by the Pennsylvania Public Utility Commission. The 7-member Board of Directors consists of representatives from West Penn industrials, environmental, consumer and RE clean energy industry groups. The Economic Growth Connection of Westmoreland acts as its central repository for Fund records, to disburse the funds and to perform financial due diligence to incoming funding requests. Energy Institute of Penn State University acts as acts as the Fund Administrator, which has teamed up with Energetics, Inc to broaden its technical and business capabilities. PNC Bank acts as the Fund Manager to manage the non- invested assets.

***Romania Energy Efficiency Fund (FREE)***

The Fund is set up as a public-private partnership independent of the government. The institutional structure is composed of the Board of Administration, the Investment Committee, FREE staff (Implementing Agency) and the Fund Manager.

- The Board of Administration decides on the business strategy of the FREE, approves the business plan prepared by the Fund Manager, appoints the Investment Committee member and makes sure the Fund's strategy and policy is in compliance with the national strategy and policy for energy efficiency and financing policy of the government.
    - The Investment Committee is tasked to evaluate and review the financing application submitted by the Fund Manager. The Investment Committee recommends to the Board projects for financing. The Investment Committee makes recommendations to the Fund Manager for the completion of data requirement or it may reject the financing application if criteria for evaluation and selection are not fulfilled.
    - The FREE staff is headed by the Executive Director, who manages the daily activities of FREE. The Financial Controller manages the finance and administration function of the FREE and is responsible for the financial management and financial reporting, disbursement, accounting and auditing aspects.
    - The Fund Manager is responsible for the investment aspects of the Fund and is expected to establish and manage the portfolio of projects, which will make the fund sustainable within 3 years.

# SECTION 5 - URBAN DEVELOPMENT FUNDS

## 5.1 INTRODUCTION

The rapid urbanization of most Indian cities has led to unprecedented demands on the infrastructure for services such as water, sewer, transportation, public health and safety that require enormous public investments. The inability to mobilize the required financial and other resources has led to deterioration in the standard and quality of life in urban centers (Mathur 2004). Statistics published by the National Institute of Urban Affairs (NIUA 2000) point out that large proportions of the urban population had little or no access to safe drinking water (15%) or basic sanitation (50%). With the expectation hat urbanization and urban growth will continue at a rapid pace, there will be an ever-increasing need for additional municipal services, thereby creating significant stresses on the urban local bodies (ULBs) that are responsible for providing the basic human services.

While the ULBs' responsibility to meet the growing demand for services is increasing rapidly, there is no commensurate increase in their revenue base, which instead appears to be depleting constantly. Faced with such a situation the ULBs are becoming increasingly dependent on other sources of funding for their operation and maintenance requirements. Many ULBs have accumulated huge debts and are facing serious problems in even servicing their debt, thereby further reducing their capacity to raise the needed financing to provide the basic human services.

The recognition of this need for developing alternative financing sources has led to the concept of innovative "urban development funds" for financing infrastructure investments and basic services. There is also an increasing acceptance of the concept that the private sector can and should play a role in developing partnerships with the public sector to develop new financing mechanisms (Fitch 2004). The emergence of public-private partnerships has led to some interesting organizational structures for establishing urban infrastructure funds or urban development funds. The experience form these funds indicated that the concepts may be applicable for the establishment of an Energy Conservation Fund.

This section provides a brief overview of urban development funds including some examples of such funds in several Indian states, and reviews the potential lessons these funds may provide for establishing the Maharashtra Energy Conservation Fund.

## 5.2 KEY DRIVERS FOR URBAN INFRASTRUCTURE FUNDS

The following are the key factors that point to the need for an urban development fund to finance municipal infrastructure projects and municipal services.

