



# POWERING THE REVOLUTION

## AN ASSESSMENT OF CUBA'S RENEWABLE ENERGY

FOCUS QUESTION: HOW IS THE DEVELOPMENT OF RENEWABLE ENERGY CREATING OR HELPING GREATER ACCESS FOR CUBAN INDIVIDUALS?

### BACKGROUND

- Cuba is a **sugarcane** monocultural economy that lacks major national industrial development
- U.S. intervention led to an attempt to revamp the Cuban economy through tourism, but only led to a **cycle of U.S tourist dollars to U.S. owned entities**
- Prior to the collapse of the Soviet Union, Cuba heavily relied on **imported oil** from the country
- After the collapse of **Soviet Union**, Cuba tapped into its own oil reserves and also opened trade relations with **Venezuela**
- Biofuels were used in conjunction with heavy oil use
- **Several conditions** led to Cuba's decision to take on renewable energy; collapse of the Soviet Union, economic crises, U.S trade sanctions, hurricanes, oil dependency

"In 2014, the Cuban government announced plans to generate 24 percent of the country's electricity from renewable sources by 2030, with an installed capacity of up to 2GW." - Renewable Energy World

### LA REVOLUCIÓN ENERGÉTICA

- Three sectors were **prioritized** in "The Special Period of Peacetime," preceding the revolution:
  1. Energy efficiency
  2. National Crude oil
  3. Sugar Industry
- Early stages of the revolution involved replacement of inefficient household appliances and lightbulbs
- The Energy Revolution is based on **six fundamental building blocks**:
  1. Improve energy efficiency through replacement of inefficient appliances and lightbulbs
  2. Complement large central power plants and improve transmission and distribution networks
  3. Develop renewable energy projects
  4. Increase exploration and production of country's fossil fuel deposits
  5. Increase international cooperation
  6. Raise public awareness

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Sugarcane - <https://simple.wikipedia.org/wiki/Sugarcane>  
Wind Turbines - <https://cleantechnica.com/2012/07/27/wind-turbine-net-capacity-factor-50-the-new-normal/>  
Solar Panels - <http://www.publicdomainpictures.net/view-image.php?image=9099&picture=solar-panels>

Table 1. Traditional versus alternative development criteria for assessing renewable energy

Traditional Development	Alternative Development
<b>Funding/Finance/Donors/Actors</b>	<b>Funding/Finance/Donors/Actors</b>
Bilateral (State-to-State) Multilateral (International Institutions) Non-Governmental Organizations (NGOs) Private (Individuals, Foundations, Large Corporations/Organizations)	Microfinance organizations Welfare Programs <u>Philanthrocapitalism</u> /Foundations
<b>Agency</b>	<b>Agency</b>
Foreign/International intervention and agenda setting Projects administered by foreign entities	Individual/Human focused Foreign and Local Cooperation
<b>Scale</b>	<b>Scale</b>
Tendency towards mass-development Funding directed to organizations	Targeted/Specific (e.g. Province) Funding directed to locals
<b>Social Outcome</b>	<b>Social Outcome</b>
Primarily international actors Uneven Benefits	Primarily local working with international actors More even benefits to all

### METHODOLOGY

- Created a rubric with elements based in Development and Post-Development Theory
- Applied rubric to researched renewable energy projects that have been or are being negotiated

### RESULTS

- Table 1 shows simplified features of **traditional versus alternative** development style projects
- Funding primarily aligns with traditional development, while scale aligns with alternative development
- All solar projects are to be owned under **BOO (Build-Own-Operate) Contracts** by foreign entities:
  - Unión Eléctrica (state utility) will be the sole purchaser of electricity at a negotiated fixed rate
- **Potential outcomes** of this:
  - Heavy foreign investments elsewhere have resulted in uneven distribution of benefits
  - Categories that fall under a combination of traditional and alternative development indicate greater collaboration between foreign and local entities which would result in more even distribution of benefits
- Cuba is on its way to **progressing towards its renewable energy goal** while ensuring more even benefits to its recipients

