

NEWENERGYEVENTS

**CREF2015**  
THE CARIBBEAN RENEWABLE ENERGY FORUM

**CASTALIA**  
Strategic advisors

# *Renewable Energy Island Index and Marketplace*



*Cristina Cano and Tim Kennedy  
Miami, 20 October 2015*

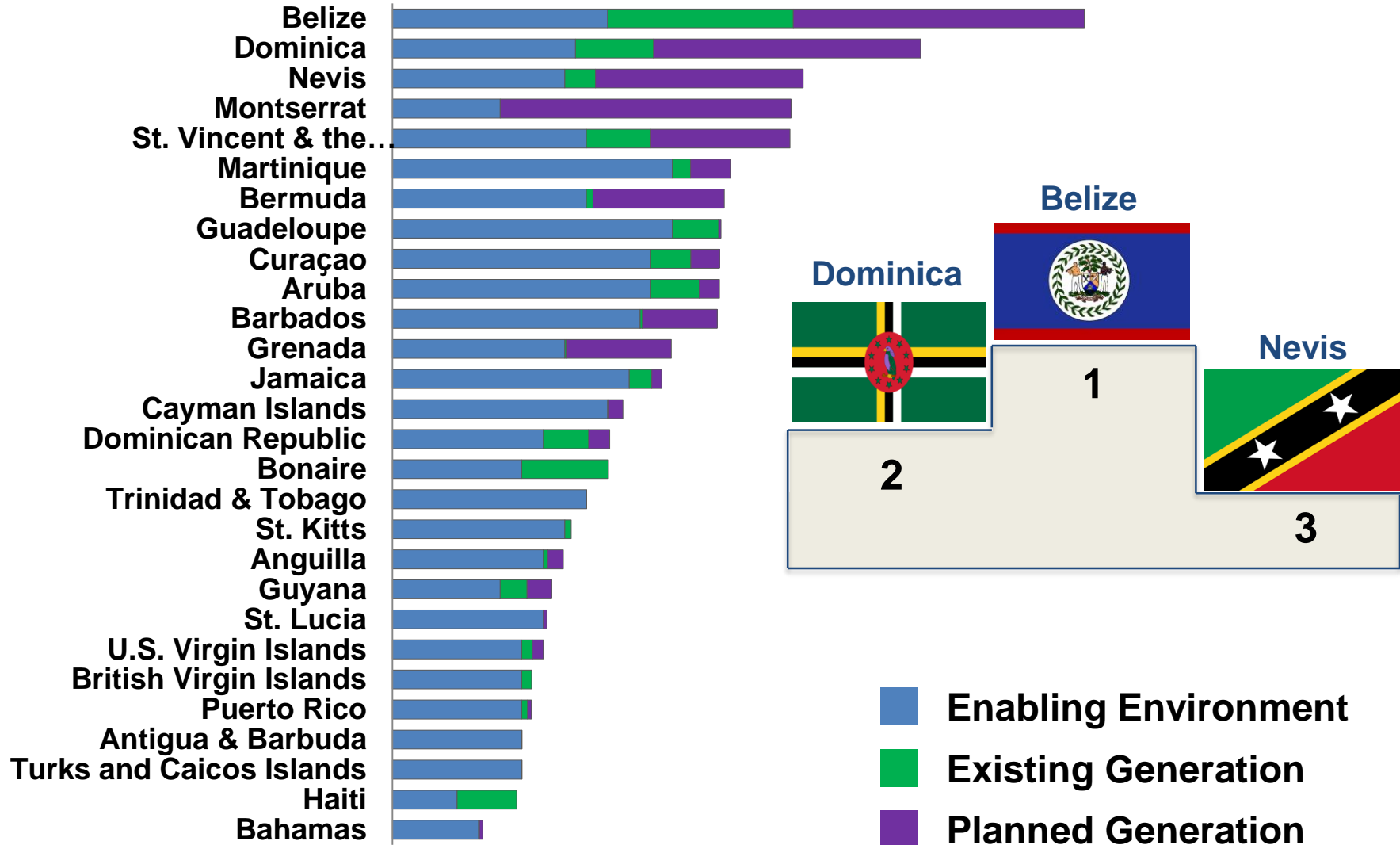
# *Introduction*



- **Partnered with CREF to produce RE Index since 2012**
- **Measure of progress by jurisdiction on RE**
  - Equal weight for enabling environment, planned generation, and existing generation
  - For more detail, our note on methodology is online, or come chat after
- **Data come from surveys sent to ministries and utilities, as well as what is publicly available online**



