

**Eco Green Generation LLC Comments to 2019 Draft State Implementation Plan  
to Reduce PM 2.5 Air Pollution Subject to an EPA Serious Nonattainment Designation  
in Fairbanks North Star Borough**

Dated, July 25, 2019

**I. Basic Premise**

Alaska Department of Environmental Conservation (DEC) has failed to consider reasonable “Best Available Control Technology” solutions currently commercially available to resolve the serious nonattainment of PM 2.5 pollution in FNSB. Specifically, a change of fuel to clean burning propane, the introduction of existing highly efficient propane combined heat and power systems, new highly efficient wind turbines, high efficiency propane furnaces and hot water heaters for residences and in transportation newly developed propane engines for school buses have not been adequately examined by DEC to date.

**II. Introduction - What is Best Available Control Technology for FNSB**

Section 169(3) of the federal Clean Air Act defines BACT as follows: The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutant which will exceed the emissions allowed by any applicable standard established pursuant to section 111 or 112 of this Act.

A notable characteristic of the federal BACT definition is the direct authorization to consider alternative production processes and available methods, systems, and techniques, including fuel cleaning. As a result of this provision, BACT evaluations are not limited to add-on control technology and include pollution prevention measures as well as any other potentially feasible methods of reducing emissions. Even changes in basic equipment, fuels, and material substitutes are to be considered.

### III. BACT - Examining “Environmental, Economic and Other Costs”



- a. *Environmental*, Stationary Sources, Power Plants: what available fuel(s) produces the least amount of PM 2.5, NOx and SOx? The definition states that BACT "means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility." Eco Green Generation LLC in its Request for Re-Hearing, FERC Docket No EL 19-53-000, July 5, 2019 identified in terms of the reduction of tonnage per year of PM 2.5, NOx and SOx the improvement that the use of methane or propane used in new state of the art cogeneration systems will produce. The conclusion was that up to 94% of the existing PM 2.5, NOx and SOx from Golden Valley Electric Association (GVEA) FNSB equipment located in the serious nonattainment zone will be eliminated. It should be noted that propane cogeneration equipment is not new, it is commercially available and it is getting more efficient. For example, the North Slope operations have used propane for power for decades.

Generally, 25% of the FNSB PM 2.5 air pollution is caused by stationary power plants, 50% from residences burning wood and 25% from transportation sources. If the

Golden Valley Electric Association's power plants inside the serious nonattainment zone produce 20% of the overall PM 2.5, NOx and SOx then implementing propane cogeneration in stationary power plants will result in an estimated 18% reduction in the overall PM 2.5 pollution.

b. Environmental, Stationary Sources, Residences, Propane Furnaces and Appliances:

Bulk propane will generally cost the equivalent of low sulfur diesel based on energy content measured in Btu's. If residences convert from wood stoves to propane nearly all of the PM 2.5 and a large percent of its precursor gases NOx and SO2 are eliminated. Home delivery of propane to an onsite tank and new furnace will require each homeowner to install replacement equipment. See Economic discussion below.

It is estimated that up to 12,000 wood stoves are in use in FNSB. Clean burning propane is capable of home delivery to every residence. New commercially available propane furnaces are 95-97% efficient. It is estimated the replacement of 6,000 wood stoves with propane furnaces will eliminate up to 25% of the overall PM 2.5 pollution.

c. Economic, Stationary Source Power Plants

In its FERC filing Eco Green identified that the health care cost of pollution just from the GVEA power plants located in the serious nonattainment zone costs the FNSB residents \$35 million annually. The replacement with propane and wind hybrid power will reduce health care expenses by \$32 million annually.

It is estimated that the current draft SIP will require GVEA to add new exhaust scrubbing equipment and new fuel for some units all costing up to \$110 million the first year with up to \$43 million per year thereafter in increased fuel costs. Eco Green's FERC filing indicates that FNSB residents can save on both the capital cost for emissions equipment and save the additional cost for lower sulfur fuel (up to \$43 million each year). The Eco Green proposal to GVEA is to sell wholesale power to GVEA at GVEA's cost avoided rate and will not charge FNSB residents for any of the new equipment.

