

## Gold “PROPER” Achievement of Environmental & Social Management

Irma Khoirunissa, Wilmar Napitupulu, Tavip Dwikorianto

PT. Pertamina Geothermal Energy, MH. Thamrin No 9, Skyline Building, 15th floor Jakarta Indonesia

irmak@pertamina.com; wnapitupulu@pertamina.com; [tavip@pertamina.com](mailto:tavip@pertamina.com)

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### ABSTRACT

The geothermal Kamojang field is owned by PT. Pertamina Geothermal Energy (PGE) which has 200 MWe in total operation (45 MW for Unit 1&Unit 2 respectively, a 55 MW for Unit 3 steam field, a 60 MW Unit 4 power plant and the Kamojang project is now developing a 35 MW installed capacity for the 5th stage development.

PGE Geothermal Kamojang is the oldest geothermal field which has been operated for more than 30 years in Indonesia. There were many achievements received from Health Safety and Environmental Aspect, one of was PROPER (Program Kinerja Pengelolaan Lingkungan Perusahaan), the Indonesia Government program for company performance rating of managing sustainability environmental and social aspect. PROPER is an Environmental Audit that is conducted on a yearly basis by the Indonesian Environmental Agency or Kementerian Lingkungan Hidup – (KLH). KLH is presenting company performance through a transparency mechanism and public disclosure process on how the company manages their sustainability environmental and social aspect. “PROPER” has classified in to 5 ratings, which are Black, Red, Green, Blue and Gold as the highest category.

PROPER methodologies of assessment are divided into environmental management system, energy utilization, hazardous waste utilization, biodiversity, and community development aspect. PGE Kamojang has implemented integrated systems management of ISO 9001, OHSAS 18001, ISO 14001, clean development mechanism, energy efficiency and utilizing steam, and CIP- Continues Improvement Program. The Kamojang Field has received Gold PROPER Achievement since 2010 consecutively. Innovation in operation and environment and social aspects creates harmony with the people and environment at Geothermal Kamojang.

### 1. INTRODUCTION

The Kamojang geothermal power plant is located around 40 km south east of Bandung, West Java and about 24 km north west of Garut at an elevation of about 1500 m above sea level. Figure 1 shows the location map of Kamojang geothermal power plant. The Kamojang power plant has been operating a steam supply and generating electricity. Currently, Kamojang power plant generates electricity of about a 200 MWe capacity. The first power plant (Unit 1-30 MW) was completed in 1983. In 1987, the second power plant (Unit 2, 55 MW) and third power plants (Unit 3, 55 MW) were commissioned. Geothermal Power Plant Unit 1, Unit 2 and Unit 3 are operated by Perusahaan Listrik Negara (PLN) a state electricity company. The fourth geothermal power plant unit was built and is operated by PT. Pertamina Geothermal Energy (PGE) with a capacity of 63 MW. In 2015 the fifth power plant (30 MW) is being prepared for commissioning. Plant overview is presented on Figure 2.



Figure 1 Location Map of Kamojang Geothermal Power Plant

When any business industry is developed, environmental and social concern arises; these would give impact to the environment and social aspect nearby. In order to attempt to prevent or reduce harmful effects to the general population and to increase company awareness on environmental and social concerns, since 1993, the Indonesian government under Indonesian Environmental Agency

or Kementerian Lingkungan Hidup–(KLH) has launched an instrument tool (called “PROPER”) to evaluate industry performance on managing environmental and social aspects.



**Figure 2 Plant Overview**

## **2. PROPER ASSESMENT AND CRITERIA**

### **2.1 PROPER Assessment**

The PROPER awarding aims to encourage business industry to obey environmental regulations and achieve environmental excellence through the integration of sustainable development principles. The evaluation assess the process of operation and service activity, implementation of environmental management systems, hazardous and nonhazardous waste management 3R (reuse, reduce, recycle), energy efficiency, natural resource conservation and company social responsibility for the community nearby.

PROPER has classified the performance of a company that are characterized by certain colors which can drive companies to get more focused on environmental protection , which in turn creates sustainability for companies as well as for the environment and the communities (Reliantoro, 2013).

