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Climate change and the Clean Development Mechanism in Indonesia: An appraisal

Nicole Dathe

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For further information on the Working Paper Series, please contact:

Nicky Jenner
International Development
University of East Anglia,
Norwich NR4 7TJ
E: nicola.jenner@uea.ac.uk
W: www.clean-development.com

For further information on DEV and ODG, please contact:

School of International Development
University of East Anglia
Norwich NR4 7TJ, UK
T: +44 (0) 1603 592807
F: +44 (0) 1603 451999
E: dev.general@uea.ac.uk
W: www.uea.ac.uk/cm/home/schools/ssf/dev

Climate change and the Clean Development Mechanism in Indonesia: An appraisal

Nicole Dathe*

Abstract

This paper gives an up-to-date overview of the Clean Development Mechanism (CDM) market in Indonesia. Indonesia is a country that is both an important contributor to global warming as well as one of its primary victims. Some institutional and policy arrangements in Indonesia relevant to climate change are introduced. The main part of this paper is dedicated to the state of play of the Clean Development Mechanism in Indonesia. It elaborates on the Indonesian Designated National Authority (DNA), the country's theoretical potential and the actual situation in the Indonesian CDM market. Selected players and their activities are mentioned; and recent developments in the national CDM market are highlighted, before a short outlook is given.

Key words: Clean Development Mechanism, climate change, Indonesia, governance

Corresponding author:

* Nicole Dathe, MA

Dresden University of Technology, Germany. E: Nicole.Dathe@gmx.net

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Abbreviations and Acronyms

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO ₂	Carbon dioxide
DNA	Designated National Authority
DNPI	National Council on Climate Change (<i>Dewan Nasional Perubahan Iklim</i> in Indonesian)
DOE	Designated Operational Entity
EB	Executive Board
EEPSEA	Economy and Environment Program for Southeast Asia
EU ETS	European Union Emission Trading System
GHG	Greenhouse gas
GTZ	German Technical Cooperation
HFC	Hydro fluoro carbon
IGES	Institute for Global Environmental Strategies
ICCTF	Indonesian Climate Change Trust Fund
JICA	Japan International Cooperation Agency
KLH	State Ministry of Environment (<i>Kementerian Negara Lingkungan Hidup</i> in Indonesian)
MW	Megawatt
NAP	National Action Plan
OECD	Organisation for Economic Co-operation and Development
PDD	Project Design Document

Introduction

This paper looks at the Clean Development Mechanism (CDM) market in Indonesia. After a brief introduction to the concept of the CDM, Indonesia is presented as a country that is both an important contributor to global warming as well as one of its primary victims. It subsequently briefly examines the institutional and policy arrangements in Indonesia relevant to climate change. The main part of this paper is dedicated to the state of play of the Clean Development Mechanism in Indonesia. It elaborates on the Indonesian Designated National Authority (DNA), the country's theoretical potential and the actual situation in the Indonesian CDM market. Also, some selected players are mentioned and recent developments in the national CDM market are highlighted, before a short outlook is provided. This paper only looks at CDM project types that currently exist in Indonesia. It is beyond the scope of this paper to examine the reasons why Indonesia has no transport CDM projects and no forestry CDM projects.

Many of the remarks in this paper are based on 22 interviews that I conducted in Indonesia with various CDM stakeholders including government officials, CDM consultants, companies, NGOs and researchers between July and November 2008. During that time, I was doing a field study while affiliated to the German Technical Cooperation (GTZ), a German Development Agency, within their 'Indonesian-German Environmental Programme (ProLH)' in Jakarta. I also attended several workshops and seminars related to the CDM opportunities and barriers in Indonesia, upon which some of my comments also build. Finally, I sourced a substantial amount of grey literature,¹ which proved a very valuable source of information on CDM developments in Indonesia.

The Clean Development Mechanism

The CDM was established through Article 12 of the Kyoto Protocol and operationalised by the Marrakesh Accords in 2001. This project-based mechanism is the largest offsetting mechanism in the world, accounting for 87% of project-based transaction volumes in 2007², and allows private or public entities in Annex I countries to conduct emission-reducing projects in non-Annex I countries. The CDM is the only flexible mechanism that involves the participation of developing countries in the attempt to limit global warming.

The Certified Emission Reductions (CERs) yielded by the project activity can then be used by the Annex I country towards the compliance with its binding reduction targets set out in Annex B of the Kyoto Protocol. The CDM was designed as a market-based, cost-efficient instrument: As climate change is a global phenomenon that does not halt at borders, it does not matter *per se* where in the world emissions are reduced. Yet marginal abatement costs of greenhouse gas (GHG) emissions are usually a lot higher in industrialised countries than in developing countries where an old and highly inefficient energy infrastructure is often still in place. The CDM therefore has, at least theoretically, a double benefit: Annex I countries can achieve their reductions more cheaply, and developing countries benefit from the investment in clean energy through the CDM and thus from a contribution to their sustainable development.

In an attempt to safeguard the environmental integrity of the CDM, a key concept is 'additionality', such that a project activity that reduces emissions would not have taken

1 This term refers to papers, reports, technical notes or other documents produced and published in electronic and print formats by governmental agencies, academic institutions and other groups (business and industry) that are not distributed or indexed by commercial publishers.

2 Cf. Kollmuss et al. (2008). For a comparison of existing mandatory and voluntary GHG reduction programmes and offset mechanisms see *ibid*.

place without the additional revenue (CERs) from the CDM. Thus emission reductions have to be real, measurable, verifiable and additional to what would have occurred without the project in order to be eligible under the CDM. Therefore the UN CDM Executive Board oversees the rather complex and often lengthy CDM project cycle (validation, registration, verification, issuance of CERs etc.). Also, the CDM should only be 'supplemental to domestic [mitigation] action' in Annex I countries (Art. 12 Kyoto Protocol). Within the European Union Emission Trading System (EU ETS), for example, the use of CDM is regulated in the Linking Directive 2004/101/EC.

Climate change as a general issue in Indonesia

Indonesia, an archipelago comprising five main islands and over 17,000 smaller islands and islets, is Southeast Asia's biggest economy with a gross national income (GNI) of US\$ 373 billion and a GDP of US\$ 433 billion (2007).³ It was one of the countries worst hit by the Asian financial crisis in 1997/98 and was slow to recover. The World Bank classifies Indonesia, which has a GNI per capita of \$1,650 (2007), as a lower middle-income country (World Bank 2009: 351). GDP growth figured fairly constant at approximately 5% annually between 2000 and 2006, and is projected to keep a level of around 6% per annum until 2010 (OECD 2008a).

