

ecbi policy analysis report

Lessons learned from CDM project approval procedures in Southeast Asia

Dang Hanh and Axel Michaelowa

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European Capacity Building Initiative

Box 193, 266 Banbury Road, Oxford, OX2 7DL

Phone: +44 (0) 1865 428 427

Fax: +44 (0) 1865 421 898

e-mail: adm.n.ocp@gmail.com

www.eurocapacity.org

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for Economic Cooperation
and Development

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Climate Protection Programme

Dang Hanh

Hamburg Institute of International Economics, Neuer Jungfernstieg 21, 20347 Hamburg, Germany
dang.hong.hanh@hwwa.de

Axel Michaelowa

Hamburg Institute of International Economics, Neuer Jungfernstieg 21, 20347 Hamburg, Germany
a-michaelowa@hwwa.de

Introduction

The Clean Development Mechanism (CDM) has now been operational for almost three years, with projects clustering mainly in rapidly industrialising, middle-income countries. It is becoming increasingly urgent to draw lessons on how to fully mobilise the theoretical CDM potential of other developing countries, particularly the role of host country institutions in promoting CDM projects. Barriers in low-income and least developed countries (LDCs) need to be assessed to derive strategies to promote CDM projects.

The countries that are part of the Association of South East Asian Nations (ASEAN) provide a good framework for such an analysis, as they include a wide range of income characteristics and differing degrees of institutional development. Moreover, the ASEAN region has been the focus of a number of CDM capacity building efforts financed by bilateral and multilateral donors.

The flow of CDM depends on three key factors in a host country – scope for CDM projects, CDM capacity, and business environment (Figure 1). While the theoretical potential for CDM projects and the existence of a DNA are necessary conditions for attracting CDM, perceived economic risk and market and political barriers define the business environment. A favourable business environment is essential to attract and implement CDM projects.

In this study, we estimate the theoretical CDM potential of selected countries in ASEAN. We then describe the situation in these countries with respect to the functioning of the Designated National Authorities (DNAs) for CDM and the actual implementation of projects on the ground. The competitive position of the selected countries on the world CDM market will also be assessed.

A number of capacity building projects have assessed mitigation options and CDM

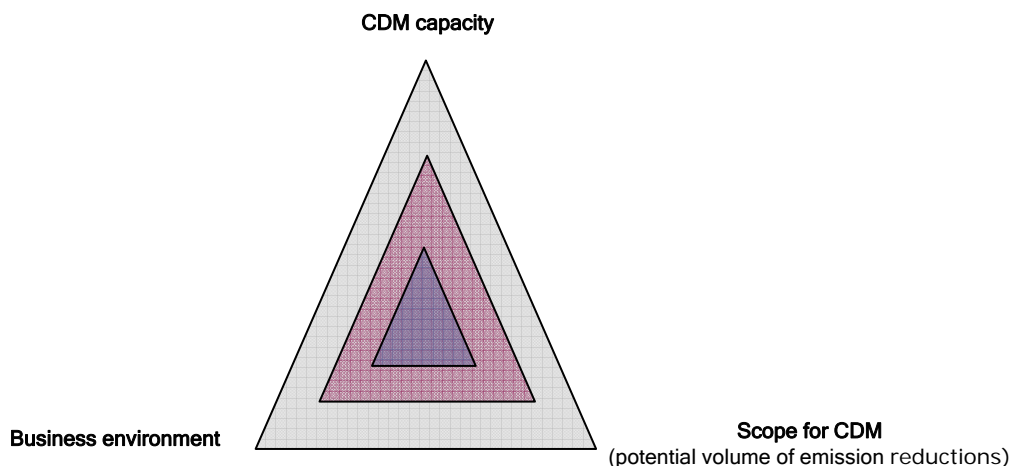


Figure 1: Key host country factors in CDM transaction decisions

Source: Niederberger and Saner, 2005

opportunities in the ASEAN region – for instance, the CD4CDM, IGES projects in Cambodia and the ALGAS, CD4CDM and NSS projects in Vietnam.

These assessments are based mainly on a top-down approach. However, the absolute greenhouse gas (GHG) mitigation potential alone cannot fully reflect the position of a country in the CDM world market.

The top-down approach generally employed to assess a host country's CDM potential is defined in **Figure 2**.

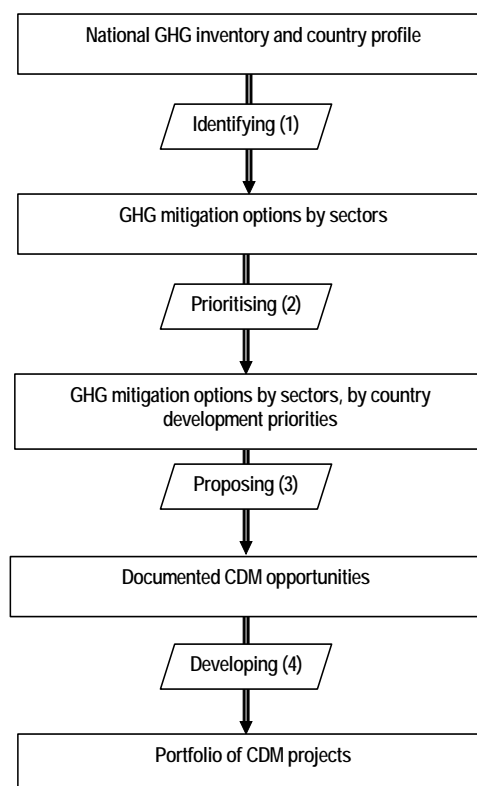
This study will assess the CDM capacity of each country in comparison with its neighbouring countries. It will focus on energy indicators and sectors with a large potential for non-CO₂ GHG reduction. As afforestation and reforestation (LULUCF) represent only a very modest proportion in the number of methodologies submitted and this trend is not likely to change substantially in the near future, they are excluded.

Structure of the study

The eight ASEAN countries that are examined in this study include Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Countries have been chosen to reflect a wide range of income, attractiveness for foreign direct investment (FDI) and status of CDM institutions.

Section II assesses the theoretical CDM potential in these countries. An energy consumption indicator is calculated to reflect the level of economic and industrial development, the structure of the economy

Figure 2: Top-down approach to identifying CDM potential



and the consumption patterns of a country. Subsequently, the energy-related carbon dioxide emissions reduction potential is assessed with respect to energy efficiency and fuel switching options.

Section III examines the investment climate in these countries, while Section IV reviews their CDM institutions and relevant regulations. Section V provides an overview of CDM experience in the ASEAN region. The concluding section looks at the overall competitiveness level of each country and discusses activities to harness the theoretical mitigation potential.

Assessing CDM Potential

Size of projects

CDM is a market-driven mechanism. Both supply and demand side factors can be distinguished in determining CDM investment flows into a country. These determinants can be differentiated as 'endogenous' (factors related to the host country itself) or 'exogenous' (factors related to investors and buyers of certified emission reductions, or CERs). Generally, *ceteris paribus*, CDM investments will flow to the countries that can generate large volumes of cheap CERs.

Given relatively high transaction costs of CDM projects versus the relatively low price of CERs in the carbon market, a CDM project must be large enough to be economically viable. This is a significant barrier for small host countries with small potential CDM projects. Analytical studies suggest a minimum size of above 20,000 CERs per year for regular CDM projects, even if further approved baseline and monitoring methodologies become available (Michaelowa and Jotzo, 2005).

At present there is no information on the potential number of small scale CDM projects available. However, a 2002 study concluded that the opportunities for small-scale CDM projects is relatively low due to the failure risk of projects, the constraints of additional transaction cost and problems related to the simplified rules for small-scale (Point Carbon, 2002). The minimum size of a project may vary considerably from one study to another given the different assessments and

assumptions about market factors such as demand, supply and thus price, as well as projections of changes in global and regional climate policy.

By the end of September 2006, 42 per cent of registered projects and 49 per cent of projects submitted for validation used the simplified baseline rules for small-scale projects. 23 per cent of registered projects and 32 per cent of those submitted for validation estimated annual reductions below 20,000 tCO₂. This is due to higher CER price expectations, lower transaction costs and the willingness of CDM consultants to work on a pure success fee basis. However, the lower share of very small projects in registered projects indicates that such projects have a lower probability of achieving registration.

Projections up to now indicate that about 70 per cent of the CDM investments will be directed towards China and India (Michaelowa and Jotzo, 2005). Other developing and LDCs have to compete for the remaining 30 per cent. The actual trend of the worldwide carbon market shows that the CDM market is dominated by a small number of countries and a small number of high volume projects. By the end of September 2006, Brazil, China, India and South Korea held 81 per cent of the expected CER volume until 2012 from registered projects; 47 per cent of the volume will be achieved by just five projects. Many non-Annex I countries are strongly in favour of a more equal regional distribution of CDM projects.

