IECA Renewable Energy Panel

Presented By: John Martin

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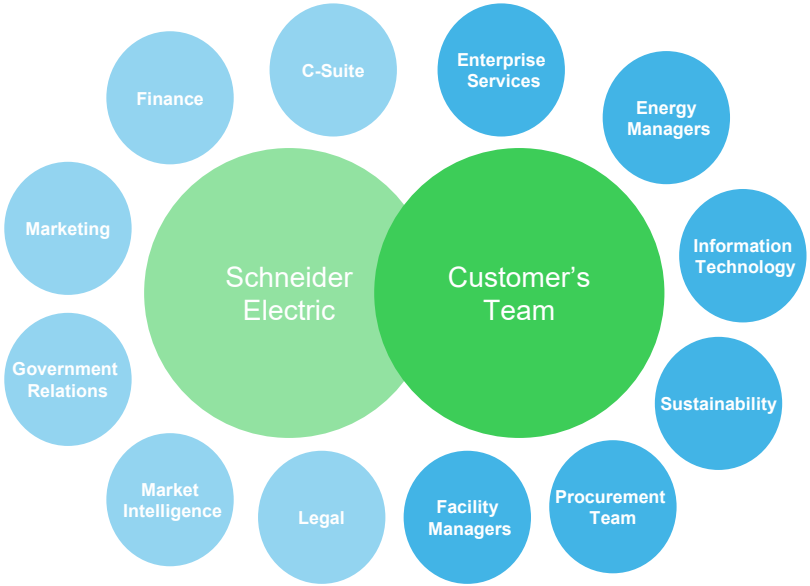
IECA's Cleantech Partner

Our mission is to enable organizations around the globe to embrace clean, renewable energy along their journey to active energy management

Our Role

- Full-service, independent renewable energy advisor to global organizations - from initial engagement through operations.
- Not a developer, technology provider nor financier of projects
- No conflict-of-interest with developers, utilities or retail electric providers
- Not owned or affiliated with a Utility or Electricity Supplier



Unparalleled Global Experience

Schneider Electric has advised on over 6,000 MW of global renewable energy PPAs…

vmware
signify
TARGET
RoyalCaribbean INTERNATIONAL
BLUESCOPE
Sprint
amazon web services
T··Mobile·
Cummins
DaVita Kidney Care
Ball
Walmart
EQUINIX
KOHLER
BROWN-FORMAN
BD
VAIL RESORTS EXPERIENCE OF A LIFETIME
hp
SMUCKER'S
GAP
FIFTH THIRD BANK
DIGITAL REALTY
IRON MOUNTAIN

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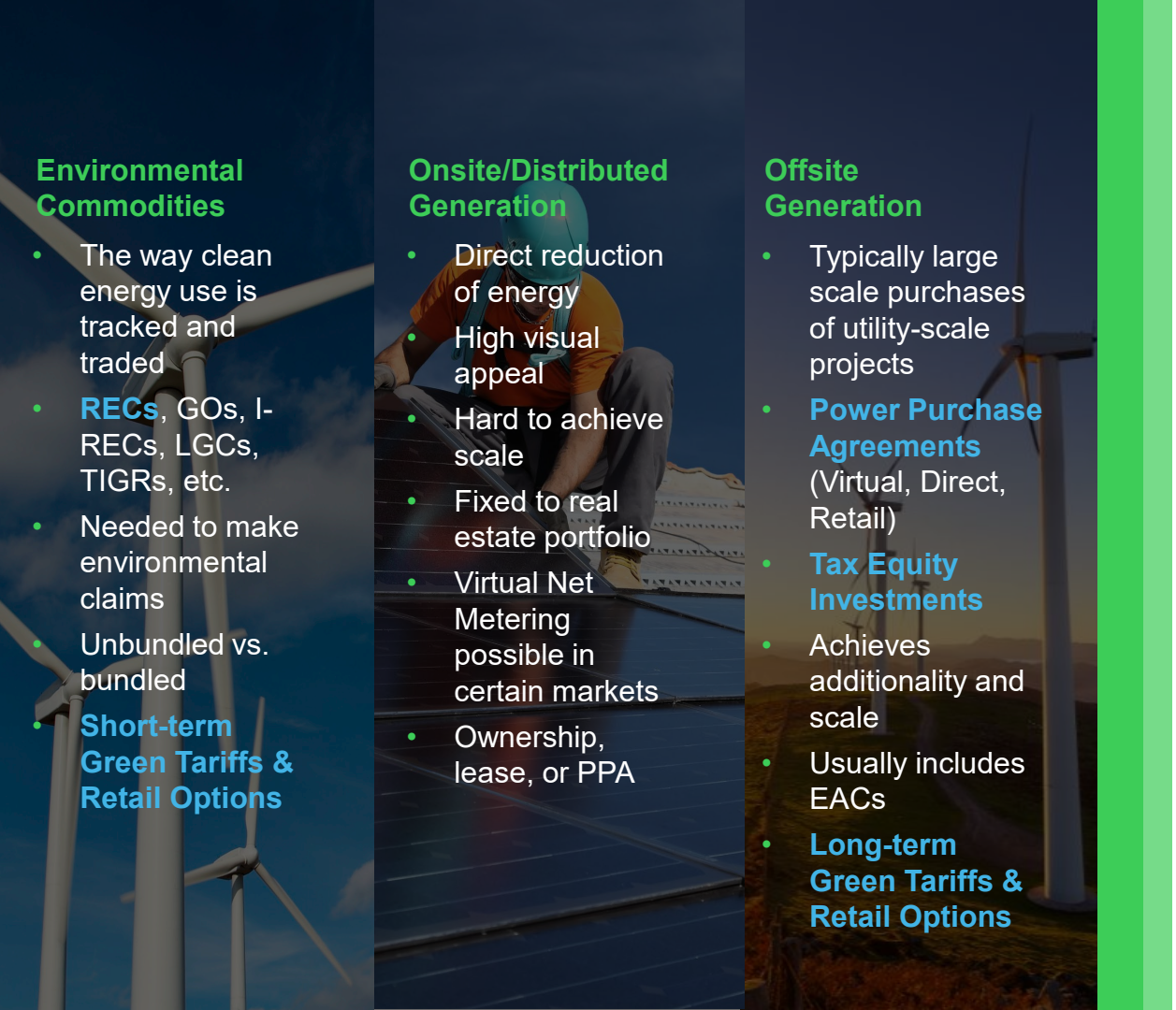

