

Proposed Oil Refinery on Dominica

As the Government suspends plans to build a 10,000 barrel oil refinery to further evaluate the benefits and disadvantages of this project, they would be advised to consider the certain environmental costs against the possible financial benefits.

The Venezuelan state oil company is reported as saying “there will be no environmental impact”. This is impossible.

Environmental Impacts

A typical oil refinery consists of several hectares of complex processing plant, with distillation columns reaching 150ft feet into the sky, many reaction vessels containing highly reactive chemicals and catalysts at high temperatures and pressures, tall “flares” where accidental releases of petrochemicals are destroyed and unwanted gas is burnt creating a highly visible continuous flame on top of a 200ft chimney. The equipment would be floodlit all night with the tall chimneys lit up by red flashing lights.

Due to the huge amounts of energy required, a power station would be built next to the refinery. Precious clean water would be taken from the local supply such as a river. In addition there would be ship jetties and tanks storing crude oil waiting to be refined and finished products waiting for export. Trucks and buses would travel back and forth on the roads transporting building materials and workers.

All these operations will have a significant impact on the surroundings and affect the quality of life of residents, either directly through noise, dusts, smells or unpleasant chemicals, or indirectly through impacts on rivers, forests, fishing, farming and tourism (see below). However, so far, we have only considered the routine day-to-day damage.

Of course, there is a very real danger of an accident occurring – such as an explosion in a processing unit releasing a toxic cloud of gas into the air or a spill of crude oil or gasoline into the sea. Causes could be natural, an earthquake, or human error or even malice. Many fatalities may result and ecosystems will take years, if not decades, to recover. The damage to Dominica’s reputation as an eco-tourist destination would remain long after any oil spill had been cleared up. Potential tourists would believe the entire island “spoiled”; for example, all the beaches and dive sites unuseable, even if they were, say, on the north coast and miles from the site of an oil spill. I believe it is this factor that is crucial.

Economics

Whilst there may be “state of the art” equipment available to reduce pollution from a refinery, it is extremely expensive to install and run. This highlights the economic problems that the smaller refineries have. Due to economies of scale, in the long term, it

is only the large refineries that actually make a profit. Small ones are relatively expensive to run and therefore tend to only make a profit in the good times and actually make a loss the rest of the time. Would Dominica be dependent on President Chavez continuing his special price deal, for the refinery to remain in profit? For large developed nations, where fuel demand is high, it makes financial sense to allow a refinery to be built in their country, although most of the population would much rather not have such obtrusive development. Risks can be absorbed, while the impacts are relatively small compared to the total size of the country.

Finally, the Venezuelan crude oil that President Chavez would be sending over for refining is of poor quality, being high in sulphur and other toxic components. The pollution potential is therefore far higher than usual and the refinery would have to be designed specifically to cope with this, increasing the initial cost. No wonder he is looking for someone else to do it!

This refinery is not the first, and will not be the last, development proposal by a foreign government which could have major environmental impact. Indeed President Chavez is reportedly funding a protective marine barrier, with what environmental consequence? For all major development projects, Dominica needs as wide-ranging and un-biased advice as possible and the people can then decide which projects are of benefit in the long term.

Brief Summary of Environmental Consequences of a Refinery

Air Emissions:

Burning of fuel and waste products creates black soot and the gases which cause acid-rain and smog, and can also affect people's breathing. The Venezuelan crude oil is particularly high in chemicals which have extremely strong smells and there will be noxious odours due to vents and small leaks. It also contains high levels of toxic heavy metals which can be released in the soot. There may also be large amounts of unhealthy chemicals released as dust from the processing units.

Water Emissions

Refining uses large amounts of clean water to wash impurities from the crude. Rainwater run-off will also require treatment as it flushes out oil and dirt from the surfaces within the refinery site. All of this must be treated before release back into the river or sea. Even using the latest treatment process the water will contain some crude oil, dissolved chemicals and solid particles which can cause smothering and poisoning of animals in the water and also upset the crucial balance of surrounding ecosystems. The water may also be hot and relatively acidic. This plume of dirty, polluting water will be carried up and down the coast by currents, thereby affecting a large area of Dominica. At some refineries, scientists consider this water too dangerous to release at the shore and are building expensive pipelines several miles long out to sea.

Solid Waste

At the end of the refining process, there will be large amounts of oily sludge, used chemicals, dirty soil and general building waste which are unwanted: typically, 800 pickup trucks per year. Only a small fraction of this can be easily processed into safe material. In an industrialized country, there will be recycling facilities and other chemical plants which might make use of some of this waste. This will not be possible in Dominica. The island will be faced with an ever-growing mound of waste which cannot be thrown in the ocean or buried without greatly damaging consequences. It will need to retain storage facilities for this to ensure no toxic chemicals leak out to the soil or rivers. Shipping the waste elsewhere would be costly even if it were possible since there are tight controls laid down by international treaties.

When the refinery is no longer needed, or is too out-of-date to be economical, there will be the huge cost of clearing the site and cleaning up the remaining contamination. Who will bear the cost of that?

Fresh Water Use

Large quantities of fresh water are used in power station cooling towers, as boiler feed-water to make steam, and for domestic purposes. In addition, water is required for fire-fighting, cooling water and process water, e.g. to wash impurities from the crude.

Sea Water Use

Sea water is used in heat exchangers to cool process units. Any fish sucked in with the water will be killed. The water is released back, warm, into the sea thereby affecting surrounding marine life.

Accidents and Emergencies

As Dominica is a volcanic island, there is a significant risk of earthquakes rupturing pipes and causing a large explosion or fire. As tankers load and unload cargo, there is always the risk of an oil spill to the sea. This would kill all marine life it touched and poison coral reefs. Oil may leak slowly out of storage tanks, undetected for years, thereby contaminating the soil and groundwater under the tank. Oil can also be released in sudden tank failures, emptying the entire contents into the surrounding area. While not common, these events do occur every year at refineries around the world.

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