Caribbean Sunshine

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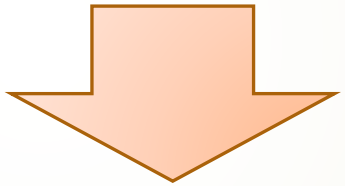
Climate Steps™

February 9, 2026

Myself – Science to Action



Climate Steps - Mission

To answer:

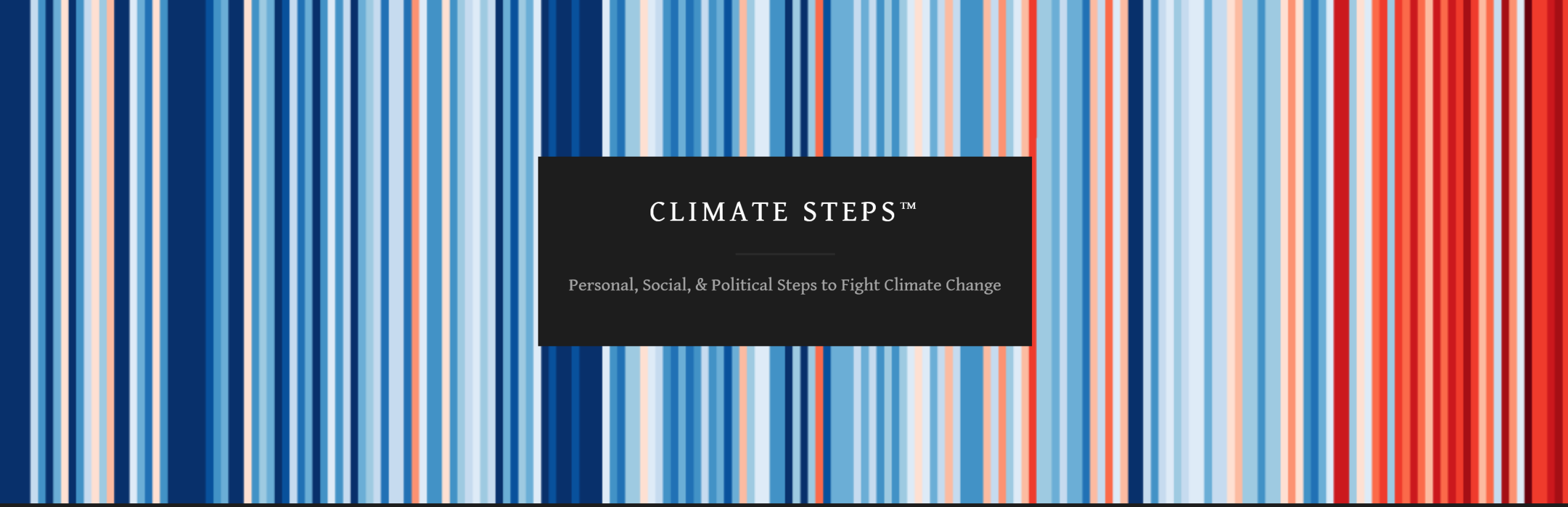
What can I do to fight climate change?

Climate Steps - Mission Rephrase

To provide the knowledge, means, and mentoring to any and all individuals who seek to take action on the climate crisis.

Climate Steps, nonprofit

1) Website - a publishing and resource platform. www.climatesteps.org.
2) The website and FB platform volunteers and users interact in idea-generating, researching, writing (invited), and support. www.fb.com/groups/ClimateSteps
3) Strong interaction with partner Earth Hero, www.EarthHero.org.

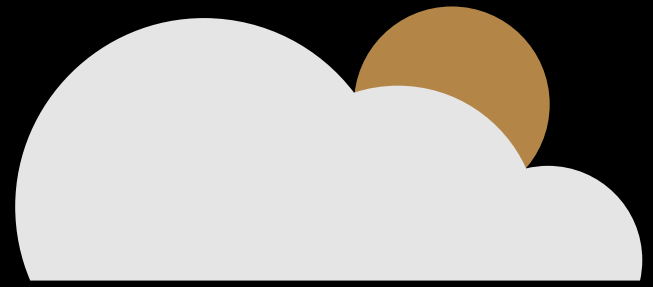


Climate Songs

FEBRUARY 19, 2020 / ANNETTE OLSON / LEAVE A COMMENT / EDIT

And then this song came along. One of the best Climate Songs ever. Adorable Irish children rapping about the climate.