Energy indicators

The endowment of resources is a favourable

development factor but it does not necessarily demonstrate the level of economic development of a country – for example, in the case of Japan. We therefore examine indicators related to the actual energy consumption of countries. To show the link between economic and energy consumption indicators, the GDP per capita of each country is compared to energy indicators in **Table 1**.

The energy consumption indicators reflect the level of economic and industrial development, the structure of the economy and the consumption patterns of a country. Energy intensity measures the amount of energy needed to produce a dollar’s worth of GDP and normally declines as energy efficiency improves unless the structure of economic activity changes. It therefore can be seen as an indicator, albeit imperfect, to reflect an economy’s potential to improve energy efficiency (Cornillie and Fankhauser, 2004).

The correlation between energy intensity and GDP per capita level is not linear. Sakamoto

(2003) differentiated the link according to the three levels of GDP per capita as follows:

1st stage: low GDP per capita, improvement of energy efficiency

2nd stage: middle GDP per capita, deterioration of energy efficiency

3rd stage: high GDP per capita, improvement of energy efficiency

GHG emissions

Among numerous complex quantitative and qualitative factors, the potential emissions reduction is one of the critical factors of a CDM project’s potential performance that investors consider in making CDM investment decisions. We compare the countries included in this study with the CDM world market leaders China, India and Brazil (**Table 2**).

The scope for emissions reductions in each country can be evaluated as follows:

- Indonesia has a substantial potential for CDM

Table 1: Energy consumption indicators in 2004

Country	Total energy consumption (TWh)	Per capita energy consumption (MWh/year)	Energy intensity (kWh/\$ 2000)	GDP - per capita purchasing power parity (\$ 2000)
Cambodia	2.3	0.2	0.1	2000
Indonesia	1373	5.6	1.6	3500
Laos	14.7	2.4	1.4	1700
Malaysia	738	31.4	2.8	11210
Philippines	384	4.5	1.5	3000
Singapore	567	130.3	4.7	27720
Thailand	1003	15.7	2.0	7850
Vietnam	278	3.4	1.2	2830

Source: Energy Information Administration, 2006

projects in the energy sector, gas flaring reduction and wastewater sector and a medium potential in landfill gas reduction.

- The Philippines has a medium potential for CDM potential in the energy, landfill and wastewater sector.
- Singapore has a medium potential for projects in the energy sector.
- Thailand has a substantial potential in the energy sector and a medium potential in manure management, wastewater and the oil and gas sector.
- Vietnam has a medium potential in the energy sector, manure management and wastewater.

- Cambodia and Laos have only limited potential.
- In comparison with the CDM market leaders, the potential of the ASEAN countries is limited.

Bottom up approach

The top-down approach applied above, however, is an imperfect reflection of a country's CDM potential because it neglects other important factors, such as comparative abatement costs and the lead time required to develop a project.

Usually, a marginal abatement cost curve will be employed as the first criterion to prioritise mitigation options of a country. The abatement costs differ

Table 2: Greenhouse gas emissions (Mt CO₂ equivalent, 2000)

Country	CO ₂ from energy ¹	CH ₄ from landfills ²	CH ₄ from manure ²	CH ₄ from wastewater ²	CH ₄ from oil+gas ²	N ₂ O from nitric acid ²	PFC from aluminium ²	HFC from HCFC-22 ²
Cambodia	0.5	0.1	0.5	1.4	0	0	0	0
Indonesia	294.1	9.1	1.0	20.9	44.2	0	0.2	0.2
Laos	1.1	0.3	0.3	0.5	0	0	0	0
Malaysia	120.5	NA	NA	NA	NA	NA	NA	NA
Philippines	75.3	4.7	1.5	7.7	0	0	0	0
Singapore	52.8	0.6	0	0.4	0.3	0.7	0	0
Thailand	174.9	0.4	2.7	6.4	6.9	0	0	0
Vietnam	51.2	1.6	3.5	8.0	0.2	0	0	0
<i>China</i>	<i>3469</i>	<i>44.6</i>	<i>19.8</i>	<i>104.3</i>	<i>4.1</i>	<i>30.1</i>	<i>5.2</i>	<i>33.3</i>
<i>India</i>	<i>1054.7</i>	<i>14.0</i>	<i>21.5</i>	<i>97.7</i>	<i>16.0</i>	<i>3.0</i>	<i>0.8</i>	<i>4.7</i>
<i>Brazil</i>	<i>336.7</i>	<i>15.6</i>	<i>8.0</i>	<i>20.7</i>	<i>2.1</i>	<i>5.0</i>	<i>3.9</i>	<i>0.1</i>

Sources: ¹World Resources Institute, 2006; ²US EPA, 2006

strongly across sectors. Another factor that might constrain a mitigation option from being economically viable is the lead time required to develop a project from the initial idea to actual implementation. Experience shows that lead times for large CDM projects can add up to anything between four to nine years. This factor is not taken into account at all under the top-down approach.

In fact, investors will predominantly prefer projects with low abatement costs at a global

level, high abatement volumes and a relatively short lead time in order to increase the Internal Rate of Return of a project.

Another notable challenge in attracting CDM projects that is not included in the top down approach is the assessment of a project's 'additionality' and development of a baseline. This 'hurdle' has a substantial impact on the overall transaction cost of a CDM project, and will therefore influence investment decisions. The current trend reasserts that investors

prefer CDM projects that can generate large volumes of CERs and for which the assessment of additionality and baseline development is relatively easy – for instance, emissions reductions of non-CO₂ gases (F-gas, N₂O and CH₄) at existing facilities. **Table 3** and **Figure 3** show the numbers and CER volumes differentiated according to CDM project types.

This paper presents a bottom-up analyses for Cambodia and Vietnam as an example. The result

Table 3: Ranking of CDM project types according to number of projects

Type of project	Number of submitted projects	Type of project	Number of submitted projects
Biomass	138	Waste	3
Hydro	99	CMM	2
Wind	77	Gas flaring reduction	2
Ag ricultural Waste	72	PV	2
Industry	70	Reforestation	2
Landfill gas	39	Renewable energy for households	2
Cement blending	19	Buildings	1
Wastewater	17	Gas-hydrogen	1
Oil-gas	16	Geothermal	1
Electricity generation	8	Households	1
Fuel switch	8	Oil-electricity	1
HFC	8	Pipeline leakage	1
Renewable energy for industry	5	Renewable feedstock for chemical industry	1
Coal-gas	4	Tidal	1
N ₂ O	4	Transport	1

Source: UNFCCC 2006

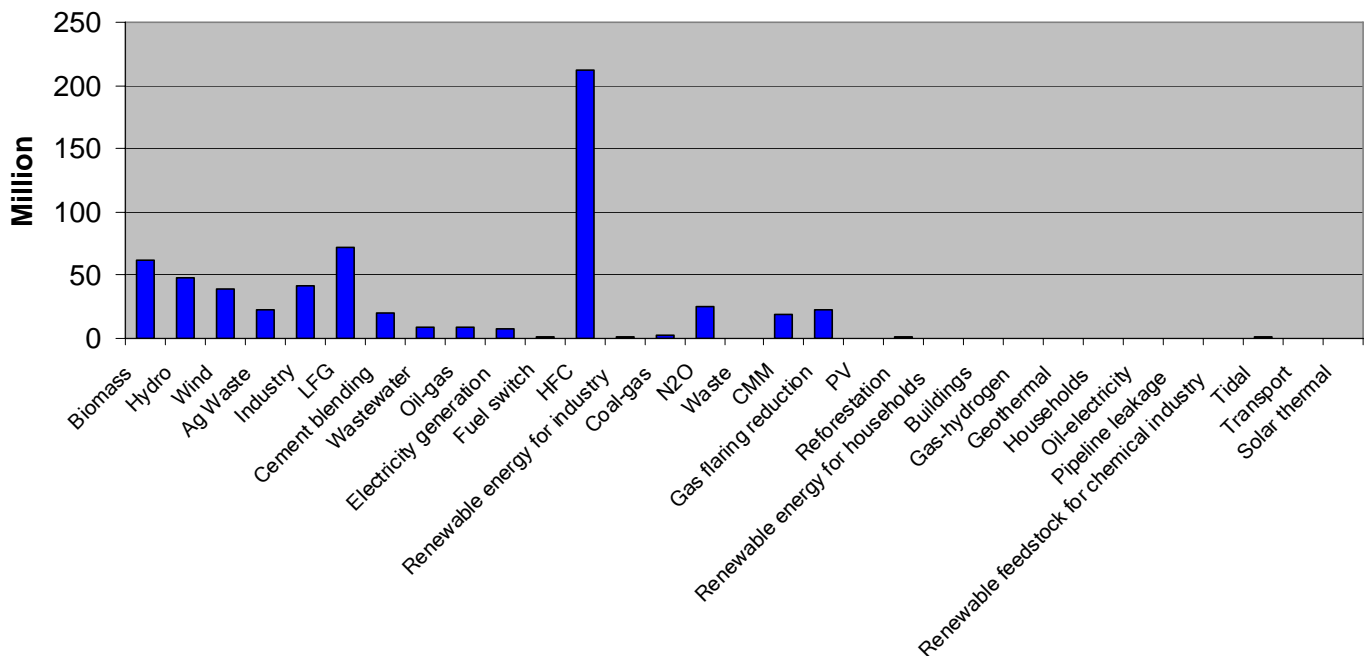
is presented in **Table 4**. Data for the assessment is based on studies executed in Cambodia under the CD4CDM project and Vietnam under the ALGAS and NSS projects, combined with our own assessment. A similar study to build a marginal cost curve for Laos is not available so far. The mitigation options for Laos are thus based on our rough expert assessment.

