IRENA
International Renewable Energy Agency

Regional Meeting
Clean Energy Corridor of Central America (CECCA)
Panama, 23 May 2018

Session IV: Accelerating Renewables Deployment in Regional Electricity Market

Honduras

CLEAN ENERGY CORRIDOR
Central America

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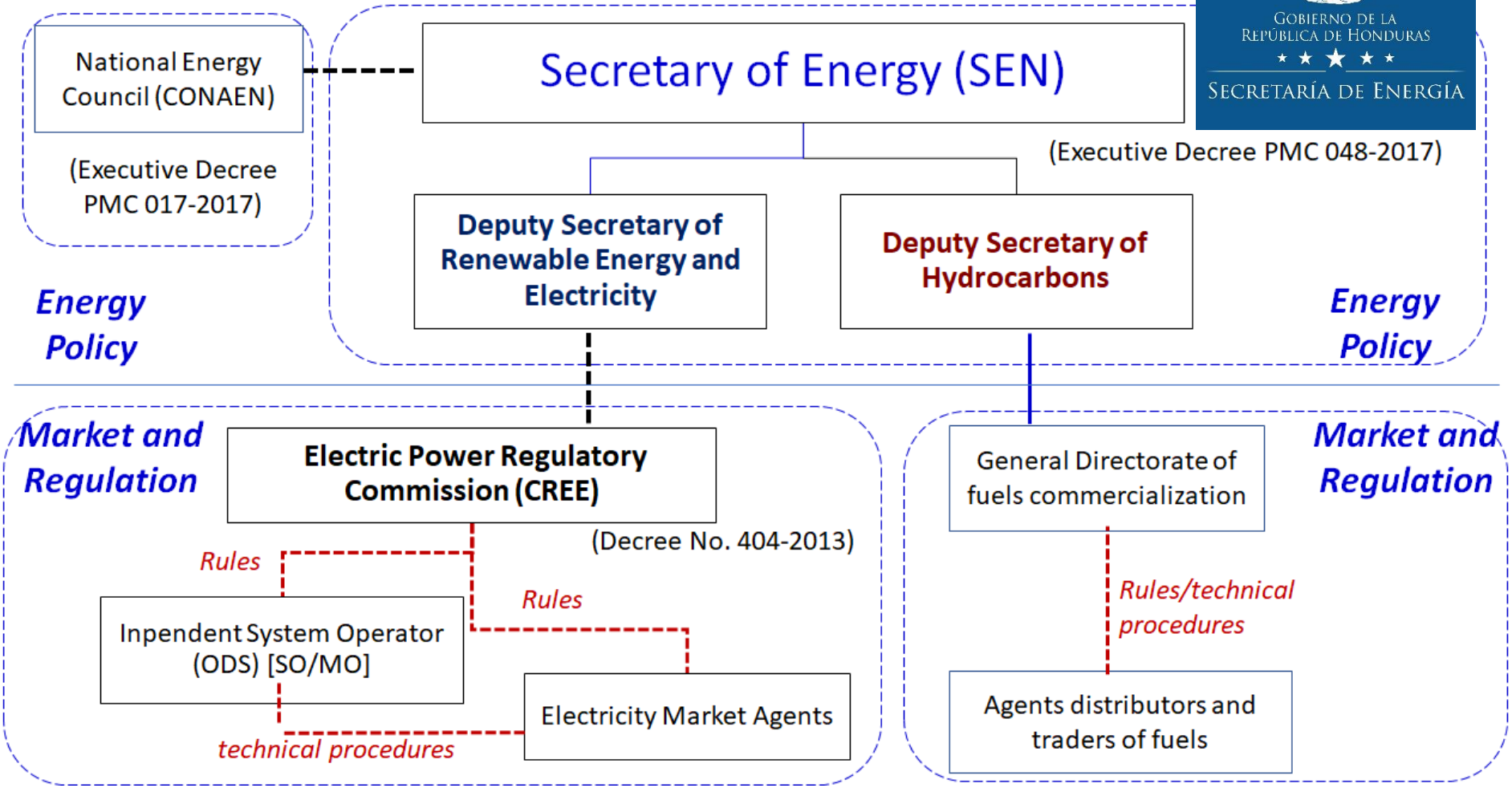
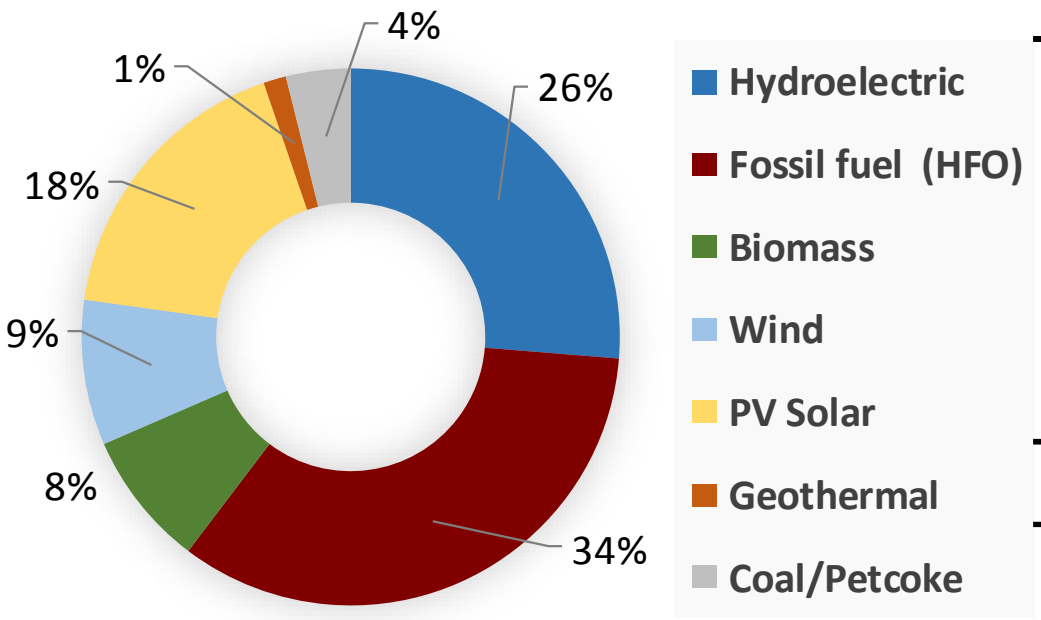
Energy Sector of Honduras