What Progress is Occurring in the Caribbean regarding Solar Energy?



Solar Energy

Passive

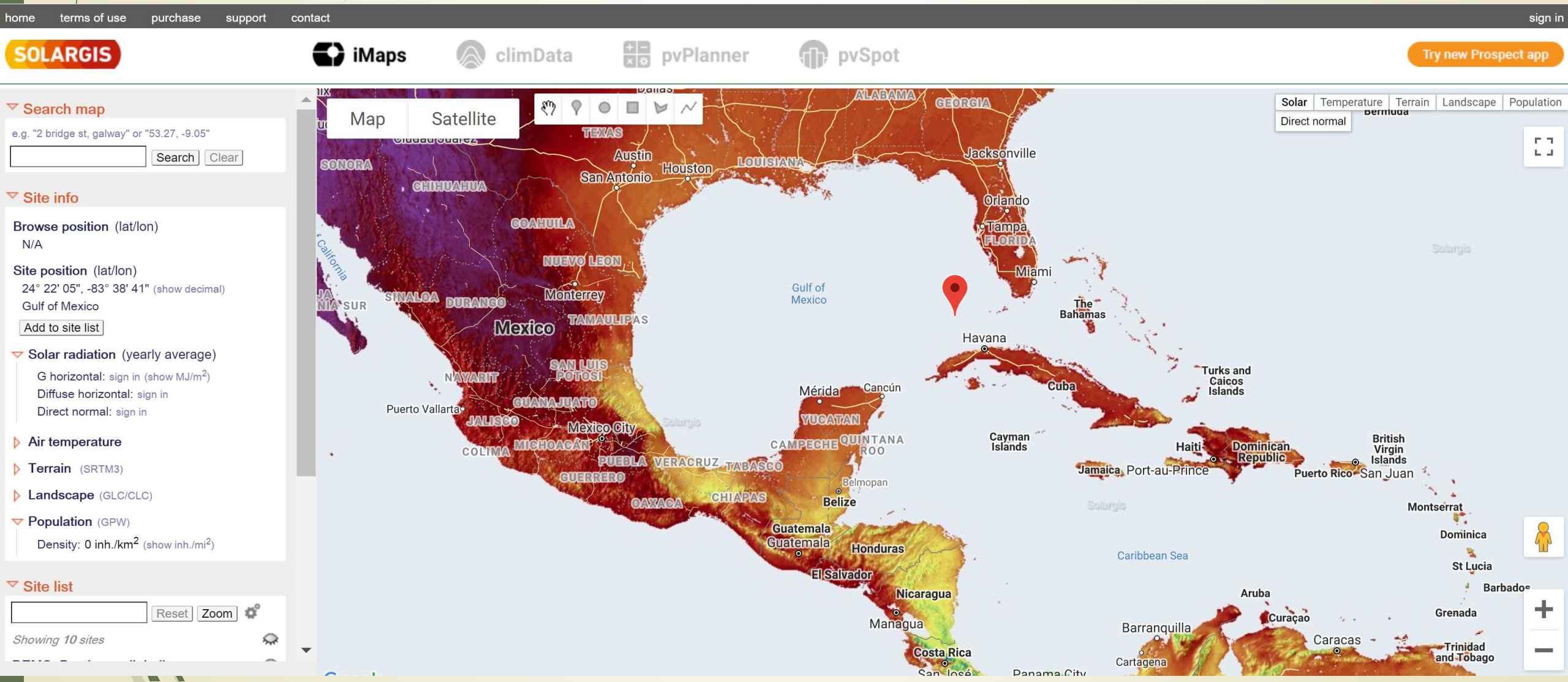
- Food production in the field
- Heating (and protection from heat)
- Laundry
- Food dehydration
- Skylights

Active/Equipment

- Solar Cooking Ovens
- Water Heating Arrays
- Solar Thermal Cooling
- Solar Panels
- Solar Tubes…

