

## Implementation Gold Standard for Further Development of CDM Geothermal Project in Indonesia

Indria Doria, Tedi Mulyana, Bagus Bramantio, Glifanny Ramadani

PT.Pertamina Geothermal Energy, Indonesia

doria@pertamina.com; tedi.mulyana@pertamina.com; bagus.bramantio@pertamina.com; glifanny.ramadani@pertamina.com

**Keywords:** CDM, Gold Standard, Sustainable Development.

### ABSTRACT

Pertamina Geothermal Energy (PGE), as subsidiary of PT.Pertamina (Persero) has registered for five Clean Development Mechanism (CDM) Projects for Lumut Balai Unit 1&2 (110 MW), Lumut Balai Unit 3&4 (110 MW), Ulubelu Unit 3&4 (110 MW), Karaha Unit 1 (30 MW), Kamojang Unit 5 (30 MW) with a reduction of the total potential emission of about 2.058 Million Tons of CO<sub>2</sub>e/year. Due to the transition phase from Post Kyoto Protocol-2012 give impact in fluctuation of Certified Emission Reduction (CER) price, its consideration for PGE to develop and upgrade PGE's CDM Projects. PGE has found an opportunity to upgrade the CDM Project as a Gold Standard scheme. Gold Standard (GS) is a benchmark for Gold Carbon Standard, which is certified credits that is sold at a premium rate due to their high quality, robustness and sustainable development benefits. Currently, GS has made a great market recognition and GS Project is more likely to be eligible for future compliance scheme. GS also has a unique certification process requiring involvement from local stakeholder and NGOs, whereas GS is supported by more than 80 NGOs worldwide, such as WWF, Greenpeace and CARE International. Now PGE has been developing five geothermal projects with the Gold Standard scheme with potential emission reduction of about 2.058 Million tons CO<sub>2</sub>e/year. Implementation of the Gold Standard scheme becomes PGE contribution as a real action for Green House Gas (GHG) emission reduction, and complies with the implementation of reducing GHG emission by 26% reduction as the national target until 2020. Upgrading the Gold Standard scheme will improve the price of CER presently to obtain potential revenue for geothermal developer. This paper also has further discussion about implementation of Gold Standard scheme process in PGE, included but not limited to preparation, validation, registration and monitoring, reporting and verification plan.

### 1. INTRODUCTION

As a result of the climate change issue, Kyoto Protocol has been declared that industrial countries should reduce their emission of Green House Gas (GHG) to an average of 5% below their 1990 levels over the commitment period 2008-2012 (UNFCCC, 1997). One of flexible mechanism comes from Kyoto Protocol names Clean Development Mechanism (CDM). Clean Development Mechanism (CDM) has two objectives : (1) to offset GHG emission produced in developed countries and (2) to promote sustainable development in developing countries, as stated in the article 12 of Kyoto Protocol (UNFCCC, 1997, p. 11). Later on, the effective contribution of CDM projects to sustainable development is being questioned due to its procedure, it does not formally define the sustainability criteria, in contrast to the other objective of the CDM, GHG offset, whose operationalisation and implementation are clearly defined and monitored (Nussbaumer, 2008). Related to the shortcoming of CDM concept and implementation in sustainable development, labelling appears to be a promising complement to enhance projects with specific features (Muller, 2008). Another option also comes from premium markets which seems to be an attractive option for giving a value to promote sustainable development (Schneider, 2007). In response to this concern, initiatives to developed CDM Project with broad local sustainable development has been launched names Gold Standard (Nussbaumer, 2008).

