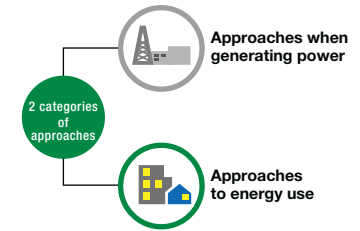




## Protecting the Earth from global warming

# Development and prevalence of high-efficiency products



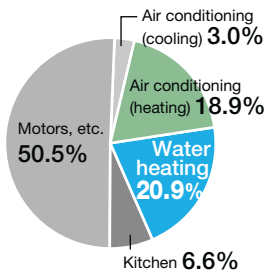
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## TEPCO approaches

### Related information

#### Breakdown of CO<sub>2</sub> emission sources in the home

Air conditioning (heating) and water heating account for more than 40% of CO<sub>2</sub> emissions from the home, and holds the key to CO<sub>2</sub> reduction in the residential sector.



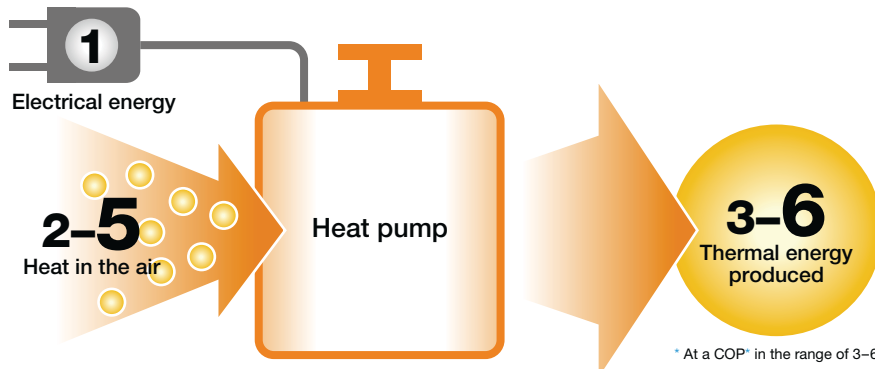
Source: Data from National Institute for Environmental Studies

### Heat pumps in extensive use to save energy in water heating and air conditioning

TEPCO is taking action to lower CO<sub>2</sub> emissions not only in the stage of power supply but also in that of power use by customers.

Water-heating and air-conditioning systems powered by heat pumps do much to save energy in the office and home. They can produce thermal energy amounting to anywhere from three to six times as much as the electrical energy they consume.

### Heat pump system

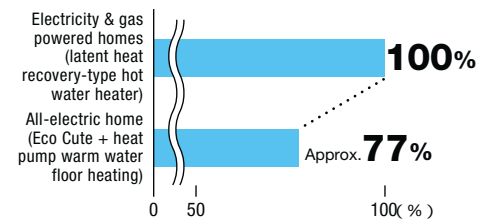


### CO<sub>2</sub> reduction in the home: All-electric homes that use heat pumps

Eco Cute water heaters use a high-efficiency heat pump which significantly reduces CO<sub>2</sub> emission compared to conventional combustion-type water heaters. They play an important role in at-home efforts toward the creation of a low-carbon society.

#### Comparison of CO<sub>2</sub> emissions from the home

##### CO<sub>2</sub> emissions



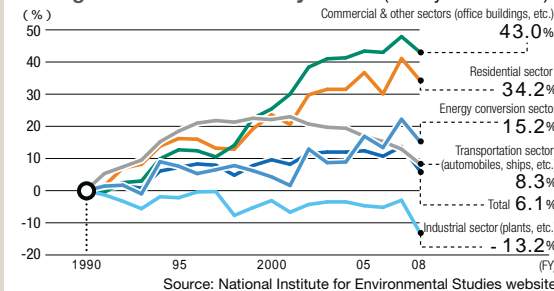
##### Calculation conditions

1. Building: wood construction, detached home with two floors, 4LDK layout, about 122m<sup>2</sup> 2. Family members: 4 3. Insulation performance: Equivalent to Next-Generation Energy-Saving Standard Region IV 4. Yearly load: cooling 8.0GJ/year; heating 6.3GJ/year; floor heating 2.4GJ/year; cooking 2.0GJ/year; hot water 20.1GJ/year; 24-hour ventilation, etc. 1.6GJ/year; light and outlets 10.8GJ/year 5. CO<sub>2</sub> emission intensity: electric power (0.332kg-CO<sub>2</sub>/kWh, TEPCO FY2008 results), city gas (enforcement ordinance for Law Concerning the Promotion of Measures to Cope with Global Warming) 6. Device efficiency

	Electricity- and gas-powered home	All-electric home
Cooling	4.23 (Air conditioning)	
Heating	4.56 (Air conditioning)	
Floor heating (latent heat recovery-type hot water heater)	0.87	3.73 (Heat pump warm water floor heating)
Cooking	0.56 (Gas range)	0.90 (IH cooking heater)
Hot water (latent heat recovery-type hot water heater)	0.95	3.2 (Eco Cute)

### Eco information

#### Change in CO<sub>2</sub> emissions by sector (base year: FY1990)



### CO<sub>2</sub> emissions from homes and office buildings are rising.

In Japan, CO<sub>2</sub> emissions have risen from the civil (offices, homes, etc.) sector and transportation sector. Each and every one of us must become more aware of the need to conserve energy.

