

# **Electrification for a Low Carbon Society**

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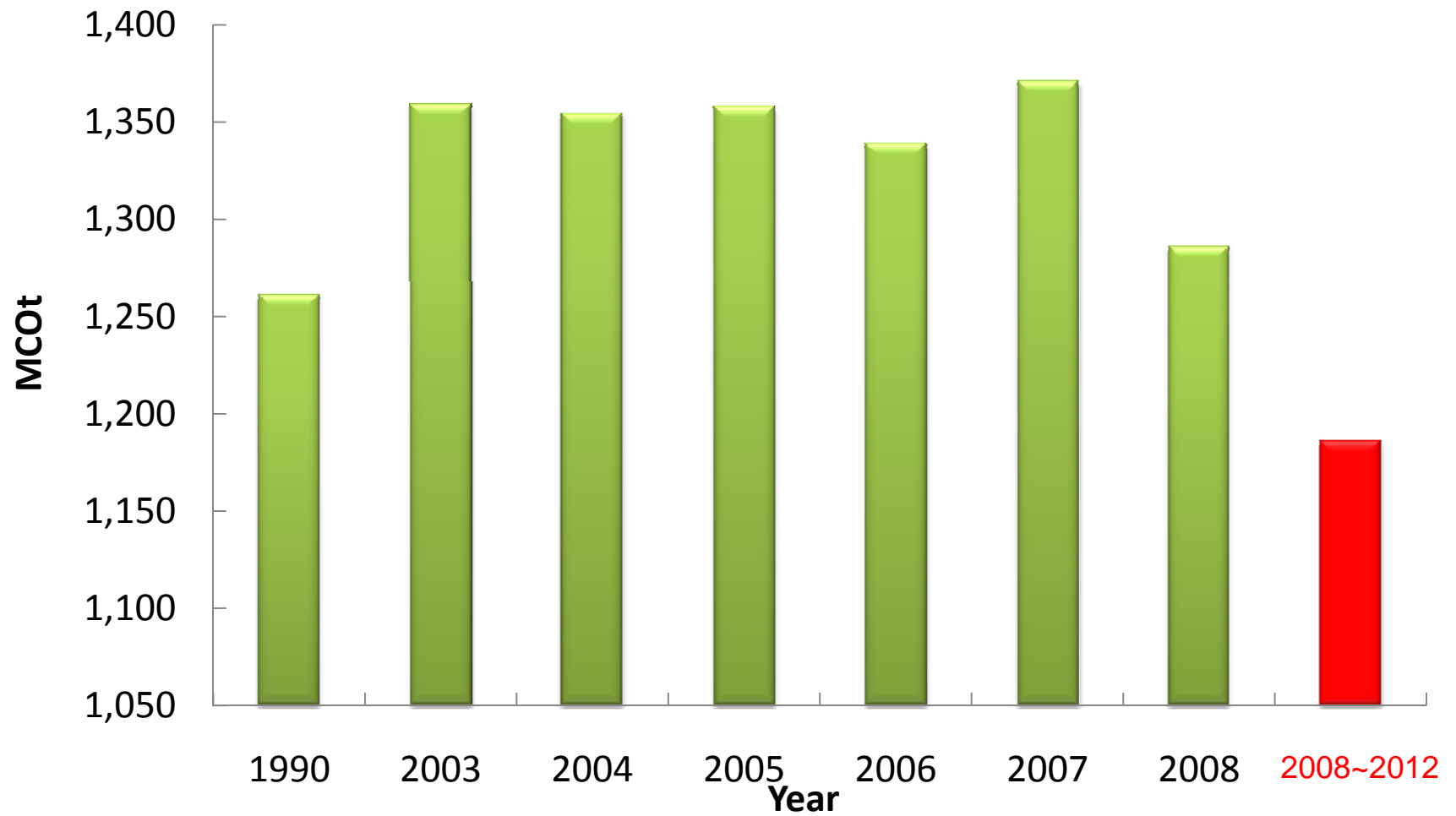
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# Outline