Environmental Commodities

- The way clean energy use is tracked and traded
- **RECs**, GOs, I-RECs, LGCs, TIGRs, etc.
- Needed to make environmental claims
- Unbundled vs. bundled
- **Short-term Green Tariffs & Retail Options**

Onsite/Distributed Generation

- Direct reduction of energy
- High visual appeal
- Hard to achieve scale
- Fixed to real estate portfolio
- Virtual Net Metering possible in certain markets
- Ownership, lease, or PPA

Offsite Generation

- Typically large scale purchases of utility-scale projects
- **Power Purchase Agreements** (Virtual, Direct, Retail)
- **Tax Equity Investments**
- Achieves additionality and scale
- Usually includes EACs
- **Long-term Green Tariffs & Retail Options**

Three Ways to Procure Renewable Energy

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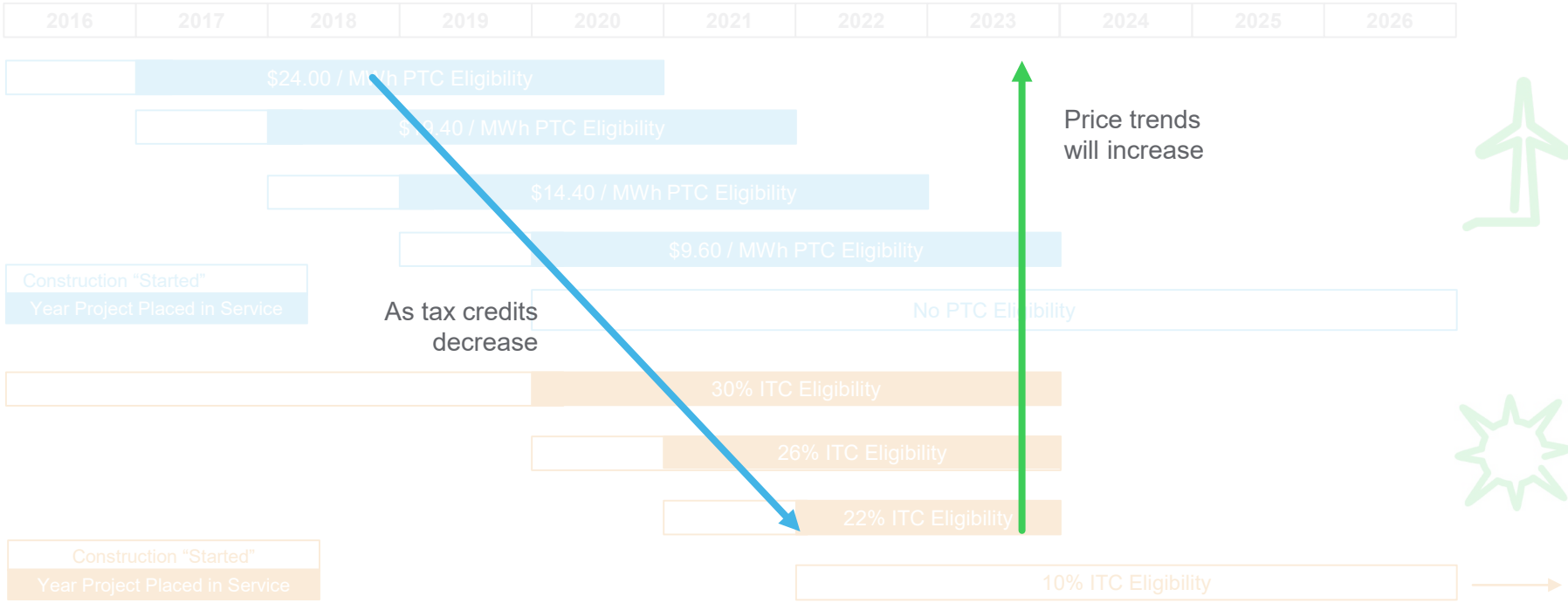
Renewables – The Fast Five

- Tax Credits Expiring
- New Players / Dynamics
- The Rise of Retail Options
- Supply/Value Chain Pressure
- Thermal Needs

