Japan-U.S. Economic Cooperation on Clean Energy

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JAPAN

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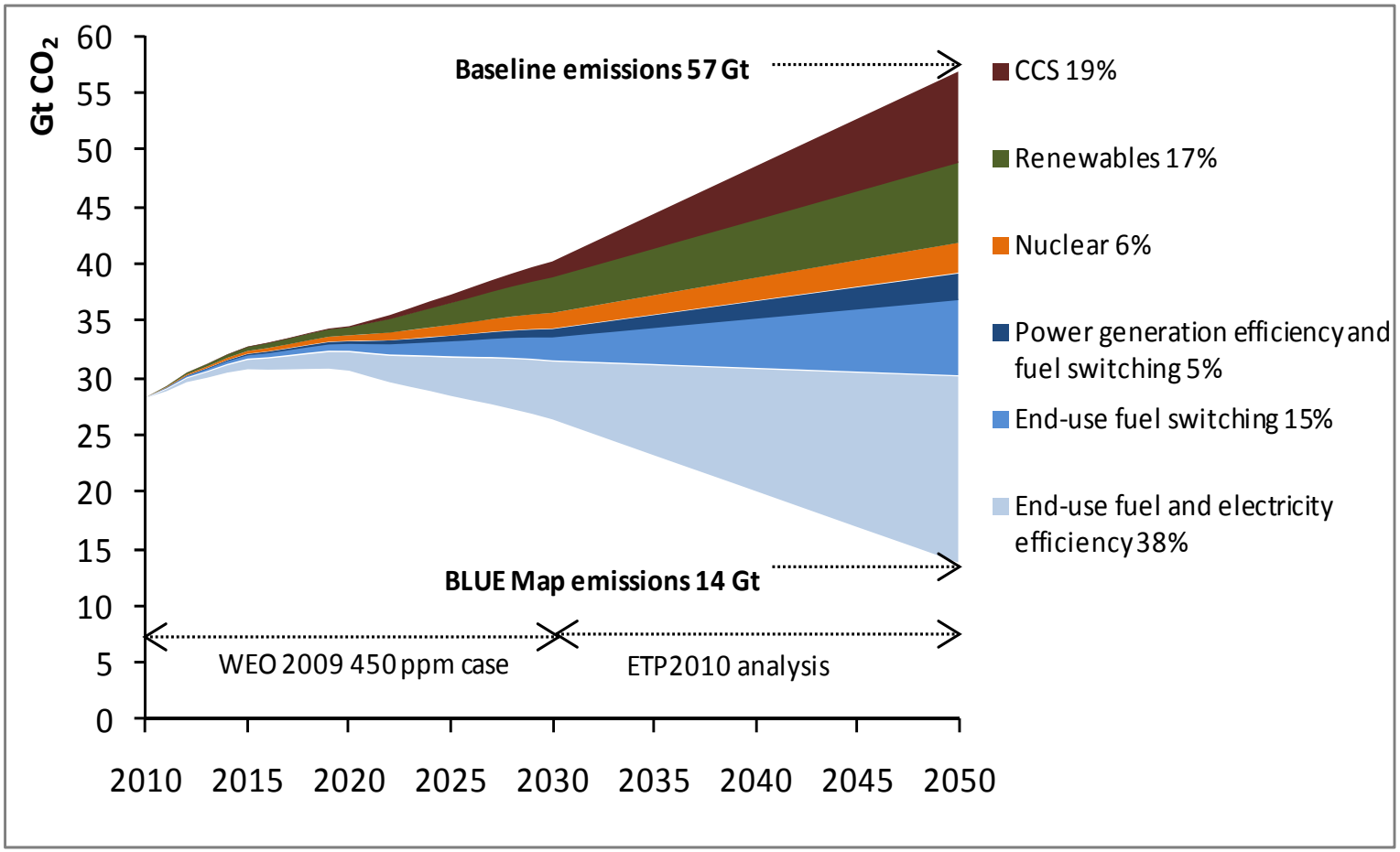
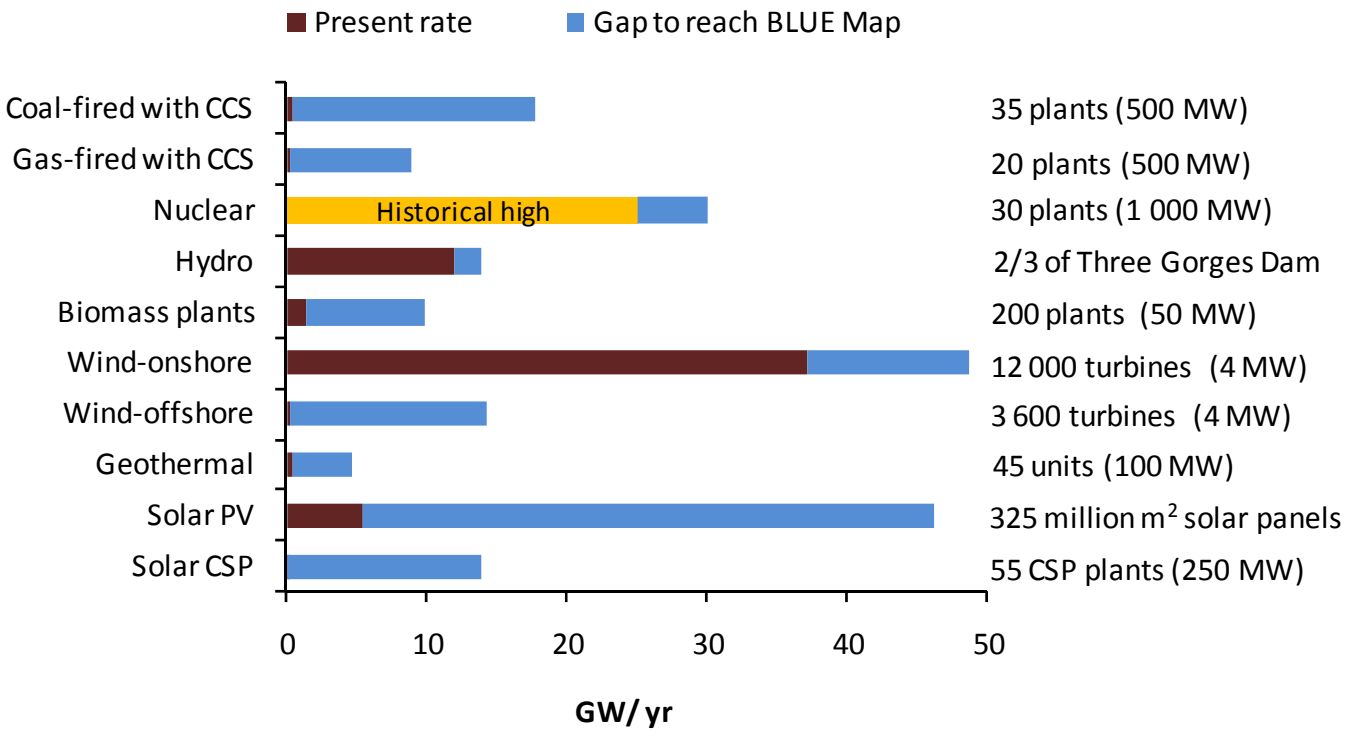
Key Technologies to reduce World CO2