The ratings of environmental business performances and/or activities are classified as follow:

- a) Gold is for businesses and/or activities that have consistently demonstrated environmental excellence in terms of production or service processes, conducting business ethically and responsibly towards society. This award is KLH's highest recognition in the program for delivering excellent environmental operation.
- b) Green is for businesses and/or activities that have performed environmental management beyond compliance through the implementation of environmental management systems, efficient utilization of resources and adequately implement community development programs.
- c) Blue is for businesses and/or activities that have performed environmental management as required in accordance with any applicable laws or compliance criteria
- d) Red denotes that the environmental management effort does not meet the requirements stipulated in the law.
- e) Black is for businesses and/or activities that intentionally perform any act or omission that leads to pollution or environmental damage and violations of laws and regulations applicable or not carrying out administrative sanctions handed down to them.

The methodology of the PROPER assessment refers to the Indonesia Ministerial Decree No 6/2013 regarding company environmental performance program. For the transparency of the program, on a yearly basis KLH publishes a report of all industry on their environmental performance.

### **2.2 PROPER Criteria and Methodology**

The PROPER criteria consist of two categories, i.e. compliance and beyond compliance criteria. The compliance criteria follows a simple logic, whether the industry complies or not complies with Indonesian environmental regulations.

## 2.2.1 Compliance Criteria

### 2.2.1.1 Environmental documents and reporting requirements

A company is considered to meet this criterion if all of its activities are covered by an environmental management document. It can be an Environmental Impact Assessment Document (AMDAL) or Environmental Management Effort and Environmental Monitoring Effort (UKL/UPL documents). The assessment also considers the compliance to environmental monitoring report requirements.

### 2.2.1.2 Water Pollution Control

In principle, compliance towards water pollution control is assessed against a waste water disposal permit issued by the local government. The waste water parameter that is disposed into the environment or water course must go through the point of compliance that has been set in the permit and effluent standard. To ensure that the waste water that is disposed of at any time does not exceed the effluent standard, the company is obliged to monitor the parameters that are in accordance with the applicable permit or quality standards. To ensure the validity of the data, the monitoring is conducted by an accredited laboratory.

### 2.2.1.3 Air Pollution Control

The compliance towards air pollution control is based on the principle that all sources of emissions should be identified and monitored to ensure that the emission disposed of to the environment does not exceed the specified emission standards. The frequency and parameters monitored must also comply with regulations. To ensure that the monitoring process is carried out safely and valid, the sampling infrastructure must meet regulatory requirements.

### 2.2.1.4 Management of Hazardous and Toxic Waste (B3)

Compliance in the management of B3 (Hazardous and Toxic Substances) waste is assessed from the inventory of the waste. The waste must be classified and quantified according to their types and characteristics. After the inventory, all the waste must be managed properly. The hazardous and toxic waste management must be equipped with a hazardous waste management license. Compliance with the provisions of B3 waste management license is the main component in assessing the compliance of a company

### 2.2.1.5 Sea Water Pollution Control

For this aspect, the main compliance is seen from the completeness of the waste water disposal permit and compliance of waste water disposal in accordance with the provisions of the permit.

### 2.2.1.6 Potential of Land Degradation Criteria

The criteria are only used for mining activities. This criterion is essentially the implementation of best mining practices, such as compliance of activities with the mining plan, so as to avoid land clearings that are left unmanaged. Setting the height and slope level to maintain its stability.

## 2.2.2. Beyond Compliance Criteria

The Beyond Compliance is more dynamic because it is adapted to the development of technology, create innovation, the application of best practices in environmental management practices and global environmental issues. The preparation of criteria related to the implementation of PROPER is performed by a technical team by considering the inputs from various parties, among others: regencies/municipalities, industrial associations, companies, NGOs, universities, relevant agencies, and the PROPER Advisory Council.

### 2.2.2.1 Implementation of Environmental System Management

The implementation of Environmental Management System includes how companies have a system that could affect suppliers and customers to implement a good environmental management.

### 2.2.2.2 Resources Utilization

The PROPER program evaluates company innovation on energy efficiency, water conservation program, protecting biodiversity, effort to reduce emission, and reduce and utilize domestic and hazardous waste hazardous in accordance to regulation.

### 2.2.2.3 Community Development and / or CSR

A company should have a strategic program for community development that is designed to address the needs of the community. The program is based on social mapping to describe the social networks that provide an explanation about the lines of communication between groups/individuals. Social Mapping provides information about a person's identification, their interests, who they network with, and their social position and social network analysis as well as the degree of importance of each stakeholder.

## **3. GOLD PROPER ACHIEVEMENT**

PGE Kamojang has taken several actions to ensure the sustainability by integrating an operational program, environmental and the local community. The journey of receiving PROPER was starting in 2003/2004, whereas PGE Kamojang received an award of Blue rating, which means that the company met environmental pollution standard of air pollution, waste water and domestic and hazardous waste.