- The demand for municipal services is increasing at a very rapid rate due to increased urbanization
- The requirements for capital for financing the infrastructure improvements and the operation and maintenance of the capital plant for providing services are extremely large. A study conducted by MMRDA in 1997 estimated that the investment requirements for urban infrastructure in Maharashtra were over Rs 10,000 crores over the 8-year period from 1998 to 2005 (MUIF 2000); however, sustainable investments during the same period were estimated to be only Rs 5742 crores in Maharashtra's 58 largest cities.
- Historically, the urban infrastructure investments were financed, in a limited way, by the local internal resources, state grants (primarily for water and roads), loans mobilized from financial institutions such as LIC under plan allocations and open market borrowing by Maharashtra Jeevan Pradhikaran (MJP). HUDCO also provided some institutional financing with state guarantees.
- The available financing falls substantially short of the financing needs for urban infrastructure improvement and its operation and maintenance; and the gap is widening as urbanization continues inexorably.
- While there have been some efforts at the municipal level to access private capital markets to finance urban investments (for example, in Maharashtra, institutions such as ICICI have been pursuing the financing of urban infrastructure projects in cities such as Pune, Thane and Nagpur; also, some cities such as Nashik and Nagpur have accessed the capital markets), these efforts have only scratched the surface of what is needed and the investments in urban finance are far short of requirements.
- The widening gap between investment needs and available funds is also influenced by the lack of a medium to long-term vision and related plans, and the lack of identification of viable investment opportunities that can be converted into "bankable projects".
- There are many problems that further exacerbate the widening gap, such as, for example:
    - Declining fiscal base of ULBs
    - Mismatch between functions and resources
    - Structural problems such as lack of a consumer orientation, lack of ability to mobilize adequate resources, limited or no citizen participation in decision-making, and inadequate tariffs
    - Multiplicity of agencies with sometimes overlapping responsibilities
    - Problems with inter-departmental cooperation and coordination
    - Lack of adequate staff

- Lack of management and technical skills for managing municipal functions and finance
- Difficulties in reconciling capital requirements and revenue budgets
- Differences in municipal laws, procedures and practices within a state
- Political and administrative difficulties in raising taxes.

These problems and issues point to the need for creating a new funding mechanism that will increase the availability of financing for ULBs, along with creating an overall policy framework for investments and related capacity building for the ULB staff. One such mechanism that appears to be increasingly popular in India is the establishment of urban development funds. The World Bank, the International Finance Corporation and other multilateral and bilateral funding agencies as well as Indian financial institutions such as ICICI, IL&FS and others have expressed their interest and willingness to create a number of such funds. The World Bank has invested in the Tamil Nadu Urban development Fund (TNUDF) and is considering the establishment of a National Urban Development Fund.

The following section provides a review of the urban development funds in Tamil Nadu and Karnataka.

## 5.3 EXAMPLES OF URBAN DEVELOPMENT FUNDS

The discussion below is adapted from the Concept Note and Business Plan for thye Maharashtra Urban Infrastructure Fund (MUIF 2004).

In recognition of the critical importance of project development, some State Governments have initiated measures to set up specialized project development boards/companies focusing on providing project development support for commercializing infrastructure projects. These agencies have, in most cases, been structured to cater to all types of infrastructure projects cutting across sectors, with an emphasis on private sector participation. Some of these funds also combine providing finance in addition to the support to project development.

Examples include:

- Tamil Nadu Urban Development Fund (TNUDF) for urban infrastructure
- Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC) for urban sector; I-WIN for all infrastructure; I-KIN for all infrastructure;
- GIDB for all infrastructure;
- PDCOR for all infrastructure;
- Punjab Infrastructure Development Board and Project Development Consultant;
- UP Infrastructure Development Board and Project Development Consultant;
- AP Project Development and Promotion Partnership between APIIC and IL&FS;

- Gujarat Urban Development Company Limited;
- I-DECK;
- Proposed Gujarat Infrastructure Fund, being promoted by Government of Gujarat, IDFC and AIG.

A summary of three of the integrated (project development and funding) infrastructure funds/boards is presented below.

