(※)This is a English translation of the HPTCJ's News Release in Japanese.

News Release

16th Jan. 2015

Heat Pump & Thermal Storage Technology Center of Japan

Primary energy saving effect by increasing diffusion of Heat Pumps

Heat Pump & Thermal Storage Technology Center of Japan (Chuo-ku, Tokyo; Chairman: Hiroshi Komiyama), a general incorporated foundation that endeavors to promote heat pump and thermal storage systems※1 that contribute greatly to measures for saving energy and mitigating global warming and are recognized as the equipment to use renewable energy in Europe, has unveiled its forecast for diffusion of heat pump equipment till FY2040 and estimated primary energy saving effects in conjunction with widespread use of such equipment and systems.

※1：A heat pump is a technology to utilize renewable energy by harnessing "heat" existing in the nature such as the air for application to air-conditioning, hot-water supply, etc. The technology contributes to prevention of global warming by replacing the traditional burning systems. Also, the combined use of thermal storage system suppresses power consumption during the electricity demand leveling hours; thus, enabling operation responding to the needs of not only the demand-side but also the supply-side (demand response, etc.).

○ Primary energy saving effects by increasing diffusion of heat pumps

If boilers, etc. that meet the heat demands in private sector (residential and commercial sectors) and industrial sector are replaced by the heat pumps, estimated primary energy saving effects are as follows (figures in the parenthesis are the crude oil equivalent) ※2:

- ✓ In FY2020：▲283,000 TJ (▲7.3 million kL)
- ✓ In FY2030：▲697,000 TJ (▲18 million kL)
- ✓ In FY2040：▲902,000 TJ (▲23.3 million kL)

※2：Compared with those of FY2012. Calculation based on calorie basis.
As for electricity, primary energy (power generation efficiency is taken into account) is used.

In comparison with the FY2012 primary energy supply (including transportation), in energy consumption at least about 3.5% reduction will be achieved (as of FY2030). So by diffusion of heat pump equipment that is to say focusing in heat usage sector, there is significant energy conservation which could be achievable.

The effect to the FY2012 domestic final energy consumption ※3 is calculated as follows, as a result more than 8% reduction (as of FY2030) would be achieved in comparison with final energy consumption of the private and industrial sector.

Effect toward final energy consumption with primary energy saving effects by increasing diffusion of heat pumps

	FY2020	FY2030	FY2040
Residential	▲7.2%	▲19.2%	▲24.6%
Commercial	▲2.5%	▲6.8%	▲8.8%
Industrial(Including agriculture)	▲2.9%	▲5.1%	▲5.4%
Total of private and industrial	▲3.6%	▲8.2%	▲9.8%
Total(Including transportation)	▲2.8%	▲6.3%	▲7.6%

※3：Compared with those of FY2012. Calculation based on calorie basis.
As for electricity, secondary energy (1kWh=3.6MJ) is used.

○ Breakdown of primary energy saving effects by increasing diffusion of heat pumps (by fiscal year for each application)

In comparison with the reference year (FY2012), the breakdown of primary energy saving effects by increasing diffusion of heat pumps by sectors (residential, commercial, industrial and agricultural sectors) and by applications (hot water supply, space heating / cooling, heating, etc.) is as mentioned below:

Breakdown of primary energy saving effects by increasing diffusion of heat pumps by sectors and by applications comparison with FY2012 (Units: TJ/year)

			FY2020	FY2030	FY2040
Residential			**127,937**	**338,936**	**455,393**
	Hot water supply		57,230	145,194	188,300
	Air conditioner		70,707	193,742	267,093
Commercial			**64,889**	**174,495**	**231,891**
	Hot water supply		3,016	46,370	82,001
	Air conditioner (High efficiency)		61,873	128,125	149,890
		Central	49,296	98,660	110,901
		VRF	12,577	29,465	38,989
Industrial			**89,532**	**182,668**	**213,024**
	For space heating / cooling		35,956	62,660	71,961
	For heating		14,541	29,121	36,460
	For low temperature drying		22,703	41,845	48,280
	For high temperature use		16,333	49,042	56,324
Agricultural			**396**	**1,190**	**1,362**
Total			**282,754**	**697,289**	**901,670**

Though the periods when primary energy saving effects become obvious are different, depending on the differences in the years when the applicable heat pump equipment are brought to the market as well as their diffusion curves, which vary by sectors or applications, if the heat pump equipment get more widely adopted as anticipated, a significant energy conservation would be achievable.

In this estimation, major items changed from the study in the previous years are as follows:

- Reference year has been changed to FY2012.
  (Reduction from FY2012 has been calculated.)
- The forecast period has been extended to FY2040.
- Diffusion curves have been changed with reflecting the most recent introduction trend of heat pump equipment.
- Calculation is performed with taking into account the trend of efficiency that incorporates the most recent efficiency of heat pump equipment.
  (For some equipment, the efficiency has been changed to the efficiency in a certain period such as Annual Performance Factor (APF), annual heat retention efficiency of hot water, etc.)
- Regarding household air conditioners and multi-split type air conditioners for buildings, an energy-saving effect through enhanced efficiency by replacing the existing heat pump equipment with the latest type equipment is added.

As for other details such as anticipated demand, setting of heat pump diffusion rates, calculation, etc., please refer to the attachment below:
Attachment: Survey on Heat Pump Diffusion Forecast

Contact;
Heat Pump & Thermal Storage Technology Center of Japan
Hulic Kakigaracho BLDG 6F 1-28-5 Nihonbashi Kakigara-cho Chuo-ku, Tokyo 103-0014, Japan
Tel: +81-3-5643-2404 Fax: +81-3-5641-4501