Tax Credits for Wind & Solar Are Stepping Down



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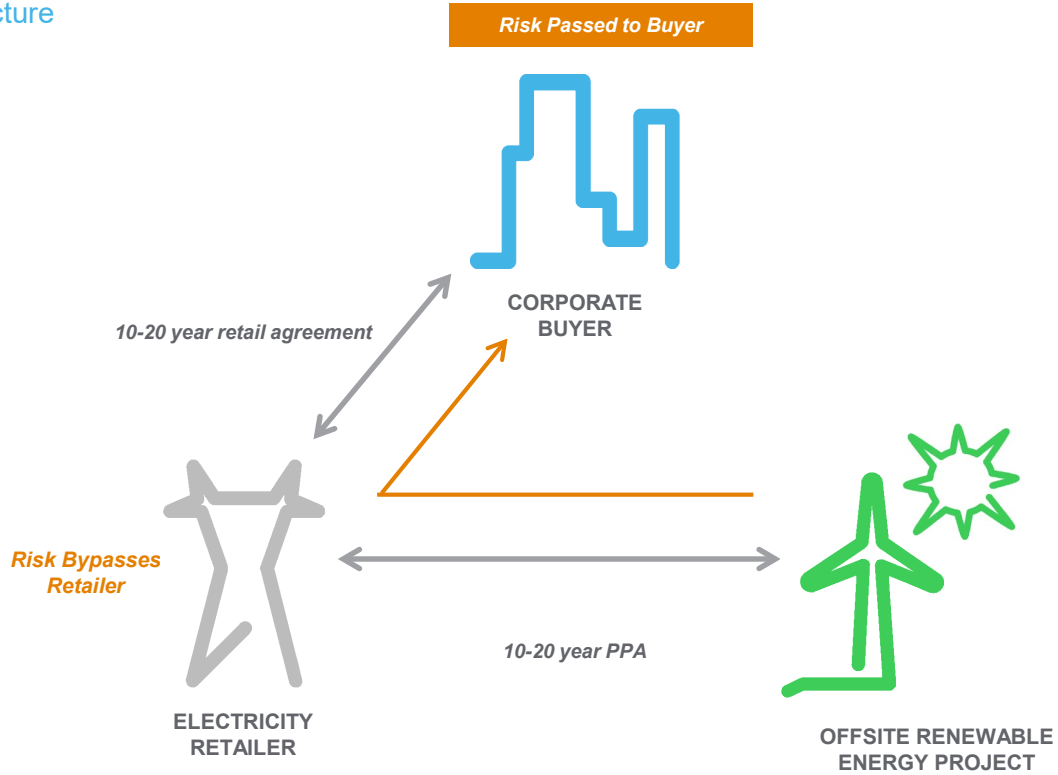
Retail Sleeved PPA

Common Contract Structure



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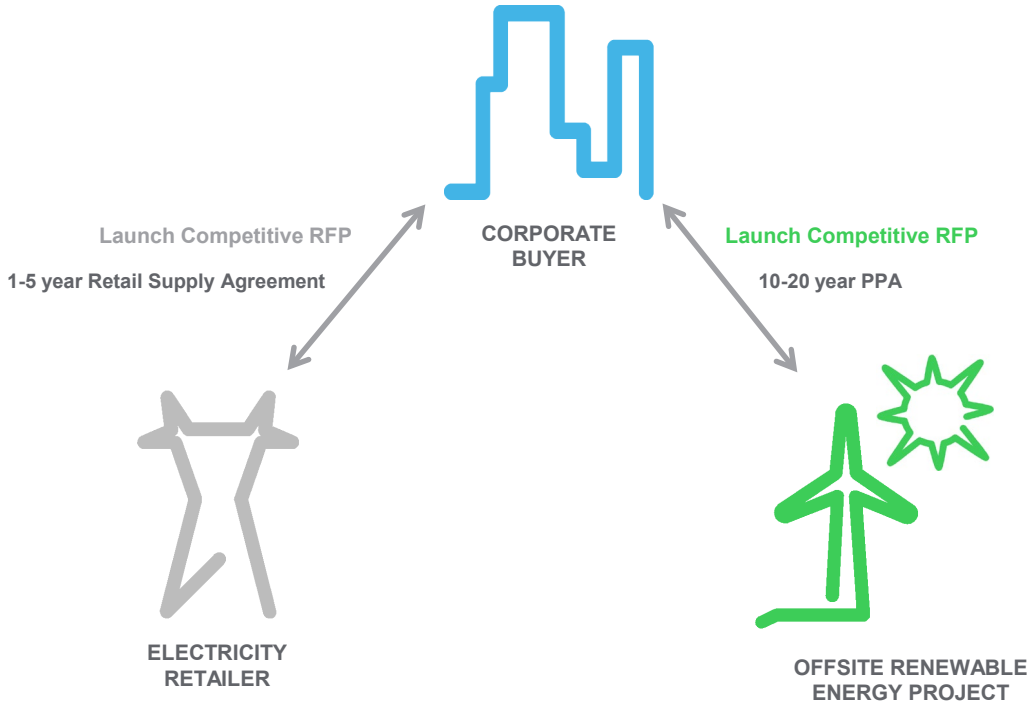
Bifurcated Retail Sleeved PPA

Competitive Approach to Contract Structure



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CASE STUDY | RENEWABLE ENERGY

Ball Enhances the Can's Sustainability with Renewable Energy

Purpose

- Reduce global Scope 2 greenhouse gas emissions
- Enhance the sustainability credentials of their packaging