1. Status of Japan's CO2 emission
2. Electrification for Green Future
3. Heat Pumps

# Status of GHG in Japan



## CO<sub>2</sub> Identity

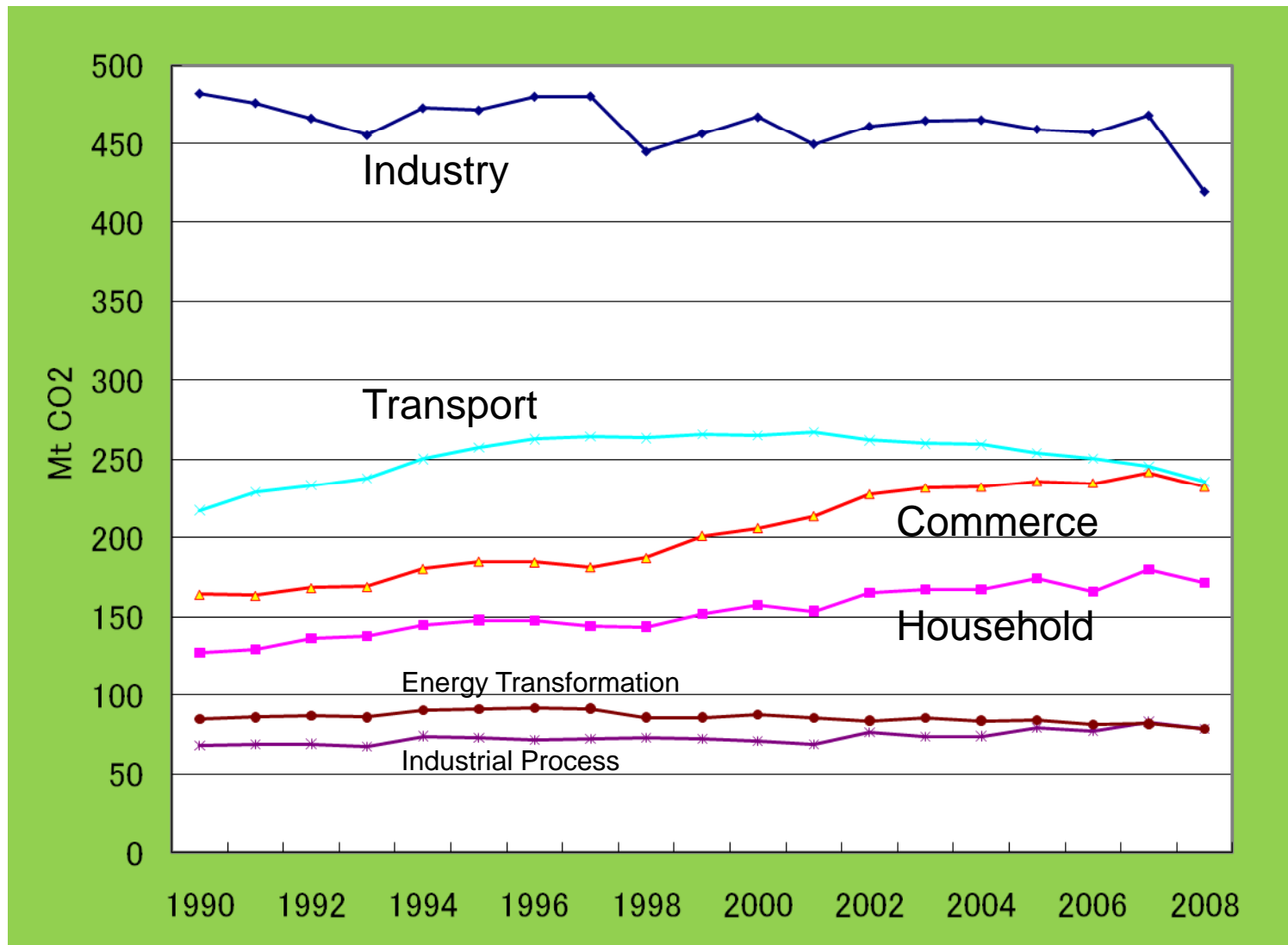
$$CO_2 = \frac{CO_2}{E} \frac{E}{GDP} GDP$$

$$\therefore \Delta CO_2 = \Delta \frac{CO_2}{E} + \Delta \frac{E}{GDP} + \Delta GDP$$

