

Submission On
Draft Environmental Impact Statement

Non-Recyclable Plastic To Liquid Fuel Processing Facility

Proposal Application Number 201600038

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The purpose of this submission is to express my strong objection to the proposed Hume non-recyclable plastic to liquid fuel processing facility. I write these comments from the perspective and experience of a 4th year physics and engineering student at the Australian National University who is also a nearby resident to the proposed facility.

1 A Realistic Global Energy Future

Humanity is currently on an unsustainable energy consumption path that will radically alter the planet as we know it today. The proposal by FOY is a deliberate attempt to reinforce these harmful energy consumption habits, by increasing the production and supporting the consumption of fossil fuels. Given the scale of this proposed project, these long-term effects should not be underestimated.

Consequently, this project is not in the interests of any present and future human beings who are subject to inhabiting this planet in the foreseeable future. Any economic and political motivations for supporting this project are subject to interpretation as gross negligence by future generations. The following analysis presents a probable energy scenario for 2050, and highlights how the proposed fuel refinery by FOY undermines the development of a sustainable human society.

1.1 Energy consumption in 2050

The basic metabolic rate for a human being is 80 watts (W). Currently in 2016, the average energy consumption rate of an Australian human being is approximately 7.8 kW. The main environmental challenges facing humanity arise from this difference in ‘necessary for life’ and gluttonous energy consumption, which is powered by unsustainable energy sources. The total world energy consumption for a population of 7 billion people is currently approximately 12 TW.

In 2050, the total global population is expected to be approximately 10 billion people. The average energy consumption of a human being will need to be a maximum of 2kW (with 1 kW dedicated to food production). This indicates that developed countries such as Australia will need to reduce up to 90% of their current energy consumption, and especially fossil fuels.

In 2050, the continuous necessary power needed to ‘run the planet’ will have increased to 20 TW. Fossil fuels are capable of supplying this energy demanded for a limited amount of time:

- Oil for \approx 50 to 100 years
- Gas for \approx 200 to 600 years
- Coal for $>$ 2000 years

However, to avoid dangerous effects of climate change, the temperature of the earth must change no more than 2°C. This means that carbon dioxide (CO₂) emissions must drop to ZERO as soon as possible, and the vast majority of all fossil fuels on the earth must stay in the ground.

It is ironic that the proposed non-recyclable plastic to liquid fuel processing facility, for all of its touted ‘green’ credentials, specifically counteracts and undermines the necessary, dire and long overdue measures needed to limit the production and consumption of fossil fuels.

The feedstock of the proposed facility is comprised of hydrocarbons stored in non-recyclable plastic, which is an incredibly stable form of energy (with a half life on the order of *several hundred years*) that will not contribute to further fossil fuel emissions. The proposition presented by FOY is to liberate the energy of this stable source into a one-off, polluting fuel source. This is the epitome of short-term, misguided and negligent thinking, which will cause unthinkable damage to the planet that will have to be dealt with by generations of the future (including myself).

The draft EIS under 3.2 Other requirements p 27-28 states: “the project will provide ACT RESIDENTS and BUSINESSES access to locally produced cleaner fuels”. However, it is unclear as to how these fuels will be used. What is the quality of the fuel, and does it meet Australian and international standards? Are these standards in line with a global energy future that needs to phase out fossil fuel motor vehicles, for alternate transportation such as electric vehicles and public transportation options based on electric trains? Will the fuel be provided at a discounted rate to the ACT Government to support the ageing fleet of ACTION diesel buses to transmit the pollution from the fuel generated in the proposed refinery to the wider Canberra region? Will independent testing of any fuel produced by the facility be undertaken, to verify the claims presented in the draft EIS (which are indeed only claims, but claims that will be the basis of the argument to approve such a facility, due to the fuel supposedly being extremely pure, refined and not containing or producing any harmful (nano)particulates when combusted)?

