CLIMATE FINANCE:

REFORMS FOR PRIVATE FINANCE TOWARDS

GREEN GROWTH IN ASIA¹

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Abstract
The overall objective of sustainable growth is to manage emissions on an absolute basis. Technology is a key for this and technology cycle, research and development, commercialization, diffusion and re-investment to new technologies should be realized. There are several ways to finance green growth but it has challenges, too. Conventional finance sources such as official development assistance is not enough for covering all necessary demands due to budget deficit in developed countries, the supply factor, and potential investors in developing countries are private industry and business, the demand sector. Mobilization of private capital in both developed and developing countries is necessary to complement other public measures including taxation, tax exemption, and regulation for mobilizing funds. Furthermore, environment is externality and should be incorporated into the market economy. The first step is to measure negative and positive impacts on environment, greenhouse gas emissions and emission reduction by measurement, reporting and verification (MRV) and then to put a price on carbon. We need reforms in an area of carbon market, green finance with MRV, performance based incentive scheme, tax reform, feed-in tariff, green certificate and viability gap fund. MRV is a crucial instrument for reforming financing and recommended to be developed, adopted and shared. For establishing practical MRV, a dialogue by industries, policy makers and financial sectors is also recommended. This paper discusses how private finance can be mobilized at different levels to capture positive return opportunities available today, what new market mechanisms and intermediaries needed to emerge.

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² The views expressed in this paper are the views of the author and do not necessarily reflect the views or policies of ADBI, the ADB, its Board of Directors, or the governments they represent. ADBI does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.
1. Green Growth

1.1 Green Asia

The Asian economy is growing faster than other regions and is expected to continue to grow in the first half of the 21st century. However, energy and environmental constraints are serious barriers to economic growth. To balance economic growth and environmental considerations, we need to reconstruct the current economic development model and for this we need “Green Growth.” Technology and finance are indispensable resources for green growth and we have to construct new mechanisms to mobilize these resources effectively and efficiently.

1.2 Technology

The technology gap between ‘developed’ and ‘developing countries’ and between large scale and small/medium scale companies are big. Technology transfer is definitely necessary as a least cost option for improving the level of technology globally. However, we have to remember that technologies are mostly developed, owned and used by the private sector and that these technologies are required for investments by the private sector. The private sector is a driving force for technology transfer as well as investment in green growth and these useful technologies should be transferred through the market mechanism. The public sector’s role is to improve the investment climate for accelerating technology transfer in the private sector. For establishing sustainable technology transfer mechanism, the followings should be noted:

i. Technology comes from a combination of equipment, software and experience and know-how embodied in engineers and workforces. Cooperation between suppliers and recipients of technology is required during operation phase, too.

ii. Technology should be improved continuously and new and innovative technologies are needed to be developed. Technology transfer is a part of the technology cycle; research and development (R&D), commercialization, diffusion and re-investment, which are needed for improvement of technologies and development of innovative technologies.
1.3 Investment and Finance

An enormous amount of funds is required for climate change mitigation and adaptation. The International Energy Agency (IEA) estimated that investment in energy related climate change mitigation in developing countries in 2020 would need to increase by $20 billion. The Asian Development Bank (ADB) estimated that infrastructure investment demand such as energy, transport and water from 2010 to 2020 will reach to $8.2 trillion and all investments should contribute to climate change mitigation and adaptation.

Public financing from developed countries such as official development assistant (ODA) and multilateral financial institutions such as the World Bank and ADB has been used for supporting projects and policies in developing countries, particularly infrastructure projects, which is necessary for economic development. However, these conventional finance sources may not cover all finance demands because firstly traditional donor countries are constrained from budgets deficits (the supply factor) and secondly potential investors in developing countries are from the private industry and business (the demand factor). Therefore we are seeking the mobilization of all potential finance resources, including private finance, of both developed and developing countries and funds managed by institutional investors. This encompasses all measures including public-private finance,
taxation and tax exemption, regulation and the enhancement of voluntary actions. We need to reform the financial mechanism and realize a paradigm shift in financing.