GOBIERNO DE LA REPÚBLICA DE HONDURAS
SECRETARÍA DE ENERGÍA



Current status of renewable energy development in Honduras

Installed Capacity [MW], 2017



Technology	Installed Capacity [MW]
Hydroelectric	675,8
Fossil fuel (HFO)	875,1
Biomass	209,7
Wind	225,0
PV Solar	450,9
Geothermal	35,0
Coal/Petcoke	99,8
Total Capacity	**2571,3**

Peak Power Demand ~ 1560 MW

RE installed capacity ~ 62 %

Source: Boletín de Datos Estadísticos- Diciembre 2017, Gerencia de Planificación, Cambio e Innovación Empresarial, ENEE

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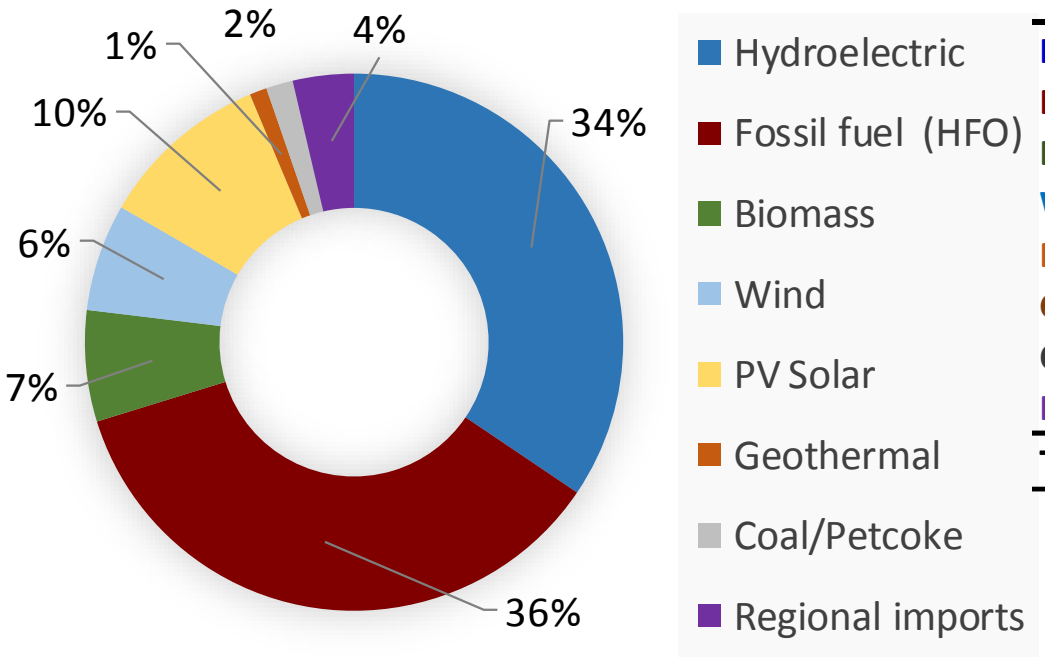
Current status of renewable energy development in Honduras

Electricity Generation [GWh], 2017



Technology	Electricity Generation [GWh]
Hydroelectric	3086,7
Fossil fuel (HFO)	3203,9
Biomass	599,7
Wind	578,1
PV Solar	923,7
Geothermal	92,6
Coal/Petcoke	144,6
Regional imports	328,6
Total generation	**8957,8**

RE generation ~ 60 %

Source: Boletín de Datos Estadísticos- Diciembre 2017, Gerencia de Planificación, Cambio e Innovación Empresarial, ENEE