While this proposal may be a viable opportunity for short-term commercial gain by FOY Group (FOY), it supports a ‘business as usual approach’ to consume fossil fuels, and does nothing to address fundamental and deep-rooted issues concerning current human energy consumption patterns. If anything, action on the scope of the entire life-cycle of consumer goods could be undertaken to reduce the production of non-recyclable plastic. Given that FOY is a public company that wishes to maximise profits for its shareholders, and given the significant risk of environmental harm (both directly to residents via pollution as well as supporting fossil fuel usage), this proposal is not in the best interests of the local and global community. It is important to note that there are many viable alternatives that should be considered.

1.2 Possible solutions

- (a) Nuclear power has not been adopted in Australia, for environmental and economic reasons. Given that the majority of European reactors (such as in Germany) are currently being decommissioned at significant taxpayer expense, this has been a wise path to take. This is also the case from an energy stand-point.

To supply meet the demands of world energy consumption in 2050 of 20TW, approximately 20,000 nuclear power plants would need to be in operation globally. This means that from today, one power plant has to go online every day, which is clearly unfeasible. Furthermore, current uranium reserves would only last 10 years given current breeder technology.

- (b) CO₂ sequestration requires carbon capture and storage of several gigatonnes (Gt) of CO₂ per year. This involves significant engineering challenges and energy expenditure to extract carbon from the atmosphere and process it for long-term storage. This is not possible in oceans due to the increased ocean acidification, which will affect countless ecosystems and food sources. Given current technology, this is also not possible using in-earth storage methods, which would have to have leakage rates significantly less than 0.1%.

On the other hand, non-recyclable plastic is already in the perfect form for long-term carbon storage. The proposal by FOY would be to use significant energy resources to transport this waste from Queensland, New South Wales and Victoria to the ACT (which is deemed as the 'East Coast' processing facility by FOY), to then use more energy to liberate an unsustainable and polluting source of energy for one-time use, for a product that is otherwise inert and could be stored for alternate uses if it were not subjected to pyrolysis.

- (c) Renewable energy presents the most promising source of sustainable energy and energy security. The main technologies and energy production capabilities are

- Running water: 4.6 TW, with usable energy around 1-2TW due to finite vertical storage space in mountain ranges
- Geothermal: which only works in high enthalpy sites, and provides $57 \frac{\text{mW}}{\text{m}^2}$
- Waves and tides: maximum of 2TW, and requires significant stretches of coastline to produce energy comparable to wind and photovoltaic sources
- Wind: 2-5TW, which would require approximately 2 million - 5 million windmills
- **Direct use of sunlight: solar constant $1000 \frac{\text{mW}}{\text{m}^2}$, potential for 120,000 TW, or 6000x the human energy consumption requirement. Combined with an efficiency of 10%, to power, for example the USA (3TW) this would require approximately 2% of Australian land area, and significantly less than 1% of land area to power Australia (at 0.2TW).** Given recent developments in battery storage technology, this presents a much more viable investment strategy than supporting harmful fossil fuels.

As a species, we must reduce the amount of energy we consume, use energy from a mix of all sources, increase the proportion of renewables while *phasing out fossil fuels*, and in the long-term plan to use solar irradiation to convert solar energy into electricity at an efficiency of 20%. The photovoltaic facility across the road from the proposed FOY site is a prime example of sound investment into a clean energy future. As a result, one must wonder as to the motivations behind the proposed FOY diesel refinery, and whether they are in the best interests of the community.

2 General concerns

2.1 Draft EIS Quality

The 974 page draft EIS is an overwhelming, opaque and misleading document, even to a person with a scientific background. I cannot fathom as to how a member of the general public could extract any meaningful information from this document, not to mention assert the validity of any claims presented.

The final EIS should clarify all relevant environmental, operational, and economic conclusions of the proposed project in PLAIN ENGLISH, but also provide sufficient evidence presented in a scientific (without economic or political bias) and verifiable manner to support any claims by made by FOY or its supposed independent contractors. I believe the current state of the draft EIS raises serious concerns as to the intentions and legitimacy of the proposed project.

