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Introduction to PPA strategy and contracts

Montel's Guarantees of Origin Certified Course

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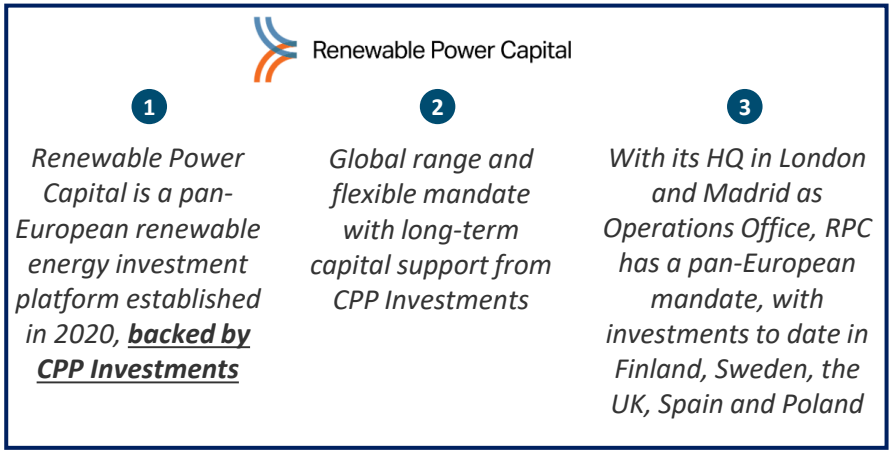
Renewable Power Capital Limited (“RPC”)

Introduction



- Renewable Power Capital is a pan-European renewable energy investment platform established in 2020, backed by CPP Investments.
- We develop, construct, own, and operate renewable energy and storage projects across Europe to deliver a cleaner, greener future.
- Our mission is to accelerate the transition whilst delivering stable returns to investors and improving local communities
- Our flexible mandate allows us to structure investments that recognise the changing market dynamics in Europe and to develop innovative solutions for managing development, construction and merchant investments
- RPC is focused on building strong, lasting partnerships centred on trust and integrity in alignment with the values of our investor and our global network of CPP Investments’ portfolio companies

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Senior Vice President, Power Markets

Prior to joining Renewable Power Capital, Tomas Tuominen led the European PPA team for Macquarie's Green Investment Group where he built their capability to originate, structure and negotiate PPAs across Europe. While at GIG, Tomas negotiated corporate and utility PPAs and physical route-to-market agreements in numerous jurisdictions for both new-build and operating assets across solar and wind technologies.

Before GIG, Tomas was a PPA Director at GE Renewable Energy, as well as a Senior Sales Manager for onshore wind turbines. Prior to GE, Tomas has worked at Statkraft in the Nordic Origination team as well as Bank of America Merrill Lynch in the Strategic Equity Derivatives team. Tomas holds a MEng (Hons) in Mechanical Engineering and Industrial Management from the University of Sheffield.

MORE ABOUT TOMAS TUOMINEN

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Introduction to PPA strategy and contracts

1. What is a PPA? Is it a new invention?
2. Who are the parties to a PPA? What are their roles?
3. Types of PPAs
4. Components of a PPA strategy
5. Execution of a PPA strategy

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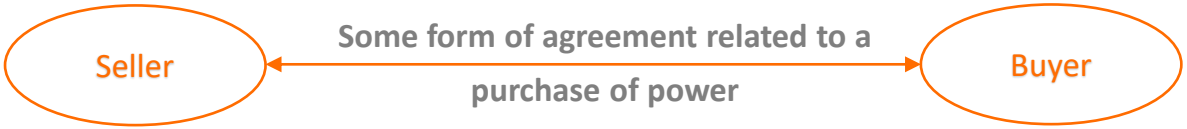
What is a PPA? Is it a new invention?