While there are options for GHG mitigation in the three countries, most of them are in renewables and energy efficiency sectors. The energy context in Cambodia and Laos is similar, both in terms of low consumption rate and the trend of development. Both countries

have a potential for small-scale CDM projects such as mini- and micro-hydro, small municipal and agricultural waste, and energy efficient appliances.

From a development point of view, these projects can benefit local communities as well as deal with local environmental challenges. However, as actual practice shows, these types of CDM projects are not likely to be favoured by carbon investors at least in the first commitment period. High risk levels and associated business costs puts such projects at a considerable disadvantage when competing for carbon finance. Such projects generate only about 25 per cent of all CDM

Figure 3: Ranking of CDM project types according to expected CER volumes by 2012



Source: UNFCCC 2006

Table 4. Sectoral CDM opportunities

Mitigation options	CER cost range	Abatement size	Difficulty in assessing additionality and baseline	Lead time	Cambodia	Laos	Vietnam
Energy efficiency							
Industrial boiler	Low	Low-medium	Medium	Low	--	--	xx
Cement manufacture (blending old fuels)	Low	Medium	Medium	Medium	--	--	x
Substitution of incandescent lamps with fluorescent lamps	Low	Low-medium	Medium	Medium	x	x	x
Cooking stoves	Low	Low	Medium-High	Medium	x	x	xx
Energy savings in building	Low	Low	Medium	Medium	x	x	xx
Waste heat recovery in heavy industry (steel, paper industries)	Low	Medium	Medium	Medium	--	--	x
Energy efficiency - Power generation							
Thermal renovation and modernisation	High	Medium-high	Medium	Low-medium	--	--	xx
Cogeneration	Low	Medium	Medium	Medium	x	x	xx
Renewable energy							
Wind power	High	Medium	High	Medium	--	--	x
Mini hydro power plants	Low - medium	Low	High	Medium	x	x	xx
Large hydro power plants	Medium	High	High	High	--	xx	xx
Solar power	Very high	Low	High	Medium	x	x	xx
Geothermal power plant	Medium-High	Medium-High	High	High	x	--	x
Biomass	Low-Medium	Medium	High	Medium	x	x	xx
Transportation							
Fuel switching	Medium	Low-medium	High	Medium	--	--	x
Public transportation	High	Low	High	Medium	x	x	x
Fugitive emissions control							
Landfill gas (LFG)	Low	Medium-High	Low		x	x	xx
Associated gas from oil production	Low	Very high	Low	Medium	--	--	xx
Methane capture from agriculture waste	Medium	Medium-High	High	Medium	x	x	xx
Coal mine/bed methane	Low	High	Low	Medium	--	--	x
Industrial gases							
N ₂ O - nitric acid	Very low	High	Low	Medium	--	--	x
PFC aluminium	Low	High	Medium	Medium	--	--	x
N ₂ O - adipic acid	Very low	Very high	Low	Medium	--	--	x
HFC 23	Very low	Very high	Low	Medium	--	--	--

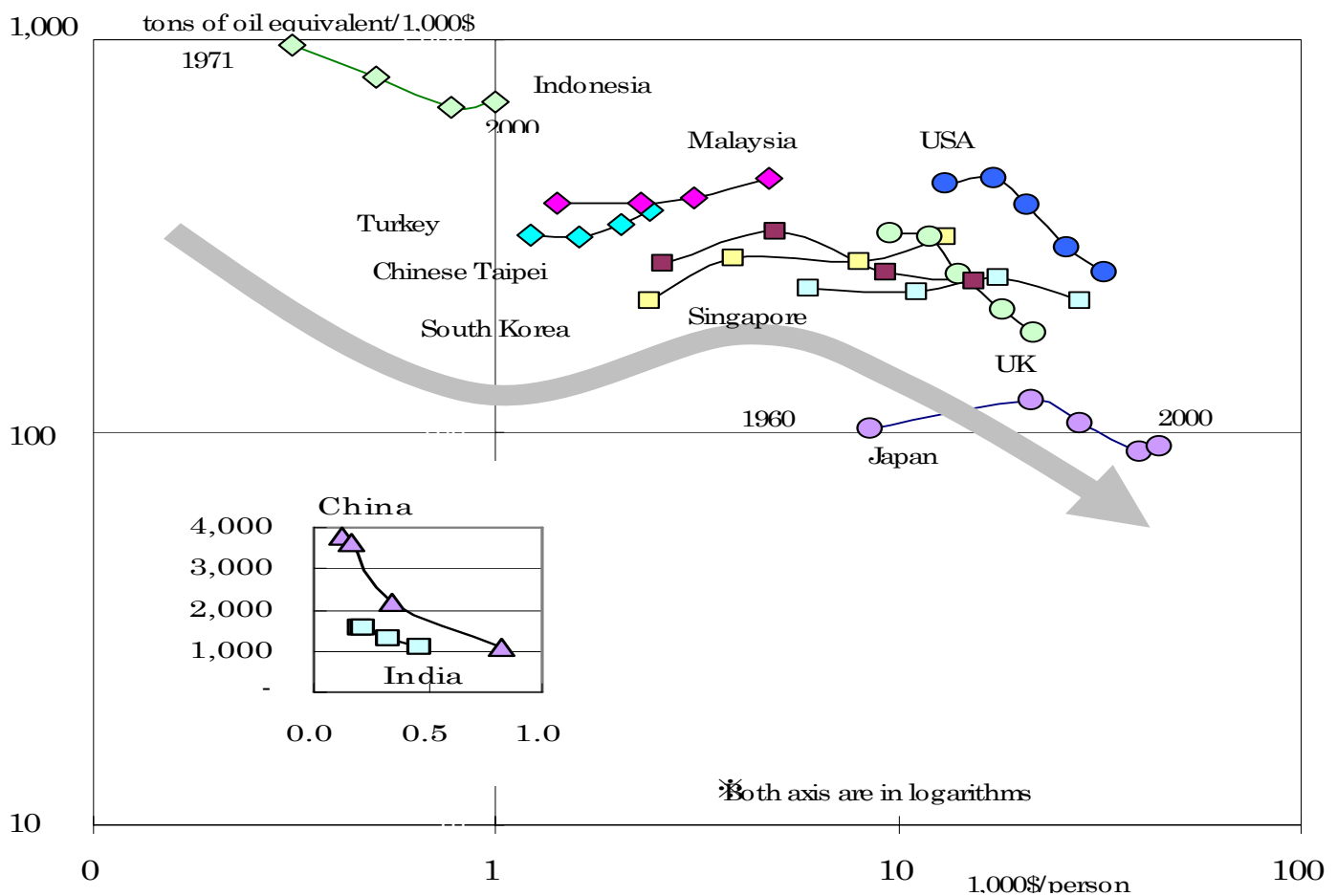
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carbon credits (UNFCCC, 2006), reflecting the fact that the market will seek out the cheapest credits and not the best environmental outcome (Pearson, 2005). This trend is likely to continue unless there is pressure to push the CDM to deliver additional sustainable development benefits to host countries and draw investors to renewables.

Given the circumstances of Cambodia and Laos and the current preference in CDM project types, it is a difficult challenge to find a niche for the two countries to enter the carbon market. The story is slightly different for Vietnam. In terms of socioeconomic

development, Vietnam is in a better position compared to Cambodia and Laos. Moreover, its CDM endowment is also more diverse and more competitive in quality terms. However, there are only a limited number of mitigation options that can issue enough high quality and quantity (>100.000 CERs) projects situated in the sectors favoured by investors as reflected in **Figure 4**. With a limited driving force for leveraging investment, a considerable inflow of CDM investment in Vietnam is not likely to happen, as least not during the first commitment period.

