CASE STUDY
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Producing fuel for other people's planes

A case study on the Omega Green Biofuel refinery in Paraguay

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Social conflicts have emerged since access to the affected Santa Rosa community has been privatized by the company that owns the project land. Gate impeding access for both visitors and residents.

1 SUMMARY

This case study examines the Omega Green project: the first so-called advanced biofuel refinery in South America. It is being built by the Brazilian company ECB in Paraguay, a small South American country characterized by its tropical forests and abundant water. The refinery, one of the world's largest to date, aims to primarily produce aviation biofuels in a country with very little demand for them. The main feedstocks for the refinery are expected to be soybean oil, animal fats from the export beef slaughter industry and pongamia oil.

Those feedstocks are, whether directly or indirectly, linked to the destruction of ecosystems, of biodiversity and serious negative impacts on the local population, especially peasant and Indigenous Peoples. Paraguay is already heavily impacted by monocultures of genetically engineered soybeans and corn, eucalyptus and beef production; an economic model imposed by transnational companies that extract income and leave behind deforestation, dying ecosystems, pollution, poverty and ill health.

The refinery will be installed in Villeta, a small city very close to the capital, Asuncion, on the banks of the Paraguay River, one of the main sources of life in the national water system. Potential pollution from the biofuel refinery, as well as increased construction and shipping along the river pose a serious risk of significant adverse impacts and also seriously affect the livelihoods of the local fishing community. The project owner, ECB, was granted a total tax exemption and a permit to repatriate its capital and profits at no cost to the Paraguayan government. The government has thus supported the major investment with no regard to the impacts on the Paraguay River.

AVIATION BIOFUELS

Biofuels are a part of the aviation industry's promises of green flying through technological 'solutions' and are therefore being massively promoted. Biofuel production is currently possible at commercial scale with various sources of biomass inputs such as: sugar crops, starch, plant oils (palm and soybean oil or corn ethanols), animal fats (including tallow) or used cooking oil. This case study shows that biofuel production for aviation does not rule out the use of biofuels made from crops and trees grown for that purpose, such as soy and pongamia. It also illustrates the very serious environmental and social impacts of the beef export industry, which can be boosted further by increasing the value of its waste products through biofuel production. A thorough look at different greenwashing strategies of the aviation industry can be found in Stay Grounded's fact-sheet series.[1]

2 INTRODUCTION

How 'sustainable' are biofuels for aviation? In this case study, we look at one specific planned production site: the Omega Green refinery. And we ask, why the first aviation biofuel refinery in South America, and one of the largest in the world, is being built in Paraguay.

The case can be considered a paradigm because it is the largest private investment in the history of Paraguay,[2] and because of the symbolic and economic implications it has for the city of Villeta. The guiding questions are relevant on two accounts: the low level of aviation in the country and the high negative impact of the raw material production, mainly soybean oil and animal fats, on the people and the territory.

Transgenic soy, illegally introduced to the country in the mid-1990s, and legalized in 2004, already covers more than half of the countries' area planted with temporary crops. **Soy production has led to land grabbing, deforestation and the poisoning of soils, water and air; it displaces people, sickens and kills local residents and farm animals through pesticide poisoning, and destroys subsistence crop production (see chapter 8.3).**

Paraguay has historically been an agricultural country, and **beef production** remains a central part of its economy. Due to the advance of GMO soybeans in the eastern region of the country, livestock farming **is being pushed into the Paraguayan Chaco, part of the great South American Chaco, one of the most fragile ecosystems of the region.** The Chaco is home to great biodiversity and indigenous peoples, including the Ayoreo people, who are still living in voluntary isolation.

