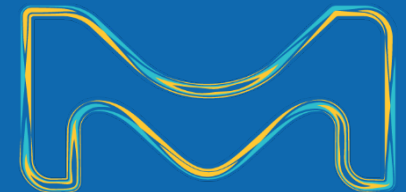


# Renewable Electricity Supplier Toolkit

JULY 2023



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# Basics and Target Setting

Essential aspects to consider when evaluating an Energy Strategy



### **Corporate Targets & Sustainability Strategy**

e.g. targets set by your company to reduce greenhouse gas emissions or increase renewable energy share.



### **Economics:**

budget availability for up-front investments, need to reduce operating costs, etc.



### **Additionality & Impact:**

the generation of true new renewable energy, e.g. by financially supporting new or developing renewable generation sources. Only buying into what's already available or planned doesn't constitute additionality and carries the risk of loss of reputation.



### **Supply Security:**

dependence on or independence of non-renewable sources.

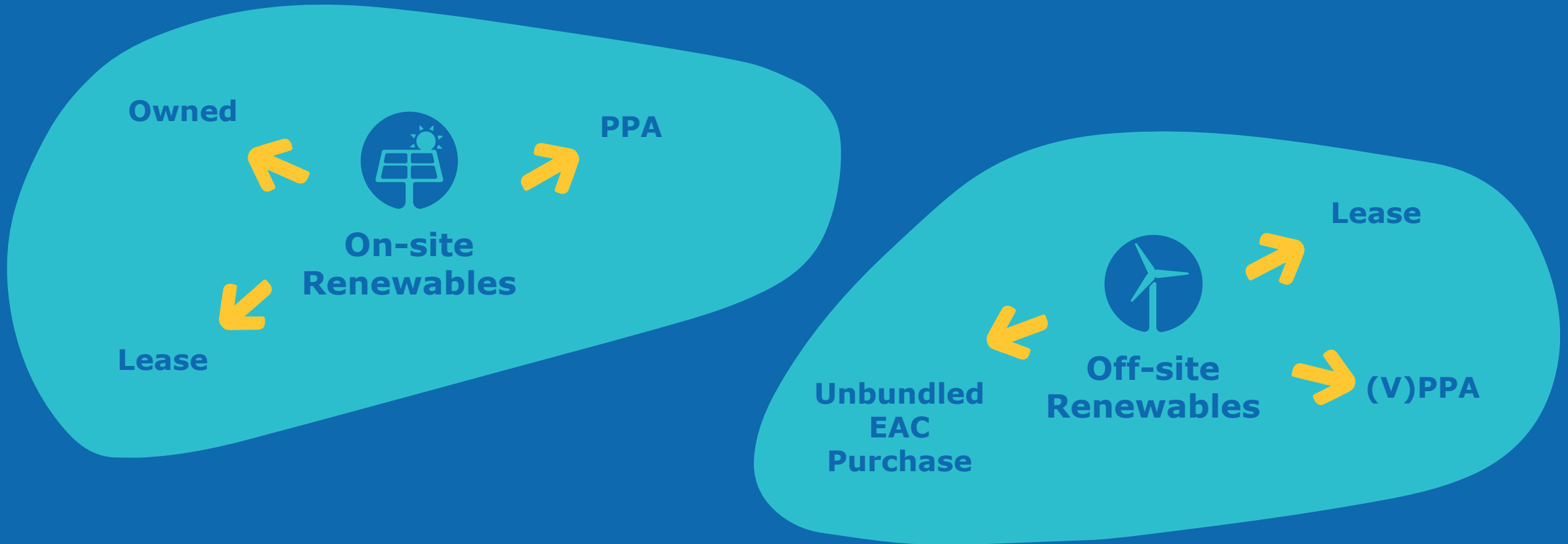


### **Public Relations & Inside-Outside Reputation:**

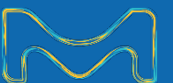
public visibility of sustainable commitments, talent attraction, etc.



## Renewable Electricity Options Assessment



**(V)PPA:** (Virtual) Power Purchase Agreement. **EAC:** Energy Attribute Certificate.





## Basics and Target Setting

# Advantages & Disadvantages

### 1 Onsite Renewables

Requires a capital investment or a long-term agreement with a third party and typically addresses less than 100% of the site's energy needs. It's financially viable in selected markets where energy prices are high. Tax/investment incentives may be available.

