

Climate Change: What Informs a Nation's Policy?

Yamaguchi Mitsutsune, Special Advisor, the Research Institute of Innovative Technology for the Earth (RITE), compares the characteristics of policymaking on climate change in Japan with the process in the United States and Europe.

On 1 June 2017, US President Donald Trump announced that the United States will leave the Paris Agreement. This announcement will have a huge impact on the entire world. However, in the long term, this can be considered part of the significant trend in the decision-making processes in the United States. In fact, the United States, Europe and Japan significantly differ in their processes of formulating a climate policy. This article will attempt to clarify the trilateral differences and recommend improvements concerning Japan.

EU's Climate Policies: Politically Motivated and Top-down

The EU's climate policies are uncommonly characterized by the extent to which they are politically motivated toward achieving the ultimate goal of the climate policies, in other words, by how much global emissions should be reduced in the long run. In 1996, the EU Council decided to limit the extent of the temperature rise, which has occurred since pre industrialization, within two degrees Celsius (hereinafter "two-degree target"). The EU acted as a world leader when it elevated the decision to a global re-

duction target, namely "well below two degrees," as set in the 2015 Paris Agreement. The two-degree target is a political agreement rather than one derived from scientific knowledge. All of the EU's well-reasoned climate policies formulated during and after 1996 regard the target as absolute and are oriented toward its achievement.

follow. However, no cost-benefit analysis is conducted due to reasons such as the difficulty in the monetary assessment of damages or of agreeing a discount rate to calculate the present value of future climate damage. Also, the cost of the policies is calculated on a least-cost model basis and thus is usually much lower than the actual re-

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Specifically, a plan for the emissions reductions was decided to help achieve the target (e.g. global 50% emissions reduction by 2050 compared to those in 1990) and that effort is assigned to countries in some form. Inevitably, this involves a top-down process.

Another characteristic is the accompaniment of an impact assessment (mainly cost analysis) at each step of the decision-making processes. This is what the rest of the world should

sult. The model assumes an international (or EU) uniform carbon tax. Yet this is far from the reality.

As an EU member state, the United Kingdom also regards the two-degree target as absolute, but it differs in some respects. First, the UK created a global trajectory for greenhouse gas (GHG) emissions reduction on the assumption that the two-degree target would be satisfied and that the probability of the temperature rising above

four degrees would absolutely be kept at or below 1%. From the amount of emissions indicated in the 2050 section of the reduction trajectories, the UK calculated the global amount of emissions per capita before multiplying it by the estimated population of the country. In this way, the UK decided to set a legally binding domestic GHG emissions reduction target in 2050 of 80% in comparison to 1990. Second, unlike the EU, the UK always performs a cost-benefit analysis whenever an important policy is formulated. For this purpose, it does an in-depth analysis of the discount rate.

US Climate Policies: Cost-oriented

The United States is completely different. Though there are plenty of papers in the peer-reviewed journals among US researchers as to what extent the world should tackle climate

change to mitigate its dangerous consequences, US policymakers have paid little attention to the long-term ultimate objective of climate policies. The agreement on the two-degree target was led by Europe. The United States is much less motivated to achieve the target at any cost. When making a decision, it places the most importance on the cost of mitigation. During the negotiations for the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the 1997 Kyoto Protocol, only the United States had calculated the cost burden that concluding the treaties would cause for the country's economy. The failed Waxman-Markey bill, the basis of the US Pledge for 2020, also underwent several kinds of cost calculation. In this respect, it is rather strange that the US Government did not perform a cost calculation (or did it, but not

disclose it?) of implementing the US 2025 target of a 26–28% reduction compared with 2005 submitted under the Paris Agreement. Instead, the United States performed a cost-benefit analysis for the Clean Power Plan (CPP) for existing thermal power plants. The CPP served as the basis of the US target. Concerning important government regulations, such as the CPP, cost-benefit analysis is required in the United States by Executive Order 12866, although this is not applicable to law. The Executive Order is still valid under the Trump administration. In addition, the US Congress plays a major role in decision making, and lawmakers' main concern is short-term cost, not the long-term target toward the end of this century.