Furthermore, from 2004 to 2010 a Green PROPER rating is achieved. The requirement of beyond compliance criteria was fulfilled through the implementation of environmental management systems, efficient utilization of resources and adequately implements community development programs.



Since 2010, PGE Kamojang is honored to receive the most prestigious environmental business award. Unique innovations had been created. These combined with innovation operation and the local community, i.e. developed equipment of steam generator for sterilization of fungus media growth. This equipment was built for a group of farmers at Kamojang site, from the environment overview this leads to reduced air pollution due to replacing fossil energy. Another innovation for internal operation purposes were to set equipment of grass cutting and well head painting spray were used geothermal steam as an energy alternative (Figure 3 and Figure 4).



**Figure 3 Direct Used Innovations on Fungus Cultivation**



**Figure 4 Direct Used Innovations on Grass Cutting**

### 3.1 Environmental Management System

The journey begins with the environmental management efforts to keep it well-maintained and with the commitment in preserving and preventing environmental damage and to comply with applicable laws and regulations. On this basis, the PGE Kamojang Area implements an integrated system for the management of quality, occupational health and safety as well as environmental protection. This system integration is known as the Corporate Management System (CMS).

The integration of these three international standards is then applied in the CMS and continues to be maintained until now. These systems regulate the management of quality, occupational health and safety as well as the environment. Starting from planning, implementation, monitoring and improvement when found any nonconformity between planning and implementation on an ongoing basis. To facilitate this process, the entire implementation cycle of the Environmental Management System (EMS), starting from the planning stage to evaluation and improvement, has implemented IT-based technologies. This technology assists the implementation of the EMS that has been set by the company. The application software also provides progress of the monitoring (e-monitoring) towards the already planned system integration.

To anticipate deviations in the EMS implementation by contractors, the company has procedures that require contractors to carry out the management of environmental aspects as it should be. The procedure is set out in the Contractor Safety Management System (CSMS) Application Guide. The contractor must meet the CSMS standards set by the company. The aim is that contractors can also run the EMS as planned and established by the company.

### 3.2 Utilization of Resources

#### 3.2.1 Alternative Substitute ODS and CDM

In the effort to run an environmentally friendly business activity, in 2010 the company implemented a program, where the retrofit of the refrigerant freon R-22 is shifted to the local product of Musicool MC-22 hydro-carbon. Through this program, apart from the energy saving effort, the use of Musicool to substitute ODS (Ozone Depleting Substances) also shows the company's commitment to prevent the depletion of the ozone layer.

The substitution was carried out on all refrigerants in the company office and plant. The local product can be used as an alternative to ODS, reducing discarded emissions and simultaneously it is also proven effective in saving electricity/fuel by 30%, providing a

better cooling effect, lighten the work of compressors so that it may extend the life of the air-conditioners compressor. The company is proud that a domestic product made by Pertamina can provide better benefits for the creation of a clean environment.

In addition, PGE Kamojang is registered at UNFCCC Executive Board. The milestones on CDM project cycle would be CDM project implementation & monitoring activities, that have been running since 2010.

### 3.2.2 Energy Efficiency

The consumption of energy becomes one of the important parts in conserving the environment and the implementation of resource conservation. Efficient energy use will greatly affect the environment and can reduce carbon emissions that can damage the environment. Energy efficiency becomes one of the strategic policies practiced by the company through energy management.

The goal is to maximize the utilization of energy systematically, planned and integrated. To implement this policy PGE Area Kamojang has made the following efforts:

1. 1). To set an energy management team from various departments led by an energy manager,
2. 2). Establishing a short- and long-term strategic plan on energy efficiency that includes the setting of goals, objectives and procedures for the implementation.
3. 3). Providing program direction, and implementation and policy-related inputs.
4. 4). Forming a team of auditors to perform as well as evaluate the energy audit.
5. 5). Forming Continuous Improvement Program (CIP) teams: Quality Control Circles (QCC), Quality Control Project (QCP), and Contributing, Suggestions (CS) for the application of continuous improvements that is consistent with the conservation of resources. These CIP activities are initiated from program planning (PLAN), implementation (DO), result evaluation (CHECK), to the standardization (ACTION) and quality convention activities. Furthermore, a CIP's activity audit and result audit are also performed by the CIP Auditor Team from PGE's mother company (Pertamina Corporate) to monitor the implementation and verify the result of the CIP.