2.2 Insufficient community consultation

The community consultation for such a significant project has not included all the relevant stakeholders, if not to say has been non-existent. My place of residence is a mere 3km line-of-sight distance from the proposed location of the facility, while other residential areas are significantly closer at well within 1500 metres to houses. I did not receive any notice from FOY or consultant group PURDON PLANNING in regard to this proposal. Given that 200 tonnes of plastic will be processed daily, in a facility that operates 24/7 and has storage capabilities of 1,890,000 litres of fuel, this immediate proximity of a major industrial facility for the entire East Coast of Australia to local Canberra residential areas should pose a serious cause for alarm among residents.

Given the non-existent community consultation for residents not living on the fringes of Macurthur and Gilmore, I believe the majority of the community is not aware of the plans for this proposed facility, which means that they cannot voice their concerns as I am currently doing here in this statement. This is unethical and negligent in regards to the community engagement process followed by the parties involved, even if they do technically meet the minimum standards as required by law. This does not instil confidence to techniques employed and promises and reassurances made by PURDON or FOY.

Furthermore, given that it appears that FOY purchased land and has been working on the bloated EIS for several months, the very short amount of time provided to digest and provide comment on this document is not satisfactory. Unlike FOY, members of the community do not have the resources (time, money or expertise) to provide detailed validation of all claims in the EIS. This might lead to the belief that the EIS was deliberately constructed in such a manner to discourage community engagement.

2.3 General questions

- Given that prevailing winds will transport any and all pollution from the FOY facility over the mountain ridges of Fadden and Isaacs, to accumulate and concentrate pollutants in eddies on the lee side of the ridge, where residential properties are located, how have the models used in the draft EIS accounted for this effect? Any and all modelling data should be provided in the draft EIS, and the results should be presented both in PLAIN ENGLISH as well offering technical detail for any interested scientific parties, to allow for independent verification of any provided models.

It has previously been shown that the AUSPLUME is not an accurate model for the significant topology of the Fadden and Isaac ridges. How will this be addressed in the final EIS? Will alternate and more detailed models be used? Justifications should be presented using hard scientific evidence, not empty and unverifiable assurances. The engagement with relevant departments of the Australian National University could be undertaken to provide independent and unbiased analysis of any models used and claims presented.

- Will the pollution of the plant in fact be “less than the emissions from a single home wood-fire which sits within residential area” as stated in the community meeting with FOY at Rose Cottage? How should the wording be interpreted? Does it mean that every home owner can consider the pollution to be equivalent to if their neighbour was running a wood-fire oven 24/7? Or that the emissions of a single wood-fire, as usually forming a fixed and localised emissions profile, should be expanded to have the same density profile over the entire residential area? If so, this pollution is not to be underestimated, especially given that the feedstock for the FOY plant could contain many carcinogenic materials which may escape the loading, screening and filtering processes employed in the facility as outlined in the EIS.
- What guarantees will there be that the emissions on site actually meet the criteria stipulated in the draft EIS? Will there be extensive arrays of environmental and atmospheric monitoring sensors? Will this data be provided in an open access manner to the public in real-time, with a high frequency (minute by minute basis) sampling frequency? How far will this network of sensors extend into the surrounding residential areas, to assert the claims that pollution from the facility will not be widespread? If the pollution as measured by the sensors indeed does not meet the claims as presented in the EIS, what specific guarantees and actions will be taken to reduce the pollution? Will this include provisions for shutting down the site?

While FOY group marketing suggests that this facility will improve the green credentials of the city, given sufficient awareness, the majority of intelligent Canberrans should see through this facade to the reality of the situation, which is that this facility will produce an unsustainable product while posing significant risk of pollution and bushfire risk to nearby residential areas.