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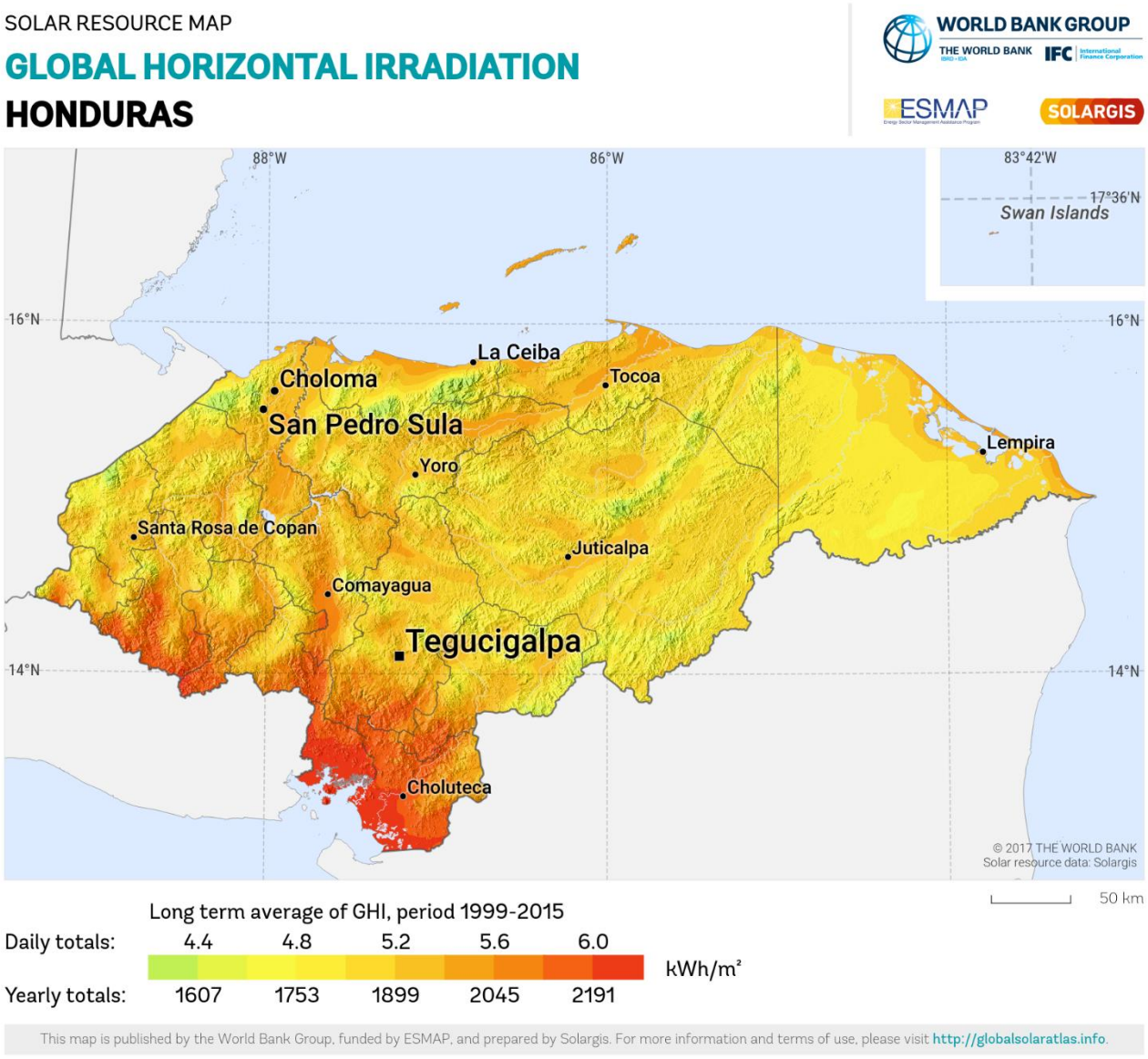
Renewable energy resource potential (Honduras)



Source: Solar and Wind Energy Resource Assessment (SWERA),M. Flores, UNAH, Honduras 2008

