

## Submission on Sectoral Approach

The Government of Japan submitted the document below as submission regarding the paragraph 1 of the Bali Action Plan in May 2008;  
[http://unfccc.int/files/meetings/ad\\_hoc\\_working\\_groups/lca/application/pdf/submissionjapan.pdf](http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/submissionjapan.pdf)

In addition to this submission, Japan would like to issue 5 submissions which include updated information on the following issues.

- (1) Global long-term goal
- (2) Innovative technology development
- (3) Commitments or actions by developed countries and actions by developing countries
- (4) Sectoral approach
- (5) REDD

In this submission, the Government of Japan outlines its view on Sectoral Approach.

### 【Background】

- The paragraphs 1 (b) (i) and (ii) in the Bali Action Plan require the consideration of nationally appropriate mitigation commitments and actions by developed countries (while ensuring the comparability of efforts among them) and nationally appropriate mitigation actions by developing countries. Also, the paragraphs 1 (b) (iv) provides for the contribution of cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4, paragraph 1 (c), of the Convention.
- Furthermore, at the Leaders Meeting of Major Economies on Energy Security and Climate Change in July, developed major economies agreed to implement economy-wide mid-term goals and take corresponding actions in order to achieve absolute emission reductions while developing major economies agreed to pursue appropriate mitigation actions with a view to achieving a deviation from the business-as-usual emissions.
- In order to make such national actions globally ambitious and sustainable, it is indispensable to ensure equity based on the principle of “common but differentiated responsibilities and respective capabilities” as well as to determine the concrete steps to achieve emission reductions.

### 【Advantages of Sectoral Approach】

- Introducing “Sectoral Approach” can ensure equity and determine concrete steps to achieve emission reductions in order to make national actions globally ambitious and sustainable. In the first step, this approach categorizes greenhouse gases into CO<sub>2</sub> which accounts for 80% of total emissions and other gases. CO<sub>2</sub> is further categorized by certain sectors, such as industry, power generation, residential, commercial and transport, so that appropriate sectoral measures can be considered on the basis of analysis on reduction potential and cost, taking into account sector-specific circumstances (dealing with LULUCF and international transport (aviation and marine bunker fuels) independently).
- The basic concept of this Sectoral Approach is already embedded in the Kyoto Protocol, the Annex of which defines sectors and energy sources. In the Leaders Meeting of Major Economies in July in Toyako, the leaders agreed to promote the exchange of mitigation information and analysis on sectoral efficiency.
- Sectoral Approach on a bottom-up basis is a useful tool for setting ambitious and feasible national emission reduction targets for developed countries. It enables each developed country to aggregate sectoral reductions volume, reflecting sectoral reduction potentials and projection of activities. They should be verified cross-nationally. In addition, model analyses based on marginal abatement costs will provide images of reduction potentials in a specific sector compared with corresponding sector in other countries. Such Sectoral Approach will contribute to ensure comparability and fairness in

national emission reduction targets among developed countries.

- Sectoral Approach can also accelerate mitigation actions of developing countries, which will contribute to global emission reduction. Best practices and Best available technologies (BATs) for each sector can be identified through cross-border analysis. It is possible to promote transfer of those identified Best practices and BATs from developed countries through analyzing reduction potentials and setting indicators. For major developing countries, in particular, sectoral efficiency indicators can be utilized for measurable, reportable and verifiable mitigation actions. Many of these actions have no regret nature with co-benefits such as energy conservation and alleviation of air pollution. It is necessary to assess realistic potential for global emission reduction based on the scientific and technical bottom-up calculations. In order to realize the total global GHG emissions peak in the next 10 to 20 years, it is necessary to establish a framework with all countries through Sectoral Approach bearing in mind “fair and equitable rules” that developed countries contribute more than developing countries.
- It should be emphasized that the Sectoral Approach 1) does not replace national emission reduction targets; 2) is consistent with the principle of “common but differentiated responsibilities and respective capabilities”; 3) does not apply a single common standard to all countries and also 4) does not lead to any trade sanctions.