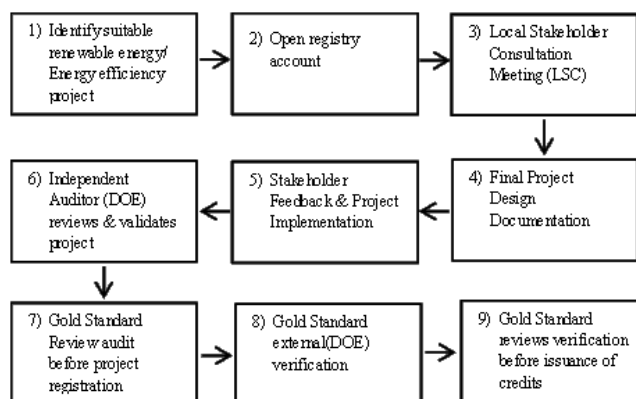
Gold standard CDM was initially created by the World Wide Found (WWF) for Nature as an innovative approach to provide project developers with a tool that ensures the delivery of credible projects with real benefits for the host country (Gold Standard, 2003). The objective covers several things, such as: (1) ensuring the offset of the GHG by assessing the addition in a conservative manner, (2) promoting low-carbon energy systems, and (3) supporting sustainable development in the host countries. Gold Standard has been developed under the framework of the CDM as an add on methodology, which fosters broad sustainable development dividends at a local level (Nussbaumer, 2008) and it certified credits sell at a premium rate due to their high quality carbon by supporting the sustainable development. Gold Standard also has a unique certification process required involvement from local stakeholder and NGOs, where GS supported by more than 80 NGOs worldwide, such as WWF, Greenpeace and CARE International. Concept of Gold Standard CDM is based on the assumption that the CDM does not significantly contribute to sustainable development. Focus on promoting sustainable development, Gold Standard evaluation cover three major components: Sustainability Matrix, Environmental Impact Assessment (EIA), and Stakeholder Consultation (Gold Standard, 2003). The Sustainability Matrix records contributions from project participant to sustainable development, and EIA use when environmental pre-screening or initial stakeholder consultations demonstrate that the impacts are likely to be significant. Stakeholder consultation needs to be conducted in order to ensure stakeholders know about the CDM project and understand the sustainable development contribution brought by the CDM project implementation.

### 2. IMPLEMENTATION OF GOLD STANDARD CDM

#### 2.1 Gold Standard CDM Certification Process

Figure 1 illustrates the procedure of Gold Standard Certification Process which consist of several steps, such as identifying the project, open Gold Standard Registry account, conduct Local Stakeholder Consultation Meeting (LSC), finalize project design documentation (Gold Standard Passport), organize Stakeholder Feedback Round (SFR), submit documentation for validation by DOE, and submit for Gold Standard Registration. After a project is successfully registered as a Gold Standard Project, the project participant must prepare monitoring report for verification process, and Gold Standard CERs will be issued after verification

review. The main idea about Gold Standard is by preparing the Gold Standard Passport, validation and monitoring-verification process.



**Figure 1. The Gold Standard Certification Process (Gold Standard, 2014)**

## 2.2 Gold Standard Passport

Gold Standard Passport consists of information about the project, such as Project Description, documentation of Local Stakeholder Consultation, Do No Harm Assessment, Sustainable Development Matrix, Sustainability Monitoring Plan, and ODA declaration. Refer to The Gold Standard Toolkit Version 2.2 (Gold Standard, 2012), these are following component in Gold Standard Passport document:

### 2.2.1 Project Description & Proof of Project Eligibility

The Gold Standard Passport document must be clearly stated about the project overview and the proof of Project Eligibility. Project eligibility section consists of the information about scale of the project (large or small) and project type with the animal's symbols for represent the project, such as the buffalo symbol represent the CDM, the pelican symbols represent the voluntary market projects, the hummingbirds represent the voluntary standalone micro-projects or micro-programs, etc. Project description must include information about project type, justification of eligibility of the project activity, and the greenhouse gas that will be emitted from the project and also project registration type.