# Big picture: Familiar top performers, with a big impact for geothermal



## 1. Belize



**Enabling Environment:** finalized RE strategy, now in implementation; six RE projects identified through tender

**Existing Generation:** 55MW hydro, 31MW bagasse

**Planned Generation:** Nearly 120MW of new RE capacity planned by 2019, including 23MW of solar

## 2. Dominica



**Enabling Environment:** Revised energy policy ready to be passed

**Existing Generation:** 6.3MW hydro, ~0.7MW solar PV

**Planned Generation:** production well drilling complete for 10MW domestic generation; +100MW potential export

## 3. Nevis



**Enabling Environment:** finalizing RE strategy; concession assigned for geothermal in Sept 2014

**Existing Generation:** 2.2 MW of wind

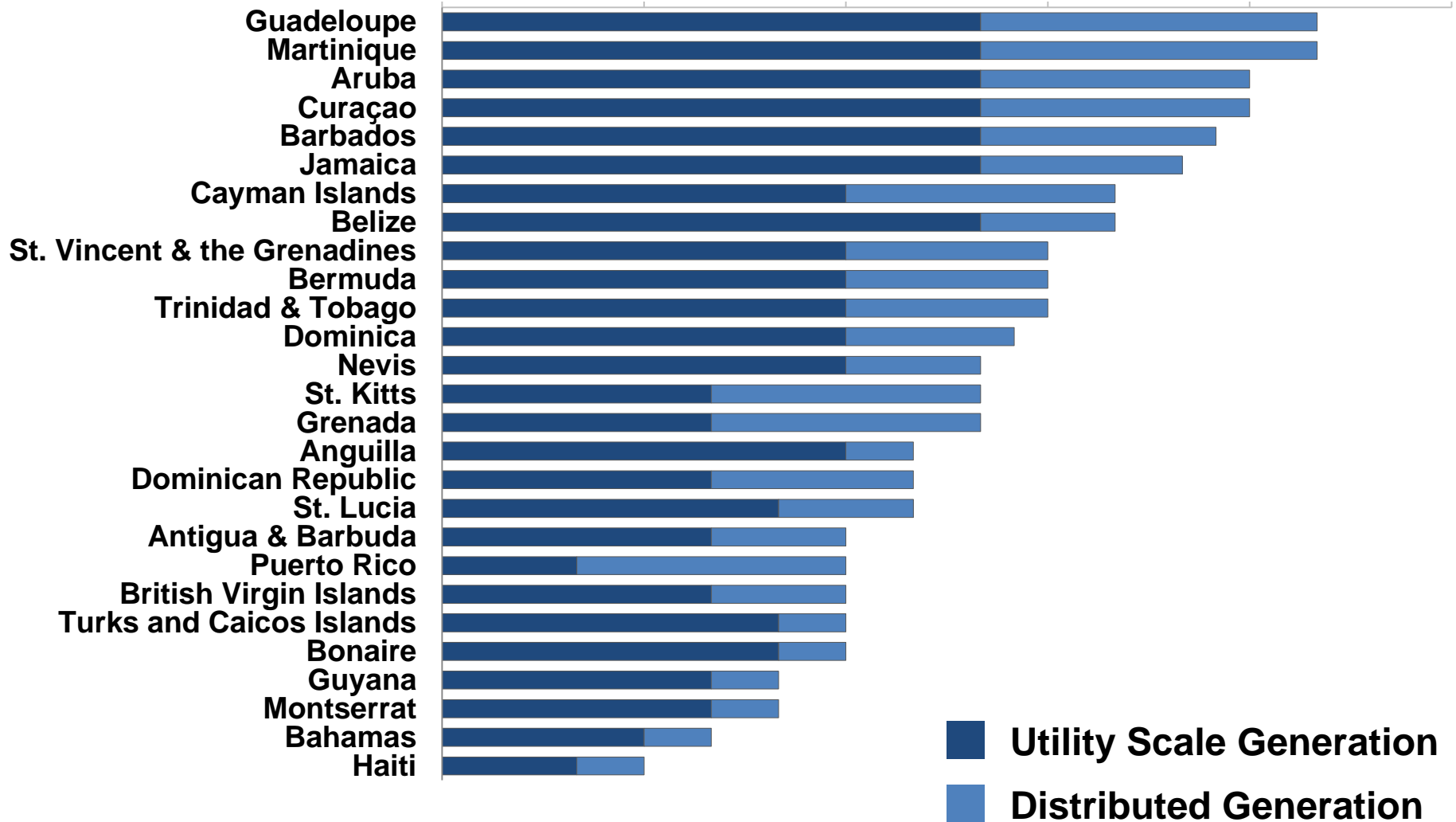
**Planned Generation:** concession agreement signed for Geothermal plant