A roof in Puerto Rico, 2020 Annette Olson CC-BY 4.0

History of Solar in the Caribbean



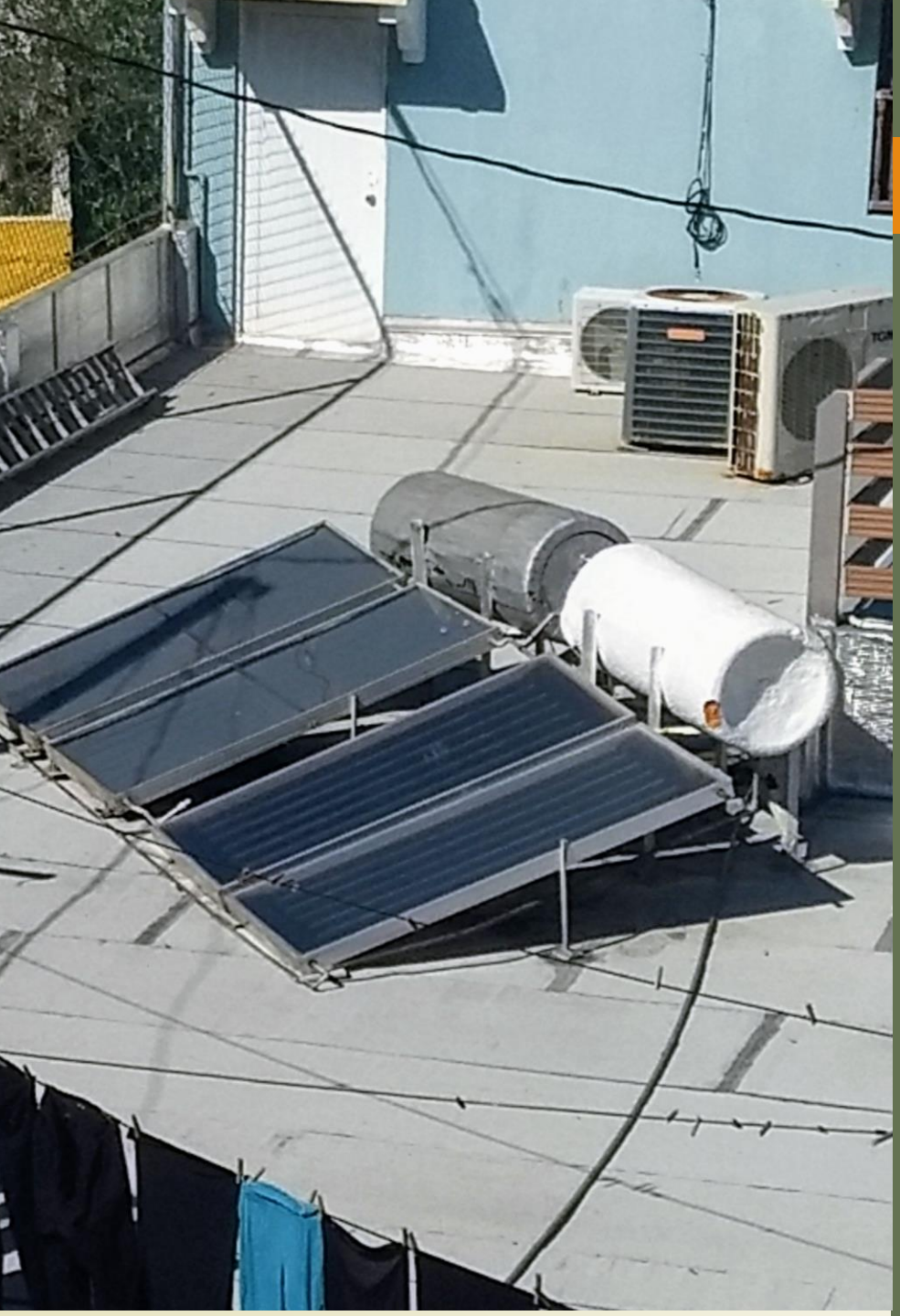
Recommended Experts

- Dr. Devon Gardner, Programme Manager for Energy & Head of the Energy Unit, Caribbean Community (CARICOM)* Secretariat. He's based in Guyana. https://energy.caricom.org/gardner/.
  - 2020 Presentation on Innovation, Opportunities and the Caribbean Reality – Considerations for a Regional Vehicle Strategy
- Martyn Ford, Rocky Mountain Institute Islands Energy Program, CARICOM Community Leader for Renewable Energy Community.
  - Martyn assisted the Climate and Energy Program of the Worldwatch Institute with research for the Caribbean Sustainable Energy Roadmap and Strategy (CSERMS) report
- Caribbean Centre for Renewable Energy and Energy Efficiency. www.ccreee.org.

* CARICOM does not include the Dominican Republic or Puerto Rico.

Why More Solar is Useful in the Caribbean

- Environmental Protection, multiple facets.
- Economic development via jobs.
- Increased resilience against storms, both "normal" and climate-extreme
- No FF sources themselves, rising cost of shipping fuel = of fuel itself. (TR-2016; CED Greentech.) The *cost of electricity in the Caribbean 3-5 times what it is here in the States.* (U.S. Solar Institute, date?)
- Remote rural towns, with little connection infrastructure. (Task Report, 2016)
- Power plants are aging. (TR-2016)
- Increased independence anyway, due to manufacturing removal; need more self-sufficiency (pers. Comm. Dr. Nelson Cardona Martinez – UPR-Mayaguez)
- Supports tourism – energy intensive, views, …



Past Trends - Solar Water Heaters

- **1970s** - **Barbados** became a leader in solar water heating –fuel crisis, a housing development spark, an entrepreneur, and the prime minister being interested. (Husbands 2016)
  - Started a tax rebate in 80s, reduced taxes on parts, increased taxes on electric and gas water heaters…, solar on 2 government buildings, and a solar crop dryer.
  - Next prime minister followed suit.
  - Now most new businesses' roofs have a form, Many other countries do not. Ali, 2007, Gardner (###) 50,000 solar water heaters in Barbados (Husbands, 2016)
- 1990s, St. Lucia solar plant