**Figure 2: Financial Flows to Developing Countries**

![Financial Flows to Developing Countries](image)

| Source: OECD DAC Statistics |

Another background factor we have to remind ourselves of is the growth of private funds. The financial market in emerging countries, such as Thailand, Malaysia and Viet Nam are growing and private finance extends finance to both infrastructure and industrial projects, which require long-term financing. Also private finance in developed countries looks at the emerging country market a high growth opportunity. A large amount of private funds are becoming available now and they are actually directed to green growth projects when the investment climate of the projects is satisfactory for private financing. Public finance is expected to play a catalytic role for mobilizing private finance.
2. Measurement as the First Step toward Market Mechanism for Carbon

2.1 Measurement and Pricing

Environment is an externality and the best solution for eliminating the externality is to incorporate externalities into the market mechanism. The first step of this integration process is the measurement of the negative impact of economic activity on the environment and the benefit of environment’s contribution and so that a “price” could be determined. A base price would then be decided by regulation, for example a carbon tax, and also determined in the market by the demand and supply, which are generated by the regulatory framework.

The methodology of measurement of greenhouse gas (GHG) emissions and emissions reduction - measurement, reporting and verification (MRV) is an essential component. The clean development mechanism (CDM) methodology is one of the most commonly used methodologies globally and it has more than 200 variations. Its contribution is enormous but it can be improved because CDM is not perfect and we are still in the learning-by-doing
phase.

i. Reductions are defined as the gap between the baseline emission and the project emission. Under CDM, the assumptions necessary for calculating the baseline emission are rather complex and, sometimes, unrealistic. It is pointed out that CDM methodology is different from the approach, which is used for demonstrating the reduction potential at business negotiation or confirming the benefit of energy savings by owners.

ii. CDM methodology is a case-by-case approach. The benefit of the case-by-case approach is its flexibility. It is easy to take into account of the differences of local conditions and accommodate new types of technologies and ideas. However, it is not transparent and predictable. Investors would like to be certain about the emission reductions, particularly when reductions convert to credits and generate additional cash flow.

2.2 Improvement of MRV

The Cancún Agreements explicitly acknowledge the role of private finance to achieve 2020 goals. We have to accelerate the shift of the private finance to low carbon investment. Yet today, there is limited understanding of the role and definition of climate finance by private financing. Therefore we need to construct the common understanding for climate finance and the role of private finance for climate finance and need to develop instruments for defining and monitoring the flows to low carbon development. The system of MRV could be extended to include some private climate-specific flows, such as those related to CDM. In addition, foreign direct investment (FDI) is a key financing vector and can play an important role in support of the diffusion of low-carbon technologies. Until recently, however, the potentially important role of FDI has received little systematic attention in the climate change debate. In partnership with others, the OECD is working on how to define and measure green FDI, with a view to promoting a better understanding of the contribution FDI can make to the shift to a low-carbon economy and the role policies may play in the greening of FDI. MRV is rather new concept, particularly for financing. There are varieties of MRV such as CDM, Voluntary Certified Standard, J-MRV and so on. As of today, there is no single comprehensive MRV which can cover all major investment fields like from energy efficiency at energy supply sector and at small demand side investment, renewable energy use and land use change. However financial institutions have been involved in many activities and it is expected to use their experience for proposing ideas for MRV. MRV Alliance by financial institutions could be effective for constructing practical MRV as well as creating momentum
for shifting to low carbon investment. CDM is a good practice but it needs to be improved. We need to construct an innovative MRV system using CDM experiences. The ideal MRV is a comprehensive system and clear principles are needed. The system’s principles are crucial because they indicate the direction of solutions when we face a difficult decision when calculating reductions. Therefore one of the important principles should be “simple and practical” and “objective.” A key for actual evaluation is baseline setting because the reductions are defined as the gap between baseline emissions and project emissions and it is not practical for MRV if baseline setting is complex and subjective. One of the best options is benchmarking. Investors and verifiers can share the view over CO₂ emission reduction prior to verification because “rules of game” is rather simple.