- Energy Efficiency and Renewable Energy contribute over half of World CO2 reduction

(Source: IEA)

Necessary Investment each year to achieve “Blue Scenario” up to 2050

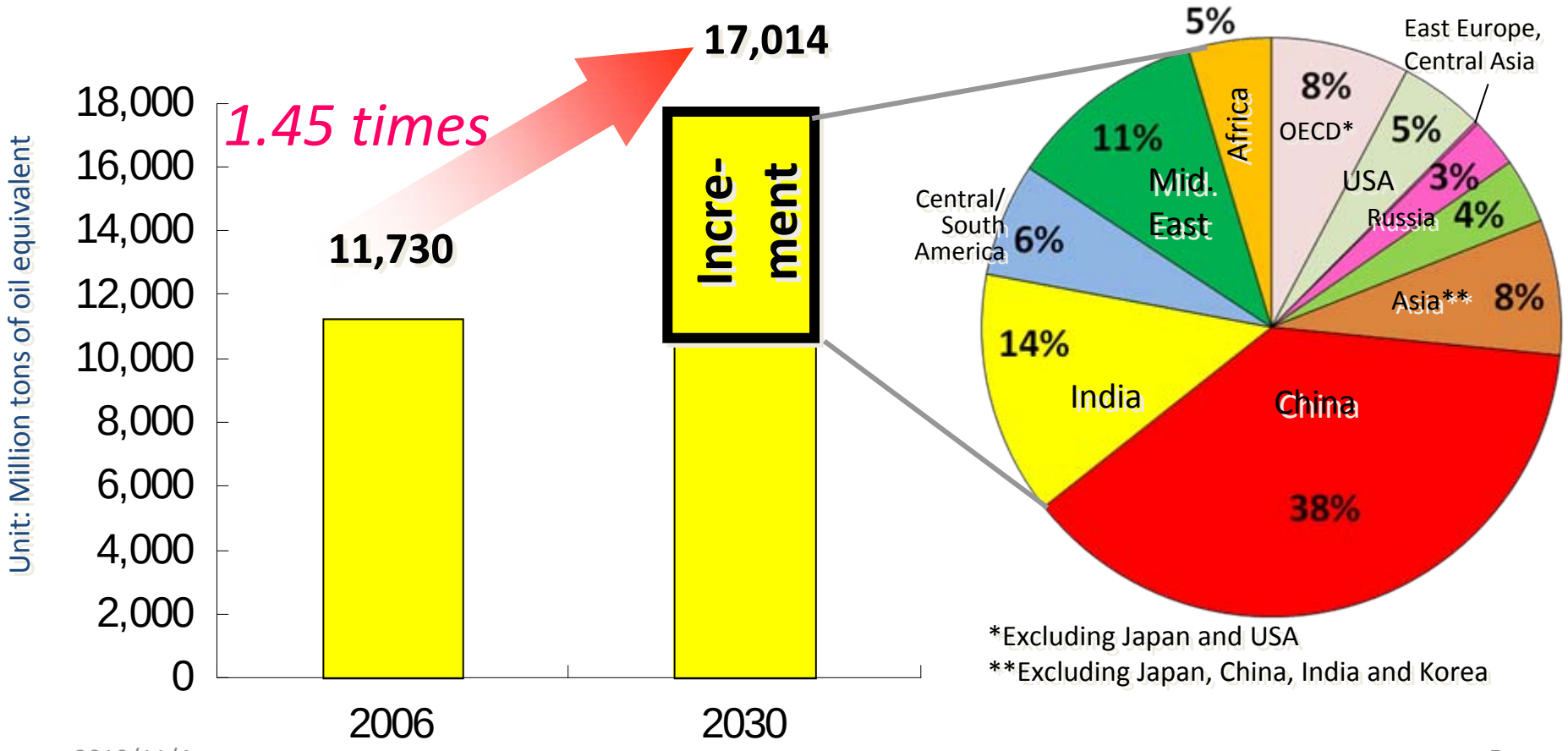


It is necessary to accelerate investment into clean tech than current levels

(Source: IEA)

Prospects of World Energy Demand

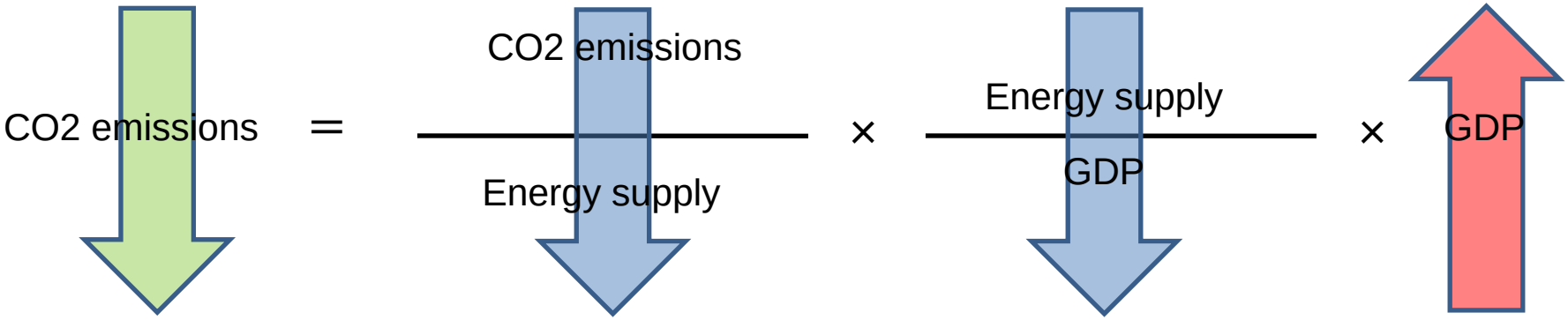
- From 2006 to 2030, world energy demand increases by 1.45 times.
- China and India will account for over 50% of the increase (China: 38%, India: 14%).



