Assessment of Incentives for Appliance Energy Efficiency in India

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Alliance for an Energy Efficient Economy

New Delhi

Contents

List of Figures

List of Tables

Abbreviations

BAT	Best Available Technology
BEE	Bureau of Energy Efficiency
BLY	Bachat Lamp Yojana
CAGR	Compound Annual Growth Rate
CEA	Central Electricity Authority
CFA	Central Financial Assistance
COP	Conference of Parties
DELP	Domestic Efficient Lighting Programme
DSM	Demand Side Management
ECBC	Energy Conservation Building Code
EE	Energy Efficiency / Energy Efficient
ETC	Evacuated Tube Collector
FPC	Flat Plate Collector
GHG	Greenhouse Gas
GoI	Government of India
GW	Gigawatt
IEA	International Energy Agency
IESS	India Energy Security Scenarios
INDC	Intended Nationally Determined Contributions
INR	Indian Rupees
IREDA	Indian Renewable Energy Development Agency
JNNSM	Jawaharlal Nehru National Solar Mission

kWh	Kilowatt-hour
kW_p	Kilowatt Peak
lpd	litres per day
MEPS	Minimum Energy Performance Standard
MNRE	Ministry of New and Renewable Energy
MoP	Ministry of Power
MTEE	Market Transformation for Energy Efficiency
MU	Million Units
MW	Megawatt
NAPCC	National Action Plan for Climate Change
NCEF	National Clean Energy Fund
NITI	National Institute for Transforming India
NMEEE	National Mission for Enhanced Energy Efficiency
PV	Photovoltaic
RE	Renewable Energy
SWH	Solar Water Heater
S&L	Standards and Labelling
TWh	Terrawatt Hour
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

A reliable and adequate supply of energy is crucial for economic growth in India, as well as for improving the quality of life for all citizens. Equally important for sustainable growth and improving the quality of life is the need to address climate change.

Based on the Central Electricity Authority's (CEA) *Load Generation Balance Report 2015-2016* released in May 2015, India's electricity sector had an energy deficit of 3.6% (38,138 MU) and a peak deficit of 4.7% (7,006 MW) in 2014-2015. For the year 2015-2016 the anticipated energy deficit is 2.1% (24,077 MU) and the anticipated peak deficit is 2.6% (4,108 MW). The per capita electricity consumption in India was estimated to be 957 kWh for the year for 2013-2014 and 1010 kWh for 2014-2015, which is still far below several countries in the world, e.g. per capita electricity consumption in China is about 4000 kWh and that in developed countries averages 15,000 kWh. Further, 300 million people still lack access to electricity. The Government of India (GoI) is committed to providing affordable 24x7 power to all households by 2019. With the objective of providing universal access and sustaining a growing economy electricity demand is expected to reach 1900 TWh by 2022.

Meeting the objectives of universal access, an adequate supply of energy to drive economic growth and India's commitment to reducing CO_2 emissions requires concerted efforts in increasing energy efficiency (EE) and the share of renewable energy (RE) in capacity generation.

The Energy Conservation (EC) Act 2001 was introduced with the aim of reducing the energy intensity of the Indian economy by promoting energy conservation and energy efficiency. The Bureau of Energy Efficiency (BEE) was set up in 2002 under the Ministry of Power (MoP) and has since introduced several schemes to promote energy efficiency in the residential, commercial and industrial sectors. Schemes such as the Standards and Labelling (S&L) Programme for Appliances and Equipment, the Energy Conservation Building Code (ECBC) and Demand Side Management (DSM) for agriculture, SMEs and industry resulted in 10,836 MW of avoided capacity generation during the Eleventh Plan (2007-2012). The National Mission for Enhanced Energy Efficiency (NMEEE), introduced during the Eleventh Plan to provide a regulatory and policy framework to promote the market for energy efficiency, has been approved for the Twelfth Plan (2012-2017) as well with an allocation of INR 775 crore. One of the initiatives of NMEEE is Market Transformation for Energy Efficiency (MTEE), which aims to accelerate the shift to energy efficient appliances by making products more affordable.