As written above, the impact on the US economy (cost) is the most important factor in the process of formulating climate policies in the United States. President Trump's announcement to leave the Paris Agreement, though regrettable, is attributable to the concern about cost and the impact on the country's international competitiveness (especially in comparison with China's lenient targets).

Japan's Climate Policies: "Policy without a Price Tag"

What about Japan? It excels in accumulating policies and measures in a detailed manner and using technologies and sectors to formulate plans for achieving a target. Japan has also clarified what the country's electricity generation mix, including the breakdown of renewable energy such as solar and wind, will be like in 2030. This is obvious when compared with the Nationally Determined Contributions (NDCs) that the EU and the United States presented the UNFCCC. Japan clarified these in more detail and, in 2016, formulated a 155-page plan for achieving the target. Unfailingly implementing the plan will ensure its success.

In comparison with its European and American counterparts, Japan lacks cost-consciousness and political

Paris Agreement: Essential Elements

The Paris Agreement builds upon the United Nations Framework Convention on Climate Change and – for the first time – brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. To reach these ambitious goals, appropriate financial flows, a new technology framework and an enhanced capacity building framework will be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Agreement also provides for enhanced transparency of action and support through a more robust transparency framework.

The Paris Agreement requires all Parties to put forward their best efforts through "nationally determined contributions" (NDCs) and to strengthen these efforts in the years ahead. This includes requirements that all Parties report regularly on their emissions and on their implementation efforts.

In 2018, Parties will take stock of the collective efforts in relation to progress towards the goal set in the Paris Agreement and to inform the preparation of NDCs.

There will also be a global stocktake every 5 years to assess the collective progress towards achieving the purpose of the Agreement and to inform further individual actions by Parties.

Source: http://unfccc.int/paris_agreement/items/9485.php

Table 1: Outline of Six Options for the Medium-term Target (Target Year 2020)

| Reduction rate compared to 2005 (Reduction rate compared to 1990) | Measures and policies | Economic impact (2020) | | |
|---|--|---|---|---|
| | | Real GDP | Number of unemployed workers | Household disposable income |
| Option (1) ▲4% (+4%)” | —Extension of existing technologies —Equivalent to the US and EU targets in marginal abatement cost” | (Base case) | | |
| Option (2) ▲6 - ▲12% (+1% - ▲5%) | —25% reduction by developed countries overall —Equalize marginal abatement cost among developed countries” | Not analyzed | | |
| Option (3) ▲14% (▲7%) | —Replace old equipment with latest equipment at the end of life time | 0.5 – 0.6% decrease in real GDP than in the base case | 110 thousand – 190 thousand more unemployed workers than in the base case | 40 thousand – 150 thousand yen decrease in disposable income than in the base case |
| Option (4) ▲13 - ▲23% (▲8% - ▲17%) | —25% reduction by developed countries overall —Equalize abatement cost per GDP among developed countries” | Not analyzed | | |
| Option (5) ▲21 - ▲22% (▲15%) | —Require replacement with latest equipment at the end of life time (In some cases, replacement before the end of life time will be required) | 0.8 – 2.1% decrease in real GDP than in the base case | 300 thousand – 490 thousand more unemployed workers than in the base case | 90 thousand – 390 thousand yen decrease in disposable income than in the base case |
| Option (6) ▲30% (▲25%) | —25% across-the-board reduction by developed countries —Require replacement with latest equipment before and at the time of renewal” | 3.2 – 6.0% decrease in real GDP than in the base case | 770 thousand – 1.2 million more unemployed workers than in the base case | 220 thousand – 770 thousand yen decrease in disposable income than in the base case |

Note: The figures in the second row of options (1) – (6) are compared to the 2005 figure while the parenthetical figures in the bottom row are compared to the 1990 figure.

Source: *Medium-term Goal of Global Warming Countermeasures — Domestic Discussions and Future International Negotiations*. National Diet Library. *Chosa-to-joho* No. 645, 4 July 2009. National Diet Library (2009).

motivation. For example, in presenting the Japanese NDC, the Government has not calculated the cost to implement the plan. Japanese people receive no information about the cost that would accrue from the efforts to satisfy the Paris Agreement. Personally, I refer to it as the presentation of policy without a price tag. Consequentially, it is unclear whether Japan's target is actually achievable. According to a calculation by my research institution, the cost of achieving the target (CO₂ price) is very high, 165–400 dollars per ton CO₂, with huge differences

among policies. It would be particularly high if the power generation mix is fixed, creating a lot of concern about the implementation of the target.