### 2.2.2 Sustainability Assessment

- 'Do No Harm' Assessment  
Do No Harm' assessment is conducted to analyze the risk that the project might result in negative environmental, social and/or economic impacts. This assessment consists of several components, such as human rights, labor standard, environmental protection and anti-corruption. Project must not complicit Human Rights abuses, must not involve involuntary resettlement and must not complicit in the alteration, damage or removal of any critical cultural heritage. The full assessment results in a filled-in 'do no harm' assessment table in Gold Standard Passport.
- Detailed Impact Assessment – Sustainable Development Matrix  
Sustainable Development Matrix are filled to score the project on environmental, social, and technological and economic indicators. Then, to allow for a detailed scoring, twelve indicators are considered. Select corresponding parameters to represents the status of each indicators. For each parameter describe briefly what baseline situation would be and what situation the projects are. Based on this description of the baseline and targeted values of parameters, score each indicator 'negative', 'positive' or 'neutral' in comparison with the baseline situation. Negative indicators can potentially be 'neutralized' with mitigation measure. These mitigation measures must then be monitored. All non-neutral indicators must be monitored as well.
- Sustainability Monitoring Plan  
The Gold Standard requires project participant to monitor the impact of the project on sustainable development. This is used to verify if the project has indeed contributed to sustainable development and consequently is eligible for the issuance of Gold Standard premium quality labels. All non-neutral indicators must be monitored. In monitoring plan, must be explained about the current status (or expected status under the baseline) of your parameters, the future status and the way you will monitor them. The monitoring of Sustainable Development Indicators shall be verified for each verification period, as well as during each mandatory verification site-visit. All non-neutral indicators and all mitigation and compensation measures put in place to prevent violation or the risk of violating a safeguarding principle of the 'Do No Harm' Assessment or to 'neutralize' a Sustainable Development Indicator and/or to address stakeholder concerns shall be monitored. Based on the monitoring plan, project participant will gather data and report on the sustainable development attributed to your project. These reports will be subject to verification by the DOE later on.

### 2.2.3 Environmental & Social Impact (ESIA)

Project has to fulfill host country (local, regional or national) requirements concerning Environmental & Social Impact assessment. As part of the Cover Letter, project participant must provide The Gold Standard Foundation with a declaration warranting that the project complies with local registration.

#### 2.2.4 Stakeholder Consultation Meeting

- **Local Stakeholder Consultation Meeting**

Local Stakeholder Consultation meeting is conducted to facilitate the project participant to inform the local stakeholder about the project implementation and discuss about the monitoring sustainable development. Project participant should not forget to follow up after the meeting and then upload Local Stakeholder Consultation Report to the Registry.

- **Stakeholder Feedback Round**

The Gold Standard process includes two rounds of stakeholder consultation, first Local Stakeholder Consultation Meeting then follow by Stakeholder Feedback Round. . Local Stakeholder Consultation must include physical meeting and the Stakeholder Feedback Round means to reach out to stakeholders who cannot be physically present at the meeting. The Stakeholder Feedback Round may also include a physical meeting although this is not mandatory. Stakeholders should be encouraged to make comments on the Local Stakeholder Consultation report and if applicable the revised project documentation. Project participant can perform the stakeholder feedback round in parallel to the validation process but the contracted DOE must be able to take feedback received into account to complete the validation.

### **2.3 Gold Standard CDM Validation Process**

After Gold Standard Passport completed, Project Participant will continue to organize a Validation Process by the independent Designated Operational Entities (DOE). Refer to The Gold Standard Toolkit Version 2.2 (Gold Standard, 2012), these are following step of validation process which consist of DOE Site Visit, Interview with local residents, and Validation Assessment.

#### 2.3.1 Select DOE & Upload Validation Workplan

Project should have to be validated by independent third party (DOE), and then DOE opens account in the Registry of Gold Standard. DOE should upload validation work plan. DOE will receive the following documents form the project participant: a complete PDD, a complete Gold Standard Passport and all supportive documentation (e.g. pre-feasibility assessment feedback, compliance statement with environmental law, environmental & social impact assessment, etc.).

#### 2.3.2 DOE Site Visit

The site visit will enhance the quality of the validation by allowing a better assessment of the impact of the project and the scoring of the sustainable development indicator. Beside that, DOE also consider to conduct a few follow-up interviews with local residents and/or NGOs to ensure that comments from the two rounds of consultation have indeed been taken into account.

#### 2.3.3 Answer question regarding PDD and Passport

After validation and site visit, DOE report to the Project participant to responds to the Corrective Action Requests (CARs) and Clarification Requests (CRs). The validation process can only be completed and a final validation report issued when all requests are solved according to the validator.