It is the fourth most populous country on the planet, a founding member and driving force of the Association of Southeast Asian Nations (ASEAN) and an influential member of the Group of 77 (G77), the largest intergovernmental organization of developing states in the United Nations. Moreover, Indonesia is part of the G20, the world's most important industrial and emerging-market countries. Indonesia is also one of the five *Enhanced Engagement Countries*, along with China, India, Brazil and South Africa, which are 'selected, globally important non-member countries' for which the Organisation for Economic Co-operation and Development (OECD) has prepared an Economic Assessment (OECD 2008b). The country is endowed with a wealth of natural resources (natural gas, coal and oil) and is the world's biggest exporter of coal (Mining Journal 2009).

Indonesia's per capita emissions of CO₂ is 1.7 metric tons per year (2004), which is low compared to many developed countries including the United States (20.6 metric tons per capita per year), Australia (16.2 metric tons), Germany (9.8 metric tons), or even compared to China (3.9 metric tons) (World Bank 2009: 352-353). However, due to its large population of around 240 million the country's total emissions are substantial. If emissions from deforestation, forest fires and grassland conversion activities are taken into account Indonesia is the world's third biggest emitter of GHG, after China and the US, according to a study commissioned by the World Bank in 2007 (PEACE 2007).

Of an annual output of over 3 billion tons of CO₂ equivalent, approximately 85% (2,563 MtCO₂e) stem from land-use change, forestry and conversion activities. Indonesia's total annual emissions from energy, agriculture and waste amount to approximately 451 MtCO₂e; equivalent to Germany's allowed cap under National Allocation Plan II between 2008 and 2012 which is 453 MtCO₂e per annum. Even when emissions from forest origin are excluded, Indonesia is the biggest GHG emitter in Southeast Asia and ranks 11th in the world (JICA 2008). Indonesia is therefore also part of the *Major Economies Forum on Energy and Climate*, launched by the US in 2007 to bring together the world's 17 biggest emitters of GHG.⁴

3 As a comparison, the GNI of Austria and Belgium was US\$ 355bn and US\$ 433bn respectively, the GNI of Malaysia and Thailand US\$ 174bn and US\$ 217bn respectively (World Bank 2009: 352-353).

4 The other 16 major economies and biggest GHG emitters are: Australia, Brazil, Canada, China, the European Union, France, Germany, India, Italy, Japan, Korea, Mexico, Russia, South Africa, the United

Indonesia is also likely to be one of the primary victims of climate change, with a recent study by the Asian Development Bank (ADB) identifying Southeast Asia as a region that is more vulnerable to climate change than other regions in the world. The Indonesian archipelago has the second longest shoreline in the world (81,000 km) and is expected to be particularly vulnerable to the consequences of a higher global mean temperature, such as rising sea levels (KLH 2007: iii).

More than half of Indonesia's population live less than 25 km from a coastline (World Bank 2009: 344) and in some places sea level rises of 8 mm per year have been recorded. Emil Salim, former Indonesian Environment Minister, predicts that Indonesia will lose 20% of its islands. Case *et al.* (2007) have also identified other impacts of observed and projected climate change in Indonesia including changes in water and food availability, warming sea-surface temperatures with negative impacts on coral reefs, loss of biodiversity and ecosystem services and health impacts such as the spread of vector-borne diseases (e.g. malaria, dengue).

Global climate change models forecast that all parts of Indonesia will face a relatively uniform increase in temperature between 0.1 and 0.3°C per decade over the next 100 years (Case *et al.* 2007: 4). Yet, there are indications that Indonesia may already be feeling the impacts from global warming. For example, in February 2007 Jakarta suffered the worst floods the country had ever experienced, with flooding in 60% of the Indonesian capital.⁵ A study by the Indonesian State Ministry of Environment revealed that flooding in combination with sea level rise could lead to a permanent inundation of parts of Greater Jakarta, including the international airport, Soekarno-Hatta (Jakarta Post 2009).

Global warming in Indonesia is expected to manifest itself in more severe and frequent weather events, which may trigger economic downturn and rising poverty and thereby impede Indonesia's sustainable development. The ten biggest natural disasters in Indonesia between 1907 and 2007 occurred after 1990 and were mostly weather-related, such as flooding, drought and forest fires. Combined, these events caused economic losses of US\$ 26 billion, of which 70% can be solely attributed to the climate (KLH 2007: 1). Furthermore, the Singapore-based *Economy and Environment Program for Southeast Asia (EEPSEA)* reported that of all cities in Southeast Asia, Jakarta is the most vulnerable to the impacts of climate change (Jakarta Post 2009). Hence, Indonesia clearly has a strong interest in the mitigation of GHG that contribute to global warming given the highly detrimental effects for the country.

The institutional setting and policy arrangements related to climate change

The State Ministry of Environment (Kementerian Negara Lingkungan Hidup, KLH) was established in 1978, with Emil Salim being its first and longest serving State Minister of Environment to date in Indonesia (1978-1993). Indonesia ratified the UN Framework Convention on Climate Change (UNFCCC) in August 1994, and the Kyoto Protocol in December 2004. As a non-Annex I country, it has no obligation to reduce its GHG emissions. The Convention, however, requires that all non-Annex I countries establish and communicate 'a national inventory of anthropogenic emissions' as well as 'a general

Kingdom and the United States; see <http://georgewbush-whitehouse.archives.gov/news/releases/2007/09/20070927.html>.

5 Agus Sari at the Amsterdam Conference on the Human Dimension of Global Environmental Change, 24 May 2007. For more information on the observed and projected climate change as well as its impact in Indonesia see Case *et al.* (2007).

description of steps taken or envisaged by the Party to implement the Convention',⁶ such as actions to mitigate climate change. The country submitted its so-called 'First National Communication to the UNFCCC' in October 1999, which draws upon official Indonesian data from 1994 (KLH 1999). Since then, there has been no official data update, but the Second National Communication is currently (as of April 2009) being finalised in Indonesia and expected to be submitted to the UN Climate Secretariat soon.

That Indonesia is an important player in the fight against climate change became evident in December 2007, when the country hosted COP13 in Bali, where more than 130 Environment Ministers and over 10,000 participants from all over the world witnessed the adoption of the Bali Road Map. Indonesian President Susilo Bambang Yudhoyono has expressed his commitment to addressing environmental and climate change issues, as reflected in a statement during COP13 where he proclaimed that "there is no need to wait to begin reducing greenhouse gas emissions" (personal interviews; Bappenas 2008b: 7).

The National Council on Climate Change (*Dewan Nasional Perubahan Iklim*, DNPI) was established in July 2008 based on Presidential Regulation No. 46/2008. The DNPI's tasks are to formulate, monitor and evaluate the implementation of national policies on climate change and coordinate activities related to climate change adaptation, mitigation and financing, and technology transfer.⁷ The DNPI is chaired by the Indonesian President and managed by Mr. Rachmat Witoelar, the State Minister of Environment, and is Indonesia's national focal point of global climate negotiations. It is divided into six working groups dealing with issues of adaptation, mitigation, technology transfer, finance, forestry and post-Kyoto aims.