# *The region is advancing: 2012 vs. 2015*

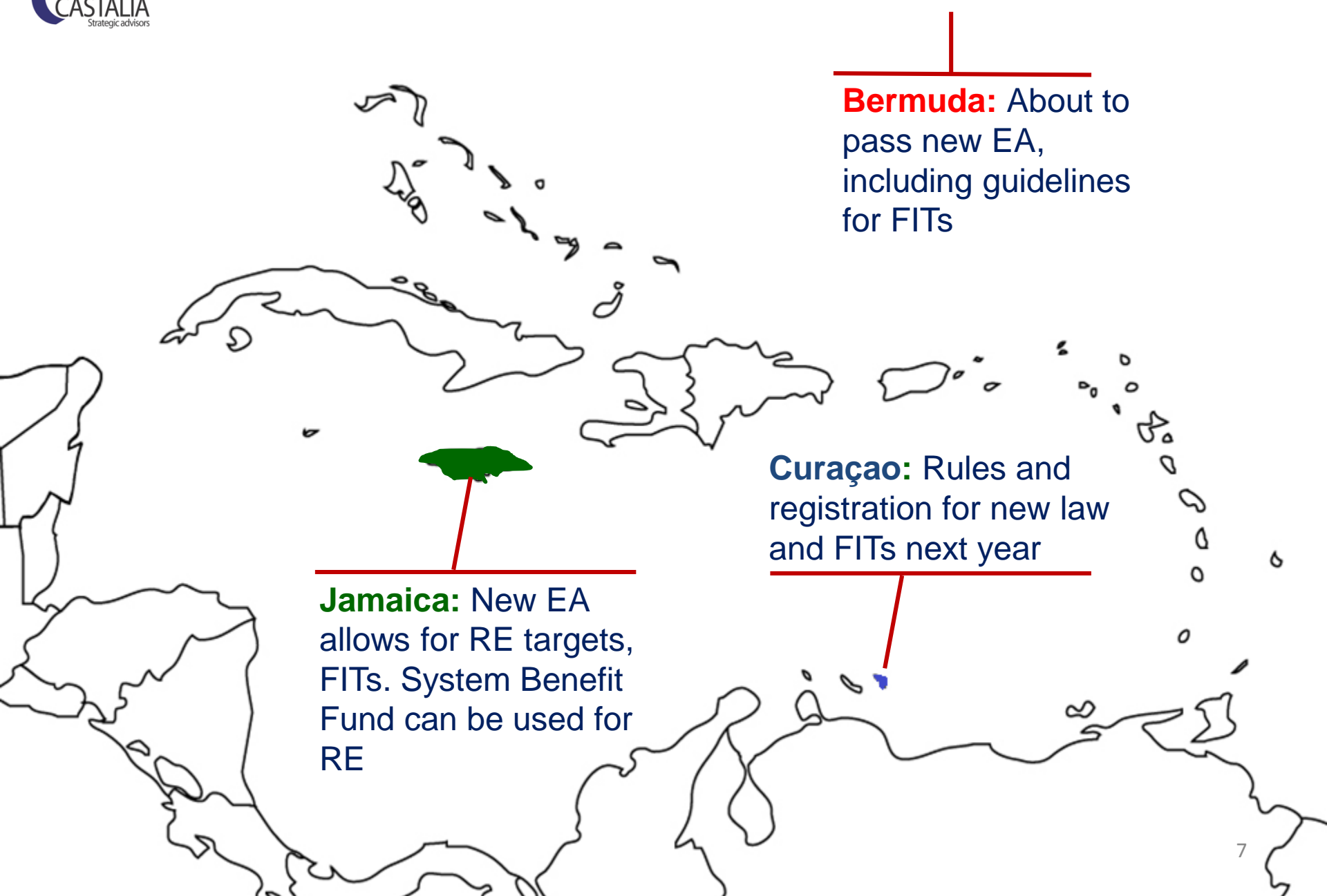


<b>Countries in Index</b>	<b>22</b>	<b>28</b>
<b>Avg Total (0-5)</b>	<b>1.1</b>	<b>1.4</b>
<b>Enabling Environment (0-5)</b>	<b>2.3</b>	<b>2.7</b>
<b>Existing Generation (% RE)</b>	<b>8%</b>	<b>10%</b>