#### 2.3.4 Validation Completed

After validation is completed, Project Participant must upload following documents to registry: final version of the validated PDD, final version of the validated Gold Standard Passport, validation report and cover letter. Cover letter as a legal basis for the project, consist of identification of the entity/person that will be responsible for communication on behalf of your project, the person whom The Gold Standard quality labels will be issued, ownership of the credits, terms & condition.

#### 2.3.5 Review by the Gold Standard

Once the project has been validated by the DOE, The Gold Standard initiates a period during which the Secretariat, TAC and the NGOs Supporters may request further clarification or corrective action from the validator or the project participant, about 8 week long period after submitted the final validated document.

#### 2.3.6 Gold Standard Registration

After successful review period by The Gold Standard, the project will obtain the 'registered' status. The Gold Standard reserves the right to review potential changes to the project design, which may occur due to request for review for projects. If changes significantly impact the project, The Gold Standard may request an additional review period of weeks.

### **2.4 Gold Standard CDM Monitoring & Verification**

Gold Standard monitoring process must consider about several components such as update monitoring table on PDD and GS Passport, update data entry sheets of self-monitored parameters, update remarks on the monitoring process used, update current status of parameters in the table, and other data sources that substantiate with the projects. Refer to the The Gold Standard Toolkits Version 2.2 (Gold Standard, 2012); these are following steps to conduct monitoring and verification process for Gold Standard project:

#### 2.4.2 Select DOE for Verification

First of all, the project participant selects one DOE from UNFCCC recommendation of accredited DOE for the relevant scope to execute verification process. Selected DOE then opens an account in the registry by follow the procedure listed. After having an account, DOE have to submit the verification process work plan to the Registry. The work plan covers several components related to the project, such as: document to review, verification timeline/project schedule, list of stakeholders to interview, detailed about verification for each indicators, composition of the audit team and their experience (because auditor has to incorporate local experience in house country) then include Gold Standard Project ID and CDM reference number (if applicable), etc.

### 2.4.3 Start Verification Process

Project participant, or by the DOE, has to complete and upload the carbon and sustainability monitoring reports together with the completeness check and other supporting documents to the Registry. The components which will be verified are based on the monitoring report of emission reductions, leakage, sustainable development indicator, achievements and implementation of mitigation/compensation measures, and responses to the complaint from the local stakeholder. For the CDM project, Gold Standard verification shall be conducted at the same time and periods as the verification under regular CDM cycle. In case of having permanent design changes in the project after registration process, project participant should have to report to the Gold Standard for approval of design changes.

### 2.4.4 DOE Site Visit

One of the mandatory procedures of verification process is conducting site-visit by the DOE. The purpose of site-visit is to verify the location of the project and installation and having objective comments from interview the project personnel. DOE also have to verify the monitoring of sustainable development indicators. For CDM verification site visit could be held parallel with site visit for Gold Standard verification.

### 2.4.5 Verification and Certification by DOE

After completing the verification check list and conduct the site visit, DOE will process the submitted document and possibly give some Corrective Action Request (CARs) and Clarification Request (CRs) to the project participant. All CARs or CRs should be answered and clarified by the project participant

### 2.4.6 Review and Certification by Gold Standard

For review the submitted document will take approximately 3-week period during which Gold Standard Technical Advisory Committee members as well as the GS NGO Supporters may request further clarification or corrective action from the verifier or project participant. Request must be delivered to the GS within two weeks after the summary sent. Based on the result of verification and judgment from DOE, GS will consider about three options: cancelation (if the violation is too extreme), request for having immediate action to restore compliance the GS requirements (at least two of SD categories scoring positive, and the third one scoring neutral) or issue the credits.

