

OVERVIEW ON ENERGY UNAVAILABILITY

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Abstract

The scarcity of fuel and electricity blackouts in various regions are part of the symptoms of energy insecurity observed throughout the period of 2006-2007. The lack of energy supplies brings the implications of disruption of societal activities, economic development, and efforts to improve welfare. For this reason, energy security has become an important factor in development. In order to formulate appropriate policy for the future, it will be necessary to undertake a comprehensive study of the current condition of the energy sector in Indonesia.

Keyword: Energy Insecurity, Energy Shortages, Blackout

1. Introduction

Every energy user clearly wants access to reliable energy sources without disruption when they need power. However, disturbances and disruptions do occur, such as the scarcity of oil-based fuels and electricity blackouts that happen in all regions throughout Indonesia.

This article discusses the existence of energy insecurity and illustrates the situation with case studies of energy shortages. The problems of oil fuel shortages and blackouts are the focus. This study is based on documentation of media reports during the period of 2006 through September 2007.

The disruption of oil fuel supplies resulted partially from limited supplies, technical problems, illegal activities, and bad weather. Meanwhile, electricity blackouts were caused by the demand for electrical power exceeding the capacity of power plants and distribution infrastructure, the disruption of oil fuel supplies for electrical power plants, various technical problems, and environmental issues.

Overall, it could be said that throughout the period of observation, periodic energy shortages consistently occurred in the various regions for a number of different reasons. This trend indicates a systemic imbalance. For that reason, a systematic evaluation must be done to identify the extent of the complexity of the problem and to determine the efforts that must be made to prevent the making of ad hoc decisions.

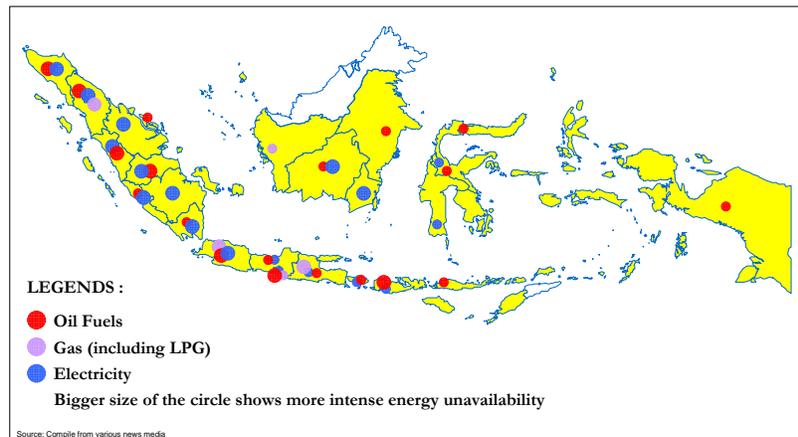
The second part of this article lists the incidences of fuel shortages and electrical blackouts and the factors causing them. The third section discusses the implications of these problems. The fourth part then analyzes the need for within the context of the various problems originating from energy shortages in Indonesia.

2. Energy Unavailability 2006 – 2007

The energy shortages occurring in almost all regions of Indonesia constitute a serious problem that impacts society and activities in all sectors. Besides its local impacts, the continuation of this shortage will influence the national economy in both the short and long term.

In order to be able to make a more in depth analysis of the current conditions, the news reports on the issue appearing in both print and electronic media from January 2006 through September 2007 were used as the primary source of information. This writing sets out facts relating to oil fuel scarcity and electricity blackouts as reported during that period, even though some of the cases discussed had occurred and had been continuing long before the observation period commenced.

The portrait of energy shortages that has emerged over the past two years can be seen in the map set out in Figure 1. The limited reportage on Kalimantan, Sulawesi, Papua and some other islands can help explain the lack of indicators on the map for those regions. This is because the information sources for this study were reports in the mass media in Jakarta.



