

APRIL 2018

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HOW THE CELUKAN BAWANG COAL-FIRED POWER PLANT IS DESTROYING THE HEALTH AND WELL-BEING OF PEOPLE IN NORTHERN BALI

The Celukan Bawang coal-fired power plant is having a severe negative impact on the local community damaging the environment, people's health and their ability to make a living and provide for their families. The impacts include: (1) inadequate land compensation due to improper and non-transparent processes; (2) the destruction of livelihoods, especially to farmers and fishermen, which has impoverished the local community; (3) environmental damage caused by coal waste residue on land and at sea; (4) worsening public health with an increase in respiratory illnesses, and inadequate monitoring of the health impacts of the power plant.

Governments at all levels continue to ignore these impacts. The surrounding community is left alone to deal with the problems. Facing these conditions, there are several things that governments must do at various levels:

- *Buleleng District Government: monitor air quality and conduct periodic medical checks on community surrounding the power plant*
- *Bali Provincial Government: monitor of the environmental degradation caused by the power plant and cancel the power plant expansion.*
- *Central government: develop a national energy plan based on sustainable, renewable energy.*

Celukan Bawang coal-fired power plant is located on the coastal area.



Ketut Mangku Wijana who owns a coconut field located within the power plant area explained that since the power plant came to his village, his coconut fields have stopped producing as much yield as they used to.



CELUKAN BAWANG COAL-FIRED POWER PLANT

The power station in Celukan Bawang, Bali, constructed by China Huadian Engineering Co, Ltd (CHEC), Merryline International Pte. Ltd (MIP) and PT General Energy Indonesia (GEI), was opened in 2015 with a capacity of 426 MW. It is located approximately 115 km northwest of Denpasar. This coal-fired power plant was built with an investment of approximately US\$ 700 million. For the operation, this power plant uses 5,200 tons of coal per day. Brief profile of the Celukan Bawang power plant can be seen in *Table 1*.

Table 1. Profile of CFPP Celukan Bawang

OWNER	PT General Energy Bali
CONSTRUCTED BY	China Huadian Engineering Co, Ltd (CHEC), Merryline International Pte. Ltd (MIP) and PT General Energy Indonesia (GEI)
LOCATION	Celukan Bawang Village, Gerokgak Sub-district, Buleleng District, Bali Province
CAPACITY	Phase 1 was built with a 3 x 142 MW capacity or 426 MW
STATUS	Commercially operating since 2015
TOTAL INVESTMENT	Approximately US\$ 700 million with loan from the China Development Bank (CDB)

THE IMPACTS OF THE POWER PLANT

Greenpeace Indonesia has carried out extensive studies into the impact of the power station, including field observation, interviews with stakeholders particularly with community members, and secondary sources from mass media. The evidence is that Celukan Bawang coal-fired power plant has had a number of negative impacts on the local community.

LAND AND COMPENSATION

“I did not sign any construction permits for the power plant during my tenure as village head, even after the head of the sub-district and district instructed me to sign it. There were many unresolved issues, including land compensation, the impacts of which remains unclear.” — Muhajir, former village head of Celukan Bawang (2002 - 2013)

Although the power plant began operations in 2015, several villagers told Greenpeace that issues over land compensation remain unresolved.

Ketut Mangku Wijana, 56, is a resident of Tinga-Tinga Village, Gerogak Sub-district, Buleleng District. Ketut

owns a coconut field located within the power plant area.¹ This is his story.

“There are three plots of land owned by members of the community that are located in ring 1 of the power plant. I am one of those community members. I refused to give up my land because I was not comfortable with the price they offered me. They have not been transparent since the very beginning and they also used a middle man to buy my land on the cheap. Initially, there were several rumours as to what the land was going to be used for. But eventually, after more people sold off their land, we found out that it was going to be used for the power plant. If the community had known this from the start, most of them would probably not have sold their land.”

Karimun, 63, a resident of Celukan Bawang Village, Gerogak, lives only 50 meters from the plant's smoke stacks, with nine other family members. To reach her house, visitors must pass the power plant grounds

¹ Interview in Tinga-Tinga, May 16, 2017.

and need to get permission from the military officer and security guard to do so. Karimun says the power plant has resulted in dust, fumes and liquid waste that she's seen being dumped near his house—against which she protested.

*"I'm worried about my health. I've gotten sick, so have my grandchildren, usually from respiratory issues and fevers. But what can I say. The price is not right, so I don't want to move."*²

Many community members complained that the compensation offered by the power plant management is very low.