BACT is not limited to additional emissions equipment, but it can include entire new system equipment, fuels and processes. Another significant economic advantage and corresponding environmental advantage is each of the cogeneration facilities will provide district heat in addition to power. This heat will be in the form of hot water and will cost less than the existing equivalent heat generated in schools and government buildings. Less heating oil and diesel will be consumed by the schools and government buildings thereby providing a corresponding reduction in the amount of pollutants released into the air shed. None of the GVEA power production equipment is currently being used for district heat. The new cogeneration equipment is twice as efficient in producing heat and power as the existing power equipment.

d. Economic, Residences

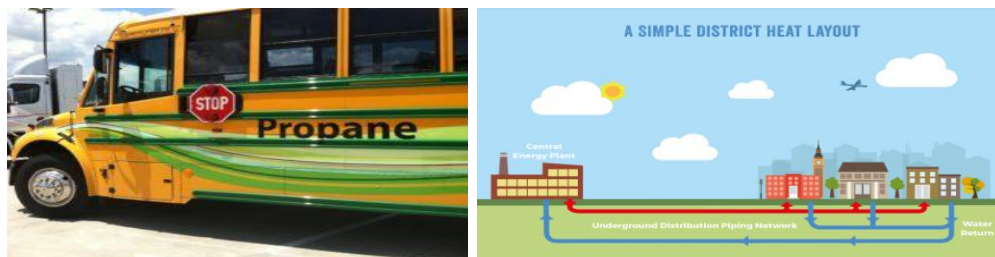


Propane is a complete change of fuel solution and the key to its adoption is price. The price point to be achieved is the price of delivered wood and its incumbent heating cost when furnace efficiency and moisture content of the wood are included. Previous SIP's have sought to address wet wood, ie that wood that has greater than 20% moisture content. The unfortunate truth is almost all wood in FNSB is consumed with more than 30% moisture content. Wood stoves are inefficient burning at a below 60% efficiency while new propane stoves are 95% efficient. An additional fairy tale is to replace old wood stoves with newer "EPA Certified" wood stoves. The problem is that just after a few months of continuous operation, even the certified wood stoves burn poorly.

The proof is the experience of Libby, Montana who more than 10 years ago replaced over 90% of the existing wood stoves with EPA certified stoves. Today, the amount of pollution in Libby is the same as it was before the change out. FNSB has nearly the same levels of pollution today as 3 years ago despite the change out of hundreds of wood stoves. In reality, the only effective solution is to bring in and utilize a new cost effective cleaner fuel, that being propane.

The costs of a furnace/appliance and storage tank change out is between \$5,000 and \$10,000. It is anticipated that a combination of federal grants and low interest loans will allow even lower income families to stop burning wood and use propane instead. In 5 to 10 years, the majority of wood stove users can be converted to propane.

e. Other costs



Transportation, Pollution can be effectively reduced with the adoption of propane school buses. Denali National Park uses propane buses already. For example, in San Diego, California air quality is an issue. For decades, reducing emissions including greenhouse gas, NOx, and carbon dioxide has been one of the goals of San Diego's Metropolitan Transit System. However, until recently, the organization's fixed-route mini bus and paratransit routes still ran on gasoline. In fall 2016, that changed when MTS added 77 propane autogas vehicles to its mini bus and paratransit fleets, which reduced both fuel costs and emissions.

## RESULTS

- With its first 77 propane autogas buses, MTS will remove more than 2 million pounds of greenhouse gas produced by its bus fleet each year.
- MTS found that incorporating propane autogas into its fleet was seamless for operators, maintenance, and its board of directors.
- MTS achieved a first-year savings of \$750,000 operating the 77 propane autogas buses, with a potential for more than \$2 million in annual fuel savings once the rest of the fleet is converted to propane autogas over a five-year period.

In addition to reducing PM 2.5 and NOx, a fuel savings of approximately 35% compared to diesel and 25% savings in maintenance costs is reported by school and transit districts that adopt propane buses.

Last week, (July 2019) a study in Georgia compared academic achievement of school children riding propane buses versus diesel buses. The results showed students riding on propane buses achieved higher test results. This finding dovetails with the extensive discussion in Eco Green's Request for Re-Hearing with FERC where two studies, one in Spain and another in the US showed PM 2.5 pollution causes cognitive impairment in the brains of children between 0 and 8. Little boys are especially at risk as they will have reduced academic achievement, reduced lifetime earnings and an increased percentage of criminal behavior.