Source: *Compiled from various Media*

Figure 2. Map of Energy Shortages in Indonesia 2006-2007

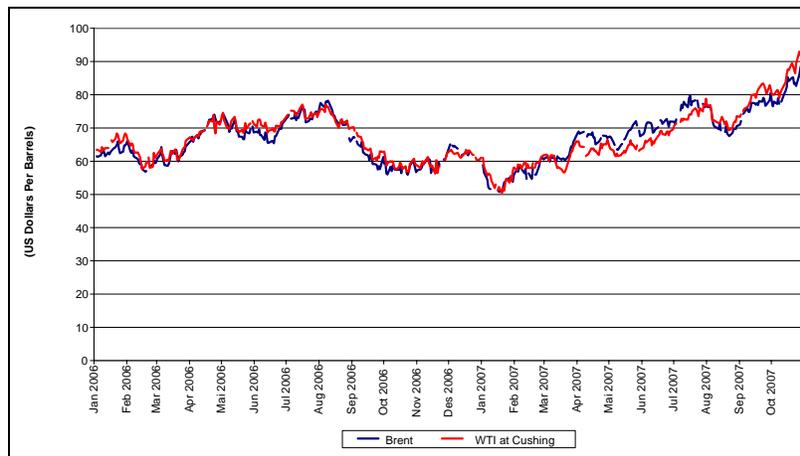
In general, the energy shortages occurring during the observation period were caused by limitations in infrastructure and the ability of energy producers, as well as fuel shortages, technical problems, illegal activities, as well as environmental factors. The excerpts from these reports below provide a physical illustration of the energy shortages in the various regions of Indonesia.

Fuel Shortages

Both internal conditions and external changes have resulted in the high frequency and severity of oil fuel shortages at certain periods of time, all which have caused increased effort and cost in getting supplies. This indicates a condition of *energy insecurity*.

Indonesia's dependence on fossil fuel energy, in particular, oil fuels, is very high. At the same time, oil and gas reserves are sparse and the production of crude oil is tending to decrease. With the capacity of oil refineries remaining stagnant for a decade, the importation of oil fuels has been increasing in order to meet increasing demand. The limited resources and infrastructure have created dependence on foreign supplies leaving Indonesia vulnerable to the fluctuations of international oil prices.

The soaring world oil prices have resulted in government oil fuel subsidies swelling as a consequence of its net imports of oil. Figure 2 shows that at the beginning of 2006 the price of oil (Brent and West Texas Intermediate) fluctuated at around 60-68 US\$/barrel, then rose to close to US\$80/barrel in August 2006. Even though the price had returned to around US\$60/barrel at the beginning of 2007, the price soared uncontrolled to more than US\$90/barrel by the end of October 2007, the highest recorded price in this decade.



Source: Energy Information Administration, www.eia.doe.gov

Figure 2. Crude Oil Prices 2006-2007

One of the efforts made to control the pressure of subsidies on the annual state budget was the limitation of supplies of subsidized oil fuels, kerosene in particular. On the other hand, up to now there has appeared to be no consistent effort to provide alternative energy sources for households. The sudden limitation of supplies resulted in shortages of kerosene throughout the country.

In the city of Langsa and Aceh Regency in NAD Province, this shortage of kerosene continued throughout 2006 and into the first part of 2007, while distributor's/retail prices double from the official price set by Pertamina. New reports stated that people were having to stand in line for up to two days to get supplies of kerosene, and that sellers were having to set limits on individual purchases. This situation was triggered by

reduced levels of supply from Pertamina, with volumes distributed decreasing from 3000 liters to only 1200 liters per week, or a 60% drop in the usual volume supplied¹.

A situation similar to that in Aceh also occurred in Tanjung Pinang in the Riau Islands, as well as in Langkat, North Sumatra. Besides having to stand in long lines to get kerosene, the amount of individual purchases was severely curtailed. Similar long lines of people wanting to buy kerosene could be seen in various areas of Kalimantan and Sulawesi as well.