"It's not even enough to build a new house. I've even had to get a loan. I received Rp 76 million for my land, and spent Rp 150 million to build a new house," said Sadli, a resident of Celukan Bawang.³

Muhajir, the former village head of Celukan Bawang, said that a third party began buying land in the area in 2002, but villagers did not know what it would use for. The rumor was that it was going to be used to construct a soy sauce factory. *"The residents feel like they were lied to,"* he said.⁴ Muhajir refused to sign the construction permit for the power plant—even though the sub-district head had done so, and the district head had told him he must sign.

Agus Adnan, the head of the village council of Celukan Bawang, said the power plant had affected not only the local economy and health, but also the village's social cohesion.

"The community have become divided and scared. This is a social effect that is clearly felt across the community," he said.⁵

The impacts have been aggravated by the close proximity of the power plant to homes in Celukan Bawang, a result of poor planning and a failure to follow the law on environmental impact assessments (EIA). According to Law Number 23 Year 1997 on environmental management, the minimum distance of a factory to a residential area should be one kilometer. This indicates that the project was done without proper planning in environmental management.

DESTRUCTION OF LIVELIHOODS

"There are many fishermen who no longer go out to sea and work random jobs. Some of them have become traders or construction workers. I now work as a toy vendor to make up for the decline in income from fishing. The power plant has created poverty amongst fishermen in Celukan Bawang." — Eko S, Secretary of Bakti Kosgoro Fishermen Group, Celukan Bawang

When construction started, the government and power plant management promised the local community that prosperity and progress would follow. In reality, the power plant did the opposite. Local residents interviewed by Greenpeace complained that the plant had not boosted economic prosperity. In fact, the opposite - it created poverty amongst the local community as it destroyed traditional sources of livelihood, such as farming and fishing.

The village representative of Celukan Bawang, Agus Adnan, said the power plant had provided jobs for some local residents, but the numbers were small. A few worked as turbine maintenance staff, but most local hire jobs were janitors. *"The number of local residents hired to work at the plant does not compare with the level of grief they endured,"* he said.⁶

This criticism was echoed by Sadli, a community leader of Celukan Bawang, who said the local economy had declined as a result of the power plant and few jobs were created. Many residents were unhappy. He said promises made to the community had been broken. *"There is a power plant here, but the community has had to pay a high price for electricity. They promised us free electricity, but that did not happen,"* he added.⁷

Fishermen in Celukan Bawang have suffered too. Eko S, the secretary of the Bakti Kosgoro Fishermen Group in Celukan Bawang, said he has been making less money since the power plant was built. Fishermen have to travel further out to sea because catches near the coast have dropped. *"There are less and less fish near the coast, because the corals are damaged,"* said Eko.⁸

² Based on interview in Celukan Bawang, May 17, 2017.

³ Ibid.

⁴ Based on interview in Celukan Bawang, May 18, 2017.

⁵ Ibid.

⁶ Based on interview in Celukan Bawang, May 18, 2017.

⁷ Based on interview in Celukan Bawang, May 17, 2017

⁸ Based on interview in Celukan Bawang, May 18, 2017

Fishermen's boats which are rarely used for fishing nowadays because their catches near the coast have dropped.



He accuses the coal bulk carriers that travel through the waters of destroying the corals, which are home to the fish. The situation is made worse by the hot waste that is dumped in the sea, and the coal which falls off the carriers.

Eko has records showing that before the power plant, fishermen brought home about 300 buckets of fish per day. These days, their catches are only 15 buckets per day, sometimes even 10.

Baidi Suparlan, the head of the Bakti Kosgoro Fishermen Group, agrees that the power plant has had a bad impact on the fishermen's income. Before the plant, he said, fishermen could make up to one million Rupiahs per day. Now they are only making a few hundred Rupiahs—and sometimes not even that. *“And this is even after they went further into the sea, spending even more money to do so,”* he said.

Baidi said he had sent a complaint to the Department of Fisheries in Buleleng, but has yet to receive any response.⁹

Farmers are experiencing the same loss of livelihood. Karimun, 63, a resident of Celukan Bawang, said that since the power plant was built, her income has

collapsed because of falling yields in her coconut and banana fields.

*“Many of my coconut trees have died. They used to produce more than 1,000 coconuts during harvest time, but now I’m getting only about 100 or 200 coconuts ... The banana field used to produce a lot of bananas. I could plant almost anything and it would grow, like green beans and cassava. But it has become so much more difficult now. I tried to plant chilies, but it got dried up and shriveled. It’s become so much harder to plant anything since the power plant was built.”*¹⁰

GROUND AND WATER DEGRADATION

“The impacts (of Celukan Bawang coal-fired power plant) could get even worse as time goes on.” — Mulyadi, a member of the Buleleng Parliament

⁹ Ibid.