### 2 Unbundled EACs

Purchase of environmental benefits and claims associated with an existing renewable energy plant. A good first step for developing renewable energy markets, or to "top off" on green power in developed markets. It's currently a popular option, but large corporate buyers are seeking more tangible buying strategies tied to the development of new renewable energy projects. Contract terms of 1-3 years, typically with no additionality.

### 3 PPA

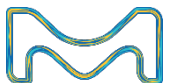
Purchase of energy along with the environmental benefits and claims associated with a specific renewable energy plant. The buyer takes legal title to the energy generated at the production point. It's often difficult to execute due to the logistics and permitting involved in getting physical power to the buyer's site. Contract terms of 15-20 years, with clear additionality.

Shorter term contracts of 1 to 5 years, typically with no additionality, may be available in deregulated markets through a competitive supplier agreement, which simplifies the transaction. The buyer is not always directly contracting with the asset owner.

### 4 VPPA

A financial Contract for Differences where the buyer doesn't physically receive the power, and continues to receive physical power from its utility provider. Buyers can sign large volumes from wind or solar projects to gain economies of scale and use the EACs generated to offset electric consumption at any location within the same EAC market. Contract terms of 10-15 years, with clear additionality.

Reference: <https://3degreesinc.com/latest/faqs-ppa-vppa/>

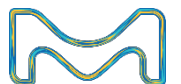
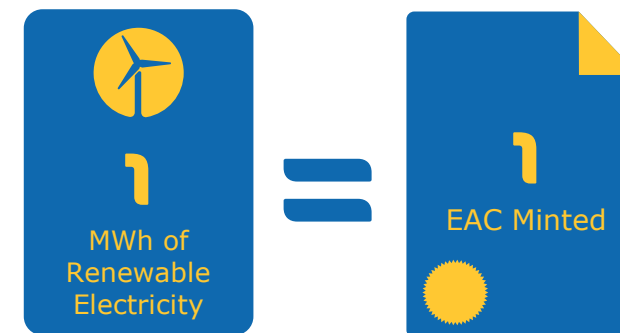
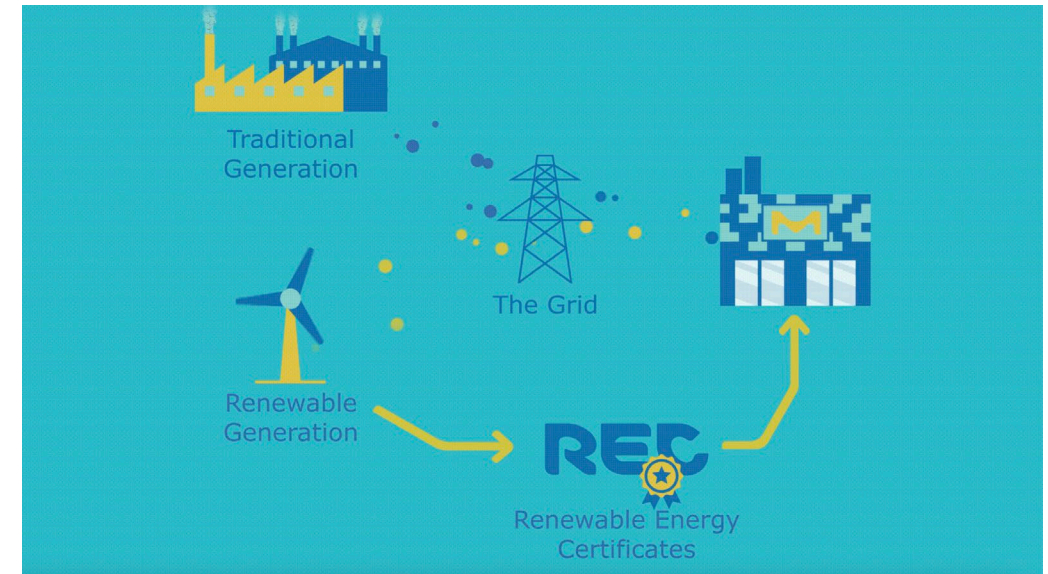


## Energy Attribute Certificates (EAC)

# Addressing Emissions from Electricity with Renewable Energy Certificates

**Renewable Energy Certificates are fundamental to all renewable energy claims.**

- An Energy Attribute Certificate, or EAC, is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation.
- EACs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource.
- EACs are the instrument which electricity consumers must use to substantiate renewable electricity use claims.
- Depending on geography, different national or international systems are in place. EACs must be applied in their respective markets.

