

# 立法會 *Legislative Council*

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## **Panel on Housing**

**Meeting on 14 April 2015**

### **Updated background brief on "Energy saving initiatives in New Public Housing Developments" prepared by the Legislative Council Secretariat**

#### **Purpose**

This paper provides updated background information on the energy saving initiatives implemented by the Hong Kong Housing Authority ("HA") in new public housing developments ("PHD"), and gives a brief account of the views and concerns expressed by members of the Panel on Housing ("the Panel") on the subject.

#### **Background**

2. In its briefing for the Panel on the housing-related initiatives in the 2015 Policy Address<sup>1</sup> on 2 February 2015, the Administration advised that HA has been striving to develop public housing in a sustainable manner by incorporating various design features during the planning and design stages to match with the natural environment, adopting a site-specific design approach and optimizing the use of natural resources. The best block layout design for each site will be determined according to the results of the Air Ventilation Assessment. HA will continue to conduct comprehensive micro-climate studies, which was first introduced in 2004, for all new PHD to take into account the local environmental and climatic characteristics and to reduce energy consumption.

3. Furthermore, HA will continue to adopt environmentally friendly measures to reduce energy consumption and carbon emissions, such as the use of the twin-tank system to reduce wastage during water tank cleansing,

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<sup>1</sup> See paragraphs 36-37 of LC Paper No. [CB\(1\)437/14-15\(01\)](#)

optimizing the provision of greenery, and the installation of photovoltaic panel system on roof of public rental housing ("PRH") blocks to generate energy. HA has also adopted advanced lift technologies, such as gearless lift drive and utilization of regenerative power from lift system, to further enhance the energy performance of public housing blocks.

4. The Panel was briefed on the energy saving initiatives in new PHD at its meeting on 8 February 2013. According to the Administration<sup>2</sup>, lighting, lift and water pump systems consume around 55%, 21% and 16% respectively of the energy used in communal areas of a public housing domestic block<sup>3</sup>. Brief descriptions of the various energy saving initiatives implemented by HA in new PHD are set out in **Appendix I**.

5. As advised by the Administration at the above meeting, HA has achieved a substantial reduction in annual electricity consumption in communal areas within new PHD, by 42% (or 436 kWh<sup>4</sup> per flat) over the past 11 years from 2000-2001 to 2011-2012. HA will continue to implement more energy saving initiatives with a view to further reduce annual electricity consumption in communal areas by another 10%<sup>5</sup> in 2014-2015.

### **Deliberations of the Panel**

6. In discussing the energy saving initiatives implemented by HA in new PHD at the Panel meeting on 8 February 2013, members expressed the following views.

7. Members generally expressed support and appreciation for HA's efforts in implementing energy saving initiatives in PRH estates and considered that HA, being the largest developer in Hong Kong, had an exemplary role to play in the implementation of energy saving measures. Some members suggested that apart from taking forward energy saving initiatives in the common areas of PRH estates, there was also a need to implement more environmentally friendly designs within PRH units. This could include the provision of windows on opposite sides to enable better air flow and reduce electricity consumption of air conditioning.

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<sup>2</sup> See LC Paper No. [CB\(1\)516/12-13\(03\)](#)

<sup>3</sup> For a typical 41-storey domestic block with 799 flats.

<sup>4</sup> Reducing from 1 032 kWh per flat in 2000-2001 to 596 kWh per flat in 2011-2012, for a typical 41-storey domestic block with 799 flats.

<sup>5</sup> Reducing from 596 kWh per flat in 2011-2012 to 536 kWh per flat in 2014-2015, for a typical 41-storey domestic block with 799 flats.

8. Given that the use of more energy-efficient lift installations could reduce electricity consumption by as much as 50%, some members suggested that HA should consider expediting the replacement of lifts in aged PRH estates. The Administration advised that HA had put in place a structured lift modernization rolling programme where the conditions of all lifts over 25 years of age were evaluated regularly.

9. Some members requested HA to consider retrofitting escalators in PRH estates with sensors so that the escalators would only be activated when in use. The Administration advised that most of the escalators in PRH estates were outdoor escalators without sensor systems. With the availability of sensor technology for outdoor escalators, HA would consider adopting sensor systems which could be used in all kinds of weather.

10. Some members were of the view that the energy saving initiatives implemented in new PHD, such as the use of light emitting diode ("LED") lighting, if proven cost-effective, should be used on a wider scale and be extended to existing PRH estates and government offices. In reply, the Administration said that the performance and product reliability of LED bulkheads would need to be ascertained before their installation on a wider scale in PRH estates.

### **Latest development**

11. The Administration will report and update the Panel on the energy saving initiatives implemented by HA in new PHD at the meeting on 14 April 2015.