In the Climate Change Performance Index 2009 published by Germanwatch, which takes into consideration absolute emissions as well as trends and climate policy,⁸ Indonesia ranks 27th of the 57 countries assessed, ahead of Spain (28th) and the Netherlands (33rd), (Germanwatch 2008: 6). The index, however, excludes emissions from deforestation and land use, which Germanwatch estimate account for about 45% of Indonesia's total emissions⁹. The NGO draws attention to the fact 'that these emissions are largely driven by consumption patterns of industrialised and newly industrialised nations' (Germanwatch 2008: 9). The Japan International Cooperation Agency (JICA) also emphasises that 'Indonesia shows deeper commitment to the climate change issue than other developing countries,' (JICA 2008).

Another development indicating Indonesia's commitment to combating global warming is its recent effort to mainstream climate change. At COP13 Indonesia launched its National Action Plan (NAP) for *Addressing Climate Change* detailing Indonesia's vision to combat climate change and to design and implement a coordinated national policy to limit global warming (KLH 2007). The document was prepared under the supervision of KLH but with participation from all relevant ministries. The NAP looks at three major areas: (1) Ways of reducing GHG, (2) adaptation and (3) institutional development. The policies address both global issues (mitigation, adaptation, cross-sectoral aspects), and sector issues (e.g. energy, agriculture, industry and infrastructure). It also highlights the

6 Art. 12 para 1(a) and 1(b) KP to the UNFCCC.

7 DNPI meeting in September 2008 in Jakarta.

8 For a selection of Indonesian climate and energy related policies and measures up to 2006 (incl. transportation, forestry, and clean air) in Indonesia see the website of the World Resources Institute (WRI): <http://projects.wri.org/book/export/html/14> or <http://projects.wri.org/sd-pams-database/indonesia>.

9 Yet other sources such as the controversial 2007 PEACE study estimate that the share of emissions from deforestation and land use in Indonesia is over 80%.

tools available to the government, such as taxation, investment policies, decentralisation and awareness raising.

The NAP has been taken into consideration by the National Development Planning Agency (Bappenas), which incorporated it into the 'Yellow Book' released in 2008, *National Development Planning: Indonesia Responses to Climate Change* (Bappenas 2008a). This document contains a policy matrix of proposed actions to mainstream climate change into the National Development Plan. The policy matrix lists short, medium and long-term targets and indicators as well as the responsible institutions for the three broad areas of mitigation, adaptation and cross-sectoral issues. Actions and indicators also include the CDM as a crosscutting activity.

The Presidential Decree No. 5/2006 on the National Energy Policy specifies Indonesia's desirable energy mix by 2025. Oil should have a maximum share of 20% (compared to 54% in 2005); natural gas 30% (29% in 2005), coal 33% (14% in 2005), biofuels and geothermal 5% each and other forms of renewable energy should have a share of at least 5% and liquefied coal at least 2% (Bappenas 2008a: 22-23). On the one hand, this aspirational energy mix reflects Indonesia's diversity and high potential in non-fossil energy forms whilst at the same time aiming for a huge increase in the share of coal in the energy mix. There are several explanations underpinning this decision: (1) The country wants to reduce its dependency on oil, (2) Indonesia currently produces more than three times as much coal as it consumes (BP 2008), and (3) over a third of its population still has no access to electricity (World Bank 2005). The planned doubling of the coal share is worrying with regard to climate change, since coal has the highest carbon emission factor of all fossil fuels with roughly 25 kg carbon per gigajoule (GJ), compared to oil (20 kg / GJ) and natural gas (15 kg / GJ).¹⁰

The Clean Development Mechanism in Indonesia

The following section will look at the development and current state of play of the CDM market in Indonesia and where it stands in the global context. The establishment and work of the Indonesian DNA will be explained, and the potential of CDM in Indonesia as well as the Indonesian CDM project pipeline will be elaborated on.

Indonesia's CDM market in a global and regional context

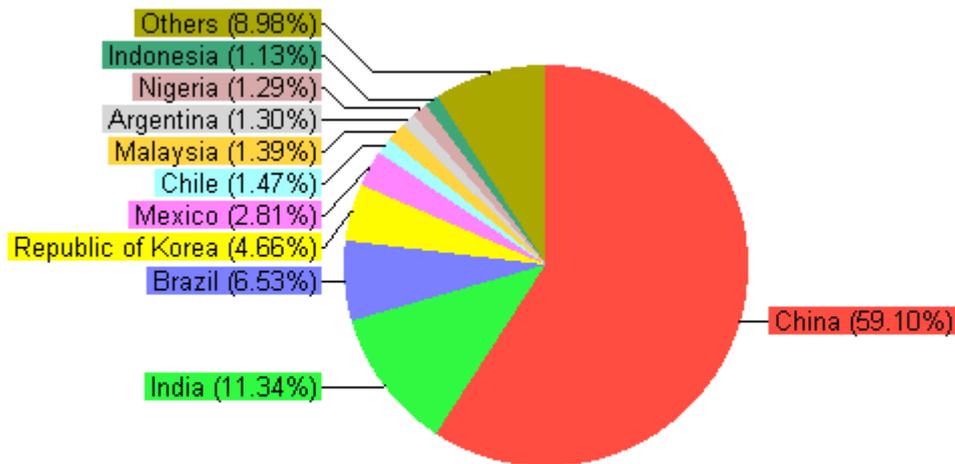
As of 30 September 2009, Indonesia ranks 9th in the world with regard to numbers of projects registered at the UN CDM EB with 30 out of a total of the over 1,800 projects (equal to approx. 1.6%) (Table 1) (UNFCCC 2009). Indonesia ranks 10th with regard to the expected average annual CERs (more than 3.6 million, equal to 1.13% of total expected annual CERs) from registered projects (Fig. 1).

Many people point to the CDM giants India and China when complaining that Indonesia is lagging behind. However, care must be taken in making those comparisons, since the countries feature different types of industries. For example, India and China have more energy-intensive smelters and coal-fired power plants than Indonesia, and China has lucrative industrial gas projects, such as hydro fluoro carbon (HFC) projects. Since HFC has a global warming potential that is around 12,000 times higher than that of CO₂, it is clear why Indonesia does not have the same CER potential as China and India. Also, with Indonesia's DNA established in 2005, the country was a 'late bloomer' compared to India and China.

¹⁰ 1 kg of carbon corresponds to 3.67 kg of carbon dioxide; see UNDP (2000: 467).