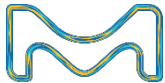




# Energy Attribute Certificates (EAC)

## EAC Markets in >30 countries

Source:  
[https://assets.naturalcapitalpartners.com/downloads/Energy\\_Attribute\\_Certificate\\_Factsheet.pdf](https://assets.naturalcapitalpartners.com/downloads/Energy_Attribute_Certificate_Factsheet.pdf)  
This map is subject to change as markets evolve.



## Energy Attribute Certificates (EAC) – Example

### Persimmon Creek Wind Farm Oklahoma, USA



#### 2020 – 2021 RECs purchased for 5 US sites:

- Burlington, Massachusetts, USA
- Danvers, Massachusetts, USA
- Temecula, California, USA
- St. Louis, Missouri, USA
- Milwaukee, Wisconsin, USA





### Various site options



#### **Own assets:** needs CAPEX

- Usually solar (wind is atypical)
- Mounting options:
  - On buildings (roof or facade)
  - Ground-mounted (e.g. parking lot or free lot)



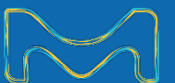
#### **On-site PPA**

PPAs offer lower overall savings but can be more appealing since no upfront investment is needed. Longer term agreements usually mean lower PPA prices. Shorter terms may be available, but could require a premium on the PPA price.

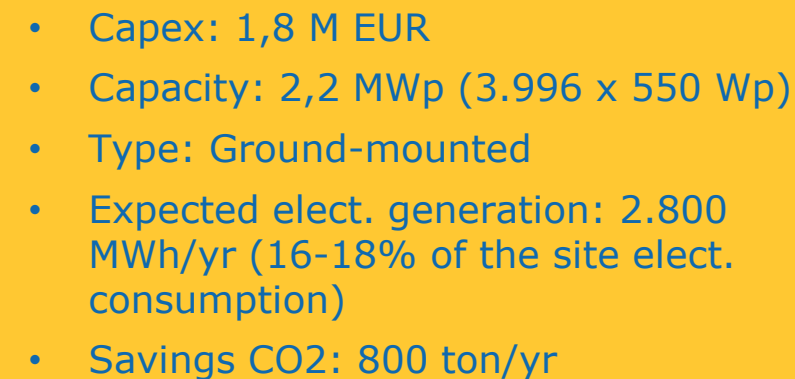


#### **Lease arrangements**

There are different options for lease arrangements (e.g. lease of equipment or lease of land).