The GoI set up the Commission for Additional Sources of Energy (CASE) as early as 1981, in the wake of the oil shocks of 1970s, primarily to address energy security and energy self-sufficiency. In 1992 the Ministry of Non-conventional Energy Sources (MNES) was set up, which was later renamed the Ministry of New and Renewal Energy (MNRE). The RE sector in India started as early as the 1970s and has today expanded to include grid-connected power (using wind, solar thermal,

solar PV, small hydro, bio-mass, urban/industrial waste), off-grid power (biomass, watermills/micro-hydro, small wind systems, rooftop solar PV) and decentralised systems (solar lanterns, solar home lighting, solar street lighting, solar water heaters, solar cookers, solar pumps, wind pumps, family-size biogas plants). In the budget for 2015 the GoI has set a goal to install non-hydro RE capacity of 175 GW by 2022.

In stressing the importance of EE as the first step in sustainable energy, this report aims to put forward the case for accelerating the adoption of high efficiency EE appliances through market transformation. First, it puts forward the criticality of EE being a first step in sustainable energy, which will help meet the twin objectives of sustainable growth and addressing climate change. Second, it analyses the impact of EE appliances in reducing the demand-supply gap and CO_2 emissions. Next, it presents an analysis of programmes to promote RE appliances, to see which of these can be applied to accelerate the demand for higher-rated EE appliances. Finally, it puts forward the case for government supported schemes to lead a market transformation in higher-rated EE appliances.

1.1 The Standards and Labelling Programme

The Standards and Labelling (S&L) programme was launched in May 2006 with the objective of reducing the energy intensity of electrical appliances and equipment, leading to energy savings. The S&L programme covers twenty-one products, four under the mandatory labelling scheme and seventeen under the voluntary labelling scheme. The labelling of appliances is intended to improve consumer awareness about the energy saving potential of appliances and equipment, enabling consumers to make an informed choice when purchasing appliances and equipment. The labelling of appliances is also intended to encourage manufacturers to produce energy efficient products, in addition to continuously improving energy efficiency standards. By 2010 the S&L programme resulted in 3336 MW of avoided capacity and 7848 MU of electricity savings.

In order to consistently and continuously reap the benefits of the S&L programme the following steps are essential

- continuous appraisal and improvement of Minimum Energy Performance Standards (MEPS) to set higher standards for EE appliances
- introduction and promotion of the best available technology (BAT) in the market
- market transformation to accelerate the adoption of higher efficiency appliances
- up-to-date testing, verification and labelling facilities to ensure adherence to standards
- elimination of older models

1.2 Objective of the Study

The objective of this study is to support the case for government programmes and incentives to accelerate India's Standards & Labelling programme and catalyse larger market transformation for higher efficiency appliances and products.

Key objectives of the study

1. Energy Efficiency is established as a mandatory first step in ensuring universal access, energy security and reduction in CO_2 emissions.
2. The EE business sector, utilities, BEE, MoP and other government policy makers use the study to identify and implement programmes to accelerate adoption of higher-rated energy efficient appliances and continuously improve the standard of efficiency for appliances.
3. Manufacturers and consumers are consulted to understand the barriers to energy efficient appliance uptake, influencing the types of schemes considered by BEE to accelerate the adoption of higher-rated energy efficient appliances.

2. Methodology

Task 1: Establishing EE as the first step in meeting energy needs and addressing climate change

This study presents the role of EE in meeting energy needs, particularly universal access to electricity, and in combating climate change by drawing on information presented in recently published studies and reports on Energy Efficiency.

Task 2: Review of Incentives in the RE Sector

In-depth literature review of the RE sector was undertaken to evaluate how incentives have accelerated the deployment of renewable energy technologies in India.

Task 3: The case for implementing programmes to transform the EE appliance market

This study presents the case for implementing government-supported programmes to improve the market share of higher-rated EE appliances and enhance the effectiveness of the S&L programme.

3. Energy Efficiency: The 1st Step towards Sustainable Energy

Energy efficiency not only contributes towards reducing energy demand but also makes the addition of new capacity, especially from RE sources, more cost-effective. There can be no argument against the need to significantly increase India's power generation capacity in order to provide affordable 24x7 power to all households by 2019, sustain a rapidly growing economy and provide a good quality of life for all Indians. At the same time, the GoI has set an objective of reducing the rate of increase in CO_2 emissions as stated in The National Action Plan for Climate Change (NAPCC).