Source: IEA World Energy Outlook 2008

“Low-carbon Economy and Society” Energy Conservation and New Energy

“Low-carbon economy and society” = **Non-fossilization of energy supply** × **Energy Efficiency Improvement** × **Economic growth**



- ✓ Expansion of the introduction of new energy
- ✓ Promotion of nuclear energy
- ✓ Expanded utilization of bio-fuels

Others

- ✓ Promotion of energy Efficiency
- ✓ Improvement of energy utilization intensity
- ✓ Improvement of fuel efficiency performance

Others

- According to BNEF, Clean Energy Market

$ 46B(2004)

$162B(2009)

Innovative Energy Technology Development

- Japan has formulated "Cool Earth - Innovative Energy Technology Program" to achieve the long-term goal and Identified 21 key innovative energy technologies.

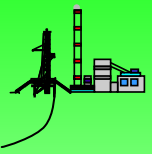
Efficiency improvement ***Low carbonization***

Supply side

Power Generation

2. Efficient coal-fired power plant

3. CCS



4.Innovative solar power

5. Advanced nuclear power

1. Efficient LNG-fired power plants

6. Superconducting power transmission

Demand side

Transport

7. ITS

8. FCV

9. PHEV/EV

10. Biofuel

Industry

11. Innovative materials/ manufacturing process

12. Steel making process with Hydrogen

Residences/Buildings

13. Efficient houses/buildings

14. Efficient lighting

15. Fuel Cell for residential use

Cross sectoral

16. Efficient Heat pumps

17. Efficient IT devices/networks

18. HEMS/BEMS/Regional EMS

19. Power storage

20. Power electronics

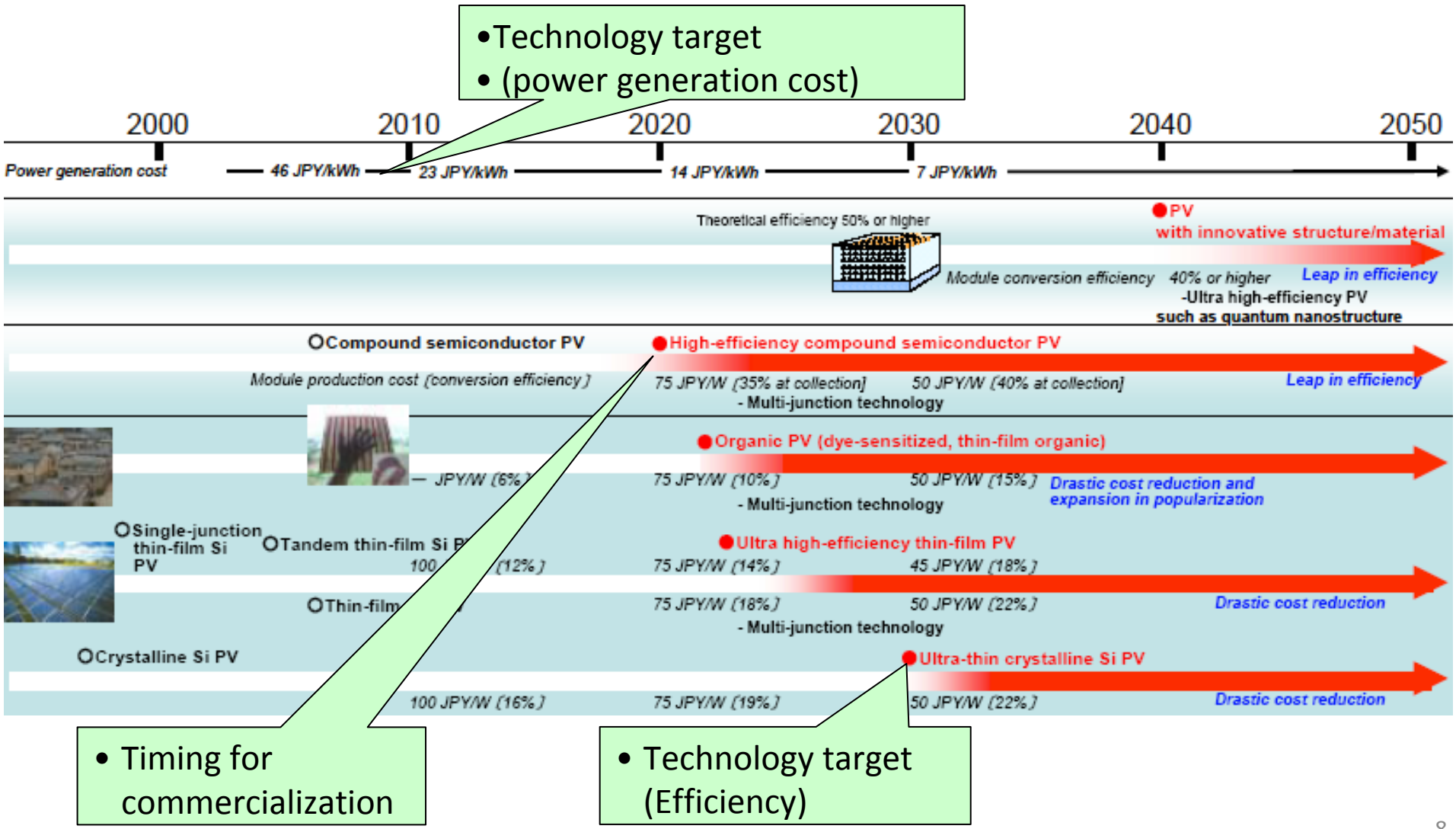
21. Hydrogen production/storage/transport

