Japanese Policies Related to New and Renewable Energy & Grid Integration

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Renewable Energy Policy in Japan

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Japan has implemented a variety of policy measures aimed at short-, medium- and long-term targets:

- R&D Support – beginning with Sunshine Project in 1970s
- Subsidy for Installation of Renewables
- RPS Act
- Promotion of Certificate of Green Power
- Voluntary Purchase of Surplus Electricity from Residences (by Electric Utilities)

Results: Succeeded in creating a primary market for renewables (especially in PV)
World's largest producer and leader in efficiency of PV

PV Deployment Target

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Action Plan for Achieving a Low-Carbon Society (*)
(Cabinet Decision, July 29, 2008)

-Installations: promote dramatic increase in solar power generation systems with target of increasing capacity 10-fold by 2020 and 40-fold by 2030

-Price: Reduce by half the current price of solar power generation systems within three to five years

Potential for Dramatic Deployment (even in APEC region)

Technologically many options are available:

- -Residential PV systems (80% of installed capacity in Japan)
- -Mega solar systems
- -Grid-independent systems
- -Others

(*) http://www.kantei.go.jp/foreign/policy/ondanka/final080729.pdf

Changes in Domestic Introduction Volume, System Price, and Power Generation Cost for PV Systems in Japan

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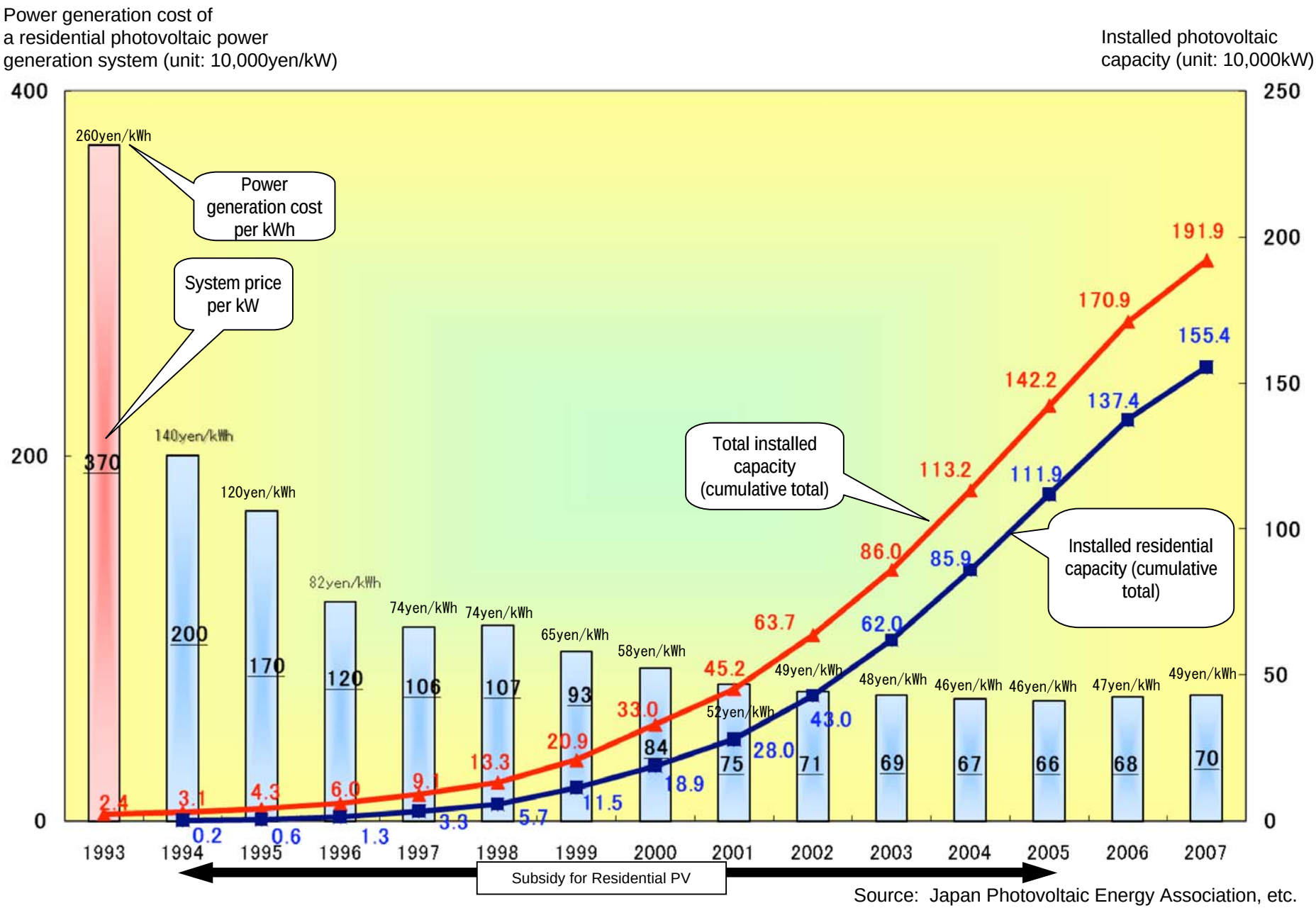