### 2.4.7 Gold Standard credit/label issuance

For project that successfully issued the credits, the Gold Standard credit remains valid until it is permanently retired in the applicable registry. Another concern is for the project that also gaining certification under the UNFCCC process, credit must first be issued by the UNFCCC. The Gold Standard then adds the premium quality label to these credits upon delivery of the UNFCCC serial numbers and payment of the issuance fees or the Share of Proceeds delivery to a Gold Standard CDM registry account. The credits will be issued to the account in the Registry. Also the volume of GS CERs and CERs is the same; CERs originating from CDM are related with the Gold Standard Label, except for the CERs deducted by the UNFCCC as Share of Proceeds for the Adaptation Fund.

## 3. GOLD STANDARD CDM PT.PGE

### 3.1 Opportunities for PT.PGE CDM Projects

Pertamina Geothermal Energy (PGE), as subsidiary of PT.Pertamina (Persero) in geothermal developer companies in Indonesia, has already registered for five Clean Development Mechanism (CDM) Projects in UNFCCC for Lumut Balai Unit 1&2 (110 MW), Lumut Balai Unit 3&4 (110 MW), Ulubelu Unit 3&4 (110 MW), Karaha Unit 1 (30 MW), Kamojang Unit 5 (30 MW) with total potential emission reduction about 2.058 Million Tone CO<sub>2</sub>e/year (Table 1). Due to the transition phase from Post Kyoto Protocol-2012 give impact in fluctuation of Certified Emission Reduction (CER) price, its consideration for PGE to develop and upgrade PGE's CDM Projects. PGE found an opportunity to upgrade CDM Project as a Gold Standard scheme, by register the existing CDM Project to Gold Standard Registry.

**Table 1 – List of PT.PGE Gold Standard CDM Project. (PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd, 2012)**

CDM Project Number	Name of Project	Current Status	Registration date in UNFCCC	Estimated Installed Capacity (MW)	Estimated Emission Reduction (ton CO <sub>2</sub> e/year)	Estimated Crediting Period
7430	Kamojang 5	- Registered in EB-UNFCCC - Gold Standard Registration Process	28 November 2012	30	156.669	1 January 2014 – 31 Dec 2020
7431	Karaha 1	- Registered in EB-UNFCCC - Gold Standard Registration Process	27 November 2012	30	156.669	1 January 2014 – 31 Dec 2020
5785	Lumut Balai 1&2	- Registered in EB-UNFCCC - Gold Standard Registration Process	22 May 2012	110	581.784	1 January 2015 – 31 Dec 2021

CDM Project Number	Name of Project	Current Status	Registration date in UNFCCC	Estimated Installed Capacity (MW)	Estimated Emission Reduction (ton CO <sub>2</sub> e/year)	Estimated Crediting Period
7315	Lumut Balai 3&4	- Registered in EB-UNFCCC - Gold Standard Registration Process	19 September 2012	110	581.784	1 January 2017 – 31 Dec 2023
5773	Ulubelu 3&4	- Registered in EB-UNFCCC - Gold Standard Registration Process	15 May 2012	110	581.784	21 June 14 – 20 June 2021

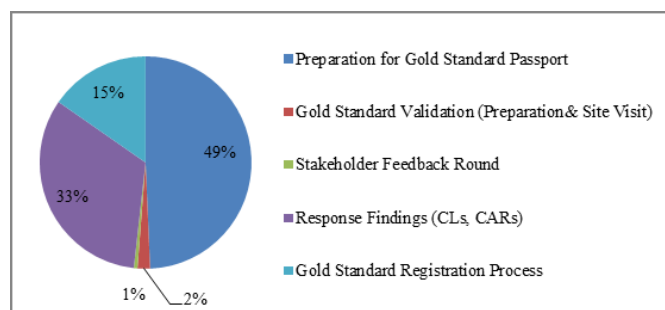
### 3.2 Implementation Gold Standard CDM Projects in PT.PGE

PGE has already processed for upgrade to Gold Standard CDM, by developing five geothermal projects for with potential emission reduction about 2.058 Million Tone CO<sub>2</sub>e/year, as the first Gold Standard CDM Projects in Indonesia. Implementation of Gold Standard CDM in PT.PGE began in February 2013, with initial preparation by prepared the Gold Standard Passport document and selects the DOE for validation process (Tabel 2). After completed the Gold Standard Passport document, PT.PGE as part of Project Participant, arranged for the Validation & Site Visit Process by the selected independent DOE. Validation process include some activities such as site visit, interview with local residents and document review. Site visit focused on checked some location related with the Gold Standard CDM Project, such as estimated location for Geothermal Power Plant, well cluster and environmental condition near the Power Plant location. In site visit, DOE interviewed some local residents to get information about impact of the project related to the Sustainability Development. DOE also interviewed local operator and reviewed submitted document related to the CDM Project.