<b>Planned Generation (0-5)</b>	<b>0.8</b>	<b>1.0</b>

# ***Enabling environment: Driven by utility-scale, advances expected quickly***



# Major sector reform underway



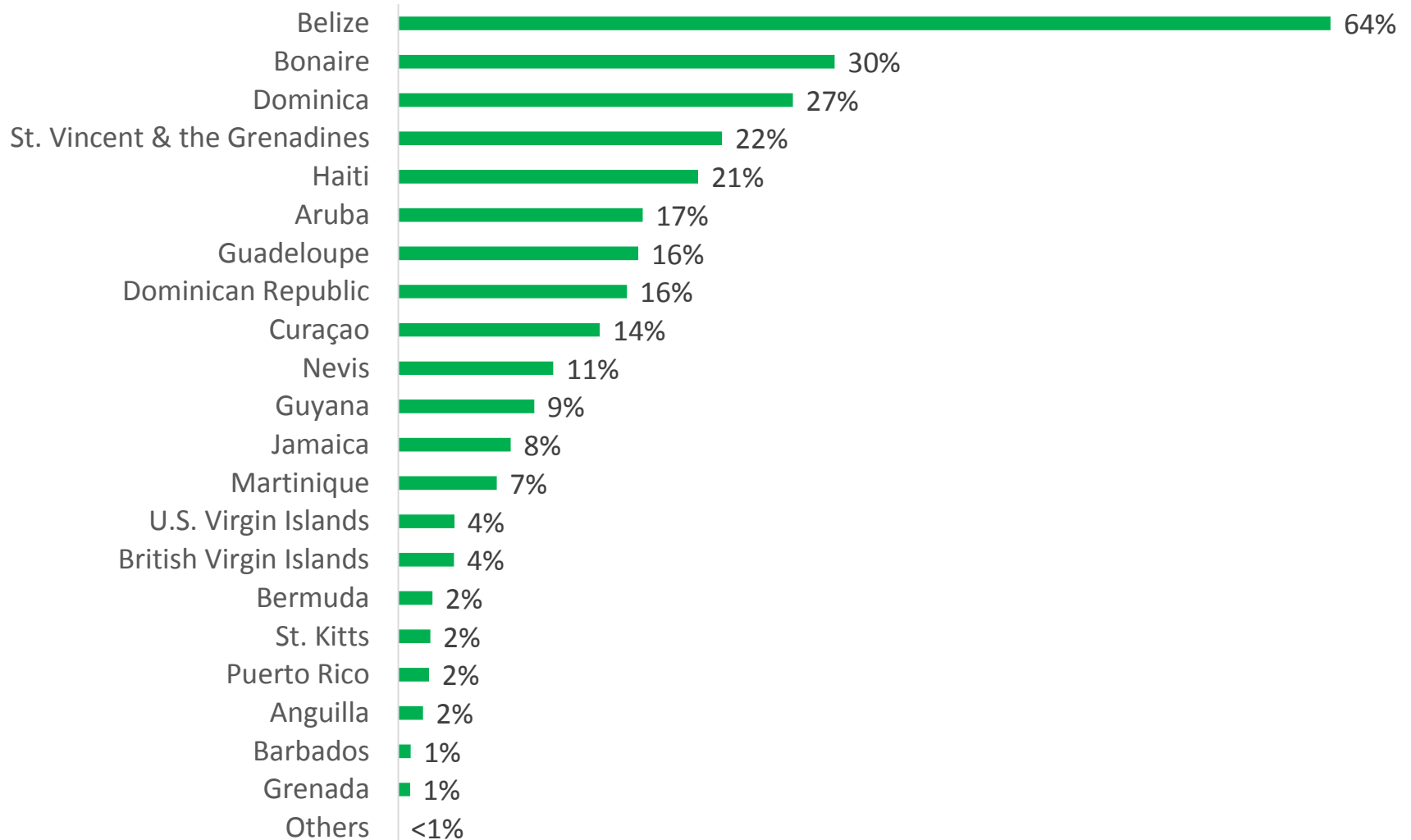
**Bermuda:** About to pass new EA, including guidelines for FITs

