

Overview of Investment Opportunities in Renewable Energy Systems Generation



EU-Caribbean Sustainable Energy Conference

Barbados, 10-11 October 2016

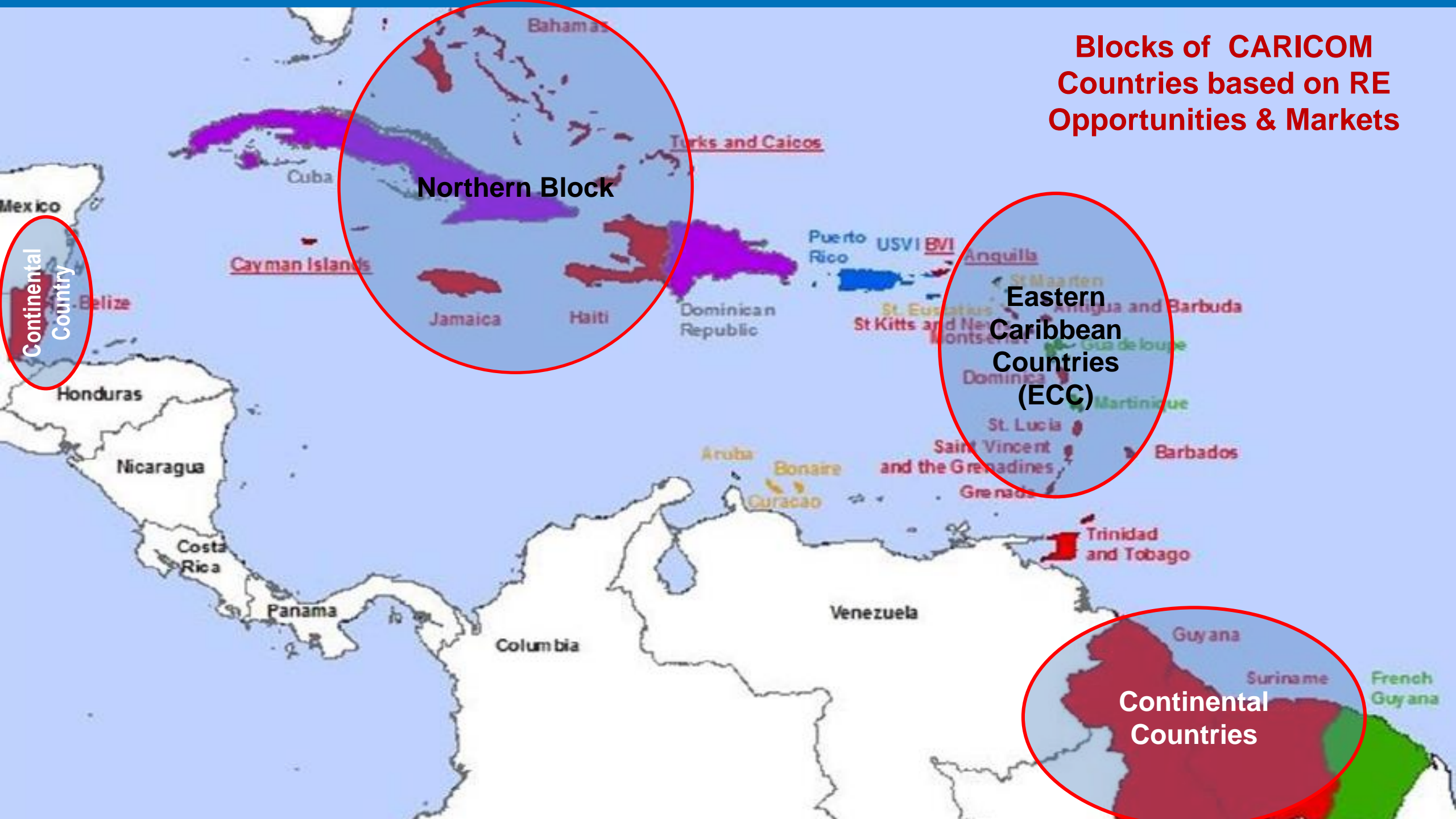
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Blocks of CARICOM Countries based on RE Opportunities & Markets



Continental Country

Northern Block

Eastern Caribbean Countries (ECC)

Continental Countries



POTENTIAL/ OPPORTUNITIES

Sources/Technologies

1. **Solar**
2. Wind
3. **Geothermal**
4. **Hydropower**
5. **Bio-Energy (include biofuels)**
6. **Marine RE:**
 - Wave, Wind, OTEC, SWAC
7. **Waste-to-Energy**
8. **Off-Grid & Micro & Mini Grids**
 - solar, wind,