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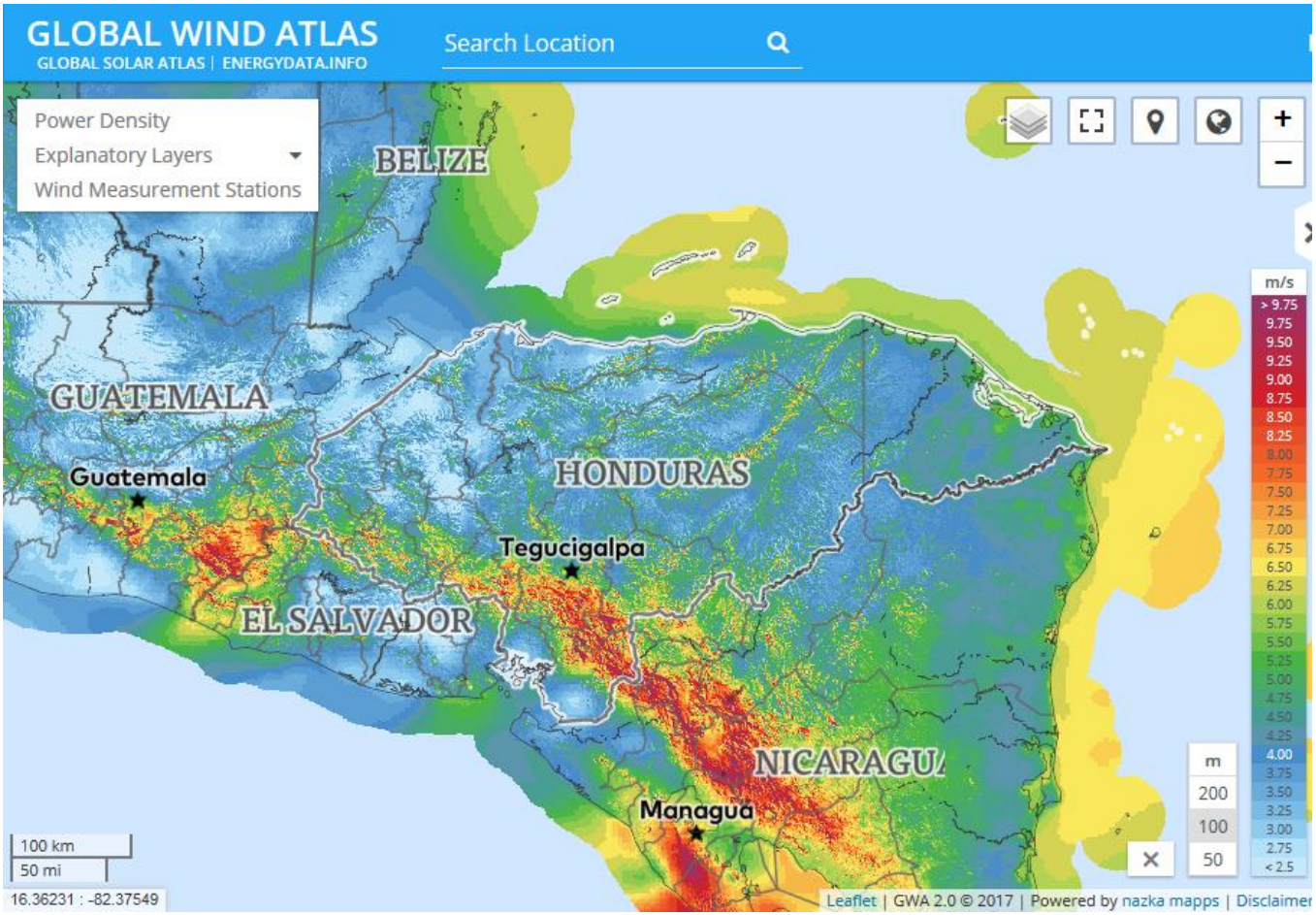
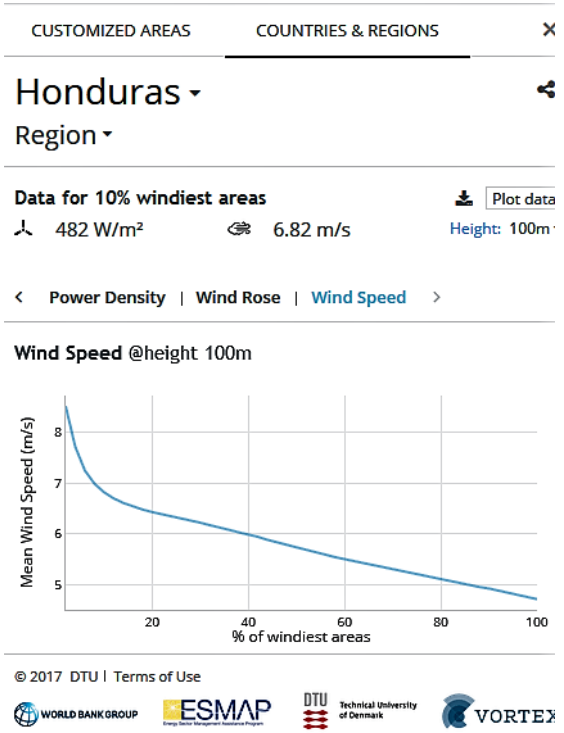
Renewable energy resource potential (Honduras)