### *5.3.1 Tamil Nadu Urban Development Fund*

Since 1988, the Government of Tamil Nadu has been implementing the Tamil Nadu Urban Development Project (TNUDP) which has been financed by the World Bank. The TNUDP was a major multi-sector, multi-town urban development project, of which one of the components was the Municipal Urban Development Fund (MUDF) which was set up to provide debt finance to city governments on a pilot basis. The successful track record of MUDF encouraged the Government of Tamil Nadu (GoTN) to broaden the scope of the fund, with a view to attracting private capital into urban infrastructure and facilitate better performing urban local bodies to access capital markets. In 1996, GoTN with the assistance of World Bank invited three financial institutions (FIs) -- ICICI, HDFC and IL&FS -- to convert MUDF into a trust, namely TNUDF, with a private fund manager to deploy resources of the trust. Accordingly the Tamil Nadu Urban Development Fund (TNUDF) was established as a trust under the Indian Trusts Act, 1882 as an infrastructure development financial intermediary, which finances the infrastructure requirements in the state. The asset management company namely, Tamil Nadu Urban Infrastructure Financial Services Ltd (TNUIFSL) has been formed to manage the mandate of the TNUDF. The shareholding of this entity is as follows:

- GoTN - 49%
- ICICI - 21%
- HDFC - 15%
- IL&FS - 15% to

The main purpose of the TNUDF is to channel increased financial resources including private financing, into high priority infrastructure investment, contributing directly to improved living standards of urban population. The specific functions are outlined below.

- finance viable urban infrastructure projects
- mobilize resources from the capital markets
- facilitate participation of private sector in infrastructure development through direct investment and through joint delivery mechanism of Public Private partnerships
- improve financial management of urban local bodies enabling them to access debt finance from markets
- Operate a complementary window, the Grant Fund, to assist in addressing the problems of the urban poor. The Grant Fund is being managed by TNUIFSL.

The TNUDF has so far approved 168 projects at a total project cost of Rs.594.37 crores. As of March 2000, TNUDF sanctioned loans worth Rs 410 crores and disbursed Rs 101 crores.

The TNUDF also assisted cities in project development and resource mobilization from community and the market. Specifically, the projects include: a bridge project on a BOT framework in Karur; Alandur sewerage project with private sector participation on BOT basis; mobilization of resources from the users for sewerage projects in Alandur; municipal bonds for Madhurai Municipal Corporation for toll bridge; implementation of accrual based accounting system in all urban centers of the state, etc.

TNUDF is now embarking upon a major initiative to improve energy efficiency in water pumping, water and sewage treatment, street lighting and municipal solid waste disposal.

### *5.3.2 Karnataka Urban Infrastructure Finance Development Corporation (KUIDFC)*

The KUIDFC, set up in 1993, as a fully government owned company, acts as an implementing agency for urban projects funded by multi-lateral agencies. It also provides limited project development services to municipal authorities. So far its services have been linked to projects funded under the GoI Mega City scheme and under the ADB's Karnataka Urban Development Project. A similar World Bank funded project is also likely to be routed through the KUIDFC. Support has, therefore, been confined to project development under these schemes, and monitoring of project implementation. However, KUIDFC has now started to generate reserves which may be used for additional project finance.

### *5.3.3 Infrastructure Development Corporation (Karnataka) Limited*

The Infrastructure Development Corporation (Karnataka) Limited, (iDeCK) was set up in July 2000 by the Government of Karnataka in partnership with the IDFC. The iDeCK is a new generation State level institution created to promote and develop infrastructure projects in Karnataka that will be based on private capital and management with strong public sector support and commitment within the context of a competitive framework. The Government of Karnataka has, over the past two years, collected cess on infrastructure (to the extent of Rs 200 crores), which would be provided to iDeCK for its operations. iDeCK would utilize a part of these funds (to the extent of Rs 50 crores) for the purpose of facilitating Government to strategize its priorities, developing projects for commercial investment and the other portion of funds (to the extent of Rs 150 crores) would be invested as first mile equity in projects. iDeCK is an asset management company incorporated under the Companies Act, 1956, with up to 49 percent holding by the Government of Karnataka and 51 percent by the IDFC and its partners. The IDFC has taken the lead responsibility for iDeCK's operations. The Board of Directors of iDeCK would comprise representatives from IDFC and its partners and the Government of Karnataka. The nominee of the Government would be the non-executive chairman of the company, with the day-to-day operations being the responsibility of a professional Chief Executive Officer appointed by the IDFC.