3. CCS (restated)

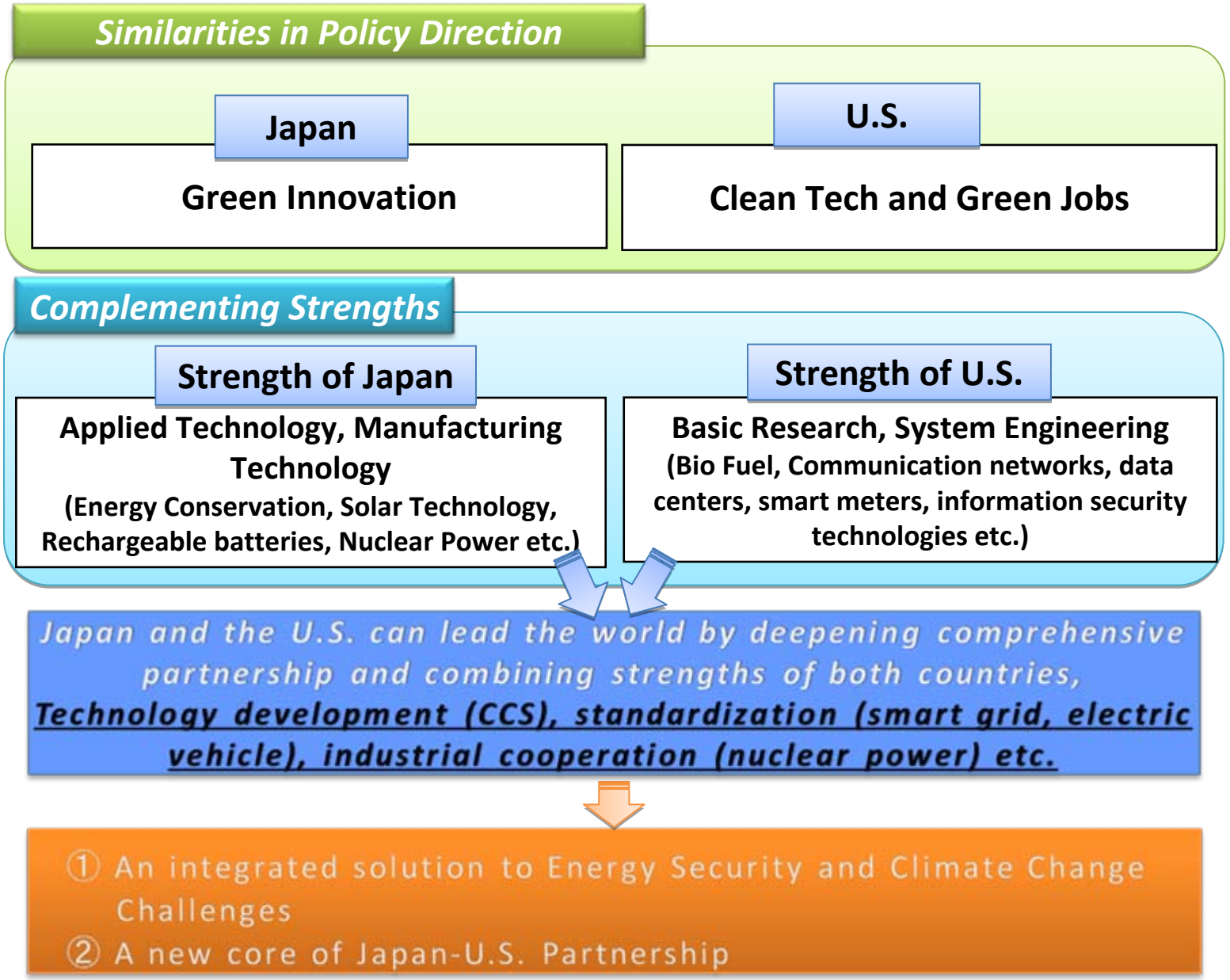
Technology roadmaps toward 2050

- Roadmaps for each of 21 innovative energy technologies were developed.

(The roadmap for innovative PV is shown here as an example.)



Japan-U.S. Clean Energy Technology Cooperation (Concept)



Agreement on Clean Energy Technologies at Japan-U.S. Leaders' Meeting

●Prime Minister Hatoyama and President Obama agreed in November 2009 to clean energy technologies cooperation

METI and DOE identified the initial areas for the joint activities concluded as

⇨ "**Clean Energy Technologies Action Plan**".

Themes for Partnership

- Cooperation between National Labs
- CCS (Carbon Capture and Storage)
- Energy Efficiency
- Okinawa- Hawaii Cooperation
- Smart Grid
- Electric Vehicles
- Nuclear Energy

Smart Grid Technology

Japan ⇒ Home appliances, PV cells, power storage, energy management technology, etc.

U.S. ⇒ Communication networks, data centers, smart meters, information security technologies, etc.

- Global deployment of an integrated system through enhanced cooperation in standardization, etc.