Reducing Energy Demand & Improving Universal Energy Access

In 2012 residential buildings accounted for 22% (175 TWh) of electricity demand and commercial buildings accounted for 12% (86 TWh) of demand. Electricity demand in the residential sector is expected to grow to 480 TWh by 2022 and 842 TWh by 2030 and demand in the commercial sector to 142 TWh in 2022 and 238 TWh in 2030. Based on the report *Energy Efficiency in Building Sector in India: Practice, policies and programs* (Mili Majumdar, 2014), using higher efficiency appliances in the residential sector can potentially save 75 TWh by 2021. Drawing from the LBNL study *Estimate of Technical Potential for Minimum Efficiency Performance Standards in 13 Major World Economies* (Virginie Letschert, Louis-Benoit Desroches, Jing Ke, Michael McNeil, 2012), Table 1 lists the estimated savings by using the Best Available Technology in selected appliances.

Table 1. Estimated energy savings from using BAT in appliances

Appliance	Energy Savings (TWh) in 2020	Energy Savings (TWh) in 2030
Fans	22	45
Lighting	19	8
Refrigerators	6	18
Room Air conditioners	42	130

Energy efficiency is also closely linked to universal energy access. By reducing electricity demand, the planned growth in generation capacity can serve a larger share of the population in a shorter timeframe.

Making RE Generation More Cost-effective

The GoI has set a goal of achieving non-hydro RE capacity of 175 GW by 2022, of which solar power would contribute 100 GW, wind power 60 GW, biomass power 10 GW and small hydro 5 GW. But even with this level of investment in renewable energy, India's primary fuel for electricity generation in 2022 and even up to 2030 will be coal, comprising more than 50% of the energy mix. Although the cost of RE power has decreased sharply over the last five years and is expected to do so till 2030, adding more RE in the energy mix would require significant investment. On the

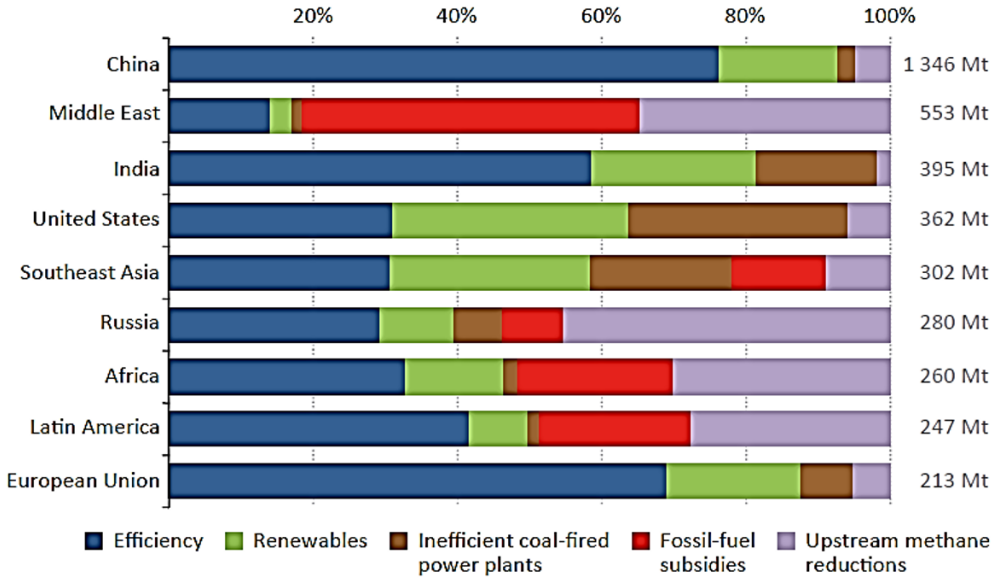
other hand, implementing practical energy efficiency measures in the near term would reduce electricity demand, enabling the same RE generation capacity to serve a larger section of the population, thereby making it more cost-effective.