In 2007, shortages of oil fuels, such as premium gasoline and diesel, began occurring in Bali when an oil tanker's engines died delaying deliveries and causing long lines at local gas stations across the island. In May, in Gorontalo, Sulawesi, lines appeared at local gas stations when a ship carrying supplies Bitung, North Sulawesi, was late arriving. In the same month, in Sampit, Central Kalimantan, long lines also occurred when there was a shortfall of 10,000 liters in the usual 20,000 liter delivery of oil fuels, in particular diesel, to local gas stations. Then in Majene, West Sulawesi, more long lines appeared due to a supply shortfall of 60%. In Mataram, NTB, and Denpasar, Bali, a number of local gasoline stations had to close due to a lack of premium fuel. Even the nation's capital, Jakarta, could not escape the oil fuel shortages, especially for kerosene. In West Jakarta, the kerosene supplies came three days late, while distributors were in the habit of receiving and channeling supplies 3 times a week. Similar distribution delays occurred in East Jakarta, North Jakarta and Tangerang due to delayed delivery.

Meanwhile, shortages of premium gasoline continued to color the energy shortages in Indonesia. In June 2007, a shortage of premium fuel occurred in Solok, West Sumatra, causing long lines at gas stations as a result of delayed deliveries. In Central Sulawesi, lines were also long due to the delayed arrival of a tanker load of fuel from Bitung. Also in mid 2007, long lines of motorists wishing to buy premium gasoline could be seen all over Timika, Papua, even though Pertamina insisted that stocks for that area were adequate for 2 days.

The shortage of oil fuels was also caused by dishonest practices, such as the diluting and hoarding and smuggling of oil fuels for personal gain. For example, the kerosene shortage happening in Padang at the end of 2006, was the result of kerosene hoarding by industrialists that caused a supply shortfall for households. At the beginning of 2007, in East Java, police raided a fuel dilution installation and found 1.6 tons of kerosene earmarked for processing into automotive lubricant. Several cases were also uncovered of subsidized kerosene being mixed with turpentine residue or diesel fuel and then sold at much higher prices to factories.

From February 2005 to February 2006, 151 cases of oil fuel smuggling were reported, and more than 1.4 millions tons of oil fuel confiscated, consisting of 23,563 tons of premium, 802,333 tons of diesel fuel, 304,680 tons of kerosene, 284,488 tons of MFO and 15 tons of aviation turbo fuel. It is believed that smuggling continued throughout the period of 2006 dan 2007. The huge kerosene subsidy had created a significant gap between the price of oil fuels for industry, as well as for kerosene, in Indonesia and abroad. Besides the subsidies, the maneuvering of unscrupulous agents out for a quick

¹ www.liputan6.com 08/01/2007

profit and the poor monitoring of Pertamina, and low level of public attention to the problem, all contributed to the emergence of this problem.

The problem of gasoline and LPG shortages also frequently emerged during the observation period. At the beginning of 2007, West Kalimantan experienced a shortfall by almost half in LPG supplies. This was a result of constraints in delivery of LPG from Tanjung Uban in Riau to Tanjung Priok in Jakarta for the period of March-April 2007. This caused lines of up to 500 meters long of people wishing to purchase LPG in Bandung, West Java, due to supply shortfalls caused by disruption of production at the gas refinery in Balongan Indramayu.

Shortages of and long lines for LPG also occurred in Jakarta, Yogyakarta, and Central Java due to the temporary closure for routine servicing of the refinery in Balikpapan, East Kalimantan, which has a production capacity of 300 tons per day. In Central Java, this situation was exacerbated by delivery delays due to bad weather.

The shortage of LPG supplies caused an increase in consumer prices for the product. In mid 2007, shortages also occurred in LPG Medan, North Sumatra. Supply shortages at agent level caused retailers to scramble to find agents who did have supplies, albeit at higher prices; meaning that prices rose from the Rp 51,000 to 55,000 per kilo set by Pertamina to Rp 70,000. In the Purwokerto area, the LPG shortages shot prices up to Rp 58,000 per kilo. The most disconcerting thing about this particular shortage was that it occurred at a time when gas production of Pertamina's Production Unit IV had reached 700 metric tons a day, with a surplus of 4,800 metric tons per day, overshooting the usual production of 450 metric tons daily with a surplus of 2,000 metric tons a day.