3. Application of MRV for Reforms of Financing

3.1 Carbon Market

The carbon market provides additional revenue to the GHG emission reduction projects. CDM as an international emission trading has mobilized more than USD 6.5 billion to developed countries for supporting GHG emission reduction projects in developing countries in 2008. Under the CDM, GHG emission reduction at project level is evaluated by appropriate methodology and converted into carbon credits. The price of credits is decided through the carbon market. It is functions as a market-based incentive mechanism for energy efficiency and renewable energy projects but it is unlikely to provide for our total sum of investment needs and therefore it should be combined with other funding sources.
It is observed that carbon market encourages the low carbon investment to some extent but
still it need to have further improvement. One of the hot issues seems to be carbon pricing itself. Carbon price becomes extremely lower level. After COP17 price of CER downs to below €5 per ton at European market. Peak of CER in the early September 2008 was around €21 per ton and this means that CER price has dropped to nearly 20% of the peak price in these 3 years.

It is considered that too lower carbon price will provide negative impact on the behavioral change of industry and citizens and low carbon investments because upward trend of carbon price urge industry and consumers to choose lower carbon options for mitigating the risk and increasing the profit. Now the necessity of the long term price signal on carbon price is seriously considered. One of the examples is UK which adopted “Carbon Budget” in 2008. This policy said the allowed CO2 emission in UK will be reduced to under the long term policy plan and it would be reduced by 34% in 2022 compared to 1990 level. This is not a direct intervention of the carbon price but may put impact on the carbon price at the market. In Asia there are many renewable energy base CDM projects including biomass waste. Asia is, generally speaking, biomass resource rich region and share of biomass at the primary energy supply has been high and CDM accelerate the use of biomass waste for energy. “Waste for Energy” become a big stream and contribution of carbon market is big. Another big benefit is pollution control. Biomass waste polluted water and soil but CDM requires appropriate treatment of waste.

The CDM market is deeply depressed because of the sluggish economy and the uncertainty of the regulatory framework after 2013. Demand for the credits depends on the regulation for the GHG or CO2 emission and economic activities. By the slowdown of the economy by the financial crisis in 2008, demand for credits has dropped sharply and again dropped by the Euro crisis in 2011. For instance, World Bank estimation of the total demand for international offset credits under Kyoto Protocol in 2008 was some 2 billion but now it has dropped 1.2 billion. On the supply side, registered projects under Kyoto Protocol are increasing and issued credits are accumulating steadily even though its price has been dropped. It is observed supply side of credits from GHG emission reduction project is not so flexible compared to demand side in the short term.

However, in Asia, a new trend is emerging. Each country is developing their own carbon markets with as yet no links to each other. Australia has started a carbon price mechanism called Clean Energy Future (CEF) from July 2012 and it will transition to a carbon market on July 2015 from fix carbon tax system. Republic of Korea is going to start an emissions
trading scheme (ETS) in 2015, and People’s Republic of China will have 7 regional experimental schemes in 2014 and these experimental schemes are going to be developed into a nationwide scheme in 2015 or 2016. India started Performance, Achieve and Trade (PAT) as a variation of ETS and Japan will construct a new offset credit mechanism as an offset credit supply mechanism, called Bilateral Offset Credit Mechanism (BOCM) which is to be constructed by developing country’s government and Japanese government individually. It is expected to be incorporated into a de facto global market because a large scale market with plenty of liquidity will reduce transaction costs. It is better to facilitate the harmonization among fragmented carbon markets for the faster transformation to a universal market than promote independent ones. International Emission Trading Association (IETA) is facilitating harmonization and they believe its key is harmonization of MRV. And one of the best ways to keep transparency and level playing fields is benchmarking.

In addition to a regulatory framework, voluntary action may give commercial value to reductions. For instance, companies or individuals may offset the CO₂ emissions from their activities by using carbon credits as their voluntary environmental contribution. For that
purpose, they may choose any type of credit standard by themselves. However, the magnitude of demand for this is limited.