Figure 1: Share of the CER cake globally

Expected average annual CERs from registered projects by host party. Total: 318,758,684



<http://cdm.unfccc.int> (c) 29.09.2009 14:52

Compared to other member countries of the ASEAN, Indonesia is the most significant host country for CDM projects in terms of CER potential by 2012 when looking at projects in the pipeline. As far as registered projects are concerned, Malaysia with 65 projects (as of 30 September 2009) and the Philippines with 40 projects registered at the CDM EB rank far ahead of Indonesia with 30 registered projects.¹¹ However, the expected average annual emissions reductions and thus CERs from these projects are only slightly greater for Malaysia and a lot lower for the Philippines than for Indonesia (Fig. 1).

Table 1: Comparison of the CDM market in India, China, Indonesia (as of 30 September 2009)

Country	Number of EB registered Projects (World total 1,835)	Expected average annual CERs (Total 318,942,814)	CERs issued by host party (Total 333,068,667)
China	637 (34.71% of total)	188,586,302 (59.13% of total)	153,233,820 (46.01% of total)
India	456 (24.85%)	36,134,925 (11.33%)	71,725,127 (21.53%)
Indonesia	30 (1.63%)	3,609,760 (1.13%)	325,800 (0.10%)

Source: www.cdm.unfccc.int

¹¹ Thailand has 24 projects registered at the EB, Vietnam 10, Cambodia 4, and Singapore 1; see UNFCCC 2009.

With regard to the amount of CERs already issued, however, Malaysia, Thailand and even Vietnam with its four registered projects rank ahead of Indonesia. According to one interviewee working in both Indonesia and Malaysia, the Malaysian authorities are more responsive and work faster compared to those in Indonesia which may, in part, explain why it has attracted more CDM projects. It has also been suggested that Malaysia is ahead of Indonesia in the number of projects registered at the EB because Malaysia has identified its potential and focussed on it, such that the majority of projects are related to palm oil. By contrast, in Indonesia many report that there is a lot of potential and 'we would like to have as many [CDM projects] as possible but we do not focus on the one or two types with the biggest potential',¹² a strategy which may deliver better results.

There is currently no accumulated knowledge on CDM in ASEAN, but first steps in that direction are being taken. Theoretically, ASEAN's role in promoting CDM in its member countries could drive clean and green investment in the broad sense. As early as in 2004, an ASEAN 'Skillshare Workshop' on CDM project development and modes for regional cooperation, as well as a roundtable meeting of representatives from DNAs in ASEAN member countries, was held at the ASEAN Secretariat in Jakarta (KLH 2005: 23-24). A more recent ASEAN CDM Capacity Building Workshop took place in July 2008 in Bangkok.¹³ During this *READI Workshop on CDM*, success stories, barriers and challenges, as well as the potential role of ASEAN countries in a post-2012 global carbon market were discussed. Interestingly, Liana Bratasida from the Indonesian Ministry of Environment was one of the workshop's key contributors in her different roles as the former chair of the ASEAN Working Group on Multilateral Environmental Agreements, a member of the CDM Executive Board and as a representative from Indonesia.

The Indonesian Designated National Authority (DNA)

According to UNFCCC requirements, if a non-Annex I country like Indonesia wants to participate in the CDM it has to establish a DNA to approve national CDM project proposals. The initiative to establish the Indonesian DNA started in 2003 with the participation of GTZ, CDM expert Axel Michaelowa, and the Indonesian NGO *Pelangi*. It was not until July 2005, however, that the National Commission for CDM (NC-CDM)¹⁴ was established as the Indonesian DNA by the Minister of Environment Decree 206/2005.¹⁵ The DNA was located at the Ministry of Environment and chaired by former chair of the National Commission for CDM, Mrs. Masnellyarti Hilman. As the CDM is a cross-sectoral issue, DNA members also come from eight other ministries including the Ministry for Energy and Mineral Resources, Ministry of Forestry, Ministry of Foreign Affairs, Ministry of Industry, Ministry of Home Affairs, National Development Planning Board (Bappenas), Ministry of Transportation and the Ministry of Agriculture. NGO representatives are also involved. The DNA has technical advisors and consults with external experts on the project proposals.¹⁶ Meetings of the NC-CDM are held at least four times per year and a secretariat deals with the everyday business.¹⁷

Project proponents have to submit their Project Design Documents (PDDs), and may have to attach an environmental assessment report. All CDM project proposals are checked for their consistency with the Sustainable Development Indicators established

12 Interview with Gustya Indriani from the NGO *Pelangi*.

13 Personal interview at the ASEAN Secretariat in October 2008.

14 In Bahasa Indonesia the National Commission for CDM is called *Komisi Nasional Mekanisme Pembangunan Bersih (KOMNAS MPB)*

15 For detailed information on the process of establishing the National Commission for CDM see KLH (2005).

16 More than 80 local experts are listed as external consultants; see Bfai (2008).

17 For details on the task, structure, requirements and approval procedures of the DNA, see KLH (2005) or the DNA's website, where a list of the approved projects incl. PDD and status can also be found.

by the Indonesian DNA. Formally, decisions for and against a project require that at least half of the members or their representatives are present and a majority agreement is reached (Bfai 2008: 4). In practice, however, the DNA tries to support the prospective CDM project developers by reminding them of the permits required, both for successful submission and to ensure the project runs smoothly under Indonesian regulations once it comes into operation.¹⁸

With the recent establishment of the DNPI, however, there have been institutional changes relating to the Indonesian DNA and today, the DNA is located at the DNPI under the leadership of Mr. Dicky Edwin Hindarto in the DNPI's Financing Working Group.¹⁹ However, the formal procedure for that change has not yet been enacted, thus the Ministerial Decree (referred to above) will remain valid until replaced by a new decree. There are those, however, that believe the DNPI should not be the institution responsible for CDM and who would have preferred that the DNA remain at KLH.²⁰

The CDM potential in Indonesia

As early as in 2001, a *National Strategy Study on the Clean Development Mechanism in Indonesia* was conducted by KLH with support from GTZ and the World Bank to look at the theoretical potential of the CDM and the institutional conditions in the country, and to give strategic recommendations for CDM implementation (KLH 2001).

Point Carbon's (2005) country analysis revealed that Indonesia "excels in potential for geothermal power, small hydro and waste biomass from palm oil and forestry operations, and the oil and gas sector could substantially reduce gas flaring. Moreover, Java's large agglomerations could sustain many landfill gas projects. The Active Geothermal Association was the first to recognise the benefits of CDM and has developed several interesting projects, whose additionality is not in doubt," (PDD 2006: 14). Point Carbon also assessed that "Indonesia has a relatively vibrant project developer sector, particularly within the energy production industry" (PDD 2006: 14).

There is widespread agreement that there are CDM possibilities especially in the renewable energy sector and with energy efficiency projects. According to Gustya Indriani from Pelangi, 'a lot of players come from the industry, therefore energy efficiency has a very big potential in Indonesia'.²¹ In general, however, high-emission heavy industrial companies play a rather small role in Indonesia, unlike in China, which is why the potential CO₂ savings in the industrial sector are rather limited in comparison (Bfai 2008:2). Agus Sari from EcoSecurities also sees great potential for emission reductions in the agro-business, fuels from renewables, and in the oil and gas sector (Sorotan 2008: 8).