**Table 2 – Timeline of CDM Gold Standard Registration Process for PGE CDM Project**

Project Activity	Project Karaha-1	Project Kamojang-5	Project Lumut Balai 1-2	Project Lumut Balai 3-4	Project Ulubelu 3-4
Start upgrade Gold Standard CDM	February 2013	February 2013	February 2013	February 2013	February 2013
Completed Gold Standard Passport	22 August 2013	22 August 2013	22 August 2013	22 August 2013	22 August 2013
Gold Standard Validation Site Visit	24 September 13	23 September 13	11 November 13	1 November 13	13 November 2013
Stakeholder Feedback Round	9 October 2013	10 October 2013	24 October 13	24 October 13	21 October 13
Response Findings closed (estimation)	6 June 2014	6 June 2014	6 June 2014	6 June 2014	6 June 2014
Registered as Gold Standard CDM (estimation)	September 2014	September 2014	September 2014	September 14	September 2014

After finished the site visit, DOE processed and reviewed the entire submitted document, then DOE gave report for the validation result. The report consists of list of findings in Gold Standard Passport which needs to be clarified or corrected by the Project Participant. For response the findings, Project Participant gave the clarification or correction statement and submitted the additional supporting document, if necessary. DOE checked the finding responses then requested other clarifications and correction if it's not clear enough to be closed. Validation process will be automatically closed after the DOE issue the Validation Report.



**Figure 1. Estimated Time Period of Gold Standard Registration Process for PGE CDM Project**

Figure 1. show the percentage of estimated time spend for CDM Gold Standard Registration Process. About 49% of overall time needed for Preparation for Gold Standard Passport document. In this part, Project Participant must complete the requested information about the CDM Project listed in Gold Standard Passport document, and also completed supporting documents such as ODA (Official Development Assistance) Declaration –the declaration by which the Project Participant states that the project has not directly or indirectly received or benefited from official development assistance on the condition that the credits are transferred too the donor country of assistance (Gold Standard Toolkit, 2012), Local Stakeholder Consultation Report, etc. PGE, as part of project participant, previously has been compiled Project Design Document and registered the CDM Project to UNFCCC. When preparing Gold Standard Passport, PGE has continued and developed Project Design Document (PDD) into Gold Standard Passport document. Almost 33% from overall estimated time are needed for “Response Finding” session, where Project Participant need to

response the Clarification Request (CRs) and Corrective Action Request (CARs). Some of the CRs and CARs need to be clarified and corrected by additional supporting documents, or just closed by explanation statement. To follow up the Gold Standard registration process, Project Participant can access and monitor in website (Gold Standard, 2014).

### 3.3 Benefits of Implementation of Gold Standard CDM

Implementation of Gold Standard scheme would effect some benefits for PGE; (1) contribution in supporting Sustainable Development implementation and (2) contribution for Green House Gas (GHG) emission reduction which complies the "National Action Plan for GHE" to reduce GHG emission for 26% reduction and 41% with international support until 2020 (Indonesia Presidential Regulation No.61/2011). On the other side, the implementation of Gold Standard CDM is expected to influence the improvement of the CER Price presently to obtain potential revenue. Gold Standard become a prominent carbon offset certification scheme that demands higher standards for CDM project in exchange for higher prices on the Global Carbon Market (Evans, 2011), because of its premium quality of carbon. Since the transition phase from Post Kyoto Protocol-2012 give impact in fluctuation of Certified Emission Reduction (CER) price, PGE found an opportunity to confront the CER price fluctuation by upgrade CDM Project as a Gold Standard scheme. The PGE Gold Standard CDM Project now still on going process in registration on Gold Standard Registry and waiting for the commissioning date to start the monitoring process, so the improvement of CER price by labeling into Gold Standard CER could not be predicted by now, but its expected to be increased if it is compared with the CER price.