Source: Japan Photovoltaic Energy Association, etc.

Incentives for Renewable Energy Installations

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Residential PV Systems

Subsidy: ¥70,000 ($700) per KW
Start: January 13, 2009
Budget amount: ¥9 billion ($90M) (FY2008 supplementary budget)
¥20 billion ($200M) (FY2009 Government draft)

Commercial & Public Sector

Subsidy: 1/3 (commercial sector) or 1/2 (public sector) of installation costs
Budget Amount: ¥33.5 billion ($335M) (FY2008)
¥30.0 billion ($300M) (FY2009 Government draft)

Other Incentives

-Subsidy for residential fuel cell cogeneration systems (will start in FY2009)
-Tax incentive (for residential/commercial sectors)
-Subsidies for demonstration projects

PV Action Plan (November 2008)

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Ministry of Education, Culture, Sports, Science and Technology
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Promoting R&D, Standardization

Support to Installation

subsidies, taxation and voluntary schemes (Certificates of Green Power, etc.)
collaboration by several ministries to diffuse PV systems in various fields
(e.g., residences, railroads, tollways, educational facilities, public facilities,
large scale plants, local areas, etc.)

Regulatory Scheme

RPS (Renewables Portfolio Standard) Act
Act for Energy Conservation (encourage installations of PV systems to fill the requirement)

Industrial Strategy (under consideration)

Actual and Forecasted Energy Mix in Japan

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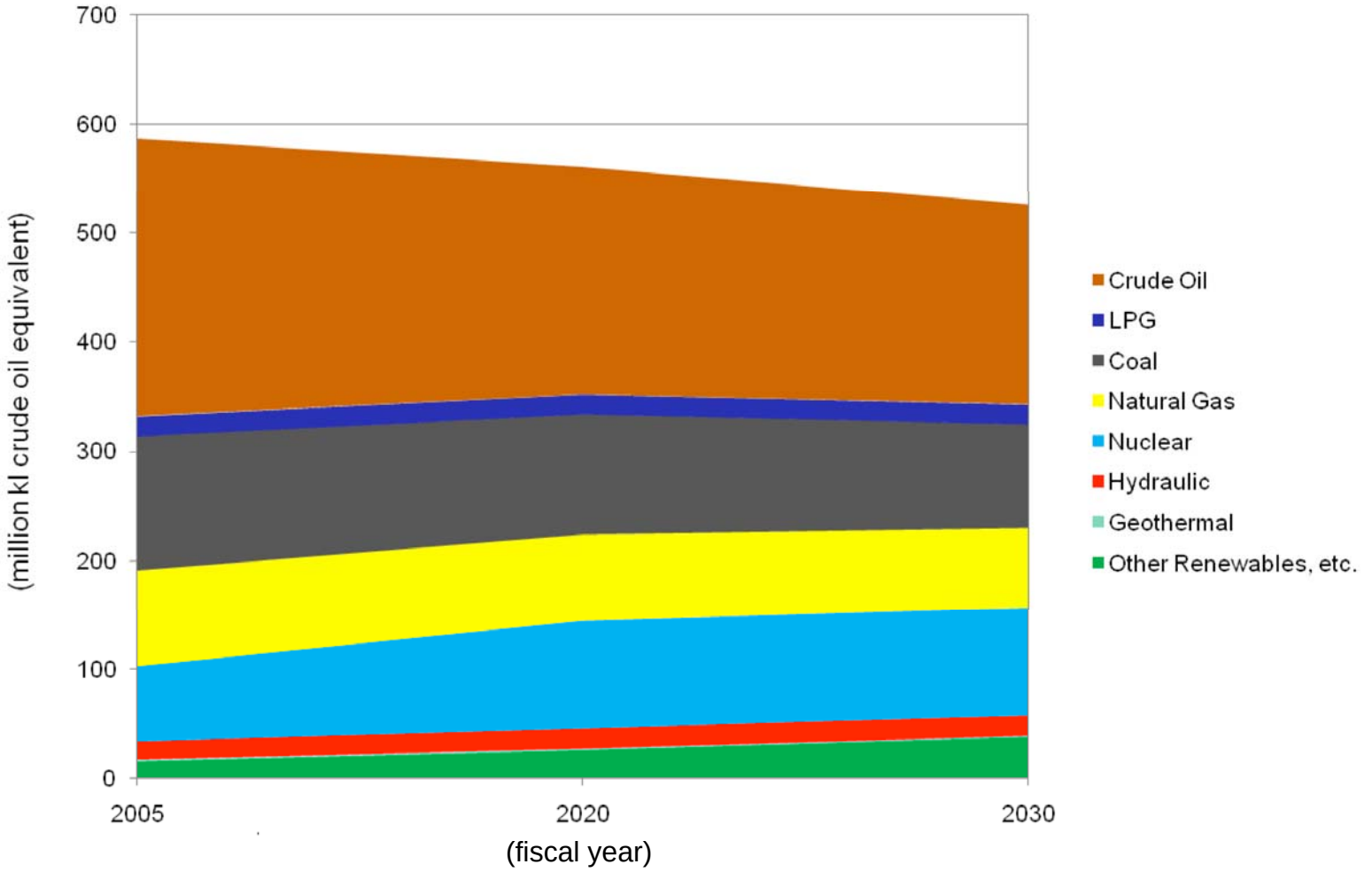