**Curaçao:** Rules and registration for new law and FITs next year

**Jamaica:** New EA allows for RE targets, FITs. System Benefit Fund can be used for RE

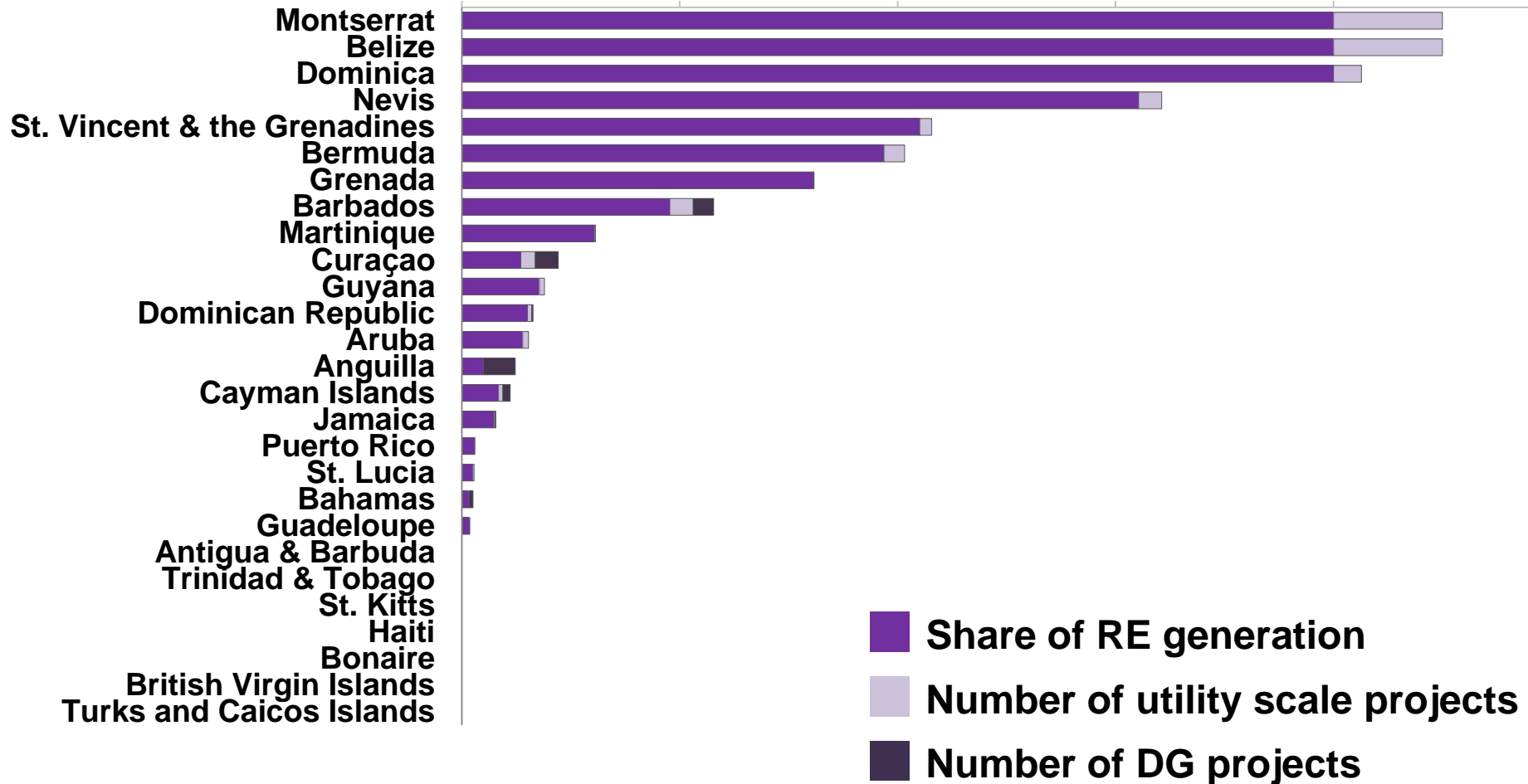


# ***Existing generation: Avg of 10% of generation from RE—33% for top five***



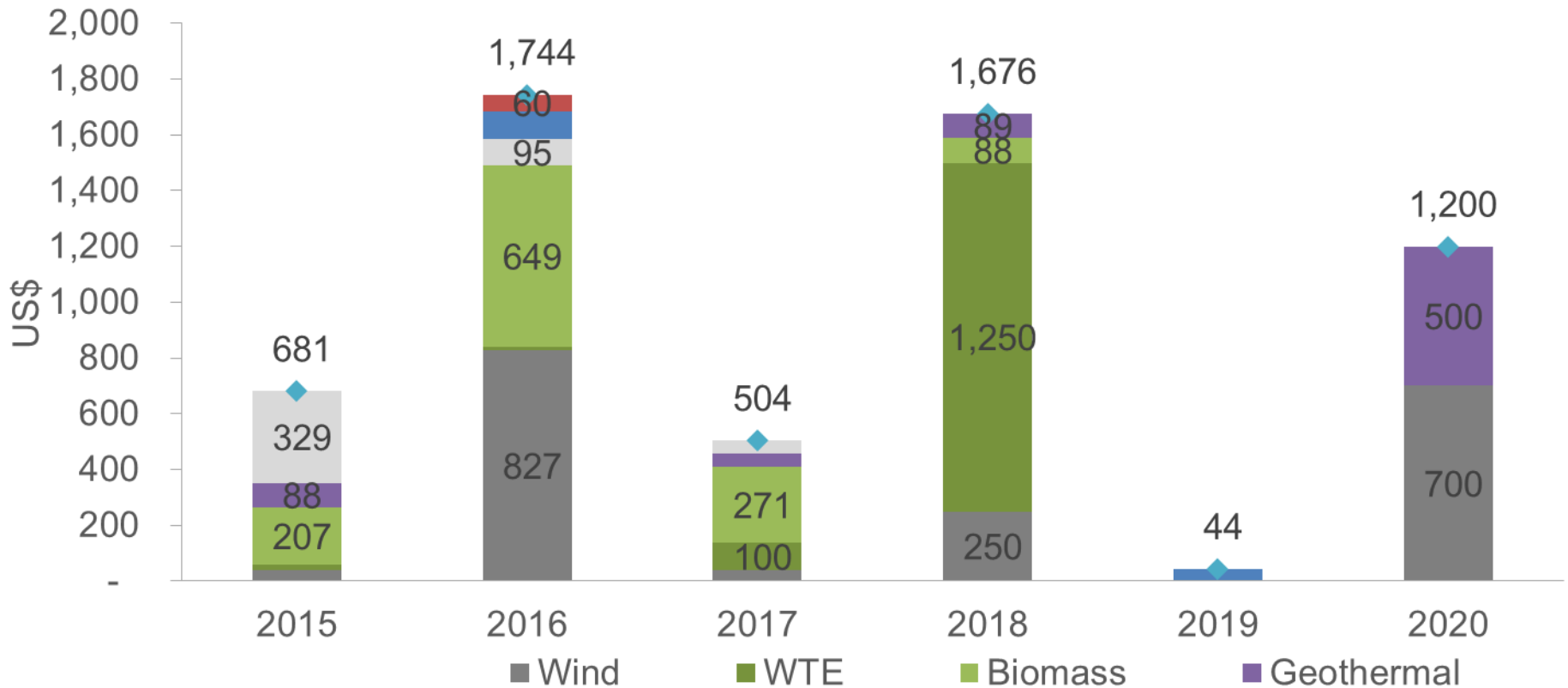


# ***Planned generation: Mix of cost competitive firm and intermittent options***