Numerical estimates of Indonesia's CDM potential vary. However, PEACE (2007) claims that around 235 MtCO₂e could be reduced through CDM projects. This is within the range estimated by the Indonesian Ministry of Environment (125-300 MtCO₂e), whilst estimates produced by EcoSecurities suggest higher figures of between 250 and 500 MtCO₂e (Bfai 2008: 2).

Even though there is agreement that Indonesia has a lot of CDM potential, there has been criticism by some Indonesian CDM stakeholders that the way this potential is managed needs to be improved. With regard to renewable energy, for example, the

18 Personal interviews with project developers and DNA staff.

19 Correspondence with GTZ staff in August 2009.

20 Personal interview.

21 Personal interview in September 2008.

promotion, establishment and diffusion of biodiesel, solar and wind energy all need extensive research and effort, yet some feel the Indonesian government is not giving this issue enough attention. Equally, landfill projects (methane avoidance) are considered to have a big potential owing to their potential contribution towards sustainable development. The question is how Indonesia can use that potential, since from a regulatory point of view there are a lot of technical, bureaucratic and ownership issues. These concern land owners, the land, rights of the local governments and the people living in close vicinity to the landfill. It is, for instance, debatable who owns the CERs if the waste from the people in Jakarta goes to landfills in Bekasi, a city outside Jakarta, that are managed by the corresponding local government.

The Indonesian company PT. Gikoko Kogyo has been successful in resolving these issues in some of their projects. For example, despite regulatory barriers for landfill projects, Gikoko's Landfill Gas Reduction Project in Bekasi has demonstrated that the successful implementation of a CDM project can also yield multiple sustainable development benefits. This project is exemplary in that it will reduce GHG emissions, improve solid waste management and provide funding for local communities in the municipality of Bekasi.²² The commercial barriers that have previously restricted private sector involvement in solid waste management were removed by entering into a public-private sector partnership between Gikoko and the municipality of Bekasi. Gikoko had already pioneered this private sector approach to investment in municipal solid waste management for the first time in Indonesia through their EB-registered Pontianak CDM project (PDD 2007: 2). In the Bekasi project, the municipal government receives a revenue stream from the sales of the CERs, as 10% of the revenue is added to the local budget and an additional 7% goes directly into community development, with the latter being used purely for education and health for the poor. Interestingly, the local communities are to jointly manage the funds, together with the city of Bekasi and the company Gikoko.²³ Therefore, besides reducing emissions and improving solid waste collection and disposal, the CDM project directly involves and provides funds to the community living around the landfill.

Finally, the notion of CDM 'potential' has to be considered with care. The hypothetical numbers in studies for potential emission reductions in certain sectors are always based on specific assumptions regarding, for example, future political developments, energy consumption patterns and institutional settings. Fabby Tumiwa, an energy expert who at times also works for the Indonesian DNA, claims that the Indonesian potential is a lot greater than reported figures suggest, as they do not yet contain calculations of the CDM potential related to palm oil.²⁴ Moreover, it is important to acknowledge that, to date, there have not been any Afforestation and Reforestation CDM projects in Indonesia.

Indonesian CDM projects

The calculations and numbers in the following section are mainly based on the UNEP Risoe CDM Pipeline.²⁵ According to the UNFCCC, each CDM project has to be categorised under at least one of 15 different sectoral scopes. A project, however, can also fall under

22 Personal interview with John Blair, Gikoko, in October 2008.

23 Personal interview with John Blair, Gikoko, in October 2008

24 Personal interview with Fabby Tumiwa in October 2008.

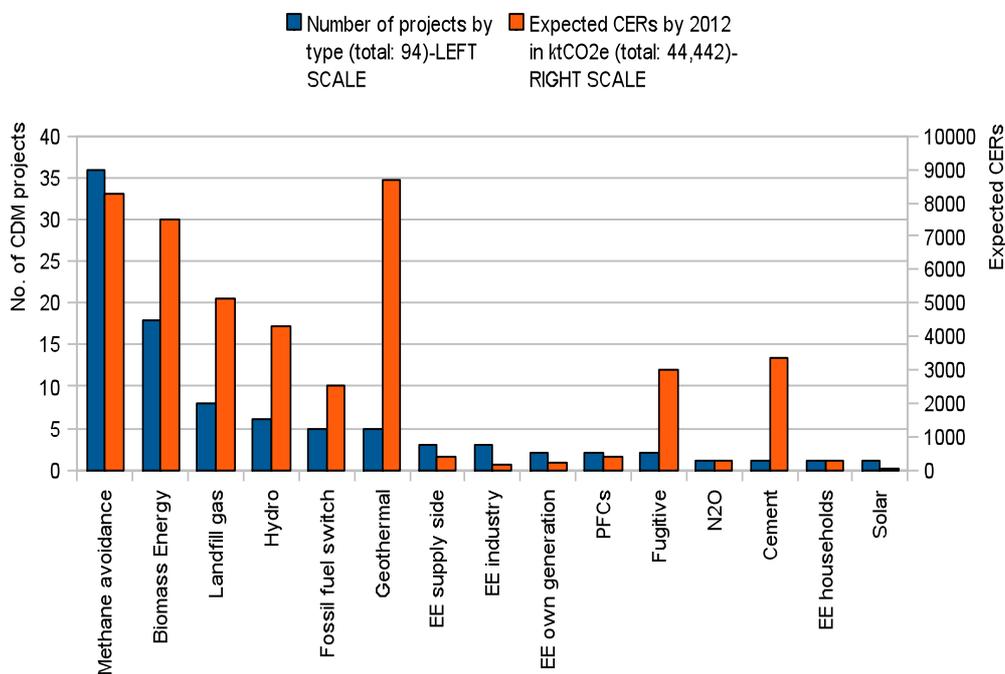
25 The Indonesian National Commission for CDM website also contains a database with an overview and status of the projects submitted to the DNA. However, there seems to be a discrepancy between the total number of projects listed on the DNA website and the higher number listed in the UNEP Risoe Pipeline. One possible explanation for that difference, other than that the UNFCCC website is -unlike the DNA website- being permanently updated, is that CDM projects may not yet have received the Letter of Approval from the DNA although they are already in the validation process, and therefore appearing on the UNFCCC website. Ulrich Elmar Hansen, UNEP Risoe Centre (personal comment).

more than one scope. The UNEP Risoe CDM Pipeline has grouped the projects into 26 different project types, which in their aggregate still correspond to the UNFCCC categorisation.