### 5.3.4 Gujarat Infrastructure Development Fund (Proposed)

The objective of the proposed Gujarati NRI Infrastructure Development Fund is to attract investments from NRGs, NRIs and other overseas investors for the infrastructure developmental initiatives in the State of Gujarat. The State Government has already initiated activities to settle the proposed fund through one of it nodal agency "Infrastructure Finance Company Gujarat Ltd. (IFCG)". The fund once settled will be managed by professional fund managers (i.e. by a non-Government company) to be appointed in this behalf by the Government of Gujarat, which would have representations on the Investment management Committee.

The operational model of the proposed Fund will use an investment-pooling vehicle, which will be organized in an offshore neutral jurisdiction (such as Mauritius). This vehicle will allow the non-resident investor to invest in the proposed Fund. The proposed structuring would be beneficial, because, in the absence of such a pooling vehicle in an offshore jurisdiction, each investor would have to seek the Indian Government's approval on each investment they desire to make in the country, which could lead to unnecessary delays.

The investors who desire to invest in the profit driven infrastructure investments in India would subscribe to shares of a Company which would be set up as a limited liability company in Mauritius, under the laws of Mauritius. This Company would be managed by an AMCI incorporated in the Mauritius, which will receive advice as to investments from the AMC situated in India. The profit driven investments by Indian residents can be made in a domestic trust, which would be created under the Indian Trust Act, 1882, which would make down line investments directly into infrastructure projects in India. The Company will route its investments in infrastructure projects through the Trust which would function as an infrastructure fund and avail of the benefits under Section 10(23G) of the Indian Income Tax Act, 1961, whereby the long term capital gains and interest realized by the Trust would be exempt from tax in India.

### 5.3.5 PDCOR

PDCOR Limited is a company promoted by Government of Rajasthan (GoR) in cooperation with the Infrastructure Leasing & Financial Services Limited (IL&FS) to facilitate private sector investment in infrastructure in the State of Rajasthan. PDCOR has the capability to provide institutional support to Government to successfully structure and implement infrastructure projects on a public-private partnership format. It is also in a position to provide policy advisory and institutional restructuring services to Government.

The management team of the company consists of professionals with multidisciplinary backgrounds with experience in developing projects on a public-private partnership format. PDCOR also draws heavily from the skills and expertise of its parent organizations, i.e., IL&FS and IL&FS Infrastructure Development Corporation Limited (IIDCL).

The shareholding of PDCOR is as follows:

- Government of Rajasthan - 24&
- IL&FS - 26%
- IIDCL – 50%

PDCOR has developed a two-phase strategy:

**Phase 1**

- To create an economic vision and agenda for strategic positioning of the State of Rajasthan with a horizon year of 2025.
- Identify priority economic sectors of Rajasthan in view to achieve the goal of sustainable development
- Identify critical gaps and bottlenecks in infrastructure to achieve the development in key sectors of the economy critical to sustainable development of the State.
- To assist Government of Rajasthan in planning, prioritizing and positioning infrastructure investments in the State.

