



**METI**  
**Ministry of Economy,**  
**Trade and Industry**

# Promotion of Innovation – the key to fundamentally address climate change

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Ministry of Economy, Trade and Industry

## 1. Domestic mitigation measures toward the Implementation of Intended Nationally Determined Contribution(INDC)

- ◆ Effective domestic measures in line with INDC and energy mix

- ✂ On July 2015, Japan submitted INDC. Japan's INDC is at the level of a reduction of 26.0% by fiscal year (FY) 2030 compared to FY 2013 (25.4% reduction compared to FY 2005) , ensuring consistency with its energy mix, set as a feasible reduction target by bottom-up calculation with concrete policies and measures.

## 2. Promotion of Innovation

- ◆ Energy & Environment Innovation Strategy

- ◆ Innovation for Cool Earth Forum (ICEF)

## 3. Contribution to emission reductions in developing countries

- ◆ Linkage between the Technology Mechanism and the Financial Mechanism

- ◆ Joint Crediting Mechanism (JCM) and other international contributions through diffusion of leading low carbon technologies<sub>1</sub>

## Long-term temperature goal

### ◆ Long-term global goal for climate action

- Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels (The Paris Agreement, Article 2 para. 1)
- Aim to reach global peaking of greenhouse gas emissions as soon as possible (The Paris Agreement, Article 4 para.1)
- Undertake rapid reductions to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century (The Paris Agreement, Article 4 para.1)

### ◆ Long-term low greenhouse gas emission development strategies

- All parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 (The Paris Agreement, Article 4 para. 19)
- Invites Parties to communicate, by 2020, to the secretariat mid-century, long-term low greenhouse gas emission development strategies in accordance with Article 4, paragraph 19, of the Agreement (1/CP.21, para. 36)

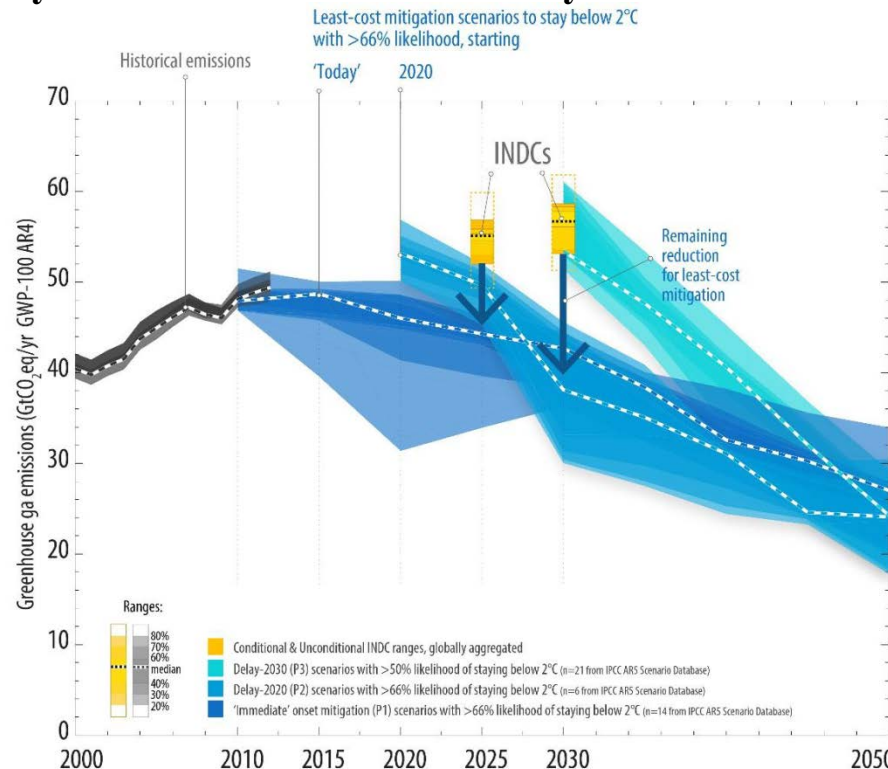
## Innovation

- ◆ Accelerating, encouraging and enabling **innovation is critical for an effective, long-term global response to climate change** and promoting economic growth and sustainable development. Such effort shall be, as appropriate, supported, including by the Technology Mechanism and, through financial means, by the Financial Mechanism of the Convention, ... (The Paris Agreement, Article 10 para. 5)
- ◆ Decides to **strengthen the Technology Mechanism** and requests the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), in supporting the implementation of the Agreement, in supporting the implementation of the Agreement, to undertake further work (1/CP.21, para. 67)