- "revolving fund to demonstrate the effectiveness of solar hot water systems in Jamaica" (Husbands, 2016)
- Solar thermal cooling ! https://www.ccreee.org/news/solar-cooling-in-the-caribbean/.

Past Trends – PV Panels

- Most immediate references seem focused on utility scale (https://www.pv-magazine.com/2019/10/24/solar-power-met-45-of-demand-on-caribbean-island-of-st-eustatius-last-year/).
- "Many Caribbean states are signatories of the PetroCaribe Energy Cooperation Agreement and the electricity monopolies pay subsidised costs to Venezuela for oil. Therefore alternative energy on utility scale has to be grid-tied under licenses." (Florius, 2017?)
- Caribbean islands installing solar power plants include Jamaica, St. Kitts and Nevis, Haiti, Barbados and St. Vincent and the Grenadines. (Florius, 2017?) Branson's island.
- https://www.researchgate.net/publication/326450750_Barriers_of_solar_energy_uptake_and_the_potential_for_mitigation_solutions_in_Barbados

Past Trends – Solar Cooling

- Prediction for a hybrid cooling system for installation on the island of Barbados indicated that the payback period for the system was less than seven years at an internal rate of return (IRR) exceeding 13 %. https://www.ccreee.org/news/solar-cooling-in-the-caribbean/.

Past Trends – Solar Cooking/Food Processing

- Sun Ovens apparently has focused on donating here and there to Dominican Republic over the years.
- Recent devastating hurricane in the Bahamas, B4Dignity is currently focused on providing 1,000 Global Sun Ovens to the 60,000+
- Creation of solar jars – home made solar ovens for Trinidad. 1999 a nonprofit taught 300 women solar cooking.
- Cuba – introduce solar cooking to 7th graders.
- Haiti
  - started solar cooking in 1980s after a 70s study found good conditions. Corporation partnership with community to buid.
  - Needed due to deforestation for charcoal creation. "Haiti burns over 400,000 tons of charcoal annually (USAID 2011); that amount translates to over 4,000,000 tons of trees destroyed since it takes 10 tons of wood to produce one ton of Haitian charcoal" (ESMAP 2007)
  - World Central Kitchen, by Jose Andres, program in food security for Haiti incudes solar ovens.
  - Other donations by other groups. Examples solar dryers for peanut roasting in Haiti.