Reducing CO_2 Emissions

Recognising that climate change is a global challenge the GoI is committed to actively engaging with the United Nations Framework Convention on Climate Change (UNFCCC), as outlined in the NAPCC. The primary objective of the UNFCCC is to stabilise Greenhouse Gas (GHG) concentrations in the atmosphere to prevent human interference with the climate system, with the long-term goal of limiting the increase in average global temperature to 2 ^{o}C. At the UNFCCC COP-19 meeting in 2013 all parties were invited to submit their action plan for climate change, known as Intended Nationally Determined Contributions (INDC). Countries determine their INDCs in the context of their national priorities and capabilities, and have been invited to present their INDCs in preparation for the upcoming UNFCC Conference of Parties (COP21) in Paris in December 2015. India too is preparing its INDC as outlined in the NITI Aayog report on *Energy Efficiency and Energy Mix in the Indian Energy System 2030*.

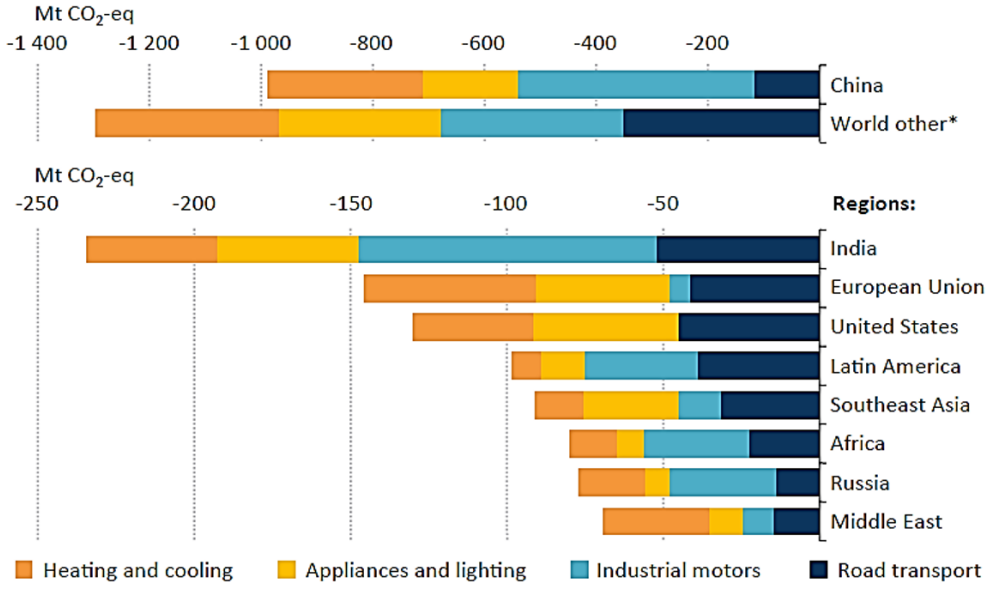
Energy production and use contributes close to two-thirds of GHG emissions, with the major component being CO_2 emissions. INDCs submitted by countries are aimed at transforming the energy sector in those countries in order to reduce GHG emissions. The *World Energy Outlook Special Report on Energy and Climate Change* (IEA, 2015) compares the expected emissions in the INDC scenario and the "Bridge" scenario. IEA's "Bridge" scenario is a set of five policy measures of which the first is increasing energy efficiency in industry, building and transport sectors. Figures 1 and 2 from the *World Energy Outlook Special Report on Energy and Climate Change* (IEA, 2015) clearly bring out the contribution of energy efficiency in reducing GHG emissions and climate change for several regions and countries. Of all the Bridge scenario measures, Energy efficiency has the greatest potential for reducing GHG emissions in India.

Figure 1. Energy-related GHG emissions reduction in CO_2-eq terms by policy measure and region in the Bridge Scenario relative to the INDC Scenario, 2030



IEA WEO Special Report on Energy & Climate Change, 2015

Figure 2. Energy-related GHG emissions reduction by energy efficiency measure and region in the Bridge Scenario relative to the INDC Scenario, 2030



* World other represents all countries except for China.

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The Government of India introduced the National Mission for Enhanced Energy Efficiency (NMEEE) in 2010 with the aim of unlocking the market for energy efficiency and help achieve avoided capacity addition of 19,598 MW, fuel savings of approximately 23 million tonnes per year and GHG emissions reductions of 98.55 million tonnes per year.

In the same year, 2010, the government introduced the Jawaharlal Nehru National Solar Mission (JNNSM) with the goal to deploy 20,000 MW of solar power by the year 2022 and to achieve parity with grid power tariff.