- In its most simple form, the definition of a Power Purchase Agreement ("PPA") is *a contract between two parties, a buyer and a seller of power*



- Almost any contract in the power market can therefore be called a PPA; there is **no such thing as a standard PPA**
- Many PPAs are signed without press releases and are not known to the public; the PPAs that are accompanied by a press release are often (but not always) long-term and include some form of transfer of GoOs
- No requirement for who the buyer and seller need to be – sellers are often developers/IPPs or utilities, and buyers are often utilities, corporates or traders
- No requirement for size or tenor of the contract
- No requirement for GoOs to be included as part of the transaction
- No requirement for physical power to be delivered (many PPAs are virtual, aka financially settled)
- No requirement for a specific pricing structure
- Can be used for hedging/speculating in power or for procuring a specific type of energy (e.g. renewable), or both
- PPAs are not new; power sales to industry have existed since the beginning of the power market.
    - Even more "modern" PPAs, such as a long-term pay-as-produced PPA from a renewable asset, signed between a special purpose vehicle and a utility, have existed for more than 15 years

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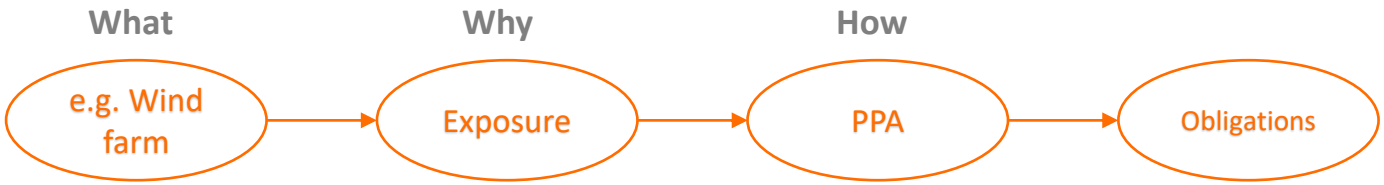
Who are the parties to a PPA? What are their roles? Seller

- The **seller** of a PPA will usually be someone that has exposure to the production of a power plant (or portfolio of power plants). They may own such a power plant, or they may have entered into a PPA themselves, which they are re-selling or re-packaging
- A seller is usually an independent power producer ("IPP") or a utility. The seller could also be a trader, but most likely only if they bought a PPA in the first place. If a seller has no exposure to a power plant in some form (and is simply trading power), it would be unusual to call their transactions a PPA
- The seller's role (obligation) is to supply the power and/or GoOs under the contract.
  - In some cases, this obligation may be absolute, to provide the products regardless of whether the wind is blowing or the sun is shining (or even whether a power plant is technically able to operate)
  - In other cases, the obligation may be limited to times when a certain asset (or fleet) is actually producing; in such cases, secondary obligations around technical performance are often required



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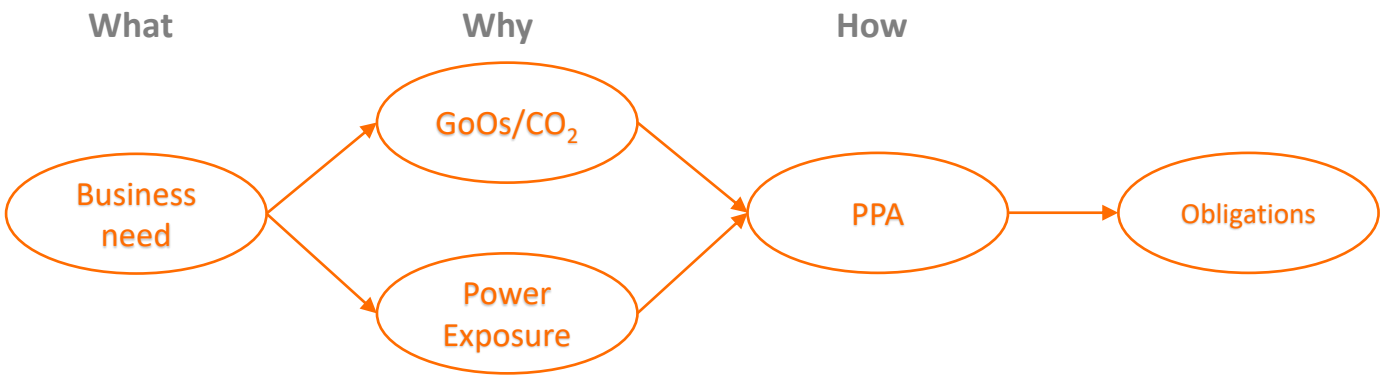
Who are the parties to a PPA? What are their roles? Buyer