Solution

- Initiate a Virtual Power Purchase Agreement (VPPA)
- Include one wind and one solar for a total 388 megawatts

Path

- Assisted Ball in its renewable energy project selection and negotiations
- Expanded on Ball's success from 2015 when they built three wind turbines

Results

- 50% reduction of Scope 2 greenhouse gas emissions *equivalent to the carbon reduction of removing 180,000 passenger vehicles from the road annually*
- 100% of North American energy load will be replaced with solar and wind by the end of 2021

CASE STUDY | RENEWABLE ENERGY

Cummins Commits to Wind Power

Purpose

- Invest in renewable energy that best fits the company's goals
- Select a project that added real renewable energy capacity in the market
- Provide tangible environmental and community benefits

Solution

- Enter into a virtual power purchase agreement (VPPA)
- Evaluate the viable options for wind power to provide the greatest return

Path

- Helped Cummins assess all the wind power opportunities to meet the manufacturer's goals
- Arranged a wind power VPPA for 75MW of the Meadow Lake Wind Farm with EDP Renewables in Indiana

Results

- Replace 100% of Cummins electricity use with wind power
- Generate wind power equivalent to the electric needed to power 20,000 average homes in the Hoosier State

CASE STUDY | RENEWABLE ENERGY

Australian Landmark Renewable PPA

Purpose

- Meet financial goals through the adoption of renewable energy
- Reduce short-term costs and long-term volatility

Solution

- Invest in solar energy
- Sign a financially viable Power Purchase Agreement (PPA)
- Design an energy purchasing strategy

Path

- Performed a full energy portfolio review to build strategy
- Ran an RFP for a PPA in New South Wales and received 15 responses from 13 developers
- Signed 88MW bundled PPA with developer ESCO Pacific for 133MW Finley Solar Project

Results

- Reduced greenhouse gas emissions by approximately 300,000 tons of CO2e each year
  comparable to taking 90,000 cars off the road and enough to power 60,000 homes
- BlueScope will offtake 66% of the 133 megawatts of energy generated from ESCO Pacific's Finley Solar Farm

BLUESCOPE

"The renewable PPA will help keep downward pressure on energy costs and support the gradual transition to renewable energy."

- John Knowlan, CEO, BlueScope

Brown-Forman Invests in Renewable Energy

Purpose

- Reduce absolute greenhouse gas (GHG) emissions by 15% by 2023
- Be the first major U.S. spirits and wine producer to publicly commit to renewable energy

Solution

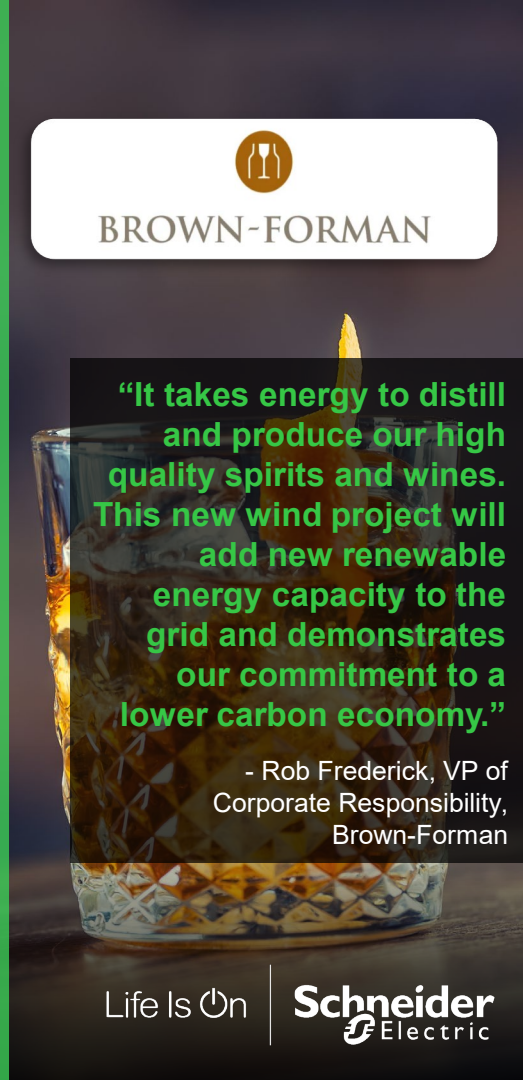
- Commit to a Power Purchase Agreement (PPA)
- Purchase wind power generated over the next 15 years to offset GHG emissions from electricity usage in the U.S. facilities

Path

- Helped evaluate and arrange deal between Brown-Forman and Infinity Renewables, the developer of Solomon Forks Wind Project, for 30MW of wind power
- Assisted in securing a stable price for power over the length of the contract

Results

- Wind farm is expected to generate the equivalent of more than 90% of Brown-Forman's annual electricity usage in the United States
- Progresses ambitious target to reduce absolute GHG emissions by 15% in 2023



CASE STUDY | RENEWABLE ENERGY

Signify Signs Poland's 1st Public VPPA

Purpose

- Progress towards 2020 carbon neutrality goal
- Provide in-country renewable solution to offset largest global manufacturing footprint in a carbon heavy grid

Solution

- 10-year 42 MW Virtual Power Purchase Agreement in Poland with Green Investment Group's Kisielice onshore wind farm

