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**Legislative Council**

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**Panel on Housing**

**Meeting on 8 February 2013**

**Background brief on "Energy saving initiatives implemented  
in public rental housing estates"  
prepared by the Legislative Council Secretariat**

**Purpose**

This paper provides background information on the implementation of energy saving initiatives in public rental housing ("PRH") estates, and gives a brief account of the views expressed by Members on the subject.

**Background**

2. To help combat global warming and climate change, the Hong Kong Housing Authority ("HA") has been implementing a number of energy saving measures to reduce energy consumption in existing and new PRH estates so as to better utilize the earth's resources.

Lighting initiatives

3. Given that lighting accounts for half of the total electricity consumption of a PRH block, HA has put forward different initiatives to cut down energy consumption of lighting in PRH estates.

*Two-level lighting control system*

4. To comply with the mandatory requirements laid down in the "Design Manual: Barrier Free Access 2008" promulgated by the Buildings Department, the illumination standard of public areas has been significantly increased to cater for the needs of persons with special needs, such as those having impaired vision. To meet the new standard without undue increase in energy consumption, a two-level lighting control system has been adopted in the design

of new PRH estates since December 2008. The system provides moderate yet sufficient illumination levels in the public areas such as lift lobbies and staircases of domestic blocks. The system is also equipped with motion sensors as well as manual switches which allow users to adjust the illumination level according to their needs.

*Wider use of electronic ballast, T5 fluorescent tube and light emitting diode ("LED") lighting systems*

5. For fluorescent type lighting fittings, about 15% of electrical energy could be saved if electronic ballast is used instead of electromagnetic ballast. HA has widely adopted the use of electronic ballast since 2003. At present, all the new buildings being constructed are equipped with fluorescent type lighting fittings driven by electronic ballasts. Furthermore, T5 fluorescent tubes of higher efficacy have been used for all exit and directional signs to replace their T8 counterparts. Coupled with the use of electronic ballast, the overall efficacy of the fixture can be raised by about 20% to 30%.

6. HA has also been conducting trial application of LED lighting system and LED bulkhead for general illumination at selected PRH estates.

*Installation of photocell sensor control for lights in public areas of domestic blocks*

7. Photocell sensor controls for lights are installed in areas with natural light, such as areas near the windows in communal areas, so that corresponding lamps can be switched off to save energy when the illumination level is sufficient. Besides, HA has also been providing optimized window design at domestic flats, corridors and lobbies at typical floors to maximize the utilization of natural lighting and cross ventilation so as to achieve energy saving at source.

Initiatives for lift installations

8. HA has adopted a number of energy saving technologies and initiatives suitable for lift installations. These include the use of permanent magnet synchronous motor machines in lift installations to replace the conventional types of induction motor machines, and the installation of compact and less heavy lifts without machine rooms for lift towers and low-rise buildings. The use of regenerative drives in high speed lifts are also being tried out. The device is able to generate electricity when the lifts are in operation to support the lighting and other equipments in communal areas. Besides, HA will also continue to replace lifts aged over 25 years with higher energy efficiency ones in existing PRH estates.

### Trial use of renewable energy

9. To promote green and healthy living and reduce carbon emission in PRH estates, HA has integrated various renewable energy applications into the design of PRH estates since 2003. Two large-scale, grid-connected photovoltaic systems have been completed in two new PRH estates, namely Lam Tin Estate (Phases 7 & 8) and Yau Lai Estate, in 2009 and 2011 respectively to generate electricity for the communal facilities in the estates. The system will be installed on the roofs of all new PRH blocks, where they will not be shadowed by nearby structures/buildings, so as to achieve at least 1.5% of electricity demand of the common areas/facilities of each block.

10. HA has begun to provide one or two outdoor light fittings utilizing renewable energy source in new PRH estates since mid 2006 to enhance public awareness of energy saving and for education purpose. For instance, hybrid wind and solar powered outdoor lightings have been provided in Sau Mau Ping South Estate to generate electricity for external lighting to the plaza. HA will continue the search and piloting of other renewable energy technologies, such as solar thermal water heating, for wider application in PRH estates.

### Education

11. HA has launched a number of activities in collaboration with environmental concern groups to further promote PRH residents' awareness of energy conservation and building energy efficiency as well as to gain their support on the energy saving measures implemented in PRH estates. Such activities include fun fair, road show, and promotional programmes through the Housing Channel broadcast at the G/F lift lobbies of PRH blocks. The "Green Delight in Estates" programme (which helps disseminate green messages to PRH tenants) and the "Action Seedling" scheme (under which seedling plants will be given out to participants who will nurture the plants at home until they are ready for transplanting to planters of new estates) are other educational activities organized by HA to foster a green culture in PRH estates and heighten environmental awareness amongst tenants. Furthermore, the Domestic Waste Disposal Programme and the trial scheme on energy conservation have been carried out to promote segregation of domestic waste at source and energy saving in PRH estates.