Ref: The solarcooking.fandom/wiki

Current RE development

- "In the span of just a few years, the focus at the annual Caribbean Electric Utility Services Corporation conference has **shifted** from issues around producing electricity from thermal capacity — usually oil — **to what blend of renewable options** constitutes the best path forward." (GTM, 2019)
- Very **different** utility structures and regulatory **frameworks** among the islands – private, public, mixed.
- **CARICOM** emphasizing standards developments and has created overarching strategic plans. Help each other move forward, but also to encourage investment by outside groups worried about different frameworks.
- Many **students** travel to U.S. to learn solar (US Solar Institute, date?); interest in solar cooling. CCREEE.org

Progress/Impacts

- …the Caribbean during the past decade ha[s] **exponentially** expanded their solar installed capacity, with a special emphasis on the rooftop solar **photovoltaic** systems in the households. Incentives, regulation. (IDB, 2020)
- On solar cooking wiki for Caribbean, advertising: *22-26 November 2021: 2nd National Congress for Solar Drying and Cooking Food*
- "The **U.S. Virgin Islands**, through strategic planning for its energy sector, as of 2015 had reduced its near total dependency on fossil fuel in 2009 by approximately **20 percent** and is **on track** to meet its goal of reducing fossil fuel dependency by 60 percent in 2025." (Task Report, 2016)
- St. Eustatius – on sunny days 100 % powered by solar utility grid.
- Haiti – at least 14,000 (in 2017) solar cookers donated to the island; doesn't include hand-built ones.
  - At least two conferences in Haiti on solar cooking. Attendees at other conferences.

Plans

- NDGoals: Range 30-98.6% Renewable Energy by 2030. Guyana, also a member, stated 100% by 2025. (Gardner, 2020)
- The CARICOM Secretariat estimates that the Caribbean will require US$20 billion in energy investment to achieve the 2027 C-SERMS targets, and the World Bank estimates that Central America will need to double installed capacity within a decade, requiring US$70 billion by 2022. (Task Report, 2016)

Is solar suitable for the severe weather?

- Yes, compared to transmission lines.

https://www.cedgreentech.com/article/why-solar-so-important-caribbean

https://genproenergy.com/**solar-under-storm-designing-hurricane-resilient-pv-systems/**

Unequal development in Caribbean

- Potential for "reinforcement of socioeconomic inequalities ." [rich install, rich save money] IDB, 2020 or LA

Refs:

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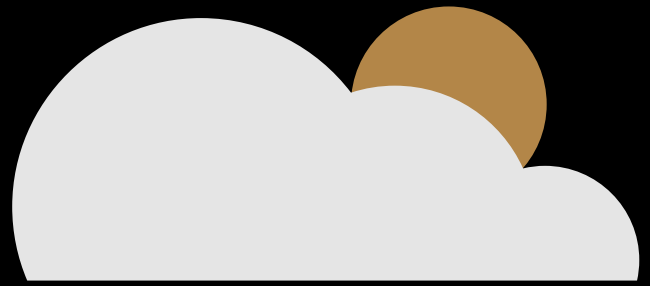
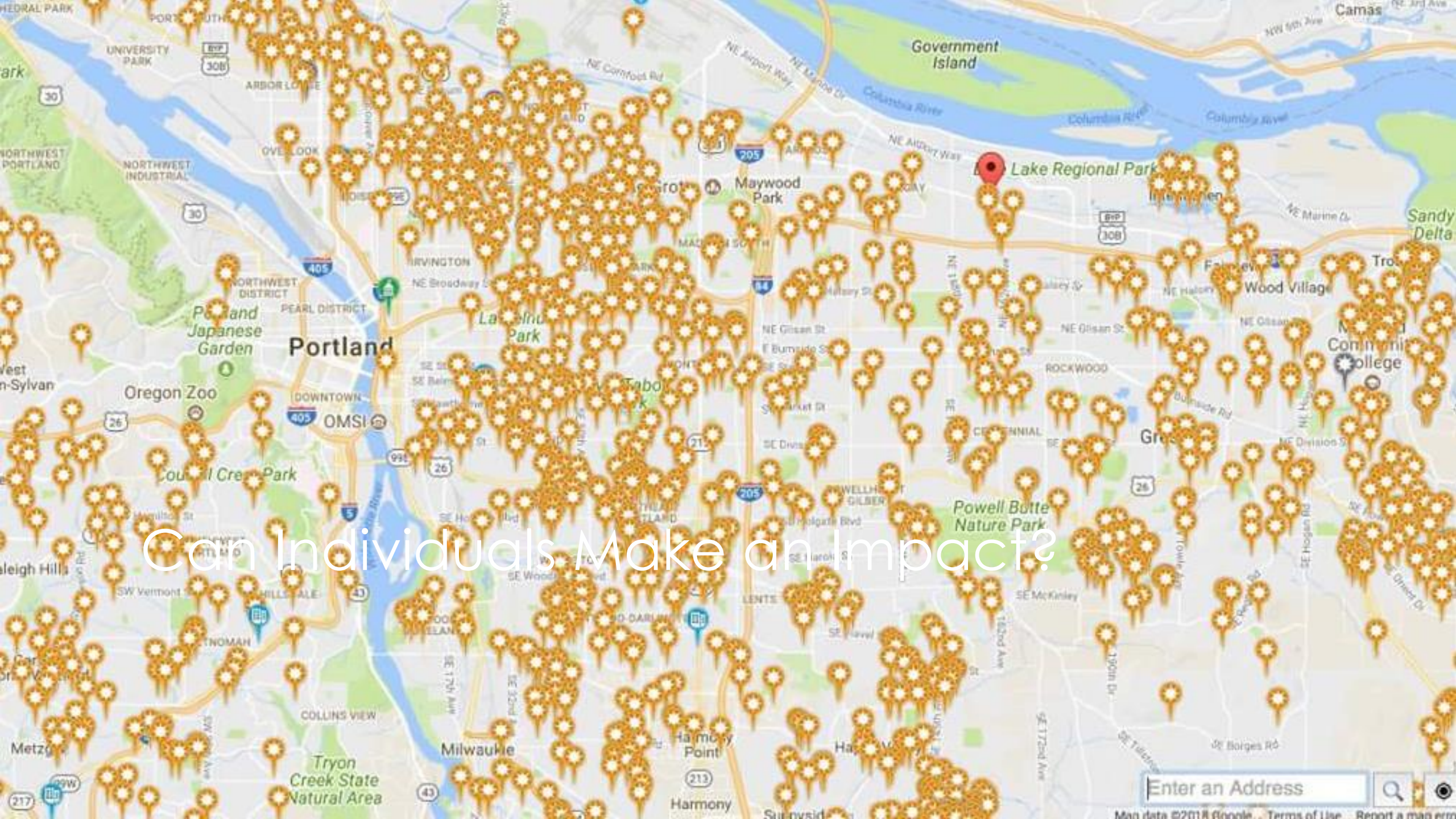
- IDB, 2020 = https://publications.iadb.org/en/shedding-light-unequal-distribution-residential-solar-pv-adoption-latin-america-and-caribbean
- US Solar Institute, date? = https://ussolarinstitute.com/3-solutions-for-residential-solar-pv-installations/

EXTRAS




Can Individuals Make an Impact?
Government Island
Lake Regional Park
Maywood Park
Portland
Oregon Zoo
OMSI
Powell Butte Nature Park
Milwaukie
Tryon Creek State Natural Area
Harmony
Enter an Address

Article: We have the Power…

https://climatesteps.org/2020/01/01/we-have-the-power-now/

Impacts

- Individuals
  - have inspired groups (Movements)
  - Forced Infrastructure changes
    - Solar = forces utilities to change to a distributed grid model
    - Biking – forces cities (and cities force) road design changes
- Social/cultural change. Passive v. Active
  - Passive: Competition among neighbors
  - Passive: Find out things are socially acceptable
  - Active ….
- Political. Active, but have to work smaller scale, not effective now at national levels except for public regulations.