NMEEE received a total outlay of INR 1010.5 crore for the period 2010-2017 (INR 235.5 crore in the XI plan ending 2012 and INR 775 crore in the XII plan 2012-2017), whereas the budget outlay for the first phase alone (up to March 2013) of the JNNSM was INR 4337 crore, which is more than five times the entire outlay for an equivalent amount of avoided capacity generation (20,000 MW) under NMEEE.

Further, in order to meet the goal of 175 GW of Renewable Energy by 2022, the GoI has already rolled out various schemes and policies such as low cost financing for renewable energy and the National Clean Energy Fund (NCEF) which has already received an amount of INR 16,388 crore up to the year ending 2015.

Given the proven savings of 10,836 MW of avoided capacity in the XI Plan period due to several energy efficiency initiatives by BEE it would be worthwhile considering an increased budget outlay for schemes and initiatives to achieve much higher targets of avoided capacity from the current plan onwards, including schemes to accelerate the market transformation for EE appliances.

3.1 Accelerating the Adoption of Energy Efficient Appliances

The main barriers to the adoption of higher-rated energy efficient appliances are the initial cost and the long payback period. To overcome the barrier of high cost of energy efficient lighting the Ministry of Power had launched the Bachat Lamp Yojana (BLY) to subsidise the replacement of incandescent bulbs with CFLs, and to date over 29 million incandescent bulbs have been replaced by CFLs. The government recently rolled out the Domestic Efficient Lighting Programme (DELP) to accelerate the adoption of LED lighting by making it more affordable.

In the case of RE appliances the government has launched schemes for at least five RE appliances, namely solar water heaters, off-grid solar power packs, solar cookers, solar pumps and solar lanterns to overcome the barrier of high cost of appliances. Tables 2 & 3 give an overview of the Central Financial Assistance (CFA) for Solar Water Heaters (SWH) and rooftop solar PV systems of up to 1 kW_p and the expected electricity savings.

Table 2 Subsidy Paid Out for Solar Water Heaters and Expected Savings[1]

Capital Subsidy: 30%-60% of benchmark cost (INR 4500-9000/100lpd for ETC system and INR 6600-13200/100 lpd for FPC system) Expected Electricity Savings for a 100 lpd / 2 m^2 system: 1200 units/year Expected CO2 Reduction for a 100 lpd / 2 m^2 system: 1.5 tonnes/year				
Year	**Subsidised Installations (m^2)**	**Subsidy Paid Out (INR lakh)**	**Expected Electricity Savings per year (million units)**	**Expected CO_2 Reductions per year (tonnes)**
2010-2011	603	17	0.36	452
2011-2012	49,329	1,421	29.60	36,997
2012-2013	6,92,905	20,891	415.74	5,19,679
2013-2014	8,88,995	25,788	533.40	6,66,746

Table 3. Subsidy Sanctioned for Off-grid 1kW_p Solar PV Power Packs and Expected Savings[2]

Capital Subsidy: 30%-90% of cost for systems up to 1kWp Expected Electricity Savings from 1kW_p SPV system: 1650 units/year			
Year	**Total kW_p Sanctioned**	**Subsidy Sanctioned (INR lakh)**	**Expected Electricity Savings per year (million units)**
2012-2013	13,000	7340	21.45
2013-2014	15,605	9226	25.75

[1] http://mnre.gov.in/file-manager/UserFiles/reports-SOLARWHIN.htm; http://mnre.gov.in/file-manager/UserFiles/potential_electricitysSavings_swhs.pdf

[2] http://mnre.gov.in/file-manager/UserFiles/projects-sanctioned-under-offgrid-SPV-JNNSM-during-2012-13-as-on-31.08.2014.pdf http://mnre.gov.in/file-manager/UserFiles/projects-sanctioned-under-offgrid-SPV-JNNSM-during-2013-14-as-on-31.08.2014.pdf http://delhi.gov.in/wps/wcm/connect/f0fc8e804bda0ff48986bddb7bfd7749/Installed_Solar_PV.pdf?MOD=AJPERES&lmod=-276192052&CACHEID=f0fc8e804bda0ff48986bddb7bfd7749

For the years 2010-2014 the total CFA given as subsidy for SWH was 481 crores for expected electricity savings of 979 MU and for the years 2012-2014 the total CFA given as subsidy for off-grid 1 kW_p rooftop solar PV was 165 crores for expected electricity savings of 47.2 MU.

