



**Review of the Environmental Impact Assessment
done by CL Environmental Co. Ltd.
of the proposed
Jamaica Energy Partners
West Kingston 60 MW power plant
At Industrial Terrace
Kingston
Jamaica**

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This document contains the professional opinion of the Jamaica Environment Trust (JET). In arriving at our opinion we have made every reasonable attempt to ensure that our resource persons are informed and reliable and experts in the area in which their comment and analysis is sought. JET encourages readers to apply their own critical analysis to the information provided in this document and by others, particularly where JET's opinion differs from those others.

With technical assistance from the Environmental Law Alliance Worldwide, the Jamaica Environment Trust (JET) evaluated the Environmental Impact Assessment (EIA) for the Jamaica Energy Partners 60MW West Kingston Plant at Industrial Terrace, Kingston, Jamaica and we hereby respectfully submit our findings in three main areas.

(1) Alternatives

The EIA does not evaluate investments in demand-side management (DSM) as an alternative means of meeting present and future energy needs in Jamaica.

Section 7.0 of the EIA contains an analysis of six alternatives, including the no action alternative, the proposed project, two alternative locations of the proposed project, the proposed project with noise insulation, and the proposed project using LNG or coal as a fuel.

However, Section 7.0 of the EIA does not contain an analysis of the alternative of meeting Jamaica's future energy needs by taking the same amount of money as the cost of the proposed plant and investing this amount of money in DSM projects in Jamaica (e.g. more efficient distribution of electrical energy, more efficient household and industrial uses of energy, etc.)

(2) Human Health Impact of Increased Particulate Matter

The EIA fails to adequately describe and evaluate the human health impact of increased particulate matter (PM) levels caused by the proposed project.

For this project, increased ambient air levels of particulate matter (especially fine and very fine particulate matter) will have greater health consequences than any other air pollutant associated with the project (for example, SO₂ and NO_x).

Section 5.3.1 of the EIA contains a 27-page analysis of how the project would impact ambient air quality in the vicinity of the proposed project.

Rather than describe the human health impact of increased levels of particulate matter (PM) caused by the proposed project, the EIA concludes that the proposed project would have no impact on human health because the predicted increase in particulate matter levels are below "significant air quality impact levels" (SILs). See page 199 of the EIA for a discussion of Jamaican SILs. According to the EIA, the SIL for annual levels of fine particulate matter (PM₁₀) is 20 ug/m³. Also, according to page 217 of the EIA, the highest predicted annual increase in PM₁₀ levels would be 1.2 ug/m³. Hence, according to page 216 of the EIA, there is no reason to inquire further about how the project would impact ambient air levels of particulate matter.

The flaw with this analysis is that human mortality is robustly associated with ambient air levels of particulate matter and that increases of less than 1 ug/m³ can cause significant levels of premature death among a large population, especially a large, low-income urban population.

Dr. Annette Prüss-Üstün of the World Health Organization (WHO) provided JET and ELAW with a spreadsheet that the WHO uses to calculate the disease burden of outdoor exposure to air pollutants, including particulate matter. This spreadsheet allows anyone to input data regarding the size and age composition of the exposed population, the expected increase in ambient air levels of particulate matter, and underlying mortality rates, to generate predictions of how the expected increase in ambient air levels of particulate matter will increase mortality in a particular area.

We used this spreadsheet together with information contained in the EIA. Section 4.10.1.2 of the EIA contains information about the size and age composition of the exposed population. The highest predicted annual increase in PM₁₀ levels would be 1.2 ug/m³. The EIA did not provide information on background levels of particulate matter in this airshed, so we used a study (Urban Air Quality and Human Health in Latin America and the Caribbean – October 2005. Link at:

http://www.webmanager.cl/prontus_cea/cea_2005/site/asocfile/ASOCFILE120051102180008.pdf

which indicates that background levels of particulate matter in Kingston average 69 ug/m³. For underlying mortality rates, we used various health statistics available on the Internet:

See: http://www.unicef.org/infobycountry/jamaica_statistics.html
<http://www.nationmaster.com/country/jm-jamaica/mor-mortality>

After entering this data into the spreadsheet (attached) the calculations show that the expected increase in ambient air levels of particulate matter associated with the proposed project would cause one additional premature death every two years (0.43 deaths per year) among the 76,000 people in the project area from short-term exposures to particulate matter, and would cause about one additional premature adult death every eight years from cardiopulmonary disease and lung cancer (0.161 and 0.015 deaths per year, respectively).