Figure 4: GDP per capita and accompanying energy consumption per GDP
 (Developed countries: 1960-2000; Developing countries: 1971-2000)



Source: Sakamoto (2003)

Investment climate

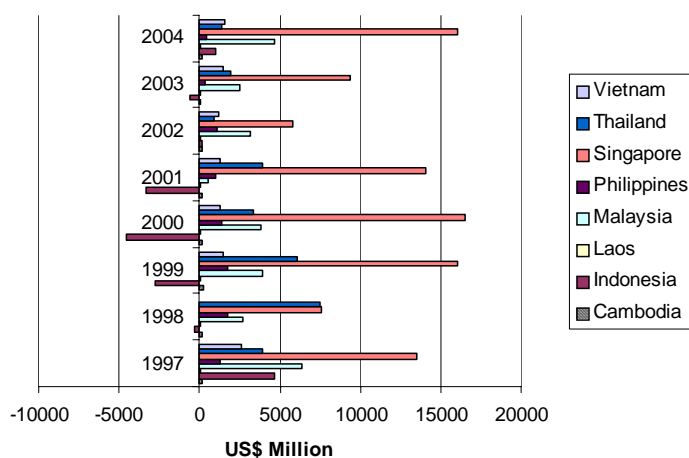
The investment climate in a country, which indicates the level of financial/investment risk involved, is another critical factor in determining the attractiveness for CDM projects. The total FDI a country receives is closely linked with the general state of the investment climate in a country. An analysis of actual FDI and ODA flows and potential CDM investments show that the countries that are recipients of a significant proportion of total flows of FDI are also those expecting to generate the most credits from proposed CDM projects (Ellis et al., 2004). FDI is therefore a possible indicator of a country's ability to attract CDM projects.

FDI investments only flow to countries and locations where relatively strong "enabling conditions" exist. These enabling conditions include, inter alia, stable political regimes, strong legal environments for contracts and proven enforcement capabilities, macro-economic stability, availability of pools of skilled workers and other sources of human capital. Since many of the poorest developing countries do not have the basic 'governance' conditions to attract FDI, ODA will remain a relatively more important source of financing for technology transfer in these countries for the foreseeable future (Ellis et al., 2004).

Cambodia, Laos and Vietnam opened up to foreign investment in the late 1980s, while Indonesia, Malaysia, the Philippines, Singapore and Thailand had already been welcoming investors since the 1970s. With the emergence of the Southeast Asia region as an attractive destination for FDI, total FDI flows

into these countries reached around US\$30 billion in 1997, the peak year for FDI flows into this sub-region (Figure 5). The decline of FDI flows was substantial due to the Asian financial crisis in mid-1997. However, long-term FDI inflows into these countries may well be influenced by declining investor expectations – overestimated growth projections for this region have been fading since foreign investors were faced with considerable obstacles for FDI projects.

Figure 5: Annual FDI in ASEAN countries 1997-2004



Source: ASEAN Secretariat - ASEAN FDI Database, 2006

After decades of war, Cambodia has been making meaningful progress in the transition to a market economy. However, it still remains heavily reliant on foreign assistance. In 2001, 58 per cent of the central government budget depended on donor assistance. Partly due to an unreliable legal environment, Cambodia

has had trouble attracting FDI and levels have fallen from 1997 onwards. Foreign investment has been concentrated in garment and textile sectors, which account for 90 per cent of the country's exports.

In Indonesia, FDI growth has been negative for a number of years and a net inflow has been achieved only recently.

After Cambodia, Lao PDR is the poorest country in East Asia. After eight years of reforms and economic progress slowed down in 1998, the government has become totally dependent on foreign aid. Low confidence in the Laotian economy, a poor investment climate and lack of infrastructure make it extremely difficult for this land-locked country to attract FDI. Most foreign investors (especially investors from Thailand) have recently withdrawn from Laos and FDI approvals plummeted from a peak of US\$2.6 billion in 1995 to a mere US\$25 million in 2004. Hydropower schemes account for much of FDI, and this sector is likely to attract most foreign investments (Bank of Lao PDR, 2005), opening a niche for CDM investments.

The Philippines has managed to attract an increasing amount of FDI, but is lagging behind Malaysia, Singapore and Thailand. Despite being the smallest country, Singapore

has consistently received the highest amount of FDI in the region.

A crucial element in Vietnam's long-term development strategy is the continued ability to attract and utilise relatively large amounts of overseas capital, both FDI and ODA. For the 2001–2005 period, the Government of Vietnam had established targets for FDI at US\$11 billion in disbursements from existing and newly licensed foreign investments and for approximately US\$10–11 billion in ODA. These levels of FDI and ODA estimates were required to support the government's GDP growth target of 7.5 per cent per year. By December 2004, Vietnam had attracted nearly US\$ 46 billion in cumulative FDI commitments.

The Annual IPS ASEAN 9+1 Competitiveness Ranking Indices compiled by the Institute of Policy Studies has comprehensively ranked the nine ASEAN countries based on four main groups of indices (**Table 5**). The competitiveness ranking may explain the

Table 5: ASEAN competitiveness ranking

Country	Overall	Economic environment	Political environment	Business environment	Social environment
Singapore	1	1	1	1	1
Malaysia	2	3	2	2	2
Thailand	3	2	3	3	3
Philippines	4	4	4	4	4
Vietnam	5	6	6	5	5
Indonesia	6	5	5	6	8
Cambodia	7	7	7	7	6
Lao PDR	9	9	9	9	6

Source: Tan et al. 2005

share of the countries in the region with regard to FDI flows as shown in **Figure 5**.

In September 2006, Institutional Investor magazine gave the risk rating for ASEAN countries as shown in **Table 6**. The magazine

Table 6: Risk rating according to Institutional Investor

Country	Risk rating	Risk ranking in the world
Cambodia	18.4	142
Indonesia	42.1	79
Laos	21.8	128
Malaysia	68.7	38
Philippines	44.2	75
Singapore	91.0	15
Thailand	62.0	53
Vietnam	42.6	78

publishes country credit ratings based on information provided by leading international banks, money management firms and economists. On the scale of zero to 100 per cent, 100 per cent represents the least risk of default.

The role of CDM Institutions and regulations

CDM Institutions

In order to be able to participate in CDM, host countries have to develop specific institutional arrangements. Although institutions may be set up quickly, it requires considerable time until the overall domestic institutional system is working efficiently and properly.

The result of an expert poll on the relative importance of factors influencing CDM investment showed that a supportive host country's CDM approval system will be one of the most critical factors to attract investors (Point Carbon 2002). A supportive system of CDM institutions will include the following factors, although this list is certainly not exhaustive:

- Fulfilment of prerequisites for CDM participation, such as the ratification of the Kyoto Protocol and notification of a DNA;
- A clear policy decision by the host Party to engage in the CDM and transparent procedures/adequate institutions for project approval by the host government;
- Availability of advanced project proposals that meet the eligibility criteria for CDM projects and/or a failure to communicate these project opportunities to interested investors;
- Degree of awareness of private sector actors in potential CDM host countries of the opportunities offered by CDM;

- Degree of knowledge and acceptance of CDM by local stakeholders.

There is no ‘one-stop shop’ approach or model to arrange a national CDM institution. There are many possibilities and each country will have to decide on the particular form of institutional development that is appropriate and in line with national circumstances.

In this section, the summary of current CDM institutional structures in the ASEAN countries will be presented with regard to the following:

- Prerequisites for CDM participation, such as the ratification of the Kyoto Protocol and notifications of DNA;
- Status of CDM-relevant regulations; and
- Involvement of domestic actors in CDM.

Then an analysis of strengths and weaknesses of the project approval procedures and the functions of existing DNAs is done. The experience of CDM project implementation in these countries will also be considered.

In this section, Laos is excluded from some in-depth analyses because the CDM institution of the country is still in its very early stage of formulation. Although the country has notified the DNA to the Secretariat of the UNFCCC, its main functions and the structure are not yet defined.

Cambodia, Malaysia, Thailand and Vietnam ratified the Kyoto Protocol in 2002, Laos and the Philippines in 2003, Indonesia in 2004 and Singapore only in 2006. The ratification was an initial step to facilitate CDM projects in

these nations.

Cambodia

Cambodia established its Climate Change Office (CCCO) in the Ministry of Environment in June 2003. The Ministry serves as the interim DNA by decree of July 2003. CCCO’s budget is completely financed by foreign donors; the government only funds the building, electricity and water. CDM activities of CCCO are funded through participation in UNEP-Risoe’s CD4CDM. The CCCO works in a very professional manner and the staff is enthusiastic. They have already provided capacity building to the one-person Laotian DNA. However, it is unclear when the final decision on the institutional structure of the DNA will be taken. Criteria for the assessment of sustainable development are currently being developed. As in the case of the existing Interim DNA, the proposed structure of the future Cambodian DNA gives a central role to the Ministry of Environment. The approval process of proposed CDM projects is similar. However, the structure has been developed to give key DNA players more formalised roles in the assessment process.

