Evaluation of Environmental and Energy Technologies

Attachment 2

Technology Evaluation Axis

Global GH Gas Reduction Effect (2050)	A: 1 billion ton or more, B: 0.3-1 billion ton, C: Less than 0.3 billion ton
Applicability	Global, mainly to Developing countries, mainly to Developed countries, etc.
Global Market Size	A: 3 trillion yen or more, B: 0.3-3 trillion yen, C: Less than 0.3 trillion yen
Public/Private Role Division	Led by Private sector, private-public Cooperation, led by Public sector
Maturity Phase	Basic research, Applied research, Demonstration, Diffusion

Sector	Category	Subcategory	Global GH Gas Reduction Effect (2050)	Applicability	Global Market Size	Public/Private Role Division	Maturity Phase
Production • Supply	Thermal Power Generation	1. High-Efficiency Coal-Fired Power Generation	A	Global	A	Cooperation	Demonstration
		2. High-Efficiency Natural Gas-Fired Power Generation	A *1	Global	A	Cooperation	Demonstration
	Utilization of Renewable Energies	3. Wind Power Generation	A	C. with Suitable Wind Conditions	A	Private-Cooperation	Demonstration-Diffusion
		4. Solar Energy Utilization (Solar Light)	A	Global	A	Private-Public	Basic Research-Diffusion
		5. Solar Energy Utilization (Solar Heat)	A	Global	A	Private-Cooperation	Basic Research-Diffusion
		6. Marine Energy (Wave, Tides, Current)	B	Countries with Coastlines	B	Cooperation	Demonstration
		7. Geothermal Power Generation	B	Countries at Volcanic Zones	A	Cooperation	Basic Research-Diffusion
		8. Biomass Utilization	A	Global	A	Private-Cooperation	Basic Research-Diffusion
	Nuclear Power	9. Nuclear Power Generation	A	Global	A	Cooperation	Basic Research-Demonstration
	CO_2 Capture, Use and Storage (CCUS)	10. CO_2 Capture and Storage (CCS)	A	Global	A	Public	Demonstration
		11. Artificial Photosynthesis	*2	Global	*2	Cooperation	Basic Research-Demonstration
Consumption • Demand	Transportation	12. Next-Generation Automobiles (HV, PHV, EV, Clean Diesel, etc.)	A	Global	A	Cooperation	Diffusion
		13. Next-Generation Automobiles (Fuel Cell Vehicles)	B	Global	A	Cooperation	Demonstration-Diffusion
		14. Aircrafts, Ships, Railways (Aircrafts)	B *3	Global	A	Cooperation-Public	Applied Research-Diffusion
		15. Aircrafts, Ships, Railways (Ships)	B *3	Global	A	Cooperation-Public	Applied Research-Diffusion
		16. Aircrafts, Ships, Railways (Railways)	C	Global	A	Private-Cooperation	Applied Research-Diffusion
		17. Intelligent Transportation System	*2	Global	*2	Cooperation	Demonstration-Diffusion
	Devices	18. Innovative Devices (Information System, Lighting, Display)	A *4	Global	A	Private-Public	Applied Research-Diffusion
		19. Innovative Devices (Power Electronics)	*2	Global	C	Cooperation	Demonstration
		20. Innovative Devices (Telework)	*2	Developed Countries	C	Cooperation	Applied Research-Diffusion
	Materials	21. Innovative Structural Materials	A *5	Global	A	Cooperation	Applied Research-Diffusion
	Energy Utilization Technology	22. Energy Management System	A	Global	A	Cooperation	Applied Research-Diffusion
		23. Energy Efficient Houses/Buildings	A *6	Global	A	Private-Cooperation	Applied Research-Diffusion
		24. High-Efficiency Energy Industrial Use	B *7	Global	A	Cooperation	Applied research-Diffusion
		25. High-Efficiency Heat Pumps	B *8	Global	A	Private	Applied Research-Diffusion
	Production Process	26. Environment-Conscious Iron Manufacturing Process	*2	Global	*2	Cooperation	Applied Research-Demonstration
		27. Innovative Manufacturing Process	A *9	Global	A *9	Cooperation	Applied Research
Distribution • Supply/Demand Unification	Energy Conversion, Storage, Transport	28. Hydrogen Production, Transport, Storage (Production)	*10	Developed Countries	C	Cooperation	Demonstration
		29. Hydrogen Production, Transport, Storage (Transport/Storage)	*10	Developed Countries	C	Cooperation	Demonstration
		30. Fuel Cells	B	Global	B	Cooperation	Demonstration-Diffusion
		31. High-Performance Electricity Storage	*10	Global	B	Private-Cooperation	Applied Research-Diffusion
		32. Heat Storage/Insulation Technology	C *11	Global	B	Private	Applied Research-Diffusion
		33. Electricity Transmission by Superconductivity	C	Global	B	Public	Demonstration
Other Technologies		34. Carbon Fixation by Vegetation	A	Global	A	Private	Demonstration-Diffusion
		35. Other GH Gas (e.g., Methane) Reduction Technology	C	Global	A	Cooperation	Demonstration
		36. Global Warming Adaptation Technology	*2	Developing Countries	A	Cooperation	Basic Research-Diffusion
		37. Earth Observation • Climate Change Prediction	*2	Global	*2	Public	Basic Research-Diffusion

(Note) The present table shows evaluation based on estimates using conditions and scenarios specific to individual technologies. Reduction effects cannot be simply added up because their overlaps among technologies are not eliminated.

(References) The following materials were referred to in compilation of the present table.
• IEA, Energy Technology Perspectives (ETP) 2012 (2012)
• IEA, Energy Technology Perspectives (ETP) 2010 (2010)
• Council for Science and Technology Policy, Innovative Strategy for Energy and the Environment (2008)
• Japan Revitalization Strategy Short- to Mid-term Progress Schedule (2013)
• Comprehensive Strategy on Science and Technology Innovation Progress Schedule (2013)
• NEDO Renewable Energy Technology White Paper (2010)
• NEDO Fuel Cell and Hydrogen Technology Development Roadmap 2010 (2010)

*1 Conversion from coal to gas and efficiency improvements are considered in calculations.
*2 No evaluation is made due to difficulties in identifying preconditions required for calculations.
*3 Reduction effects of bio-fuel partially overlap with that of "8. Biomass Utilization".
*4 Reduction effects partially overlap with that of "22. Energy Management System".
*5 Reduction effects partially overlap with that of Aircrafts, Ships, and Railways technologies.
*6 Reduction effects partially overlap with that of "2. High-Efficiency Natural Gas-Fired Power Generation", "5. Solar Energy Utilization (Solar Heat)" and "22. Energy Management System".
*7 Reduction effects partially overlap with that of "2. High-Efficiency Natural Gas-Fired Power Generation" and "22. Energy Management System".
*8 Only high-efficiency air conditioners are evaluated.
*9 Cement and chemistry fields are evaluated.
*10 No evaluation is made because the item itself does not have any reduction effect.
*11 Only heat insulation effects for buildings are evaluated.