Countries

1. **All Countries**
2. **ECC, T&T, JAM, Guy, Sur,**
3. **ECC: GRE, DOM, SKN, SLN, SVG, MON**
4. **GUY, SUR, BEL JAM**
5. **SUR, GUY, BEL, JAM**
6. **JAM, BAR, T&T**
7. **JAM, HAT,**
8. **HAT, GUY, SUR, BEL**

Solar PV



> 1GW
All countries

Wind Power



> 150 MW
ECC, TT JAM,
GUY, SUR

Geothermal ECC



Phase 1
60 MW
Phase II
>1GW

Hydropower

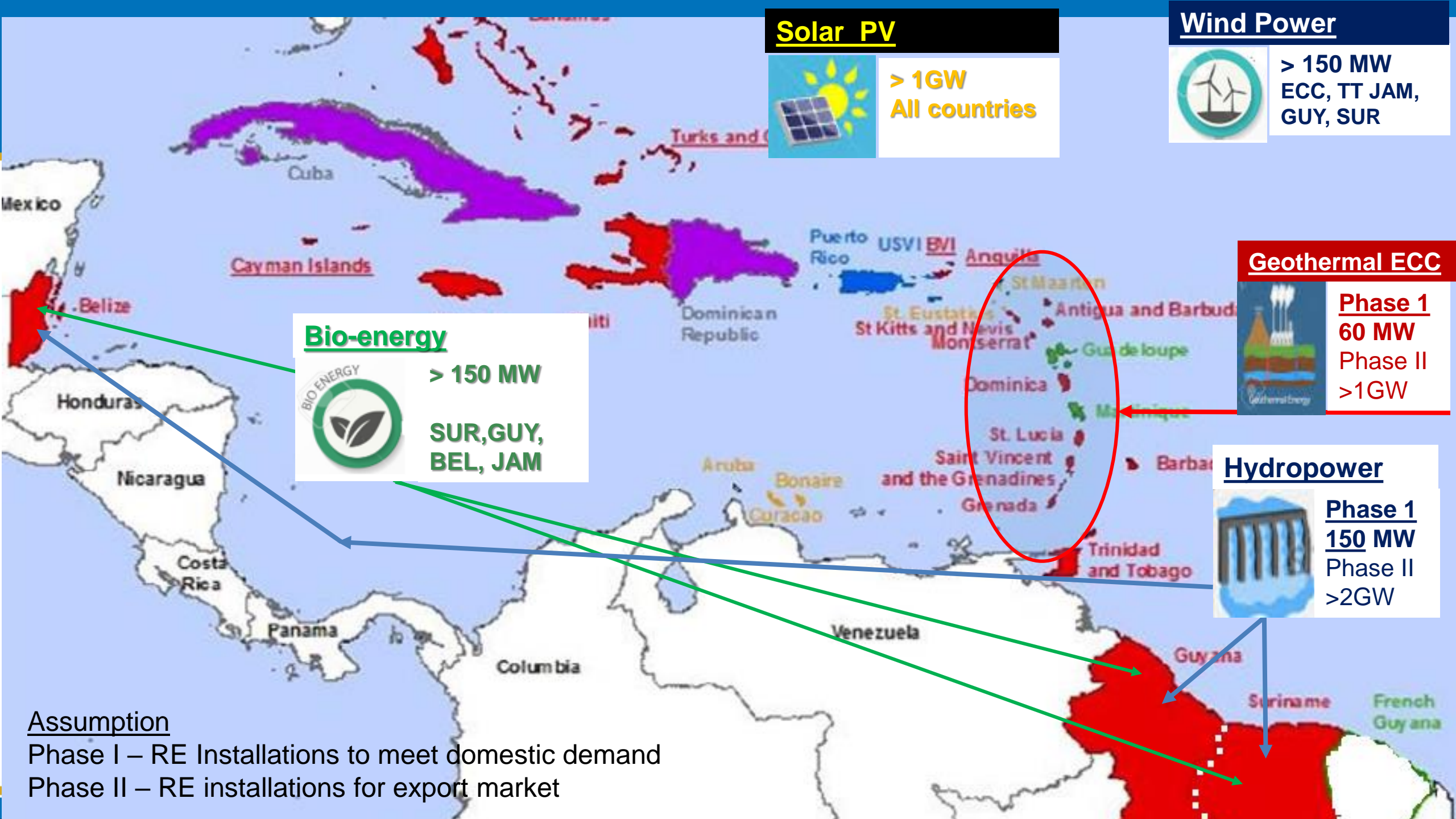


Phase 1
150 MW
Phase II
>2GW

Bio-energy



> 150 MW
SUR, GUY,
BEL, JAM



Assumption

Phase I – RE Installations to meet domestic demand
Phase II – RE installations for export market



