

## Responses to Feedback and Suggestions on Energy Efficient Homes (June 2015)

This document was prepared by the Building and Construction Authority (BCA), Housing Development Board (HDB), National Environment Agency (NEA), and the National Climate Change Secretariat (NCCS).

S/N	Suggestion	Response
<b>Better Awareness of Energy Use</b>		
1	Better upfront information on potential annual cost savings from buying an energy efficient appliance and make it easier for people to calculate the overall cost of ownership (upfront cost and running cost)	<p>We agree that this would be useful. Mandatory Energy Labelling was introduced in 2008 with a tick rating system to help consumers identify the more energy efficient appliances. In September 2014, NEA enhanced the energy label to show rescaled energy ratings and estimated annual energy cost of operating each model. By comparing the annual energy costs of different models, consumers can determine the annual cost savings of buying a more energy efficient model. The annual energy cost also allows consumers to consider the life cycle ownership cost of their purchases.</p> <p>On the <a href="#">Energy Efficient Singapore website</a>, NEA has provided information on how much households can save annually by switching to more efficient appliances.</p> <p>Households can also use the Life Cycle Cost (LCC) Calculator available online at <a href="#">Energy Efficient Singapore website</a> and within NEA's myENV mobile application to calculate and compare the life cycle ownership costs of different models of air-conditioners, refrigerators, clothes dryers and TVs.</p>
2	Provide lists of the most efficient appliances for consumers (e.g. all five- tick appliances)	<p>Consumers can identify energy efficient models of household appliances on the following platforms by searching for appliances that have more ticks on their energy labels (e.g. air-conditioners with 5 ticks):</p> <ol style="list-style-type: none"> <li>1) <a href="#">Energy Labelling Scheme website</a></li> <li>2) LCC Calculator in <a href="#">Energy Efficient Singapore website</a></li> <li>3) LCC Calculator in NEA's myENV mobile application (available on <a href="#">App Store</a> and <a href="#">Google Play</a>)</li> </ol>
3	More public education on how energy saving habits can benefit the individual should be carried out	<p>We agree. NEA has been working with schools, retailers, grassroots organisations and various government agencies to promote energy efficiency via different platforms. The Government will continue to look into more public education on energy-saving habits, and we welcome specific suggestions too.</p>
4	Educate appliance salespersons to promote energy efficiency, or give advice on which appliances are the most efficient	<p>NEA's voluntary programme trains retail salespersons to promote energy efficient appliances to consumers, such as through using the Life Cycle Cost Calculator.</p>
5	Encourage energy-saving behaviour such as making use of natural light where possible,	<p>NEA encourages energy-saving behaviour and provides more than 40 tips to save energy for households. These are featured on the <a href="#">Energy Efficient Singapore website</a> as well as in the Home Energy Auditor module in the myENV app.</p>

	switching off appliances when not in use, reducing showering time, and maintaining appliances in good operating condition	
6	Electricity bills should compare per household member use for greater accuracy.	SP Services (SPS) and the Energy Market Authority (EMA) launched a pilot in 2014 to enable consumers to compare their electricity consumption against the average consumption of residents living in the same block and against the national average consumption. This initiative seeks to raise awareness of consumption patterns and encourage energy-saving. The feedback will be considered when the pilot is enhanced with more features.
<b>Incentives &amp; Regulation</b>		
7	Provide incentives for households to save energy, such as through rebates on below-average consumption, rebates/surcharges for efficient/inefficient devices. The rebates could be offset by surcharges on inefficient appliances. Incentives can be phased out over time.	Currently, the approach is to encourage saving energy, and facilitate informed choices. The Mandatory Energy Labelling Scheme (MELS), and energy savings tips on the Energy Efficiency Singapore website, helps households to choose energy efficient appliances to reduce their utilities bills.  NEA also introduced Minimum Energy Performance Standards (MEPS), which removes less energy efficient models of household appliances from the market. This helps consumers to avoid being locked into high energy consumption and energy costs.
8	Provide incentives to trade in inefficient devices, or for low-income households who cannot afford efficient appliances	An example of such a programme is the voluntary lamp recycling initiative introduced by South West Community Development Council (SW CDC), which allows households to exchange used lamps for discount vouchers to buy energy-efficient bulbs. Five percent of the proceeds from sales of energy-efficient bulbs will go to providing lower-income residents with the same bulbs for free to help save energy costs.
9	Introduce better minimum energy efficiency standards through constant revision of Minimum Energy Performance Standards (MEPS) criteria and enforcing use of energy efficiency equipment during renovation	Minimum Energy Performance Standards (MEPS) was introduced in 2011 for air-conditioners and refrigerators. Since then, the MEPS levels for these were raised in 2013 and MEPS was also extended to clothes dryers in 2014. MEPS will be extended to cover general lamps in July 2015. Standards will continue to be reviewed from time to time.
10	Introduce progressive levels of electricity tariffs to reduce energy use of heavy consumers	In Singapore, electricity costs are not subsidised. Small and large users pay market prices. The implementation of a progressive system for electricity tariffs would mean that households which have electricity needs beyond certain threshold(s), for various reasons, will face a higher cost burden. The Government's focus is on energy conservation and efficiency. Relevant agencies will continue to study ways to encourage these.

