Cuba Trip 2018

L. David Roper 16-26 May 2018

I enjoyed a 2015 trip to Cuba so much that I wanted to go back for a longer stay. When I learned of a Renewable Energy tour of Cuba, including the XIII International CUBA SOLAR Conference, I decided to take it.

http://www.ecocubanetwork.net/wp-content/uploads/CUBASOLAR-2018-Sample-Program-11.19.17.pdfhttp://www.ecocubanetwork.net/wp-content/uploads/CUBASOLAR-2018-Sample-Program-11.19.17.pdf
This is the 2018 program, except that a few changes were made in the program.

A group of eleven people from all over the U.S. met in Miami on the evening of Tuesday 15 May 2018 to discuss the trip led by Laurie Guevara-Stone of Rocky Mountain Institute. The eleven participants were from California, Colorado, Hawaii, Vermont, Virginia and Washington.

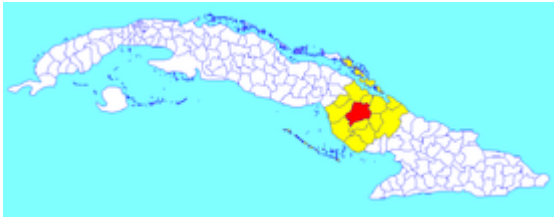
- 16 May Wed
  - American Air flight to Havana
  - Cuban guide: Amircal (Cal) Solermo Llanes
  - Bus tour of Havana
  - Family-style lunch at El Aijbe grass-roofed restaurant
  - First five nights in Copacabana Hotel in Miramar region of Havana.
  - Tour briefing, including slide-show
  - Dinner at Melen Club
- 17 May Thu
  - CubiaEnergía (environmental education and energy efficiency education)
  - Cuba plans 24% renewable energy by 2030 (2 GW). See Cuba Energy below. 100% by 2050.
  - In 2014 Cuba had 4% renewable energy.
  - Cuba has abundant sunshine (223.8 W/m^2); onshore wind speed 5.7 m/s; offshore wind speed 7 m/s.
  - Cuba has diverse biological energy sources.
  - In 2015 Cuba had 566 MW renewable energy, mostly biological (sugar-cane bagasse)
  - Cuba renewable energy: 83% bioenergy, 11% hydropower, 4% solar, 2% wind.
  - High electricity prices make renewable energy competitive.
  - Special incentives for renewable energy.
  - 14 wind farms are planned to provide 6% of Cuba's 2030 energy.
  - English company built a 50-MW solar farm.
  - Spanish company built 5.1-MW wind farm in 2008 and 4.5-MW wind farm in 2010.
  - Total wind power in 2016: 11.7 MW.
  - Chinese company is building two wind farms (101 MW).
  - Plans for 12 more wind farms for 633 MW.
  - Established 200 solar photovoltaic zones.
  - In 2017 Cuba had 32 MW in grid-connected PV systems, total 65 MW.
  - Plan to have 74 small hydroelectric plants.
  - Has a highly resilient energy system because of distributed generation.

- Fusterlandia community development and art project; Lunch at Jose Fuster's

- Visited Universidad Technológica de la Habana.
- Most solar panels are from China; Cuba has one panel factory.
- Wind turbines from China and Spain.
- Internet hot spots at hotels and some locations around Havana.
- Visited Centro de Estudio de Tecnologías Energeticas Renovables (CETER) (renewable energy technology center).
- 52% fuel is imported.
- All lighting is CFLs or LEDs.
- Evening talk by Marc Frank (Reuters), author of Cuba Revelations

- 18 May Fri
  - Antonio Núñez Jimenez Foundation for Humanity and Nature
  - 30% of farmland is private.
  - Bees in Cuba are OK.
  - Pushing rabbit meat for protein.
  - Composting for Havana organic gardens.
  - 70% live in countryside.
  - Nation gives land use to farmers for 15 years.
  - Speaker visited Amish community in Organic Valley in Wisconsin: "They will get to socialism before we do!"
  - Lunch at El Cañonazo
  - Finca Alamar (organic farm) Cuba has more than 7000 organic farms.
  - Community center visit (CDR: Committees for the Defense of the Revolution)
  - Plane crash at Havana airport kills all but one of 113 on board.
- 19 May Sat
  - Artisan market in large building
  - Lunch at El Figaro; Obama ate there.
  - Museum of the Revolution