The chaos in the kerosene and LPG markets was partially caused by the poorly planned and implemented preparations for shifting from public consumption from subsidized kerosene to LPG. There was no systematic effort to change the people's kerosene usage habits before the program was implemented. The shift to LPG occurred simultaneously with the limitations on kerosene supplies in several pilot project locations, such as the Greater Jakarta Area and Surabaya. In a situation without any alternative energy sources, with a high level of dependence on kerosene, the shortage of kerosene supplies exerted pressure on households at the lower economic levels due to rising prices.

The problem of LPG shortages on the market constituted one of the constraints in the implementation of the shift from the utilization of kerosene to LPG. The difficulty in procuring supplies resulted in some of the households that had already received the free-of-cost 3 kg LPG tanks from the government selling the tanks and returning to the usage of kerosene.

Environmental factors, such as the changing of seasons and weather problems contributed to the disruption of the oil fuel supplies. These contributing factors were difficult to predict, and it was not always clear if the problems emerging occurred solely to seasonal and climate or weather changes or may have been due to human actions/activities. In the period of 2006-2007, a number of energy shortages were caused by these factors. For example, in mid 2006, supplies of premium gasoline to Jambi were disrupted when the tanker designated to deliver supplies failed to sail due to bad weather. In Jambi and Banjarmasin, the low levels of water in local rivers due to the dry season disrupted distribution.

Then the disruption of shipments of coal to electrical power plant at Cilacap and to Tanjung Jati B harbor occurred due to bad weather causing excessively heavy seas and high waves. Exacerbating the situation, the infrastructure available for the transfer of coal at Tanjung Jati B was damaged, so that coal supplies were disrupted there for several months.

Electricity Blackouts

Significant disturbances occurred in electricity supplies due to primary energy and oil fuel shortages, and power plant and distribution channel limitations, as well as technical problems, and environmental issues.

According to the various reports appearing in the media through 2006 and up to September 2007, electrical blackouts happened in every part of Indonesia. This high frequency of blackouts in all regions throughout Indonesia is a strong indication of energy insecurity.

Limited levels of energy supplies for electrical power plants have also led to disruptions in the provision of electricity. The prolonged unavailability of gas supplies has resulted in the use of oil fuels for years at the PLTG Muara Tawar, Muara Karang and Tanjung Priok power plants that were initially designed to use gas to produce electricity. In May 2006, both Java and Bali experienced electricity deficits due to the lack of gas supplies from BP West Java for the PLTGU Priok and Muara Tawar power plants. The interconnectedness of the Java and Bali electrical networks has also exacerbated the problem of supply shortages for PLTGU Grati and PLTGU Muara Tawar, and the situation deteriorated more drastically when the Unit 5 at PLTU Paiton power plant, with a capacity of 600 MW, broke down. Throughout June 2007, a series of blackouts occurred in the Jamali area due to the fuel crisis at PLTU Cilegon and PLTU Paiton.

The electrical power deficit has led to blackouts in various other regions as well. Sporadic blackouts continue to occur in Pontianak, and in October 2006, West Kalimantan was declared an electricity crisis area. This situation resulted in electricity theft reaching 1.35 million KWh worth Rp 600 million. These conditions continued up through March 2007, then in April 2007, half of the city of Pontianak experienced a series of blackouts due to the periodic shutting down of power plant machinery for maintenance and repair purposes. In North Sulawesi, particularly Manado, Bitung, and the regencies of North and South Minahasa, the electricity crisis resulting in frequent blackouts continued from July into December 2006.