Source: Energy Outlook for Long-Term Supply and Demand (Maximum Introduction of Technology Scenario)

Actual and Forecasted Renewable Energy Usage in Japan

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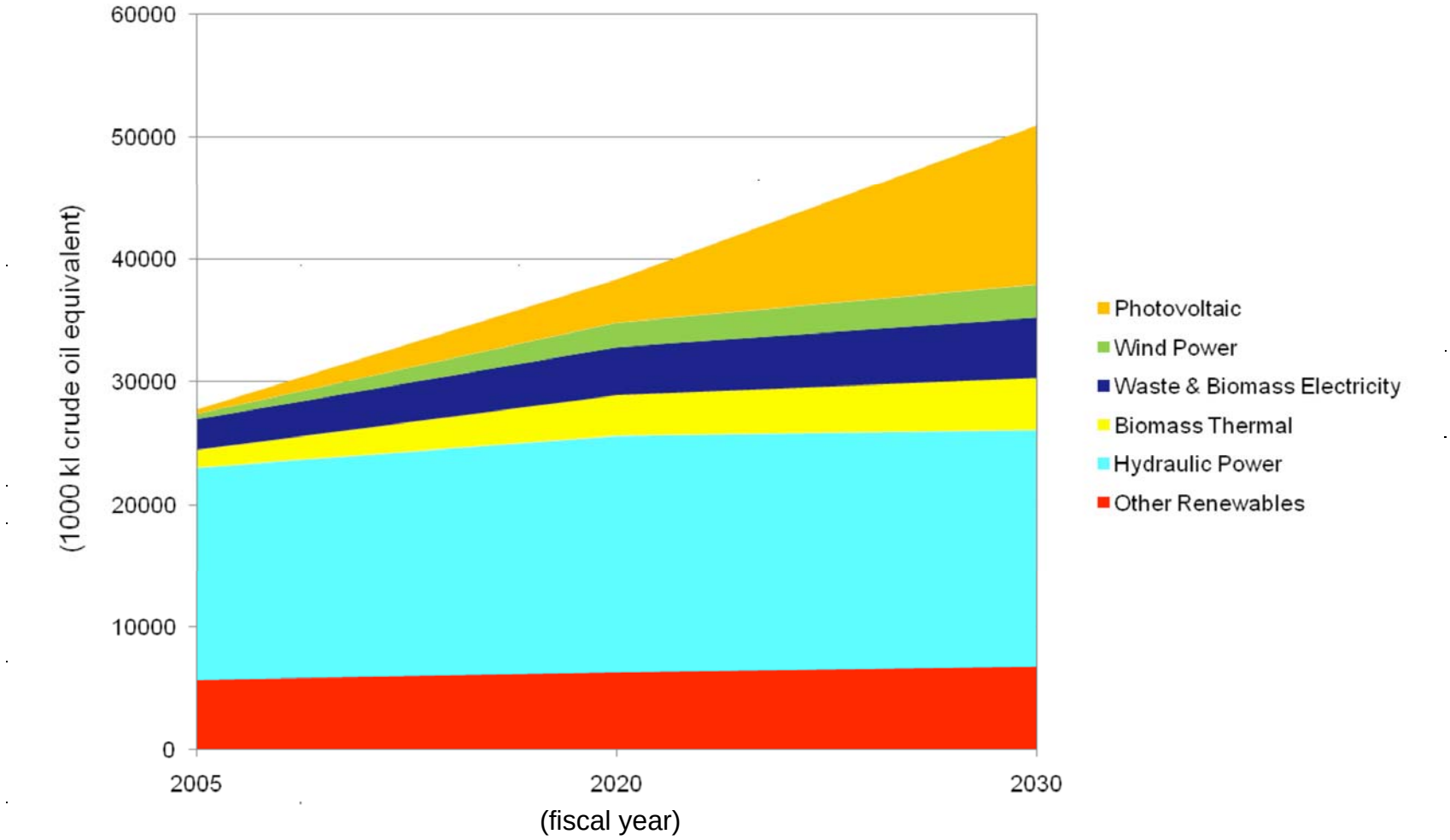