A tiny global minority of frequent fliers - 1% of the world population - is responsible for more than half of the total emissions from air passenger travel.[3] **Paraguay's air transport operations are very low.** The country is the lowest emitter of CO2 by air activity in South America, and the second lowest emitter per capita after Venezuela.[4] Surely, most Paraguayans are part of the 80% of the planet's inhabitants who do not fly at all.[5] Industry prognoses suggest that this will not change any time soon, since passenger kilometers per capita are expected to stay significantly lower in Latin America than in the US, Europe and the Middle East even until 2050.[6]

CO_2 EMISSIONS FROM AVIATION IN SOUTH AMERICA IN 2018

Country	Emissions CO_2 Mt	Emissions per capita
Argentina	4,60	104
Brazil	14,14	68
Chile	2,92	162
Colombia	3,35	68
Ecuador	0,93	56
Paraguay	0,22	32
Peru	2,40	74
Uruguay	0,39	112
Venezuela	0,41	13

Source: Global Sustainable Tourism Dashboard, Griffith University (no date)

Paraguay is seriously impacted by the climate crisis. Despite the country's minor historical contribution to global greenhouse gas emissions, it is ranked as the most vulnerable country in South America and eighth in Latin America and the Caribbean.[7] The year **2019 was the warmest in national history**, experiencing +1.5 and +1.7 °C temperatures compared to the average temperature of 1961-1990 and the pre-industrial era, respectively.[8] Average annual precipitation, meanwhile, has increased by 200 millimeters during the last 70 years, but this increase in rainfall is concentrated in a few areas, causing floods and destruction. The rest of **the country dries up and desertifies rapidly**. The territory has been suffering from an intense drought for three years,[9] and the latest news from the World Meteorological Organization (WMO) on the imminent repetition of the La Niña phenomenon suggests a further extension of this drought[10]. The Paraguay and Paraná rivers are key ecosystems, as well as a strategic factor for the human residents and the economy of the entire Southern Cone.[11] The Paraná River is flowing at the lowest level in 60 years;[12] the Paraguay River reached its lowest level since 1904 (when recording started).[13]

Based on this context of the climate crisis and low aviation demand, we reiterate the question: Why is the first advanced biofuel refinery in the region, and one of the largest in the world, being built in Paraguay? And can this be sustainable?

3 METHODOLOGY

To find answers to these questions a mixed, qualitative methodological design was used. The data collection techniques were semi-structured observation, semi-structured interviews, analysis of audiovisual documents and discourse analysis from national and international media, monitored from November 2020 until November 2021. Data processing was performed manually and with the Atlas Ti 7.5 software.

FOUR VISITS WERE MADE TO THE PROJECT LOCATION

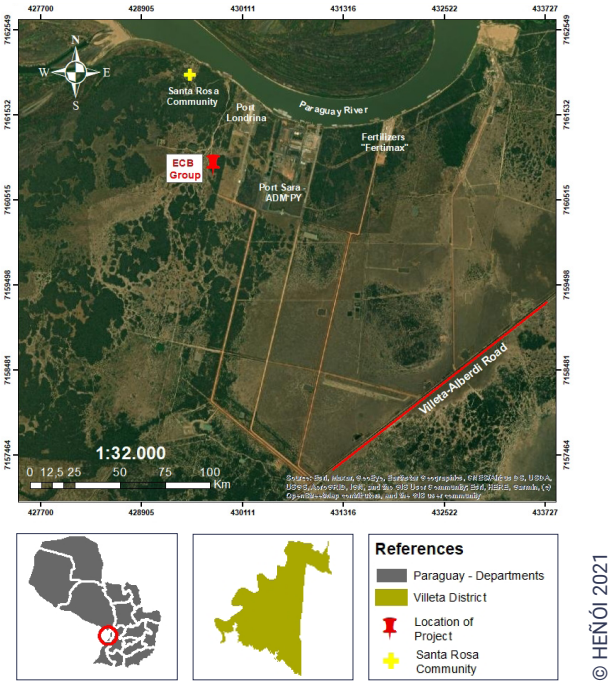
In a country with violent land struggles and lack of human rights guarantees, the local population is fearful of repression and violence by the private companies running the project. Therefore, the process of finding people willing to be interviewed was slow and difficult. The first interview was with a person the team already knew, Ezequiel Pereira, a 32-year-old man from Villeta, whose grandparents lived in Santa Rosa, the main community affected by the construction of the refinery. Based on the information provided by Pereira, an amateur connoisseur of the history of Villeta, snowball sampling was applied. The following people interviewed were a foreman and a security guard from the private company that exercises control over the territory, and two engineers in charge of the construction of the ANDE (Administración Nacional de Electricidad, the state owned electrical company) electrical terminal. Finally, a group dialogue was held with seven people from the Santa Rosa community (six women and one man), and two fishermen from the same community were interviewed. Apart from Pereira, all informants refused to be named and photographed, afraid of the possible consequences.