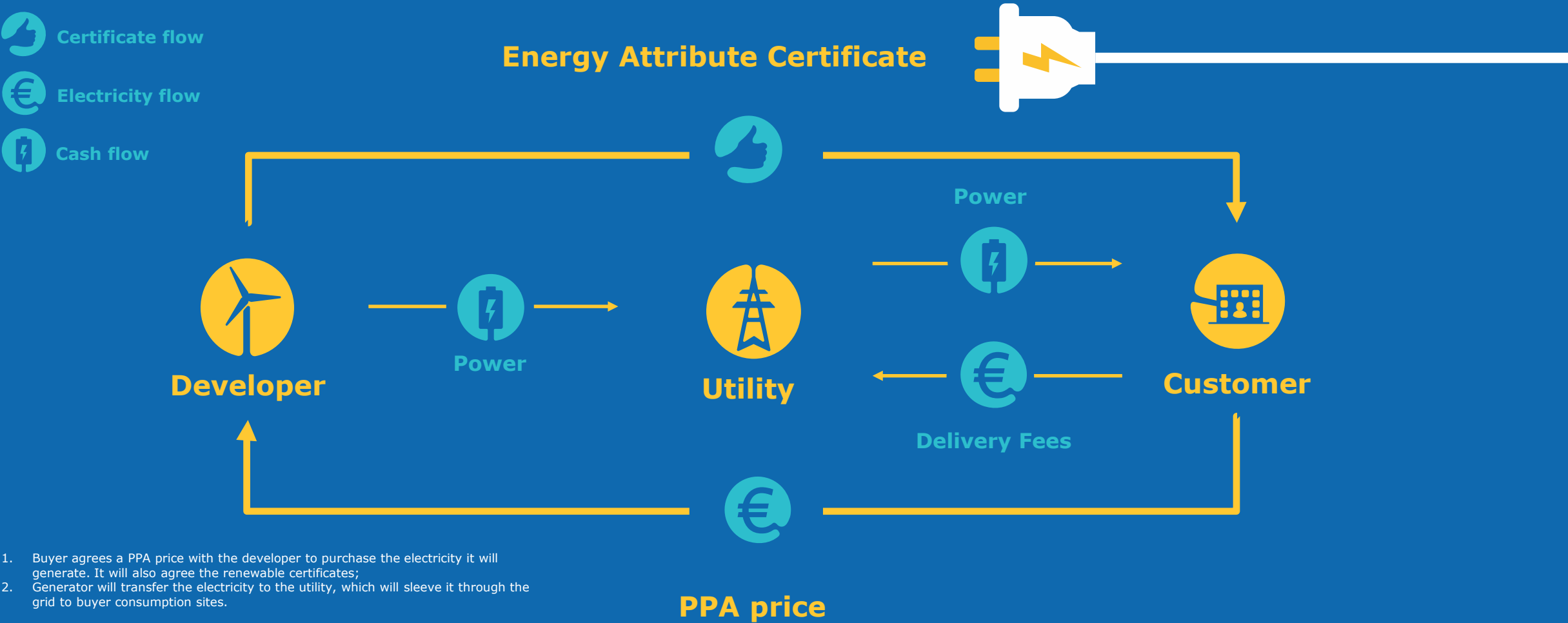
# Mollet PV project



**Roof and Ground mount evaluated -  
Ground mount found to be more  
favorable given site conditions.**



# Power Purchase Agreements – PPA

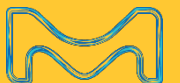




## On/Off-Site Generation, PPA – Example

# Clean Energy Project Naucalpan with Iberdrola

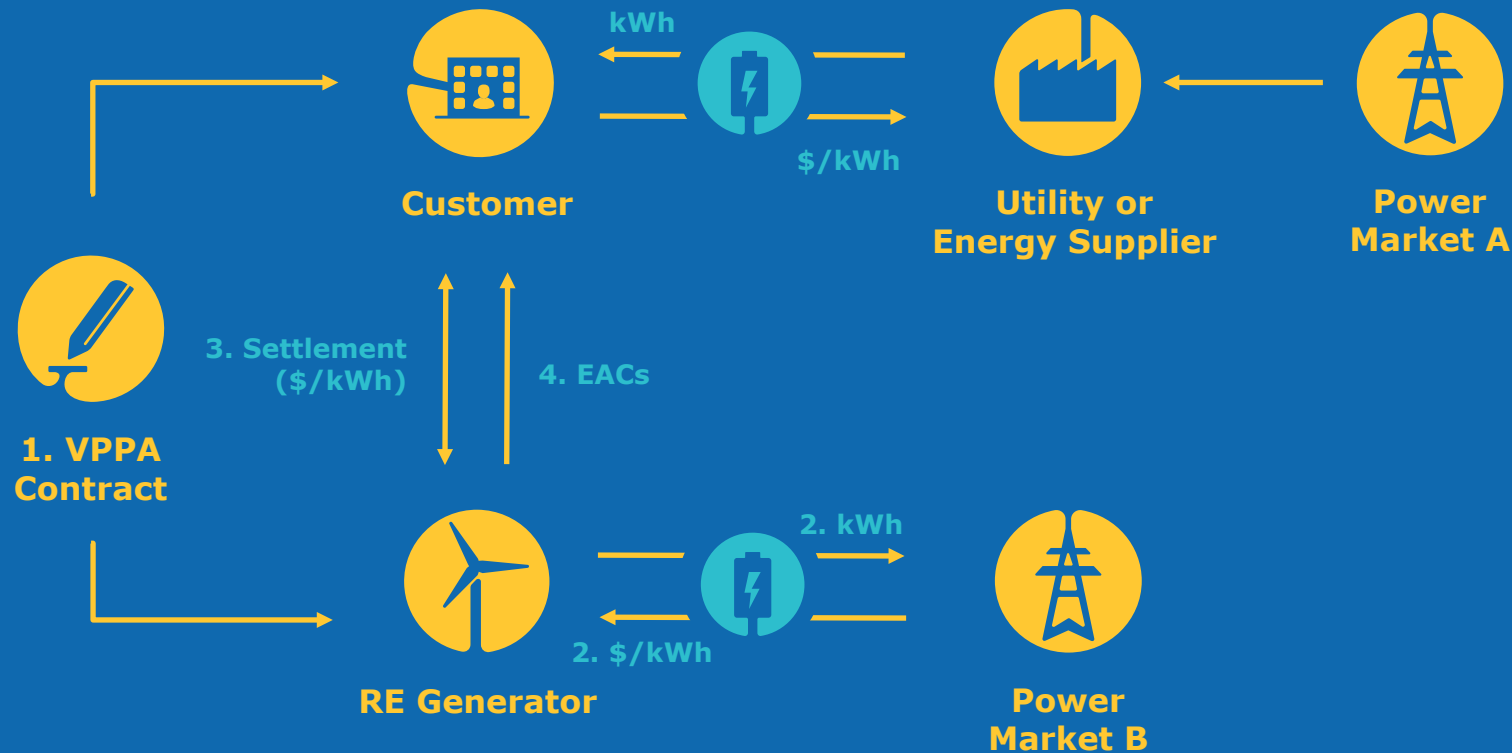
- 100% Photovoltaic energy
- 5% Discount on regulated prices
- Estimated annual savings: 50 K EUR
- Supported by a local certificate system (CELs) and audited by a third party entity (TüV Rheinland)
- Permitting and government approvals spanned 3 years
- The CO2 reduction of approximately 4,500 tons per year represents more than 50% of the site's total CO2 emissions



## Off-Site Generation

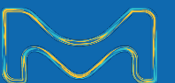
# VPPA - Virtual Power Purchase Agreements

VPPAs are credible mechanisms to achieve significant progress towards renewable energy goals by helping to bring new renewable energy to the grid. They are a popular mechanism especially in the US and Europe.



1. Customer signs VPPA with renewable generator at a fixed rate (i.e. strike price). Term is typically 10-20 years
2. Renewable energy generator sells customer's null power into wholesale market and receives market price.
3. Renewable energy generator sends / receives settlement to/from customer (Settlement = wholesale minus strike price x generated quantity).
4. Customer counterbalances utility payment for power with settlement transfer, and uses Energy Attribute Certificates (EACs) to reduce scope 2 emissions.

Source: [https://www.epa.gov/sites/production/files/2016-09/documents/webinar\\_kent\\_20160928.pdf](https://www.epa.gov/sites/production/files/2016-09/documents/webinar_kent_20160928.pdf)