Source: Energy Outlook for Long-Term Supply and Demand (Maximum Introduction of Technology Scenario)

New Utilization Targets under RPS Law

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1. RPS Law (Special Measures Law on Use of New Energy by Electric Utilities or Renewables Portfolio Standards Law):

- Obliges electric utilities to use a fixed amount of new energy towards the aim of promoting the introduction of new energies (enacted in April 2003)
- Stipulates in Paragraph 1, Article 3 that the utilization targets for the subsequent eight years beginning in the said fiscal year shall be established every four years.

2. Course of deliberations

- Based on the above stipulation, a report was compiled in March 2007 following an examination launched in November 2006 by the RPS Law Subcommittee of the New Energy Committee, Advisory Committee for Natural Resources and Energy (Chairman: Kenji Yamaji, Professor at The University of Tokyo)

3. Key Points of Report

Utilization Target for Fiscal 2014

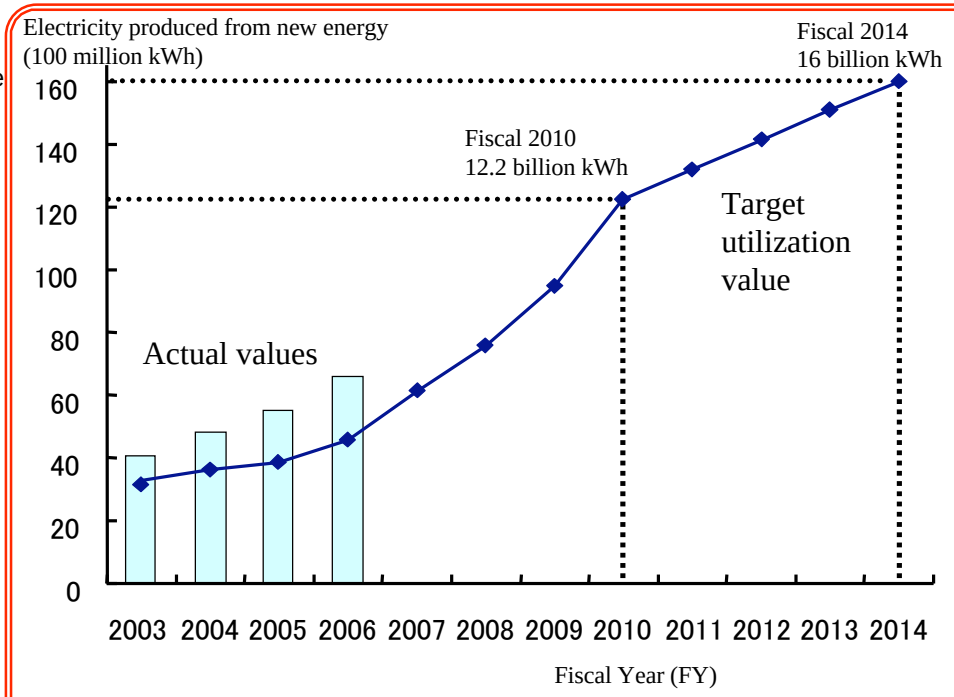
- The utilization target for fiscal 2014 was established at 16 billion kWh (figure on the right) as a "realistic and ambitious" goal.

Improvement of RPS Law System

- Photovoltaic power generation: A measure was introduced whereby electricity generated by photovoltaic power generation is recognized as twice its value for the period between fiscal 2011 and 2014.
- Small- and medium-scale hydro and geothermal power generation: Categories were expanded to include and positively approve forms of power generation where future growth is projected.
  - ∗Includes power generation using water for river maintenance with a capacity of 1,000 kW or less
  - ∗Geothermal power generation using hot springs
- Biomass power generation: Concerning the use of wood chips, an application standard that recognizes material recycling was added.