# ***Beyond the ranking: a US\$5.9 billion, 1,400MW market between now and 2020\****

*...up by US\$2.9 billion and 500MW from 2014 database*



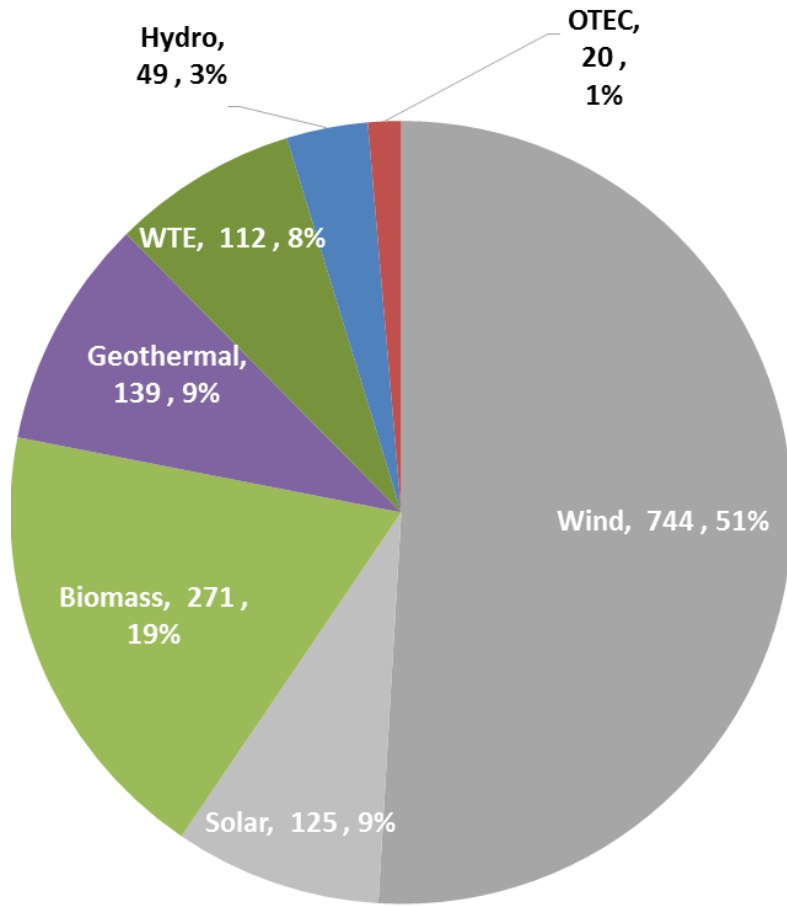
*\* many projects tracked but not included in total; only those with firm start year*

## **Sources:**

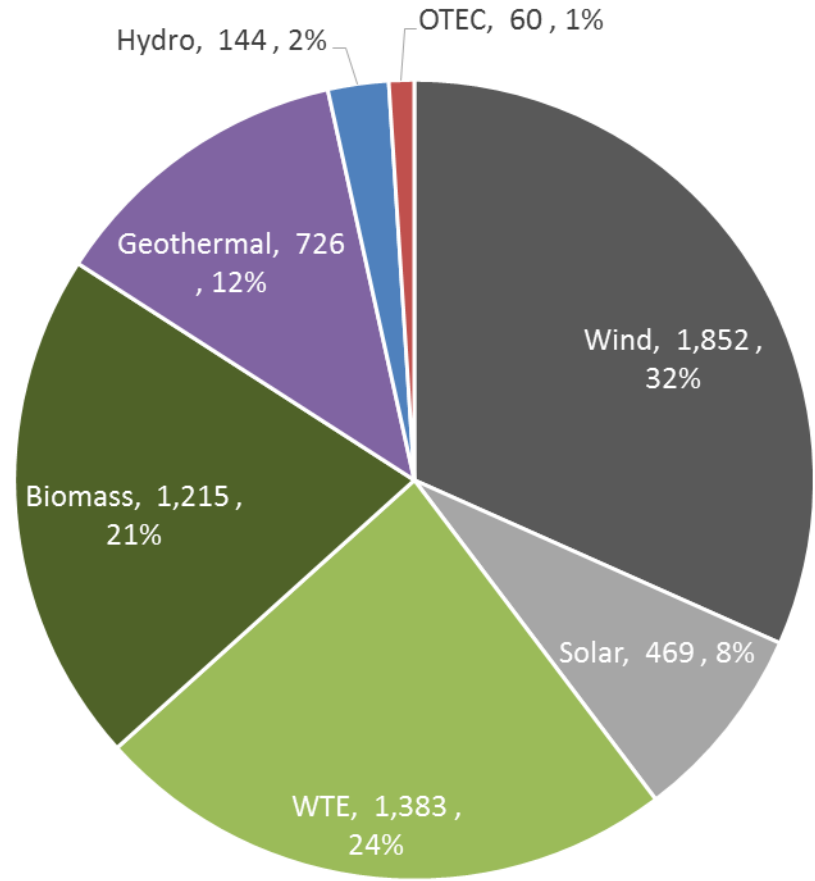
- Utilities
- Ministries
- Castalia's past work, other publicly available sources