**Phase 2**

- Translate key infrastructure bottlenecks and needs into implementable projects giving maximum economic and financial returns and, therefore, enabling the Government to arrive at an optimized allocation of budgetary resources and approach alternate financing means of such projects
- Identify critical action areas with respect to policy reforms, and create financing alternatives for promoting development in priority infrastructure sectors.
- Identify areas and policy reforms for promoting private sector participation in the priority infrastructure sector.
- Create a shelf of key projects in the identified priority infrastructure sectors essential to give economy a kick start

### *5.3.6 Kerala Sustainable Urban Development Project*

The State of Kerala will be the recipient of funding from the Asian Development Bank (ADB) to finance water supply, sanitation and waste management projects. The objective of this project is the improvement, upgrading and expansion of the existing urban infrastructure facilities and basic urban environmental services (water supply, sewerage and sanitation, urban drainage, solid waste management, and urban roads and transport) in five municipal corporations (MC) of the State of Kerala. The Project also involves institutional strengthening and capacity building of state and municipal agencies in urban management and urban services provision as well as poverty alleviation initiatives developed through stakeholder participation.

### 5.3.7 The Proposed Maharashtra Urban Infrastructure Fund

Realizing the need for supporting urban sector reforms in the State, MMRDA and Government of Maharashtra have taken initiative in association with ICICI, HDFC and IL&FS in 1995 to set up a state level financial intermediary. The proposal to set up a Financial Intermediary for financing urban infrastructure in the Maharashtra with the financial assistance from the World Bank was mooted by the Government of Maharashtra in 1996. However, despite its initial encouragement, the World Bank did not support the idea. In February 1999, at the instance of Urban Development Department, GOM, the ICICI submitted a concept note and a detailed business plan for the proposed Financial Intermediary. The proposal suggested creation of a Trust Fund and an Asset Management Company (AMC) to administer the Trust Fund. This Trust-AMC structure is similar to the arrangement devised for Tamil Nadu Urban Development Fund (TNUDF). According to the proposal, initial corpus of the Trust Fund was to be Rs 425 crores to be contributed by the GOM and MMRDA. However, this proposal was not actively pursued at the government level.

The Sukthankar Committee on Water and Wastewater sector submitted a report in March 2001 strongly recommended setting up of an Initiative Development Fund (IDF) for supporting institutional reforms and facilitating finance for urban water supply and wastewater sector. Further, the second State Finance Commission of Maharashtra is exploring the possibility of recommending similar entity for the urban sector.

Within this context and at the request of Government of Maharashtra, MMRDA re-initiated the process of setting up a state level entity for urban sector reforms and facilitating finance. MMRDA organized a meeting of financial institutions ICICI and Infrastructure Development Finance Company (IDFC) along with the representatives of the Indo-USAID Financial Institutions Reform and Expansion (FIRE) Project to discuss the need for preparation of a concept note on state level entity.

The proposed mission, objectives and functions of this Fund are summarized below:

#### *Mission*

The mission of the fund is to "contribute to the provision of adequate, efficient, affordable, sustainable and modern urban infrastructure services to the people of Maharashtra through public, private and community sector initiatives". The fund will concentrate on the following sub-sectors:

- Water and wastewater;
- Sanitation and solid waste management;
- Slum upgradation;
- Urban roads and transport;
- Municipal property development;
- Fire fighting;
- Street lighting;
- Health and education; and

- Other urban infrastructure

***Objectives***

The primary objectives of the Fund are:

- facilitating access to institutional finance and/or capital markets for increased investment in urban infrastructure through development of bankable projects;
- reducing the cost of capital to local bodies through appropriate credit enhancement measures;
- promoting private and community sector participation in delivery and financing of urban services with focus on consumer;
- improving credit worthiness of the urban local bodies;
- initiating and sustaining urban institutional reforms through capacity building, demonstration projects and policy support.

***Functions***

The proposed functions of the Fund are divided into the following categories:

- Project Development Support
- Capacity Building Support including Efficiency Improvements
- Facilitating Finance
- Provide Partial Direct Loans

## 5.4 IMPLICATIONS FOR ENERGY CONSERVATION INVESTMENTS

The primary goals of the urban development funds are to finance urban infrastructure development projects with the participation of private sector in infrastructure development through direct investment and through joint delivery mechanism of Public Private partnerships and to mobilize resources from private capital markets. Te funds also are interested in developing mechanisms to improve the financial structure and management of urban local bodies enabling them to have better capacity to access debt finance.