**Table 1: Options for Green Finance**

<table>
<thead>
<tr>
<th>Finance with MRV as conditions</th>
<th>Finance after the confirmation of GHG emission reduction by using MRV</th>
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<tbody>
<tr>
<td>Performance Base Incentive and GCF</td>
<td>Incentives to be given based on the reduction amount of GHG (fixed carbon price)</td>
</tr>
<tr>
<td>Tex reforms</td>
<td>Carbon price on the emissions</td>
</tr>
<tr>
<td>Custom duties</td>
<td>Tax exemption by GHG emission reductions</td>
</tr>
<tr>
<td>FIT, Green Certificate and VGF</td>
<td>Carbon cost adjustment</td>
</tr>
<tr>
<td>SRI</td>
<td>Market base incentives</td>
</tr>
<tr>
<td></td>
<td>Mobilization of the funds of institutional investors by rating or the creation of green assets</td>
</tr>
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</table>

Source: Author

**Carbon Market after 2103**

Emission trading is considered to be functioned, to some extent, for reducing GHG and CO2 emission globally and also many investors expect carbon market as a market base incentive scheme. Emission trading could be a least cost option. But there are conditions for using emission trading scheme as a market base reduction option. The below are “lesson we learnt” from the past experiences:

1) As a long term policy measures: Carbon pricing may push the behavioral change of industry and consumers rather easier but it should be long term policy framework when we would like to encourage the low carbon investment. We have to take care of lead time for investment including payback period of investment.

2) Price signal: For urging investment, carbon price should be at the upward trend. Price fluctuation at the market is unavoidable because it is a market. However, in the long term, price should be increased. Without expectation of upward trend of carbon price, low carbon investment is not attractive.

3) Technical improvement: CDM is actually support many GHG emission reduction projects but the necessity of improvement is pointed out by investors. For instance, methodology for evaluation of emission reductions is complicated and takes time for receiving incentives for reducing emission. Simple and practical methodology is needed and also predictability shall be improved.
The development of a global carbon market can encourage participation by further lowering the cost of mitigation actions. In the near future, a global carbon market may gradually develop through links between national and regional ETS or through crediting mechanisms or other trading systems. Any eventual linking of ETS would require some international harmonization of features, including levels and/or procedures for setting emission caps, the adoption of safety valves, and the use of international offsets. By broadening participation to include developing countries and lowering the carbon price differential between participating and non-participating countries, crediting mechanisms can also extend the carbon market, thereby reducing carbon leakage and related concerns. One such crediting arrangement is the CDM, which allows the countries listed in Annex I to the Kyoto Protocol to invest in projects that reduce emissions in developing countries.

Analysis shows that the cost-saving potential for developed countries using well-designed crediting mechanisms could be very large. However, there are serious concerns about the effectiveness and administrative burden of the current CDM, which is largely project-based. To address some of these concerns, it might be advisable to negotiate emission baselines at the sectoral level. Industries that reduce their emissions below their baseline would generate credits that could be sold in international carbon markets. Environmental effectiveness of emission cuts could be improved by setting these baselines significantly below the emission levels that would prevail if no further actions were to be taken.

In the long run, however, to achieve ambitious global emission reductions at low cost, such approaches will need to be integrated in a unified, global carbon market, such as using binding caps with trading. If well-designed, binding sectoral caps for energy-intensive industries and the power sector in developing countries, which account for almost half of current world GHG emissions from fossil-fuel combustion, could lower the cost of achieving a given global emissions target, broaden participation in actions to tackle climate change, and alleviate leakage and competitiveness concerns. Even so, they would need to be ambitious in order to be effective. Other sectoral initiatives, such as voluntary, technology-oriented approaches, can help diffuse cleaner process and technologies, but are unlikely to provide sufficient incentives for individual firms to reduce emissions as they put no explicit cost on carbon emissions.

Figure 5: Carbon Market After 2013
It is unlikely to be agreed about the international framework for after 2013 and international carbon market, like current Kyoto Credit market, will not be there. However, national carbon market and municipality base carbon market will be in the region. Followings are overview of emission trading market in Asia.

Even after 2013, carbon market will be adopted used as an option of market base mechanism. EU, Japan and Australia has their own GHG emission reduction target and it is expected to use international offset credit for achieving their reduction target. Total demand for international offset credits from 2013 to 2020 is estimated around 2.9-3.9 billion ton (World Bank 2011). Total demand of international offset credit before the end of 2012 is estimated around 1.4 billion ton. Magnitude of carbon market is not small and we expect carbon market will encourage energy efficiency and renewable investment by improving their project cash flow.