Various technical problems in the electricity production system also triggered a number of electrical power shortages. Damage to the Suralaya Unit 5 transformer at the beginning of 2007 went unrepaired until September 2007, resulting in decreased reserves and an increased production burden on other power plants. Then at the beginning of October 2007, periodic rotating blackouts had to be done for Jakarta, Tangerang and Bekasi as a result of production difficulties at the PLTGU Tanjung Priok

power station. A similar problem of rotating power outages occurred in the Bogor area after the PLTP Salak tower in Gunung Putri, Bogor, collapsed, which worsened when the SUTET facility in Cibinong was hit by lightning.

In North Sumatra and NAD, a series of 12-hour blackouts occurred over a period of days due to the breakdown of a turbine system generator that resulted in the loss of 60 MW of capacity. Then three cities in Riau experienced a 3-day electrical blackout when 4 PLN State Electricity Company towers channeling 150 KV collapsed. The total repair of the GT 22 Central Power Station in Sicanang North Sumatra and NAD also resulted in an electrical power deficit of 320 MW over a period of 2 months from mid June through the middle of August 2007. This caused a drop from an average of 950 MW to only 700-750 MW per day in PLN's ability to supply electrical power, while the demand in the region reached 1,070 MW per day, meaning that rotating blackouts had to be imposed in that service area.

Blackouts in various areas of Riau occurred due to damage to 4 transmission towers in February 2007. Blackouts also happened in Central Java and Yogyakarta due to the explosion of a circuit breaker, while in Setiabudi, Jakarta a transformer exploded in mid 2007.

The dry season resulted in decreased water supplies for electricity production at power plants. The impact of the season change was exacerbated by the damage to the forests surrounding the water catchment area and reservoirs that serve as water sources for power plants. This decreased capacity occurred throughout Indonesia at power plants in Sumatra, Java, Kalimantan, Sulawesi, and Nusa Tenggara Barat. In Sumatra, power plant production decreased by 50%, resulting in an electricity supply deficit.

The Java-Bali region experienced repeated blackouts in the middle of 2006 for the above reason. On the other hand, the dry season drives up electrical power usage by 30%, meaning that more electricity is needed in that season.

Besides the dry season, other environmental factors influencing electricity production conditions are earthquakes and tsunamis. The earthquakes in Yogyakarta in May 2006, in Padang in March 2007, and Bengkulu in the middle of September 2007 resulted in long lasting blackouts due to damage to power facilities. In addition, huge waves were reported to have resulted in the temporary disruption of service from the PLTU Cilacap power plant due to clogging of intake pipes with sand.

3. Implication of Energy Unavailability

Energy shortages have a massive and widespread impact on human lives. Besides disturbing daily activities, energy limitations disrupt work plans and productive activities. Long-term energy shortages/outages threaten national energy security and influence the sustainability of development from the point of view of economy, social life, as well as the environment.

Impact of Fuel Shortages

The uncertainty in gas supplies for various industries, in North Sumatra, particularly Medan resulted in industrial activity shutdown, with investors refusing to expand their

businesses in that region. This is certain to have a negative impact on the economy with no new jobs opening up and a loss to regional revenues.

Besides that, the shortage of fuel can also trigger commodity price rises. Especially in the case of oil fuels and LPG, shortages and prices increases directly impact consumer buying power. Oil fuel prices rises have already resulted in the increased cost of electricity production. The shortage of gas for the ceramic industry resulted in poorer quality products and a decrease in product competitiveness nationwide.

Besides problems in the economy, social and environmental impacts due to energy shortages are also unavoidable. Long lines at gas stations disrupt the mobility of the people, and trigger societal unrest. Riots have frequently flared out of such social pressures and emotional reactions to economic constraints. The scarcity of kerosene has also caused a segment of society to return to wood burning, which damages the environment and threatens the forests.

The influence of fluctuations in oil prices on the world market on energy supplies in Indonesia is increasing in line with the portion of imports necessary to meet domestic demands. Adjustments in oil prices imposed in October 2005 caused significant shocks in Indonesia's economy, while the effect of reducing the state budget deficit was felt only temporarily as the global oil prices remained volatile and continued an upward trend.

