

December 19<sup>th</sup> 2013

The Japan Refrigeration and Air Conditioning Industry Association  
Heat Pump and Thermal Storage Technology Center of Japan

**Domestic shipments hit 4 million units for “EcoCute”  
Residential natural refrigerant heat pump water heaters**

The Japan Refrigeration and Air Conditioning Industry Association and the Heat Pump and Thermal Storage Technology Center of Japan have been working to promote the use of EcoCute\* residential natural refrigerant heat pump water heaters. We are pleased to announce that total shipments of these products exceeded 4 million by the end of October 2013 (4,008,000 units).

EcoCute delivers significantly improved energy efficiency with energy-saving heat pump technology that uses thermal energy collected from the surrounding air for heating water, which accounts for about a third of residential energy consumption. Since the introduction of this world-leading product in 2001, their capabilities have been improved based on customer needs, making them more multifunctional, with features such as the ability to support floor heating, and providing more space-saving models. As a result, EcoCute has been extremely popular, with accumulated shipments exceeding 2 million units in October 2009, 3 million in August 2011, and nearly 1 million units more over the next 2 years.

We will continue to encourage better energy efficiency by promoting EcoCute, with superior energy-saving performance that is expected to contribute to climate change mitigation.

*\* Electric power companies and water heater manufacturers use the term “EcoCute” to refer to natural refrigerant oxygen heat pump water heaters.*

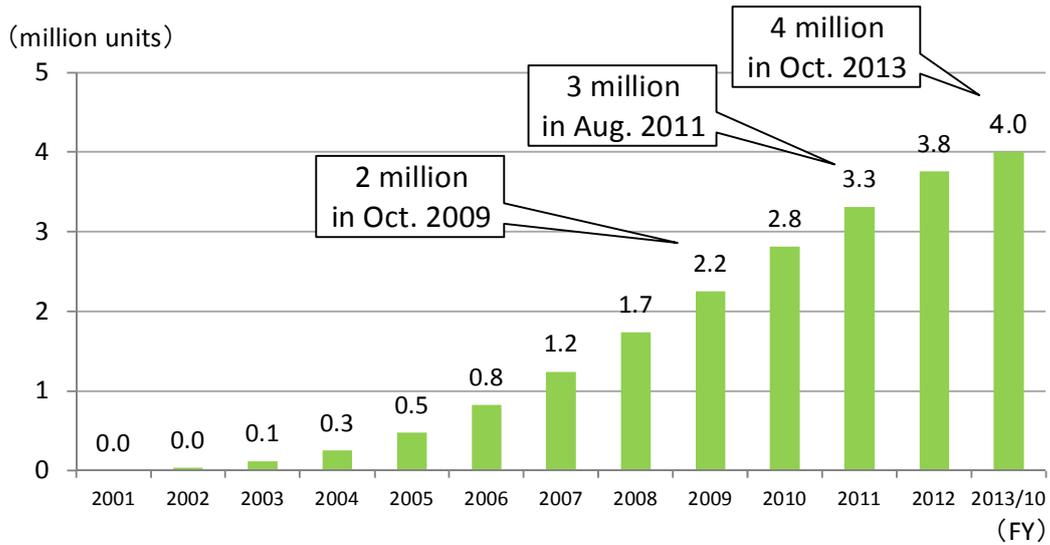
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## 1. Transition of EcoCute total shipment



## 2. How EcoCute works

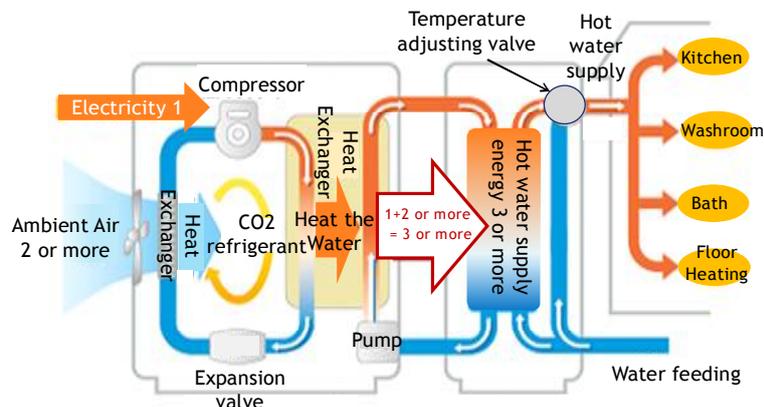
EcoCute is a water heating system that uses the heat pump principle. Water is heated by collecting ambient heat by heat exchanger into the CO<sub>2</sub> refrigerant and then using a compressor to raise the temperature of the refrigerant. Because it makes effective use of heat extracted from the air, the system can generate heat energy 3 times greater than the input electrical energy. This results in advanced energy efficiency and lower CO<sub>2</sub> emissions than conventional water heaters.