NOTE: This assessment leaves out other effects of increased particulate matter levels, such as respiratory disease, cardiovascular disease morbidity, and asthma attacks.

(3) Available Technologies

The EIA fails to suggest the use of commercially available technologies that can reduce PM emissions from the kind of power plant that JEP is proposing.

JET suggests that Jamaica Energy Partners (JEP) equip the proposed power plant with a Diesel Particulate Filter (DPF) to reduce particulate matter emissions. Currently, according to the EIA, JEP is proposing no mitigation measures for PM emissions. Equipping the proposed power plant with a DPF would prevent the increase in PM levels that we predict could be associated with one additional premature death every two years from short-term exposures to particulate matter, and about one additional premature adult death every eight years from cardiopulmonary disease and lung cancer (see above).

According to a recent submission to the U.S. Environmental Protection Agency (U.S. EPA):

"Technologies to reduce diesel emissions, such as diesel particulate filters (DPFs), diesel oxidation catalysts (DOCs) and selective catalytic reduction systems (SCR) are commercially available today. These systems have been installed on vehicles and equipment both as original equipment and as retrofit technology on over 250,000 nonroad engines worldwide. These technologies have also been equipped on a variety of large stationary diesel engines used for power production. ...

"Diesel Particulate Filters (DPFs) – As noted above, DPFs are commercially available today. Over 150,000 on-road heavy-duty vehicles worldwide have been retrofit with DPFs and over 750,000 new diesel passenger cars in Europe have been equipped with this technology since 2000. At least two engine manufacturers are already offering diesel engines for transit applications integrated with DPFs, with all heavy-duty engine manufacturers intending to include integrated DPFs with all new U.S. highway heavy-duty diesel engines starting in 2007 (to meet EPA's 2007 highway heavy-duty engine particulate standard of 0.01 g/bhp-hr). Engine manufacturers have also begun to include DPFs with new heavy-duty diesel engines in Japan to comply with Japan's 2005 heavy-duty particulate matter standard. In all cases these heavy-duty highway diesel engine applications in the U.S. and Japan will include active filter regeneration strategies to ensure that filter regeneration occurs under all engine operating conditions. In general these active regeneration strategies for highway diesel engine applications include advanced engine controls and/or diesel fuel injection strategies that serve to elevate filter temperatures to levels necessary to ensure regeneration occurs on the vehicle. For nonroad engines, DPFs have been successfully installed and used on mining, construction, and materials handling equipment where vehicle integration has been challenging.

"Large stationary diesel engines used for both primary and back-up power generation have also been installed with DPF systems to control particulate emissions. Perhaps the most comprehensive information on the application of DPFs to stationary diesel engines can be found in the California Air Resources Board staff report issued in September 2003 to support ARB's air toxic control measure aimed at reducing particulate emissions from these engines (ARB staff report available at: www.arb.ca.gov/regact/statde/statde.htm). This report includes lists of DPF applications and reports on operating experience on large stationary engines in California. The California experience includes numerous DPF installations on large engines rated above 600 kW, including Caterpillar 3516 engines rated in the 1490-2120 kW range. Operating experience with these large engine DPF systems has been generally good with DPFs providing 85% or larger reductions in particulate matter compared to uncontrolled levels. Currently one manufacturer has been verified under ARB's diesel retrofit verification program with a DPF technology for stationary diesel engines. This DPF technology has been verified as a Level 3 technology (> 85% particulate matter reduction) for a wide range of diesel engines used in stationary applications covering model years from 1996 through 2003 engines. Additional verifications of retrofit DPF technologies for stationary engines are expected under this ARB program."

See: WRITTEN STATEMENT OF THE MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION ON THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED CONSENT DECREE, CLEAN AIR ACT CITIZEN SUIT DOCKET ID NUMBER OGC-2004-0007.

<http://www.meca.org/galleries/default-file/consentdecreecomments082304.pdf>

**Submitted by: Jamaica Environment Trust
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