Government Measures

- In the future, the government will expand the potential for the introduction of new energy by reviewing various restrictions in addition to providing financial assistance for new energy.
- Particular efforts will be made to consistently tackle the following tasks:
  - ∗Promotion of nationwide measures to utilize Certificate of Green Power and other means
  - ∗Measures for the further dissemination of wind power generation including policies on system interconnection, etc.
  - ∗Promotion of technological development and other steps to reduce the cost of photovoltaic power generation



Utilization targets

	Fiscal 2006 (actual generated values)	Fiscal 2010	Fiscal 2014
100 million kWh	65.1	122.0	160.0

Generation & Transmission Capacity

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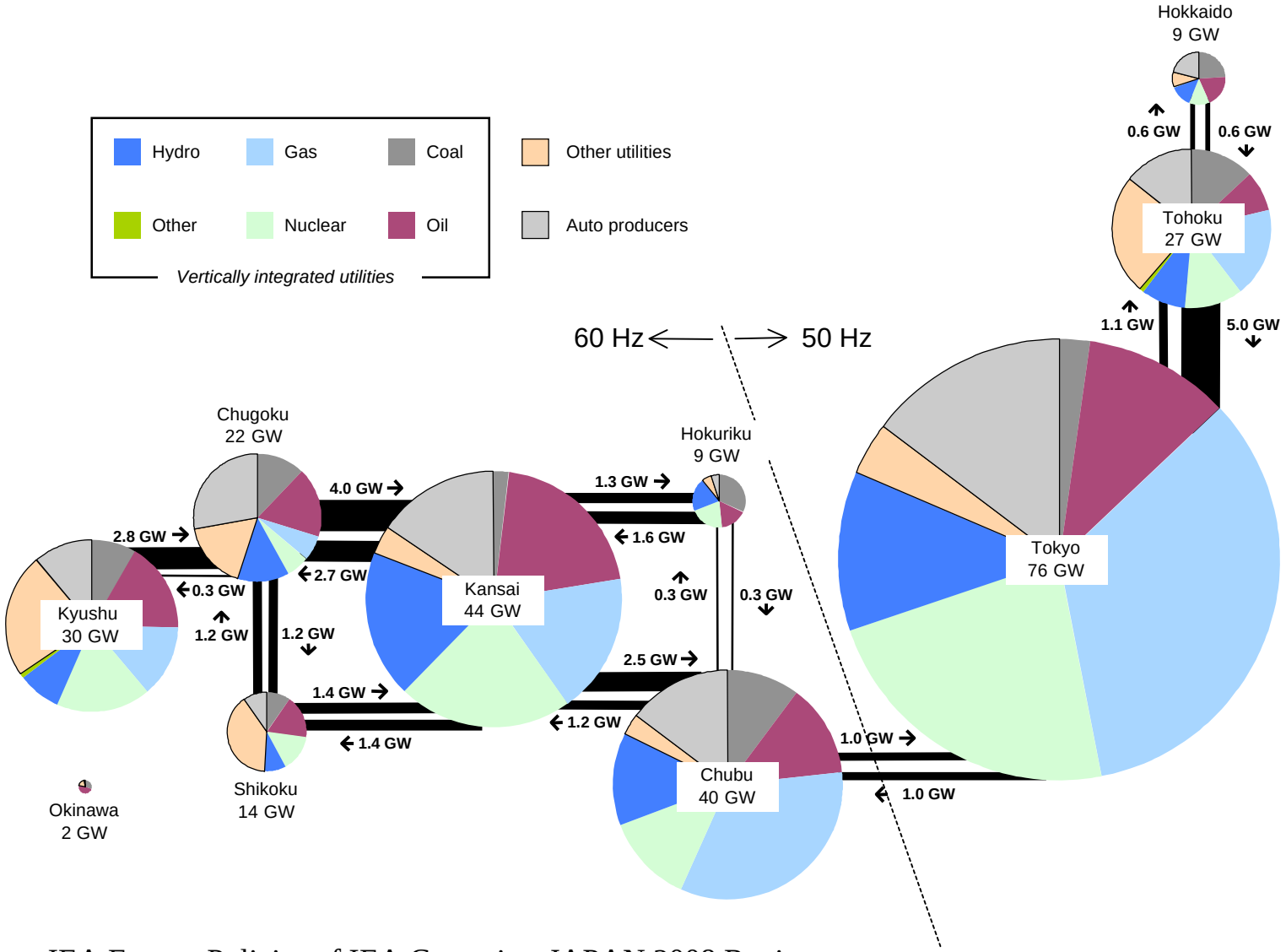