### Other energy saving initiatives

#### *Variable speed drive control for the fresh water booster pumping system*

12. HA has adopted variable speed drive control for the fresh water booster pumping system in all new PRH estates. The system has been used together with smaller stainless steel pneumatic pressure vessels and stamped stainless

steel multi-stage pumps to extend the lift span of the pumping equipment, achieve higher energy efficiency and occupy less plant room space.

#### *Hybrid ventilation system*

13. Hybrid ventilation system has been introduced at some new shopping centres of PRH estates. Combining the use of natural ventilation and mechanical air conditioning as well as switching between the two operation modes to suit users' needs, the new system reduces energy consumption and carbon emissions from the air-conditioning system.

#### *Adoption of the Building Energy Codes*

14. The lighting, electrical, air-condition and lift and escalator of new PRH blocks have adopted the design in accordance with the requirements of the Building Energy Codes ("BECs") promulgated by the Electrical and Mechanical Services Department.

#### *Compliance with the New Building Energy Efficiency Ordinance*

15. The new Building Energy Efficiency Ordinance ("BEEO"), which came into full operation in September 2012, sets out the mandatory requirements on the minimum energy efficiency standard for all major building services installations in a new building or for the major retrofitting activities in existing buildings. HA will strictly comply with the requirements under BEEO in all new construction and retrofit projects.

#### *Energy management system*

16. To reduce energy consumption in new public housing projects, HA rolled out an energy management system in December 2011, which sets a baseline for energy consumption of the building services installed in the communal areas of PRH blocks. This system helps HA manage energy use in future PRH blocks more effectively.

### **Deliberations by the Panel on Housing**

17. The Panel on Housing discussed the progress and effectiveness of environment-friendly designs and green measures implemented in PRH estates, and the performance of environmental targets and initiatives of HA at different meetings over the past few years. It also received a briefing by the Administration on the implementation of energy saving measures in PRH estates at its meeting on 4 January 2012.

18. While appreciating the efforts of HA in implementing environment-friendly initiatives in PRH estates, members stressed the need to encourage participation of tenants in taking forward these measures. They opined that very significant energy savings could be achieved as 30% of the population in Hong Kong was living in PRH estates. HA should therefore work out new quantifiable energy saving measures, such as piloting the use of LED lighting, with specific implementation timetable, and strike an appropriate balance between costs and environmental performance during implementation. It should also aim at standards higher than the statutory requirements under BECs, given that the implementation of energy saving requirements in PRH estates could substantially reduce the heat island effect. The Panel also supported HA to replace old energy-saving devices with a more effective new model in some PRH estates to further reduce energy consumption.

19. Some members were concerned about the slow progress of the application of renewable energy in PRH estates, and enquired if HA had conducted feasibility studies on the wider use of renewable energy in these estates. As regards the initiative to use solar power in new PRH estates, members stressed the need to work out an implementation timetable for rolling out the project by phases within the next ten years. Meanwhile, consideration should be given to replacing the existing incandescent lamps by compact fluorescent lamps and turning off the information panels at the lift lobbies of PRH blocks during the small hours.

20. While some members appreciated HA's efforts to conserve electricity through reduced lighting, they were concerned that insufficient lighting might cause inconvenience to tenants and supported the use of sensors in lighting systems for new estates as these would be more energy efficient. Some other members were concerned about HA's policy on the installation of lighting systems in PRH estates on account of advancement in lighting technologies. The Administration had advised that HA had been monitoring the emerging lighting technologies closely. If tests on the new lighting systems like LED and two-level lighting systems produced satisfactory results in new estates, HA would consider how best to implement such initiatives in older estates.

### **Relevant papers**

21. A list of relevant papers is in the **Appendix**.

## Energy saving initiatives implemented in public rental housing estates

## List of relevant papers

Council/ Committee	Date of meeting	Paper
Panel on Housing	3 December 2007	<p>Information paper on "Environmentally Friendly Designs and Green Measures of Public Rental Housing Estates" provided by the Administration (LC Paper No. CB(1)340/07-08(03))  <a href="http://www.legco.gov.hk/yr07-08/english/panels/hg/papers/hg1203cb1-340-3-e.pdf">http://www.legco.gov.hk/yr07-08/english/panels/hg/papers/hg1203cb1-340-3-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)896/07-08)  <a href="http://www.legco.gov.hk/yr07-08/english/panels/hg/minutes/hg071203.pdf">http://www.legco.gov.hk/yr07-08/english/panels/hg/minutes/hg071203.pdf</a></p>
Panel on Housing	3 November 2008	<p>Information paper on "Environment-friendly designs of and green measures implemented in public rental housing estates" provided by the Administration (LC Paper No. CB(1)149/08-09(04))  <a href="http://www.legco.gov.hk/yr08-09/english/panels/hg/papers/hg1103cb1-149-4-e.pdf">http://www.legco.gov.hk/yr08-09/english/panels/hg/papers/hg1103cb1-149-4-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (Background brief) (LC Paper No. CB(1)149/08-09(05))  <a href="http://www.legco.gov.hk/yr08-09/english/panels/hg/papers/hg1103cb1-149-5-e.pdf">http://www.legco.gov.hk/yr08-09/english/panels/hg/papers/hg1103cb1-149-5-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)469/08-09)  <a href="http://www.legco.gov.hk/yr08-09/english/panels/hg/minutes/hg20081103.pdf">http://www.legco.gov.hk/yr08-09/english/panels/hg/minutes/hg20081103.pdf</a></p>