#### 【Current status of efforts on Sectoral Approach】

- At an international workshop hosted by Japan (Paris, May 8, 2008), it was confirmed that power generation, industry and transport sectors have relatively large reduction potentials at low mitigation costs, according to the current outcomes of model analyses based on marginal abatement costs. Therefore, those sectors should be treated with priority although the sectors with the higher reduction potential vary among different countries. (In addition at this workshop, participants recognized that there would be a gap between reduction potentials based on a bottom-up approach and reductions level required by a top-down approach. Also noted was the necessity not only to strive for wider range of mitigation potentials, but also to take into account additional mitigation strategies including policies, innovative technologies, and behavioral change (through e.g. nation-wide campaign.)
- As for industry and power generation sectors, the Asia Pacific Partnership (APP) has identified high-efficiency technologies, studied technology introduction rates and estimated reduction potential. The APP has also promoted transfer of these technologies and knowledge to developing countries. The international industry associations also make efforts in the iron and steel, cement and aluminum sectors. Furthermore, the IEA has estimated sectoral reduction potentials for the iron and steel, cement, power generation, and petrochemical/chemical industries.
- In the road transport sector, international efforts have been made to improve fuel efficiency, while various domestic measures have also been introduced to regulate automobile fuel efficiency, manage traffic flows, diversify fuels and promote environment-friendly driving (“eco-driving”).
- In the commercial and residential sectors, mitigation actions, including setting energy efficiency standards for buildings, equipment and appliances, have been made at a national level.

#### 【Scheme of Sectoral Approach】 (see the attachment)

- In order to achieve sectoral specific reductions, each country should enhance data collection, promote technology introduction and implement policies and measures.
- Through these developments, developed countries will establish their national emission reduction targets based on aggregated reduction actions and estimated national reduction potentials.
- As for developing countries, we have to consider the nature of “measurable, reportable and verifiable” actions and supports from developed countries based on the analysis of sectoral reduction potentials. Another effective way to apply Sectoral Approach would be to consider incentive schemes for developing countries engaged in further improvement efforts, such as sectoral credit mechanisms.

- It is important to compare technologies and best practices with cross-border perspectives. Exchange and share of this information among countries should be promoted. It is especially important to focus on sectors with relatively homogenous technologies and to ensure international equity in these sectors, namely iron and steel, cement, aluminum (industry), coal-fired generation (power generation) and road transport (transport) sectors.

**【Further developments】**

- It would be meaningful to compile information by Parties on Sectoral Approach (including those on existing undertakings) under the AWG-LCA with relevant information and to launch workshops etc. on Sectoral Approach with participation from industries and academics.
- The methods for comparison among countries need to apply energy efficiency indicators and BATs data etc., which are currently identified by IEA, APP and international industrial associations like IISI and IAI. From this perspective, it can be as an effective measure to utilize the cooperative work by IEA and ISO including the work based on a common position paper by the IEA and ISO, “International Standards to Develop and Promote Energy Efficiency and Renewable and Energy Sources”.
- It is useful to utilize input from industries and experts at the fora such as the informal industry ministerial meeting, which might be scheduled before COP14.
- The Government of Japan also plans to host the second international workshop in this coming October for further analyses on Sectoral Approach. Through this workshop, Japan will continue to assist researchers’ works to clarify modeling assumptions and present them in a way that policy-makers can understand the differences among the outcomes from the different models focused on marginal abatement cost.

## Concept Paper for Submission on Sectoral Approach

Sectoral Approach is a tool to address global emissions by sectors, including industrial, power generation, residential, commercial and transport sectors. It enables the Parties to establish equitable quantified national emission targets ensuring comparability and also to accelerate global emission reductions through sector-specific transfer of technologies and practices.