- Joint R&D and deployment of emerging Clean Energy Technologies

1. Demonstration with a large-scale transmission/ distribution network (New Mexico)

Japan : NEDO

U.S. : Los Alamos National Laboratory, Sandia National Laboratory, etc.

2. Hawaii-Okinawa Clean Energy Cooperation

Cooperation with the U.S. on international standardization

It is important for both US and Japan to cooperate regarding standardization of components for Smart Grid, such as communication systems, interfaces with smart meters, etc.

- New Mexico has one of the greatest potentials for RE and hosts Los Alamos and Sandia laboratories.
- New Mexico launched the “Green Grid Initiative” which consists of five sites
- NEDO to participate in two sites and contribute to collective research.

State of New Mexico, NEDO, Los Alamos National Laboratory (LANL), Sandia National Laboratories (SNL), New Mexico State University, Intel

Collective Research on Overall Project — NEDO

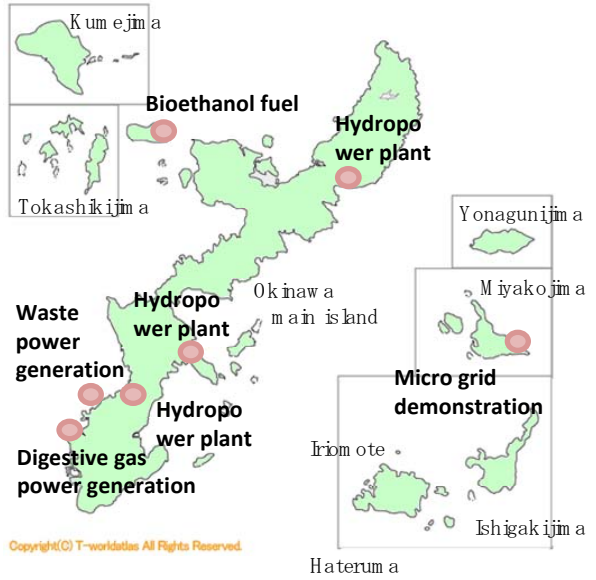
Site	Los Alamos	Albuquerque	Taos	Roosevelt	Las Cruces
U.S. partners	Los Alamos County, LANL	PNM, SNL			
	NEDO demonstration research	NEDO demonstration research			