¹⁰ Based on interview in Celukan Bawang, May 17, 2017.

Fishermen in Celukan Bawang can no longer find fish nearby because there is a dock in the middle of the sea. They agree that the power plant has had a bad impact on the fishermen's income.



The power plant has caused significant environmental degradation. The community says it has protested several times both to the manager of coal-fired power plant and the government. But there has been no significant response.

Mulyadi, a member of the Buleleng Parliament, gave the example of how the coastal ecosystem had been damaged by the construction of a docking area for the bulk carriers. *"The fishermen can no longer find fish nearby, because there is a dock in the middle of the sea. They also protested against the concrete construction,"* he said.¹¹

The waste from coal burning is also having a severe impact. The coal-fired plant began operating before there was any clarity as to how it would manage its waste. Putu Mangku Budiasa, the Head of Commission II of the Buleleng Parliament, had asked that the inauguration of the plant - the biggest in Bali island - be postponed until there was a waste management plan. *"Waste*

*management is so important. So, until there was a proper solution on how to manage the waste, they should not have started operations."*¹²

Mulyadi said that he had called for a meeting with the company's board of directors and officers to discuss environmental impacts. But the EIA permits were issued by the provincial government, and the Buleleng Parliament was unable to override the permits. *"If only we had the authority, we would have studied those permits beforehand. The power plant company was able to claim that they had already done the assessment and state that there were no harmful impacts."*¹³

Mulyadi and his team have carried out several spot inspections in response to the community's complaints on how the liquid and air pollution was affecting their health. Specifically, local people complain about the liquid pollution. He believes that the local environmental office does not monitor the power plant as closely as they should. *"The impacts could get even worse as time goes on,"* he said.¹⁴

11 Based on interview in Buleleng, May 18, 2017.

12 <http://www.mongabay.co.id/2015/08/13/mengganggu-kesehatan-limbah-pitu-celukan-bawang-bali-menaui-protas/>

13 Based on interview in Buleleng, May 18, 2017

14 Ibid.

Karimun lives only 50 meters away from the plant's smoke stacks. She has experienced many negative impacts of living so close to the power plant, namely coal dust inhalation, fumes, and liquid waste that she's seen being dumped near her house. She's experienced breathing difficulty and fevers. Her grandchildren have also experienced fevers and coughs.



IMPACT ON PEOPLE'S HEALTH

“Since the power plant started to operate, my son is sick nearly every month. Previously, he was quite healthy.” — Baidi Suparlan, the head of the Bakti Kosgoro Fishermen Group in Celukan Bawang

Despite the lack of official data on how the coal-fired power plants in Celukan Bawang is directly impacting the health of the local communities, nearly everyone who spoke to Greenpeace complained how they have become sick, often with respiratory problems.

Karimun (63), who lives closest to the power plant, said that her health has declined drastically. She's experienced breathing difficulties and fevers. Her grandchildren have also experienced fevers and coughs. Before the power

plant was built, none of them had been this sick, she said. Nowadays, they visit the doctor at least four times a month. *“I cannot sleep since it's so warm, even in the evening. It used to be cool in this area”.*¹⁵

Baidi Suparlan, the head of the Bakti Kosgoro Fishermen Group in Celukan Bawang said villagers in his community are also getting sick. For the fishermen, it is a double blow as they have lost their health as well as their livelihoods.¹⁶

The lack of quantitative data on the impacts of the coal-fired power plant on human health demonstrates the lack of government attention to this issue. Although nearby residents have repeatedly complained how bad the power plant is for their health, the government does not conduct routine checks, making it difficult to obtain quantitative data.

¹⁵ Based on interview in Celukan Bawang, May 17, 2017

¹⁶ Based on interview in Celukan Bawang, May 18, 2017



CLIMATE CHANGE
STARTS HERE

CONCLUSION AND RECOMMENDATIONS

The Celukan Bawang coal-fired power plant is destroying local livelihoods and threatening the health of nearby communities. Interviews with local residents living near the plant have revealed problems over land and compensation, the impact on the local economy, environmental degradation and health impacts caused by the power plant.

Despite this, no level of government has provided any significant response. The Celukan Bawang community is left alone to deal with these problems. The government needs to take responsibility for what is happening in Celukan Bawang in the following ways:

- Buleleng District Government: monitor air quality and conducting periodic medical checks on community surrounding the power plant.
- Bali Provincial Government: monitor the environmental degradation caused by the power plant and cancel the power plant expansion.
- Central government: develop a sustainable national energy plan which phases out thermal coal in favour of renewable energy.