These objectives are very consistent with energy efficiency projects. Considering that the ULBs use large amounts of energy for applications such as water pumping, sewage pumping, water treatment, sewage treatment, streetlighting, etc. and that the efficiency of energy use in these applications is usually very low, there are excellent opportunities for cost-effective investments in energy efficiency improvement. The use of the urban development funds (UDFs) to finance such projects can offer many advantages:

- The typical energy efficiency project has a payback of 2 to 3 years and is therefore economically more viable than many other infrastructure development projects with much longer paybacks.

- Energy efficiency improvement projects can be implemented with private sector participation. Energy services performance contractors (ESPCs) including energy service companies (ESCOs), equipment manufacturers and suppliers, engineering firms and others, are willing and able to work with ULBs to implement such projects provided a suitable project framework is established that can take care of issues such as collection and provision of accurate and reliable data and assuring a payment security mechanism (World Bank 2005). The Tamil Nadu Urban Development Fund is presently embarking upon energy efficiency projects in municipal water systems using ESCOs for implementation.
- The savings from energy efficiency projects can be quite significant and can help improve the cash flows of the ULBs
- Improved cash flows can help the ULBs become more attractive for raising additional capital for energy or other infrastructure improvement projects.

The key features of the UDFs that are advantageous to energy efficiency project financing and implementation are the availability of funds and the ability to leverage the private sector for financing and implementation. A similar structure can therefore be used for establishing the Energy Conservation Fund.

# SECTION 6 - OPTIONS FOR AN ENERGY CONSERVATION FUND FOR MAHARASHTRA

## 6.1 INTRODUCTION

Based on a review of the energy efficiency funds in the U.S. and other countries and urban development funds in several Indian states, options and suggestions for a Maharashtra Energy Conservation Fund are provided below.

The proposed Maharashtra Energy Conservation Fund (MECF) will be established to meet the requirement specified in the Energy conservation Act, 2001, listed below:

> *"The State Government shall constitute a fund to be called the State Energy Conservation Fund for the purposes of promotion of efficient use of energy and its conservation within the state.*
>
> *To the fund shall be credited all grants and loans that may be made by the state government or, Central Government or any other organisation or individual for the purposes of this act.*
>
> *The fund shall be applied for meeting the expenses incurred for implementing the provisions of this act.*
>
> *The fund created under sub-section (1) shall be administered by such persons or any authority and in such manner as may be specified in the rules made by the state government."*

## 6.2 OBJECTIVES

The primary purpose of the MECF will be to stimulate the market implementation of cost-effective energy efficiency projects. Such projects improve the efficiency of energy systems, reduce dependence on energy imports, improve economic well being, reduce environmental damage, and increase productivity.

MECF will achieve this objective by:

- Helping finance specific projects using a variety of options such as debt financing, equity financing and credit guarantees to financial institutions
- Contributing to the development of the energy efficiency market in Maharashtra by financing projects with private sector implementation through service delivery organizations (such as ESCOs)
- Developing and demonstrating model financial transactions
- Developing typical financing agreements that can be used by the private sector

- Building the capacity of local financial institutions in energy efficiency project transactions to build their knowledge, interest and capability for financing such projects

## 6.3 POTENTIAL FUNDING SOURCES

There are many potential mechanisms to develop the initial funding for this Fund, including, for example:

- Allocation from state budget
- Cess (or levy) on energy sales (example – Box 1)
- Special tariffs or taxes
- General tax revenues
- Fees from certification
- Donor funds
- Funds from public and private financial institutions

These funds can be augmented form other sources including venture capital funds, private equity capital, etc.