Source: IEA Energy Policies of IEA Countries, JAPAN 2008 Review

Comments from Electric Utility Association

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Press Conference by Chairman of FEPC (May 23rd, 2008)

The study suggested that, over Japan, **we might accept the interconnection of up to 5 million kW of wind power** (approximately three times as large as the present level of 1.7 million kW), **and up to 10 million kW of solar power** (approximately seven times the present level of 1.5 million kW) except in cases of local congestion.

Higher penetration of renewables requires a major renovation of power system infrastructure, which **will need careful discussion on who should pay for this and how**.

In consideration of the limited land space and climatic conditions of Japan, we believe that solar power, which allows rooftop installation, has higher potential for growth than wind power or biomass. We will therefore study the expanded use of solar power.

METI begins discussions at “Study Forum on Low-Carbon Electricity Systems” regarding technological options & cost burdens if significant amounts of renewable energy are to be connected to grids.

Example: Technological Option (1)

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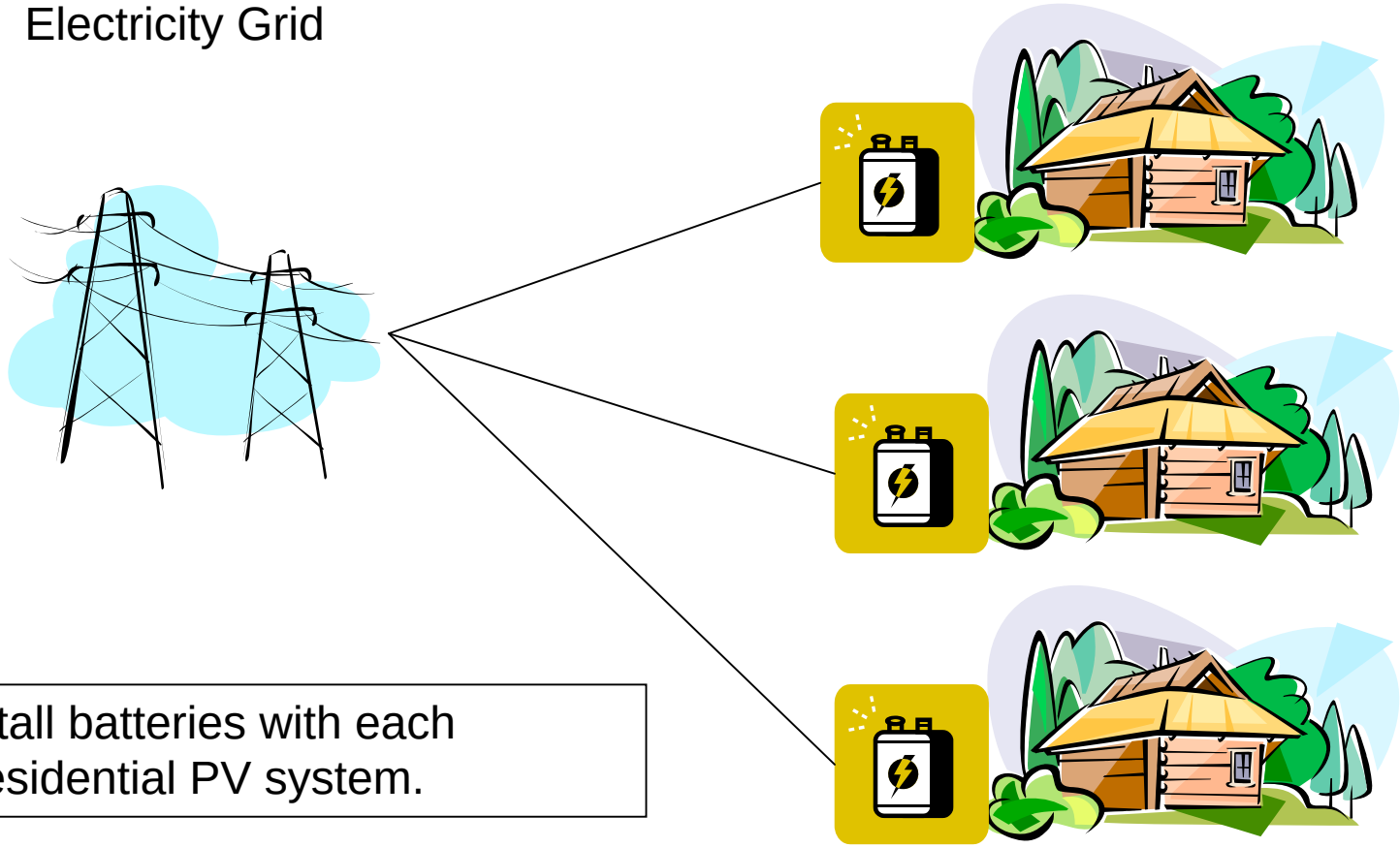
Residences with PV

Electricity Grid



Install batteries with each residential PV system.