Indonesia

The Indonesian DNA, which was notified in 2005 after three years of preparation, has a two-tier structure: the Board, which is called the National Committee on the Clean Development Mechanism (NCCDM) and a Technical Team. The NCCDM will consist of first echelons of eight most relevant governmental Ministries and Agencies. The Technical Team largely reflects the technical aspects of the NCCDM at the lower echelons

to undertake the technical works of appraising the proposals. The NCCDM is assisted by a Secretariat. In the first years, the Ministry of Environment will host the Secretariat of the NCCDM, with a possibility in the future of setting up an independent, private sector-run secretariat. When there is a need to invite additional expertise in specific project appraisal, the NCCDM can call on a Roster of Experts. When there are credible and representable complaints from affected communities, the NCCDM can also hold a Stakeholder Forum to resolve them.

The Indonesian DNA has also put together a procedural cycle and a list of criteria and indicators to appraise proposed CDM projects. The list of criteria and indicators and other information regarding CDM in Indonesia are widely published, and accessible on the Ministry of Environment's website (www.dna-cdm.menlh.go.id).

Lao PDR

The Science Technology and Environment Agency (STEA) at the Prime Minister's Office in Laos was notified as the DNA in late 2004. However, a workshop in Laos showed that this decision was taken thinking that the DNA was just another name for the climate change focal point and that no decision-making competencies would be linked to the DNA function. It has now been agreed that a formal request for "grafting" the DNA on an existing committee has to be made and that procedures need to be adopted. The main difficulty is the lack of project proposals, which prevent the DNA staff from gaining experience. Main functions of Laos' DNA are

still under discussion. Compared to Cambodia and Vietnam in terms of functioning DNA and building up a national framework, Laos lags far behind with far-reaching consequences for its perceived unattractiveness in the carbon market in general and in seeking finance donors in particular.

Malaysia

On 31 May 2002, the National Steering Committee on Climate Change chaired by the Secretary General of the Ministry of Science, Technology and the Environment (MoSTE) agreed to establish a two-tiered organisation for CDM implementation in Malaysia. The two-tiered institutional set-up comprises the National Committee on CDM (NCCDM) and two Technical Committees. The role of the National Committee is to evaluate and endorse recommendations made by the Technical Committees regarding CDM project proposals. In addition, this Committee provides policy direction and guidelines for implementation of CDM projects at the national level.

Formally, the DNA is housed at the Conservation and Environmental Management Division at MoSTE. The roles of the Technical Committees are to

- provide policy guidance on CDM projects in the sector concerned;
- ensure that the proposed CDM projects comply with national development strategies and guidelines; and
- recommend evaluated CDM project proposals to the NCCDM for national approval.

Pusat Tenaga Malaysia (PTM) was appointed as the Secretariat to the Technical Committee on Energy. The Forest Research Institution of Malaysia (FRIM) has been appointed the Secretariat to the Technical Committee on Forestry. The main roles of PTM as the CDM Energy Secretariat are to assist the Technical Committee in evaluating CDM proposals, to provide policy input on CDM to the government, to conduct CDM outreach activities and to provide advisory services to potential local and foreign CDM investors in the energy sector.

Philippines

In June 2004, the Department of Environment and Natural Resources (DENR) was designated the Philippine DNA, assisted by a steering committee with representatives from other Departments. Its tasks are to formulate and develop a national CDM policy, to develop the criteria, indicators, standards, systems and procedures, and evaluation tools for the review of CDM projects; and to monitor the implementation of CDM projects. It is authorised to create Technical Evaluation Committees, and committees on energy, on waste and on forestry have been established.

Singapore

The DNA for Singapore was notified to the UNFCCC only in 2006, and its procedures are unclear. So far, no project has been approved.

Thailand

The government of Thailand set up a National Committee on Climate Change (NCCC) and a Climate Change Expert Committee immediately following the country's

ratification of the UNFCCC in 1993. However, the bureaucratic reforms and restructuring in 2002 de facto abolished both committees and left a vacuum as far as the institutional framework for climate change and CDM was concerned. To rectify this situation and eliminate the resulting uncertainty, a NCCC was re-established in July 2003, and the Ministry of Natural Resources and the Environment (MONRE) was designated DNA.

The NCCC is chaired by the Minister of Natural Resources and the Environment, and the National Environment Board – a cabinet-level body chaired by the Prime Minister. As of October 2004, the procedure for CDM projects was as follows: project proposals are submitted to the CDM Cooperation Centre under MONRE's Office of Natural Resources and Environmental Policy and Planning (ONEP), which then forwards it to either the Energy and Industrial or the Agricultural and Resources Working Group. An EIA and Public Health Working Group also looks at each proposal. After approval from these working groups, the proposal is submitted to the NCCC, the National Environment Board and finally to cabinet. This cumbersome procedure has meant that no CDM project has been approved by the Thai DNA so far.

Vietnam

Vietnam was one of the first countries in Asia to establish its DNA. The International Cooperation Department of the Ministry of Natural Resources and the Environment (MONRE) was designated the DNA in March 2003. In April 2003, a CDM National Executive and Consultative Board (CNECB) was

formed with representatives from MONRE (three members), Ministry of Trade, Ministry of Science and Technology, Ministry of Foreign Affairs, Ministry of Finance, Ministry of Planning and Investment, Ministry of Agriculture and Rural Development, Ministry of Industry, and the Vietnamese Union of Science and Technology Associations.

CNECB initially met twice a year, but acknowledging that the semi-annual meetings would result in inflexibility and less time efficiency for project developers, CNECB meetings are convened more frequently since 2005.

Although a rough set of sustainability criteria exist, they have not been operationalised by MONRE staff. The criteria are in the process of being developed into specific, quantitative standards since 2005, with assistance from the German Technical Cooperation Agency GTZ, but the process is not yet complete. Project proposals have to be submitted one month before a CNECB session in Vietnamese and English, with an approval letter from the relevant Ministry. Members from different ministries that are part of CNECB give their comments, and a decision is taken based on a three-fourth majority voting. Rejected proposals can be resubmitted an unlimited number of times.

CDM regulations in detail - the examples of Cambodia and Vietnam

This section presents a detailed assessment of the legal framework of two countries with well-developed CDM approval guidelines. As is usually the case with trade and investment in general, host countries with the most transparent rules and most streamlined procedures will be in the best position to compete for CDM resources.

National strategies for CDM should be based on local sustainable development objectives. It is important to identify national policies already established for social and economical development in areas related to climate change such as energy, LULUCF and industry. These policies will ultimately have the greatest impact on national resources and the environment at the local level and on climate change at the global level. CDM is a real opportunity to channel resources towards projects that are most likely to further national development priorities.

CDM approval process in Cambodia

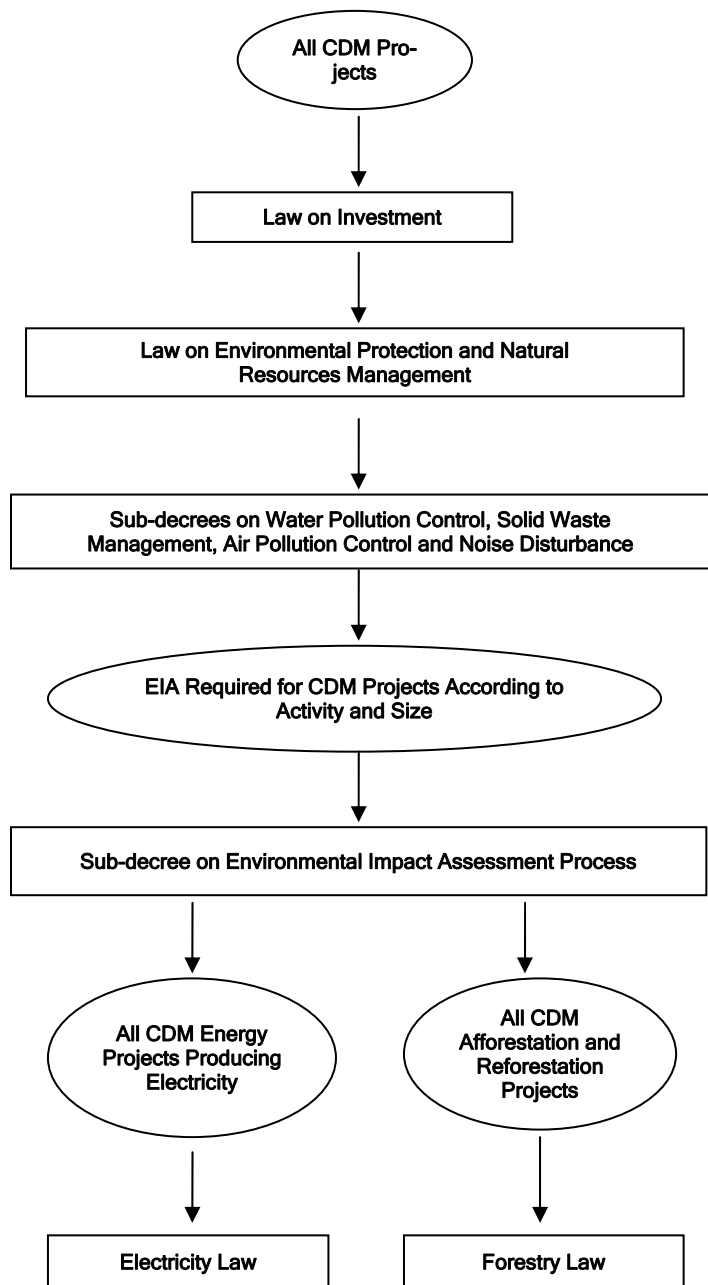
The legal framework and relevant laws and regulations for CDM investments in Cambodia are reflected in **Figure 6**.