TEPCO is promoting energy conservation in homes, offices, and plants through extensive application of high-efficiency heat pump system.

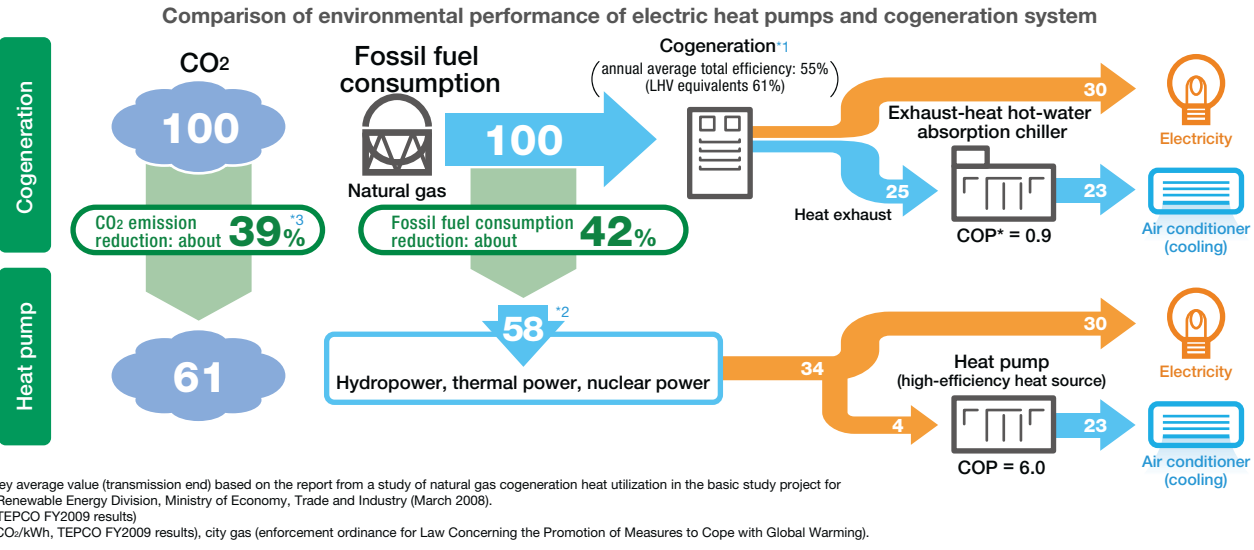


Higher energy efficiency in the business and industrial sectors

Heat pumps can also save energy in office buildings and factories. TEPCO proposes high-efficiency energy systems centered around them.



Heat pump (turbo chiller)



Terminology

**COP (coefficient of performance)**

The coefficient of performance indicates the efficiency of equipment. A higher COP indicates a higher energy-saving performance.

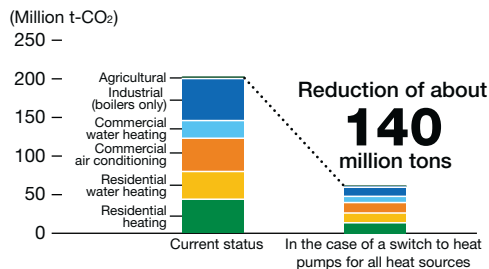
**ESCO**

Abbreviation for 'Energy Service Company'

The spread of heat pumps may be expected to reduce about 140 million tons of CO<sub>2</sub> emissions

Approximately 140 million tons of CO<sub>2</sub> emissions in the consumer (commercial/residential) and industrial sectors can be reduced if all conventional air-conditioning and water-heating systems powered by heat pumps. This accounts for about 10% of the total CO<sub>2</sub> emissions in Japan.

Potential CO<sub>2</sub> reductions enabled by heat pumps



Source: Estimates by Heat Pump and Thermal Storage Technology Center of Japan (HPTCJ)



Approaches by TEPCO subsidiaries

Providing "ESCO\* services"

Japan Facility Solutions, Inc. (JFS)

The company provides ESCO services for energy-saving measures in office buildings and plants at no initial investment and with effects guaranteed. By so doing, it assists the simultaneous reduction of CO<sub>2</sub> emissions and energy costs.