

# Implementing real-world low-carbon policy packages in the energy sector: understanding the challenges



Country experiences with energy-climate policy packages

How can we steadily commit to challenging R&Ds?  
-Taking an example of Japan's CCS technology development-

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## Self Introduction &

2008-2011 Deputy Director, Agency of Natural Resources and Energy  
Planned Japan's energy mix 2020

At the time, there was an atmosphere that, to some extent, we may give up a fraction of GDP growth in order to prevent global warming.

2016- Director, Global Environment Partnership Office  
In charge of CCS project

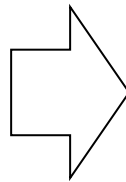
These days, we are more and more conscious to GDP growth, stock prices and employment. Climate policy is asked to carry multiple benefits.

What I experience is the change in priority in political agendas.

Climate



Prime Minister Hatoyama 2009-2010



Climate & Economy



Prime Minister Abe 2012-

## R&D of CCS comes with a significant cost

Demonstration Project – Tomakomai	USD 65.0 million / year
R&D	USD 12.5 million / year
Geological Survey for Reservoir	USD 4.6 million / year

Demonstration project costs more than USD 500 million in total.

Tomakomai CCS project starts injection in April 2016fy and will end 2018fy.



## In case of Japan, the cost is even higher

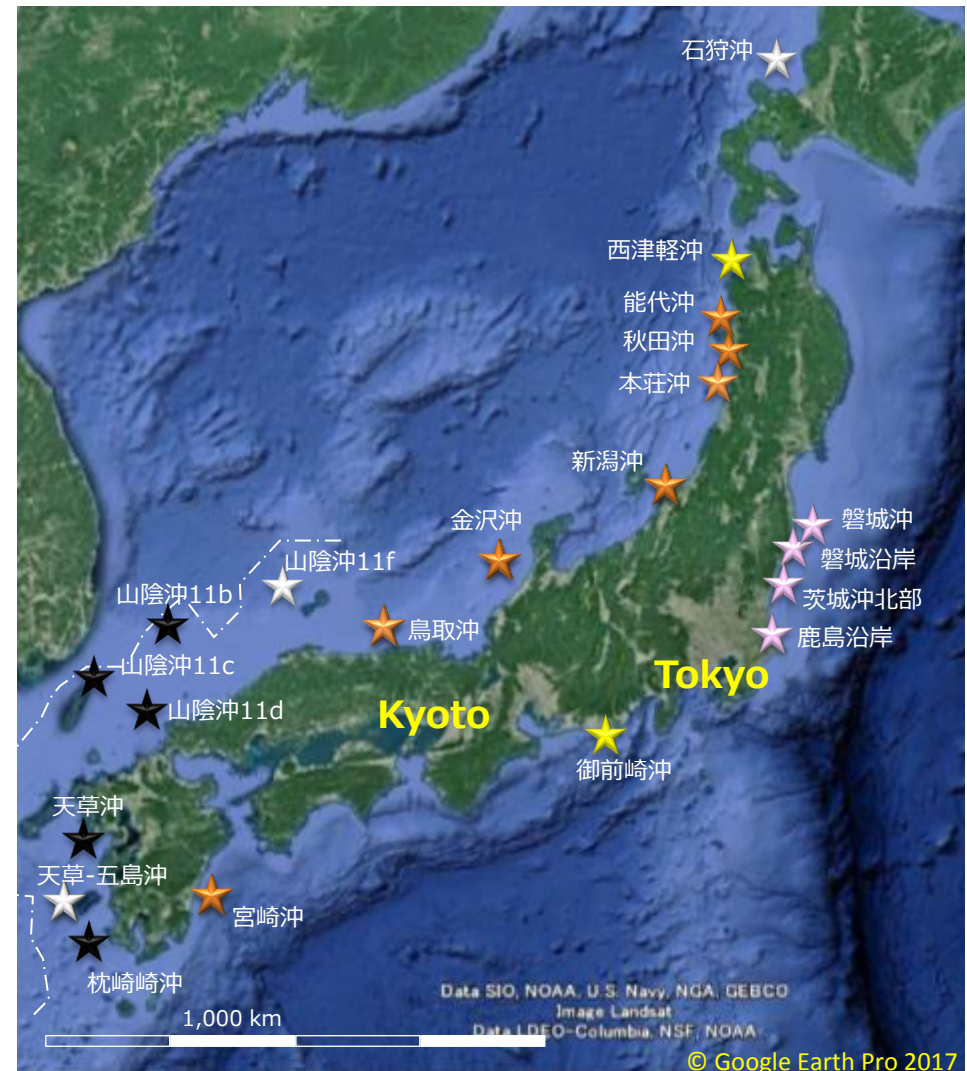
Not being blessed with oil and gas resources means;