One concern is fragmentation of carbon market. Investors to low carbon projects may use carbon market but its risk becomes higher if liquidity of the market is low. “Fragmented market” is better than nothing but it is better to harmonize among different market. Followings actions are recommended as harmonization process of fragmented market:

a) Methodology for evaluating emission total and emission reduction are needed be
b) Legal settings in project host country need to be prepared to secure the value of carbon credits. Technical support by countries with advanced infrastructure is crucial.

c) Road map both for introduction of each markets and integration of these market into to the global market should be prepared by government.

3.2 Green Finance

Many banks tend to positively finance the projects which help the environment and many public banks have special facilities to support energy efficiency and renewable energy use projects. However they tend to select using priority list-like eligibility criteria and judge them on a case-by-case basis. It is subjective and not predictable. However, MRV could be applicable as a condition because it may distinguish GHG emission reduction projects clearly and objectively. When MRV is simple and objective, investors can estimate the reduction prior to the approval of financing and are encouraged to make low carbon investments.

Among many good practices one is “GREEN - Global action for Reconciling Economic growth and ENvironmental preservation”, an initiative for supporting low carbon investments by the Japan Bank for International Cooperation (JBIC), government-owned policy-based lending bank. Under this initiative JBIC provides attractive finance, low-interest and long term finance compare to the market funding, to low carbon projects directly or indirectly through intermediary banks when project owner as a possible borrower explains GHG emissions reduction at the project and JBIC confirms it. JBIC has developed a simple and practical MRV guideline for this initiative because CDM methodology is too complicated and MRV would be a barrier for investors to use the JBIC finance initiative. Some of its key elements have been transplanted to MRV for BOCM.

Figure 6: Structure of Green Credit Line
Table 2: CDM and J-MRV

<table>
<thead>
<tr>
<th>Purpose</th>
<th>CDM</th>
<th>J-MRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle</td>
<td>Crediting mechanism under Kyoto Protocol</td>
<td>Confirmation of the emission reductions (A condition of a JBIC’s financing program (GREEN))</td>
</tr>
<tr>
<td>Facilitation of investment</td>
<td>Conservativeness</td>
<td>Simple and practical</td>
</tr>
<tr>
<td>Reduction</td>
<td>Facilitate the additional investment</td>
<td>Facilitate the emission reduction projects globally</td>
</tr>
<tr>
<td>Baseline emission</td>
<td>Baseline emission – projects emission</td>
<td>Baseline emission – projects emission</td>
</tr>
<tr>
<td>Measurement</td>
<td>Emission without the project. Technology and financial additionalities shall be considered</td>
<td>Actual emission before the investment. National average or mission from the installations before investment</td>
</tr>
<tr>
<td>Minor effect</td>
<td>Physical measurement is in principle</td>
<td>Estimation by using theoretical value and sampling are allowed as practical one</td>
</tr>
<tr>
<td>Approach</td>
<td>Why “Minor” is needed to be proved</td>
<td>Minor effect can be deducted by the certain rule</td>
</tr>
</tbody>
</table>

Source: Author

Private sector banks are implementing various financial programs for supporting Green Growth. An example is Sumitomo Mitsui Banking Corporation (SMBC)’s rating system of sustainable buildings. They reviews 8 categories with 37 check points including energy and
water use of buildings and give a rating out of 8. They will finance the buildings in the top 3 grades.

3.3 Performance-Based Incentive Scheme

MRV is applicable to incentive schemes. Under traditional incentive schemes, incentives will be given to the projects or activities by government directly or indirectly through implementation agencies. Evaluation and determination of the incentive amount is mostly determined in a case-by-case manner based on each application. Evaluation of these applications is not easy because of the complexity of the technology involved and the different business models, so there is a possibility of unfair judgment. Therefore, third-party experts are invited to the evaluation committee for improving its evaluation capability and keeping fairness. Performance-Based Incentive Schemes using MRV can determine the amount of incentives objectively and scientifically when unit incentive amount is fixed under the incentive scheme. For instance, “one ton of CO2 emission is equivalent of fixed USD price which will be determined prior to delivery”. This scheme may improve the performance of the policy program.