# ***Intermittents are 60% of planned installed capacity and 40% of planned investments***

**Installed Capacity (MW)**



**Planned Investments (US\$mn)**



# More than 50MW coming up in each of several large markets

## Cuba

**Wind:** 280MW planned for 2020

**Biomass:** 80MW—60MW Havana Energy to start operations in 2015, 20MW Jesus Rabi under construction

## Dominican Republic

**Wind:** 320MW—100MW Los Guzmancitos (under construction)

**Bagasse:** 36MW--30MW San Pedro (under construction)

**Solar PV:** 35.5MW--34MW Monte Plata (under construction)

**Dominica —**  
**Guadeloupe —**  
**Martinique** (pending interconnection)

**Geothermal:** 100MW export from Dominica, 10MW Domestic project

## Jamaica

**Solar PV:** around 85MW in two projects

**Wind:** 36.3MW Malvern Wind Farm (Financial closure); 24MW Wigton III (contract for construction signed)

## Puerto Rico

**WTE:** 79MW Energy Answers Plant (in process of environmental permitting)

# ***Tens of MW coming up in top 5 'Enabling Environments'***

## **Guadeloupe (1<sup>st</sup>)**

**Biomass/W2E:** 13MW Marie-Galante  
Biomass operational in 2017-2018

**Geothermal:** 45MW in early development

**Solar:** 67MW in early development

**Wind:** 46MW in early development

## **Barbados (5<sup>th</sup>)**

**Solar PV:** Around 23.2MW planned, 10MW under construction

**Biomass/W2E:** 32MW planned, 40MW more possible

**Wind:** 6.4MW in early stages

## **Aruba (3<sup>rd</sup>)**

**Solar PV:** 4.6MW planned, including 1MW distributed generation

**Wind:** 56.4MW—26.4MW Urirama (PPA signed)

**Waste:** 7MW planned

## **Curaçao (4<sup>th</sup>)**

**Solar PV:** 3.5MW

DG planned

**Wind:** 30MW planned (permitting)

## **Martinique (2<sup>nd</sup>)**

**Solar PV:** 62MW

Distributed generation

**Wind:** 13MW planned

**Biomass:** 5MW in early stage

# *A lively market also for smaller countries*

## **St. Thomas**

**Solar PV:** 12.7MW planed,  
4.2MW net metering

**Biomass:** 7MW Tibar, PPA  
signed

## **St. Lucia**

**Solar PV:** 3MW  
(RFP planned)

## **Grenada**

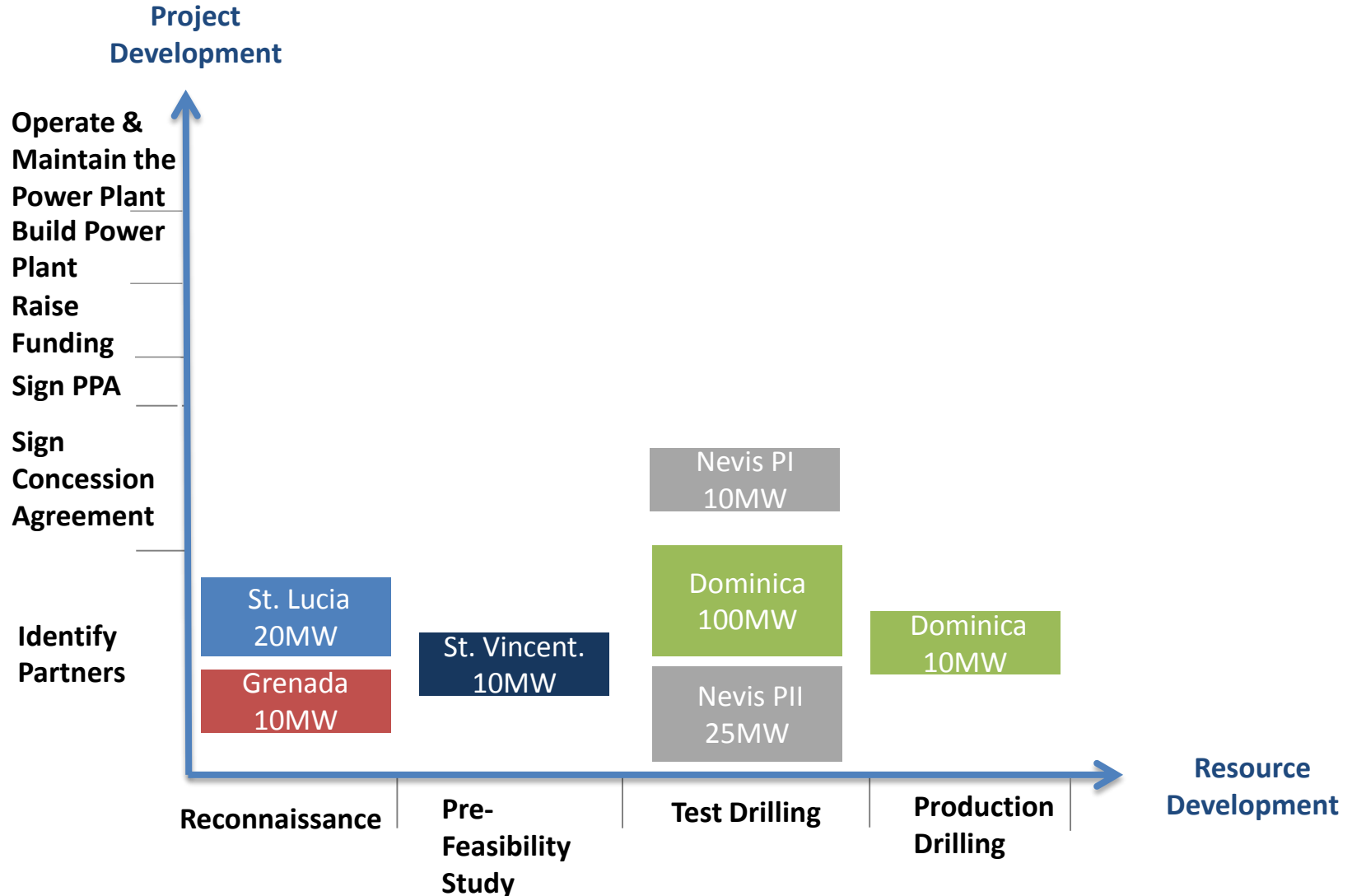
**Wind:** 2MW  
Carriacou  
(under  
construction)