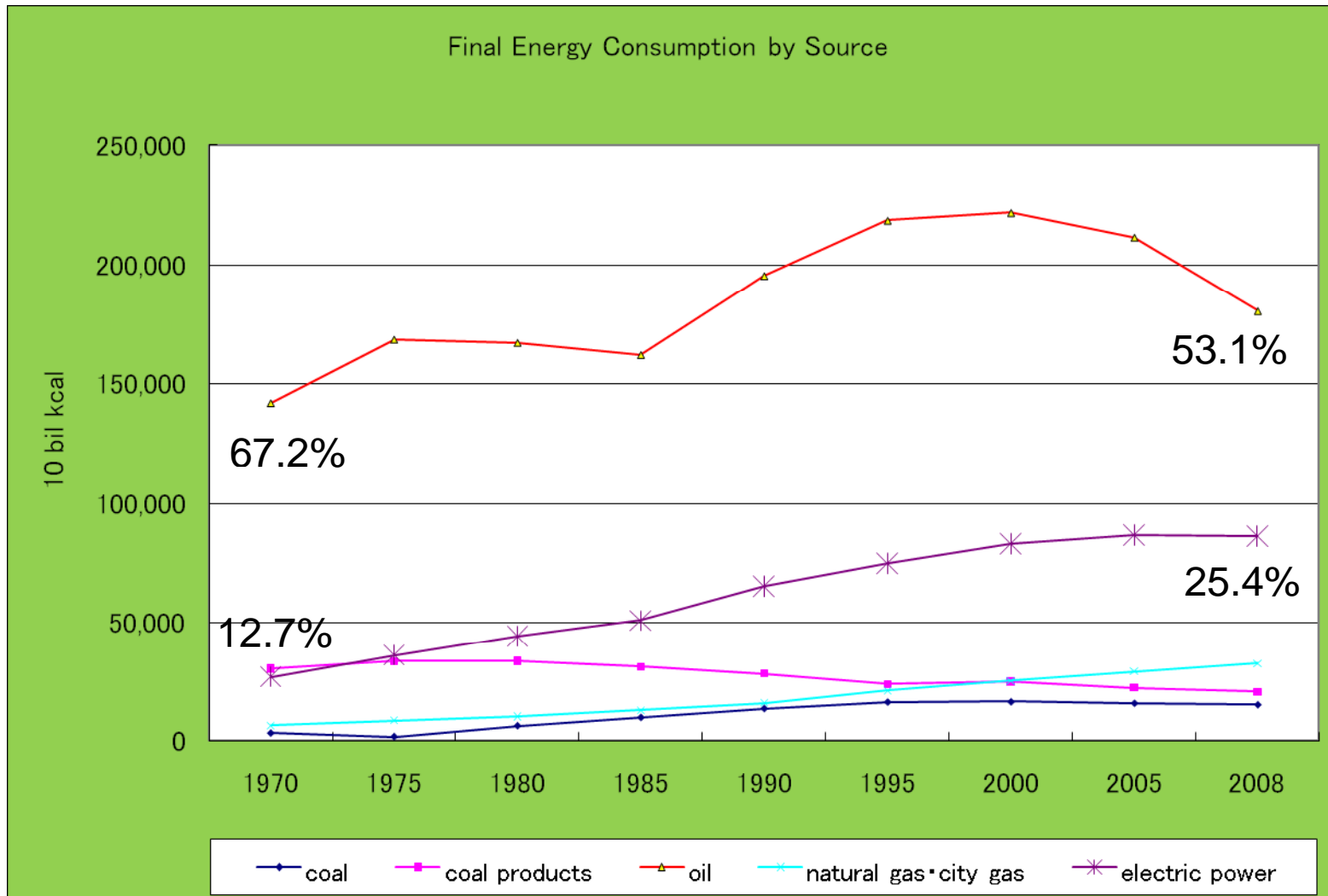
# Decomposition of Changes in CO2

	1990-2000	2000-2005	2007-2008	2005-2020	
				Aso	Hatoyama
$\Delta$ GDP	+1.2	+1.3	-3.7	+1.1	+1.1