Electricity Demand

Installed Generation Capacity

Installed Capacity CC \approx 5.54GW

Installed capacity TT \approx 2.12 GW \approx 38%

Installed RE Capacity \approx 0.55GW \approx 10%

Peak Electricity Demand

CC -- Coincident Peak appx. 3.5GW

TT -- Coincident Peak 1.3 GW, 40%

JAM – Coincident Peak 0.7GW, 20%

5ECC - Coincident Peak 0.165GW, 5%



Market Potential per Utility Scale RE Technology

RE Source/Technology

- Solar PV
- Wind
- Hydro
- Geothermal
- Bio-energy
- Others – Marine, WtE

Estimated Market/Potential

- Limited only by technical consideration
- 150 MW – JAM, GUY, SUR, TT, ECC
- 150 MW Phase I
(Phase II: Technical Pot 8000MW Guy, Sur)
- 60 MW Phase 1; (Phase II >1GW)
- 150 MW – GUY, SUR, BEL
- ??



Constraints for RE

Grid Access-Utility Scale RE

IPP Permitted (Source CSERM Report 2015)

- Antigua and Barbuda
- Barbados
- Belize
- Dominica
- Haiti
- Jamaica
- St Lucia
- St Vincent and the Grenadines
- Trinidad and Tobago

Feed In Tariff:

Barbados, Pilot with cap: GRE,
SVG, DOM

Impact of Load Profile

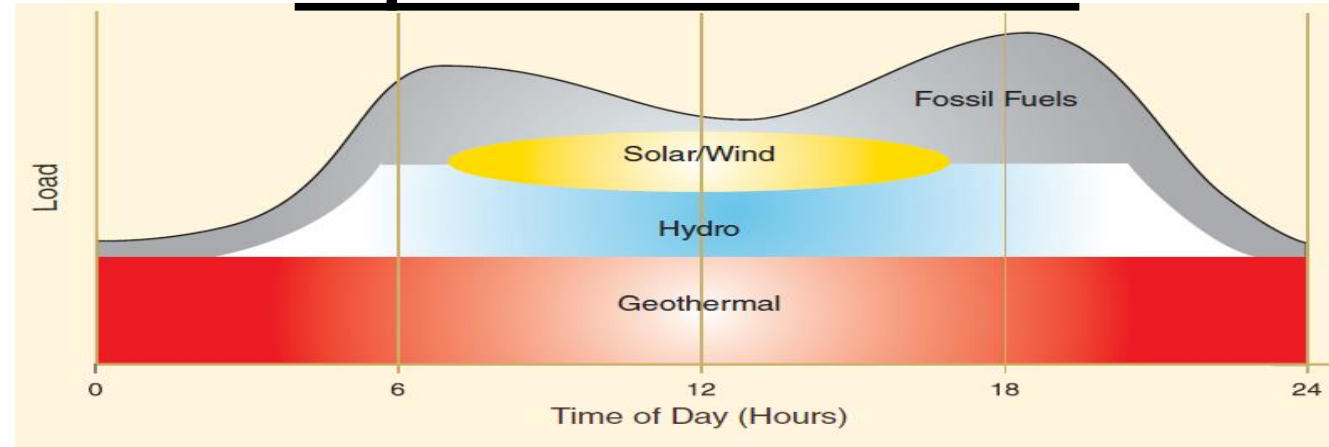
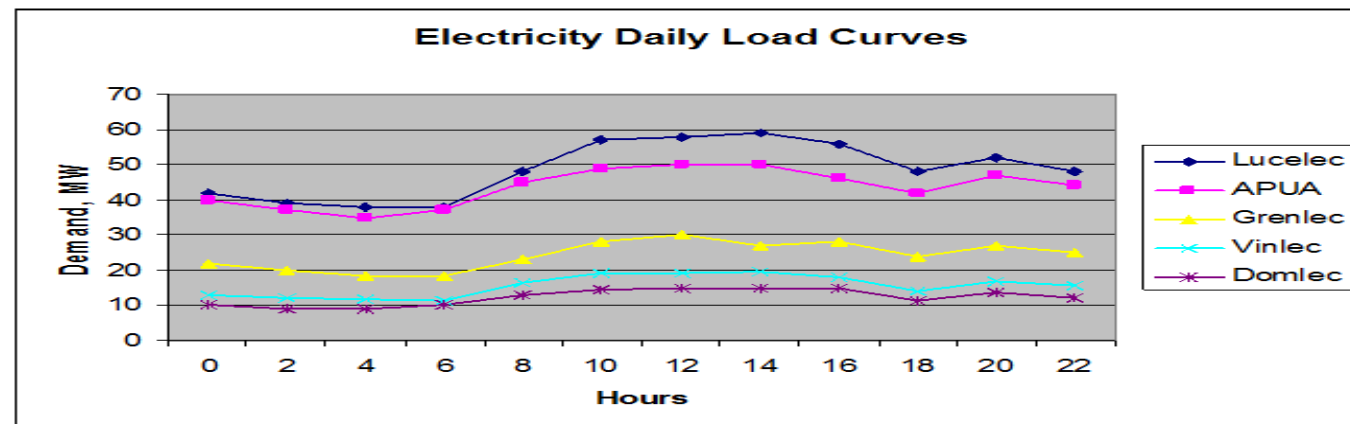


