COVID-19'S IMPACTS ON GEOTHERMAL DRILLING PROJECTS IN INDONESIA

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ABSTRACT

The Corona Virus (COVID-19) pandemic has spread rapidly to more than 200 countries around the world. This does not only raise challenges towards public health but also agitates other sectors, including the energy industry. The economic slowdown and quarantine practices contribute to large impacts on the energy sector, including geothermal.

The continued impact of the COVID-19 pandemic is clearly seen in the movement restrictions by most governments around the world, including in Indonesia. Thus, this will inevitably cause the geothermal sector to experience more postponed projects.

Drilling is one of the biggest cost contributors to build a geothermal power station with up to 34% of the total project cost. Identifying the market price for drilling material and services is very important. It will allow us to get information about the market status to calculate the total well cost. However, the market survey that has been conducted in 2019 might differ from the current actual price due to COVID-19's impact. Therefore, it will affect the geothermal project cost in total.

This paper aims at discussing how the COVID-19 pandemic will impact the current geothermal drilling cost and the latest market survey in Indonesia. There has been very limited research of COVID-19's impact on the Indonesia geothermal drilling projects. Thus, the presence of this paper intends to fill the gap in the field.

1. INTRODUCTION

Since the World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, the coronavirus disease cases have surpassed 18 million, spreading rapidly to more than 200 countries around the world (World Health Organization, 2020).

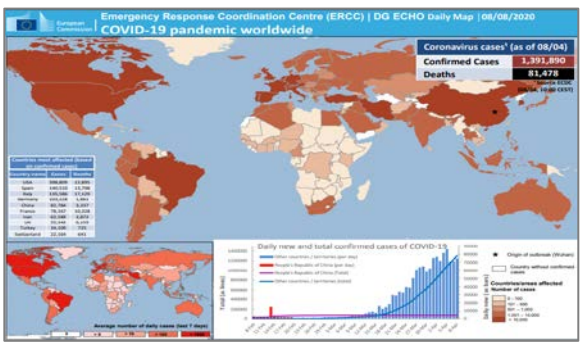

Figure 1. COVID-19 pandemic worldwide as of August 8, 2020 (European Civil Protection and Humanitarian Operations, 2020)**.**

COVID-19 affects different people in different ways. The most common symptoms include fever, cough, fatigue, shortness of breath, and loss of smell and taste (Wikipedia, 2020). The virus is transmitted between people during direct contact via small droplets produced by coughing, sneezing, or talking and touching surfaces contaminated with the virus (UNICEF, 2020).

Limiting close face-to-face contact with others is the best way to reduce the spread of the virus. Therefore, it is important to stay at least 1 metre from other people in both indoor and outdoor spaces. This practice is called social or physical distancing. Almost every government across the globe has enforced restrictions, taken lockdown measures, and shut their borders to break the chain of COVID-19.

Along with the economies of all countries, geothermal projects were also affected by the coronavirus. The exploration drilling projects have been postponed due to the impact of the COVID-19 situation on the negotiation phase, rig and personnel movement, market price, and tender process, which will impact the total project costs.

2. RESEARCH OBJECTIVE AND METHOD

2.1 Research Objective

This paper aims at figuring out how COVID-19 impacts the geothermal drilling projects in Indonesia. The answer to the main query will be constructed based on the findings to the following set of proposed research questions:

1. What are the measures that have been put in place to reduce COVID-19 chains in many countries?

2. What are the impacts of the COVID-19 pandemic on the geothermal drilling projects in Indonesia?

2.2 Research Method

This research is conducted by doing a comprehensive literature review. The review of the literature focuses on the information presented in the Indonesian government regulation, peer-reviewed journals, conference papers, and seminar materials, which cover COVID-19 and geothermal drilling project in Indonesia. The data sources that will be used are varied, including data from the Presidential Regulation, the Indonesian Ministry of Health, and other online sources.

This study is admittedly still in the early phase. Authors welcome any feedback or question that might be useful to improve the quality of the information presented in this paper.

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3. DISCUSSION

3.1 Mobilisation

Mobilisation plays an important role in geothermal drilling projects. It includes the movement of the rig, materials, consumables, all personnel and labour, and other contractors' equipment from the designated point of origin to the site.

The Government of Indonesia has implemented Pembatasan Sosial Berskala Besar (Large Scale Social Restriction), also called PSBB, in order to accelerate the management of the coronavirus. The local government can do the PSBB against the movement of people and goods for one certain province, regency, or city (President of Republic of Indonesia, 2020).

The mobilisation process therefore did not go smoothly. Thus, this will inevitably cause the geothermal sector to experience more postponed projects.