### 1. Concept of Sectoral Approach

#### **1.1 Analysis of Emissions**

##### **(1) Method for Setting Quantified National Emission Reduction Targets for Developed Countries**

###### 1) Sectoral Analyses

- ♦ Emission trends in each sector need to be analyzed by evaluating changes observed in both intensity (e.g. energy intensity, emission intensity) and production activity volume.
- ♦ In the analysis, it is beneficial to (a) analyze the sector-specific reduction potential for the case in which Best Available Technologies (BATs) and best practices have been disseminated, employing data on the introduction rate of technologies and existing equipment. In addition, (b) the reduction potentials of policies and measures, for example the introduction of new energy sources and nuclear power and those for the low-carbonization of social structures (through economic instruments or visualization of information etc.) should also be calculated.
- ♦ If data such as technology introduction rates are difficult to obtain, the reduction potential of a sector can also be calculated from expectation of the intensity improvement in the country with due consideration of costs.
- ♦ Such analysis should employ reliable data including indicators and technologies currently being identified by international industry associations such as IEA and APP for effective results.
- ♦ Model analysis based on marginal abatement costs can also contribute to providing images of how much reduction potential can be developed in a specific sector in a country in comparison with those of other countries.

###### 2) Establishment of Comparable National Emission Reduction Targets

- ♦ Quantified national emission reduction targets should be established by estimating sectoral reduction potentials and aggregating them on a bottom-up basis to calculate the reduction potential at a country level.
- ♦ Even in the case that targets are already set by a top-down approach, identifying the current technology introduction rate and level of emission intensity for each sector can also be useful in determining the steps towards achieving those targets. A cross-national comparison of target levels should be done based on such work.
- ♦ The final adjustment of the appropriateness of the level of aggregated economy-wide reductions target should be achieved by comparing the results of sectoral verification with the analyses calculated with multiple indicators such as emission intensity, marginal abatement costs and accumulated costs.<sup>1</sup> (to be elaborated in 1.2)

##### **(2) Deviation from BAU in Major Developing Countries**

###### 1) Sectoral Analyses for specific sectors

- ♦ Concrete steps to achieve reduction and limitation in specific sectors can be introduced by analyzing emission trends and future reduction potentials and identifying the necessary technologies and viable policies and measures. These reduction potentials are not intended to

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<sup>1</sup> The model analysis based on the marginal abatement cost can serve to assess the worldwide reduction potential through identifying comparable economy-wide reduction potentials of developed countries and potentials by developing countries' nationally appropriate mitigation actions

prejudge the actions of major developing countries in a future framework; detailed “measurable, reportable and verifiable” actions will be discussed based on the principle of “common but differentiated responsibilities and respective capabilities.”

- ♦ Given the enrichment of data for major developing countries, sectoral analyses, such as those by IEA, should continue to be employed, and measurement and reporting schemes for sectoral emissions should be enhanced. Capacity-building, among other support required, should be extended.
- ♦ For sector-specific emission trends analyses, it is beneficial to adopt the concept of distinguishing between intensity and production activity volume, to analyze the sector-specific reduction potential for the case in which BATs and best practices have been disseminated and to calculate the reduction potential of a sector from the intensity improvement potential.
- ♦ Such analysis should employ reliable indicators currently being identified by international industry associations such as IEA and APP for effective results.
- ♦ Model analyses based on marginal abatement costs can also serve to providing images of how much reduction potential can be developed in a specific sector in a country in comparison with those of other countries.

## 2) Specific Actions and Supportive Measures

- ♦ Concrete and responsible “measurable, reportable and verifiable” actions shall be discussed in the AWG-LCA.
- ♦ As for support to major developing countries, a scheme is necessary to promote investment which realizes efficient mitigation activities, taking into the mitigation potential discussed in 1). For example, a scheme to prioritize introduction of effective technologies with significant reductions could be considered by simplifying conditions and procedures for project-based mechanisms/financial support. The potential of mechanisms of granting credits for additional improvements made in each sector could also be considered as an effective means to provide an incentive for national actions and enhance overall effectiveness.
- ♦ A scheme needs to be considered to quantify efforts to transfer and disseminate BATs and best practices from these developed countries to developing countries as well as to assess the contributions made by developed countries in a measurable, reportable and verifiable manner.