### CONCLUSION

Gold Standard developed under the framework of the CDM, as a premium quality carbon due to its contribution and support to sustainable development. Gold Standard label focuses on promoting sustainable development, include three major components, such as the Sustainability Matrix, Environmental Impact Assessment (EIA), and Stakeholder Consultation. PT. Pertamina Geothermal Energy (PGE) has already processed for upgrade to Gold Standard CDM since February 2013, by developing five geothermal projects for Gold Standard scheme with potential emission reduction about 2.058 Million Tone CO<sub>2</sub>e/year, as the first Gold Standard CDM Projects in Indonesia. Benefits for Gold Standard CDM implementation for PGE are; (1) contribution in supporting Sustainable Development implementation and (2) contribution for Green House Gas (GHG) emission reduction. Besides these, the implementation of Gold Standard CDM is expected to influence the improvement of the CER Price presently to obtain potential revenue.

### REFERENCES

- Evans, Beth Jeans: Implications of the Gold Standard Certification Scheme for the Perceived Legitimacy of the Clean Development Mechanism. (2011).
- Gold Standard: The Gold Standard-Background and Overview (2003). Available at <<http://assets.panda.org/downloads/thegoldstandaroverview.doc>> last viewed 29 May 2014.
- Gold Standard: The Gold Standard Certification Process (2014). Available at <<http://www.goldstandard.org/energy/certification-process>> last viewed 29 May 2014.
- Gold Standard: The Gold Standard Project Registry (2014). Available at <<http://www.goldstandard.org/about-us/project-registry>> last viewed 29 May 2014.
- Gold Standard: The Gold Standard Toolkit, Version 2.2 (2012). Available at <[http://www.goldstandard.org/wp-content/uploads/2012/06/GSv2.2\\_Toolkit.pdf](http://www.goldstandard.org/wp-content/uploads/2012/06/GSv2.2_Toolkit.pdf)> last viewed 29 May 2014.
- President of Republic of Indonesia: Presidential Regulation No.61/2011(2011)
- Nussbaumer, Patrick: On the contribution of labeled Certified Emission Reductions to sustainable development: A multi-criteria evaluation of CDM Projects, *Elsevier, Energy Policy*, **37** (2009) 91-101.
- Muller, A.: How to make the clean development mechanism sustainable-the potential of rent extraction. *Energy Policy*, **35** (2007) 3203-3212.
- PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd.: Project Design Document, Version 02.4, Project Lumut Balai Unit 1 - 2 PT Pertamina Geothermal Energy (2012).
- PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd.: Project Design Document, Version 03.1, Project Lumut Balai Unit 3 - 4 PT Pertamina Geothermal Energy (2012).
- PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd.: Project Design Document, Version 02.4, Project Ulubelu Unit 3 - 4 PT Pertamina Geothermal Energy (2012).
- PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd.: Project Design Document, Version 01.6, Project Karaha Unit 1 PT Pertamina Geothermal Energy (2012).
- PT Pertamina Geothermal Energy, and South Pole Carbon Asset Management Ltd.: Project Design Document, Version 01.6, Project Kamojang Unit 5 PT Pertamina Geothermal Energy (2012).
- Schneider, L:Is the CDM fulfilling its environmental and sustainable development objectives? An evaluation of the CDM and options for improvements. Institute for Applied Ecology, (2007). Available at <<http://www.oeko.de/oekodoc/622/2007-162-en.pdf>> last viewed 29 May 2014.
- United Nations Framework Convention on Climate Change (UNFCCC), : Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997). Available at <[http://unfccc.int/essential\\_background/kyoto\\_protocol/background/items/1351.php](http://unfccc.int/essential_background/kyoto_protocol/background/items/1351.php)> last viewed 29 May 2014.