

Framework for phasing out electric shower water heater for Thailand

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Abstract:

The power capacity (kW) of instantaneous electric shower unit water heater is generally 5-10 times greater than the substitution technology i.e. compact heat pumps and hot water solar collectors. The compact heat pumps is good for the available power grid area whereas the hot water solar collector is suitable for both grid and off grid area. The morning and evening peak demand from hot water showering could be cut by the substitution technology. In view of energy policy of the country, the phasing out of electric shower unit water heater must be done. For Thailand, the Ministry of Energy is the responsible organization for phasing out. The phasing out must be in the form of the slightly change because the existing manufacturer of the electric shower unit water heater need time for adaptation to the market transformation.

Keywords: *electric shower unit water heater; phase out; heat pump; solar collector*

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1. Introduction

The value of hot water market in Thailand is around 3,000 million Baht per year (Techato, 2012). The change by transformation of the market from using electronic shower unit water heater to be replaced by the substitution technology i.e. compact heat pump and hot water solar collector would absolutely effect the existing manufacturer and stakeholders of the hot water market. He value of substitution market is however recovered or tended to create more valuable market. The starting point is to adjust the thinking for people to accept that heat pump is also a kind of renewable energy same as the hot water solar collector (Techato, 2011).

2. Short Term Measures

In Thailand, there are many types of household appliances which has energy efficiency label (label number 5) e.g. refrigerator, air conditioner, ballast, electric fan, compact fluorescent, rice cooker, lamp, T8 fluorescent, electronic ballast for T8, Swing electric fan, T8 fluorescent lamp, ventilation fan, electric kettle, stand by power for television and monitor, and electric shower unit water heater (Vongsoasup, 2012). For electric shower unit water heater, besides the energy efficiency label, there would be green label or environmental friendly label going to be launched within 2014 and managed by the Thai Environment Institute (Supapetch and Techato, 2014). The direction of promotion the energy efficiency and environmental friendly electric shower unit water heater is supposed to be the short term or medium term strategy whereas the long term is to be substituted by either compact heat pump or hot water solar collector. The substitution for Thailand may not be complex as in some country where utilized various system of hot water production or various climatic zones.

3. Existing Situation of Hot water System in Thailand

In Australia the hot water system in domestic sector is variety e.g. LPG, natural gas, electric, solar, solar-gas, solar-electric, and electric off peak. The systems were selected depend on many factors in each area but at least one system in dwelling house. Unlike Australia, in Thailand the hot water showering is not a must to have household appliances or equipment. Previously the electric shower water heater might be considered as luxurious product but it is now more and more common. The middle level people can acquire the mass model from 2,500 – 5,000 baht. Most of shower unit water heater in domestic sector in Thailand is electric type.

4. Solar Hot Water and Heat Pump Standard

To ensure the standard of substituted product, solar hot water must comply the Australia Standard and ASHRAE 93-77 (Rakwichien, 2015). For compact heat pump, there are various standard e.g. ARI 240-61, 69, ASHRAE 39-61, and DIN EN 255-3 performance test 30°C water in, 30°C ambient, and 60°C water output (new version is 14511). In view of environment, TG-57-11 had defined various aspects. In Australia and New Zealand, there are AS/NZS 5125 (Heat pump water heaters – Performance assessment), AS/NZS 4234 Appendix H (Air source heat pump water heater task performance evaluation), and AS/NZS 2712 Appendix H (Test for air source heat pump water heater low temperature classification).

5. History of Market Transformation

Since 2000, the Energy Planning Policy Office, Thailand had subsidized 21 hotels for changing from electric heater hot water system to heat pump but not any more until 2010 with roughly same amount of subsidy from the Department of Alternative Energy and Efficiency. The pilot cases of subsidy cannot transform the market because the sales growth of the electric shower unit water heater has been increasing continuously.

The attempt of having green label for the product is not the absolute problem solving and might be the wrong direction causing promotion of electric shower unit water heater. Australia has reversed the direction by phasing out the electric shower unit water heater in domestic sector. The early phasing out would create long term accumulation of saving opportunity.

6. Future Scenario

The installed power plant capacity in economies in APEC is expected to be around twofold in next 20 years like the scenario of Thailand that needs 50,000 MW compared to the existing 25,000 MW installed capacity. For Thailand, the sales of the electric shower unit water heater is estimated approximately 500,000 units per year converting to around 2.5 kW × 500,000 units or 1.25 MW. The power supply or generation for this consumption could be reduced to one fifth by substituting with the hot water compact heat pump or hot water solar collector. For the whole picture, phasing out might not be easy to start up because of the existing contribution of the manufacturer of the electric shower unit water heater for economics. In the long run the disappearing of manufacturers of the electric shower unit water heater will be replaced by the new manufacturers of the substitution goods. If there is no phase out of the electric shower unit water heater, the slow transformation run into the certain misleading e.g. the overstatement of the coefficient of performance, the lacking of performance testing standard and standard testing facilities, importing of cheap compact heat pump or hot water solar collector which has low coefficient of performance, or selling of local made low quality of compact heat pump or hot water solar collector.

7. Proposed Framework for Pilot Project

Before the implementation of real phase out for the country there might be some pilot cases for others as drafted in table 1.

8. Phase out Plan

The abrupt change of phasing out is not good for the stakeholders because of the limitation in the adjustment to the change. The first thing is to announce the plan of phase out. The second step is to stop the import of the electric shower unit water heater. The third step is to promote the pilot case to the stakeholders. The fourth step is to announce the performance testing

organization and vendor list. The fifth step is to stop the manufacturing. The eighth step is to give some incentive to domestic sector. The ninth step is to evaluate the situation and feedback. The last step is to announce the regulation of phase out. Each step can be yearly or every half year.

Table 1 Phase out pilot plan

Work plan/(output)	Beneficiaries	Activities/ (evaluation)	Communication (linkage)
(1) Project Setting Month 1-2 (Staff)	Project	Recruitment of staff, (name list)	Website and announcement (project concept on website)
(2) Promotion period Month 3-4 (Report and list of stakeholders)	consumers, designers, contractors, regulators, and manufacturers	Distribution of project information to stake holders (brochure and 200 participants)	Seminar (brochure file on website)
(3) Application Month 5-6 (Identification of pilot project)	Consumers	Searching for pilot to be subsidized 50% of total (2 pilot cases)	Team meeting and seminar (announcement on website)
(4) Implementation Month 7-8 (Contract for installation)	Manufacturer and contractor	Open for contractor bidding on the installation of the substituted product (2 installed sites)	Contractor meeting (open site visit)
(5) Monitoring and evaluation Month 9-10 (M&E report)	Project	Compare the planned activities and the progress (draft final technical and financial report)	Site visit (Guideline for buyer on website)
(6) Dissemination Month 11-12 (Frame work of phasing out)	consumers, designers, contractors, regulators, and manufacturers	Dissemination of the possibility and frame work of phasing out (final report and 200 participants)	Conference (country can be mentor for others)

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