Path

- Ran a competitive solicitation for top renewable energy projects in Poland for a VPPA to provide greatest amount of operational flexibility
- Selected Green Investment Group because of its depth of experience in the PPA market

Results

- Addressed more than 25% of Signify's global electricity footprint
- Significant leadership with Poland's first publicly announced VPPA
- Major milestone towards carbon neutrality targets

Why Organizations Source Renewable Energy

Economics

Make/save money while achieving environmental goals, tax advantages of incentives & subsidies

Environmental

Reduce impact & climate risk, stated environmental goals gain brand leadership, claims & reporting

Manage Power Prices

Hedge existing short position, secure fixed price at a discount, mitigate risk of future electricity cost increases

Reputational

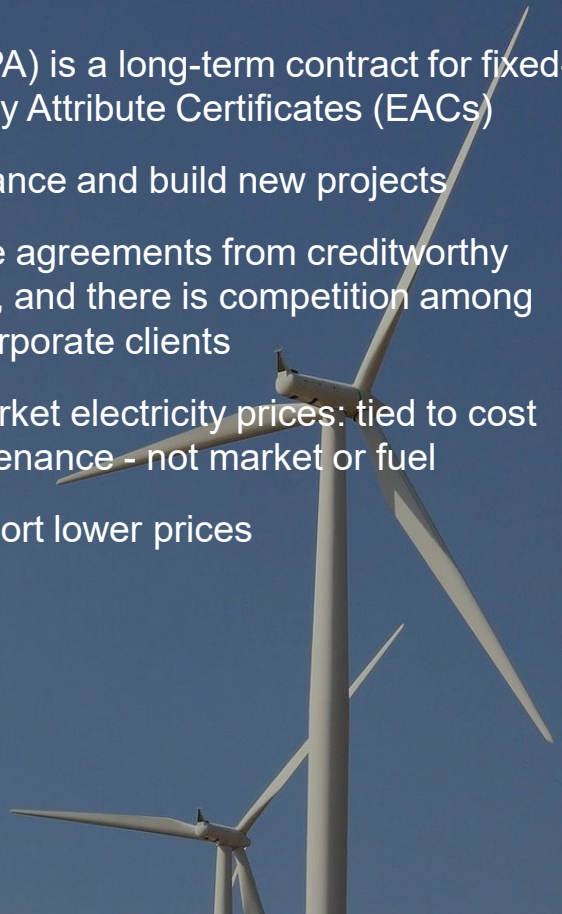
Increasing stakeholder pressures: customers, investors, value chain partners, employees, competitors, etc.

Resilience

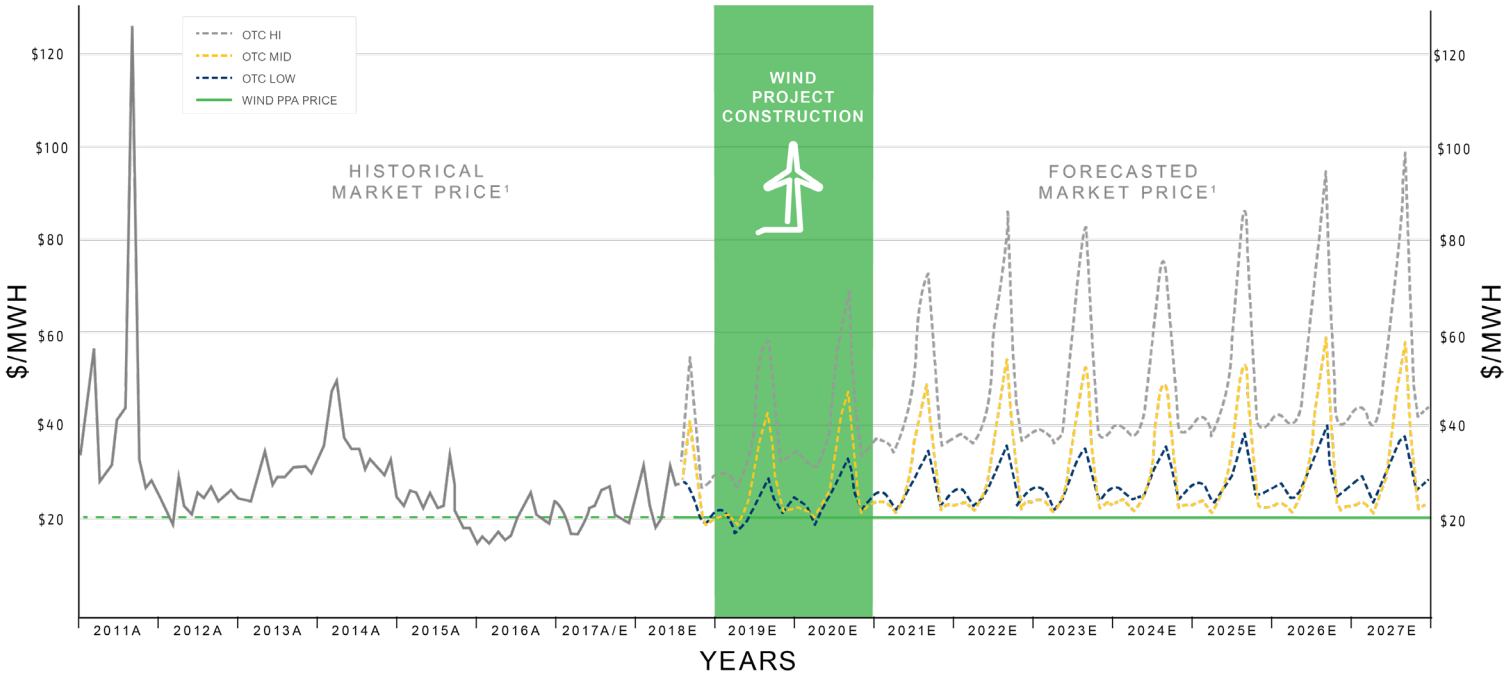
Back-up power, islanding, protect against extreme weather and events