Box 1:

Examples of implementation of energy conservation and demand-side management initiatives in Maharashtra

Under the directives from Maharashtra Electricity Regulatory Commission (MERC), utilities in Maharashtra were able to generate a corpus fund to initiate efficiency initiative. MERC directions to the distribution licensees under Section 23 of Electricity Act 2003 to curb demand, MSEB, BEST Undertaking, Mula Pravara Electric Co-operative Society, Tata Power Company Limited and Reliance Energy Limited were allowed to levy "Load Management Charge (LMC)" to consumers in Maharashtra including Mumbai whose consumption exceeded 500 units per month in the billing months of May and June 2005 (June and July in case of BEST)[3]. Utilities in Maharashtra levied Rs. 1 per unit for the electricity consumed in excess of 80% of the consumption recorded in the corresponding billing months in 2004. MERC directive also allowed a rebate of 50 paise per unit for those consumers whose consumption was lower than 80% as compared to the same months in 2004. MERC in its detailed order also directed the utilities to maintain separate accounts of the LMC levy collected and insisted on use of such a levy to initiate energy conservation and demand-side management initiatives[4].

[3] MERC Order dated 26 April 2005 (Case no. 4 of 2005)
[4] MERC Order dated 4 May 2005 (Case no. 4 of 2005)

## 6.4 MECHANISMS FOR FINANCING ENERGY CONSERVATION PROJECTS

While some of the resources of the Fund may be used as grants to facilitate the financing of municipal or other government EE projects, it is anticipated that a majority of the fund will be set up as a :revolving fund" to provide loans, equity financing and/or loan guarantees to EE projects or to EE service delivery organizations.

Examples of financing mechanisms to be employed include:

- Grants
- Loans
- Subsidies
- Loan guarantees
- Credit guarantees
- Competitive bidding
- Cooperative advertising and promotion of EC products

## 6.5 FUND MANAGEMENT AND ADMINISTRATION

Many options are available for the management and administration of the Fund, including MEDA, a non-governmental organization, or a professional financial manager. For most efficient functioning of the Fund, it is recommended that the Fund should be established as an independent organization managed by a professional fund manager. The Fund will be designed to offer a range of financial mechanisms to facilitate the implementation of energy efficiency projects, and the grant portion of the Fund may be separated form the "revolving" portion which can be designed to earn a reasonable return to the Fund investors.

The Fund manager will operate under the direction and supervision of a Board of Directors, whose composition will be determined when the Fund is established. The Board may include representatives of:

- GOI - Ministry of Energy
- MEDA
- Other relevant government Ministries
- Donor agencies contributing to the Fund
- Other investors in the Fund
- Financial institutions
- Large energy user associations (such as CII or FICCI)

- NGOs or professional associations involved in EE
- Energy services industry

The Board shall select the professional Fund Manager. The Fund manager shall be an organization or individual with substantial relevant experience in managing large funds and in project financing of energy or related projects. The Fund Manager shall be selected through competitive bidding. The compensation of the fund Manager will be performance based.

## 6.6 CRITERIA FOR PROJECT FINANCING

The Fund Manager will establish and publish the minimum qualifications for projects to receive various types of financial assistance from the Fund.

Examples of qualification criteria for projects receiving financial assistance may include:

- Technically feasible.
- Cost-effective from a societal perspective
- Environmentally beneficial.
- Financially sound
- Having acceptable level of risk
- Replicable
- Contributing to the development of sustainable EE markets
- Supported by an energy audit, or a detailed project report (DPR), prepared by an accredited energy auditor.

Generally, these are projects where the expected economic benefits are greater than the costs of the project. That is, the potential projects should be those where the total cost savings from reduction in energy usage are greater than the costs of implementing the energy efficient measure(s).

# SECTION 7 - SUMMARY AND NEXT STEPS

This report has identified various options for establishing the Maharashtra Energy Conservation Fund. The State of Maharashtra needs to establish such Fund as required by the Energy Conservation Act, 2001.