### **Relevant papers**

12. A list of relevant papers is in **Appendix II**.

### Energy saving initiatives in new public housing developments ("PHD")

(a) Energy saving systems

(i) *Reducing consumption by means of renewable resources*

In May 2011, the Hong Kong Housing Authority ("HA") decided to implement grid-connected photovoltaic system in all new PHD under planning and design, which provide domestic blocks with communal electricity consumption of at least 1.5%. The system can exploit inexhaustible solar energy and generate electricity without carbon emissions.

(ii) *Reducing consumption of lighting systems*

Since December 2008, HA has implemented a two-level lighting control system in new PHD. Under the lighting-on-demand principle, HA has developed a two-level lighting control system for lift lobbies, corridors and staircases in domestic blocks, whereby light levels are controlled by means of motion sensors and on-demand switches with timer controls.

(iii) *Reducing consumption of lift installations*

Since 1996, HA has used variable voltage variable frequency type lift power system. This energy-efficient system ensures that lift installations meet the Building Energy Code (Lift) under the voluntary Energy Efficiency Registration Scheme for Buildings ("EERSB")<sup>6</sup>. In addition, HA has adopted a light weight lift car decoration design to further save energy.

(iv) *Reducing consumption of water pump installations*

Since 2010, HA has adopted electronic variable speed drive control systems in the fresh water booster pump system to provide adequate water pressure to the topmost domestic floors.

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<sup>6</sup> In October 1998, the Electrical and Mechanical Services Department launched the voluntary EERSB to promote the application of the Building Energy Codes. To further promote building energy efficiency, the Government enacted the Buildings Energy Efficiency Ordinance (Cap. 610) which has come into full operation from 21 September 2012 onward.

High efficiency motors are also used to further reduce the energy consumption of water pump installations.

(b) Energy management tools

(i) *EERSB*

Since 2000, HA has adopted the non-statutory Building Energy Codes under the voluntary EERSB in the design of new PHD.

(ii) *Carbon emission estimation*

Since February 2011, HA has conducted carbon emission estimations for all domestic blocks of new PHD. HA has developed a carbon emission estimation methodology<sup>7</sup> to holistically evaluate the carbon emission of new PHD throughout the building life cycle.

(iii) *Energy management system to ISO 50001*

With the launching of ISO 50001 in June 2011, HA developed and rolled out its Energy Management System<sup>8</sup> for new PHD in December 2011 by modeling on the ISO 50001 best practice framework.

(c) Awareness of energy saving

To raise tenants' awareness of energy saving, HA has installed one or more solar-powered lamp poles at prominent locations in each new PHD since 2008 for educational purpose. HA also installed pilot smart meters and display panels at selected housing estates to make tenants aware of the comparative electricity, gas and water consumptions in each flat, so as to encourage the reduction of energy consumption of sitting tenants.

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<sup>7</sup> The carbon emission estimation model provides an effective design verification tool to gauge the overall performance of PHD in terms of carbon emission throughout the life cycle of the buildings. It consists of six aspects, namely (i) materials consumed during construction, (ii) materials for building structure, (iii) communal building services installations, (iv) renewable energy, (v) trees planting, and (vi) demolition.

<sup>8</sup> The Energy Management System provides a systematic framework to verify the energy performance of communal building services installations design of residential buildings against the energy baseline. It also sets a clear indicator for improving the energy performance of HA's design. The energy performance will be verified by actual energy measurements taken after the mass intake of the domestic blocks.

(d) Further energy saving measures for new PHD

(i) *Light emitting diode ("LED") lighting*

HA has been conducting trial application of LED lighting system and LED bulkheads for general illumination at selected housing estates. With reference to the assessment results of these pilot projects, wider application of such LED bulkheads may be considered in other new estates.

(ii) *New lift technologies*

To explore the use of new lift technologies, HA has been carrying out trial installations of Permanent Magnet Synchronous ("PMS") lift motor and lift regenerative power system at selected housing estates. PMS lift motor is a new technology that can drive lift machine with energy saving potential. In addition, regenerative power collected from lift system can be utilized for communal consumption.

Source: LC Paper No. [CB\(1\)516/12-13\(03\)](#)

## Energy saving initiatives in New Public Housing Developments

### List of relevant papers

Council/ Committee	Date of meeting	Paper
Panel on Housing	8 February 2013	<p>Administration paper on "Energy saving initiatives in New Public Housing developments" (LC Paper No. <a href="#">CB(1)516/12-13(03)</a>)</p> <p>Background brief on "Energy saving initiatives implemented in public rental housing estates" prepared by the Legislative Council Secretariat (LC Paper No. <a href="#">CB(1)516/12-13(04)</a>)</p> <p>Minutes of meeting (LC Paper No. <a href="#">CB(1)954/12-13</a>)</p> <p>Administration's supplementary paper on "Energy saving initiatives in New Public Housing developments" (LC Paper No. <a href="#">CB(1)1915/13-14(02)</a>)</p>
Panel on Housing	2 February 2015	<p>Administration's paper on "Housing-related initiatives in the 2015 Policy Address and Policy Agenda" (LC Paper No. <a href="#">CB(1)437/14-15(01)</a>)</p>