

### Webinar: Distributed Generation and current schemes of PV installations in Mexico

SOLARBE

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## **Company Background**

#### WHO WE ARE

Revolve Renewable Power Corp. (TSXV:REVV), established in 2012 is a renewable energy company focused on the development of utility scale wind, solar, battery storage projects and distributed generation projects in the US and Mexico.

#### WHAT WE DO

The company operates a renewable energy development platform across the US & Mexico consisting of:

- (i) Utility scale developer: Developing twelve (12) projects from greenfield to ready-to-build ('RTB') representing a total over 2,838 MW (megawatts) of generation capacity.
- (ii) Distributed generation business: 6 MW of operating projects in Mexico, 3 MW in construction. Developed, financed, constructed and operated by the company.



### MEXICAN UTILITY SCALE DEVELOPMENT PORTFOLIO

First established operations in 2012.

+300MW of previous developed projects.

**Revolve** 

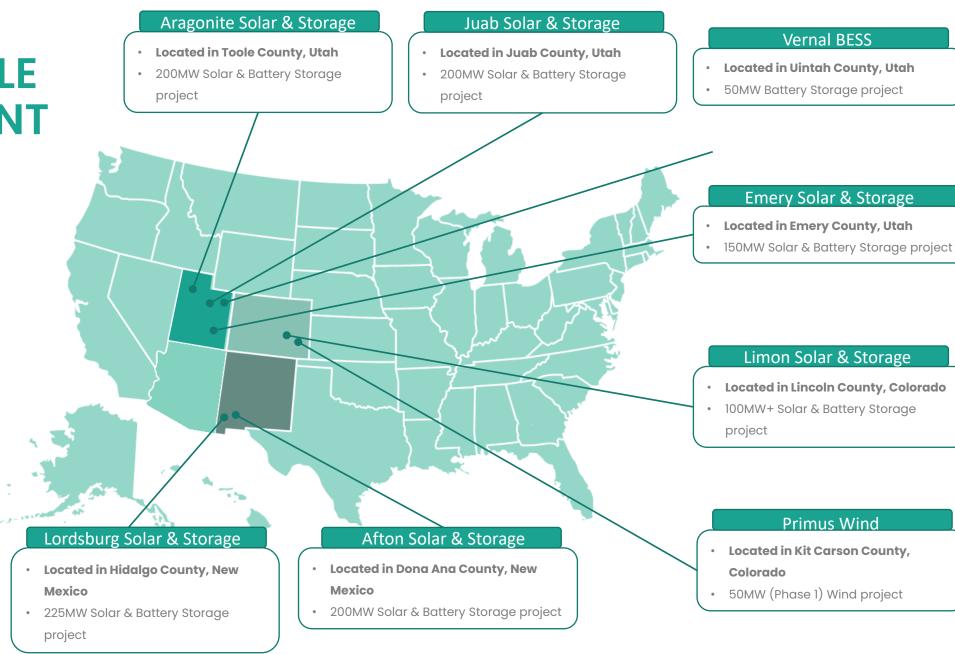
Renewable Power



### US UTILITY SCALE DEVELOPMENT PORTFOLIO

Expanded into US in early 2021. Developing 8 projects with total capacity of 1,175 MW.

Further projects being evaluated.



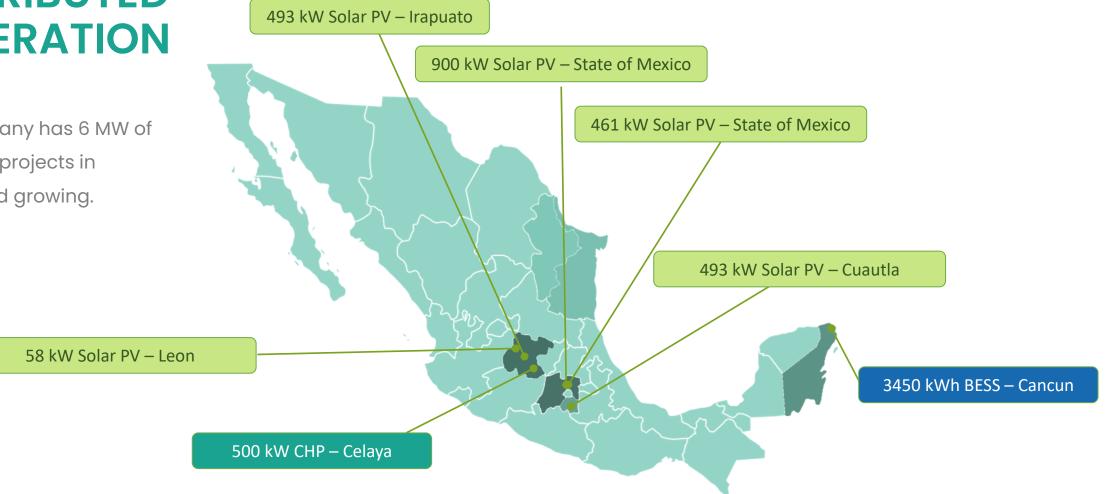


### Revolve Renewable Powe

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### **MEXICAN OPERATIONAL** DISTRIBUTED **GENERATION**

The Company has 6 MW of operating projects in Mexico and growing.