4 SCOPE

OMEGA GREEN - THE LARGEST PRIVATE INVESTMENTS IN THE HISTORY OF PARAGUAY

The Omega Green refinery is planned in the Villeta district, a few kilometers south of Asunción, the capital of Paraguay.

Location of Omega Green refinery



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It involves an **investment of about 800 million dollars** for the development of a plant that will produce Hydrotreated Vegetable Oil (HVO), some of which will be upgraded to aviation biofuels, synthetic paraffinic kerosene (SPK, also known as 'sustainable aviation fuel' or Biojet), and Green Naphtha, used in the chemical industry to manufacture products such as 'green plastic'). The total **production capacity is more than 3 million liters per day** (more than one billion litres per year) of biodiesel, aviation biofuel and by-products.[14]

Production has already been slated: the company has signed contracts[15] with British Petroleum for the supply of 1 billion litres per year from 2024 and with the Anglo-Dutch Shell for more than 2.5 billion liters of biofuels in total for a period of five years. These contracts ensure the demand for 50% of the biorefinery's capacity, according to the project owner, Erasmo Carlos Battistella.[16] The company states that the project *'will generate 3,000 direct jobs in the construction phase and about 2,400 direct and indirect jobs when it comes into operation.'*[17]

First reports about this investment in Paraguay date from 2019. Later news revealed that the Covid19 pandemic delayed the start of construction, postponing it to the second half of 2021.[18] At the time of writing this report, construction had not yet begun. Interview partners in the area confirm that *'they did some soil studies and it seems that the terrain is not good...'*. Nevertheless, the participation of the Paraguayan government delegation at the presentation of the Omega Green project during the UN Climate Conference COP26 in Glasgow, Scotland, can be seen as a confirmation that the project continues.[19]

5 THE COMPANIES

The owner, holding company ECB Group, was founded in 2011 by Brazilian businessman Erasmo Carlos Battistella. As stated in the environmental impact report, 'The current investment portfolio includes interests in companies that generate fuels from renewable raw materials such as BSBIOS, R.P. BIO SWITZERLAND SA, ECB GROUP PARAGUAY and ECB GROUP BRASIL'. The 43-year old Batistella, son of Brazil farmers and known as 'the king of biodiesel', aspires to become the third largest producer of biofuels in the world by 2030.[20] Some of the ECB Group's business, carried out in close alliance with the Brazilian government, have been reported to the Federal Public Ministry for undermining the interests of the Brazilian people.[21]

LANDOWNER INVOLVED IN DEALS CLAIMED 'SHADY' BY UNION

The ECB group does not own the land on which Omega Green is to be built. According to the environmental impact report the project property is located in the Villeta District, Central Department, on the left bank of the Paraguay River, in a place called Puerto Sara, Suribi-y,[22] and is owned by 'El Arreglo SA'.[23]

The members of El Arreglo SA corporation are unknown.[24] However, the corporation presented the best offer to the bidding of the national electricity company for the provision of land for construction of a substation transformer station for the supply of energy, coincidentally, next to the property where Omega Green is planned to be built. Unions of the national electricity company have warned about a supposed 'shady deal' prior to the bidding.[25] Beyond these warnings, **apparently the property is in the hands of people with great capacity to influence the national government**. The update of the land ownership registry was carried out in September 2019, in record time. The process took less than 24 hours, whereas the usual procedure takes several weeks or months.[26] Likewise, it is unknown who owns the lands adjacent to the Omega Green project area. The entire area is controlled by private guards, and the villagers claim that the owners are *'powerful people.'*

The technology for the biorefinery will be handled by the contractor, Honeywell UOP is the owner of the renewable fuel refining technology for UOP Process Reactors, Crown Iron Works, a US company that provides pretreatment equipment to upgrade 'renewable' raw materials to a quality suitable for biofuels refinement.[27]

Security booth for the ADM Sara and Londrina ports, which also block access to the Santa Rosa community.