The Offsite Corporate PPA Opportunity

- A Power Purchase Agreement (PPA) is a long-term contract for fixed-price wind/solar energy and Energy Attribute Certificates (EACs)
  - These are generally used to finance and build new projects
- Developers need long-term offtake agreements from creditworthy counterparties to secure financing, and there is competition among them to offer the best pricing to corporate clients
- PPA Prices can be below local market electricity prices: tied to cost of finance, construction and maintenance - not market or fuel
- Government incentives often support lower prices



Value In Offsite PPAs Requires Long-Term Commitment



[1] *Production-weighted prices for ERCOT-N, Texas.*

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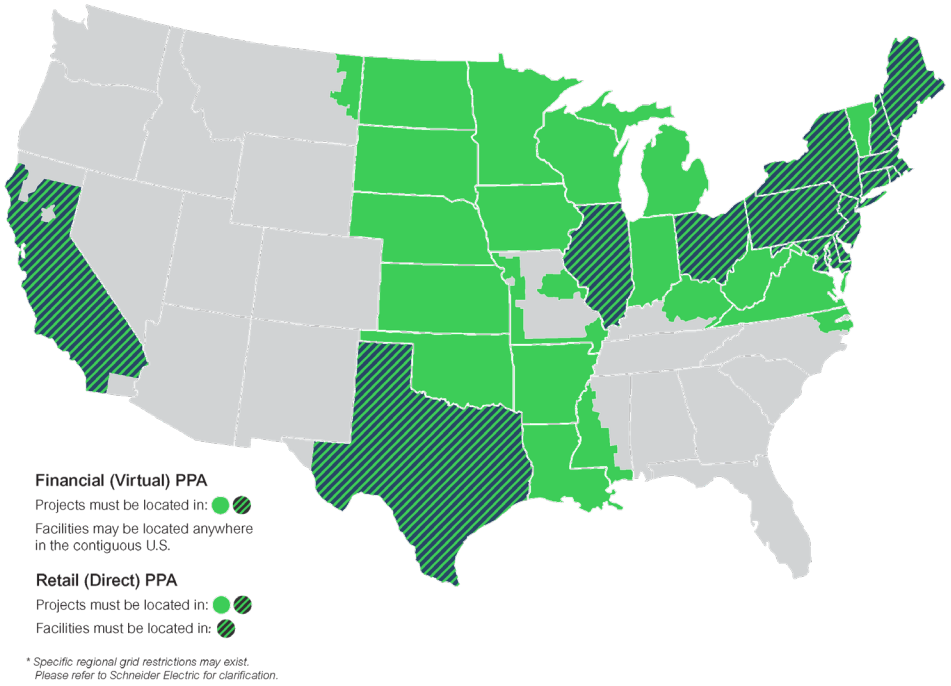
Retail (Direct) vs Financial (Virtual) PPAs in the US