The heavily political oil fuel subsidies and the equally political adjustment policies result in endless frantic efforts to fight off the impact of increasing global oil price volatility. These acrobatics do nothing more than exhaust energy on all levels and fuel continuous concerns about the weakening stamina of our nation's leadership, business players, and the public itself. These conditions will constrain Indonesia's economic development both for the short and the long term.

Impact of Electricity Blackouts

Blackouts result in the disruption and constraint of activities of all kinds on all levels of society. Unrest results, such as in North Sumatra where 4-hour blackouts were occurring 2 times a day. The public complained bitterly about the inconvenience, disruption of activities, and damage to household appliances, with social tensions becoming unavoidable because some areas were blacked out frequently, while certain others were not.

Not only were the activities of the large-scale economic players disrupted, small-scale industries also felt the bite of the shortages and blackouts. For example, curried vegetable vendors lost customers and income because they had no electricity and had to resort to using candles that provided comparatively poor illumination.

These and other impacts occurring due to the blackouts and uncertainty of power supplies caused factories/business to resort to their own electrical supply production. Needless to say the use of generators, etc. is bound to increase the cost of production and doing business in general. For example, the blackouts in North Sumatra resulted in

one hospital having to spend an additional Rp 2 million daily to operate a generator, and that does not include the cost of electrical equipment damaged by the blackouts.

Many demonstrations and other protests over electricity blackouts have been reported. Besides people being upset by frequent and long-lasting blackouts, workers frequently demonstrated when they were fired because their companies could not longer continue production. PLN, as the electricity provider, has not been able to avoid the legal risk of lawsuits as a result of the blackouts and shortages.

It should be noted that the impacts of electricity blackouts set out above impacted the people who have access to electricity, while it should also be noted that almost half of the Indonesian populace has no access at all to electricity, and are always “in the dark”. Even though PLN succeeded in creating million new connections throughout 2006, the waiting lists have also been getting longer. The people who live completely without electricity face more severe difficulties and constraints to activities than those who have to face elect outages.

4. Insights from Energy Security Perspective

The difficulties mentioned in detail above indicate widespread, repeated and continuing shortages of all kinds of energy. This indicates a systemic imbalance.

The various causes of the problem will also require specific handling. However, any effort to overcome the specific aspects of a problem will depend on appropriate decision making because the individual symptoms of a problem do not always reflect a complete and clear picture of the overall issues involved.

In the effort to fully understand the issues, the Indonesian Economic Energy Institute has adopted the energy security and sustainable development approach in its analysis.

This analysis provides the understanding that energy security challenges can emerge for a wide variety of reasons. Al kinds of things, all along the upstream-downstream chain, as well as policy and regulation of the energy sector and other sectors with the potential to disrupt/interrupt energy supply and utilization, which in turns weakens energy security. Meanwhile, the perspective of sustainable development balances efforts to overcome in the short term the problems faced by everyone so that life can be sustained on earth for the long term.

The benefits of this study are:

- a. Provide a portrait of Indonesia’s energy resilience through the evaluation of Availability, Accessibility, Acceptability, and Affordability in the energy sector and its social, economic and environmental dimensions in an effort to establish sustainable development
- b. Identify factors that can trigger energy insecurity
- c. Identify cause and affect among the various factors
- d. Predict future conditions on the basis of the implementation of existing policies and regulations
- e. Provide input for energy sector policy development and formulation of regulations
- f. Improve communication among and participation by stakeholders.

The following sections of this journal will set out a number of elements from this analysis. The second article contains a discussion of the gap between energy supply and demand. The third article sets out observations of the existing energy policy and regulations in Indonesia. The fourth article discusses the changes in the paradigm of energy security/resilience and sustainable development in order that the relationship between the individual issues on both sides can more clearly defined and understood. The last section contains a summary of statistical information that can provide a picture of energy security and sustainable development within the period of observation.

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