3.1.1 Rig and Equipment

The drilling contractors are responsible to mobilise the contractors' rig, equipment, and materials, including shipping from the point of origin, loading and unloading at port, processing through customs, land transporting to the first well site, and paying for all freight costs, duties, taxes, and fees associated with these activities.

As the country and local governments have shut the borders to their area, the mobilisation process from the point of origin to the designated drilling area will face some challenges. According to IEA, global average road transport activity has dropped to 50% by the end of March 2020. In addition, global aviation activity with lockdowns in place declined a staggering 60% by the end of Q1 2020 (International Energy Agency, 2020).

The process of obtaining permits from relevant agencies also has been slowed probably due to the implementation of the Working from Home (WFH) practice in most companies.

3.1.2 Personnel

Several airlines have opened their international and domestic flights, especially for those who want to return to their home countries. While there is no restriction for Indonesian Citizens entering Indonesian territory, currently no foreigners are allowed to enter or transit through Indonesia (Garuda Indonesia, 2020). This restriction may cause the geothermal overseas key experts unable to enter the Indonesian territory for working.

As a preventive measure, the domestic flight passengers are allowed to fly as long as they carry a Health Certificate with a non-reactive Rapid test result or a negative PCR/Swab test results, both valid a maximum of 14 days from the health facility issuance in accordance with the provisions of the flight destination area (Gugus Tugas Percepatan Penanganan COVID-19, 2020).

The Ministry of Health of the Republic of Indonesia has issued a circular letter of a price ceiling for the COVID-19 Rapid test which is Rp 150,000 (US$ 10) (Ministry of Health, 2020). The price for a PCR/Swab test, however, is more expensive at around Rp 1,500,000 – Rp 3,000,000 (US$ 102 – 204) (Mayapada Hospital, 2020). Thus, the contractors or companies who want to send their employees or workers to the work sites may consider the test price due to their budget restraints.

The productivity also has been slowed because workers are required to undergo self-isolation for 14 days before entering and after returning from the project site. As a result, the availability of workers in the field has decreased drastically and job progress has slowed down significantly (Setyawan, 2020).

3.2 Accommodation

Current evidence suggests that COVID-19 spreads through direct, indirect (through contaminated objects or surfaces), or close contact with infected people via mouth and nose secretions. Therefore, it is important to stay at least 1 metre apart to avoid contact with these droplets (World Health Organization, 2020).

The physical distancing practice will cause the number of drilling camps to increase. It is known that the drilling contractors must set up and operate limited accommodation and related services at the site, including secure serviced accommodation, canteens, dining halls, and prayer rooms.

Figure 2 shows the well pad layout for a slim hole drilling project in Ijen, East Java, Indonesia which requires less people than standard or big hole drilling projects. The portacamp VIP accommodates up to four people, whereas the portacamp sleeper accommodates up to eight people. The companies and contractors may need to add more portacamps for their workers to practice physical distancing measures. Therefore, the addition of the number of portacamps will increase the project cost in total.

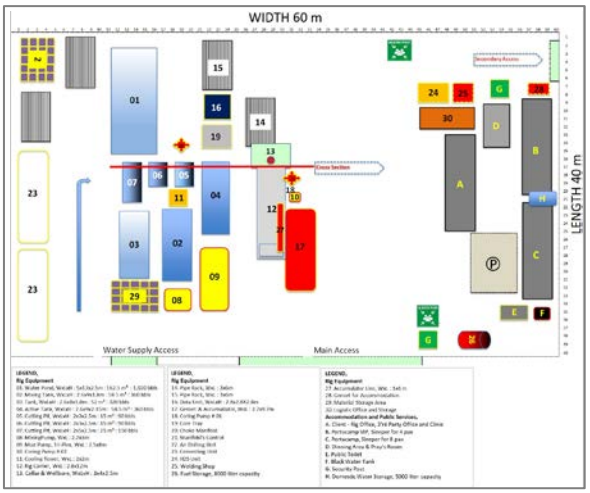

Figure 2. Well pad layout (Sunarso, 2020).