Significance of cooperation

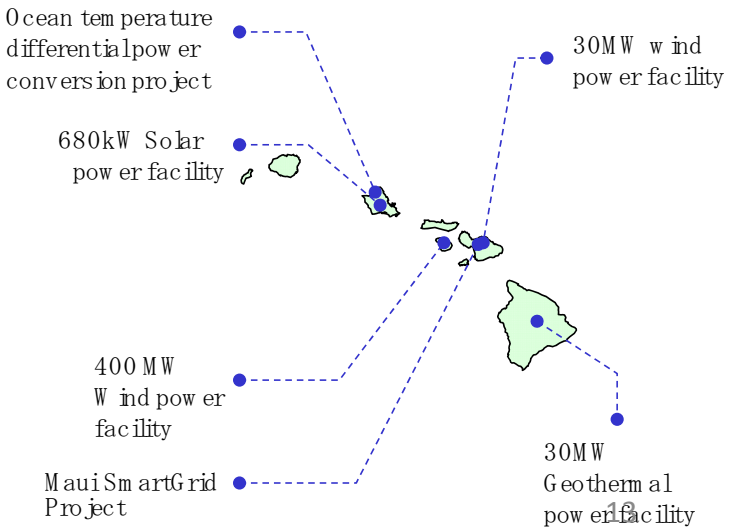
Okinawa and Hawaii are similar
- geographical conditions (island)
- climate condition
- energy structure

➢ Synergy through cooperation
➢ Joint creation of Global Model
➢Okinawa –Hawaii cooperation as symbolic Japan-U.S. cooperation

Example of activities in Okinawa



Example of activities in Hawaii



Carbon Capture and Storage (CCS)

Japan ⇒ Separation and capture technology using chemical CO2 absorbent, monitoring technology

U.S. ⇒ Solid absorbent, long-term simulation technology

◆ Accelerate the reduction of separation and capture costs and improvement of storage safety by integrating the excellence of each country through joint research.

◆ Promote concrete cooperation by using Japan-U.S. CCS Cooperation Meetings

New Research Cooperation Topics

1.Advancement of CO2 separation and capture technologies

➢Develop new absorbent by integrating efficient chemical absorbent technology of Japan and solid absorbent technology of the U.S.

Japan : Research Institute of Innovative Technology for the Earth

U.S. : National Energy Technology Laboratory

2.Advancement of CO_2 behavior prediction methods

➢Advance long-term behavior simulation technology and monitoring technologies for CO_2 stored under ground to achieve improved safety

Japan :Research Institute of Innovative Technology for the Earth, and the National Institute of Advanced Industrial Science and Technology

U.S. : Lawrence Berkeley National Laboratory and Los Alamos National Laboratories

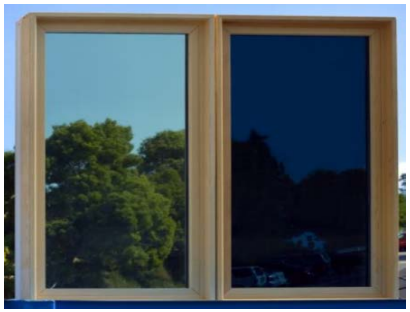
Energy Efficiency, Next-generation Vehicles and Others

Cooperation in energy saving building demonstration tests

◆ Dynamic control of sunlight

◆ PV power generation

◆ Next-generation windows



◆ Water heater with CO_2-refrigerant heat pump

Cooperation for standardization and demonstration of next-generation vehicles

Examples:

- Joint proposal for international standardization of electric vehicle charging equipment
- Joint demonstration of quick charging equipment

◆ Electric vehicle and charging equipment

➢ A Japan and U.S. working group will promote concrete activities for international standardization of quick charger connectors.

Japan : Japan Automobile Research Institute (JARI)

U.S. : Society of Automotive Engineers (SAE)

Joint US-Japan Collaboration on Nuclear Energy

Objectives

- Provide solutions to the challenges of global energy security and climate change
- Global deployment of safe and high-quality technologies (Systematic deployment of integrated equipment, plant facilities, fuel supply, operation systems and safety regulations)

U.S. Activities

1. Research and development
   Priority on development of nuclear fuel cycle technology. Verification of activities with a long-term vision.

2. Global collaboration
   Global expansion of peaceful uses of nuclear energy in a manner ensuring nuclear non-proliferation, safety and security.

3. Nuclear power station construction in the U.S.
   Plan to construct more than 30 new power stations.

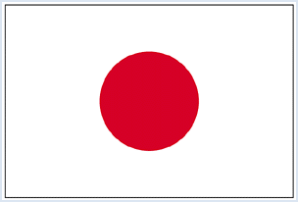
U.S-Japan Collaboration Items

1. Japan-U.S. collaborative research and development
   - Accelerate collaborative research and development on a fast reactor, advanced nuclear fuel cycle technology, advanced simulations for enhanced seismic safety of nuclear power plants, etc.

