

# DECARBONIZATION IN CHILE FROM COAL TO BIOMASS: A FALSE SOLUTION

Engie Coal to Biomass Power Plant Conversion Project in Mejillones (Chile), is a False Solution for Decarbonization.

- Engie's plans in Chile expose the worrisome trend of converting coal-fired thermoelectric plants to biomass burning, destroying huge areas of forest that capture CO2 and generating additional emissions in feedstock transportation.
- The impacts on biodiversity, on public health and from the greenhouse gas emissions from the pellet industry and biomass power generation have not been evaluated.



## BACKGROUND

In 2019, the Chilean government announced a decarbonization plan for the electricity sector based on voluntary commitments to retire coal-fired thermoelectric power plants from the companies Enel, ENGIE, AES and Colbún. Among them, the French company ENGIE<sup>1</sup> plans to convert 2 of its coal-fired units, Andina and Hornitos, which operate in the city of Mejillones, in the Antofagasta region, to use wood pellets or woodchips as feedstock.

The Declaration of Environmental Impact (DIA) for the conversion project was approved in April 2022 by the environmental authority of Antofagasta as a minor modification of the existing environmental permit<sup>2</sup>. Both units of the plant are expected to start operating with 100% biomass at the end of 2024.

Andina and Hornitos have a combined generation capacity of 320 MWe; currently they burn 90% coal and 10% biomass. If the conversion to 100% biomass takes place the power plant would be the largest biomass-fired thermoelectric power plant in the country.

The Declaration of Environmental Impact (DIA) presented by ENGIE reports that, together, both units of the plant would consume 4,800 tons of woodchips per day. According to calculations this means that the operation of the plant would require the exploitation of more than 250 hectares of eucalyptus plantation per day.

**In the event that the power plants operate at full capacity, that is, about 8,000 hours a year, it would be necessary to annually cut approximately 100,000 hectares of eucalyptus monoculture plantation to supply the plant with biomass feedstock. On the other hand, if this biomass came from native forest, it would be necessary to exploit an even larger area of forest. These magnitudes of forest exploitation are equivalent to 2.5% of the total area of industrial exotic species monoculture plantations that currently exist in Chile.**

*Power plant in Mejillones / Source and Credit: Chile Sustentable*

1 <https://www.engie.cl/>

2 [https://seia.sea.gob.cl/expediente/ficha/fichaPrincipal.php?modo=ficha&id\\_expediente=2152626705](https://seia.sea.gob.cl/expediente/ficha/fichaPrincipal.php?modo=ficha&id_expediente=2152626705)

## IMPACTS OF BIOMASS BURNING ON BIODIVERSITY AND CLIMATE

### Where will the biomass for Andina and Hornitos come from?

In the Declaration of Environmental Impact (DIA) the company informs that the units will utilize white wood pellets, black wood pellets or woodchips. Currently, however, nowhere in the world are black wood pellets produced in commercial quantities. In the case of Chile the total white wood pellet production capacity could reach some 120,000 tons per year<sup>3</sup>, which would supply feedstock for just 25 days of operation of the Andina and Hornitos units. Such competition would result in completely exhausting the national market for wood pellets for residential heating use, a market that has already had difficulties in meeting its demand over the last 2 years.



Source: [www.atalca.cl](http://www.atalca.cl) (University of Talca), [https://www.atalca.cl/content/uploads/2019/04/pallets\\_agosto2017\\_atalca.jpg](https://www.atalca.cl/content/uploads/2019/04/pallets_agosto2017_atalca.jpg)

White wood pellets that are traded globally can come from native forests in British Columbia, Canada, causing serious environmental devastation and public alarm. They also come from the southeastern United States, where unique native coastal hardwood forests are being degraded for pellet production.<sup>4</sup> At the same time, numerous African-American communities are being negatively affected by the air pollution caused by wood pellet manufacture<sup>5</sup>.

3 <http://www.radioudec.cl/empresa-de-los-angeles-abastece-con-pellets-a-mas-del-50-de-los-consumidores-a-nivel-nacional-y-genera-minimo-environmental-impact/>

4 <https://media.dogwoodalliance.org/wp-content/uploads/2018/10/Wood-Pellet-Environmental-Justice-Fact-Sheet.pdf>

5 <https://www.dogwoodalliance.org/2020/10/new-media-series-highlights-how-wood-pellet-industry-increases-environmental-racism/>  
<https://www.theguardian.com/business/2022/sep/26/uk-accused-of-funding-environmental-racism-with-subsidies-to-drax>



*Clearcut in Nova Scotia, Canadá / Source: Ray Plourde / Credit: Ecology Action Center.*

In addition to the above, conservative calculations estimate that shipping the wood pellets from British Columbia to Mejillones would generate more than 170,000 tons of CO<sub>2</sub> emissions per year<sup>6</sup>.