Source: https://globalwindatlas.info/area/Honduras

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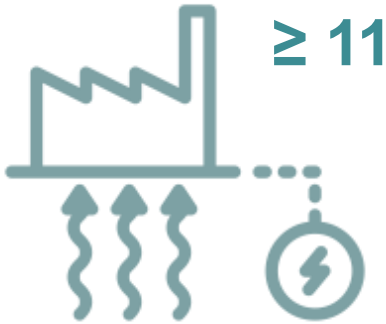
Current status of renewable energy development in Honduras

~ 5000 MW

≥ 1200 MW



≥ 112 MW

Renewable natural resource potential (estimated):

~ 5.2 KWh/m² day or 6 sun hours

≥ 300 MW

Current status of renewable energy development in Honduras

National renewable energy targets, goals or strategies

The Country Vision and National Plan Law constituted into State Policy by Decree No. 286-2009

- The Government of Honduras intends to reverse the structure of the electricity sector by 2022 to a ratio of **60 %** renewable and 40 % fossil fuel. By 2038 the energy matrix will show a net share equivalent to **80%** serving the total demand through the use of renewable energy sources.
- The Honduras **Scaling-Up Renewable Energy Program in Low-Income Countries (SREP)** is giving US$30 million in grants and near-zero interest for a diverse programme of investment plans (rural electrification, cookstoves, regulatory reform initiatives)

Renewable energy legislation (policy and regulatory support schemes)

- **Decree No. 70-2007 "The Law to Promote Electricity Generation by Renewable Resources"**
- **Decree No. 138-2013 (Reform of the decree No. 70-2017)**

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Current status of renewable energy development in Honduras

Major investments and future renewable energy projects (~ 815 MW, 3200 MUSD$)