6 RAW MATERIALS

The raw materials that Omega Green is going to require, according to its own environmental impact report, are oilseeds, animal fats, vegetable oils, recycled vegetable oils and biodiesel waste. The document describes that the refinery will use 2,400 tons per day of raw materials, divided into soybean oil and animal fats, 50% of each. This is contradictory to reports of contracts for pongamia oil supply for Omega Green (see below).

Deforested land for beef production in the Chaco region.

ANIMAL FATS FROM THE BEEF INDUSTRY

The animal fats would come from the by-products of the slaughter of beef for export.[28] Paraguay is the sixth largest exporter of beef in the world. With just seven million inhabitants, the country has a cattle herd of 14 million cows. This production takes place mainly in the Paraguayan Chaco region, part of the great South American Chaco, one of the most fragile ecosystems in the world. Large areas are deforested, introducing non-native pastures that destroy the ecosystems in which the animals are raised. In addition to driving deforestation, those pasturelands lead to other serious environmental and social impacts, including violations of the rights of indigenous peoples.[29]

Soybean monoculture, a 'green desert' where a subtropical forest stood.

SOYBEAN OIL FROM DEADLY 'GREEN DESERTS'

Soy is the main agricultural commodity produced in the country, occupying 94% of the cultivated land in the eastern region.[30] The country is the fourth world producer of transgenic soybeans, a crop that has been expanding uncontrollably for the last 25 years. The eastern region of the country, which originally had about eight million hectares of subtropical forests, is today a huge 'green desert' of oilseed crops. About 60 million kilos of pesticides are applied there every year to produce this oilseed.[31] In addition to deforestation, the contamination of surface and groundwater, and the deterioration of soils, soy has had an impact on the livelihoods of indigenous peoples and rural communities, who have for decades, denounced a systematic plan of extermination against them.

Illegal deforestation on Ayoreo territory.

OILSEEDS FROM THE AYOREO PEOPLES' TERRITORY LIVING IN VOLUNTARY ISOLATION

The third input mentioned in journalistic reports, but not in the environmental impact report, is pongamia (*Millettia pinnata*). The tree is native to Asia, very adaptable to different types of terrain and also tolerant to drought, heat and solar radiation. Oil from pongamia seeds is not suitable for human consumption, but can be used to produce biodiesel. The ECB Group announced having signed a 30-year contract with the Dutch company Investancia[32] for the supply of 300,000 tons per year of 'reforestation oil' for the production at Omega Green. Investancia has started to plant 125,000 hectares (50 million trees) in the Carmelo Peralta area, in the Paraguayan Chaco, territory of the Ayoreo people, who still live in voluntary isolation.[33] While Investancia calls it 'reforestation oil', large plantations of an exotic tree are not forests. They have a severe impact on natural resources, and the use of pesticides, fertilizers, and human presence are destructive to the indigenouos communities and to biodiversity.

7 WHY DID THEY COME TO PARAGUAY?

LOOKING BEHIND THE COMPANYS' CLAIMS ON LOCATION CHOICE

Battistella himself affirms[34] that they found in Paraguay the most competitive conditions to host a venture of this magnitude:

- **Legal security**
  Highlighting this feature, the businessman neglects various rankings that place the country among the most corrupt in the world, and with the greatest legal insecurity.[35] Favorable for large corporations such as the ECB Group are the tax conditions. The Paraguayan government granted a Free Zone regime[36] for Omega Green. This exempts the company from all types of national, departmental and municipal taxes, and grants the possibility of repatriation of 100% of capital and profits at no cost. The contract is valid for 30 years and is renewable. It is a concession of territorial and fiscal sovereignty in exchange for the generation of internal demand and jobs.

- **Raw materials**
  As has been mentioned already, the country's productive matrix offers plenty of raw materials for the project. The lack of regulation favors the expansion of soybean crops and the unsustainable production of meat.

- **Competitive logistics, especially water transport**
  The refinery is being built directly on the banks of the Paraguay River, which Battistella describes as a 'very efficient transportation channel'. This river is part of the Integration Initiative for Regional Infrastructure (IIRSA), a program in which almost all South American countries are participating. This program includes the construction of an integrated infrastructure network, aimed towards economic and industrial development. The impacts of the planned hydroways, bridges, bi-oceanic routes and other projects have led to community resistance and complaints for multiple rights violations.[37]

- **Electricity**
  Besides raw materials, Omega Green's main input is electricity. It should not be seen as a coincidence that a new power transmission station is being built less than a thousand meters from the proposed refinery site.[38] The station's construction began at the same time as ECB began its operations in Paraguay.