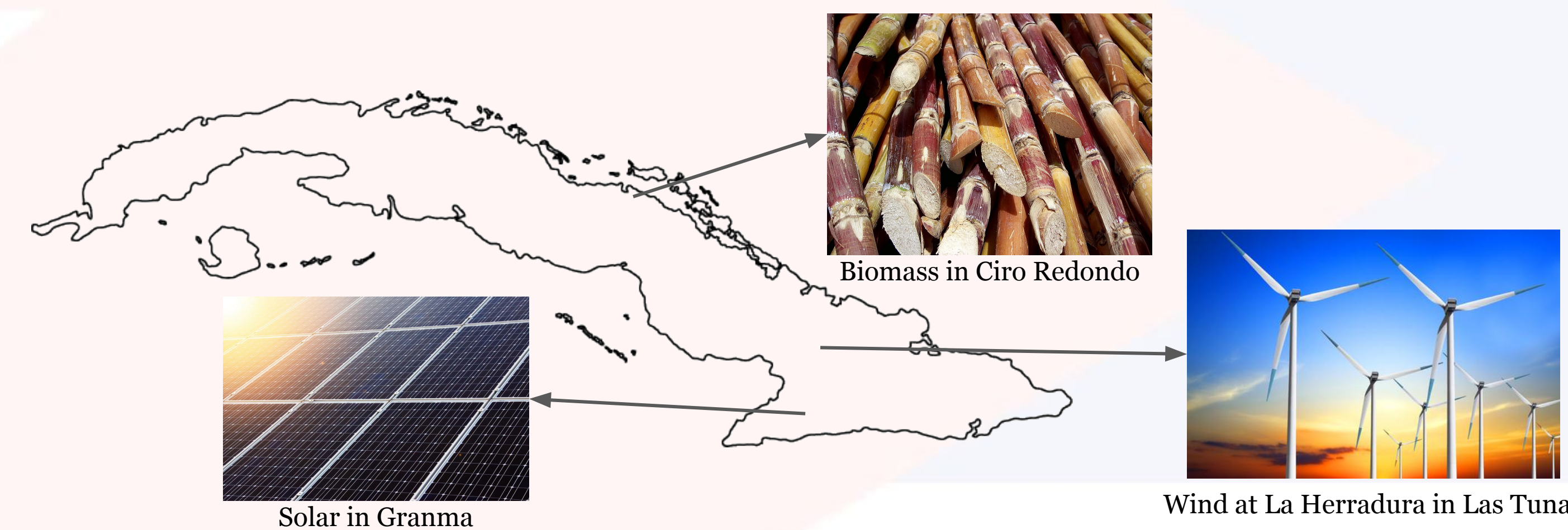


Figure 1. Examples of some renewable energy currently or will be implemented

Table 2. Current implemented or negotiated renewable energy projects in Cuba

### TRADITIONAL OR ALTERNATIVE

Red=Traditional Blue=Alternative Purple=Combination Grey=N/A

Project	Type	Location	Funding Source	Scale	Agency	Social Outcome
Havana Energy and ZERUS Investments SA	Biomass	Ciro Redondo	●	●	●	●
Cubaenergia in cooperation with Ankur (India)	Biomass	Isla de Juventud	●	●	●	●
China Goldwind Science and Technology Co. Ltd	Wind	Gibara	●	●	●	●
Integrated Department of Wind Energy Project Management of Renewable	Wind	La Herradura	●	●	●	●
EDIFRE	Solar	Cuba	●	●	●	●
Hive Energy	Solar	Special Economic Development Zone at Port of Mariel	●	●	●	●
Spanish Solar Association (UNEF) and Cuban Society for Promotion of Renewable Energy (Cubasolar, NGO)	Solar	Throughout Cuba	●	●	●	●
International Renewable Energy Agency (IRENA)	Solar	Cuba	●	●	●	●
Abu Dhabi Fund for Development	Solar	4 Provinces in Cuba	●	●	●	●
Commercial Funded Solar	Solar	Cuba	●	●	●	●
Cuban Government	Solar	Granma Province	●	●	●	●
Cuban Government	All	Cuba	●	●	●	●
United States	All	Cuba	●	●	●	●
Stonegate Bank (FL, USA)	N/A	N/A	●	●	●	●
Energizing Cuba	N/A	N/A	●	●	●	●

### IMPLICATIONS

- There is potential for other Latin American countries, such as Venezuela, to follow in Cuba's footsteps
- The Cuban case is unique to some extent because it is a **Socialist One-party government**, however, certain strategies and approaches can be used by other countries
- **Prioritizing social sectors** such as healthcare and education during this transition could result in improvements in healthcare and education programs
- Reaching out to foreign investors via renewable energy projects could provide **opportunities** for opening up lines of communication and improve upon Cuba's historically tense relationships, even potentially put Cuba on the international map

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