The big-sized rig is typically in around 7,500 – 15,000 m2 well pad area and requires up to 120 peoples (Figure 3). If the physical distancing measure has been implemented, the companies may need bigger areas. The effort required for land acquisition, some community lands might be difficult to acquire (Purba, Adityatama, Umam, & Muhammad, 2019)

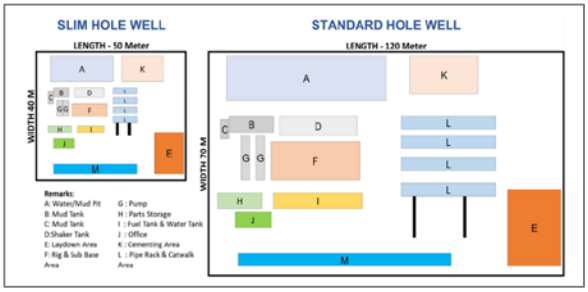

Figure 3. Comparison of typical well pad and rig layout for slim and standard well drilling (Purba, Adityatama, Umam, & Muhammad, 2019)

3.3 Owner Estimate and Procurement Process

A market survey is conducted by sending the inquiry and price estimation to the potential service or goods provider. Service or goods providers will provide lists of equipment that they will offer in accordance with the minimum technical requirements. With this information, the company will know the availability of goods and their price.

The data that have been collected from the market survey will be used to define the cost of project estimation (owner estimate). There are several methods to calculate owner estimate, however usually by using statistics calculation. The quantity of data is extensive to determine a more precise owner estimate calculation.

Drilling is one of the biggest cost contributors to build a geothermal power station with up to 34% of the total project cost (Figure 4). Identifying the market price for drilling material and services is very important. It will allow us to get information about the market status to calculate the total well cost. However, the market survey that has been conducted in 2019 might differ from the current actual price due to COVID-19's impact. Based on authors' prediction, it will decrease than last year. Therefore, it will affect the geothermal project cost in total.

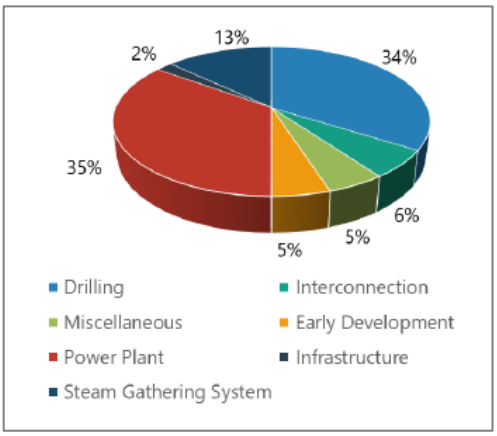

Figure 4. Investment cost breakdown of geothermal power development in Iceland (Fininda, Agustino, Purba, & Adityatama, 2020) modified from (ESMAP, 2012)

In addition to the market survey process, the tender and procurement processes also have been impacted by COVID-19. Most of the companies have implemented the WFH and online meetings to reduce physical meetings. The procurement process that usually takes up to one year, might be delayed.

Furthermore, the goods importing process during the procurement might be temporarily stopped as the many countries have shut the borders.

4. CONCLUSION

Over the past few months, the COVID-19 outbreak has certainly caused an unprecedented global economic and social crisis. The pandemic has significantly affected all aspects of life, including the energy sector. The geothermal industry is also severely affected by this crisis, which has slowed transportation and activities.

Faced with an unprecedented situation, most governments are focused on bringing the disease under control and reviving their economies. The Government of Indonesia has implemented movement restrictions for goods and people. Although, Indonesia is entering the "new normal" era, the geothermal drilling process may still need time to recover and go to a new normal.

The implication of the pandemic to the geothermal business are still evolving but three areas in particular stand out: mobilisation, accommodation, and market survey and procurement process.

During the COVID-19 situation every geothermal project aims at the same objectives, which are to protect the health and wellbeing of the companies' employees, contractors, and supplier, to minimise the risk of being a place of infection, and to reduce the risk of operational disruption.

Therefore, the companies may need the plan to cover the safety and health for their employees and families, especially for those on the working site, as well as to maintain geothermal drilling operation.

5. RECOMMENDATION

The research presented in this paper has led to useful results and conclusions on deepening the COVID-19's impacts on geothermal drilling projects in Indonesia. Furthermore, it has uncovered many areas that need to improve. Thus, some recommendations have been provided to identify and discuss the need for better geothermal practices in the future:

1. The companies may need to build a crew change management protocol on site as a precaution measure, including to add more portacamps and areas for their workers to practice physical distancing.
2. The working style by conference call and virtual meetings may needs a good internet access and strong IT backbone. Good internet access, a strong IT backbone, and security for internal meetings and working may be one of the companies' priorities in order to keep the operation work smoothly. The procurement and invoicing process also may be changed to e-tender, e-billing, or e-invoicing systems.
3. As for overseas key experts, it is the time for the geothermal companies to be more focused on utilising the local experts. Aside from the easier

access to the site, the local experts probably also have more local knowledge and information.

4. As the market survey that has been conducted in 2019 might differ from the current actual price, the geothermal companies need to redo the market survey again in 2020 to get the closest owner estimate.

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