- Not publicly mentioned by Battistella, but a possible determining factor, are the **political ties between the current president of Brazil, Jair Bolsonaro, and Paraguayan president, Mario Abdo.**[39] Part of the continuous growth of the ECB Group's business is based on the ability to reach 'very convenient' agreements with public officials in Brazil.[40] In Paraguay, the company's relations with the government are very close and friendly. During the COP26 in Glasgow, Scotland, the entire Paraguayan delegation joined the official presentation at the Brazilian stand of the Omega Green project, showcasing 'sustainable development' to combat climate change.[41]

Ayoreo woman (name unkown) walking on burned land after deforestation.

8 IMPACTS

Besides the economic plundering and environmental destruction mentioned in different parts of this document, there are other impacts to be considered:

1. IMPACT ON THE TERRITORY AND NEIGHBORING COMMUNITIES

Omega Green is part of a broader process of industrialization of Villeta. The process of industrialization began in the mid-twentieth century with the arrival of the cotton company Anderson, Clayton and Company. It was consolidated with facilities of the state cement company Industria Nacional de Cemento (INC) in 1969, and the country's first industrial park in 1977, both under the dictatorial regime of Alfredo Stroessner (1954-1989). Around 70-80 industries are currently located along the 80 km of riverbank in the Villeta municipality.

The industrialization brought parallel processes of loss of territories and community ties. According to a key informant interviewed during our field-visits, two local long-standing fishing communities have disappeared in the process. A third is severely threatened, as we found out during our field work. **The Santa Rosa community is located on land adjacent to the plot reserved for Omega Green. Social conflicts have emerged since access to the community has been privatized by the company, El Arreglo S.A, that owns the project land. This weakens community ties and capacities, forcing settlers to abandon their lands and homes.**

A typical house in Santa Rosa; View at the arrival to the community. The school (closing soon due to lack of students) and the church are on the right side.

The historical perspective offered by the informants on the process of industrialization and deterritorialization of Villeta shows that the large companies have benefited at the price of the destruction of the livelihoods of the inhabitants. **With the arrival of Omega Green once again the dilemma for these people resurfaces as expressed by a key informant during the interview: *'Do we die by starvation or do we die by poisoning?'*.**

ACCESS TO THE COMMUNITY PRIVATIZED

The Santa Rosa community is located in the immediate vicinity of the Omega Green plant (see map). Currently the community has 11 families, about 50 people in total. The residents explain that one of the causes of depopulation is the difficult access to the community. The access is privatized by the owners of the land, El Arreglo SA. Despite the fact that the community has the legal status of right-of-way,[42] the guards in charge of allowing access to the land abuse their *'power'*, committing arbitrary acts. According to our interview partners: *'We have to ask permission, even if we are locals'*, said a member of the community during our visit.[43] **This isolation, which significantly affects the free movement of people, resources and livelihoods, is wearing down the community.** During our field-visits we received reports of cases ranging from health emergencies, such as pregnant women who could not get out of the community to be cared for and an extreme case where the death of a young person occurred. For the institutions responsible for evaluating the cause of d the person's death to enter, *'they had to use force, break the padlock to open the gate.'*

Another reason for depopulation is the loss of their livelihoods. The main source of income for the community is fishing and those who engage in this activity are mostly male adults. The community refers to the drastic decrease in fish fauna as a likely consequence of the contamination of this section of the river by highly polluting industrial and port activities. In short, **the community is landlocked in land that they don't own, with less and less income and sources of work**. The inhabitants report that between the end of 2020 and the beginning of 2021, trucks entered the Omega Green construction area. They observed that workers began cutting down wooded areas and conducted soil and water studies, but they did not return. According to the villagers, Omega Green did not engage in prior consultation or provide information about this undertaking that could potentially affect the community.