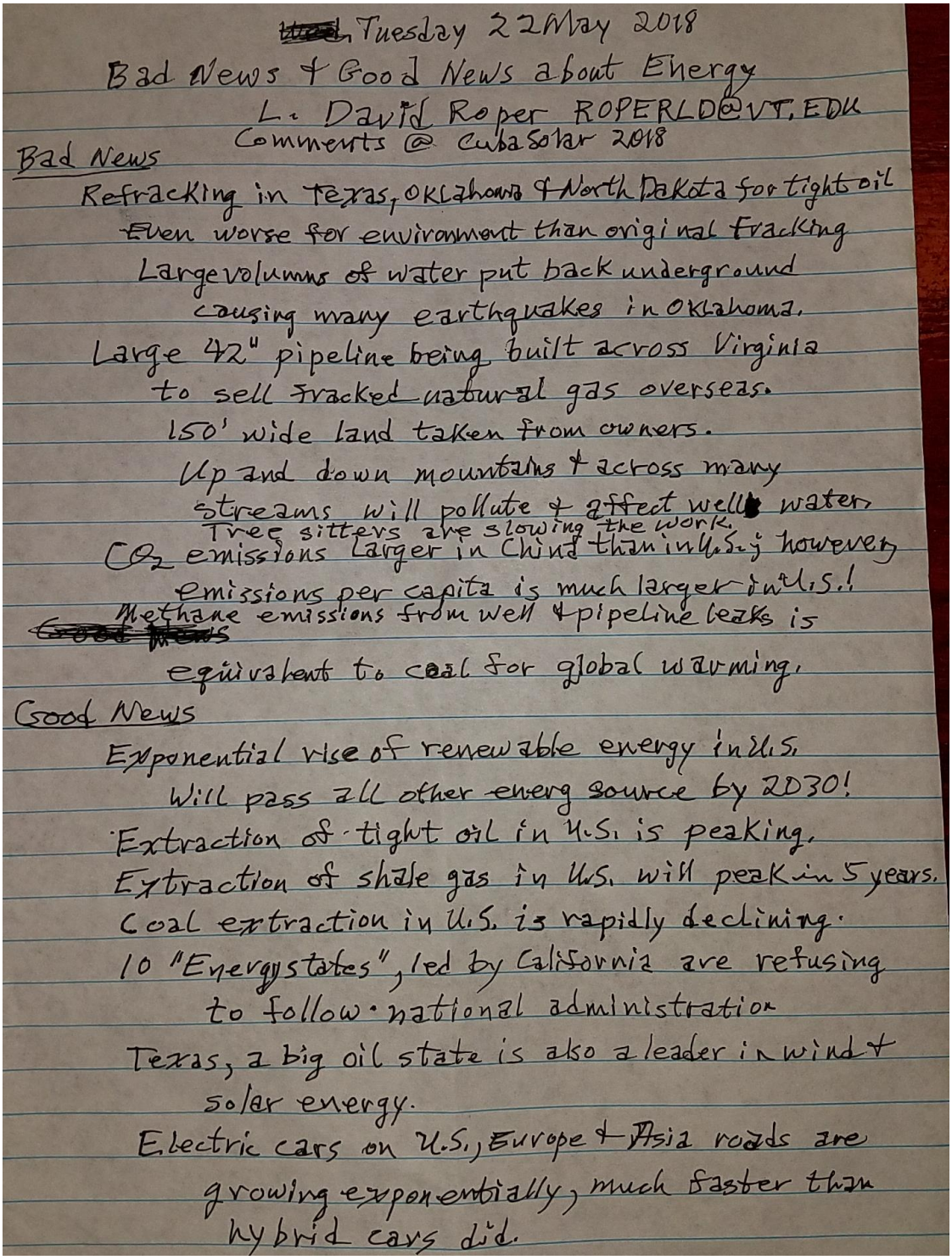
- 20 May Sun
  - Bus to La Finca del Medio organic farm location.
  - Two horse carts on muddy and rock dangerous path to La Finca ~1/4 mile:

YouTube "Habla Casimiro".
  - 3 guys (Schaefer, Nuess & Roper) stayed overnight at 740 Casa Carola in Camagüey. Excellent lobster dinner! 
- 21 May Mon
  - Tour of Camagüey. Martha Jimenez Statues:

  - Lunch at Meson del Principe.
  - About half of motorcycles are electric.
  - Mini-split heat pumps in many buildings.

    - John Schaefer: “Cuba is a living museum of transport technology.” Horse riders, horse carts, dual-ox carts, horse taxis, bicycles, motorcycles, bicycle taxis, 1950s cars, old Russian Lada cars, modern Asian cars, truck buses, old buses, new Chinese buses (Yutong), airplanes.
    - Last five nights at Hotel Brisas Covarrubias on the north coast 44 miles from Las Tunas city.
- 22 May Tue
    - Renewable energy conference started “Energia, medio ambiente y desarrollo sostenible” (Energy, environment and sustainable development)
    - “Un mundo major con la energia del sol.”(A major world with the energy of the sun.)

- 23 May Wed
  - Food waste for energy: biogas
  - Elene Vigil Santos: Need to quit burning fossil fuels. My requested comments:



Tuesday 22 May 2018

Bad News & Good News about Energy

L. David Roper ROPERLD@VT.EDU

Comments @ CubaSolar 2018

Bad News

Refracking in Texas, Oklahoma & North Dakota for tight oil
Even worse for environment than original fracking
Large volumns of water put back underground
causing many earthquakes in Oklahoma.
Large 42" pipeline being built across Virginia
to sell fracked natural gas overseas.
150' wide land taken from owners.
Up and down mountains & across many
streams will pollute & affect well water.
Tree sitters are slowing the work.
CO_2 emissions Larger in China than in U.S.; however
emissions per capita is much larger in U.S.!
Methane emissions from well & pipeline leaks is
equivalent to coal for global warming.

Good News

Exponential rise of renewable energy in U.S.
Will pass all other energ source by 2030!
Extraction of tight oil in U.S. is peaking.
Extraction of shale gas in U.S. will peak in 5 years.
Coal extraction in U.S. is rapidly declining.
10 "Energy states", led by California are refusing
to follow national administration
Texas, a big oil state is also a leader in wind &
solar energy.
Electric cars on U.S., Europe & Asia roads are
growing exponentially, much faster than
hybrid cars did.

- 24 May Thur
    - Trip to Las Tunas city
        - Casa Insólita: House with inside rotated by 20°.
        - José Martí memorial:

        - Solar farm: 2.5 MW
- 25 May Fri
    - Free day: Some went to Puerto Padre
- 26 May Sat: to Frank País Airport in Holguin to fly to Miami

References

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- https://www.wiseinternational.org/nuclear-monitor/383/cubas-renewable-energy-development
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Trip Roads

Cuba Energy

Cuba looking to change its energy profile

Knowledge and a new mentality are key to accomplishing ambitious goals set to expand the use of renewable resources and change the country's energy profile

Lisdys María Labrador

• POLITICAL will is not enough, nor is clarity about what must be done, evidenced in the regulatory framework created to facilitate Cuba's transition to an energy profile based on greater use of renewable resources. It is imperative that the consciousness of authorities and the people be raised, so that this change is understood as a critical element in our strategy for sustainable development.

The country has taken important steps toward meeting this ambitious goal, but there is much to be done, and more than a few challenges to be overcome. To better understand the situation, **Granma** spoke with Luis Hilario Bérriz Pérez PhD, president of the state enterprise Cubasolar, who believes, "We can become a leader in terms of renewable resources, as we are in many other areas."