# The aggregate effect of the INDCs and 2°C scenarios

- ◆ The estimated aggregate annual global emission levels resulting from the implementation of the INDCs do not fall within least-cost 2°C scenarios by 2025 and 2030. In this regard;
  1. Communicating a nationally determined contribution **every five years** as well as regularly providing information including a national inventory report of anthropogenic emissions that shall undergo a **technical expert review**, in accordance with the Paris Agreement and the COP21 decision
  2. **Developing innovative technologies** that contribute to medium- and long-term climate change mitigation are essential.

## Estimated global emissions following the implementation of the communicated intended nationally determined contributions by 2025 and 2030 and 2°C scenarios



Note: Large uncertainties remain regarding climate sensitivity. For instance, the IPCC Fifth Assessment Report states that climate sensitivity is likely in the range 1.5°C to 4.5°C. It should be taken into consideration that scenarios may differ to a large extent depending on the climate sensitivity.

【Source】 UNFCCC Synthesis report on the aggregate effect of the intended nationally determined contributions (Nov. 2015)

# Actions for Cool Earth 2.0 (ACE 2.0) \*

\* Reinforcement of Japan's contribution to climate change actions which was presented as "Actions for Cool Earth (ACE)", announced by Prime Minister Abe in 2013

- Prime Minister Abe announced Two-fold Contribution composed of **Assistance to Developing Countries and Innovation** at the plenary session of the COP21
- ◆ Japan will provide, in 2020, ¥1.3 trillion of public & private climate finance, 1.3 times up from the current level, to developing countries
- ◆ Japan, as a forerunner in innovation, contributes to significant reduction of GHG emission by formulating the "Energy & Environment Innovation Strategy" to reinforce the development of innovative technologies in energy and environment as well as joining the "Mission Innovation" initiative

(Prime Minister Abe also expressed his intention to promote transfer of leading low carbon technologies through initiatives such as the Joint Crediting Mechanism (JCM).)

# Energy & Environment Innovation Strategy

## Formulation of a national strategy towards significant reduction of GHG emissions from a long-term perspective

- Japan will formulate a national strategy, "Energy and Environment Innovation Strategy", in order to lead the world in the development of innovative technologies towards significant reduction of GHG emissions.
  - As a forerunner in innovation, Japan will identify innovative technologies from a long-term perspective and will focus research and development of such technologies.
- In this spirit, Japan has become a founding member of "Mission Innovation", a plurilateral initiative among interested Parties that aims to foster research and development in clean energy technologies.

Listed below are examples of innovative technologies that enable significant reduction of GHG emissions. Promising areas of technologies will be identified in due course.

### <Technologies>

### <Targets by 2050>

#### Storage and Transportation of Hydrogen

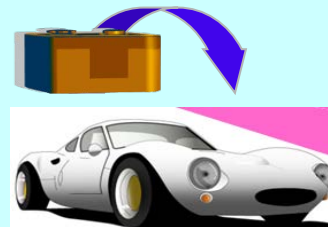
Technologies to produce hydrogen using natural energies (e.g. solar, geo-thermal, wind) and to store and transport hydrogen.



Establish a hydrogen supply chain to achieve a CO2-free society. Develop technologies to safely mass transport hydrogen.

#### Next-generation Storage Batteries

Significantly low-cost and high-performance storage batteries using new materials.



Develop storage batteries whose energy density is more than five times thicker than that of the conventional one at less than one-tenth of the current cost, compared to existing technologies.