There are currently (as of 1 September 2009) 94 CDM projects in the Indonesian project pipeline with the estimated potential to reduce around 45 MtCO₂e by 2012.²⁶ Given Indonesia's CDM potential of around 235 MtCO₂e the current Indonesian CDM pipeline taps just one fifth of this potential. In the global context, Indonesia's share, in terms of numbers of CDM projects in the pipeline, is just 2%, whilst expected emission reduction potential is around 1.6%. Interestingly, the *National Strategy Study on CDM in Indonesia* from 2001 estimated that, for the energy sector, Indonesia's potential global share in the CDM market would be around 2% (range: 1.5 - 3.5%), generating an expected revenue stream of at least US\$ 224 million during the first commitment period (2008-2012), (KLH 2001: xxxi and 52).

Of the over 90 projects in the Indonesian pipeline, 55 are at the validation stage, 11 are awaiting registration and 30 are registered with the EB. Most of the projects involve methane avoidance,²⁷ biomass energy and landfill gas (Fig. 2). Given that methane has a global warming potential more than 21 times that of CO₂ it is perhaps not surprising that these three project types, all of which reduce methane, are most common as they will generate most CERs.

Figure 2: Number of projects in the Indonesian CDM Project pipeline by type vs. expected CERs by 2012 according to project type. (Source: UNEP Risoe CDM pipeline, cdmpipeline.org, as of 1 September 2009)



²⁶ These and the following numbers and calculations are based on the UNEP Risoe CDM Pipeline as of 1 Sept. 2009.

²⁷ This category covers projects producing biogas from manure, wastewater, industrial solid waste, palm oil solid waste, and projects that avoid CH₄ by composting or aerobic treatment.

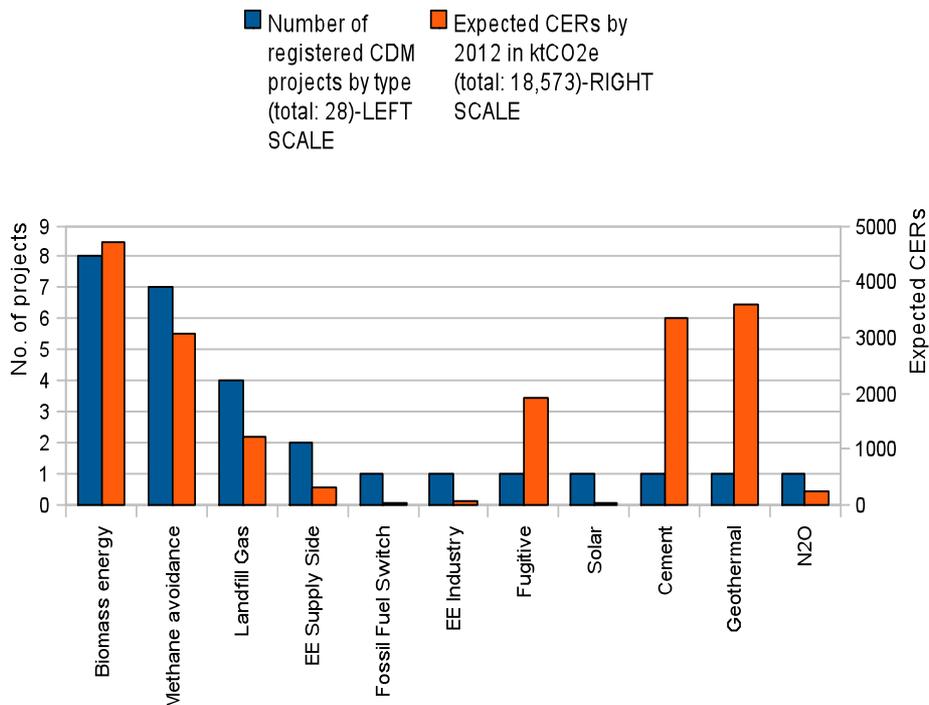
However, Figure 2 also highlights that some project types reduce more GHGs than others. For example, the five geothermal projects, two projects reducing fugitive emissions from fuels and one cement project in the pipeline, are projected almost avoid the same amount of GHG emissions as would be achieved from over 50 methane avoidance and biomass energy projects (red bars in Fig. 2).

If all the CDM projects in the pipeline came into existence, they would install an expected 863 megawatts (MW), contributing to the provision of much needed electricity in Indonesia.²⁸ The CDM project types contributing to this generating capacity are hydro (400 MW), geothermal (318 MW), biomass energy (118 MW), methane avoidance (19 MW) and landfill gas (17 MW), (UNEP 2009).

Of the 30 projects registered (as of 30 September 2009) there are 15 small-scale and 15 large-scale projects. They reduce around 3.34 MtCO₂e per year and will yield over 18 million CERs by 2012 if all expected CERs are issued (Fig. 3). Compared to Indonesian's CDM potential of between 120 and 300 MtCO₂e, the expected 18.5 MtCO₂e GHG emission reductions by 2012 seem relatively small.

The majority of registered projects fall into the following sectoral scopes as defined by the UNFCCC: (1) Energy industries (renewable/non-renewable), (13) waste handling and disposal and (4) manufacturing industries (UNFCCC 2009). As was the case with the complete Indonesian CDM project pipeline, biomass energy, methane avoidance and landfill gas projects are still the most common project types among the EB registered projects despite the fact that one cement and one geothermal project combined are expected to achieve almost 40% of the projected 18.5 MtCO₂e emission reductions.

Figure 3: Number of registered Indonesian CDM projects by type vs. expected CERs by 2012 according to project type. (Source: Data from the UNEP Risoe CDM pipeline, cdmpipeline.org, as of 1 September 2009).



28 For more information on Indonesia's energy needs see World Bank (2005).

So far, only six of 30 projects (of which four were registered in 2006, two in 2008) have received CERs, corresponding to 326,000 tons of abated CO₂e. For three of those projects, however, the issuance success (amount of expected CERs compared to the CERs finally issued), was very low at just 12% for the Methane Capture and Combustion from Swine Manure Treatment Project, 18% for the Aceh Solar Cooker Project and 31% for the Indocement Alternative Fuel Project. The Darajat Unit III Geothermal Project and the MEN-Tangerang 13.6 MW Natural Gas Co-generation Project achieved higher issuance success with 65% and 79% respectively. The Tambun LPG Associated Gas Recovery and Utilization Project, on the other hand, received more CERs than expected with an issuance success rate of 154%, higher than the global average of 114% for projects mitigating fugitive emissions from fuels (UNEP 2009). The Indonesian solar project was the first and to this day only CDM solar project worldwide that received CERs. Therefore, a comparison to the global average issuance success rate of similar projects is not possible. As for the other projects, the Indocement Alternative Fuel project significantly underperformed compared to the global average of 89% for biomass energy projects, while the MEN-Tangerang Natural Gas Co-generation project corresponds almost exactly to the global average of 79% for energy efficiency supply side projects.