The procedure to approve a submitted CDM project is illustrated in **Figure 7**. The whole process is expected to take around 55 working days.

CDM approval process in Vietnam

In order to facilitate CDM projects, a Prime Minister's Guidance on CDM is being developed in Vietnam. It was to come into

Figure 6.: Summary of key legislation applicable to CDM projects in Cambodia



force at the end of 2005 but is delayed considerably. Recently, there are a

number of the laws and/or regulations relevant to all investment projects in Vietnam which all CDM projects must comply with, including:

- Law on Foreign Direct Investment, Ministry of Planning and Investment
- Law on Environment Protection, Ministry of Natural Resources and Environment
- Law on Finance, Ministry of Finance
- Law on Tax, Ministry of Finance

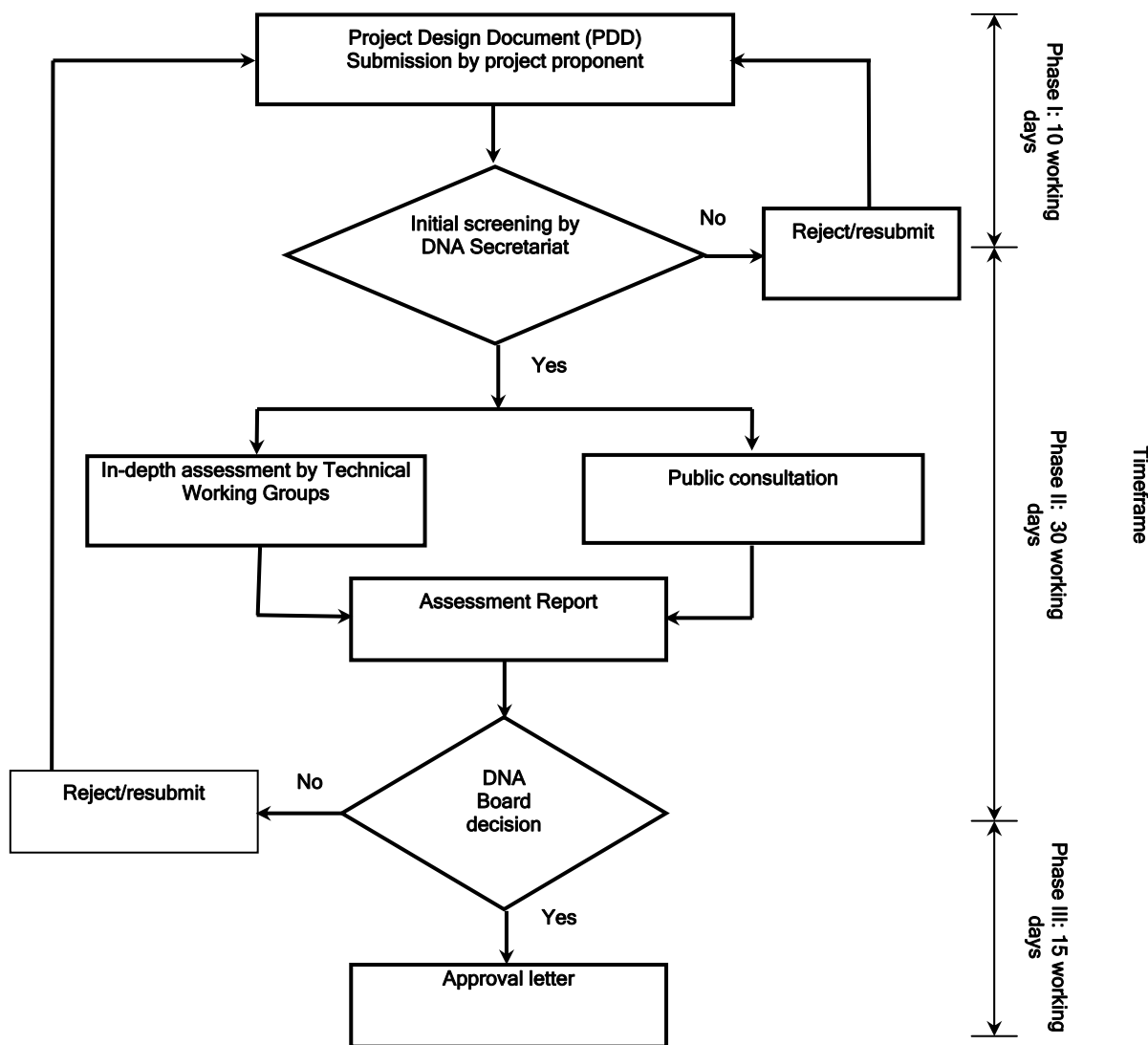
Besides these laws, the specific sectoral laws and/or regulations will also apply for sectoral CDM projects – for instance, CDM afforestation and reforestation, CDM energy etc. Within the energy sector, the relevant sectoral regulations include:

- The Decree of Government No. 45/2001/ND-CP dated 2 August 2001 on activities and use of electricity
- Law on Mineral Resources
- Law on Oil and Gas
- National Policy on Energy

If a CDM project is conducted in the agricultural sector, it shall be consistent with the Strategy for agriculture and forestry development by 2020. The Law on Forest Protection and Development will be applied for forestry CDM projects. The key legislation applicable to CDM projects in Vietnam is summarised in **Figure 8**.

The procedure to approve a submitted CDM project is illustrated in **Figure 9**.

Figure 7: Approval process for proposed CDM projects in Cambodia



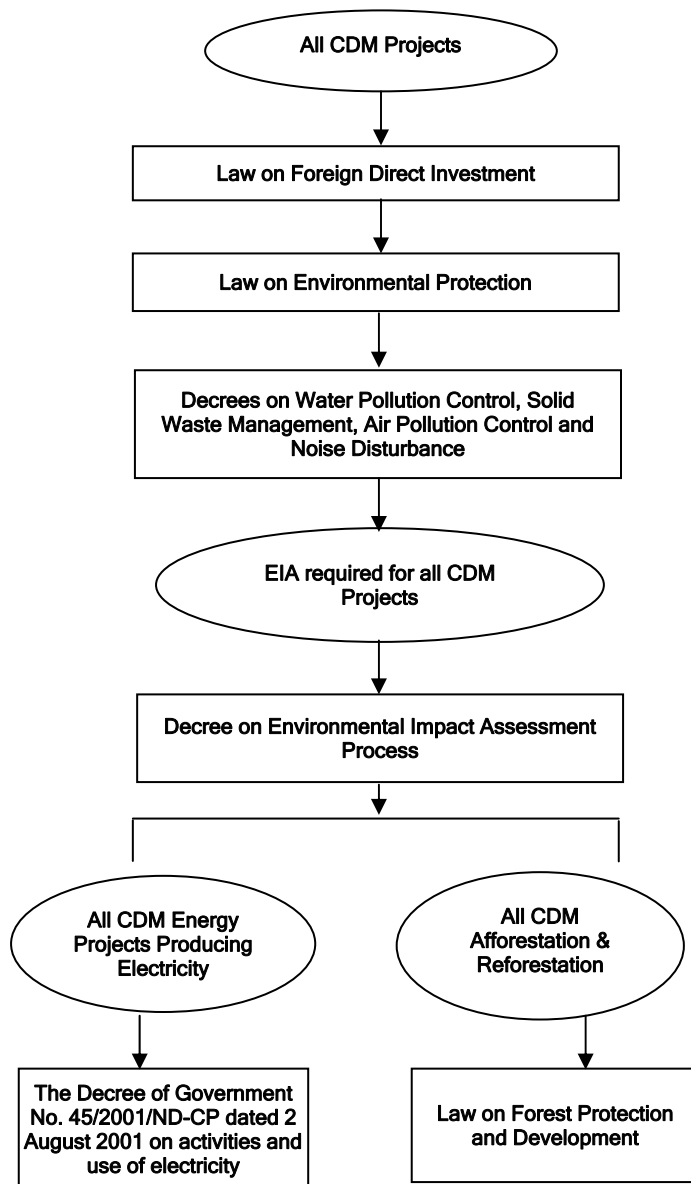
Domestic stakeholder involvement

Attaining broad stakeholder participation is one of the most challenging steps for a host country to promote CDM projects (Table 7). Some countries have centralised programmes within the central government institutional framework. Others have achieved active participation from all sectors of the society and different sectors of the economy. Participation of the private sector encourages a less bureaucratic, more result-oriented and

business-like approach. Private and public developers together or on their own are the real actors and the driving forces for the implementation of cost-effective mitigation options (Manso, 2003).