# “Mission Innovation”

– an initiative to dramatically accelerate public and private global clean energy innovation

## Basic concept of Mission Innovation

- ◆ Given the importance of accelerating widespread clean energy innovation as an indispensable part of an effective, long-term global response to our shared climate challenge, encouraging participating countries\* to increase their respective clean energy research and development investment
  - \*Participating countries: 20 countries including Denmark, France, Germany, Italy, Japan, Sweden, the United Kingdom, the United States, etc.
- ◆ Overview of Mission Innovation:
  1. Participating countries targeting to double their respective governmental clean energy research and development investments over five years
  2. New investments focusing on breakthrough technologies
  3. Given that each country’s clean energy innovation portfolio is unique, each country would have flexibility in how it doubles its own clean energy research and development budget

## Japan’s policy

- ◆ Based on the idea that innovation is critical in enabling significant reduction of GHG emissions in the long-term, Japan has been actively engaged in research and development in the field of energy and the environment throughout the years (Japan ranks highest among G7 countries in terms of the amount of public investment in research and development in this field compared to its GDP)
- ◆ In order to further promote research and development of innovative technologies that enable significant reduction of GHG emissions in the long-term, Japan will **formulate the “Energy and Environment Innovation Strategy” by spring 2016**
- ◆ Japan will continue to take lead in this field by incorporating various opinions and efforts of each country at conferences such as G7 summit and the Innovation for Cool Earth Forum (ICEF), an international conference where world leaders from businesses, academia and governments come together to discuss how to best address climate change through innovation

- Japanese government launched an international conference, ICEF, in order to establish a global platform for leaders from business, academic and public sectors to promote innovation in low carbon technologies including their dissemination.

**Hosts** : METI, NEDO (Co-Hosts : MOFA, MOE)

**Steering Committee** (Prof. Yoichi Kaya (Chair) President of RITE; Prof. Emer. Univ. of Tokyo) : currently has 14 members from 9 countries (Japan, Australia, Canada, Egypt, Finland, Germany, India, South Africa and US) to cover various opinions.

### ◆ The 1st Annual Conference ◆

**Date, Venue**: October 8th 2014, Tokyo

**Participants**: About 800 policymakers, business leaders and researchers from as many as 80 countries and regions participated.

### ◆ The 2nd Annual Conference ◆

**Date, Venue**: October 7th and 8th 2015, Tokyo

**Participants**: About 1000 policymakers, business leaders and researchers from as many as 70 countries and regions participated.

### ◆ The 3rd Annual Conference ◆

**Date, Venue**: October 5th and 6th 2016, Tokyo



**October 7th, 2015**

**Opening Session (9:00-9:30)**

**Plenary Session (Part 1) ( 9:30-11:50)**

**— Principal Issues in the Future GHG Reduction —**

**Special Presentation by IEA**

**Plenary Session (Part 2) (13:00-15:45)**

**— Future Perspectives from Innovators,  
Visionaries and Global Leaders —**

**Concurrent Sessions (Part 1) (16:15-18:45)**

- Cement
- Energy Systems
- Geothermal Power
- Hydrogen Energy
- Iron and Steel
- Nuclear Energy
- Technology Transfer to Developing Countries and Investment Promotion

**October 8th, 2015**

**Concurrent Sessions (Part 2) (9:00-11:30)**

- Artificial Photosynthesis
- Business Engagement in Climate Change
- Electricity Storage
- Low-Carbon Mobility
- Role of Public Funding for Research, Development and Demonstration
- Smart Grids
- Wind Power
- Zero Energy Building

**Concurrent Sessions (Part 3) (12:45-15:15)**

- Advanced Liquid Biofuels
- CCS
- Solar Energy
- International Framework for Complementing UN

**Press Release of Roadmap by IRENA**

**Plenary Session (Part 3) (15:45-18:15)**

**— Future Strategy for Climate Change —**

**Closing Session (18:15-18:45)**

- In order to establish global GHG emission reductions at accelerating rate, development and deployment of innovative measures is indispensable.