Example: Technological Option (2)

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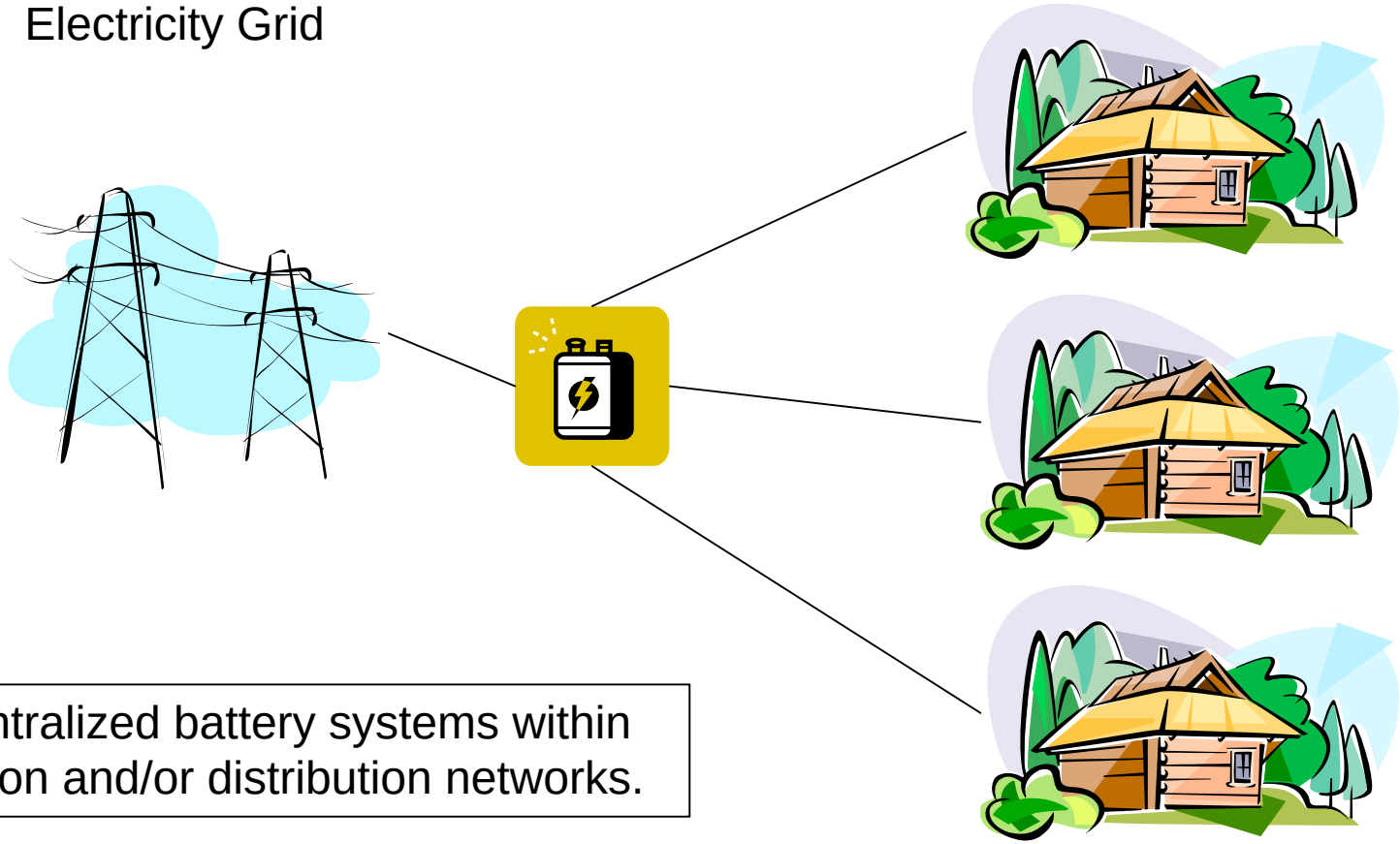
Residences with PV

Electricity Grid



Install centralized battery systems within transmission and/or distribution networks.