## (3) Support for Deviation from BAU in Other Developing Countries

- ♦ Developed countries should provide technical and financial support for developing countries which try to establish energy efficiency targets or action plans and also make efforts to achieve them. For example, a scheme to prioritize introduction of effective technologies with significant reductions could be considered by simplifying conditions and procedures for project-based mechanisms/financial support, or could be also considered mechanisms of granting credits for additional improvements made in each sector.
- ♦ A scheme needs to be considered to quantify efforts to transfer and disseminate technologies and best practices from these developed countries to developing countries as well as to assess the contributions made by developed countries in a measurable, reportable and verifiable manner.

## 1.2. Cross-border Analysis

From the perspective of international comparability, sectors are largely grouped into the categories below<sup>2</sup>. Priority should be given to sectors in which knowledge can be easily accumulated internationally and cross-national common actions promise large impacts.

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<sup>2</sup> LULUCF has been discussed as an independent methodology; and therefore, it would not be appropriate to address it in this context. International air and marine transport are studied by ICAO and IMO, and therefore will also not be discussed here.

**Category (A) Sectors with advanced international efforts (Iron & steel, cement, aluminum)**

*Sectors in which sectoral measures including target setting have made progress in international industry associations, thus furthering the sharing of technologies and practices. Therefore, efficiency indicators can be easily established and cross-national comparisons can be done. Securing international equity is important in these sectors in order for national differences in reduction levels not to adversely affect the market (pose leakage issues).*

- Because the sectors in category (A) are susceptible to the status of domestic and overseas reduction efforts, the status of reduction efforts should be reviewed through measures such as intensity-based cross-national comparison with considerations of current status and cost. Internationally coordinated actions, including the establishment of common indicators based on the principle of “common but differentiated responsibilities and respective capabilities” shall be pursued.
- In order to establish a method for comparison, energy efficiency indicators and BATs data etc. currently being identified by international industrial associations, IEA and APP should be employed. From this perspective, it can be an effective measure to utilize the cooperative work by IEA and ISO including the work based on “a common position paper by the IEA and ISO, International Standards to Develop and Promote Energy Efficiency and Renewable and Energy Sources”. There are some advancing effort in progress which can be effectively utilized as shown below.
  - ◆ Efforts by Industry Associations
    - (a) IISI (International Iron and Steel Institute): Membership of approximately 180 leading steel producers of the world (covering approximately 60% of world emissions from the iron and steel industry). Agreed on the integration of measurement method: launched data collection program.
    - (b) WBCSD CSI: Represents 18 cement producers of the world. Promotes collection of best practices regarding climate change measures, development of guidelines, and compilation of a database on CO<sub>2</sub> emissions.
    - (c) IAI (International Aluminum Institute) : Represents 80% of world aluminum production. Successful achievements in GHG emission reductions in aluminum industry through integrating measurement methods, establishing common reduction targets, benchmarking, reporting and monitoring (14% GHG emission reductions from 2000 through 2005 while achieving 20% increase in production).
  - ◆ Actions in Asia-Pacific Partnership on Clean Development and Climate (APP) Iron and Steel Task Force agreed integrate measurement methods. It also promotes identification of effective energy saving technologies and examination of diffusion rates in each country in order to calculate technology-specific reduction potentials of dissemination efforts. These activities are also promoted in the Cement Task Force.
  - ◆ IEA Analyses (“Worldwide Trends in Energy Use and Efficiency”)  
IEA estimates such as reduction potentials of BATs dissemination efforts for steel and cement sectors.
- These efforts require intergovernmental partnership and support. In order to share the BATs and best practices currently being identified and to promote their transfer and dissemination to developing countries that are home to these industrial sectors, a forum under the UNFCCC can be set so that experts representing both the public and private sectors can discuss BATs, technology transfer and reduction efforts, subsequently accumulating and sharing detailed knowledge which lead to internationally collaborative actions.