◆ Point 1: Implementation of policies to promote RD & D of innovative technologies

- Important role of private sector, together with the need of appropriate government policies that direct both public and private investments toward RD&D of low carbon technologies

◆ Point 2: Establishment of concrete action plans for the future: construction of road map for solar energy and storage

- ICEF will support the project called Low Carbon Technology Partnership Initiatives (LCTPi) organized by several organizations such as IEA and World Business Council for Sustainable Development (WBCSD).
- ICEF will construct an innovation road map for solar energy and storage.
- ICEF will continue this kind of work of constructing road maps of other innovative technologies for mitigating climate change.

◆ Point 3 : Promotion of financial scheme for technology transfer to developing countries

- Request for international organizations such as World Bank to expand financing to technologies which contribute both emission reduction and economic development, with an expectation that private finance will do the same

# Linkage between the Technology Mechanism and the Financial Mechanism

## Linkage between the Technology Mechanism and the Financial Mechanism in Decision 13/CP.21

- ◆ Recognizes the importance of and the need for defined, mutually beneficial and functional linkages between the Technology Mechanism and the Financial Mechanism (para. 5)
- ◆ Recognizes that the definition and elaboration of linkages between the Technology Mechanism and the Financial Mechanism has the aim of ensuring financial resources for, and scaling up action on, technology development and transfer (para. 6)
- ◆ Underlines the need for the Technology Executive Committee (TEC), the Climate Technology Centre and Network (CTCN) and the operating entities of the Financial Mechanism to enhance cooperation and collaboration with a view to enhancing the fulfilment and implementation of their respective mandates effectively (para. 7)
- ◆ Requests the TEC, the CTCN and the operating entities of the Financial Mechanism to continue to consult on and further elaborate, including through an in-session workshop at the forty-fourth sessions of the subsidiary bodies (May 2016), the linkages between the Technology Mechanism and the Financial Mechanism (para. 8)
- ◆ Invites the Board of the Green Climate Fund (GCF), to consider ways to provide support, for facilitating access to environmentally sound technologies in developing country Parties, and for undertaking collaborative research and development for enabling developing country Parties to enhance their mitigation and adaptation action (para. 10)

COP (Conference of Parties)

Financial Mechanism

Global Environment Facility (GEF)

Green Climate Fund (GCF)

Report Guidance

Technology Mechanism

Climate Technology Centre and Network (CTCN)

Technology Executive Committee (TEC)