Figure: Simplified Load Curve (Gehringer & Loksha, Geothermal Handbook, 2012)





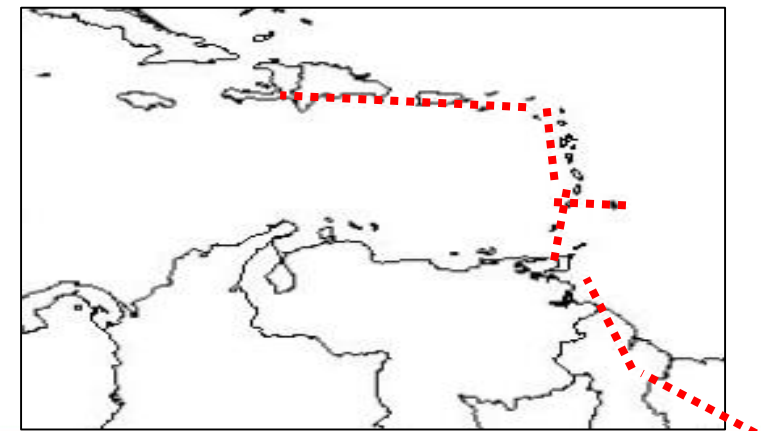
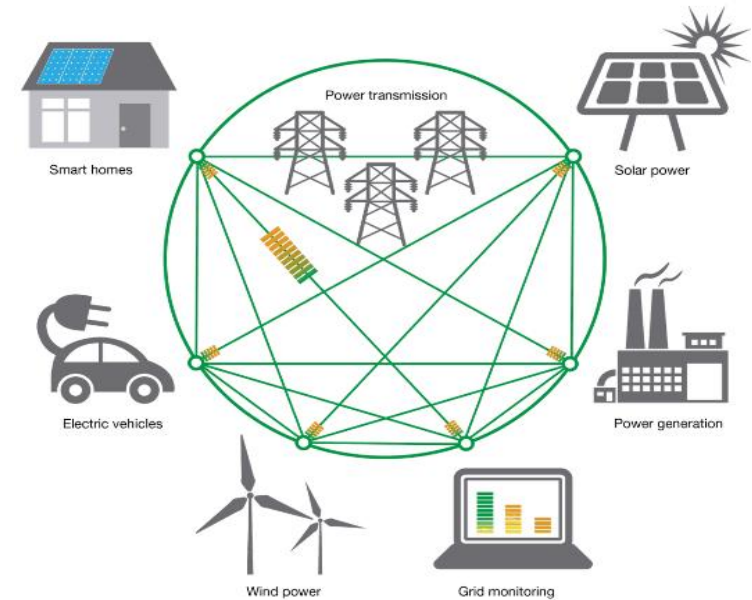
Potential for Investment in Infrastructure

• Smart Grids

- Increase RE penetration
- Value-add energy services
- Maximize the capacity of grid, minimize need for expansion

• Inter-connection of electricity grids by land and under-sea cables

- Expand market size
 - Brazil (2GW), French Depts. & US Territories (>0.5GW)
- Optimize GE, Hydro potential
- Allow some countries to achieve RE targets





END

THANK YOU

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