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June 14, 2010

Dear Southern Alliance for Clean Energy (gulfchallenge@cleanenergy.org):

My name is Alachua Haskins and I am nineteen years old. I am a rising sophomore at Brandeis University in Waltham, MA and am working at the Florida State University Center for Economic Forecasting and Analysis (CEFA) in Tallahassee, FL this summer.

During the past two years, I have spent considerable time abroad. Between August of 2008 and January of 2009, I spent four months studying in a high-school program in Israel, while living on a kibbutz. Between high school and college, I lived for 10 months in Poland, working as the assistant to Poland's only female Rabbi, assisting her in building a Progressive Jewish community in Krakow.

During my time abroad, particularly in Poland, I was constantly impressed by the extent to which people elsewhere base their aspirations on what they believe to be the American way of life, and on their perceptions that we are a creative, resourceful, responsible people. As a result, I have developed a strong belief that we have responsibilities to live up to -- not only to ourselves but to the global community that depends upon us. If we do not conserve our resources, if we do not prioritize being independent of the resources of others, and if we do not act with respect for our environment, we will not only fail ourselves by becoming a second-rate power, falling further and further into debt, but we will also fail to honor the respect and dependence upon us of peoples throughout the world.

Accordingly, I believe that being responsible about the use of our energy resources, and prioritizing behavior that is less self-indulgent, is of the highest importance to current and future generations, to America, and to the world. Please see attached; my plan for the Clean Energy Gulf Challenge, outlining a detailed policy and technology discussion explaining how America can end domestic oil production in the Gulf of Mexico and oil imports from the Persian Gulf.

Sincerely,

Alachua Haskins

Love Your Waste; Hate Your Car

Introduction

In response to the Clean Energy Gulf Challenge, an innovative and visionary approach to engage the public in eliminating America's dependence upon oil from the Gulf of Mexico and the Persian Gulf is presented below. These sources constitute 7% and 13%, respectively, of our annual use of oil. Accordingly, the Plan set forth below reduces America's use of oil by slightly more than 20% by the year 2020. Because of the necessity of ramp-up, as well as gaining public acceptance, it is anticipated that the rate of implementation of the technologies and conservation programs described below will be lower in the first five years (2010 – 2015) than in the succeeding five years (2015 – 2020).

Table I shows, in a simplified format, the anticipated percentage of oil reduction that will result from the implementation of the following four methods.[1] The numbers in Table I are based on the reductions that will occur from the implementation of the Plan, but this tabular format can be used to map out other combinations of energy-related policies.

Table I

	Percent Decrease by 2015	**Percent decrease by 2020**
Plan Type		
Electrification of Vehicles	2.4	6
Infinitely Variable Transmissions	2.72	6.8
No-Drive Days	1.52	3.8
Waste-to-Energy Plants	1.4	3.5
Total Percent Decrease:	8.04	20.1

I. Electrification of Vehicles

- *Based on a Model Developed by "Better Place"*[2]

1) Environmental Sustainability

Currently, in the US, 40% of our oil is used to power cars and SUVs; and consequently, a transportation system based on renewable energy would be highly beneficial. In Palo Alto, the startup company Better Place (founded 2007) became the highest-funded green startup in history, funded by $200m of venture capital and investment bank money. The company has invented an infrastructure and network necessary for "mass electrical car adoption." Cars run on lithium-ion batteries, containing 95% reusable materials, and the battery switch stations owned and operated by Better Place are designed to be powered by solar panels so they will not offset oil saved by the amount of electricity being used by Better Place to re-charge batteries.

2) Technological Capability

Under the plan developed by Better Place, the batteries will be owned by Better Place, and leased to car owners. Each battery is expected to perform for over 8 years and 2,000 recharges. Each customer will be supplied with his personal 220V charge spot, and charge spots will also be installed at

[1] Numbers in the 2015 column are 40% of the numbers in the 2020 column

[2] This proposal is advocating for a model similar to Better Place, not advocating on behalf of Better Place itself

workplaces, public parking lots and along urban streets. In addition, battery switch stations will be placed throughout the country so that when a driver is traveling away from home, and cannot afford to wait while his battery is recharged, the battery in his car can be exchanged expeditiously for another battery. These stations are being designed for an automated, robotic, exchange, as the car proceeds along a conveyor belt, taking less time than a stop at a gas station, and where the driver does not even have to get out of his car. The worry of being stranded with a dead battery that has caused many to be skeptical of the electric car would no longer be a concern.