To date, 17 Indonesian CDM project proposals have been rejected by DOEs and one Indonesian CDM project, the PAA Biogas Extraction Project for Heat Generation, was rejected by the EB in October 2008 on the grounds of failure to prove additionality.²⁹

Selected players in the Indonesian CDM market

There are established and well-known players in the Indonesian CDM market, such as the brokers and consultancies Ecoscurities, South Pole and Asia Carbon. The following section identifies other key players and briefly reflects on their contributions and activities.

The most prominent DOEs in Indonesia are Det Norske Veritas (DNV) (14 of the 30 EB registered projects) and Technischer Überwachungsverein (TÜV) Süd (9 of the 30 registered projects). If one takes into account the whole Indonesian CDM project pipeline, which includes another 55 projects at validation stage and 11 projects requesting registration, other validators like TÜV Nord, TÜV Rheinland, Société Générale de Surveillance (SGS), Lloyd's Register Quality Assurance (LRQA) and Japan Quality Assurance Organization (JQA) are also playing an important role (UNEP 2009).

The NGO *Pelangi* has worked on climate change-related topics since its establishment in 1992, and has been involved in CDM issues since around 2000 when it was the only local organisation working on CDM. Gustya Indriani from Pelangi summarises: "We acted as consultants, as researchers and also as advisors to the government and stakeholders."³⁰ In the beginning, the focus lay on awareness raising and capacity building for all stakeholders in the CDM and Pelangi has also supported the establishment of the Indonesian DNA. When Agus Sari (now Indonesian Country Director of EcoSecurities) became Pelangi's director, he decided that climate change would form Pelangi's core remit together with energy and transportation. More recently the Pelangi's portfolio has

29 The EB 'could not register the project activity submitted for registration by the DOE (JQA) because the project participant and the DOE have failed to substantiate the additionality of the project activity, in particular, by changing the input values of investment analysis submitted in response to the review from those contained in the PDD without any justification, and failure of the DOE to assess the impact of these changes on the additionality of the project'. See: <http://cdm.unfccc.int/Projects/DB/JQA1205142016.76/Rejection/>.

30 Personal interview in September 2008.

been expanded to air quality and technology transfer issues. Since 2005, Pelangi has focused more on research and policy advocacy and is no longer involved in CDM consultancy. They are, however, working with the community to develop several small CDM-like projects for the voluntary market. The NGO *CER Indonesia* focuses on mitigation activities in the energy, waste, and forestry sectors. They conduct CDM trainings and studies on CDM related policies, write PDDs and do asset mapping for potential CDM projects in the regions.³¹ The importance of NGOs for CDM assistance has been acknowledged by Masnellyarti Hillman, (former) head of Indonesia's National Commission on CDM.³²

Japan's *Institute for Global Environmental Strategies' (IGES)*³³ engagement in Indonesia with regard to CDM has proved a success story. With its *Integrated Capacity Strengthening for CDM Project in Indonesia (2004 - 2009)*, which included the development of a CDM Country Guide For Indonesia (IGES 2006), IGES has certainly strengthened capacity.³⁴ Evidence of this is provided by the example of Gikoko, a company that is now active in the Indonesian CDM market, which first learned about CDM in a workshop organised by IGES in 2004.³⁵ IGES's success is certainly attributable to its cooperation with the local institutions and experts, especially KLH, and the NGOs Yayasan Bina Usaha Lingkungan (YBUL) and Carbon and Environmental Research Indonesia.

The *World Bank*, a key actor in the governance of clean development on a global scale, has a carbon finance focal point in Indonesia and the Prototype Carbon Fund has acted as a PDD consultant for several Indonesian CDM projects, a couple of which have not only been registered at the EB but also been issued CERs. The World Bank also funded the controversial PEACE study (2007) and conducted workshops on CDM in Indonesia. The World Bank Indonesia is involved in the preparation of several other studies focussed on barriers to CDM implementation in Indonesia, and the production of clean technology by APEC countries.³⁶ Furthermore, the Indonesian Ministry of Trade has asked the World Bank to examine Indonesia's potential to develop as a producer of climate friendly goods and services and to assess whether current trade policies encourage or hinder the diffusion of clean technologies. Another World Bank study will look at Indonesia's position in the international negotiations concerning the liberalisation of environmentally friendly goods and services.

The United Nations Development Programme (UNDP) in collaboration with Fortis Bank has sought to mobilise the benefits of carbon finance for the developing world through the *MDG Carbon Facility*, which was launched in June 2007 and operates within the CDM framework. This mechanism is designed to support the development and the commercialisation of emission reduction projects. The focus lies on the promotion of projects that contribute to the Millennium Development Goals (MDGs), yielding sustainable development and poverty reduction benefits.³⁷ In general, UNDP is supposed to work closely with UNEP and the World Bank on capacity development for CDM, as articulated in the Nairobi Framework and in the Partnership Agreement

31 Personal communication with Syahrina D. Angraini (Programme Director CER Indonesia) in December 2008.

32 Masnellyarti Hillman at the workshop 'Financial Policies and Incentives for Climate Mitigation Action and opportunities for Further Development in Indonesia' in Jakarta in July 2008.

33 The research institute IGES was established in 1998 by the Japanese government.

34 IGES was honourably mentioned several times by my interviewees. An overview of IGES' activities in Indonesia can be accessed at <http://www.iges.or.jp/en/cdm/indonesia.html>.

35 Joseph Hwang from Gikoko in a DPNI meeting in September 2008.

36 Interview and communication with staff of the World Bank Indonesia Office between September 2008 and March 2009.

37 See <http://www.mdgcarbonfacility.org/>.

between UNEP and UNDP on climate change (UNDP 2008). Interestingly, the UNDP representative and Carbon Focal Point in Indonesia comes from an investment banking background and seems to look at CDM from a business rather than development perspective,³⁸ something that Pelangi has experienced first hand. UNDP states that the MDG Carbon Facility's purpose is to support projects that would otherwise not be pursued due to their inherent risks or low profitability. During Pelangi's discussions with UNDP, however, it became obvious that UNDP wanted to have projects with a reduction potential of at least 100,000 tons of CO₂e per year. Pelangi was rather incredulous about that requirement, as it would involve dealing with a big company³⁹ in order to get emissions reductions on such a scale. Pelangi, on the other hand, is trying to reduce poverty in Indonesia through its work on small-scale projects.

The Asian Development Bank's (ADB) *Carbon Market Initiative* aims to provide upfront co-financing for CDM project preparation and implementation. ADB achieves this through the Asia Pacific Carbon Fund, the Technical Support Facility and the Credit Marketing Facility.⁴⁰ In July 2008, ADB also announced its new Future Carbon Fund, which will use carbon credits generated beyond 2012 to help finance clean energy projects.⁴¹ Although ADB published an extensive Country Environment Analysis of Indonesia in 2005 and has been trying to set up an energy efficiency fund similar to the one in Thailand, it seems to be relatively quiet on the CDM front (ADB 2005 and interview data).