The following are the recommended next steps:

1 Review the findings of this report with the State Energy Conservation Advisory Committee.

2 Based on the results of this review. finalize the design of MECF in terms of the:

- Objectives
- Funding sources
- Financing mechanisms
- Criteria for selecting EE projects for financing

3. Define the fund management and administration scheme
4. Launch the Fund with an initial budget allocation
5. Select the Fund Manager
6. Solicit funds form various organizations
7. Develop and document the organizational and operational procedures
8. Start the operations of the Fund.

# SECTION 8 - REFERENCES

EC Act 2001. Government of India, *The Energy Conservation Act, 2001*, No. 52 of 2001, The Gazette of India, October 2001.

Fitch, 2004. Streeter et al, *Public-Private Partnerships: The Next Generation of Infrastructure Finance*, Special Report – Project Finance, Fitch Ratings, August 2004.

GOM 2002. Government of Maharashtra, *State Budget for 2002-03*, Finance Department, Mumbai, March 2002.

GOM 2005. Government of Maharashtra, *Budget in Brief - 2005-06*, Finance Department, Mumbai, March 2005

IIEC, 2005. International Institute for Energy Conservation, *Maharashtra Energy Development Agency (MEDA), Strategic Energy Conservation Plan*, Final Report, October 2005

Johnson 2004. Brad Johnson, *National Enabling Framework for Municipal Finance,* presented at the International Association of Development Funds Conference, September 2004.

LBNL, 2005. Amol A. Phadke and Jayant A. Sathaye, *Economic Benefits of Reducing Maharashtra's Electricity Shortage through Electricity End-Use Efficiency Improvement,* Lawrence Berkeley National Laboratory, Berkeley, CA, USA, February 2005.

Limaye, 2003. Dilip R. Limaye, *Energy efficiency Enhancement Project, Policy Matrix, Final Report,* Charles River Associates, May 2003.

Mathur, 2004. Dr. Mukesh P. Mathur, *Municipal Finance and Municipal Services in India Present Status and Future Prospects*, National Institute of Urban Affairs, India, presented at the International Association of Development Funds Conference, September 2004.

Moitra, 2005. Sumit Moitra, "Bengal Debt Scene Unsustainable: RBI", The Financial Express, Kolkata, Oct. 26.

NIUA 2000. *Urban Statistics – Handbook 2000, National Institute of Urban Affairs, New Delhi, 2000.*

Padmanaban, 2005. S. Padmanaban, "What can Indian States do to promote Energy Efficiency?", Technical Paper, USAID/India, new Delhi, 2004.

Rao 2003. M. Govinda Rao, "State Level Fiscal Reforms in India", Technical Paper, Instiutute for Social and Economic Change, Bangalore, 2003.

Reddy, et al., 1992. C. Rammanohar Reddy, Antonette D'Sa, and Amulya Reddy, "The Debt-Energy Nexus: A Case Study of India", Economic and Political Weekly, July 4, 1992.

RBI 2004. Reserve bank of India, State Finances – *A Study of Budgets of 2002-2003*, Published by Deba Prasad Rath for the Reserve Bank of India, Mumbai, 2004.

Srinivasan 2000. T.N. Srinivasan, "India's Fiscal Situation: Is A Crisis Ahead"? Research Paper, Yale University, May 2000.

York and Kushler, 2005. Dan York and Marty Kushler, *ACEEE's 3rd National Scorecard on Utility and Public Benefit Energy Efficiency Programs,* ACEEE Report no. U054, Washington D.C., October 2005.

World Bank 1990. Fischer, S. and W. Easterly. "The Economics of the Government Budget Constraint." World Bank Research Observer *5,* No. 2 (July 1990).

World Bank 2002. *Maharashtra: Reorienting Government to Facilitate Growth and Reduce Poverty, Volume 1: Executive Summary and Main Report,* Poverty Reduction and Economic Management Unit, South Asia Region, October 2002.