Performance Base Incentive System could reduce the economic burden of adoption of advanced technology for investors by incentives but these incentives will be paid to the applicants during project implementation period depending on its performance. Possible flow of this system is as follows.

1) Announcement of tender for the incentive system. Aim and eligible criteria are included.
2) Application from applicants
3) Review of applications by implementation agency and conditions for incentive payment shall be agreed with applicants as contracts.
4) After conclusion of contract with the agency, applicants start the project by using incentives.
5) Monitoring of the CO2 reductions will be performed by the applicants and monitoring report with the third party’s evaluation will be submitted to the agency.
6) The agency reviews and pays incentives to the applicants depending on the amount of the reductions.
7) Monitoring, Review and Payment cycle will be implemented annually following the contract.
This process is similar to CDM because "project first and payment later". But payment of the performance base incentive system will be made by the government through the agency. Unit incentive price which is denominated as price per CO2 ton can be fixed on the contract. Therefore investors for securing CO2 reductions can avoid price fluctuation risk. Project cash flow can be improved by this scheme and private finance institution may provide finance easier.

For the implementation of this scheme, banks can submit applications and receive incentives on behalf of project. One of the conditions of actual implementation this scheme is financing which will cover the initial investment cost and bridge to the incentives later. From this point of views, it is more practical when banks provide finance first and receive incentive which will be allocated to the repayment to the banks.

**Figure 7: CO2 Reduction: Case of Performance Base Incentive**

Source: Author

**Figure 8: Carbon Market and Performance Base Incentive System**
Performance base incentive system is very cost effective incentive system. However, one crucial condition is how to get startup cost including initial investment. A possible solution is combination with private finance. Private finance reviews the project and the possibilities of incentives by Performance Base Incentive System and they can provide finance to the project when project cash flow including these incentives is enough. Under this scheme, project developers will receive incentive directly and financial institutions will submit application and receive it on behalf of project developers.

It may be useful to the Green Climate Fund (GCF) in order to use its funds effectively. GCF is going to start its operation to mobilize finance resources necessary for climate change mitigation and adaptation in developing countries and is expected to play a catalytic role in the mobilization for private funds.

GCF appoints intermediary banks for implementing the program first. These intermediary banks provide finance to CO2 or GHG emission reduction projects by their own decision making when they confirm CO2 emission reductions by the project by using MRV and the economic feasibility as well. They monitor its reduction amount by using MRV and report it to GCF. GCF reviews the report and provides the incentives to the intermediary banks who share them with the project organizers following the profit share contract agreed prior to
submitting the application to GCF. Its amount is determined by the approved reduction amount (amount of incentives is amount of reduction multiplied by the pre-determined unit reduction price). “The more reductions, the more incentives” is a simple incentive scheme and reduce the GCF’s institutional workload. Small and compact but efficient, GCF can realize its goals by adopting a Performance-Based Incentive Scheme.

**Figure 9: GCF and Performance base Incentive System**

<table>
<thead>
<tr>
<th>Eligible Project:</th>
<th>CO2 emission reduction project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Incentive:</td>
<td>Depending on CO2 emission reductions</td>
</tr>
<tr>
<td></td>
<td>Price is pre-fixed by GCF</td>
</tr>
<tr>
<td>Eligible Banks:</td>
<td>Banks able to manage MRV process defined by GCF</td>
</tr>
<tr>
<td>Role of GCF:</td>
<td>Delivery of incentives and administration of Evaluation Committee</td>
</tr>
</tbody>
</table>

- Low financial risk for GCF ⇒ Realizing small capacity of GCF
- Use incentives effectively
- Wide Window ⇒ Support many and varieties of private projects

### 3.4 Tax Reform

Carbon tax is one of the options for giving a price to CO2 emissions. The tax rate is determined by the government, like Australian carbon tax (Clean Energy Future, CEF) which is at $23 per CO2 ton emission. Carbon tax schemes urge installations under this scheme to reduce CO2 emissions to avoid a heavy tax burden. This scheme is similar to ETS but the price determination mechanism is different; the carbon price under ETS would be determined by demand and supply in the market whereas a carbon tax is determined by the government. One of the benefits of a carbon tax scheme is it avoids the fluctuation of the carbon price and regulated companies can calculate the future tax amount and the effect of
energy efficiency improvement investment. However, how to determine the appropriate tax rate, or carbon price, is crucial. A carbon tax scheme is easy to transform to ETS and Australia plans to shift to ETS in July 2015.