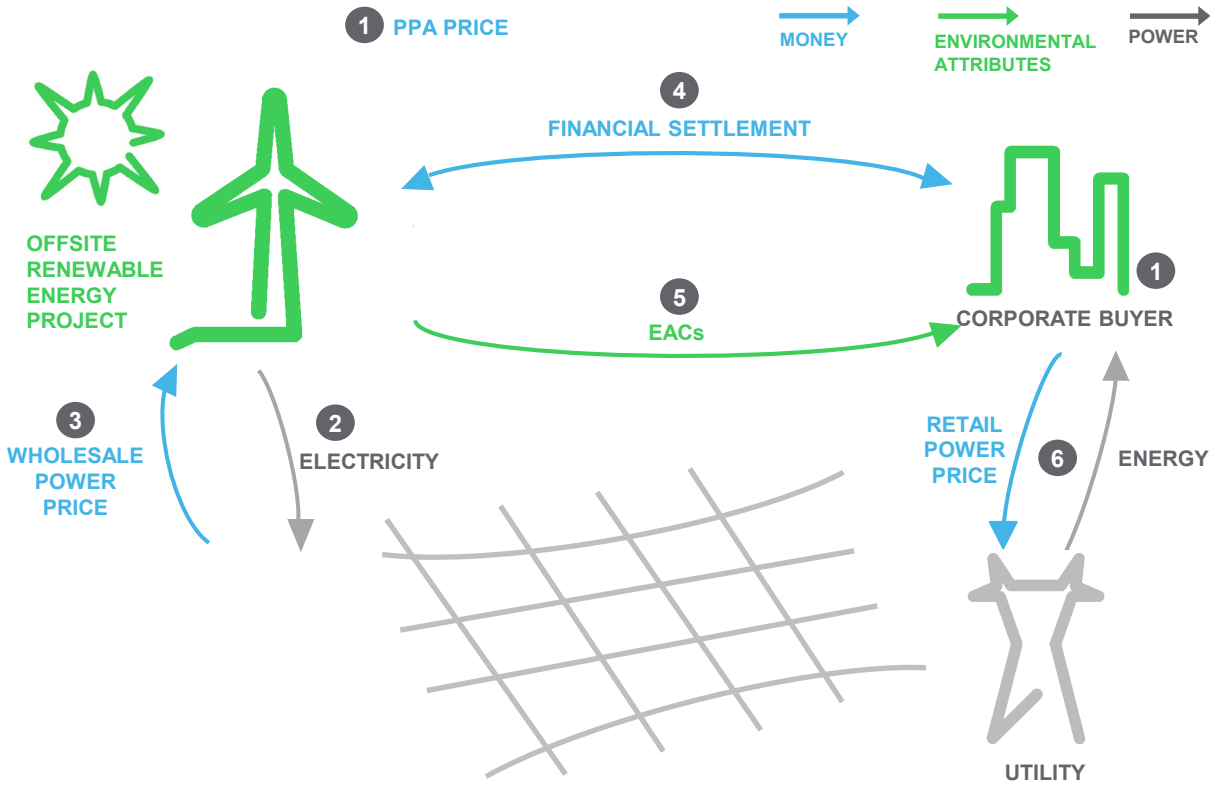
Retail (Direct) PPAs

- Client load must be in deregulated retail market
- Contract sleeved through utility/RES
- Can be easier to transact
- Can be riskier than they look

Financial (Virtual) PPAs

- Power liquidated into local spot market and settled financially
- Allows operational flexibility for buyer
- Can be complicated & risky
- Can provide significant economies of scale and financial benefits

Financial (Virtual) PPA



1. Corporate buyer guarantees fixed price for energy & EACs.
2. Project owner delivers power to grid operator.
3. Grid operator pays project owner wholesale market price for power.
4. Project owner and corporate buyer financially settle difference between fixed power price and wholesale market price.
5. EACs are delivered to Corporate buyer.
6. Corporate buyer continues to purchase power from utility or deregulated retail supplier.

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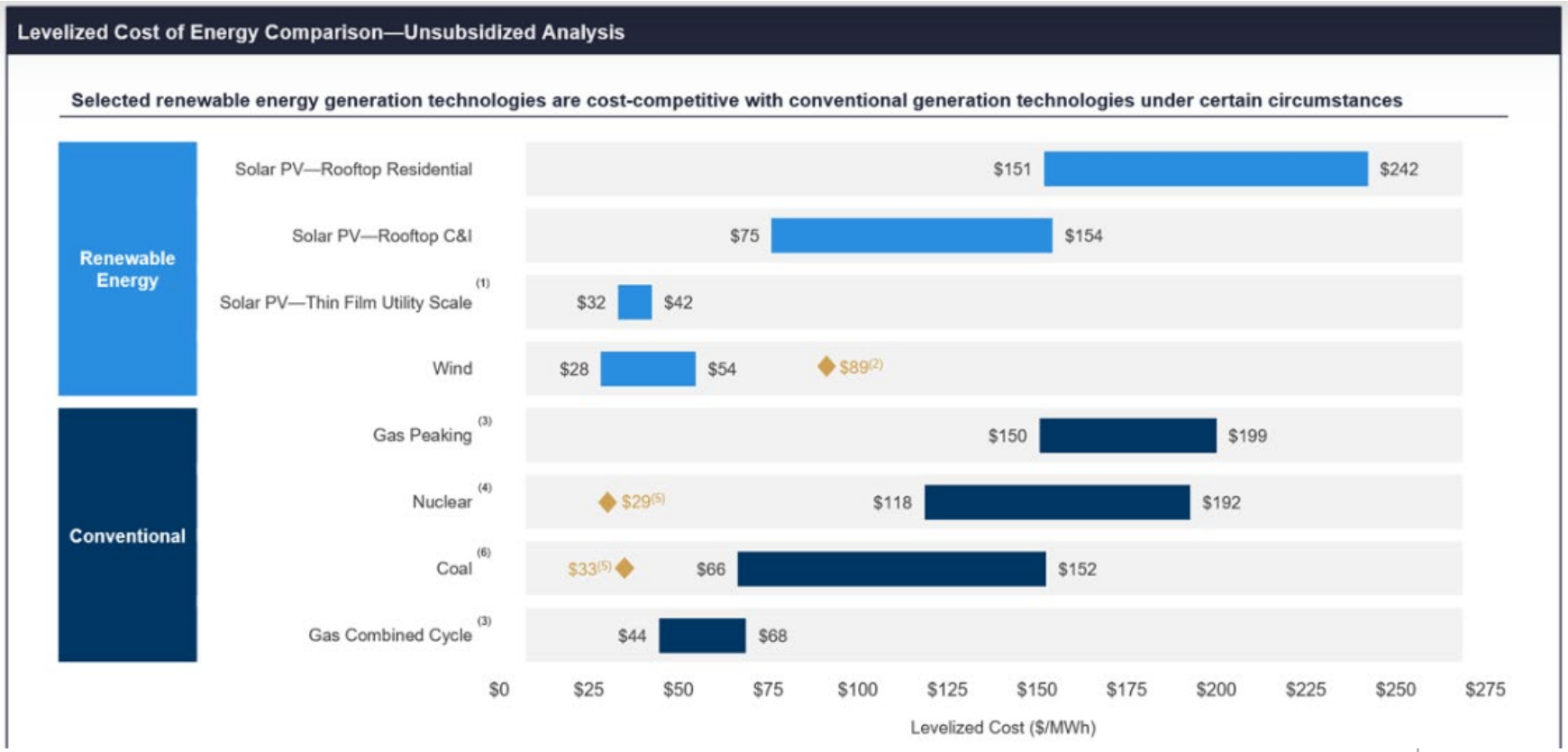
Levelized Cost of Energy