**Energy Management Solutions**

11	<p>Improve accessibility of energy management solutions which allow real-time energy monitoring, remote monitoring through apps, warnings for excessive energy use, comparison with other similar households, and automation of energy-saving actions.</p> <p>More trials (e.g. installing smart meters at selected blocks) could provide better understanding of effectiveness.</p> <p>Note: respondents also noted that these solutions may not lead to sustained behavioural change, may not be cost effective, and may not work if there is no positive feedback or penalty system. These systems could also encourage laziness, and could be less reliable than current meters.</p>	<p>A list of suppliers that provide home energy monitoring solutions can be found at <a href="http://www.e2singapore.gov.sg/Households/At_Home_10_Energy_Challenge/EnergySaving_Products.aspx">http://www.e2singapore.gov.sg/Households/At_Home_10_Energy_Challenge/EnergySaving_Products.aspx</a>.</p> <p>The Government will consider if and how more information on such solutions can be made available. At the same time, trials will continue to assess the benefits of such systems. One such effort is the Internet of Things @ Home (IoT@Home) initiative that the Infocomm Development Authority (IDA) is working on in partnership with HDB, and with agencies and industry partners, to develop and trial innovative solutions for homes, including for sustainable living. Additionally, HDB's smart-enabled homes in Punggol Northshore, expected to be completed in 2020, will be equipped with additional infrastructure to support residents' adoption of smart solutions like commercial Home Energy Management Systems, to monitor energy consumption patterns, manage appliances in real-time from anywhere, and possibly reduce energy usage.</p>
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<b>Other</b>		
12	<p>Improve passive design of homes, such as through installing double glazed or tinted windows, and through windflow and solar modelling to improve natural ventilation and increase comfort. Heat dissipating paint and vertical greenery could be used. Ceiling fans could also be installed in new houses.</p>	<p>HDB's approach towards passive design has been to maximise building facades towards a North-South orientation, and HDB buildings are designed to be naturally cross ventilated, with good airflow for human comfort.</p> <p>For example in Punggol Eco-Town, Computational Fluid Dynamics windflow modelling at town and precinct levels was carried out to help optimise orientation and layouts of buildings to help enhance thermal comfort.</p> <p>Greenery in HDB precincts also reduces the urban heat island effect to improve comfort. Aside from trees and shrubs planted on the ground floor, HDB has provided roof top greenery on Multi-Storey Car Parks (MSCPs) since 2005 to create a visually pleasant and conducive living environment for residents. Vertical greenery is also provided in some of these MSCPs where needed.</p>
13	<p>Encourage solar energy adoption through tax breaks or feed-in tariffs. Incremental cost of solar panels could be added to cost of HDB flat and be offset by electricity savings.</p>	<p>It is important that we price energy correctly to reflect its true cost, and to avoid distorting the price signals and market dynamics in our liberalised electricity market.</p> <p>HDB is supporting solar energy adoption with rooftop solar PV systems via solar leasing. Under the solar leasing approach, there is no upfront cost payable by HDB. The solar generated energy is used to power the buildings' common services such as lifts, lighting and water pumps.</p>
14	<p>Encourage use of sensor (e.g. motion detectors) in households to reduce energy wasted on lighting when no one is present</p>	<p>Sensors can help to save energy. However, households should assess if the expected cost savings justify the costs of installing such sensors. NEA encourages households to practice energy-saving behaviour such as turning off lighting and other appliances when not in use, including switching them off at the power socket.</p>
15	<p>Encourage efficient air-conditioning technology, e.g. central air-conditioning, improved dehumidification, detection if room doors are not closed</p>	<p>NEA has raised the energy efficiency of home air-conditioners in the market through the Mandatory Energy Labelling Scheme (MELS) and Minimum Energy Performance Standards (MEPS) initiatives. MEPS disallows less energy efficient models of air-conditioners from being sold in Singapore.</p> <p>For new private residential developments, BCA's Green Mark Scheme encourages installation of energy efficient air-conditioning systems, with credits awarded for efficient air-conditioning based on NEA's Energy Labelling Scheme.</p> <p>Late last year, the Energy Innovation Programme Office, funded by the National Research Foundation, launched an Energy Efficiency Grant Call to encourage the development of innovative technologies and solutions for air-conditioning and mechanical ventilation (e.g. improved dehumidification, improved effectiveness of air delivery and ventilation systems).</p>
16	<p>Encourage heat pumps to save</p>	<p>Heat pump water heaters are more energy efficient than conventional electric storage, electric instantaneous and</p>

	energy used for heating water	gas instantaneous water heaters. The use of heat pump water heaters in Singapore is currently not widespread. NEA will continue to encourage households to use more energy efficient appliances, where possible. Consumers will ultimately decide weighing the benefits and other considerations such as space requirements.
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