## **St. Croix**

**Solar PV:** 4MW Spanish  
Town (under construction);  
3MW (bid under evaluation)

**Biomass:** 7MW (under  
construction)

# Geothermal is important in the Eastern Caribbean





# Some challenges –many projects stalled or unlikely to proceed

Country	Description	Technology Type	Size (kW)	StartOp	Comment
Puerto Rico	Trade Winds Energy (Barceloneta)	Wind	75,000	Stalled	PPA awarded, but new AEEPR administration renegotiated all PPAs.
Puerto Rico	Interamerican Energy Sources (Toa Baja)	Solar PV	60,000	Stalled	PPA awarded, but new AEEPR administration renegotiated all PPAs.
Puerto Rico	NRG Solar Caribe (Juncos)	Solar PV	52,000	Stalled	PPA awarded, but new AEEPR administration renegotiated all PPAs.
Barbados	St. Lucy solar farm	Solar PV	8,000	Stalled	"Currently we are in the process of working through the necessary planning permits, and
Cayman Islands	W2E facility	Waste-to-Energy	5,000	Stalled	Unlikely to be implemented soon. Financial evaluation has shown that W2E facility would not be
Puerto Rico	Landfill Gas Technologies Fajardo	Landfill gas	4,000	Stalled	PPA awarded, but new AEEPR administration renegotiated all PPAs.
Anguilla	1MW Solar plant	Solar PV	1,000	Stalled	RFP issued in 2012, no updates, ministry not sure it went forward, on hold.
U.S. Virgin Islands	Bonovi Landfill	Landfill gas	815	Stalled	Project construction has been completed, plant currently out of operation due to lower-than-e
Puerto Rico	GG Alternative Energy Coporation (Fajard	Solar PV	20,000	Stalled	PPA awarded, but new AEEPR administration renegotiated all PPAs.
Dominican Republic	WCG Santo Antonio de Guerra PV Plant	Solar PV	50,000	Unclear	
Guyana	Amaila Falls	Hydro	165000	Unlikely to proceed	Government's decision to initiate the project will be based on IDB's study, deadline of July.
Dominican Republic	Montecristi PV Plant	Solar PV	57,960	Unlikely to proceed	PPA signed in 2012, no further updates.
Dominican Republic	Isofoton La Victoria PV Plant	Solar PV	50,000	Unlikely to proceed	PPA signed in 2011, no further news/not listed on company website.
U.S. Virgin Islands	Waste to Energy Plant	Waste-to-Energy	20,000	Unlikely to proceed	Capacity of plant altered from 33 MW to 20 MW, USVI voted against project in 2012.
St. Vincent & the Gren	Ribishi Point Wind	Wind	7,200	Unlikely to proceed	Cancelled due to project site's close proximity to the airport.
Barbados	Lamberts Wind Farm	Wind	5,600	Unlikely to proceed	Current status unclear, downsized in 2012, BL&C still in negotiation with Barbados Farms Limite
St. Kitts	North Star Belle Vue Wind Farm	Wind	5,400	Unlikely to proceed	North Star secured deal with OPIC in 2013, but no further developments have occurred.
Cayman Islands	Solar Plant (New Generation Power)	Solar PV	5,000	Unlikely to proceed	Company abandonend its bid due to questionable financial viability.
Cayman Islands	Wind Project (New Generation Power)	Wind	3,000	Unlikely to proceed	Company abandonend its bid due to questionable financial viability.
Dominica	Tarrou Solar	Solar PV	2,000	Unlikely to proceed	No news, were completing financial modeling in 2012, unlikely to go forward.
Curaçao	Airport OTC Plant	OTC	100	Unlikely to proceed	Minister of Economy Stanley Palm has effectively dismissed this project.

- Are we any closer to addressing the historical bottlenecks?
- Especially with regard to geothermal—large potential, but just one project
- Countries are responding to a changing environment with new laws and regulatory frameworks—will this help get projects done?
- How do leading developers view the market and how strong is their appetite for engagement?

# Contact Us

Cristina Cano

Manager and Head of Colombia Office

[Cristina.Cano@Castalia-Advisors.com](mailto:Cristina.Cano@Castalia-Advisors.com)

Tim Kennedy

Senior Analyst

[Tim.Kennedy@Castalia-Advisors.com](mailto:Tim.Kennedy@Castalia-Advisors.com)

## Paris

7 Rue Claude Chahu  
75116 Paris  
France

## Sydney

36 -38 Young Street  
Sydney, NSW 2000  
Australia

## Wellington

Level 2, 88 The Terrace  
PO Box 10-225  
Wellington  
New Zealand

## Washington

1747 Pennsylvania Ave NW  
Suite 1200  
Washington DC  
20006, USA

## New York

200 Park Avenue  
Suite 1744  
New York, NY  
10166, USA

## Bogotá

Carrera 7 No. 99-53  
Torre 1, Oficina 1424  
Bogotá  
Colombia