APPENDIX 1
PUBLIC SECTOR PUTS ENVIRONMENTAL SUSTAINABILITY INTO PRACTICE

The public sector will walk the talk. It will adopt measures to better economise on the use of resources such as energy and water. By demonstrating the economic and environmental benefits of such measures, we hope to encourage individuals and companies to take action to become more efficient and sustainable as well.

EXISTING EFFORTS

Over the last two years, the government embarked on the following efforts:

- All large[1] government office buildings, as well as polytechnics and ITEs, will conduct energy audits to improve their energy efficiency by March 2010. As at January 2009, 12 of 48 buildings have completed energy audits, adopted energy saving measures and reaped $3 million in total annual savings. Another 10 buildings have completed energy audits and are in the process of implementing energy efficiency measures that can achieve a potential annual saving of $2.5 million. The remaining 26 buildings will complete their audits within the next year.

- All large government buildings have to ensure that the ambient indoor air temperature is maintained within the range of 22.5°C to 25.5°C.

- Large government buildings have to progressively meet a minimum standard of 4.7 in terms of the Coefficient of Performance (COP)[2] of their air conditioning plants, either after their energy audits or at the next chiller plant replacement. A few of our buildings are already able to meet this standard. Currently, CPF Building, Environment Building and MOM building have each achieved a COP of at least 4.7. The Treasury is expected to improve its COP to 5.4 by August 2009.

- From April 2007, all new government building developments with more than 5,000m^2 Gross Floor Area (GFA) have to attain BCA's Green Mark (GM) Scheme Certified Level or higher. This was subsequently made mandatory for all new buildings in Singapore with GFA of 2,000m^2 or more in April 2008.

FUTURE MEASURES

The public sector will implement the following new measures:

Energy Efficiency

- **Energy Audits:** We will require buildings with central air-conditioning systems and air-conditioned floor area of more than 10,000m^2 to also conduct energy audits by FY2011[3]. Mandatory audits will also be extended to infrastructure facilities, which account for almost 15% of total public sector electricity consumption.

- **Energy Smart Office label**: The Energy Smart Office label provides recognition for best practices in energy efficiency for buildings in Singapore. Office buildings with energy

[1] With more than 15,000m^2 of air-conditioned floor area.

[2] The COP is an indicator used for measuring the efficiency of chiller plants. According to ASHRAE (American Society of Heating Refrigeration and Air-Conditioning Engineers) standards, a COP of 4.7 would fall under the 'Good' category, achievable by 'high-efficiency optimised chiller plants'.

[3] Financial Year (FY) 2011 starts from April 2011 and ends at March 2012.

performance amongst the nation's top 25%, and which maintain a healthy and productive indoor environment, can qualify for the Energy Smart label[4].

We will require all existing government office buildings with central air-conditioning systems and more than 10,000m^2 air-conditioned floor area to achieve the Energy Smart Office label, within two years of their energy audits[5]. New government office buildings with central air-conditioning systems also have to attain the label within 2 years of operations.

- **Coefficient Of Performance (COP) of air-conditioning plants:** A major potential source of energy savings for buildings is improving the system efficiency of their central air-conditioning plants, as measured by their COP. The upfront cost required to optimise these plants to achieve a COP of 4.7 is expected to be less than $1 million, with a payback period of about 4.5 years.

  We will extend the requirement to install instrumentation to monitor the COP of central air-conditioning plants and to achieve a COP of at least 4.7 at the next available opportunity, to buildings with more than 10,000m^2 air-conditioned floor area.

- **Maintaining appropriate ambient indoor temperature:** We will encourage all government agencies to work with energy service companies (ESCO) to determine how best to monitor indoor temperatures and ensure that the indoor air temperature of all government premises remain within the range of 22.5°C to 25.5°C. An increase of 1°C in the air-conditioned indoor room temperature could reduce air-conditioning electricity consumption by about 3%.

- **Office Information and Communication Technology (ICT) equipment:** We will require all new office ICT equipment to meet the latest ENERGY STAR standards, where available, from FY2009 onwards. We estimate that adopting the latest ENERGY STAR 4.0 standards for desktops, monitors and laptops alone can save the government about $12.8 million annually, or net lifecycle savings of $30.7 million.

Water Efficiency

The Water Efficient Buildings (WEB) initiative under the PUB's 10% Challenge Programme seeks to reduce water consumption in the non-domestic sector. To date, 444 government buildings including schools are already certified as Water Efficient Buildings.

PUB will work with all government agencies and schools to achieve the WEB label for buildings they own by FY2010.

Recycling

Currently, approximately 73% of government agencies already implement recycling programmes, which include initiatives to recycle paper products, plastics, metals (e.g. aluminium

[4] Qualifying buildings are also required to achieve a COP of at least 4.7 for their central air-conditioning plants.

[5] Buildings which have already completed their energy audits should attain the Energy Smart Office label by end FY10.

cans) and print cartridges. Proceeds from the sales of these recyclables for each agency can amount to a few thousand dollars annually.

Going forward, all government agencies will implement recycling programmes by FY2009.

General Environmental Sustainability

- **Eco-Office Label:** The Eco-Office Green Office label rates offices on a range of practices – energy efficiency, recycling, water conservation, reducing paper use, purchase of environmentally friendly office equipment, use and reuse of reusable resources, and monitoring of resource consumption.

  Government offices have to achieve the Eco-Office Green Office label by FY2011.

- **Green Mark (GM):** Buildings with higher GM levels use less energy than typical buildings, and energy savings over the buildings' lifetime exceed any higher upfront cost involved. For instance, new buildings which achieve the GM Platinum standard are expected to reduce energy consumption by 30-35% and the cost savings achieved can pay back the additional upfront capital cost within 6 years. Existing buildings which achieve the GM Gold^{PLUS} standard can reduce energy consumption by about 25-30%, with a payback period of 6 to 10 years.

  Going forward, all new government buildings with more than 5,000m^2 air-conditioned floor area, including buildings with development cost fully or partly funded by the government (e.g. new universities and hospitals), will have to attain the GM Platinum level. Existing government buildings with more than 10,000m^2 air-conditioned floor area also have to attain the GM Gold^{PLUS} standard by 2020.