**Category (B): Sectors in which enhanced international efforts are expected (Power generation, road transport)**

*Sectors in which enhanced international efforts are expected since technologies and practices can be identified. Efficiency indicators can also be found for these sectors relatively easily, such as indicators for generation efficiency and fuel efficiency. However, these sectors are susceptible to country-specific natural and geographic conditions (e.g. potential for applying renewable energy) and national policy (e.g. introduction of zero-emission power sources, transport infrastructure); thus, simple cross-national comparisons of indicators require caution.*

- Taking early measures would be possible and beneficial for the coal-fired power generation and road transport sectors, both of which are large emitting sectors and for which technologies can be identified relatively easily.
- For certain technologies, it is possible to quantify levels of reduction efforts to some extent using indicators and BATs data being developed by the IEA and APP. BATs and best practices currently being identified in the IEA and APP should be shared under the UNFCCC as well, with enhancing public-private partnership efforts for their transfer and dissemination.
  - ♦ Efforts in the Asia-Pacific Partnership for Clean Development and Climate The Power Generation and Transmission Task Force compiled a handbook on the operation and maintenance of coal-fired power plants. The task force is also engaged in calculating reduction potentials.
  - ♦ IEA Analysis("Worldwide Trends in Energy Use and Efficiency") IEA analyzes energy efficiency of fire power generation and calculates its reduction potential.
- Because of the large influences of non-technological factors (population, natural and geographical conditions) and policy measures reflecting national circumstances, simple comparisons of sectoral reduction target levels are not appropriate. (appropriate policy measures should be discussed in comparing levels of national emission reduction target for developed countries.) On the other hand, it is important for countries to understand their sector-specific intensities and to evaluate their efforts to improve them.

**Category (C): Sectors centered on domestic efforts (commercial, residential, waste, other industries, etc.)**

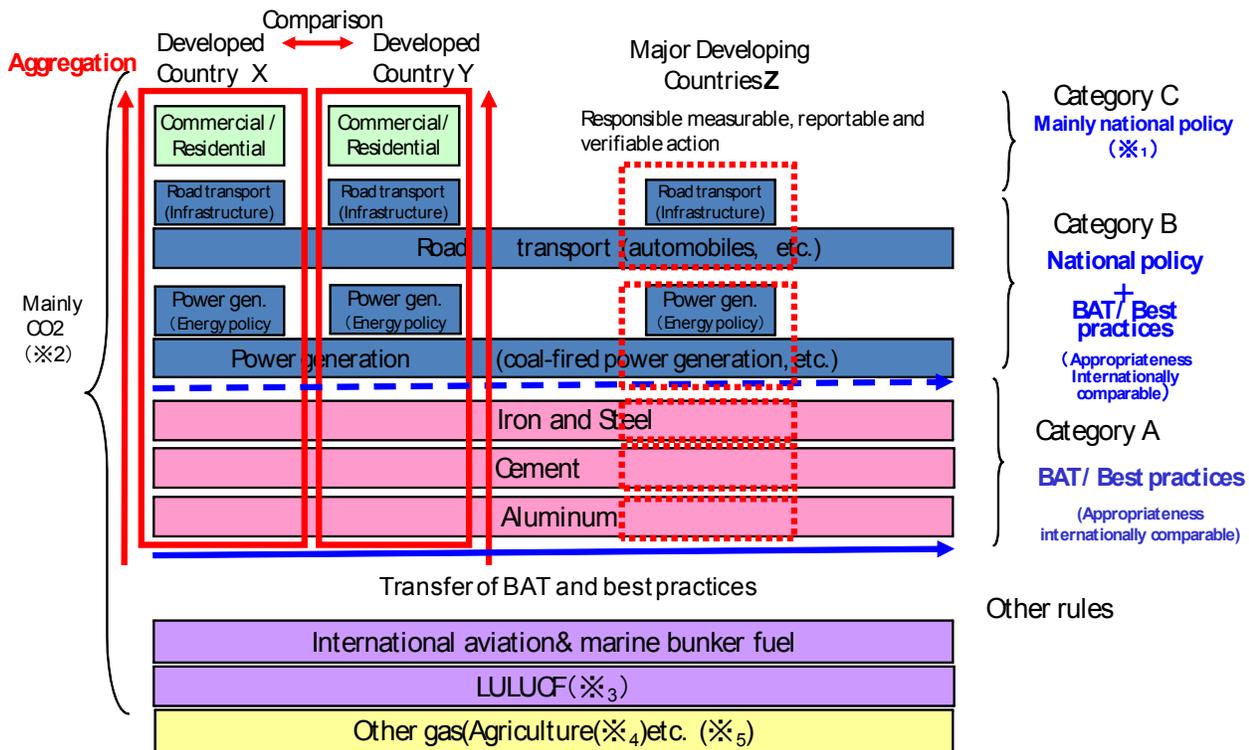
*Sectors with complex emission processes or a covering a vast range of technologies. Efficiency indicator setting and cross-national comparison have difficulties.*