Recent developments and trends in the Indonesian CDM market

The CDM community in Indonesia is rather small, and most players in the market know each other with CDM-related workshops and events feeling much like a 'family reunion' of Indonesian CDM players.⁴² At the beginning of CDM development in Indonesia, there were still regular discussions with various CDM stakeholders. Liana Bratasida, the former Indonesian alternate member of the Executive Board, usually convened those meetings before and after EB meetings 'just to update each other'.⁴³ Since then, the CDM in Indonesia has grown and produced a lot of new CDM consultants, and no such regular meetings take place anymore. . The idea to establish an Indonesian CDM Business Association to unite CDM stakeholders and exchange information was launched in autumn 2008 by EcoSecurities and South Pole in cooperation with GTZ. However, as of late August 2009, there has been no reported progress on its implementation.

The fact that there is less regular exchange among the CDM community may also be attributed to fiercer competition between project developers. 'Sometimes, the consultants have to draw a line, because even though the potential is big in Indonesia, the number of projects that could be developed and the number of companies that are really interested to get involved with CDM are not that big and not that easy to find', reports Gusyta Indriani from Pelangi.⁴⁴

The CDM market in Indonesia has gained considerable momentum since 2008. One indication of this is that the DNA approved 46 projects in 2008, compared to 13 projects in 2007, six projects in 2006 and five projects in 2005 (IGES 2009). There has been a growing interest in the Indonesian CDM market from various stakeholders, highlighted

38 Personal interview in August 2008.

39 Personal interview with staff at Pelangi in September 2009.

40 See <http://www.adb.org/clean-energy/cmi.asp>.

41 See <http://www.adb.org/media/Articles/2008/12516-asian-carbon-funds/>.

42 Personal interviews.

43 Personal interview with Gusyta Indriani from Pelangi.

44 Personal interview.

for example by the fact that CDM consultancies are hiring more staff. Most interviewees involved in the Indonesian CDM are optimistic and some even describe the CDM opportunities in Indonesia as 'great' or 'fantastic'⁴⁵ and acknowledge an exponential acceleration of developments in the CDM market. Bigger companies, especially foreign investors, are also increasingly interested and active in the Indonesian CDM market (Sorotan 2008). The Indonesian-German Chamber of Industry and Commerce (Ekonid), for example, devoted a 2008 edition of their magazine "Sorotan" to the topics of CDM and energy in Indonesia, entitled *More (Cleaner) Energy for Indonesia*. It was even mentioned in an interview that although a company might potentially only receive a thousand CERs, they are still interested in CDM for image reasons.

Government entities have also shown interest in learning about carbon financing and the CDM. The Indonesian Ministry of Finance, for example, in collaboration with the World Bank held a series of weekly meetings in the second half of 2008 during which different stakeholders in carbon finance gave expert talks and exchanged views about specific issues. This was seen as a way to enhance knowledge about the carbon market as well as potential fiscal and financial implications and opportunities for Indonesia. Whilst this has been perceived as a positive step, there remains some scepticism regarding the opportunities associated with the CDM among some members of the Ministry of Finance.⁴⁶

GTZ and other development agencies in Indonesia, such as the United States Agency for International Development (USAid), who have not done anything related to CDM up to now, also recognise its potential. As Suzanne Billharz of USAid put it: "We are aware and informed about its use as a financing tool for lowering carbon emissions. [The CDM] will be taken into account as part of USAid's Global Climate Change assessment, which will shape the mission's strategy for 2009-2013."⁴⁷

Under the auspices of the State Ministry of National Development Planning (Bappenas), the Indonesian Climate Change Trust Fund (ICCTF) was established and launched on 14 September 2009 to mobilise, pool and coordinate the required funding for mitigation and adaptation programmes in Indonesia in the short, medium and long term.⁴⁸ The ICCTF is designed to 'bridge international financial resources with national investment strategies' (ICCTF 2009). One of the more specific objectives of the ICCTF is to 'facilitate private sector investment in climate change' (ICCTF 2009), though they do not explicitly state whether this will involve supporting CDM projects. The strategies and priority areas to be funded through the ICCTF are defined by the 20 Year Indonesian Climate Change Sectoral Roadmap (20-ICCSR), which has identified the energy sector, including renewable energies and energy efficiency, as a main priority for mitigation.⁴⁹ It remains to be seen if and to what extent CDM might be affected through the ICCTF.

It remains to be seen what effect the move of the DNA from KLH to the DNPI will have, and if it becomes the 'CDM acceleration unit' that Indonesia hopes for. Currently, the DNPI still does not have the legal status that would make it a strong and fully operational institution and a number of issues between the DNPI, Bappenas and the Ministry of Environment are yet to be resolved.

45 Various personal interviews.

46 Personal discussion with staff of the Ministry of Finance in October 2008.

47 Statement by Suzanne Billharz, USAid, in August 2008, passed on through personal communication by Walter North, USAid Mission Director in Indonesia.

48 The detailed design of the ICCTF is contained in the ICCTF Blueprint document, which will shortly be available on the ICCTF website: <http://icctf.org/>.

49 Communication from Syamsidar Thamrin, Bappenas, in September 2009.

The 2007 *NAP Addressing Climate Change* set the benchmark of a 400% increase in the number of CDM projects approved by the Indonesian DNA by 2009, compared to 2007 (24 projects). Interestingly, the policy matrix in the NAP has the aim of 'doubling the number of CDM projects from the previous period' for the three time frames 2009-2012, 2012-2025 and 2025-2050 (KLH 2007). This suggests that Indonesia not only sees the CDM as a valuable tool, but also that the country is confident that the CDM will remain an integral part of any Post-Kyoto Agreement to be approved in December 2009 in Copenhagen. Recently, hope for new impetus in the Indonesian CDM market has been placed on the concepts of the programmatic CDM / Programme of Activities and the sectoral approach, since the former could help projects especially on the local level come into existence. But to date, no concrete results have materialised.

Given the fact that most buyers of Indonesian CDM credits are from Japan, Switzerland, the Netherlands and the UK, it will be interesting to see the effects of changes in the global carbon market, especially the EU ETS, on the Indonesian CDM market. For example, in its communication of January 2009, the European Commission suggests that 'for advanced developing countries and highly competitive economic sectors, the project based CDM should be phased out in favour of moving to a sectoral carbon market crediting mechanism' (European Commission 2009: 11). Yet at the time of writing, there was still no clear definition of an 'advanced developing country' and 'highly competitive economic sectors', so it is uncertain to what extent Indonesia should be concerned about whether the European Commission's suggestions are to be enforced.

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