$\Delta$ CO2/ Energy					
$\Delta$ Energy /GDP	-0.2	-0.5	-2.8	-2.3	-3.7
$\Delta$ CO2	+1.0	+0.8	-6.5	-1.2	-2.6

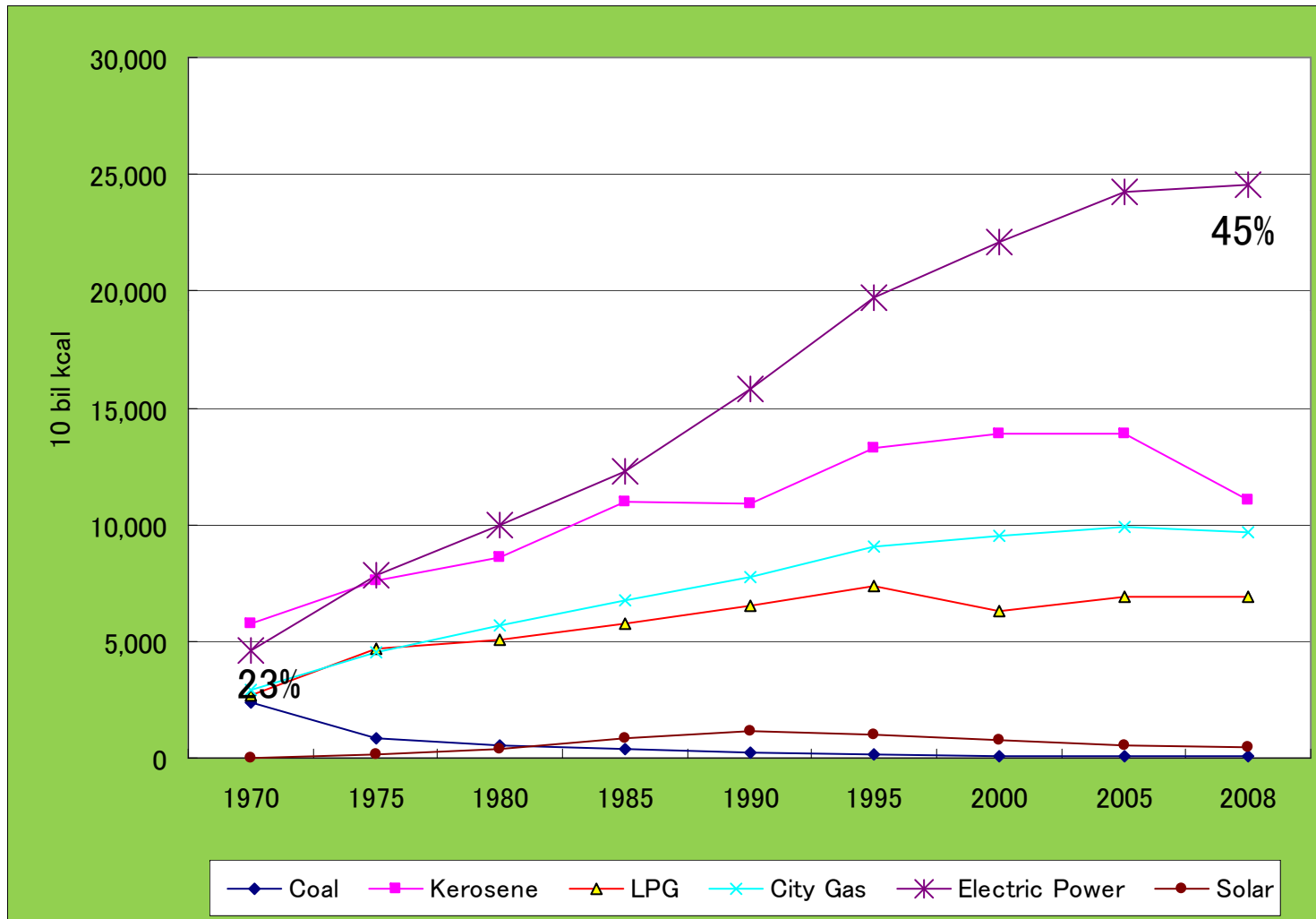
# CO2 Emission By Sector (1990-2008)