Regarding the construction of the Omega Green plant near the community, there are conflicting positions. Some believe that given the current conditions of the community, any means of work should be accepted. Others claim that none of the factories installed in the port area of Villeta have benefited the population and ask why Omega Green would be any different. Despite people from the community abandoning their land, the women expressed that one of the elements that allows them to survive is solidarity. As one of them said, *'We all know each other; who has the most, helps the neighbor.'*

2. ENVIRONMENTAL IMPACT ON THE RIVER

The most significant environmental impacts generated by activities in port areas[44] are spills or leaks of fuel and liquid effluents such as oil, pesticides and other pollutants, impacting the entire ecosystem and associated human activities such as fishing. The effects of spills can be persistent over time and can compromise surface water or, by seepage into groundwater.

Other probable impacts[45] are destruction of habitats and disruption of fauna caused by navigation, elimination of riparian vegetation, land filling for installation of cargo infrastructure, drainage and changes in the river hydrological dynamics, all impacting biological diversity. Current legislation does not stipulate that studies on impacts of fluvial infrastructures in the Paraguay River are carried out in port areas. Specific environmental policies and technical regulations need to be established to measure alterations in surface and underground waters, the dynamics of the river bed, and in the quality of life of the inhabitants in surrounding areas.

View of the Paraguay River from Santa Rosa.

3. IMPACT OF THE EXPANSION OF SOY AND UNSUSTAINABLE LIVESTOCK

Transgenic soy monocultures have been expanding in Paraguay for 25 years. This expansion is driven by transnational companies in alliance with landowners. Many of these landowners are Brazilian and dispossess traditional rural communities and indigenous peoples of their lands in Paraguay. Corrupt state officials and judges are often complicit in dispossession, which is almost always done with violence.[46]

These monocultures, in addition to being preceded by **deforestation** (and therefore the destruction of ecosystems and loss of biodiversity), use large amounts of **pesticides**, both biocides and chemical fertilizers, which destroy the soil, pollute surface and ground water (see section 'Raw materials'). The pesticide drifts lead to severe health impacts on neighboring villagers, their domestic animals and their crops. Direct poisoning by fumigation on communities has produced **at least 4 verified deaths in Paraguay**: Silvino Talavera (2004),[47] Rubén Portillo (2010, death condemned by the IACHR),[48] and Adela and Adelaida Álvarez (2014).[49] Many other reported cases have gone unpunished.
Water poisoning also destroys the functionality of the basins of the country's valuable water system, impacting fisheries and deteriorating water quality for the entire population.

This agricultural model negatively impacts peasant and indigenous traditional agriculture, threatening the survival of native and traditional germplasms. An especially concerning case is the survival of the eleven native varieties of corn, which form the basis of the country's traditional diet.

The other main input for the Omega Green refinery is beef tallow, a subproduct of large-scale meat production, which causes similar environmental impacts. **Beef production has been expanding relentlessly**, mainly in the Paraguayan Chaco, stimulated by the ease with which national and foreign investors access huge tracts of land and deforest them with impunity. Today **the Paraguayan Chaco suffers one of the highest deforestation rates in the world**, losing around 800 hectares per day. By 2020 about 40% of the natural forest cover had been lost, and it is estimated that in 10 years about 70% of the forest will be gone.[50]

This production model, enforced by transnational companies and oriented towards consumption in the Global North, implies a loss of territorial, food, genetic and economic sovereignty; deprives the country of its common goods and displaces communities, bringing poverty, severe health impacts and even death to the people.

The road to Santa Rosa.

9 CONCLUSIONS

The Omega Green refinery is not planned for satisfying the national demand of aviation fuels, which is comparatively low in Paraguay. The project is designed for the economic convenience of its investors, due to the favorable conditions in terms of costs and availability of raw materials, and other inputs such as cheap electricity, whilst disregarding the serious negative impacts to the local population, especially peasant and indigenous peoples.

Omega Green is part of a biofuel development process in the region with the false promise of being a 'sustainable solution' to the climate crisis. Soybean oils, animal fats and pongamia, **the raw materials expected to be used for the biofuel production, are feedstocks directly and indirectly linked to the destruction of ecosystems, elimination of biodiversity, and the displacement and impoverishment of the population.**

The ecological impact in the area where the refinery will be constructed compromises the Paraguay River, one of the main sources of life in the national water system. The impact on the local population is evident in the destruction of the Santa Rosa community in Villeta. Given the weak structure and integration of the community, and the absence of state public policies that guarantee the population's rights, Santa Rosa is in a position of high vulnerability.