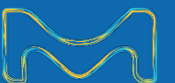
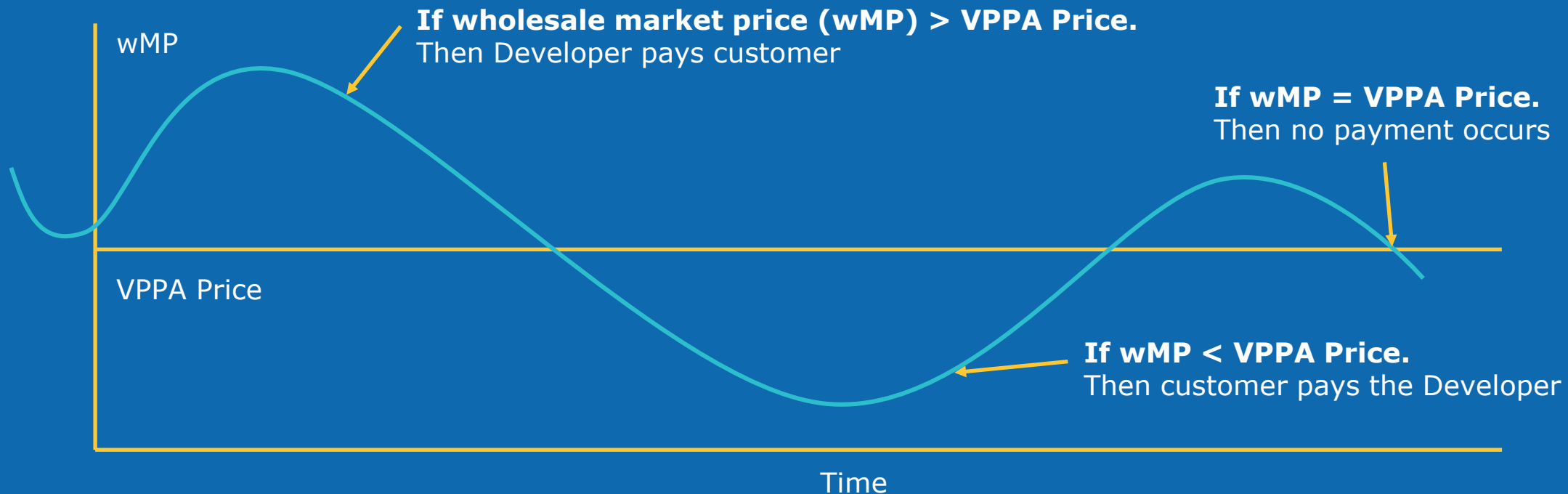


## Off-Site Generation

# VPPA - Virtual Power Purchase Agreements: How do they work?

- RECs are delivered to customer, **but physical energy is not.**
- REC pricing is financially settled via the Contract for Differences (CFD).
- Customer receives (or pays) the net difference between the VPPA price and Wholesale Market Price (wMP).
- No direct impact on conventional energy procurement at the facility level.

Source: [https://www.epa.gov/sites/production/files/2016-09/documents/webinar\\_kent\\_20160928.pdf](https://www.epa.gov/sites/production/files/2016-09/documents/webinar_kent_20160928.pdf)



# Powering the Life Science Industry with Renewable Energy



We signed a 12-year renewable energy contract (virtual power purchase agreement) for 68mw of wind power...

Azure Sky Wind will be located in Throckmorton, Texas, 160 miles west of Dallas

We're adding new renewable energy capacity to the grid

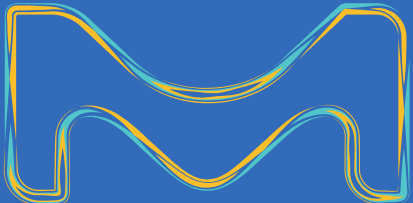
68 MW can illuminate 11.3m LED lightbulbs simultaneously...



Generating approximately **258,000mwh** of renewable electricity annually

... generated by 14 wind mills standing 600ft tall...

... matching 100% of our U.S. life science electricity consumption!



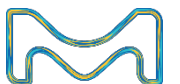
## Availability by Region

- Widely available
- Partially available
- Hardly/not available

Structure	Americas	Europe	China	Taiwan	Korea	ROW	Additionality Claims	Notes
<b>On-Site Owned</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Upfront CapEx Investment. Low coverage (typically 10-25% of site consumption).
<b>On-Site PPA</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Long lease. Need to be aware of deed restrictions, easements, etc. imposed for the term of the lease. Buyout clause, end of lease terms, ownership of mounting equipment, etc.
<b>Utility Green Tariff</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: orange;">●</span>	<span style="color: pink;">●</span>	Naming conventions vary by country (e.g. Utility Green Tariffs could be called Bundled EAC PPAs in some regions).
<b>Unbundled EAC Purchase*</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: orange;">●</span>	<span style="color: pink;">●</span>	Typically purchased from a renewable energy broker.
<b>Bundled EAC PPA**</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: pink;">●</span>	<span style="color: pink;">●</span>	<span style="color: orange;">●</span>	<span style="color: orange;">●</span>	<span style="color: orange;">●</span>	EAC purchase bundled with physical energy purchase.
<b>Virtual PPA</b>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: pink;">●</span>	<span style="color: pink;">●</span>	<span style="color: pink;">●</span>	<span style="color: pink;">●</span>	<span style="color: green;">●</span>	