<b>Council/ Committee</b>	<b>Date of meeting</b>	<b>Paper</b>
Panel on Housing	2 November 2009	<p>Information paper on "Environment-friendly designs of and green measures implemented in public rental housing estates" provided by the Administration (LC Paper No. CB(1)193/09-10(03)) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg12cb1-193-3-e.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg12cb1-193-3-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (updated background brief) (LC Paper No. CB(1)193/09-10(04)) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg1102cb1-193-4-e.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg1102cb1-193-4-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)794/09-10) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/minutes/hg20091102.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/minutes/hg20091102.pdf</a></p>
Panel on Housing	24 May 2010	<p>Information paper on "Measures to Increase the Greening Ratio of New Public Rental Housing Estates and the Provision of Recreational Facilities in Existing Estates" provided by the Administration (LC Paper No. CB(1)1909/09-10(03)) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg0524cb1-1909-3-e.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg0524cb1-1909-3-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (updated background brief) (LC Paper No. CB(1)1909/09-10(04)) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg0524cb1-1909-4-e.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/papers/hg0524cb1-1909-4-e.pdf</a></p> <p>Minutes of special meeting (LC Paper No. CB(1)2573/09-10) <a href="http://www.legco.gov.hk/yr09-10/english/panels/hg/minutes/hg20100524.pdf">http://www.legco.gov.hk/yr09-10/english/panels/hg/minutes/hg20100524.pdf</a></p>

Council/ Committee	Date of meeting	Paper
Panel on Housing	6 December 2010	<p>Information paper on "Environment-friendly designs of and green measures implemented in public rental housing estates" provided by the Administration (LC Paper No. CB(1)606/10-11(05))  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg1206cb1-606-5-e.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg1206cb1-606-5-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (updated background brief) (LC Paper No. CB(1)606/10-11(06))  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg1206cb1-606-6-e.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg1206cb1-606-6-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)1180/10-11)  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/minutes/hg20101206.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/minutes/hg20101206.pdf</a></p>
Panel on Housing	10 February 2011	<p>Information paper on "Performance of Environmental Targets and Initiatives in 2010" provided by the Administration (LC Paper No. CB(1)1209/10-11(05))  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg0210cb1-1209-5-e.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg0210cb1-1209-5-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (updated background brief) (LC Paper No. CB(1)1209/10-11(06))  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg0210cb1-1209-6-e.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/papers/hg0210cb1-1209-6-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)2023/10-11)  <a href="http://www.legco.gov.hk/yr10-11/english/panels/hg/minutes/hg20110210.pdf">http://www.legco.gov.hk/yr10-11/english/panels/hg/minutes/hg20110210.pdf</a></p>



Council/ Committee	Date of meeting	Paper
Panel on Housing	4 January 2012	<p>Information paper on "Energy saving measures in existing public rental housing estates" provided by the Administration (LC Paper No. CB(1)699/11-12(06))  <a href="http://www.legco.gov.hk/yr11-12/english/panels/hg/papers/hg0104cb1-699-6-e.pdf">http://www.legco.gov.hk/yr11-12/english/panels/hg/papers/hg0104cb1-699-6-e.pdf</a></p> <p>Paper on environment-friendly designs and green measures implemented in public rental housing estates prepared by the Legislative Council Secretariat (updated background brief) (LC Paper No. CB(1)699/11-12(07))  <a href="http://www.legco.gov.hk/yr11-12/english/panels/hg/papers/hg0104cb1-699-7-e.pdf">http://www.legco.gov.hk/yr11-12/english/panels/hg/papers/hg0104cb1-699-7-e.pdf</a></p> <p>Minutes of meeting (LC Paper No. CB(1)1148/11-12)  <a href="http://www.legco.gov.hk/yr11-12/english/panels/hg/minutes/hg20120104.pdf">http://www.legco.gov.hk/yr11-12/english/panels/hg/minutes/hg20120104.pdf</a></p>
Panel on Housing	3 December 2012	<p>Information paper on "Performance of Environmental Targets and Initiatives in 2011/12" provided by the Administration (LC Paper No. CB(1)231/12-13(03))  <a href="http://www.legco.gov.hk/yr12-13/english/panels/hg/papers/hg1203cb1-231-3-e.pdf">http://www.legco.gov.hk/yr12-13/english/panels/hg/papers/hg1203cb1-231-3-e.pdf</a></p> <p>Paper on environment-friendly designs, green measures and energy saving initiatives implemented in public rental housing estates prepared by the Legislative Council Secretariat (Background brief) (LC Paper No. CB(1)231/12-13(04))  <a href="http://www.legco.gov.hk/yr12-13/english/panels/hg/papers/hg1203cb1-231-4-e.pdf">http://www.legco.gov.hk/yr12-13/english/panels/hg/papers/hg1203cb1-231-4-e.pdf</a></p>