3) Timing and Estimated Cost of Implementation

It is not realistic to expect a majority of cars to become electrified in 10 years because cars are durable goods, and because biases of consumers toward gasoline-powered transmissions are deeply engrained. However, if fifteen percent of our cars were equipped with rechargeable batteries by 2020, our oil consumption in the U.S. would be reduced by 6%. This calculation is based upon the following: 40% of the annual consumption of oil in the United States is for gasoline used in passenger vehicles.[3]

Since the electrical cars would not be equipped with either a battery or the variety of parts necessary to make up a fuel transmission system, they would cost customers less than cars as currently equipped. Customers would then rent their batteries from Better Place, or a competitive company, at a price that would be lower, per mile, than the cost of fuel. The capital costs to Better Place would include not only the costs of establishing thousands of battery switch stations throughout the United States, but also the costs of inventorying hundreds of thousands of lithium batteries (currently approximately $10,000 per battery). However, it is expected that the costs of batteries will steadily decrease, similar to the rapidly decreasing costs of computers. The costs associated with generating solar energy have also been rapidly declining; and accordingly, the capital and operational costs associated with constructing and operating battery switch stations should decline.

4) Public/Private Investment Strategy for Plan Execution

Better Place is currently funded by private investment, and has raised $200 million to date. As the business becomes bigger and more successful and the prices of batteries and costs associated with constructing solar-generating switch stations drop, we can anticipate that the capital requirements of Better Place can be supported by a combination of revenues which are retained by the company as well as one or more public offerings. It is also feasible to contemplate that a franchise network could be developed, and recharging stations therefore would be funded and operated by thousands of independent proprietors.

The promise of this route to fuel-conservation has been recognized by Brandeis University International Business School which has just awarded Better Place the 2010 Asper Award for Global Entrepreneurship.

II. Modification of Transmissions in Vehicles Powered by Fuel Oil

- *Based on a Model Developed by Torvec, Inc. and VMT Technologies*

1) Environmental Sustainability

In the past ten years, at least two companies (Torvec, Inc., located in Rochester, New York, and VMT Technologies, located in Provo, Utah), have developed sophisticated technologies for substituting what are known as infinitely variable transmissions for converting conventional transmissions that utilize anywhere from three to six gears. Instead of shifting from one gear to the next three to six gears, these

[3] http://www.nrdc.org/air/transportation/gasprices.asp, with further calculations: .15x.40=.6

variable transmissions smoothly evolve through infinite increments of ratio change, and in the process eliminate the need for clutches, torque converters and other costly parts. The claimed potential savings of these patented technologies are 8% of annual fuel usage in passenger vehicles. [4]

2) Technological Capability

The failure of automobile companies to capitalize on these developments to date can be attributed to the financial difficulties these companies have been suffering in the past few years. However, at the present time, prototypes incorporating these technologies are being actively tested by a number of these companies, such as Dodge. The technological capability is existent, and will be proved through the testing of prototypes. If, as projected in item 1, 15% of vehicles by 2020 are battery operated, 80% of the remaining 85% of vehicles would equate to 68% of vehicles on the road. That, in turn, would translate into a savings of 6.8% of the annual consumption of oil in the United States.

3) Timing and Estimated Cost of Implementation

Under the Plan, the tooling necessary to incorporate infinitely variable transmissions would begin within the coming year; production of cars and SUVs incorporating this technology would immediately ensue, and over the succeeding nine years, as new vehicles replaced currently existent vehicles, 80% of passenger vehicles on the road (that were not electrically powered vehicles) would be fitted with infinitely variable transmissions. It is anticipated that the retail cost of a vehicle incorporating an infinitely variable transmission would not exceed the cost of a currently available vehicle.

4) Public/Private Investment Strategy for Plan Execution

Automobile companies will be able to incorporate the new technology into their normal retooling costs, without the necessity of further public/private investment.

III. No-Drive Days

- *Energy Conservation for Transportation*

1) Environmental Sustainability

The United States consumes approximately 20m barrels of oil/day, with passenger vehicles consuming 8m barrels of oil/day.[5] If each individual were required to choose one day per week, per car owned, on which our car could not be on the road, there would be a significant decrease in the amount of fuel consumed. People would be constrained to plan their affairs, outside of the house, so as to consolidate them within six days. For those who felt the need to be traveling outside of the home on all seven days, they would be required to engage in car-pooling arrangements; or where a household owned more than one car, the members of the household could share a car. In California, Miami and elsewhere, car-pooling is already encouraged through the use of "fast lanes", during commuting time, for cars carrying two or more persons.

The system would be enforced by requiring each car to have a permanent sticker indicating the no-drive date. Any car on the road on a prohibited day would be ticketed in the same fashion as a car traveling with an outdated license plate or no license plate. Those revenues could be used for energy efficiency and low income loans. The system would be designed in a flexible enough manner so as to enable a citizen, whose preferred no-drive day changed, to exchange his sticker for another sticker.

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[4] www.torvec.com/products_ivt.html, www.ezinearticles.com/?VMT-Technologies-Announced-Green-Transmission-For-SUVs-and-Trucks&id=3201010, .8x.4x.25

[5] http://www.nrdc.org/air/transportation/gasprices.asp

Such a system is practical because there are few people who could not find one day in which being at home was feasible.