Before focusing on the issue of renewable resources, could you comment on some of the strengths of our energy policy?

The national energy policy has changed, I would even say radically, and one of the events that showed this was Irma. In the wake of the hurricane, the country was left at zero in terms of electrical generation. This is the first time that has happened. But by a week later, Havana had re-established 95% of its service, and the country had practically 100% of its electricity within a month.

This can sometimes be perceived as normal, something we're used to. But we can understand the difference when we look at Puerto Rico, since despite the United States being one of the world's most powerful empires, the island still has not recovered in terms of energy, since Hurricane María hit. This reflects several issues and the first is, without a doubt, the social system. This happens here because we have demonstrated that we have a highly resilient energy policy, based essentially on distributed generating that lends itself to a very rapid recovery.

Beyond this undeniable reality, we know that demand for energy in Cuba is growing, making clear the need to search for alternatives, such as the use of natural gas, biogas, and renewable resources, to ensure the country's economic sustainability...

That's right. In 2017, 58% of energy use was concentrated in the residential sector, and moreover, the greatest portion of this energy was used for cooking and refrigeration. Some experiments and statistical analysis have shown that, for example, expanding sales of bottled gas could allow for a reduction in the maximum demand of around 360 MW.

Another very interesting fact is that, Cuba's territory, of about 111,000 square kilometers, receives solar radiation equivalent o the energy produced by 50 million tons of oil, everyday. That is, the solar radiation Cuba receives in a single day, is greater - in its energy value - than all the oil consumed in five years. Imagine the impact, if we were able to take advantage of this incredible potential, to use increasingly more of our own energy resources.

The estimated projection is that by 2030, renewable resources will be used to generate 24% of the country's electricity, and these could provide for 60% of the growth in consumption.

Among the terms used in relation to the issue is making our homes and state institutions "energy-plus" sites. What does that mean?

ISMAEL BATISTA

The estimated projection is that by 2030, renewable resources will be used to generate 24% of the country's electricity.

To explain this aspect, we must refer to Decree-Law 345, "On the development of renewable resources and efficient use of energy." This regulatory framework allows for something I would call a revolution within our Energy Revolution. To date we have been thinking about consumption, and this decree is telling us that we can become producers of energy, that the electric company can buy the energy we are able to produce.

Of course, to do this, knowledge and resources are indispensable. For example, if I want to have hot water in my house, using solar energy, either I need a heater, or I need resources and information to make a heater. Or if I want to become an energy producer, I need a photovoltaic panel. Therefore, another big challenge is the production of these elements by our national industry.

This decree also allows for the gradual elimination of obstacles and customs tariffs on importing equipment that operates with renewable resources, or resources for their construction.

A change of mentality, and lots of information, are very much needed, because we have learned to protect ourselves from the sun and use oil, but it's time to change this behavior and take advantage of the infinite possibilities of solar energy.

But using the energy is not enough, it must be collected and stored, right?

Storage is an indispensable element if we want to become a country of producers and not of net consumers. For example, if you ask most local authorities about the energy they have at their disposal, they talk to you about the national plan, what is allocated to them, but this what is given to them, not what they have. The energy you really have at your disposal is that you have managed to accumulate.

Accumulation must be based on the final use. If you need water, you need to collect water. If you need light, you need to collect and store electricity.

To get an idea of what this means, we could explain to people that the radiation their houses receive, on just one square meter of their roof, is equivalent to their home's entire monthly consumption . This is where the local factor comes into play, because this process must take place at your house, at mine...

Considering the principles of sustainable development, could we say that it has a direct relationship to our socialist social system?

I use a formula that for me is the answer to that question: Renewable Energy Sources + Accumulation of Energy + Socialism = Sustainable Development. Anyone can talk about sustainable development, but it is not a capitalist concept. It is a concept that necessarily involves human solidarity, in which the social being is always placed above money.