The Japanese government accepted the two-degree target as an international agreement, but had very little internal discussion about why it had to be two degrees. Due to space constraints, allow me to present my conclusion first. It is common knowledge among mitigation experts worldwide that keeping the temperature increase well below two degrees, as stated in the Paris Agreement, is physically, techno-

logically and economically exceptionally difficult. Yet, we cannot preclude the possibility that climatic sensitivity may be found to be high rather than low, in which case it would undeniably result in the collapse of the ice sheets in the West Antarctic and eventually lead to a drastic rise in sea levels. Hopefully we will domestically discuss to what extent we should mitigate climate change, in other words, have our own goal and present it all over the world to stimulate discussions on the new target.

Therefore the formulation of

Table 2: Comparison of the Results of the Analysis of General Equilibrium and Macro Models
Excerpt: Disposable income and marginal abatement cost

| | AIM (CGE) | Keio (CGE) | JCER (CGE) | JCER (Macro) |
|---|-----------------|------------------|-----------------|-----------------|
| Option (1) Standard case | 0 | 0 | 0 | 0 |
| Option (3) -14% versus the 2005 figure (-7% versus the 1990 figure) | | | | |
| Disposable income marginal abatement cost (V/tCO ₂) | ▲ 1.1 10,099 | ▲ 3.1 18,332 | ▲ 0.8 14,519 | ▲ 0.7 18,093 |
| Option (5) -21% versus the 2005 figure (-15% versus the 1990 figure) | | | | |
| Disposable income marginal abatement cost | ▲ 2.3 28,430 | ▲ 8.2 46,764 | ▲ 1.9 33,684 | ▲ 2.1 43,719 |
| Option (6) -30% versus the 2005 figure (-25% versus the 1990 figure) | | | | |
| Disposable income marginal abatement cost | ▲ 9.1 61,029 | ▲ 15.9 87,667 | ▲ 4.5 81,555 | ▲ 5.6 99,883 |

Note: Author created the table based on Appendix 3 of Document 1 from the 7th meeting of the Medium-term Target Committee.

Terms: AIM: Asia-Pacific Integrated Model; KEO: Keio Economic Observatory Model; JCER: Japan Center for Economic Research Model; CGE: Computable General Equilibrium

Japanese climate policies needs more discussion about the target, calculations and disclosure of cost. The question of cost was discussed satisfactorily, however, when the Japanese 2020 target was formulated in 2008–2009. The Cabinet Office created a committee consisting of the country’s representative think tank on climate change. Using eight models, the committee presented six options from perspectives such as cost per GDP, marginal abatement cost, impact on disposable income and international competitiveness, etc. Finally, then-Prime Minister Aso Taro decided to add 1% to the reduction rate specified in option (3), which totaled a 15% reduction compared to the 2005 figure. **Table 1** shows the six options and **Table 2** shows the result of analysis of the general equilibrium and macro economic models concerning such choices.

When explaining the grounds for the abovementioned decision, Aso said the target represented Japan’s determination to lead the world and to shoulder an additional cost of one billion yen by increasing solar power generation by 20 times, double the ten times originally specified in option (3). It is notable

that the then-prime minister emphasized the need for citizens to shoulder some burden in achieving the target, before flatly stating that repeating the idealistic argument of “the more it is reduced, the better” would be an irresponsible attitude toward the citizens (press conference on 10 June 2009). Unfortunately the decision was scrapped due to the change of government to the Democratic Party of Japan that followed immediately after. It is noteworthy that Japan once had an example like this, and similar calculations by models followed for a few years, but currently we have regressed and the situation has worsened, characterized by the presentation of policy without a price tag. In the formulation



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Then-Prime Minister Aso Taro announces that as its mid-term target Japan would aim to reduce greenhouse gas emissions by 15 percent from the 2005 level by 2020, 10 June 2009.

of related policies, we need to ask the government to specify cost, especially in the discussion of Japan’s forthcoming long-term target toward 2050. Also, policymakers, scholars, the mass media and general public must remain more conscious of this issue. 17

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