2) Technological Capability

No technological capability would be necessary. The program would not necessarily save 1/7 of the fuel currently used in passenger vehicles. However if fuel usage in passenger vehicles, utilizing gasoline, were reduced by at least 1/9, there would be a 3.8% annual savings in the total amount of fuel utilized in the United States. [6]

3) Timing and Estimated Cost of Implementation

If the system were enforced as a federal mandate upon the states, as a condition of receiving federal highway funds, adoption in all fifty states could be fully implemented by the year 2020. The costs of implementation would be similar to the costs involved in implementing similar vehicular requirements, principally the licensing of all vehicles to be on the road.

4) Public/Private Investment Strategy for Plan Execution.

No initial public investment (or funding) would be required, but it could be beneficial to set aside some of the money earned through ticketing to be used for marketing and advertising.

IV. Waste-to-Energy Plants [7]

- *Based on a Model of Waste-to-Energy Plants in Denmark*

1) Environmental Sustainability

Americans are opposed to incineration inherently because of the image of toxic air pollution that it brings to mind. However, the majority of waste emitted is CO_2 (neutral biomass). Landfills produce roughly twice as much climate-warming gas, including methane, and CO_2 is approximately 20 times less potent than methane. The modern facilities that have been developed, particularly in Europe, are equipped with dioxin cleaners. The practice of incinerating trash has been labeled as "the most environmentally friendly destination for urban waste that cannot be recycled" according to a 2009 study by the EPA.[8]

2) Technological Capability

Denmark, a country of 5.5 million people, now has 29 plants. America, a country of 300 million people, has 87 plants. The acceptance of plants is so high in Denmark and across Europe (home to 400 plants) that they are able to be placed directly in the communities which they serve, as they are quiet and odorless. In the city of Horsholm, 80% of its heat and 20% of its electricity comes from burning trash. Waste-to-energy plants in Denmark generate enough power to meet the needs of nearly 2.4 million homes. While approximately two-thirds of waste is recycled in Denmark (compared with less than 25% in the U.S.), 26% is incinerated, and only approximately 8% is transmitted to landfills. The use of incineration to dispose of waste has also gained large acceptance in other European countries, including France and Germany.

[6] 1/9 x .85 (the percentage of cars utilizing gasoline, based upon the assumption that 15% are utilizing batteries served by Better Place) x 40% = 3.8%.

[7] The information in this section, unless otherwise cited, is from http://viewer.zmags.com/showmag.php?mid=wsdps

[8] http://www.nytimes.com/2010/04/13/science/earth/13trash.html

By the year 2020, incineration plants could be constructed and operational in 40 of the largest municipalities in the United States. From the areas served by these facilities, it is planned that 60% of the 250 million tons of waste generated annually in the United States will be incinerated[9] (whereas this is approximately twice the percentage of waste that is incinerated in Denmark, the percentage of waste in the United States that is recycled is less than 25%, compared with approximately 67% in Denmark, leaving a much greater proportion of waste available for incineration in the United States). Based on statistics generated in Denmark, 125 million tons of waste should produce an amount of energy (in the form of heat and electricity) equivalent to the energy produced by 3.5% of our annual consumption of oil. In Denmark, the relative proportions of heat and electric produced by incineration plants were 4.33 MWh of heat per 1 MWh of electricity.

3) Timing and Estimated Cost of Implementation

Waste-to-energy plants may cost up to $200 million a piece to build (roughly the same cost as a 60mw biomass plant), and it is anticipated that the construction period for a plant is two years.

4) Public/Private Investment Strategy for Plan Execution

In Denmark and other European countries that substantially utilize incineration as a method of waste disposal, incineration plants are typically owned and operated by the municipalities in which the facilities exist; and accordingly, it is anticipated that costs of construction in the United States would be financed through borrowings (e.g. bond issuances) by the municipalities in which such facilities existed, or otherwise by public funding. Data developed in Europe indicate that the ongoing costs of transmitting waste (other than waste which is recycled) from the geographical areas serviced by an incinerating facility should not exceed the costs of transporting waste to landfills. Conversely, whereas waste transmitted to landfills produces no benefits to offset the harmful environmental attributes and consequences of traditional landfills, the benefits of incinerating waste are the energy that is produced, as well as a reduction in the harmful emissions from a well constructed incineration facility vis-a-vis a landfill.

Conclusion

We are at a critical turning point in moving America away from her dependence on "Gulf oil." The American Power Act calls for the reduction of oil by 17% by the year 2020 in order to jumpstart America once and for all to make a shift to renewable energy. By implementing the Plan, we can do even more. By combining electric cars, infinitely variable transmissions, no-drive days and waste-to-energy plants, we can reduce America's oil consumption by slightly more than 20% by the year 2020.

[9] http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw2008rpt.pdf