If Engie chose to use woodchips from monoculture plantations in southern Chile, it would compete for this raw resource with the Chilean pulp and paper industry. Similar industrial tensions would occur if the woodchips were sourced from Argentina or Brazil, in addition to the tremendous impacts on biodiversity and exploited territories.

The current forestry model of monoculture plantations of exotic commercial species is a scientifically proven root cause of ecological damage and conflict with rural and indigenous communities. In Chile, many rural communities live surrounded by non-native pine and eucalyptus plantations, which have destroyed biodiversity and degraded water resources, in addition to presenting an escalating risk of forest fires in the context of global warming. Evidence shows that the expansion

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<sup>6</sup> <https://www.youtube.com/watch?v=qadWRkPkKus>

of the plantation forestry model has increased the poverty of local rural indigenous communities<sup>7</sup>, and the model is currently under increasing public scrutiny due to its social and environmental impacts.

Additionally, an intensification of forest exploitation to feed the electricity generation industry in Chile would increase the threat to the native forests of the country from rising market demand for wood pellets and woodchips. Regulatory problems regarding the production of woodchips in Chile are a cause of long-standing concern due to the degradation of the native forest due to extraction for household firewood, for industrial uses and the subsequent substitution by commercial monoculture plantations. The native forests of Chile are globally unique; they have high rates of endemism and, in addition, constitute essential landscapes for the capture and storage of CO<sub>2</sub>. The biomass-based operation of the Andina and Hornitos power plant units would put them at risk.

In this context, although the announcement to close the coal-fired thermoelectric power plants in Chile is welcome, their conversion to biomass constitutes the wrong path for decarbonization, since it will put strong pressure on the forests of Chile and other nations on the planet, affecting native ecosystems and impacting invaluable landscapes that sequester CO<sub>2</sub> and mitigate the impacts of climate change.

For these reasons, the ENGIE proposal has been criticized by the civil society organizations of the Chao Carbon Coalition<sup>8</sup> as a false solution for the energy transition.



*Chilean native forest* / Source and credit: Chile Sustentable.

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7 <https://link.springer.com/article/10.1007/s10745-020-00204-x>

8 <https://www.chaocarbon.cl/>

## CONCLUSIÓN

Although the conversion of coal-fired power plants to biomass may be politically convenient, and there is currently support for the use of biomass on an industrial scale as a response to climate change, it is clear that in the case of the conversion of the Andina and Hornitos plants the impacts have not been described by the company, nor addressed in the environmental assessment process. The establishment and cutting of 100,000 hectares of eucalyptus plantation per year for the operation of these plants would mean loss of biodiversity, reduced water retention capacity across the landscape, and a significant decrease in CO<sub>2</sub> capture.

In addition to the above, it is possible to estimate, based on information from ENGIE, that the operation of the biomass plant would result in more than 3 million tons of CO<sub>2</sub> emissions per year<sup>9</sup>. It is also likely that emissions from the converted units cause irreparable damage to public health. Biomass burning generates emissions of CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub> and PM, which affect air quality and the environment, with the smallest particulate matter, **PM2.5** being the most dangerous.

In summary, the above information shows that the conversion of thermoelectric plants from fossil fuels to biomass feedstocks perpetuates an industry that, in addition to generating impacts on public health and worsening global warming, is directly responsible for local and global pollutants and the destruction of forest landscapes that capture CO<sub>2</sub> and that contribute to maintaining the water cycle. The aforementioned social, economic and environmental effects show that the conversion of ENGIE's coal-fired thermoelectric plant to biomass burning constitutes **a false solution and is therefore an incorrect path for the decarbonization** of the electricity sector in Chile and in the world.

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<sup>9</sup> Source: The calculation is based on the IPCC estimate that establishes 112,000 kg/TJ ([https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\\_Volume2/V2\\_2\\_Ch2\\_Stationary\\_Combustion.pdf](https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf), Table 2.2).

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