# Electrification in Economies

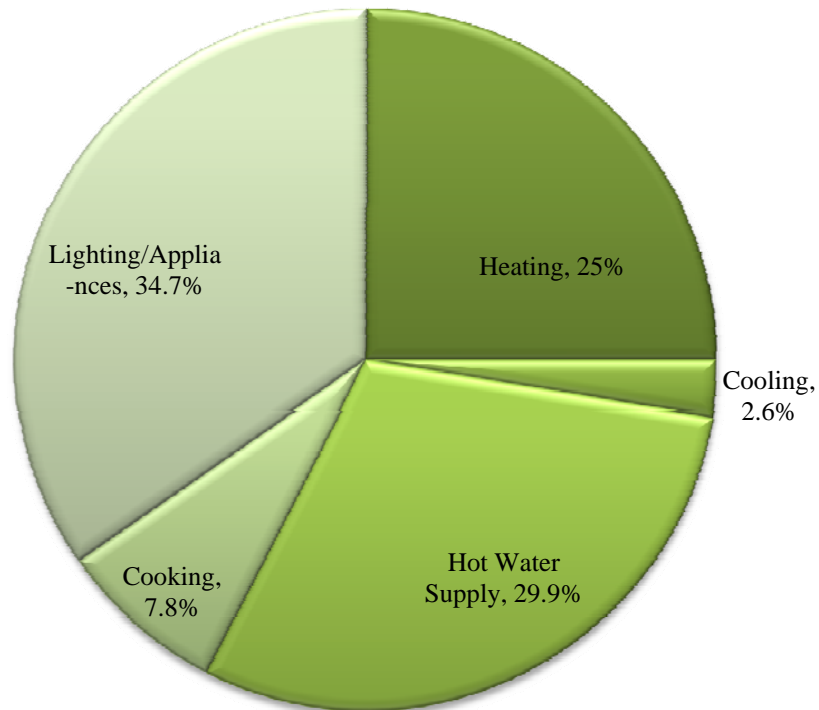


# Electrification in the Household Sector

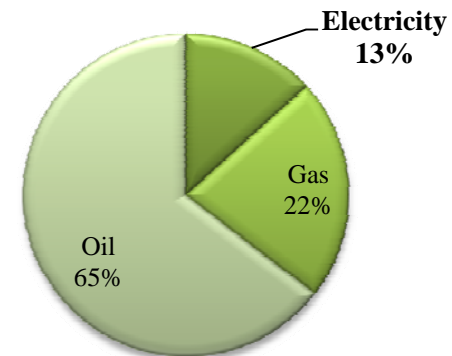




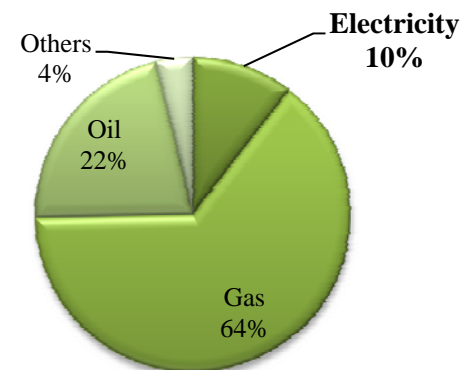
# Energy Use in the Household Sector (2008)