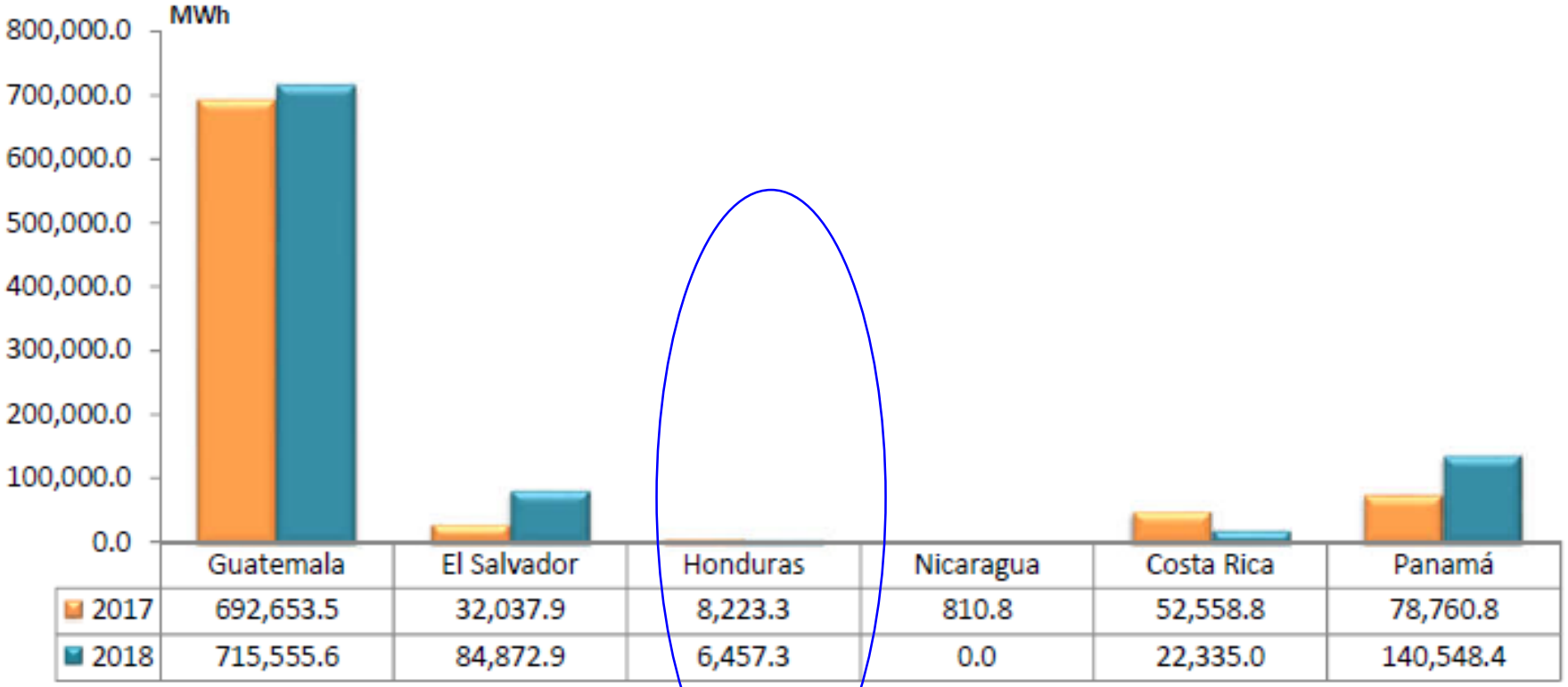
Project	Expected income year	Central type	Power Capacity [MW]	Units	Av. Energy generation per year [GWh]	Estimated investment cost [MUSD$]	Cost UDS$/MW-inst
Patuca III (Piedras Amarillas)	2019	*Dam*	104	2	340	455,8	4,4
Patuca II (Valencia)	2026	*Dam*	270	3	1337	768,0	2,8
Patuca II-A (La Terrosa)	2026	*Dam*	150	3	691-800	682,1	4,5
Los Llanitos	2023	*Dam*	98,2	2	370,4	566,7	5,8
Jicatuyo	2024	*Dam*	172,9	4	667,2	584,4	3,4
El Tablón	2022	*Run-of-river*	20	2	991,1	164,4	8,2

Renewable energy development in the national electricity market of Honduras

- **Policy, regulatory or institutional challenges**
  - The **General Law of the Electric Industry** (***Decree No 404-2013****, May 2014*). This law allows for the liberalization of the electricity market in Honduras. However, many of key aspects of the reform are still pendant.
  - **Institutional strengthening** in the energy sector.
  - The development of **a long-term sustainable energy policy**.
- **Technical challenges**
  - Establishment of ancillary services markets
  - Investments in transmission network
- **Financial challenges**
  - Proper management of social and environmental issues
  - Adequate technical studies for a reasonably low risk expectation