Based on experience in Cambodia and Vietnam, cooperation and a supportive atmosphere within ministries and relevant governmental agencies is a priority while establishing the institutional structure for CDM. In the two countries, capacity building

Figure 8: Legislation applicable to CDM projects in Vietnam



projects have helped achieve smooth inter-ministerial co-operation thus far. However, this is not sufficient to create driving forces for promoting CDM activities. The next stage of capacity building programmes should focus on local actors, including companies, consultants specialised on energy and environmental issues as well as

banks and other financial institutions in order to promote CDM among the business community.

Project approval process

The overall project approval procedure is of paramount importance for investors, as this step will determine part of the transaction costs incurred. Based on the design of the CDM project approval procedures in Cambodia and Vietnam, a strength–weakness assessment of the procedures of each country is undertaken in Table 8. The assessment of the functions of the DNA are shown in Table 9.

In summary, the CDM institutional system in both Cambodia and Vietnam has been developed to meet the necessary conditions to enter the carbon market. However, distinguishing themselves in the CDM market with respect to the host country CDM institutional competitiveness depends upon how efficiently these systems perform.

Table 7: Local stakeholders participating in CDM projects and their main roles

Government	<ul style="list-style-type: none"> • Overall coordination and information service • Initiate and support the development of CDM related expertise/capacity on all levels • Devise GHG policies, including integration of these policies with sectoral policies • Develop CDM specific rules and criteria • Definition of standards/protocols • Project cycle management (assessment, selection, evaluation) • Co-financing of projects, e.g. through revenues from CO₂ tax • Verification (including: baseline, additionality, monitoring) • Enforcement • UNFCCC reporting
Enterprise, industry	<ul style="list-style-type: none"> • Plan and propose projects • Financial engineering for projects • Implement projects • Monitor emissions and baselines • Report on successful projects and problem areas • Provide feedback on efficiency of procedures etc.
Institutions, firms providing special expertise	<ul style="list-style-type: none"> • Provide technical/economic/financing know-how • Help mobilise the industry sector • Baseline calculations • Modelling • Verification/certification services
NGOs	<ul style="list-style-type: none"> • Help in promoting public awareness on the issue • Help in project identification • Watchdog role: policies, procedures, implementation, enforcement

CDM project experience in ASEAN

Host countries in ASEAN show significant differences in status of CDM project development. These differences can be mainly explained by the diverse potential for CDM in each country, for instance resulting from the structure of the energy sector and the investment climate and differences in establishing the related policy and institutional framework.

So far, the Philippines has the lion's share of projects submitted in the region (**Figure 10**).

This is mainly due to a large number of small projects in the agriculture waste sector (**Table 10**).

CERs generated until 2012

In terms of the total CERs expected from submitted CDM projects until 2012 (**Figure 11**), however, Malaysia tops the list while the Philippines is much below than even Thailand and Indonesia despite having submitted the most number of projects.

The low CER volumes of CDM projects in Vietnam, Cambodia and Lao consistently reflect the total number of projects developed in these countries.

One can distinguish the region by the three groups:

- High CER generation: Malaysia, Thailand and Indonesia
- Middle CER generation: the Philippines and Vietnam
- Low CER generation: Cambodia and Lao PDR

Although this list can change in the long term if middle-ranking countries develop more appropriate strategies to mobilise CDM flows, the picture is likely to remain the same, with perhaps some swapping of positions within the high-ranking group.

Figure 9: Approval process for proposed CDM projects in Vietnam

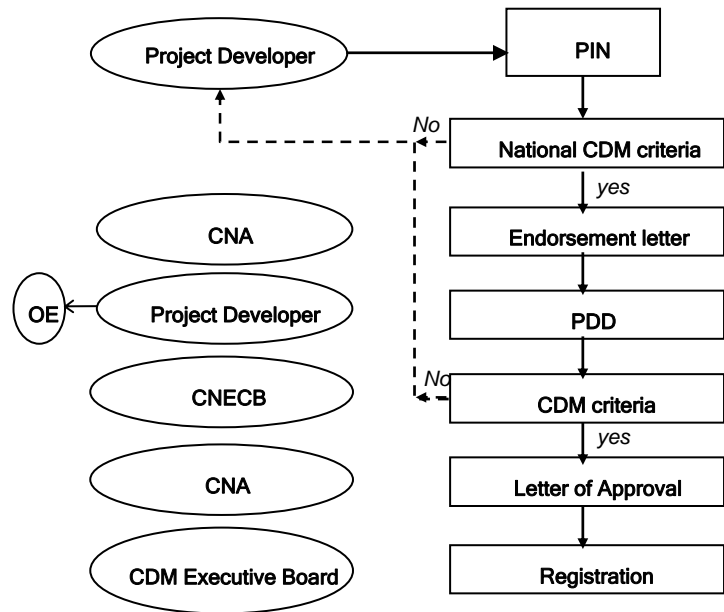


Table 8: Strength (S) -Weaknesses (W) assessment of the CDM-project approval procedures in Cambodia and Vietnam

Criteria	Cambodia	Vietnam
Cost-efficiency	S: no approval fee	S: no approval fee
Time-efficiency	55 working days for CDM approval, 28 days for Letter of Endorsement S: quite clear timeframe for approval phases and one window approach W: medium time length compared to other DNAs	Submit one month before either April or September meeting of CNECB W: less efficiency and flexibility in comparison with other countries and time frames in international stages
Definition of mandatory provisions (EIA; compliance with applicable legal framework; national/sectoral development plans)	S: provided detailed guidance with regard to legal requirements for CDM projects	S: provided detailed guidance with regard to legal requirements for CDM projects W: EIA for all projects
Consistent set of sustainable development criteria	W: general and qualitative criteria	W: general and contained qualitative criteria
Provision of monitoring and ex-post evaluation	W: not yet available	W: not yet available
Project document required	S: submission of only PDD required	Both Project Idea Note and PDD required S: minimise risks W: increased burden for project developers
Simplified procedure for small scale projects	W: not yet available	W: not yet available

Table 9: Evaluation of DNA functions of Cambodia and Vietnam

Criteria	Cambodia	Vietnam
Orientation function		
Priority portfolios	X	X
Strategic studies	X	X
Policy making	X	X
Regulation function		
Project assessment and approval	X	X
National registry and project reporting	--	--
Promotion function		
Public awareness: training, information dissemination/providing	X	X
Technical and commercial assistance	--	--
Coordination among ministries	Fairly good	Good
Involvement of interested stakeholder	Limited representation from private sector, NGOs	Limited representation from private sector, NGOs

development. Unsurprisingly, these criteria vary by countries – as do host countries’ national circumstances and development priorities. Except Laos and Singapore, six ASEAN countries have determined the criteria and indicators for sustainable development screening of CDM projects. Nonetheless the importance given to these indicators varies between countries.

An assessment of the sustainable development

impacts of a specific CDM project against economic, social or environmental criteria is best done at the national level. However, an overview of sustainable development aspects based on project types is possible. Some project types, such as renewable electricity generation; electricity generation and

Project activities submitted by country and sector

Table 10 and Figure 12 show that most of the CDM projects in the region are concentrated to a few categories. The majority are biomass power projects and agriculture waste. This is consistent with economic structures that are based on agriculture and food processing in and reflect biomass as an important source of energy in the region.

