To: WSES Vice President
From: Ross Fischer
Subject: Potential for Energy Investment in Cuba
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The main purpose of this report is to explore the possibility of expanding Western Slope Energy Systems (WSES) investments to the Cuban Energy Industry and explore the impacts these projects have in Cuba. Furthermore, the report will describe the history and current state of the Cuban Energy Revolution, and explain two potential current investment opportunities. In summary, Cuba shows active interest in attracting Foreign Direct Investment (FDI). Similarly, the US is relaxing restrictions on trade and investment; On October 14, 2016, the U.S. Treasury department announced new amendments to the Cuban sanctions including humanitarian-related transactions. Because of these new amendments, WSES is now legally allowed to invest in Cuban Energy.

Cuba's "Revolución Energética", or Energy Revolution, kicked off in 2006 to address the country's energy crisis: too much oil was being imported and the electricity infrastructure was outdated and at the mercy of tropical storms. Cuba's plan to fix the crisis addressed five points: energy efficiency, availability, use of renewable resources, use of local oil and gas, and international cooperation (Guevara-Stone, 2009). Cuba managed to switch to a decentralized power distribution system, which not only increased reliability, but increased the percentage of the population served. They have also managed to bring electricity to more than 10,000 people in isolated areas by using renewable energy resources (Mira Käkönen, 2014). One of the biggest day-to-day impacts on the Cuban people was the government initiative to replace many outdated and inefficient household appliances (Hernandez, 2013). Figure 1 shows an outdated, 50's era American fridge in a Cuban woman's apartment. The government replaced many units for free and covered half the cost of larger appliances like fridges. Unfortunately, many people's "fridge debt" put an enormous economic burden on them. This was magnified since the Chinese appliances were of poor quality and often needed repairs. Nonetheless, the Cuban government is still moving forward with the energy revolution.

Figure 1. An old, American fridge in a woman's Havana Apartment. (Goitia, 2007)

In March of 2014, Cuba passed the Foreign Investment Act which incentivized investing in all sectors (Feinberg, 2014). Later in 2015, the Cuban Ministry of Foreign Trade and Investment published *Portfolios of Opportunities for Foreign Investment* which summarized the oil and renewable energy industries (Cuban Ministerio del Comercio Exterior y la Inversion Extranjera, 2015). Items like current capacity, workforce, and plant locations are provided for investors (Cuban Ministerio del Comercio Exterior y la Inversion Extranjera, 2015). Cuba aims to expand their renewable energy resources from 4% to 24% of total production by 2030 (José Antonio Suáreza, 2012). A few projects helping with this goal are two new biomass plants in the provinces of Cienfuegos and Ciego de Ávila. Each will output 60 MW, and their documents are currently awaiting final approval (Salomón, 2016). Figure 2 shows one of the processes that will be used in the new plants.

Figure 2. Waste from sugarcane processing (bagasse and straw) in the process of being converted into a biofuel. (Echevarría, 2016)

Included in the *Portfolios of Opportunities for Foreign* Investment, Cuba has outlined opportunities for FDI. There are various oil exploration and drilling projects available, but there are also more sustainable projects. One option is a 174 MW windfarm located in the Maisí municipality along a coastal strip. The current plan is to install four adjacent wind farms 200 meters from the coast. Additionally, there would be an expansion of the local electrical network, internal communications, and substations to link the turbines to the grid. The estimated investment is $286.5 million USD. A second option is an expansion of photovoltaic solar parks in western Cuba. These western, tropical, Cuban climates provide an average solar radiation of 5 kWh/m^2 with little seasonal variation (Judith A. Cherni, 2009). This is a favorable level for solar electricity production. The project would generate up to 100 MW of energy at a cost of $200 million USD ($2 USD/kW). Both projects would direct their electricity to the national electric system to reduce the use of fossil fuels.

When a new opportunity for FDI opens, it is usually because of a political or economic change. In this case, both have happened. Cuba has provided incentives for FDI to strengthen their economy and infrastructure; and under President Obama the U.S. has tried to rebuild relations with Cuba. A benefit of sharing wealth incentives both countries to keep a healthy relationship. There are impacts reaching further than economics or politics; the environment, society, and people's lives are changed, too. Most apparently, the economy is boosted when foreign money is moved into the country through investment projects. No matter the type of energy development, jobs will be created and established industries will have the chance to support or grow from the new developments. When energy capacity and competition is increased, it becomes easier and cheaper for towns to light their streets, improving safety. Similarly, people may not experience blackouts or as high of a utility bill. Energy intensive industries like mining, petroleum refining, and chemical production that have been prohibited from starting can do so now because of access to energy. Another benefit is the increased collaboration between people; when introducing new ideas and technology to another society, there are indirect benefits like the increase in human capital and competition. These sort of human resources can propel a society to be self-sustainable and efficient.

Despite these benefits, there are drawbacks associated with growing. Expanding an economy, increasing consumption, and generally having a high standard of living can't be done without environmental impacts. Despite expanding renewable energy capacity relative to non-renewable, both types of energy will still rise in Cuba in the short run. This means more oil, coal, and pollution. Even if Cuba only used solar panels, for example, the amount of land needed to install them would be immense and many natural habitats would be destroyed. Economically, some people warn that FDI will only benefit the host country in the short run, and the majority of profits will return home. Similarly, some people liken FDI to a sort of "economic colonialism" in which foreigners have more power in the country than they should. Historically, however, countries in isolation have grown at a much slower pace, and so FDI is allowed.

In order to further develop Cuba's energy infrastructure, we must navigate through the United States' Code of Federal Regulations (CFR). In October, 2016, The Treasury announced amendments made to Cuban Sanctions and regulation §515.591 was added to the title 31 of the CFR (U.S. Government Publishing Office, 2016) which states:

> "Persons subject to the jurisdiction of the United States are authorized to provide to Cuba or Cuban nationals services related to developing, repairing, maintaining, and enhancing Cuban infrastructure that directly benefit the Cuban people, provided that those services are consistent with the export or reexport licensing policy of the Department of Commerce. For the purposes of this section, infrastructure means systems and assets used to provide the Cuban people with goods and services produced or provided by the public transportation, water management, waste management, non-nuclear electricity generation, and electricity distribution sectors, as well as hospitals, public housing, and primary and secondary schools. This authorization includes projects related to the environmental protection of U.S., Cuban, and international air quality, waters, and coastlines."

In other words, investment for electricity generation and distribution is now allowable - so long as the services are consistent with the export or reexport licensing policy of the Department of Commerce. As explained by the licensing policy §746.2, Western Slope Energy Systems may export or reexport without a license if our transaction meets any of the Bureau of Industry and Security's license exceptions (U.S. Government Publishing Office, 2016). One of the exception is titled "Support for the Cuban People (SCP)" and explained in regulation §740.21. Based on this section, WSES qualifies for a license exception because our investment: improves living conditions and supports independent economic activity, may be used to improve communications, and facilitates engagement, communications, and commerce (with the U.S.). Any

of these arguments are sufficient to prove our “Support for the Cuban People.” And thus WSES is allowed to legally expand investment to Cuba.

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