- Each country should consider domestic reductions when comparing levels of national emission reduction targets for developed countries. However, for some technologies, cross-national comparisons based on energy efficiency indicators and BATs, etc. are possible (e.g. comparison of the energy efficiency of household appliances achieved by the introduction of the Top Runner Program). Further examination is needed on methodologies for calculating potentials.
- On the other hand, it is important for countries to understand their sector-specific intensities and to evaluate their efforts to improve them.

## **2. Proposals for Future Work**

- Meeting in Poznan
  - ♦ Collect related information on Sectoral Approach from Parties (BATs, policy measures, sectoral reduction potential analysis by parties, etc)
  - ♦ Collect information on BATs, best practices and model analyses from IEA, APP, industrial sector and experts.
  - ♦ Consider materialization on Sectoral Approach at the Business Roundtable.
- Early 2009
  - ♦ Consider sector (power generation, transport, steel, aluminum, cement)-specific reduction

- efforts (through workshops, etc.)
- ♦ Consider technical/financial support for developing countries.
- ♦ Consider comparability among developed countries.



- ※<sub>1</sub>: In the commercial /residential sector, it is also possible to share technologies and best practices for certain appliances etc.. Although efforts to compare and standardize these technologies and best practices are important, their significance in the sector varies among countries, thus complicating comparisons across the entire sector; and hence they are omitted in this figure.
- ※<sub>2</sub>: Iron and steel, cement and aluminum sectors embrace emissions other than energy-originated CO2 emissions.
- ※<sub>3</sub>: In LULUCF sector, volume of emission and removal can be calculated only after the establishment of the rules for accounting. Volume of emission and removal will become part of total emission reduction target for developed countries.
- ※<sub>4</sub>: In the agricultural sector, further consideration is needed as the uncertainties of GHG emissions are high considering the difference of production system, varieties, GHG emissions calculation method and emission coefficients by nation or regions, due to climate and land conditions.
- ※<sub>5</sub>: As for other gases, reduction volume through consideration of possible measures will become part of total emission reduction target for developed countries.

(Examples of sector-specific intensity)

- ◇ Iron & steel, cement, aluminum: emissions per unit production or energy consumption per unit production
- ◇ Electricity: heat efficiency
- ◇ Road transport: fuel efficiency
- ◇ Other industries: emissions per unit production value (or, emissions per unit production volume)
- ◇ Commercial: emissions per production value
- ◇ Residential, waste, other: per capita emissions

(Examples of reduction potential by policies & measures)

<Power generation sector> Consider the potential for introducing new energy, renewable energy and nuclear power based on energy security policy.

<Road transport sector> Traffic flow measures, improvement of public transport, promotion of environment-friendly driving (“eco-driving”)

<Commercial/residential sector> Low-carbonization of social system (by economic instruments and, visualization of information, etc.), national campaigns, enhanced recycling