Heat pump unit



Hot water tank unit



Heat pump unit

Hot water tank unit

### 3. Survey Result: Customer intentions and satisfaction with EcoCute

The Japan Refrigeration and Air Conditioning Industry Association conducted a survey to analyze customer intentions and satisfaction among those who purchased EcoCute after the Great East Japan Earthquake in 2011.

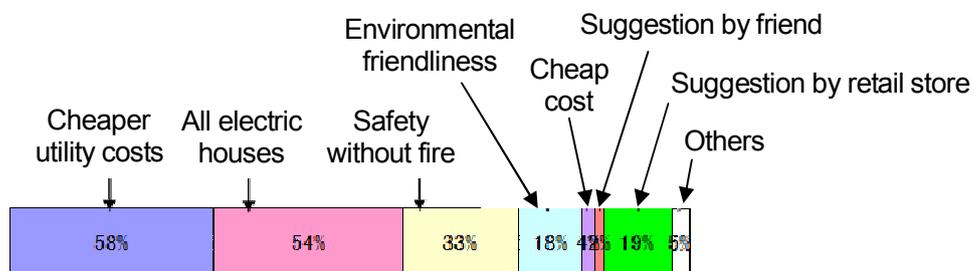
The results were as follows:

- Those who purchased EcoCute said that their primary motivations were expectations of “cheaper utility costs,” “safety,” and “environmental friendliness.” Satisfaction after purchase was extremely high (96%), suggesting that the product met these expectations.
- At the same time, not many users knew that EcoCute can be used to produce hot water as long as tap water is available—even during a power outage—or that this hot water can be used in disasters or other emergencies. This suggests room for improvement in terms of product promotion.
- Although demand for EcoCute has remained low since the Great East Japan Earthquake, the survey results suggest that its superior energy efficiency is likely to generate higher demand in the future.

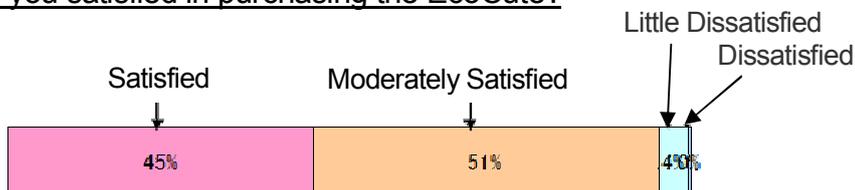
※Survey result URL (In Japanese)

[http://www.jraia.or.jp/product/heatpump/i\\_enquete.html](http://www.jraia.or.jp/product/heatpump/i_enquete.html)

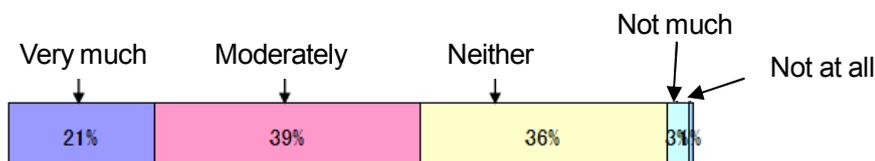
#### What was the motivation when purchasing EcoCute? (Multiple Answers)



#### Are you satisfied in purchasing the EcoCute?



#### Are you willing to recommend your friend about EcoCute?



- Recent heat pump trends
  - The Japanese Cabinet recently approved a government ordinance to partially revise the Order for Enforcement of the Act on the Rational Use of Energy (Energy Saving Act) (the Top Runner Program). The purpose of the revision was to add new equipment that is particularly needed for ensuring the rational use of energy based on the Energy Saving Act. Starting on March 1, 2013, the EcoCute electric water heater system was added to the Top Runner Program under the Energy Saving Act (goal-achievement reference year: 2017). Manufacturers who produce or import 500 or more EcoCute units per year is required to deliver specific energy consumption features based on the Top Runner product, which is the product with the best energy consumption features at the reference time.
  - Amendments to the residential energy-saving standards were enacted in October 2013. Because the previous standards primarily focused on a simply building envelop performance, two criteria was added to the new standards: one is advanced building envelop performance standard including heat insulation and thermal barrier performance and the other is primary energy consumption standard which comprehensively estimates energy saving performance consisting of the efficiency of each facilities and the introduction of renewable energy sources. The new standards which will be obligatory by 2020 have been under investigation. With this move to assess energy consumption performance, a highly-efficient heat pump unit is an effective means of satisfying the new standards.
  - In June 2013, the Heat Pump and Thermal Storage Technology Center of Japan calculated the potential for reducing primary energy consumption through the increased use of heat pumps and released the results to the public.<sup>1</sup> This study concluded that using heat pumps as substitute for boilers used to meet thermal demands<sup>2</sup> in the consumer and industrial sectors could result in a primary energy reduction (crude oil equivalent) of around 270 million kiloliters (approximately 40%).

<sup>1</sup> Press Release <http://www.hptcj.or.jp/e/learning/tabid/361/Default.aspx>

<sup>2</sup> Residential space heating & hot water supply, commercial hot water supply, and industrial heating (only the temperature range that could be offset by using a heat pump was selected; this accounts for about 49% of the energy consumed by industrial boilers).