District heat, The introduction of cogeneration facilities will produce district heat in the form of hot water. Most of the facilities will be located near schools thus allowing neighboring residences and businesses the ability to be plumbed with hot water. This hot water will displace a significant amount of heat supplied by fuel oils. The hot water is a co-product of the production of electricity from the new propane cogeneration facilities.

#### IV. Renewables – Why More Wind Helps



##### a. Environmental

BACT requires DEC to examine alternative equipment to replace stationary sources of pollution. BACT requires consideration of the most pollution limiting option. So, why has electricity from wind turbines not been thoroughly vetted by the DEC draft SIP? Included in this required examination is whether or not wind turbines could replace existing stationary sources. Wind does not produce PM 2.5 pollution. The current 2019 DEC Draft SIP is devoid of such discussion. The lack of a complete examination is an axiomatic failure by DEC to comply with EPA BACT regulations.

A complete review of wind will examine whether there are sites with appropriate wind regimes that can provide FNSB with wind generated power. In fact, an existing wind farm in Delta Junction, and a licensed public utility in Alaska, developed by local owners has over the last 10 years established the site as containing a world class wind resource. Earlier this year Eco Green Generation proposed the inclusion of 42 MW of highly efficient wind turbines at the Delta Junction wind farm combined with the production from state of the art propane cogeneration units in FNSB.

The wind production in Delta Junction during the four key winter months that suffer the greatest amount of pollution is a majority of its annual production. This timing is beneficial as wind produced electricity is available during the most severe air pollution days. The Delta

Wind farm will replace approximately 1.8 million gallons of diesel annually and eliminate an 800 mile round trip by 90 tandem tank trucks.

*b. Economic*

The economic benefits from the wind farm are significant. Currently, the DEC SIP focuses on upgrading antiquated power production facilities of GVEA with Selective Catalytic Reduction units that only address the reduction of NOx and have no impact on SOx and little effect on PM 2.5. The capital cost of these upgrades is in the tens of millions and will be passed directly to all GVEA members. Whereas, the developers of the Delta Wind Farm will not charge the public for the wind farm equipment. Rather, the electricity will be sold wholesale to GVEA and the price will be at GVEA's "cost avoided" rate approved by the Regulatory Commission of Alaska.

Retiring the antiquated GVEA power plants in Fairbanks and Healy One can save rate payers up to \$150 million in unneeded emission upgrades that at best just "put lipstick on an already sick cow".

The DEC SIP proposes significant increases in fuel costs to obtain fuels with lower sulfur content. The diesel#1 that is proposed may cost rate payers in FNSB an additional \$43 million per year. Contrast that increase in fuel cost with zero cost increase by adopting the propane/wind hybrid system. The propane costs will be assumed by the developer and the price paid is again based not on the cost of the propane or the operational costs of the wind farm, but on the cost avoided rate of GVEA.

Returning to the annual health care costs paid by the residents of FNSB, the initial cost difference between propane/wind and the existing GVEA equipment emissions is \$32 million per year. Even after new emissions equipment is added to old outdated equipment, the emissions of the upgraded equipment will still exceed the health care costs associated with the state of the art propane/wind option.

**V. Conclusion**

For a moment, imagine you are a parent of small children and are considering moving to Fairbanks. This parent now understands the existing air pollution not only causes lifetime health issues but it also impairs cognitive abilities especially in little boys that may limit their educational achievement, reduce their lifetime earning capacity and put them more at risk of criminal behavior. Now DEC's SIP at best shows they will be part of repaying over \$150 million of capital emission equipment costs while also incurring more expensive power every year thereafter resulting from the substitution of more expensive fuel.

Then the coup de gras, at its best, DEC's proposal will take 5 years to reach targeted attainment while the propane/wind solution will reach it in as little as 18 months. The choice between the two options is an easy one for any alert parent. Sooner, less money verses longer and a lot more expensive, how is it that DEC thinks an old cow with new lipstick should even be in consideration?

Respectfully submitted,

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