Given the verified savings of 7848 MU under the S&L programme for the years 2007-2010, and the potential savings in adopting BAT as given in Table 1, a comparable budget outlay for accelerating the adoption of high-efficiency appliances could significantly increase electricity savings and avoided generation capacity.

Both EE electrical appliances and RE appliances have the common benefits of reducing the energy supply-demand gap and reducing GHG emissions. However, there is a glaring discrepancy in the number of schemes and the budget outlay for RE appliances versus those for EE electrical appliances, in spite of both having similar barriers to adoption such as high initial cost and long payback period.

There is a need to address these barriers to the adoption of high efficiency appliances by implementing schemes targeting different stakeholders, i.e. manufacturers, retailers, consumers and independent organisations. Chapter 4 gives an overview of some of the government supported schemes implemented to increase the adoption of RE appliances by addressing the barriers of high initial cost as well as enabling market transformation for RE appliances. It would be worthwhile to review and analyse these schemes to assess their applicability for the EE appliance market and S&L programme.

4. A Review of Incentives for Renewable Energy Appliances

The RE sector in India started as early as the 1970s and has today expanded to include grid-connected power (using wind, solar thermal, solar PV, small hydro, bio-mass, urban/industrial waste), off-grid power (biomass, watermills/micro-hydro, small wind systems, rooftop solar PV) and decentralised systems (solar lanterns, solar home lighting, solar street lighting, solar water heaters, solar cookers, solar pumps, wind pumps, family-size biogas plants).

In the 1970s and early 80s the focus was primarily on capacity building and R&D. In the 1980s there was a significant push for financial assistance and incentives in the form of subsidies to promote the use of RE power generation and RE appliances. From the late 1980s onwards the focus has been more on fiscal incentives to promote commercialisation of RE power generation and RE appliances, with the idea of moving from direct subsidies towards soft loans and rebates on taxes, duties and excise. The Ministry of New and Renewable Energy (MNRE) and the Indian Renewable Energy Development Agency (IREDA) have been pivotal in promoting RE generation (grid-connected and off-grid) and RE appliances and equipment.

By promoting Renewable Energy and Renewable Energy appliances the government aims to

- reduce the energy supply-demand gap without increasing dependence on oil and coal
- reduce the use of diesel and kerosene
- reduce the impact on the environment
- address climate change issues

Some of the schemes already in place for RE power generation are Renewable Purchase Obligation (RPO), Generation Based Incentives (GBI) and concessional import and excise duties for setting up RE power plants.

Incentives for RE Appliances

There are several types of incentives available for RE appliances, though the specific incentives available for each type of RE appliance varies. The main reasons for providing incentives for RE appliances are to

- make RE appliances affordable and cost effective for consumers
- support capacity building, training, seminars, consumer awareness
- enable technology upgrades and production expansion for manufacturers
- enable a shift towards commercialisation of RE appliances

Capital Subsidy	Capital subsidy is primarily given to consumers, both residential and commercial, to make RE appliances more affordable. A percentage of the cost of the RE appliances is subsidised through CFA.
Loans	Soft loans with low interest rates are available to consumers for the purchase of RE appliances and to manufactures for technology improvement and expansion of production facilities.
Electricity Rebate	Electricity rebate is targeted at consumers who purchase RE appliances. Consumers are charged a concessional rate per unit of electricity or are given a fixed rebate per month.
Property Tax Rebate	House owners who purchase RE appliances are given a concession in property tax.
Support for Mandatory Regulation for RE Appliances	This support is extended to municipal corporations for amending building by-laws to enforce the use of RE appliances.
Concessional Duties, Excise and Taxes	These concessions are available to manufactures for equipment and raw material.
Publicity Support	Funds for creating awareness about RE appliances are available to manufacturers, banks and financial institutions and government agencies.
Training	Support for training is available to government agencies as well as to industry for technology improvement.
Project Services Support	This incentive is available to programme administrators, for e.g. government agencies.

Tables 4, 5 and 6 list the incentives available for solar water heaters, off-grid solar PV systems and grid-connected solar PV systems respectively. Incentives for other RE appliances are listed in Annexure I.