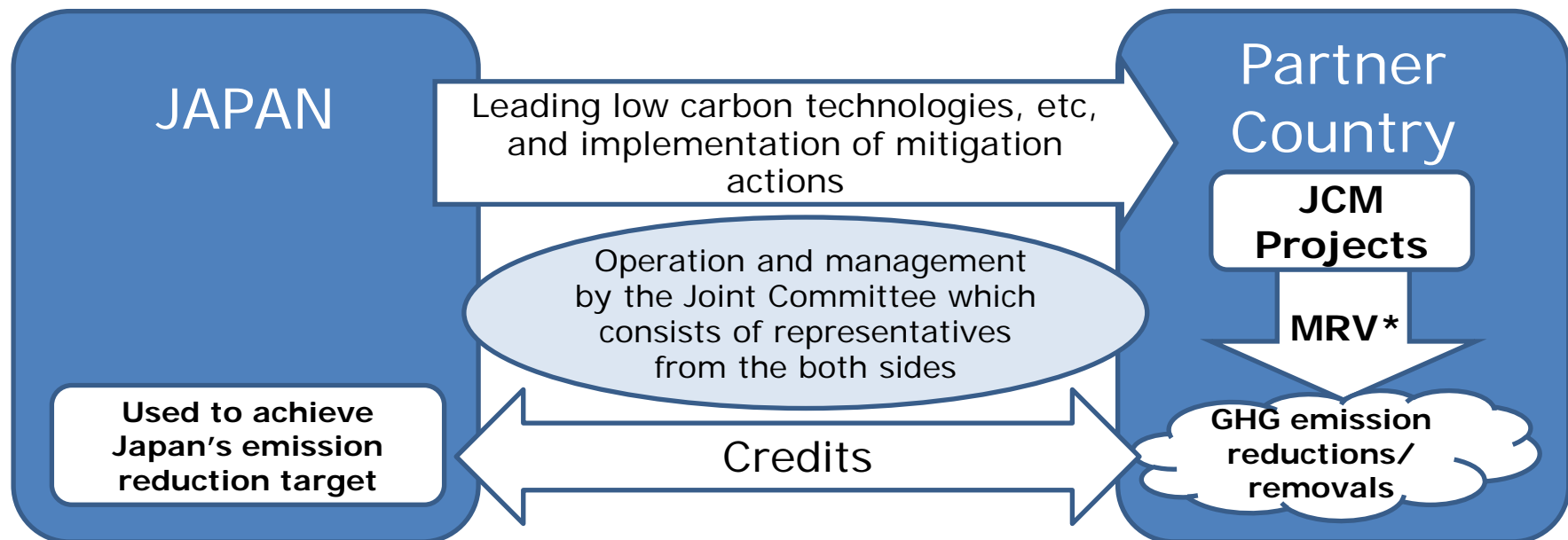
Report Guidance

Linkage

- Recognizing the importance of functional linkages
- Ensuring financial resources for, and scaling up action on, technology development and transfer
- Continue to consult on and further elaborate the linkages between the Technology Mechanism and the Financial Mechanism

# Basic Concept of the Joint Crediting Mechanism(JCM)

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions from Japan to GHG emission reductions or removals in a quantitative manner and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals.



\* measurement, reporting and verification

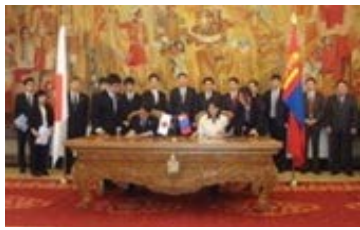
## Article 6 of the Agreement

2. Parties shall, where engaging on a voluntary basis in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards nationally determined contributions, promote sustainable development and ensure environmental integrity and transparency, including in governance, and shall apply robust accounting to ensure, inter alia, the avoidance of double counting, consistent with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement.
3. The use of internationally transferred mitigation outcomes to achieve nationally determined contributions under this Agreement shall be voluntary and authorized by participating Parties.



# JCM Partner Countries

➤ Japan has held consultations for the JCM with developing countries since 2011 and has established the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar and Thailand.



Mongolia  
Jan. 8, 2013  
(Ulaanbaatar)



Bangladesh  
Mar. 19, 2013  
(Dhaka)



Ethiopia  
May 27, 2013  
(Addis Ababa)



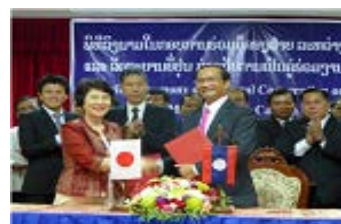
Kenya  
Jun. 12, 2013  
(Nairobi)



Maldives  
Jun. 29, 2013  
(Okinawa)



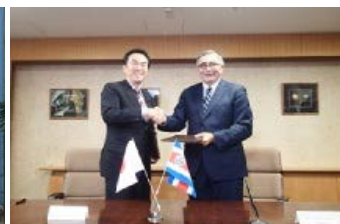
Viet Nam  
Jul. 2, 2013  
(Hanoi)



Lao PDR  
Aug. 7, 2013  
(Vientiane)



Indonesia  
Aug. 26, 2013  
(Jakarta)



Costa Rica  
Dec. 9, 2013  
(Tokyo)



Palau  
Jan. 13, 2014  
(Ngerulmud)



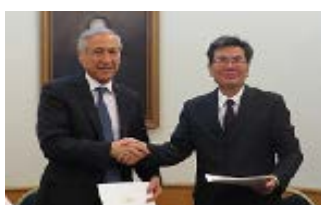
Cambodia  
Apr. 11, 2014  
(Phnom Penh)



Mexico  
Jul. 25, 2014  
(Mexico City)



Saudi Arabia  
May 13, 2015



Chile  
May 26, 2015  
(Santiago)



Myanmar  
Sep. 16, 2015  
(Nay Pyi Taw)



Thailand  
Nov. 19, 2015  
(Tokyo)

➤ In addition, the Philippines and Japan signed an aide memoire with intent to establish the JCM.