The economic returns of the venture would only benefit the owners. The handover of economic sovereignty that the free zone status implies is a violation of the public interest of the Paraguayan nation. **The refinery will bring more destruction and suffering and expand agribusiness , driving the extinction of Paraguayan peoples. In short, Omega Green will provide fuels for other people's planes, instead of healthy and sufficient food for the local population.**

PRODUCING FUEL FOR OTHER PEOPLE'S PLANES.
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in Paraguay

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END NOTES & LITERATURE

[1] Stay Grounded (2021): https://bit.ly/3GrMYEa
[2] infonegocios (2019): https://bit.ly/326jYDe
[3] Gössling et al. (2020): https://bit.ly/3nXzuJZ
[4] Data from Global Sustainable Tourism Dashboard, Griffith Institute for Tourism (no date): https://bit.ly/3klKyhS
[5] Institute for European Environmental Policy (2019): https://bit.ly/3E1gSy3; ibid footnote 3
[6] ibid footnote 3, table 3
[7] CAF - Development Bank of Latin America (2014): https://bit.ly/2YxTWai. Climate change vulnerability and adaptation index for the Latin American and Caribbean region
[8] Grassi (2020): https://bit.ly/3BX6xl2. Estado del Clima en Paraguay.
[9] The industrial production of commodities denounces serious negative impacts, echoed by the mainstream press. See eg.: Última Hora (2021): https://bit.ly/3F4vLzO. On the contrary, there is no ampli fication of the voices of peasant and indigenous communities that suffer from this manifestation of climate change in their chances of survival, due to lack of water availability and the worsening of the conditions for food production, due to lack of productive infra-structure and favorable public policies. See eg.: ABC Color (2020): https://bit.ly/3ojuVsa; Última Hora (2020): https://bit.ly/3wxi8pT
[10] World Meteorological Organization (2021): https://bit.ly/3bYqrl1
[11] A good analysis of the implications of the Parana river crisis is available at Página 12 (2021): https://bit.ly/30bTgZc
[12] Telam (2021): https://bit.ly/31Ik837
[13] AP News (2021): https://bit.ly/2YxXg5g
[14] See Environmental Impact Assessment available at: https://bit.ly/3GTpkk0. The report does not include the quantities of each fuel to be produced. Various information requests by HEÑÓI to com-pany and owner (by phone, email, social networks) were not answered.
[15] La Nacion (2021): https://bit.ly/3F08HSX
[16] La Nacion (2021a): https://bit.ly/30i41ZJ
[17] ibid footnote 15.
[18] Aibid footnote 16.
[19] ABC Color (2021): https://bit.ly/3C5yEyD
[20] The Intercept Brasil (2021): https://bit.ly/3H6WE89
[21] Several processes involve suspected operations such as influence peddling and conflict of interest, among others. As an example, see the process initiated by the alleged over-invoicing of the sale of biofuel processing plants in Marialva and Passo Fundo, in " PAUTA DA OCTIGENTÉSIMA SEXAGÉSIMA QUARTA SESSÃO ORDINÁRIA DE 06 MAIO DE 2015". Available in https://bit.ly/3n2lNcf
[22] The WGS 84 / UTM zone 21S coordinates are: 429189.00 m E / 7160844.00 m S.
[23] Servicio Nacional de Catastro, Paraguay (no date): https://bit.ly/3D3TS1d. It is a 70 hectare property that is identified in the National Land Registry Service as Finca N ° 1620, Register N ° 8232, and appears in the name of 'El Arreglo SA'. Ironically, in Spanish slang, 'arreglo' is used for a fix, 'shady deal'.
[24] The lack of transparency and high level of corruption of the Paraguayan state, added to the slow adoption of digital technolo-gies, make it extremely difficult to find reliable information.
[25] ABC Color (2021a): https://bit.ly/3F4CnOJ
[26] The update process carried the file number 127214. Servicio Nacional de Catastro (no date): https://bit.ly/3H9rVHB