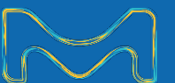
\* Typically purchased from a renewable energy broker

\*\* EAC purchase bundled with physical energy purchase



# Buyers Consortia and Training Material

- Net Zero Consortium for Buyers/Sustainability Roundtable, Inc.:  
<https://sustainround.com/services/nzcb/>
- CEBA: [Clean Energy Buyers Association](https://cebuyers.org) (cebuyers.org)
- NREL's Procurement Analysis Tool for Renewable Energy Buyers (US only)  
Webinar: <https://www.epa.gov/greenpower/epa-webinar-nrels-procurement-analysis-tool-renewable-energy-buyers>
- Energize Educational Series through PSCI and SMI – training material for our suppliers:  
Log in | [NeoNetwork](https://neonetworkexchange.com) (neonetworkexchange.com)  
→ for details see next page





# Energize

A program to increase access to renewable energy for pharmaceutical supply chains

Powered by Schneider Electric's Zeigo

IN PARTNERSHIP WITH:



We are a proud sponsor of the **Energize program**, a first-of-its-kind collaboration of 19 companies aimed at increasing the adoption of renewable electricity in their supply chains. The program is designed to help our suppliers learn about renewable electricity purchasing, explore the market, and engage in renewable energy procurement.

- **Register for Energize** and select **Merck KGaA ("Vibrant M" Logo below)** as your customer: [Registration Link](#)
- **Attend Education Series:** The free, live education series will educate you on renewable energy procurement options.
- **Access educational material on the Energize platform:** After you register for Energize, you will receive instructions to set up an account on the Energize platform. The platform houses all of Energize's online, on-demand educational material.

AMGEN

AstraZeneca

Biogen

Boehringer  
Ingelheim

Bristol Myers Squibb

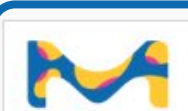
charles river

Chiesi

GSK

Johnson & Johnson

MERCK



NOVARTIS

novo nordisk

Pfizer

Roche

sanofi

Takeda

teva

ucb



### NGOs to Research

- CDP: <https://www.cdp.net/en>
- SBTi: <https://sciencebasedtargets.org/>
- RE100: <https://www.there100.org/>
- GHG Protocol: <https://ghgprotocol.org/>
- Energy is at the heart of the solution to the climate challenge (IPCC and IEA).
- The International Renewable Energy Agency (IRENA) provides analyses and outlooks regarding renewables.
- A Brief Guide to Renewable Energy (UNFCCC), a brief overview by MIT Climate Portal.



## Benefits of Certifications & Partnerships

**Brand  
Enhancement**

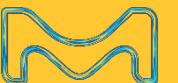
**International  
Recognition**

**Third Party  
Validation**

**Stakeholder  
Involvement in  
Purchasing Decisions**

**Marketing Claims  
Compliance**

**Clear Commitment  
Communication**



### Some suggestions if you're just getting started

#### Form a "core team" and find a sponsor

- Establish clear objectives and responsibilities.
- Challenge each other and "write your story" together.

#### Do your homework, learn from others, and understand your options

- Consult with customers, suppliers and peers with experience in renewable energy.
- Consult with trusted advisors and consultants.

#### Take time to introduce concepts to functional stakeholders and decision-makers

- Contracting methods and risks can be confusing and this will become your "extended team", so be persistent in asking for their input.

#### Choose wisely

- There are multiple options available, so choose approaches that match your company's values, sustainability objectives and risk tolerance.
- Aggregations/consortiums are a great fit for some, but not all.
- Credibility is critical.

#### Tell your story

Choose your words carefully to inspire your suppliers, customers, employees and shareholders.

We wish to hear more about your journey - feel free to let us know what approaches you are taking to increase your renewable energy share.