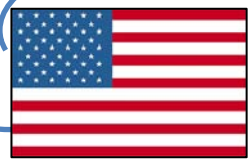
2. Support for new introduction into third countries
   - Japan-U.S. collaboration towards peaceful use based on nonproliferation.

3. Support for U.S. new construction plans
   - Japanese companies are actively involved. NEXI and JBIC offer financial support. (Currently, Toshiba and Mitsubishi Heavy Industries are planning to construct a nuclear power station.)

APEC (Asia Pacific Economic Cooperation)



2010 APEC
(YOKOHAMA, JAPAN)



2011 APEC
(HAWAII, U.S.)

Theme: Change and Action

APEC's New Vision for Action

I.Regional Economic Integration

II. Growth Strategy
1. Balanced Growth
2. Inclusive Growth
3. Sustainable Growth (Green Growth)
4. Innovative Growth
5. Secure Growth

Shift to green economy

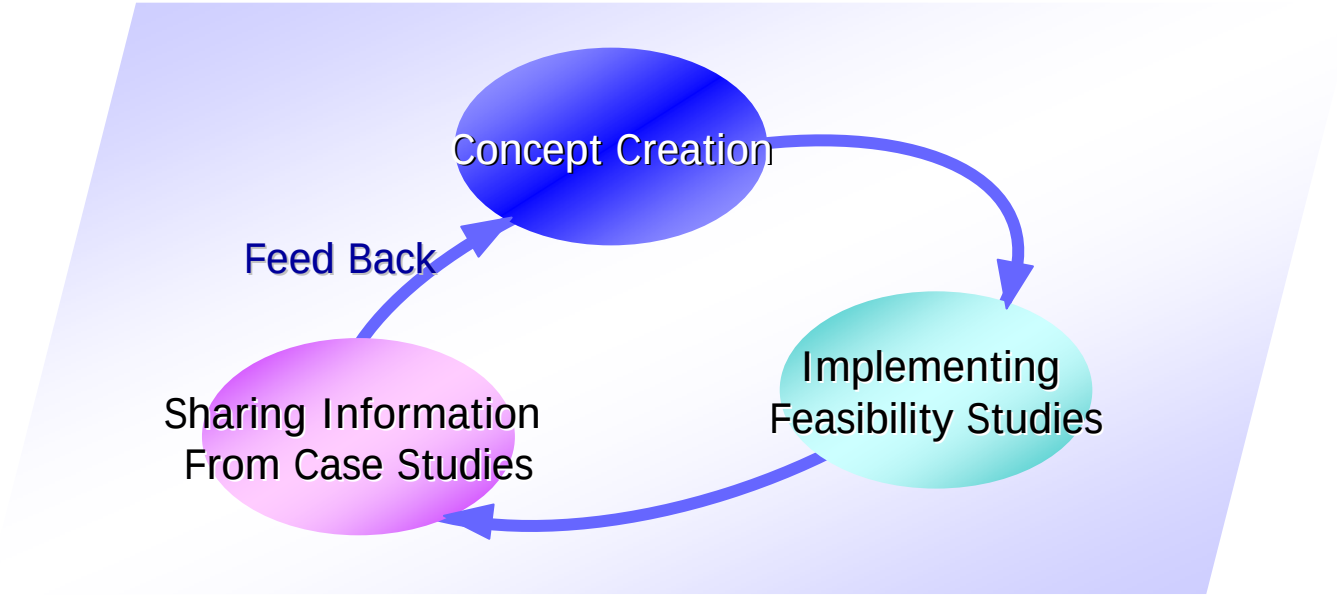
- Promoting energy efficiency and low-carbon energy
- Improving access for environmental goods and services (EGS)
- Promoting energy conservation activities through green ICT

APEC Low-Carbon Model Town Project

Source METI

APEC Low-Carbon Model Town Project

- Half of world population live in cities.
- Cities consume most of the energy.
- Low-Carbon Model Town Project was agreed at APEC Energy Ministers' Meeting (EMM9) held in Fukui, Japan
- Japan to contribute 1 billion yen in three years.
- Tianjin City Project proposed by China at the EMM9 as the first case, and it is hoped that many will follow.



Thank you
for your attention!!

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