Honduras experience with the Regional Electricity Market

Annual injections into regional market

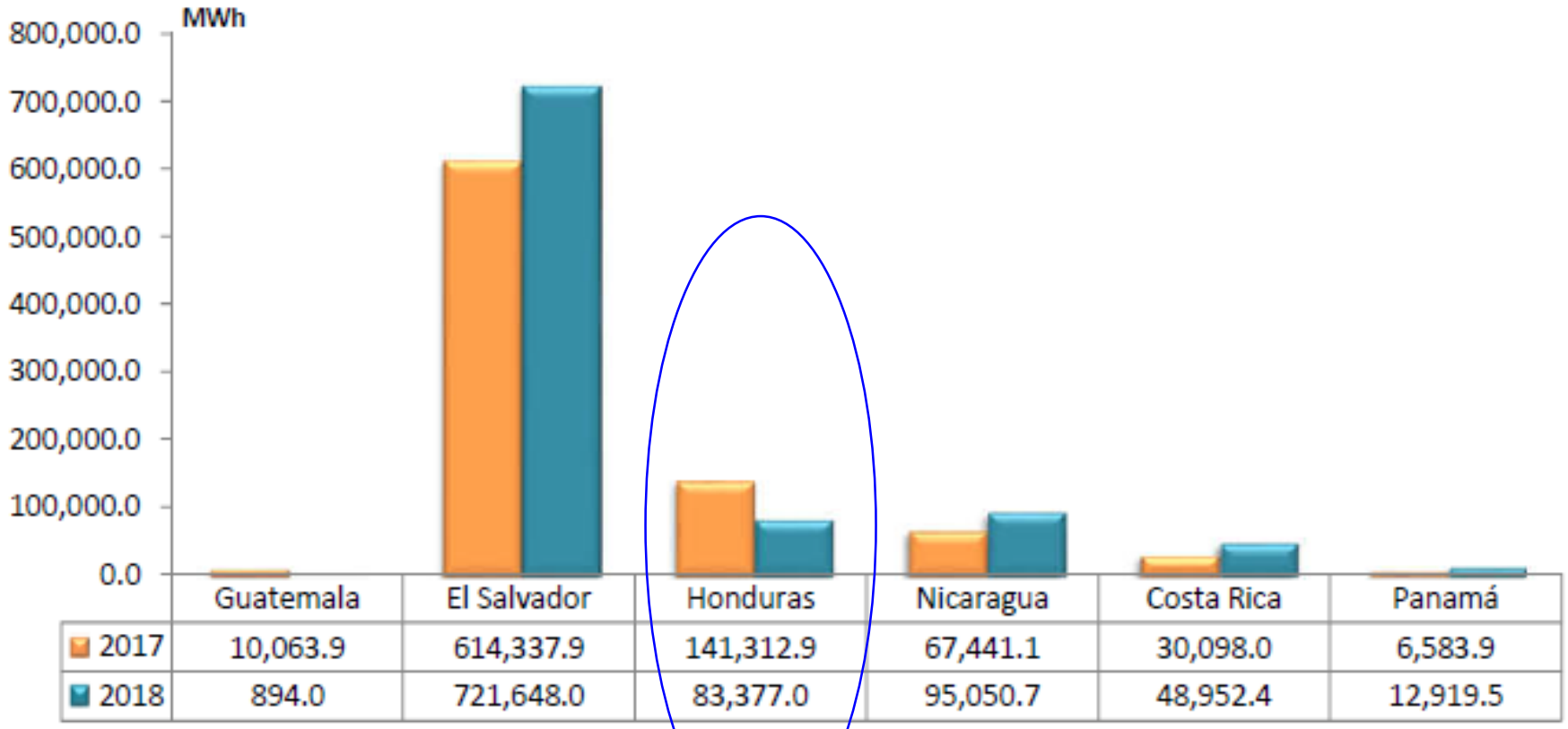


	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panamá
2017	692,653.5	32,037.9	8,223.3	810.8	52,558.8	78,760.8
2018	715,555.6	84,872.9	6,457.3	0.0	22,335.0	140,548.4

Source: Transacciones Regionales Programadas en el Mercado Eléctrico Regional MER (MWh) viernes, 18 de mayo de 2018, disponible en sitio web: http://www.enteoperador.org/

Honduras experience with the Regional Electricity Market

Withdrawals



	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panamá
2017	10,063.9	614,337.9	141,312.9	67,441.1	30,098.0	6,583.9
2018	894.0	721,648.0	83,377.0	95,050.7	48,952.4	12,919.5

Source: Transacciones Regionales Programadas en el Mercado Eléctrico Regional MER (MWh) viernes, 18 de mayo de 2018, disponible en sitio web: http://www.enteoperador.org/

Honduras experience with the Regional Electricity Market

- **Barriers to exporting more renewable power into the regional market**
  - Lack of an ancillary services market with harmonized rules (regulatory issues)
  - Weakness of the interconnection system (technical constraints)
  - Integrated planning for ER