Another approach for giving incentives through a tax system is tax exemption. For instance, in Thailand, investors to CDM funds enjoy tax incentives through tax exemption. This kind of tax exemption scheme can be transformed to a performance-based tax exemption scheme when investors can demonstrate the reductions to the tax authority. This could be a good incentive for institutional investors and also venture capital for clean energy projects.

3.5 Custom Duties

Keeping a level playing field is a crucial objective for international business activities. The climate change policy framework is an international public good and negotiated under the UN framework. Under Climate Change Conventions, two types of approaches are implemented; one is a national approach which is implemented by each government and another is sector wide approach like international maritime and aviation. Internationally traded products and services, which are, in principle, regulated by each national scheme, are under severe international competition and an increase in the cost of carbon is a serious competitive issue, so states and companies are seeking fair regulation.. Customs at the point of import is a possible place to enforce carbon pricing in goods. Adding the cost of carbon to imported products and services that have not paid for emissions inside the country is required but it is technically very complicated because it is necessary to know the supply chain and emission of each part of the chain. Also we have to add the impacts on the international trade. The best way is a sector wide, cross country approach for determining carbon price.

3.6 Feed-in Tariff, Green Certificate and Viability Gap Fund

CO2 emissions will become an explicit cost through the regulatory framework but it takes time and this is the reason why the incentive mechanism is required. Carbon emission trading is one of the market options providing incentives. However, sometimes emission trading may not provide a sufficient amount of incentives for cost recovery, particularly technology development costs. The gap needs to be full filled by additional incentives.

The following are options to encourage market-based approaches;

i. Feed-in tariff (FIT); FITs are used widely for supporting uncompetitive but climate
friendly electricity supply. FITs fix the price of the purchase of electricity power generation by using the supported energy sources, such as renewable energy. This policy provides certainty of the price of electricity generation over a long-term period and stabilizes project cash flow. This is an attractive incentive to investors. A key of this scheme is price/tariff determination; there would be no investment if the price is too low and too much supply if the price is too high. The appropriate tariff level will be changed by the technological innovation and it is necessary to revise the tariff reflecting innovation. The cost of incentives is shouldered by utilities first and then transferred to consumers.

ii. Green Portfolio/Green certificate: This scheme decides the volume or ratio of the supply first, by setting the mandatory target of green energy. Price of service is determined by demand and supply conditions and in the long run, the probability of the oversupply and short supply is likely to be low. However, price risk shall be taken by investors. The cost of incentives is shouldered by utilities first and then transferred to consumers.

iii. Viability Gap Fund (VGF); this scheme is applied to the project case-by-case, typically infrastructure projects that have a gap between payable tariff and tariff for cost recovery. Subsidies are necessary to recover the investment cost. An option of application of VGF is as follows; firstly the project to be supported by this scheme is decided and then a tender would be made. The lowest price offer for services which take into account of all incentives, including emission trading or other carbon related revenue, will be accepted and the gap from the payable tariff for service buyers would be filled by VGF. This scheme assures there is enough revenue for investors and cost effective incentives. However, sufficient completion is a condition to be cost effective. MRV can be used for checking the cost performance of the VGF’s incentives and confirming the tax payer’s burden for the incentives. Cost of incentives is funded by the host government but a part of its cost can be supported by using ODA or multilateral funds.

Figure 10: Feed-in Tariff, Green Certificate Market, Viability Gap Fund
### 3.7 Social Responsibility I Investment (SRI)

Institutional investors manage huge amounts of funds and invest in many varieties of financial products. They are aware that they can make contributions to enhance low carbon investment and support companies that take proactive actions for green economy. Environment, social and governance (ESG) investment is one of their initiatives. ESG investment market is growing and it is estimated it was worth over €7 trillion in 2010 (EuroSif 2010). EU and US markets are leading the ESG market and their magnitude is €5 trillion and 2 trillion respectively. This kind of initiative is expected to be taken by the institutional investors in developing countries and its indications show that this is happening. For instance, the Principles for Responsible Investment (PRI), which is UN organization led initiative, are signed by 22 institutions in developing countries in Asia (Asian total is 206).