DECREE-LAW 345

— Article 6. The production of equipment, means, and replacement parts for the development of renewable sources of energy, and those needed to increase efficiency in the use of electrical energy and fuel, constitutes a strategic objective for the nation's industry.

— Article 7. New construction undertaken as part of investment projects, will use architectural designs that contribute to energy savings, in accordance with what has been established in current legislation.

— Article 8. Individuals and incorporated entities can acquire equipment using renewable energy sources and others that allow the efficient use of energy at moderate prices, or through bank loans, in accordance with principles established in current legislation for the granting of credit.

— Article 10.1. Incorporated entities which import raw materials, components, parts, pieces, equipment, and accessories for the execution of an investment projects, or which fabricate equipment, devices, and spare parts for the use of renewable energy sources, will enjoy tariff exemptions, following procedures established by the Ministry of Finances and Prices.

— Article 15.1. The Ministry of Energy and Mines will promote the production of energy by consumers, including the residential sector, on the basis of technologies that take advantage of renewable energy sources to allow for self sufficiency and sales of any surplus to the national electric grid.

— Article 15.2. The Electric Union will buy all electricity generated with renewable sources of energy produced by independent producers, as long as established technical norms are observed. •

Particularly note paragraphs 4 & 5 comparing Cuba's hurricane recovery to Puerto Rico's.

CERTIFICADO

A: *Leon David Roper*

Por su participación en el Décimotercer Taller Internacional Cubasolar 2018.

Dado en Las Tunas, Cuba, a los veinticinco días del mes de mayo del año dos mil dieciocho.

Lic. Eliseo Gavilán Sáez
Presidente del Comité Organizador

Dr. Luis Bérriz Pérez
Presidente de CUBASOLAR

MINISTERIO DE EDUCACIÓN SUPERIOR
UNIVERSIDAD DE LAS TUNAS

La Facultad de Ciencias Técnicas y Agropecuarias de la Universidad de Las Tunas y la Sociedad Cubana para la Promoción de las Fuentes Renovables de Energía y el Respeto Ambiental (Cubasolar) otorgan el presente

CERTIFICADO

A: León David Roper por haber aprobado el programa del Curso X, Entrenamiento__, titulado: **Curso asociado al XIII TALLER INTERNACIONAL CUBASOLAR 2018**, que se desarrolló del 21 / 5 / 2018 al 25 / 5 / 2018

Dado en: Las Tunas a los 25 días del mes de mayo de 2018.

Dr.C Karel Ismar Acosta Pérez
Decano Facultad Ciencias Técnicas y Agropecuarias
Universidad de Las Tunas

MINISTERIO DE EDUCACIÓN SUPERIOR
UNIVERSIDAD DE LAS TUNAS
DECANO
Facultad de Ciencias Técnicas

Dr.C. Luis Bérriz Pérez
Presidente de Cubasolar

Pictures

http://www.roperld.com/science/CubaTripPictures.pdf

Excerpt from Cuban Revelations: Behind the Scenes in Havana by Marc Frank

These days I'm asked why Cuba doesn't follow on the heels of Tunisia, Egypt, Yemen, Syria, Libya, and other Middle Eastern and North African kingdoms and autocracies. I reply:

- There is no significant Internet or satellite TV penetration.
- The demographics are completely different.
- It is relatively easy for young people to emigrate.
- There is comparatively good and free health care and education for all.
- The police and military do not systematically brutalize and bloody the population.
- The leaders and their families are not stealing the oil wealth and openly fooling around at European casinos.
- You are allowed to drink, party, and have sex out of wedlock.
- Women are relatively liberated.
- There is no developed business class.
- The United States does not have diplomatic and economic relations with Cuba.
- Soaring wheat prices fueled the fire in lands where the poor rely on bread, while in Cuba the government has made sure that rice and beans are available for all.
- There have been three grass-roots discussions on what ails the country over the last five years.
- The government has launched a significant reform of the economy, is lifting some onerous regulations on daily life, and has promised minor political reform.
- The Cubans cherish their hard-won social peace.