Example: Technological Option (3)

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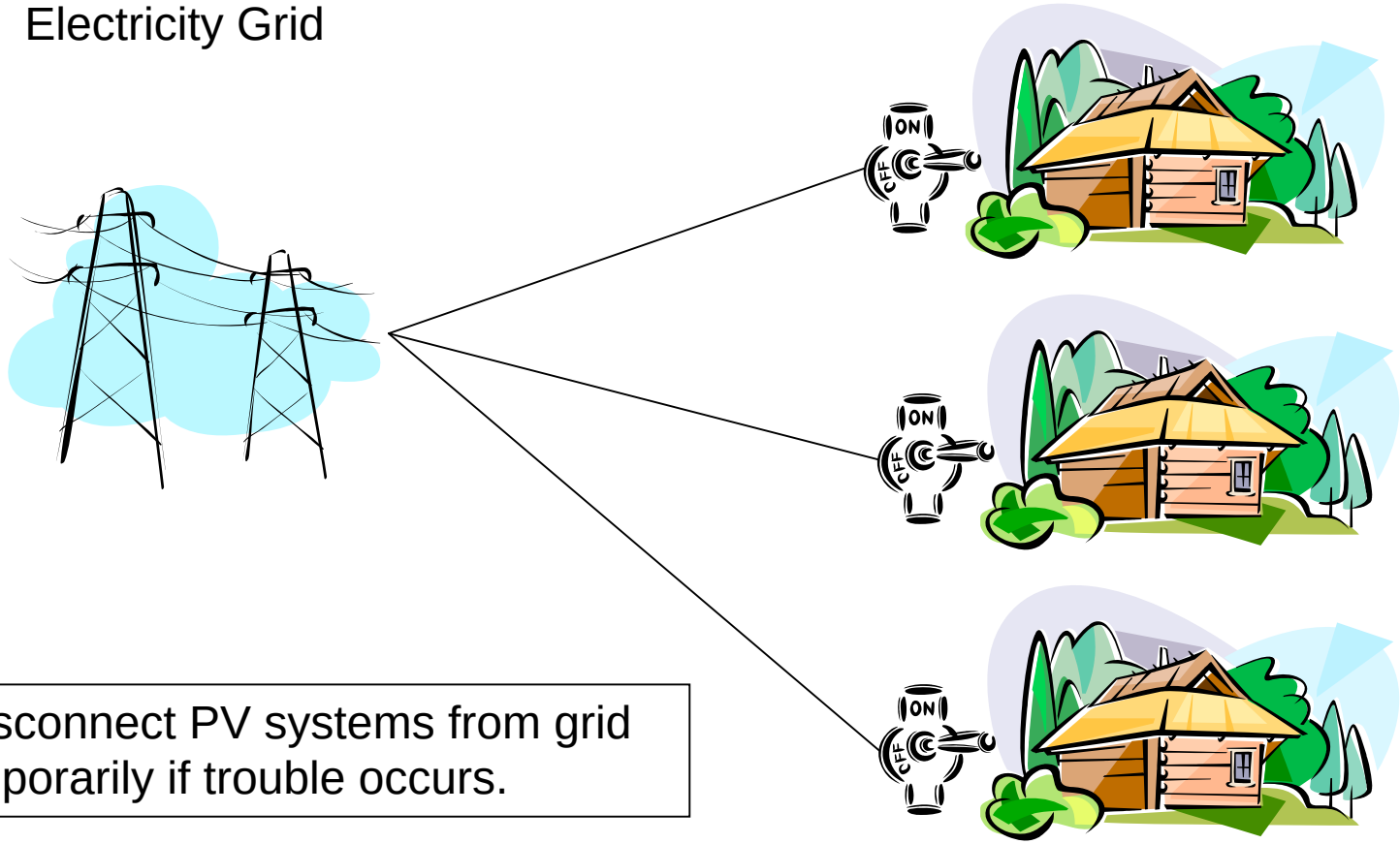
Residences with PV

Electricity Grid



Simply disconnect PV systems from grid temporarily if trouble occurs.

Example: Technological Options

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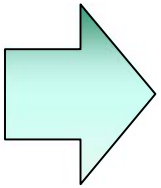
Distribution Cost

Option (1) > Option (2) > Option (3)

(highest) (Lowest)



Considering Industrial Policy…

-Cost reduction effect for option (1) … ?
-Energy wasted for option (3) … ?
-Or other options … ?

Thank You

Questions?

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