# LATAM: Solar deployment main challenges



Latin America has seen a significant growth in solar deployment in recent years. However, there are several challenges for further expansion.

• Mexico:

- Regulatory uncertainty for utility scale
- Permitting bottleneck for utility scale: Generation permit

O Colombia:

- Interconnection process and availability, incremented problem due to high development pipeline
- Social and community acceptance

O Chile:

• Transmission has not been upgraded as per their own law requirement causing severe saturation and hourly rate disruption. BESS is almost a must-have for new project development.

• Brazil:

• Competitive market due to high expected expansion

## **Mexico: Current state**



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Since 2020, permitting for utility scale energy development in Mexico has been significantly reduced. From COVID delays, lack of clarity and consistency in requirements, to rejection of energy generation permit.

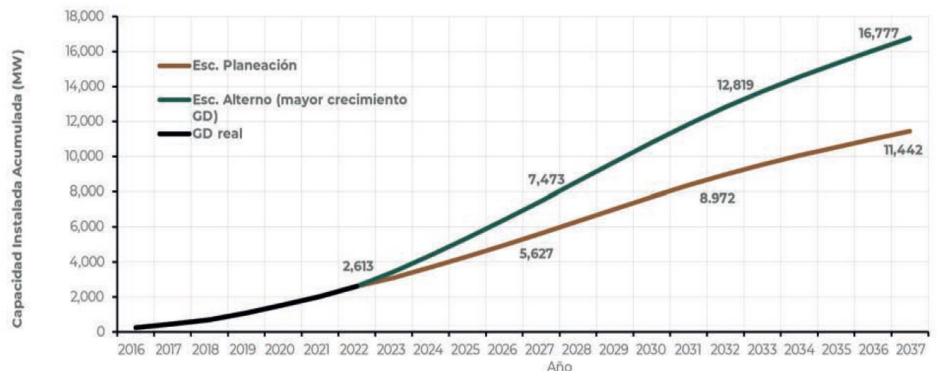
- Additionally:
  - Growing energy demand by nearshoring effect and climate change. At least 2.5% annual increase for the next 15 years.
  - Energy margin in the grid is thin with minor blackouts occurring in this hot season.
  - New energy generation is highly needed, with limited permitting in utility scale.

### • Distributed Generation (DG):

- Mexican Energy Law allows DG systems up to 500kW => no permitting process
- One interconnected system per energy consumption contract with grid distributor CFE (Comisión Federal de Electricidad).
- Isolated generation systems of less than 500 kW can be installed if they are not interconnected with the grid nor between them.

### Mexico: Distributed generation expected grow Revolve Renewable Power

According to governmental official development plan (PRODESEN report 2023), DG is expected to grow from 2.6 GW in 2022 to between 11.4 GW to 16.8 GW in 2037.