Sustainable development impacts of CDM projects in ASEAN

The host country government has the prerogative to establish criteria to assess whether or not a proposed CDM project activity helps in achieving sustainable

Figure 10: ASEAN submitted CDM projects, by country

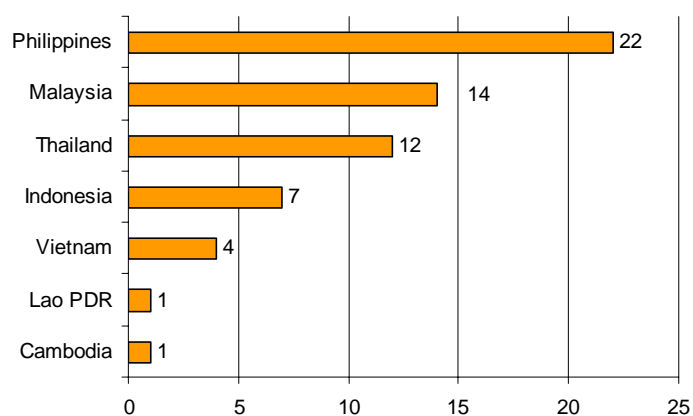
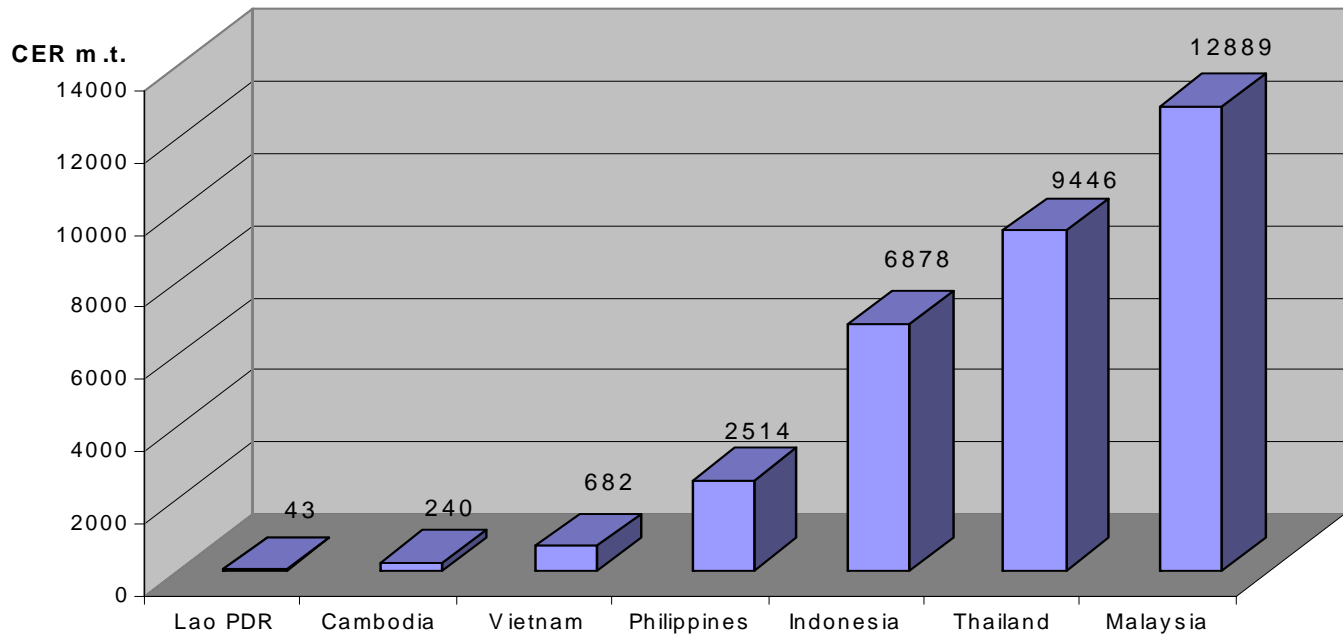


Figure 11: ASEAN CERs generated until 2012 by country



Source: Data from UNFCCC CDM website

methane capture from agriculture waste products; recycling of waste fuels in cement factories; and advanced manure management systems can have clear positive effects on local environmental pollution, economic development and employment, while reducing GHG emissions.

These types of projects, with considerable sustainable development benefits, are the most popular in the ASEAN countries' CDM project portfolio and for the time being, these sectors offer relatively high potential CDM projects. Fortunately, CDM projects that result in considerable reduction of GHG emissions but bring few other environmental, economic or social benefits are not popular in this region.

If the sustainable development criteria established by the ASEAN countries consistently reflects the sustainable development priorities of these host countries and the assessment process is implemented efficiently, the CDM projects will have positive impacts in this region.

Table 10: Type of ASEAN CDM projects submitted to the UNFCCC

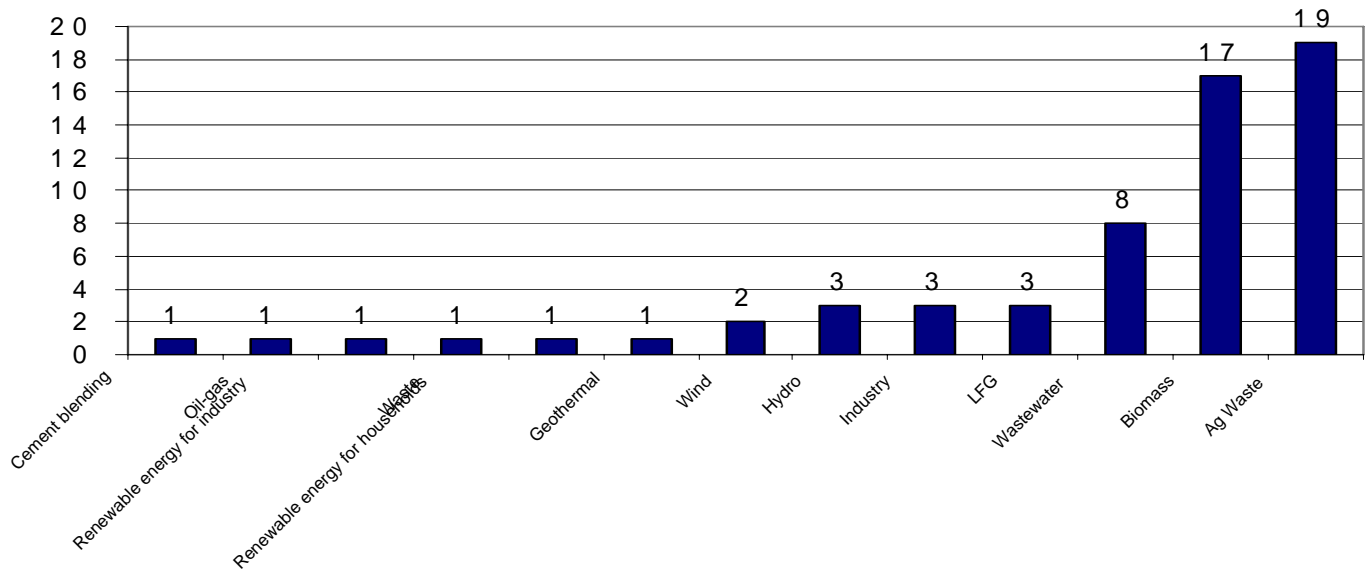
Project types	Total project type	Number of submitted project activities						
		Cambodia	Indonesia	Laos	Malaysia	Philippines	Thailand	Vietnam
Cement blending	1	--	1	--	--	--	--	--
Oil-gas	1	--	--	--	1	--	--	--
Renewable energy for industry	1	--	--	1	--	--	--	--
Waste	1	--	--	--	--	--	--	1
Renewable energy for households	1	--	1	--	--	--	--	--
Geothermal	1	--	--	--	--	1	--	--
Wind	2	--	--	--	--	2	--	--
Hydro	3	--	--	--	--	--	--	3
Industry	3	--	--	--	3	--	--	--
Landfill gas	3	--	--	--	1	1	1	--
Wastewater	8	--	--	--	--	1	7	--
Biomass	17	1	4	--	8	--	3	--
Agricultural Waste	19	--	1	--	--	17	1	--
Total	61	1	7	1	14	22	12	4

Conclusions

Assessing the potential of ASEAN countries in the global CDM market shows that no country in the region has a very large theoretical CDM potential. Most CDM potential is centered in renewable energy and agricultural waste. Nevertheless, a well-designed and transparent approval process can mobilise CDM investments even in countries that are not very attractive for foreign direct investment,

such as the Philippines and Cambodia. Cambodia is one of the few LDCs that has managed to get a CDM project registered. The Philippines has been able to mobilise a relatively wide range of CDM project proposals. Malaysia has suffered from a relatively slow approval process with tough requirements on technology transfer and the bilateral character of the investment. Countries without a supportive DNA process, such as Thailand, have had problems in attracting projects.

Figure 12: Type of CDM projects submitted to the UNFCCC by ASEAN countries



Unless a combination of all the success factors can be achieved, ASEAN countries will be able to attract some CDM niche investment but not be able to play in the CDM “champions’ league” with China, India and Brazil. Developing a ‘niche’, or specific project type where the country has a realistic advantage would be helpful – for instance, Malaysia and Indonesia can develop a niche in palm oil mill wastes, and Thailand a niche in wastes from starch production facilities. The task of assisting and boosting local project developers in accessing international carbon markets should be prioritised along with

strengthening of national institutions. Countries also need pro-active ‘marketing’ instead of waiting for projects to come to them.

It is essential that capacity building activities should be maintained and extended, in collaboration with governmental or international donors, particularly addressing the capacity building needs for other national stakeholders like financial institutions, NGOs, private entities and local independent consultants.

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