- Need to carry out geological survey from scratch. \*USD 10 million per well

4 years of survey is revealing that we may not be blessed by geologically-proven and publically-accepted reservoirs either, which means;

- Need to transport CO<sub>2</sub> long-way from major emission areas to a few available reservoirs.

- ★ continue geological survey
- ★ may continue
- ★ suspended (public acceptance)
- ★ suspended (geological reason)
- ★ suspended (other reasons)



## How can CCS R&D project survive?

Further R&D is required.

- less energy intensive CO<sub>2</sub> separation system
- long-way transport system \*CO<sub>2</sub> cargo ship is under consideration



Typical questions we face are;

- Can our society bare such high cost?
  - \* In fact, even with further R&D, CCS cost in Japan may not be reduced to less than USD 100 / ton.
- Do we need to continue this R&D?
  - \* Competition with other expenditures; medical care, nursery, scholarship...



## How far can climate policies get support from the public?

Support from the public is already significant.

- Every household is paying USD 6.6 per month \*300kWh/month
- USD 79.2 per year
- Further rise in electricity bill to be seen

2016fy      USD 67.5 per year

National total    USD 15.0 billion

2017fy      USD 79.2 per year

National total    USD 17.8 billion



Kyoto, 100ha, 37.5MWh

# Required to have multiple benefits: Climate and Economic Growth

## **NRG Energy & JX – Petra Nova Carbon Capture Project**

United States, Texas

USD 1 billion

Project participation (50%) by JX

CO2 separation plant by Mitsubishi Heavy Industry



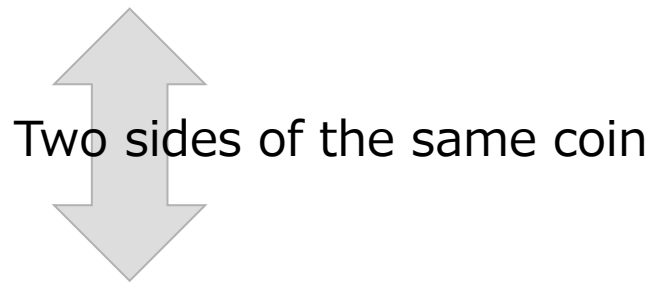
## **Japan-Saudi Arabia Summit Meeting (March 13)**

Signed agreement on implementation of joint studies on technologies toward low carbon energy systems such as CCS and hydrogen.

# Role of global initiative; R&D + Deployment

R&D

Mission Innovation



Deployment



An international initiative for technology deployment, which stimulates introduction of low-carbon policies in developing countries, expansion of the global clean-energy market, could support continuous efforts and challenges in R&D.

My team is now working to;

- Establish CCS policy in Saudi Arabia through mutual cooperation.
- Design electricity pricing system that favors peak demand cut in Viet nam.



# Promoting action that leads to further action

## NDC Partnership

- We see this partnership is very innovative and could convince national leaders to do more in R&D and technology deployment.
- Results of R&D and technology deployment, through business or official development aid, can be visualized by registering projects to the data base.
- Recognizing a country's action (may be partially motivated by business reason) as a commitment to the climate change issue could encourage leaders to further invest in a challenging R&D like CCS.



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