**Super-Efficient Equipment Programme (SEEP)
*(Frequently Asked Questions)***

The Bureau of Energy Efficiency (BEE) is proposing a Super-Efficient Equipment Programme (SEEP) under the 12thFive Year Plan. This note explains the rationale of such a program and its features. It discusses common concerns related to it, in a format of question and answers.

**Introduction**

The consumption of power in India must be reduced in order to limit our dependence on imported coal, and also to meet our international voluntary commitment to reduce emissions’ intensity by 20-25 percent by 2020.

The purchase of electric appliances by consumers is expected to increase rapidly over the next decade, accounting for more than a quarter of the incremental power demand. As consumers are reluctant to buy energy-efficient appliances due to their high sensitivity to the first-cost, manufacturers do not produce efficient models. Moreover, inefficient products often yield higher profit margins for the manufacturers. As a result, the country pays a huge cost in terms of deteriorating energy security, and large upfront investments in the expansion of power capacity. The ultimate cost is borne by consumers.

Standards set a minimum efficiency threshold, and labeling increases consumer awareness. However, these processes are slow. The super-efficient appliances (SEAs) available in the world use advanced technology to reduce power consumption by as much as 40 to 60% compared to even 5-star models. The table below shows the present production for ceiling fans, air-conditioners, refrigerators, and televisions, as well as the difference in the electricity consumption level of the 5-star model currently available in the market, with that of the super-efficient model. As seen in the table, we produce about 3crore ceiling fans, 31 lakh air-conditioners, 88 lakh refrigerators, and 1.5 crore televisions. Moreover, the sales of these appliances are increasing at a very fast pace. A rapid penetration of super-efficient models of these four appliances can save as much as 20,000 MW of peak capacity (and 60 Billion Units) by 2020, compared to the moderate Standards and Labeling (S&L) programme.[[1]](#footnote-1),[[2]](#footnote-2) Other appliances and equipment like lighting and agricultural pumps also have similar kind of saving potential.

**Table: Energy Savings of Super-Efficient Appliance models compared to 5-Star models**

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| --- | --- | --- | --- |
| **Appliance** | **Current Sale (Million p.a.)** | **Decrease in consumption#** | **Basis for performance** |
| **Ceiling Fan** | 30.0 | 42 % | A brushless DC (BLDC) motor |
| **Air-conditioner** | 3.1 | 36 % | Grade 1 AC (Source: Top 10 China, 2010)  |
| **Refrigerator** | 8.8 | 69 % | Grade 1 (215-litre) refrigerator (Source: Top 10 China, 2010) |
| **Television** | 14.9 | 41 % | A 32” LCD TV with LED back-lighting, auto brightness control (Source: Top 10 US, 2010) |

\*- A conservative constant sales growth rate in the period 2010-2020

#- Models more efficient than the reference SEA are available, but have not been considered here.

**Structure of SEEP**

SEEP is designed to overcome the shortcomings of the present incentive structure, and create incentives for manufacturers as well as consumers to produce and purchase SEAs. This programme proposes to deal directly with the manufacturers of select key appliances. Usually, only a handful of manufacturers account for 70 to 90% of the market share of these appliances. SEEP would compensate the manufacturers for a major part of the incremental cost of producing SEAs, and encourage them to not just produce but also sell SEAs at an affordable price to common consumers. In this manner, the programme would help to introduce appliances that are far more efficient than the ones currently available in India thus, narrowing the massive gap between the efficiency of the average purchase and that of the most efficient technology available internationally.

The BEE would pay the agreed incentive to manufacturers after the appliances are produced and sold. The BEE would also widely publicize the special SEA label and the participating manufacturers along with the SEA models. The Monitoring and Verification (M&V) system is designed to ensure that quality is maintained on the ground. SEEP proposes to implement these measures for mass-market appliances such as fans, refrigerators and televisions, which consume the maximum energy and are bought by a large number of Indian households.

The nature of the programme being very different from current programmes, several questions may arise. Questions which may be frequently asked are addressed below.

***Why don’t consumers buy efficient appliances?*** Consumers are usually highly sensitive to the first-cost, and moreover, do not pay the full cost of electricity (especially given that the cost of new generation is much higher than the average tariff) [[3]](#footnote-3). Consumers have too many other considerations at the time of the purchase, such as the appearance of a new fan or refrigerator. Energy efficiency is at best one of such considerations.

In fact, when a consumer buys an inefficient product, he is actually imposing an additional cost on his fellow consumers. All consumers collectively have to then invest in the expansion of infrastructure for power generation, transmission and distribution, which is avoidable. This happens because we do not charge the ‘marginal cost’ of supply to consumers.

***Why should we not force manufacturers to produce only Super-Efficient Appliances?*** Banning normal appliances is too harsh a measure and would be unjustified for manufacturers who do not have access to the requisite technology. Moreover, any ban demands strict vigilance, and often leads to inefficient goods being sold in the black-market.