Table 4. Incentives for Solar Water Heaters (SWH)

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	30% of benchmark cost Equivalent of INR 4500/100 lpd (ETC) or INR 6600/100 lpd (FPC) or 30% of benchmark cost (ETC: INR 10,000/m^2, FPC: INR 11,000/ m^2), whichever is less	MNRE 2010-2014	domestic, commercial, non-commercial in general category states; commercial in special category states,
- Capital Subsidy	60% of benchmark cost Equivalent of INR 9000/100 lpd (ETC) or INR 13200/100 lpd (FPC) or 60% of benchmark cost (ETC: INR 10,000/m^2, FPC: INR 11,000/ m^2), whichever is lower	MNRE 2010-2014	domestic, non-commercial in special category states
- Capital Subsidy	INR 1900 / m^2	MNRE 2010-2011	For housing complexes
- Loan	Loan at 5% interest on 80% of the benchmark cost (ETC: INR 10,000/m^2, FPC: INR 11,000/ m^2) **Cannot be used along with capital subsidy**	MNRE 2005-	Domestic, commercial, non-commercial in all states
- Loan	Interest free loan	2005-2010	Domestic users in NE, hill states, islands, CG, JH, UK
- Loan	Loans at 5% interest for technology improvement & expansion of production facilities	IREDA	Manufacturers
- Building by-laws (mandatory SWH)	Up to INR 10 lakhs for amending building by-laws	MNRE 2001-	Municipal corporations
- Property tax rebate	Support for property tax rebate - 10% for existing houses in Thane, MH	MNRE 2010-2011	Individuals

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Electricity rebate	Support for electricity rebate - INR 40/month in Assam - INR 100/100 lpd up to 300 lpd in Haryana - 15 paise/unit in Rajasthan - Flat rebate of INR 50/month in Uttarakhand - 50 paise/unit in Karnataka - 40 paise/unit up to max of INR 80/month in WB	MNRE/ States 1999-	All SWH users
- Publicity support	Up to INR 5 lakhs for publicity on cost sharing basis	MNRE 2010-2011	Manufacturers
- Publicity support	Up to INR 10 lakhs for publicity campaigns	2010-2011	Banks, FIs, MCs, SNAs, utilities
- Training / Technology upgrades	Soft loans for technology upgrades & study tours abroad	2010-2011	Industry
- Training	Up to INR 2 lakhs for seminars, training, workshops	2010-2011	

Table 5. Incentives for off-grid solar PV systems

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	CFA of 30% of benchmark cost for systems up to 1kW$_p$	MNRE 2010-	Individuals in general category states
- Capital Subsidy	CFA of 90% of benchmark cost for systems up to 1kW$_p$	MNRE 2010-	Individuals in special category states
- Loan	Loans at 5% interest rate	MNRE 2010-	Individuals
- Project Services Support	Up to 3% of CFA available to programme administrators	MNRE 2010-	Programme administrators

Table 6. Incentives for grid-connected solar PV systems

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	CFA of 30% of benchmark cost for 1kW$_p$ to 500kW$_p$ systems	MNRE 2010-	All consumers in general category states
- Capital Subsidy	CFA of 70% of benchmark cost for 1kW$_p$ to 500kW$_p$ systems	MNRE 2010-	All consumers in special category states
- Project Services Support	Up to 3% of CFA available to SNAs & other government agencies for project monitoring & technical assistance	MNRE 2010-	SNAs, government agencies
- Basic R&D	Up to 1% of CFA available for R&D on metering, grid connectivity, online monitoring, testing, etc	MNRE 2010-	
- Training	Up to 2% of CFA for training, seminars, workshops	MNRE 2010-	

5. Conclusions

This report brings out the effectiveness of making Energy Efficiency the first step in reducing electricity demand, meeting the goals of universal access and addressing climate change, by highlighting the actual verified savings from Energy Efficiency programs, including the S&L programme, as well as the potential savings that could be achieved by the adoption of the Best Available Technology (BAT) for EE appliances.

It also draws attention to the level of government supported schemes for EE appliances versus those for RE appliances, by highlighting the example of subsidies given for RE appliances for expected electricity savings that are significantly lower than the actual verified savings from the S&L programme and estimated potential savings from using BAT for EE appliances. The report also highlights the significant budget outlay for new generation capacity in comparison to the budget for an equivalent amount in avoided capacity.