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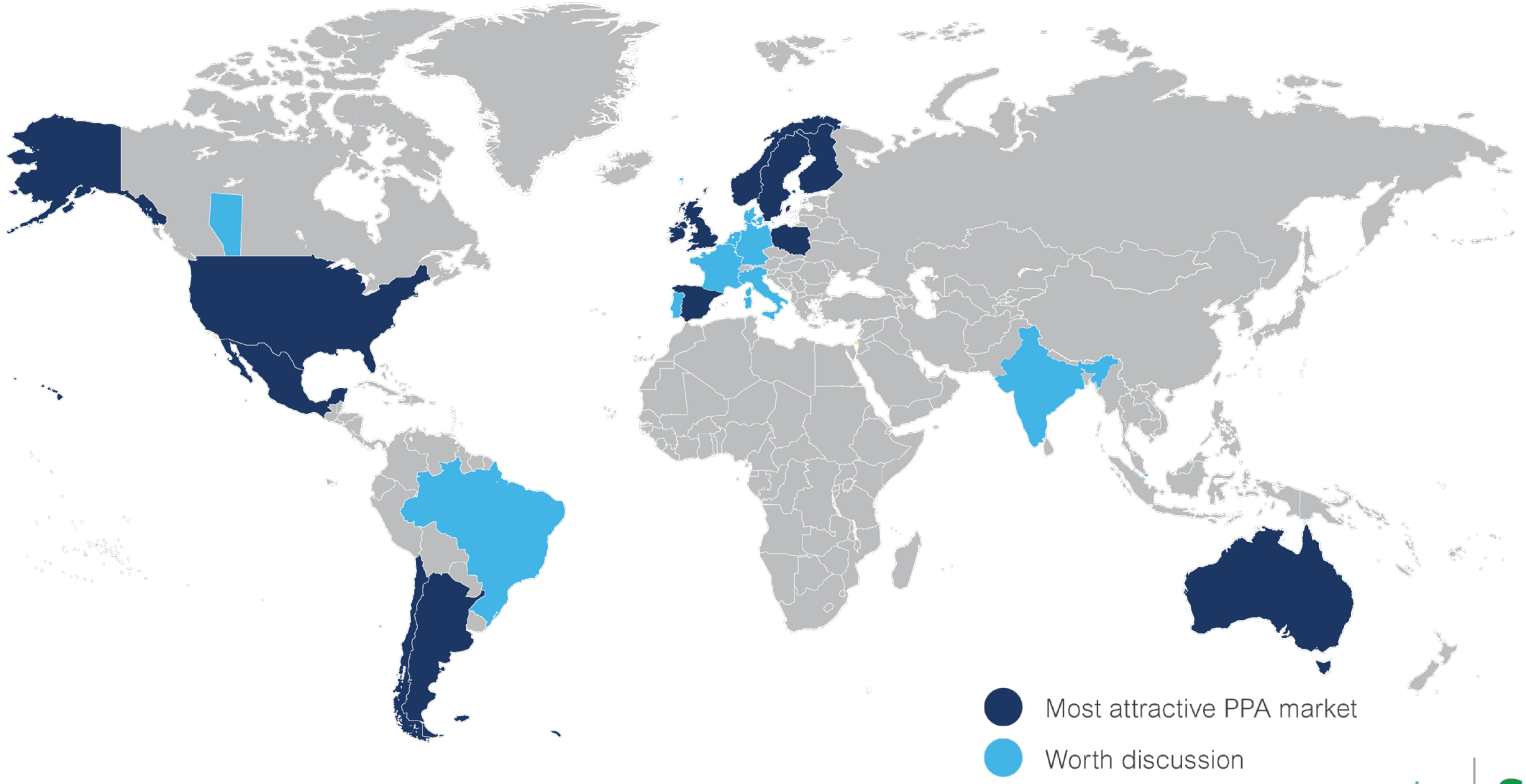
Global Renewable Energy PPA Opportunities



A Comparison of Retail and Virtual PPAs

Retail PPAs

Benefits

- Energy physically delivered to operations site
- Stable energy rates over the contract term locked in
- Earn story of company directly running on renewable electricity
- Best for organizations with concentrated load in a specific deregulated retail electricity market
- Straightforward accounting

Considerations

- Exposed to long-term wholesale price risk
- Firming and shaping necessities are complicated and costly
- Accept risk of uncertain future electricity prices
- The generating facility and the operations location must be located within the same grid region
- Only companies with operations in deregulated retail states can engage in this deal structure

Virtual PPAs

Benefits

- Stable energy rates over the contract term locked in
- More contractually flexible than Direct PPAs
- Can address load in a regulated state
- Source energy for multiple load centers with one transaction
- Best for organizations with dispersed load or in regulated markets

Considerations

- Must take long-term wholesale electricity pric risk
- Accounting treatment must be evaluated
- Lack of correlation to electricity spend is possible and creates new set of financial risks