### 3.2.3 Water Conservation

To maintain the quality of water resources in the operational environment, the company has implemented a policy on the conservation of water resources as stipulated in the company's policy that was established through the five-Year Program of Energy and Water Resources Management. During project implementation, the company has established a Water Resources Management Team charged with the implementation of water resources conservation programs.

The company had been carrying out preventive and persuasive measures through water saving that were able to reduce 30% of the water saving as well as by implementing a sealing water hotwell pump modification program, by performing a sealing water modification that was previously using raw water sources to using condensate water from the auxiliary cooling water pump. The advantage of this program is to be able to significantly reduce the use of surface water as well as to increase the reliability of the power plant

### 3.2.4 Hazardous Waste

Drilling cuttings as per Indonesian regulation is classified as a hazardous waste. PGE Area Kamojang has conducted a study on the utilization of drilling cutting in order to utilize the waste into building materials or hard surface level or paving block.

Other dominant hazardous wastes are containers of used chemicals (NaOH). The strategy to minimize used chemical container, we built chemical storage that is provided by using the needs supply system of chemical used.

### 3.2.5 Biodiversity

The biodiversity protection management program is run in collaboration with the Forestry Institution, local community and other stakeholders as the party that has formed a strategic plan for the protection of biodiversity. Specific courses are provided i.e. workshops in the handling of forest fires, the planting of endemic Kamojang natural wood and the nursery of timber forest plants.

The socialization or concerns are performed to provide the knowledge about the protection of forests and their native plants and animals that are protected. PGE Area Kamojang is already successful in reforesting the Malpinas land with replanting and caring of 3,000 seeds of endemic Kamojang wood, i.e. the Ki Beureum, Puspa, Huru, and Ki Hujan.

### 3.2.6 Community Development

The corporate social responsibility program undertaken by PGE Area Kamojang relies on objectives set by the Company. These programs are also tailored made to the needs of the community in areas of operation.

Creating economic independence of the community is one of the targets and objectives of the CSR activities of PGE Area Kamojang. That is why the emphasis of this activity is focused on developing the potential of the surrounding community. After identifying the potential, the company develops an action plan to equip people with a variety of training required and opens access to markets for local products..

The two example programs of CD that is described in the education and encourage local entrepreneurship program are as follows:

#### 3.2.6.1 Education

The An Nur Community Learning Center (Annur CLC) is a true story about the desire of the Kamojang community to improve the quality of education and welfare of the surrounding community. The desires arose from the number of children dropping out of school but are still trying to help provide welfare for their families and elder people. The level of education of the community is generally low. Through the An Nur Foundation, PGE Area Kamojang is trying to pave the way to make this dream come true.

This condition underlies the company's efforts to improve educational equity and prosperity, starting from granting scholarships to 15 students in the An Nur CLC in 2005. This became the beginning of the community education system improvement efforts.

Through literacy education programs that are integrated with the introduction of entrepreneurship, thereby increasing local economic empowerment, the An Nur CLC together with PGE Area Kamojang initiated a skill-based community economic improvement program combination of school and vocational program.

Together with the An Nur Foundation, the company implements a variety of training. In addition, the company also provides assistance in the form of production means, such as sewing machines, embroidery machines, food packaging machines, bean-curd making equipment, to looms. The presence of these tools that are coupled with workshops on entrepreneurship is proven to increase the income of the surrounding community.

Currently, Annur CLC also successfully develops education independently and life skill education for the community, for elderly and younger people. For their dedication, An Nur CLC received an award from UNESCO on literacy efforts.

With the assistance of PGE Area Kamojang, the CLC begins to change lives for the better. School-age children can get free access to education.

#### 3.2.6.2 Local Entrepreneurship

PGE Area Kamojong does overlook local entrepreneurs. The company prioritizes the involvement of local entrepreneurs and service providers in the area of operation.

The company's policies related to an increase in the Occupational Health and Safety aspects and Environment are not only carried out internally, but also to its local business partners who are working or employed in the operation area, by providing training to local partners on the implementation of CSMS, Good Corporate Governance and quality management

The company encourages and assists local companies to receive the standard company's policy on managing health safety and environment. The standard reference to be met in the execution of work must be in accordance with the application of the Contractor Safety Management System (CSMS).

#### **4. CONCLUSION**

Environmental and social aspect will run well if it is supported by industrial, government and society. The PROPER award is given by the KLH (Environmental Agency), this award recognizes operational excellence that leads to greater sustainability and energy efficiency.

Innovation, value creation on environmental and social excellence and a good neighborhood in running business industry creates a good harmony for the community and environment.

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