Indonesia, especially Bali province, should be part of a global trend in which the use of coal-fired power plants as a source of electricity is increasingly replaced by renewable energy such as solar and wind power. Concrete steps should be immediately taken by the government to close old coal-fired power plant, cancel all new coal-fired power plants and provide incentives to develop renewable energy.

REFERENCES

- Adnan, A. 2017. Kepala Badan Perwakilan Desa (BPD), Desa Celukan Bawang. Wawancara (komunikasi personal).
- Dadvand P et al, 2013. Maternal Exposure to Particulate Air Pollution and Term Birth Weight: A Multi-Country Evaluation of Effect and Heterogeneity. *Environmental Health Perspectives*. <http://ehp.niehs.nih.gov/pdf-files/2013/Feb/ehp.1205575.pdf>
- Dewi F and Sugiharto E, 2013. Pemodelan Pola Penyebaran Polutan Utama (SO₂, NO_x dan debu) Cerobong Asap PLTU Cilacap Menggunakan Gaussian Plume (Disertasi Doktorat, [Yogyakarta]: Universitas Gadjah Mada).
- Eko S. 2017. Sekretaris, Kelompok Nelayan Bakti Kosgoro Desa Celukan Bawang. Wawancara (komunikasi personal).
- Global Asthma Network (GAN), 2014. The Global Asthma Report 2014. http://www.globalasthmareport.org/resources/Global_Asthma_Report_2014.pdf
- Kan HD, Chen BH, Chen CH, Wang BY & Fu QY, 2005: Establishment of exposure-response functions of air particulate matter and adverse health outcomes in China and worldwide. *Biomed Environ Sci*. 2005 Jun;18(3):159-63.
- Karimun. 2017. Warga, Desa Celukan Bawang. Wawancara (komunikasi personal).
- Kertaraharja, A. 2015. Mengganggu Kesehatan, Limbah PLTU Celukan Bawang Bali Menuai Protes. *Mongabay Indonesia*, 13 Agustus 2015.
- Kopplitz et al 2017: Burden of Disease from Rising Coal-Fired Power Plant Emissions in Southeast Asia. *Environmental Science & Technology*. <http://dx.doi.org/10.1021/acs.est.6b03731>
- Krewski D et al 2009: Extended Follow-Up and Spatial Analysis of the American Cancer Society Study Linking Particulate Air Pollution and Mortality. *HEI Research Report 140*. Health Effects Institute, Boston, MA. <https://www.healtheffects.org/publication/extended-follow-and-spatial-analysis-american-cancer-society-study-linking-particulate>
- Lee SJ, Seo YC, Jang HN, Park KS, Baek JI, An HS & Song KS, 2006. Speciation and mass distribution of mercury in a bituminous coal-fired power plant. *Atmospheric Environment* 40:2215–2224.
- Mangku Wijana, K. 2017. Warga, Desa Tinga-Tinga. Wawancara (komunikasi personal).
- Muhajir. 2017. Mantan kepala desa, Desa Celukan Bawang. Wawancara (komunikasi personal).
- Mulyadi. 2017. Anggota, DPRD Kabupaten Buleleng. Wawancara (komunikasi personal).
- Muzakky M & Taftazani A, 2012. Studi Pengukuran Aktivitas Anal Luruh U-238, TH-232 dan K-40 dalam Filter PM10 dan PM2,5 di Daerah Jateng II. *Ganendra Majalah IPTEK Nuklir*, 15(1).
- Paraning, K. 2017. Kepala, Puskesmas Desa Celukan Bawang. Wawancara (komunikasi personal).
- Sadli. 2017. Ketua Ranting Nahdlatul Ulama, Desa Celukan Bawang. Wawancara (komunikasi personal).
- Suparlan, B. 2017. Ketua, Kelompok Nelayan Bakti Kosgoro Desa Celukan Bawang. Wawancara (komunikasi personal).
- Swain EB et al, 1992. Increasing Rates of Atmospheric Mercury Deposition in Midcontinental North America. *Science* 257:784
- Van Donkelaar et al, 2016. Global Estimates of Fine Particulate Matter using a Combined Geophysical-Statistical Method with Information from Satellites, Models, and Monitors, *Environ. Sci. Technol*, doi: 10.1021/acs.est.5b05833.
- Winarta I, Giriantari dan Ariastina I, 2014. Studi Emisi Karbon Sistem Pembangkitan Bali. *Majalah Ilmiah Teknologi Elektro*, 13(2).
- World Bank. World Development Indicators. <http://databank.worldbank.org/data/home.aspx>
- World Health Organization (WHO), 2014. Global Health Estimates. http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html

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Celukun Bawang coal-fired power plant in Bali.

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