[27] InfoNegocios (2021): https://bit.ly/30fDpIM. Another company involved in the project is Acciona SA, a global mega-corporation involved in 'green business' in the areas of energy, real estate, water, transportation, and the financial sector. The ECB Group has selected Acciona to carry out the Front End Engineering and Design (FEED) which has subcontracted different companies. IDOM (no date): https://bit.ly/30fIzVa
[28] The Environmental Report speaks of 'sebo bovino y otras grasas animales' (beef tallow and other animal fats), neither mentioning what kind of other animal fats, nor the proportion in which they will be used. Nonetheless, it is a safe assumption that they will use residues from industrial beef production, since there is no other animal industry in Paraguay of sufficient size to supply raw materials.
[29] Iniciativa Amotocodie (2021): https://bit.ly/3kpQ0jP
[30] Ministerio de Agricultura y Ganadería, Paraguay (no date): https://bit.ly/3HcFExt
[31] Heñói (2021): https://bit.ly/3l2GuNM
[32] Blog Biocombustible avanzado (2021): https://bit.ly/3wBtXLz; ECB Group (2021): https://bit.ly/30cCMjg
[33] BioRefineries Blog (2021): https://bit.ly/3nXHiLF; Iniciativa Amotocodie (2010): https://bit.ly/3qePQO0
[34] La Nacion (2021a): https://bit.ly/30i41ZJ
[35] As example, see the a) Index of Capacity to Combat Corruption (CCC), created by the Council of the Americas (NYC, USA) and Control Risks (UK), ABC Color (2021b): https://bit.ly/3D8etBe; b) Index of perception of corruption by Transparency International, ICEX (2019): https://bit.ly/3C5wAqn
[36] EBC Group (2020): https://bit.ly/3EibDK1; Ministerio de Relaciones Exteriores (2020): https://bit.ly/3GVbKgi
[37] There are many articles on this regard, such as Iniciativa Amoto-codie (2021): https://bit.ly/3FRZpsr; Féliz et al. (no date): https://bit.ly/3FVFWHE; Jiménez Cortés (2018): https://bit.ly/3D37rwJ
[38] Construction of the substation began in 2019, to distribute power generated by the Itaipu Dam providing availability of output of 9 new Medium Voltage lines to reinforce the electrical distribution system in the Villeta area and its surroundings. The cost of the work (about 24 million dollars) was financed by the Development Bank of Latin America (CAF), the Fund of the Organization of Petroleum Expor-ting Countries for International Development (OFID). See more at ANDE (2020): https://bit.ly/3D6CAAi
[39] Nodal (2021): https://bit.ly/3msI6aa
[40] Idem footnote 20
[41] Idem footnote 19
[42] The right-of-way (servidumbre de paso) is a legal figure contemplated in Article 610 of the Paraguayan Civil Code, which consists of the right of use, without possession, of the property of another person. It is frequently used to grant the right to use a road to small indigenous and peasant communities that remained 'within' large estates.
[43] As mentioned in footnote 24, there is a lot of unclear information regarding the ownership of the land for the plant site and around it. The information provided by the local informants is sometimes contradictory. Same thing with the land ownership and the possibility that ECB (or El Arreglo) bought a different plot of land to build the plant.
[44] Los Puertos Fluvio-Marítimos y su Impacto al Medio Ambiente Humano y Natural, Benvenuto (2013): https://bit.ly/2YEKORq
[45] Wetlands International (2019): https://bit.ly/3F1ha8k
[46] Rojas Villagra (2009): https://bit.ly/3lff2SR; Reporter Brasil (2010): https://bit.ly/30Z5Nj3. For more information on corruption and land ownership, consult Franceschelli (2016): https://bit.ly/3q32ShH and the annual reports of CODEHUPY (Coordinadora de Derechos Humanos del Paraguay) since 1996: https://bit.ly/3GXWorn.
[47] El Surti.com (2017): https://bit.ly/3reVxO5
[48] CODEHUPY (2019): https://bit.ly/3DZSj4N
[49] El Surti.com (2020): https://bit.ly/3HYt2tY
[50] Idem footnote 29