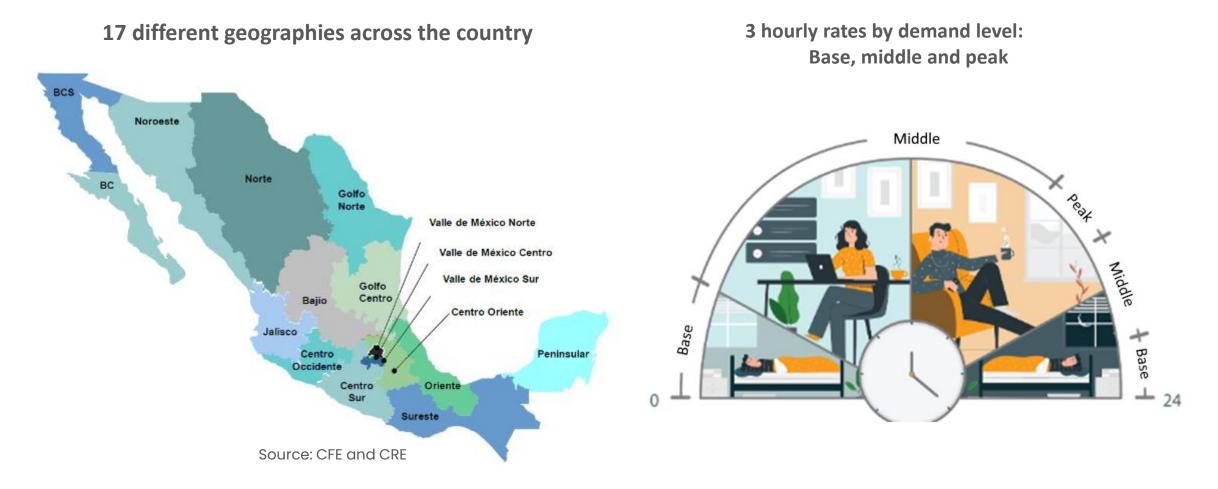
Source: PRODESEN 2023

# Mexico: Industrial energy fees



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Currently, only CFE is a basic energy supplier for low and medium voltage. Above 100kW in load capacity, most industries have the industrial energy fee type "GDMTH" (Hourly High Demand in Medium Voltage).



TSXV:REVV

# Mexico: Industrial energy fees

There are additional fees in the GDMTH fee type that depends on:

- O Contracted demand
- O Total monthly energy consumed
- Monthly maximum demand

CFE fees have increased 12% in average from June 2012 to June 2013, while inflation was less than 6%.

Additional benefits of distributed generation (DG) systems:

- Reduces dependency to energy fee increases
- Reduces dependency to fossil fuel prices volatility



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# **Mexico: DG technology options**



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The three main technology options for distributed generation that are currently growing in Mexico are:

#### Photovoltaic (PV):

- ✓ Competitive energy
- Generates on middle fee energy rate
- Low capacity factor



- ✓ More energy generation
- ✓ Sustained generation
- ✓ Backup function
- Dependant on fossil fuel pricing
- May not align with renewable energy / ESG corporation goals

### VEGETABLE OIL BIOETHANOL-HEATING OIL-NATURAL GAS-COAL -BIOMASS -BIOGAS -MUNICIPAL WASTE

### Battery Energy Storage System (BESS):

- ✓ Reduction on maximum load
- Shift of consumption to base energy rate
- Backup function
- No DG capacity limit (not considered energy generation)
- High CAPEX





# **Mexico: PV schemes for DG system acquisition**

Leasing:

Three main schemes for acquiring a PV energy generation system in distributed generation in Mexico are:

Reduced initial investment

#### **Direct purchase:**

- ✓ No debt required
- Highest flexibility on the system as is owned by the Client

- Highest risk due to exposure for design faults, construction bad practices and hidden defects
- Requires complete initial investment

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Requires management of operation and maintenance

- Debt management
- Co-ownership of the system may lead to complicated terms in contract or complex relationship with the provider
- Partial flexibility on the system

#### **Power Purchase Agreement (PPA):**

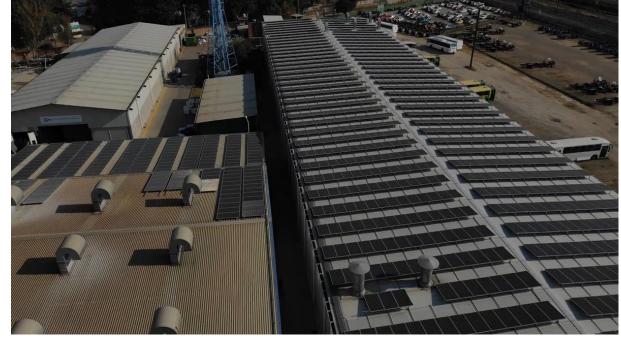
- ✓ No debt required
- No investment required
- Lowest risk, pay only for generated energy
- Least responsibility as the system is not owned
- Least management required  $\checkmark$
- Flexibility on the system depends on relationship with the provider as is owned by them

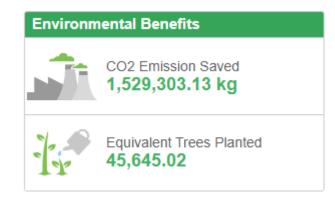


# Mexico: Rooftop PV success case study

Revolve Renewable Power

- 900 kWp / 667 kWac (two CFE contracts)
- Located in State of Mexico
- Started operation in late 2019
- 2400 Longi PV modules
- 7 SolarEdge inverters
- 3.9 GWh generated lifetime energy as of June 2023
- Given the consumption pattern, the PV generated energy price was able to be agreed 17% lower than CFE average fee, this estimated more than 1 million USD in savings after 10 years.





## Mexico: BESS success case study



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Three BESS systems in Quintana Roo, Mexico :

- Totalling 1900 kW / 3450 kWh
- Started operation in May 2023
- Considering only May 2023, it is estimated a reduced emission of 23,168 kg of CO2

#### • Benefits:

- Between 30% to 60% less energy consumption at peak hours, consumed in base hours instead.
- Between 30% to 50% lower maximum power demand at peak hours.
- About 20% savings in CFE receipt





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