***Why can’t the Standards and Labeling Programme do the job?*** The S&L and SEEP programmes are intended to perform complementary functions. The lowest star level in mandatory S&L programme provides a minimum efficiency performance standard (MEPS). Higher star levels provide information to customers about the expected savings from purchasing more efficient models. Thus, S&L programme provide a floor for the performance of appliances, and a source of information. In contrast, SEEP is intended to raise the ceiling on the performance level of appliances. Incentives to manufacturers are intended to make super-efficient products affordable.

Further, successful S&L programmes require that most manufacturers agree to the prescribed performance levels, or at least, do not oppose them. Otherwise, disgruntled manufacturers will sell their products in parallel markets where branding is not important, but price is. Because the support of most manufacturers (if not a consensus) is required, S&L programme improve efficiency of appliances only gradually. In contrast, SEEP can be used to leapfrog to the best (or close to the best) technology available worldwide. Over time, programmes like SEEP can be used to ratchet up S&L performance thresholds. Thus, where rapid improvement in efficiency is required, S&L programme need to be supplemented by programmes like SEEP.

***Why does SEEP propose to give incentives to manufacturers instead of consumers?*** To take the example of fans, with over 30 million of them being produced every year, the process of disbursing and monitoring incentives to consumers would be too complicated and expensive. Moreover, consumers would need to be compensated for the price difference, where as manufacturers would have to be compensated only for the incremental cost of the SEAs in comparison with normal appliances. Given that the price of SEAs is more than twice that of normal appliances, the cost of the programme would more than double.

***Why will manufacturers pass on the benefit to consumers?*** The manufacturer will receive the SEEP incentive only when they sell equipment. For doing so, they will have to set the price of the appliance such that the price-sensitive consumer will buy it. If a manufacturer does not pass on the benefit of the incentive by reducing the price of the SEA, he will not be able to sell it, and will not get the incentive.

***Why should money come from the budget, and not from electricity consumers?*** The reduced energy use due to efficient appliances has two benefits. (a) It reduces the cost of electric utilities (and hence electricity consumers) through reduced purchase of expensive power. By this rationale, electricity consumers (through utility Demand Side Management programme, or DSM) should pay for this benefit. But with over 60\* electric utilities in the country, getting synchronized action from all utilities and their respective state electricity regulatory commissions (SERCs) is extremely time consuming, to say the least. The time gained through a centrally funded project will be invaluable because it will prevent a lock-in effect, especially now that India is building its stock of appliances and equipment at a record pace. Inefficient appliances once produced continue to burn excessive energy till the end of their life, anything from 10 to 18 years. (b) Another benefit of reduced energy use is that it enhances the energy security of the nation. In this case, it will result in a direct reduction in the import of coal. Budgetary support is therefore justified. Moreover, budgetary support will prevent the loss of precious time, and getting locked into an inefficient stock of appliances. After the programme is proved and streamlined, during its next phase (or for targeting selected appliances), it would be possible to recover the cost from electricity consumers through the electricity tariff..

***Will this be a permanent and continuing incentive?*** No. In the initial years, the cost of SEAs is bound to be high, due to the use of new technology and changes in production lines. With increasing volumes, the costs would reduce, and consumers would be able to afford the product. Hence, the need for a subsidy would reduce with time. In fact, it would be possible to discontinue it after 3 to 4 years. This programme is similar to the incentive given to renewable energy technologies. However, the incentive to energy benefit ratio is far more attractive.[[4]](#footnote-4)

***What is the possibility of manufacturers starting to produce inefficient products once the incentive is discontinued?*** In most cases, the cost of the SEA will fall with increasing volumes, after which it will become economical for consumers to pay the full cost. There exists a possibility, in case of some appliances, that the cost may not fall adequately within a period of say 4 years. But the level of incentive required would certainly reduce. By that time, most manufacturers would have acquired the SEA technology and modified their manufacturing lines, and consumers would be more aware of the benefits of SEAs. At such a juncture, at the minimum, the 5-star level can be upgraded to match the efficiency of the SEA. Such a rapid effort to upgrade labeling will prevent fall back to inefficient models to a sizable extent.

Even assuming that none of this happens (which is an unlikely situation), the expenditure incurred on SEEP will still be beneficial. This is because the cost and benefits of SEEP elaborated in this note do not take into consideration such positive spillover effects.

***Do we have a precedent for such schemes?*** Several industrialized countries have implemented similar schemes. The US has implemented schemes called (a) Golden-Carrot for SE refrigerators (1994-1997), and (b) 80 plus programme for more efficient power supply for computers. In fact, utilities in California have a series of such programmes[[5]](#footnote-5). China implemented a major programme in 2000-2006 to upgrade the efficiency of refrigerators under manufacture. More recently, it has rolled out a major incentive programme to increase the efficiency of air-conditioners. The list of such ‘up-stream’ programmes is sizable.