In conclusion this report recommends increased support from the government to enable a market transformation in EE appliances making higher efficiency appliances more affordable and cost-effective, thereby accelerating the demand for higher efficiency appliances.

Annexure I: Incentives for RE Appliances

Table 7. Incentives for Rooftop Solar PV for Diesel Abatement

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	@ INR 75 per watt of SPV panels to a maximum of 30% of the cost of systems 25kW-100kW	MNRE 2009-	Profit-making bodies, commercial establishments
- Capital Subsidy	@ INR 100 per watt of SPV panels to a maximum of 40% of the cost of systems 25kW-100kW	MNRE 2009-	Non-profit making bodies

Table 8. Incentives for Solar Lanterns

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital subsidy	Subsidy of INR 2400 per lantern	MNRE 2006-	Un-electrified villages in special category states & UT islands
- Capital subsidy	Free solar lantern for girl child from BPL family studying in classes 9-12	MNRE 2006-2011	Girl child from BPL family studying in classes 9-12
- Capital subsidy	Up to 90% of the benchmark cost for solar charging stations with LED lanterns	MNRE 2012-2014	Villagers in 60 LWE affected districts across AP, Bihar, Chhattisgarh, Jharkhand, MP, Odisha, Maharashtra, UP, WB

Table 9. Incentives for Solar Home Lighting

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	30%-40% of benchmark cost for SPV system with battery and CFL/LED lights (programme for installation of 68,000 SPV lights in areas with unreliable power)	2013-2014	Rural and urban households with unreliable or no power
- Taxes, Duties, Excise	Zero import duty and excise exemption for Equipment and Raw Material		
- Loans	For integrated manufacturing plants (polysilicon material to solar modules) and thin film based modules Low interest loans and priority sector lending incentives under Special Incentive Package (SIP)		Manufacturers
- Incentives to banks and FI's	INR 3-10 lakhs for capacity building INR 15-40 lakhs for awareness generation INR 3-10 lakhs as cash prizes for best 3 branches INR 2-5 lakhs for documentation of best practices INR 2-5 lakhs for manuals, software INR 2-10 lakhs for monitoring and learning	2009-2011	Banks, FIs financing home lighting systems

Table 10. Incentives for Solar Cookers

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	30% of benchmark cost	MNRE 2014-2017	Consumers in general category states
- Capital Subsidy	60% of benchmark cost	MNRE 2014-2017	Consumers in special category states
- Project Services Support	Up to 3% of CFA available to SNAs and government agencies for project monitoring & technical assistance	MNRE 2014-2017	SNAs, government agencies
- Training	Up to 1% of CFA for training, seminars, workshops, awareness campaigns	MNRE 2014-2017	
- BIS certification support	One-time support of INR 15,000/year for BIS certification/renewal for those	MNRE 2014-2017	Manufacturers who met sales target of 500 cookers

Table 11. Incentives for Solar Water Pumps

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Capital Subsidy	INR 57600/HP for DC pumps up to 2HP INR 54000/HP for DC pumps >2HP to 5HP INR 50400/HP for AC pumps up to 2HP INR 43200/HP for AC pumps >2HP to 5HP INR 194400 total for pumps >5HP to 10HP	MNRE 2014-	Individuals, SHGs, NGOs JLGs, farmers, organisations in rural and urban areas
- Subsidy	For special category states 60% of the cost of products in the range of INR 1,70,000 per kW	5 years starting from 2014-2015	Farmers in Punjab, Rajasthan, Haryana, Bihar
- Subsidy	For other states 30% of the cost of products in the range of INR 1,70,000 per kW	5 years starting from 2014-2015	Farmers in Punjab, Rajasthan, Haryana, Bihar

Table 12. Incentives for Biogas Plants

RE Incentive	Financial Details of Incentive	Sponsor & Duration	Beneficiary
- Subsidy	CFA of INR 5,500 – INR 15,000 for 1 cubic metre systems, depending on state	MNRE 2014-	Individuals
- Subsidy	CFA of INR 9,000 – INR 17,000 for 2-6 cubic metre systems, depending on state	MNRE 2014-	Individuals

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