

LCQ5: Trial schemes for Light Emitting Diode road lights

Following is a question by the Hon Lam Kin-fung, Jeffrey and a written reply by the Secretary for Transport and Housing, Ms Eva Cheng, at the Legislative Council meeting today (April 21):

Question:

In its reply to my question raised in the examination of the Estimates of Expenditure 2010-2011, the Highways Department indicated on March 18 this year that the Department was conducting trial schemes for Light Emitting Diode (LED) road lights, and had installed LED road lights in Selkirk Road and Moray Road in Kowloon Tong. It had also planned to install about 100 LED road lights in different districts this year at an estimated cost of around one million dollars. In this connection, will the Government inform this Council:

(a) why the cost of installing 100 LED road lights amounts to one million dollars (i.e. an average of \$10,000 for each road light);

(b) how the prevailing high pressure sodium lamps used for road lighting compare with LED lights in terms of light output, luminous efficacy and electricity consumption;

(c) of the respective electricity expenditure on footpath lighting and street lamps in each of the past three years; of the ways to reduce the electricity expenditure at present, so as to achieve higher standards of energy efficiency;

(d) whether time or ambient lighting level is used to decide the switching on or off of footpath lighting and street lamps at present; how it can avoid having footpath lighting and street lamps switched on even when the lighting level is sufficient;

(e) of the numbers and main locations of the footpath lighting and street lamps installed with photo-sensors for automatic control at present; whether it had, in the past three years, assessed the effectiveness and benefits of such devices in terms of energy efficiency and reduction in electricity expenditure; if it had, of the outcome; and

(f) whether it had, in the past three years, studied installing lighting facilities with photo-sensors for automatic control at rear staircases of buildings and using government buildings as trial spots, so as to save energy; if it had, of the outcome, and how it ensures that such devices will not cause fire safety and security problems?

Reply:

President,

(a) Although quite a number of lighting manufacturers have started developing Light Emitting Diode (LED) lights in recent years, among them, only a very few established ones are able to produce the necessary certification for their products (such as lighting test, safety and protection certification). As there is less competition for certified products and the scale of production is small, the market price of certified LED road lights is relatively high. Most of the cheaper LED road lights available in the market cannot furnish basic certification and reliable test reports. With the effectiveness of such products in doubt, they cannot be used in the trial schemes.

(b) Footpath lighting currently uses high pressure sodium (HPS) lamps with high-efficiency 50- or 70-watt bulbs. The luminous efficacy of HPS lamps is 88 to 93 lumen per watt, while the luminous efficacy of LED road lights of better quality is 60 to 80 lumen per watt. The overall light output of these two types of road lighting is similar. However, comparing with

prevailing footpath lighting, the light distribution of LED road lights is more focused, hence compares less favourably with prevailing footpath lighting in terms of the evenness and coverage of illumination. However, the advantage of using LED road lights is that they can produce the same level of illumination as conventional lighting fittings with a lower light output, resulting in a potential electricity saving of about 10% to 15%.

(c) In 2007, 2008 and 2009, the annual electricity expenses for footpath lighting and road lights were about \$82.8m, \$86.5m and \$83.5m respectively. During that period, the number of street lights increased by 2,000 points. However, the Highways Department (HyD) has, through various measures, increased the overall luminous efficiency of the road lighting system with a view to reducing the expenditure on electricity consumption. These measures include the replacement of about 4,000 road lights with low-wattage ones of higher efficacy, and the replacement of the magnetic ballasts of about 7,000 road lights with dimmable electronic ones. As a result of these two measures, there is a saving of about \$1.5 m in electricity charge per annum.

HyD is also conducting tests on the new ceramic discharge metal halide road lights and LED road lights, with a view to examining and comparing the feasibility of using the two types of road lights on an extensive basis, having regard to their prices, energy efficiency, safety and durability.

(d) and (e) In general, the on/off switching of road lights is automatically controlled by photoelectric sensors. Photoelectric sensors are installed in roadside lighting control cabinets. The cabinets number about 3,800 throughout the territory currently, and each cabinet controls several circuits of road lights. When the photoelectric sensors detect a fall of the ambient lighting to below a specified level (i.e. 55 lux), road lights are switched on automatically. On the contrary, when the ambient lighting

is detected to be higher than the specified level, road lights are switched off automatically to save energy. The sensors have been used for years; the ambient lighting level also varies for each group of road lights, and as a result the actual saving in energy consumption varies. Therefore, we are unable to provide figures about the actual saving in energy consumption as a result of the use of the sensors in question.

(f) According to the information provided by the Electrical and Mechanical Services Department, photoelectric sensors are in general unsuitable for rear staircases in buildings with insufficient daylight penetration. However, the Government is now piloting the use of motion sensors for lighting control in some government buildings. To achieve energy savings, the illumination level for unoccupied rear staircases is kept at a relatively lower level, but will be raised to the normal level whenever movement is detected. And as the illumination of the rear staircases is maintained at a certain level even when they are unoccupied, the fire safety and security requirements can be met.

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