***How will compliance be ensured, and gaming avoided?*** The envisaged Evaluation, Measurement and Verification (EM&V) protocol for SEEP will have two direct checks for the quantity of the appliance, and two checks for quality. The manufacturer will have to first demonstrate that he can produce the SEA (through a tested product in an approved lab), following which he will be required to provide monthly statements along with a certificate from a chartered accountant for the quantity of SEAs produced. The quantity will be cross-checked against the excise duty paid by the manufacturer. Each SEA will carry a specially designed label uniquely numbered by the BEE.

For quality control, random samples from the market will be tested. An additional feature of feedback from consumers is proposed. Consumers purchasing an SEA under the scheme can participate in a lucky draw, by registering the product through an SMS containing the BEE label number, which will identify the product purchased by the consumer. Feedback will be obtained by contacting these consumers. A part of the budget will be allocated for this detailed EM&V process.

***How will the incentive level be decided for an appliance?*** Two possible methods are available to decide the incentive level for each appliance. (a) Bidding: For the declared technical specification of the appliance (say fans), manufacturers can be asked to bid for the minimum incentive required. The manufacturer could be asked to guarantee a minimum quantity of sales to prevent non-serious bids. Bidding by a single winning manufacturer will defeat the basic objective of encouraging all manufacturers to produce SEAs. This can be partially remedied by allowing all bidders to match the lowest bid, and giving a small incentive to the lowest bidder (to maintain an incentive for low bidding). (b) A flat incentive: All manufacturers will be offered a flat incentive (like a Feed-in-tariff), equal to the estimated incremental cost of producing the SEA. A ceiling of Rs 1.5/unit of electricity saved in the first 5 years of usage of the SEA can be set for this purpose.

Bidding will minimize the incentive per piece. However, this may result in the adoption of the new technology by fewer manufacturers, which will in turn limit the sale of SEAs. As seen before, since the benefit of the SEA would be equivalent to low cost energy supply, sales of SEAs should ideally be maximized. It may be appropriate to encourage all manufacturers and maximize the uptake, after setting an incentive level (say equivalent to Rs 1.5/unit). In other words, competitive bidding may reduce the incentive below the estimated cost level, but is also likely to reduce the electricity saving, and which will have to be produced from costly sources (with a tariff of Rs 3 to 4 / unit). A net result of this would be increase in overall cost.

Hence, a flat incentive (similar to the feed-in-tariff) may be beneficial especially till most manufacturers start producing SEA models. At the same time, offering an excessive incentive is wasteful. This trade-off can be managed by a three step process (a) set a fixed (but declining) incentive level for the first 2 years, (b) implement competitive bidding during the second round of year three and four. Finally withdraw the scheme at the end of second round, and (c) progressively upgrade the S&L levels in the second or third year to lock-in savings. At any time, if more than 50-70% of the products sold meet the SEA levels, the scheme could be stopped and the S&L levels upgraded.

***How is the funding level determined?*** The requirement for funds is a function of (a) the number of appliances under the programme (b) starting date for each appliance, (c) the level of incentive, and (d) the sales of SEAs. All four factors can only be estimated, and the actual funding requirement may turn out to be different. With the proposed cost ceiling (cost of conserved energy) of Rs 1.5 / unit, and the expenditure being incurred post-facto, i.e. after the production of SEAs, exceeding the budget would be a welcome sign.

***How is this programme good for the aam aadmi?*** The energy saved due to SEAs will directly reduce electricity bills for consumers who buy SEAs. Moreover, it will also reduce the electricity bill of utilities due to reduced electricity purchase from costly sources such as imported coal or natural-gas. Hence, it will reduce the electricity tariff for all. A reduction in imports will also strengthen the energy security, leading to a wider positive impact.

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10th Jan, 2012.

1. Even if the S&L programmeis implemented aggressively, the SEEP would still result in an additional saving of 40 Billion Units. [↑](#footnote-ref-1)
2. *Potential Savings from Selected Super-Efficient Electric Appliances in India*. Prayas Energy Group, Pune, India, June 2011. Available at: <http://www.prayaspune.org/peg/publications/item/155.html> [↑](#footnote-ref-2)
3. Technically speaking, there are two reasons for the problem:(1) a higher discount rate (20-30%) for consumers, compared to the discount rate for public agencies (~10%), and (2) the tariff is not set at the ‘marginal cost’ of supply in order to avoid a regressive impact. [↑](#footnote-ref-3)
4. The levelised subsidy for solar electricity is about Rs 8/ unit, and the SEEP budget request of Rs 6,200 Cr is comparable to the Present Value of subsidy for only 500 MW of solar plants. The SEEP energy benefits are likely to be equal to 20,000 MW of solar plants. [↑](#footnote-ref-4)
5. <http://www.dsireusa.org/> [↑](#footnote-ref-5)