ESG covers a variety of corporate policies and actions but also ESG is subjective in definition. Climate change is ranked as the top priority category in environment related investment following the survey by PRI. When focusing on climate change, many innovative approaches are possible. A rating scheme for climate change and environment actions is an option. Good Bankers Co. developed a forest conservation rating system. They review around 19 items which are considered as forest conservation friendly actions and give a grade among 15 rating grades, AAA to C, depending on the scores by their reviews. This is assumed to be used in combination with conventional financial rating; fund managers can consider both financial and environment rating for their investment. Good Bankers released a new initiative with Tokyo Stock Exchange in 2012 to direct the funds of the stock market to the companies seeking aiding sustainable development. They review the corporate policies and actions according to sustainable development based on the replies to their
questionnaire and show a table of their findings with comments. This could be an incentive to companies to take action on climate change and their own sustainable growth because they may expect to higher stock price by the improvement of the reputation of the company in terms of sustainability.

**Figure 11: Forest Eco Fund**

Source: Good Bankers Co., Ltd.

SRI has become measurable by using a rating system but the rating process should be more objective. One of the possible ideas is to construct a “Green Asset” identified by MRV. Firstly financial institutions invest in projects with GHG emission reduction confirmed by MRV and it should be securitized into a green asset portfolio which would be funded by institutional investors. This concept means the creation of a new asset class market, the green asset market, for institutional investors. For instance, the green asset portfolio can be encouraged by tax exemption and it is a good incentive for the creation of a green asset market as an option for the reform of the institutional investors market.

We may develop a “Green Asset Portfolio Scheme” as a regulatory scheme. Bank Indonesia, Central bank of Indonesia, has a conceptual plan to develop a Green Banking Scheme and this can be combined with green assets, which are identified by MRV. An idea is to set green asset ratio as a mandatory target, like the renewable energy ratio in the
electricity market. By introducing a mandatory target, the commercial value of green assets increases and then supply of funds to GHG emission reductions will be increased.

Figure 12: Transformation of Money Market

4. Conclusions and Recommendations

Our goal is the elimination of environmental externalities and, among the many environment externalities, the most critical and urgent issue is CO$_2$ emission reduction. The first step for the integration of the cost of CO$_2$ emissions into the market mechanism is measurement of CO$_2$ emissions and CO$_2$ emission reduction. MRV is a useful instrument for reforming the financing mechanism by giving CO$_2$ emitted in economic activities a price. Once established, the transition to a green economy would be accelerated.

The following actions are recommended for the reform of financing:

i. **Adoption of MRV**: Financial institutions can identify the low carbon investment, activities, products and services to be financed and also evaluate their performance as “Green Institutions” by reviewing the outcome of their financing activities using
MRV. Tax and government incentive schemes can be transformed to CO2 base price schemes by adopting carbon tax and tax exemption of green investment. Governments and financial institutions are recommended to adopt MRV for their reform. MRV is in the learning-by-doing stage and should be improved. Experience of MRV is recommended to be disclosed to the public.

ii. **Capacity building and sharing experiences**: If small numbers of financial institutions adopt MRV, its impact is limited. It is necessary to team up with many institutions to generate a momentum. Multilateral institutions such as ADB and GEF are recommended to provide capacity building to the financial institutions that don’t have enough capability to implement MRV. And leading public and private financial institutions should transfer their experience through their business activities such as co-financing.

iii. **Dialogue with industry groups**: Technology information and experiences of management of projects is needed for constructing practical and effective frameworks. Collaboration with industry is crucial and dialogue with industry groups by policy makers and financiers is recommended.
References


Hongo, T. 2010. Road to Market Mechanism for Sustainable Use of Biodiversity.

Hongo, T. 2011. About J-MRV