## Heating



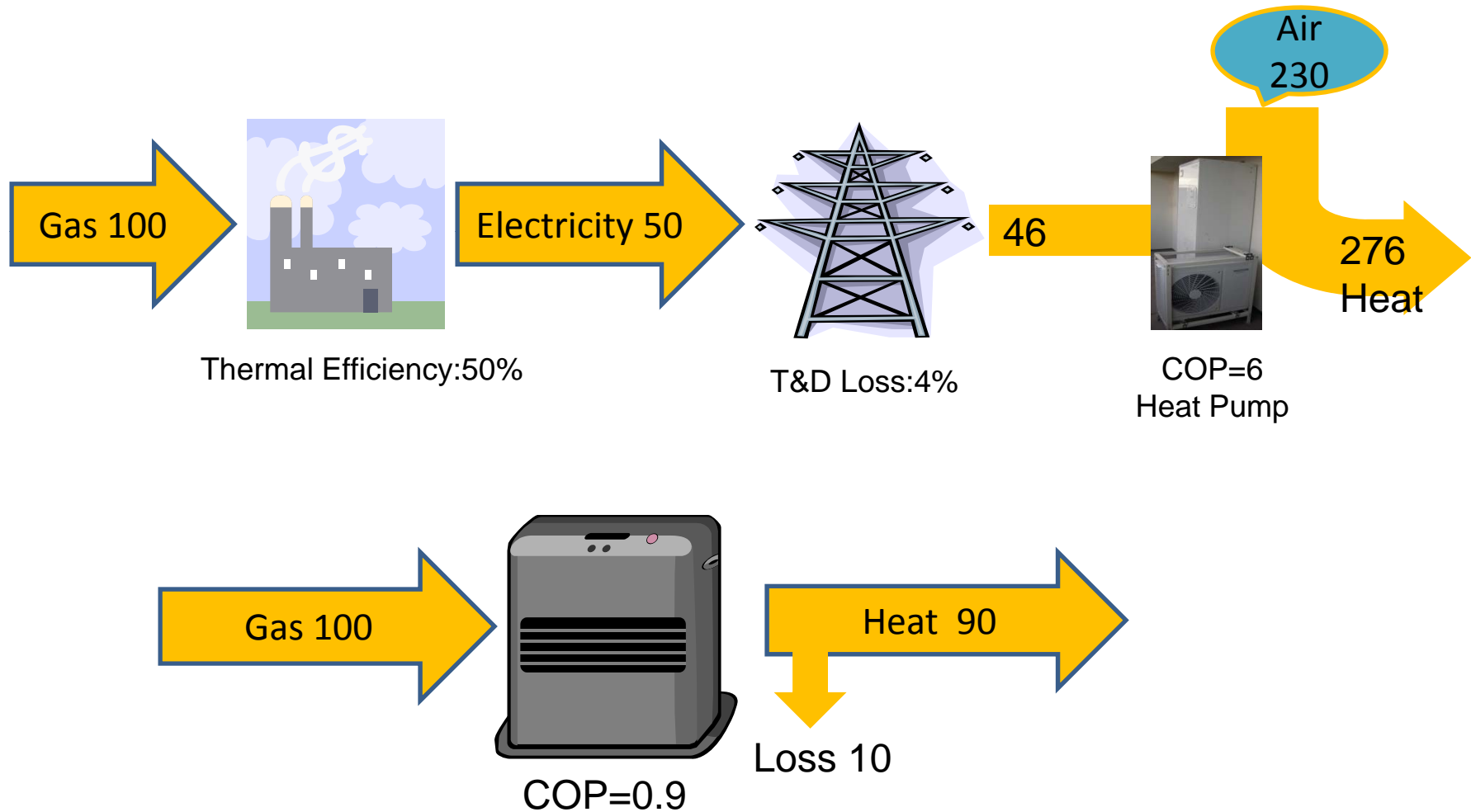
## Hot Water Supply



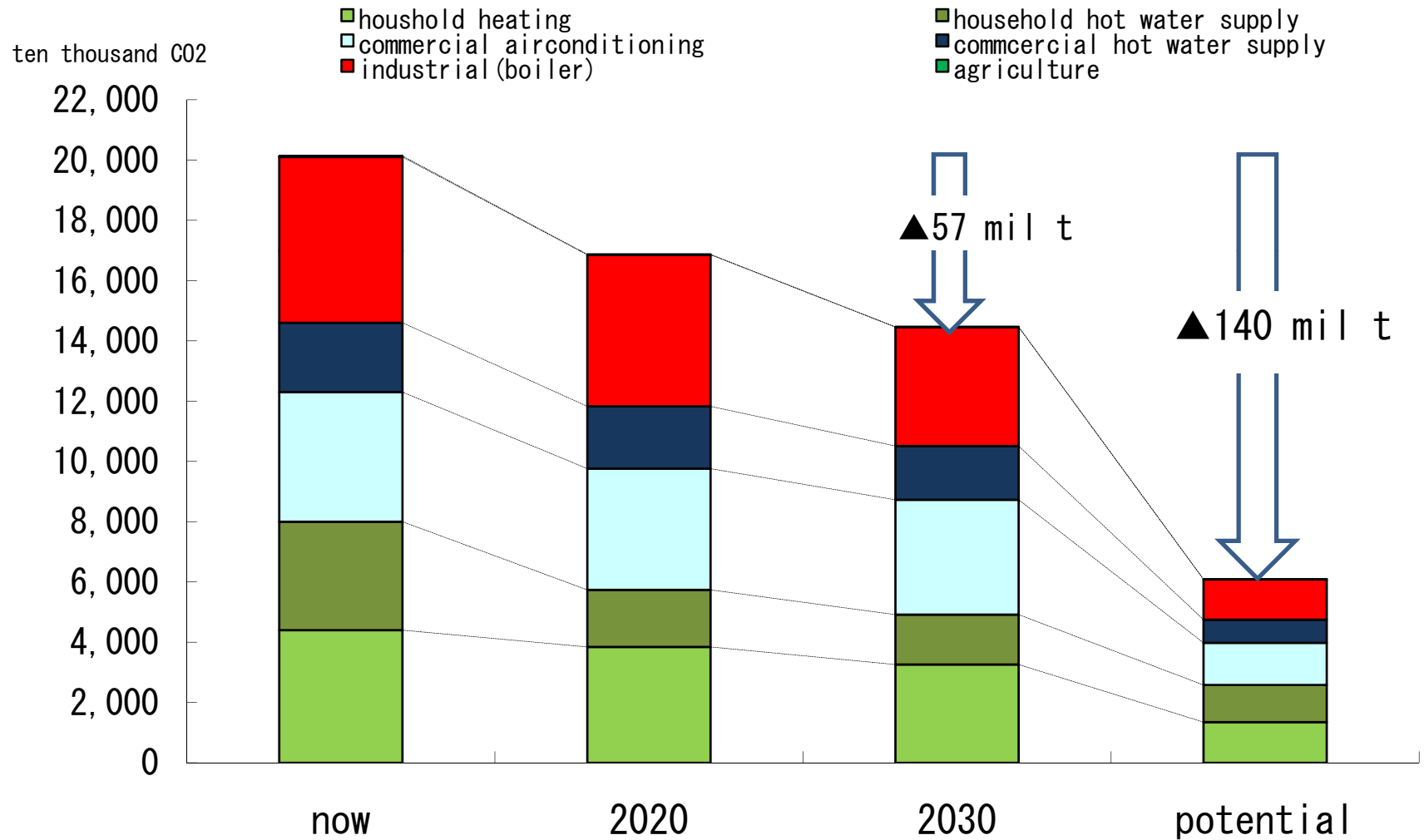
# Heat pump is Renewable

- Device to pump up heat with little electric power.
- Heat in the air is renewable resource for heating, cooling and hot water supply.
- Heat is used for generating electricity. Heat pump uses electric power to generate more heat.
- Grid electricity with heat pump is CHP.

# Heat Pump Is Clean and Efficient



# Potential CO2 Reduction by Heat Pump



Thank you for your attention!