- The **buyer** of a PPA will generally be someone that is looking to acquire an exposure to power (physically, or through a derivative) and/or GoOs. Often, the products under the contract will have some specific requirements (e.g. to be from a specific plant or type of renewables), but sometimes a buyer will *simply* be buying a standard baseload power contract with no GoOs involved.
- Each PPA buyer has their own motivations and requirements
- The buyer's role (obligation) is to accept, and pay for, the power and/or GoOs under the contract



- Other parties involved in *some* PPAs
  - Commercial, technical and legal advisers (often during negotiations)
  - Balancing responsible parties (in some PPAs, a "BRP" might be the buyer itself)
  - Financing parties (often not directly a seller or buyer, but may be heavily involved in setting the terms, and may end up stepping in for the seller (or even for the buyer) in case something goes wrong)

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Types of PPAs

- PPAs come in many different varieties, and there is no single, standard approach. By defining an approach to the following seven PPA characteristics, it will generally be possible to describe the type of PPA in question
- Physical or Virtual (delivery method)
- GoOs included or not (renewable/green or something else)
- As-Produced or Fixed Shape (volume definition per shortest settlement period)
- As-Produced or Fixed Volume (volume definition over a certain period)
- Fixed Price, Floating Price, Floor, Collar, and/or other combinations (pricing mechanism)
- Local or cross-market, e.g pan-European (delivery point)
- Short- or long-term (tenor)

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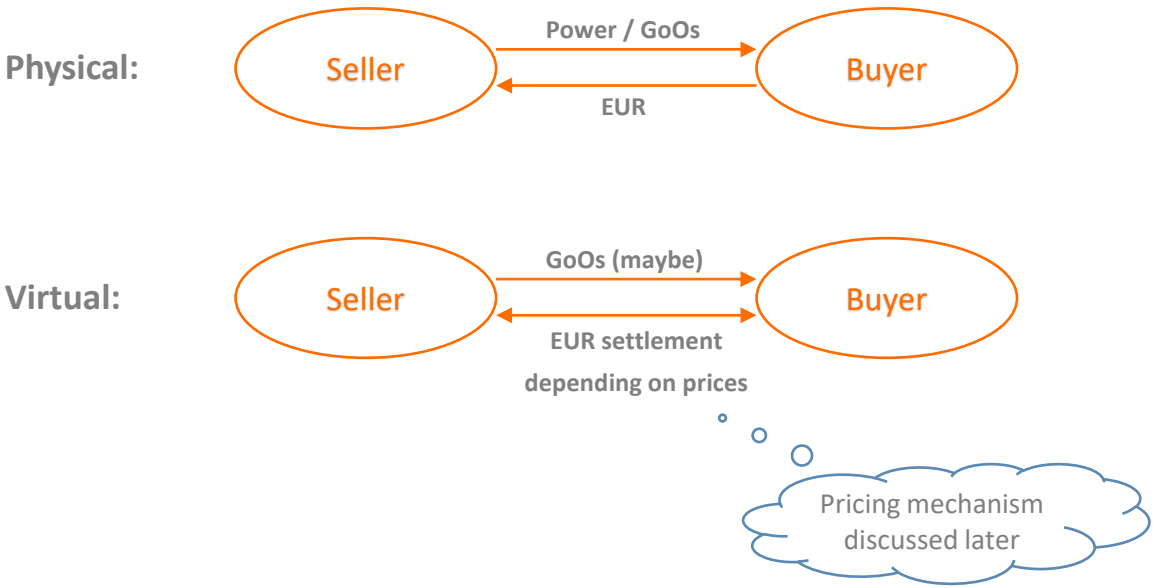
Physical or virtual

- **Physical or Virtual (delivery method)**
  - A physical PPA involves the delivery of physical power (and a payment from buyer to seller for that power)
  - A virtual (aka financially settled PPA) will generally only involve payments (e.g. a payment from seller to buyer if market prices are high or a payment from buyer to seller if market prices are low)
  - The choice of physical vs virtual may be driven by market design, regulation (and/or regulatory reporting requirements), accounting requirements or by making some of the other main PPA characteristics easier to implement



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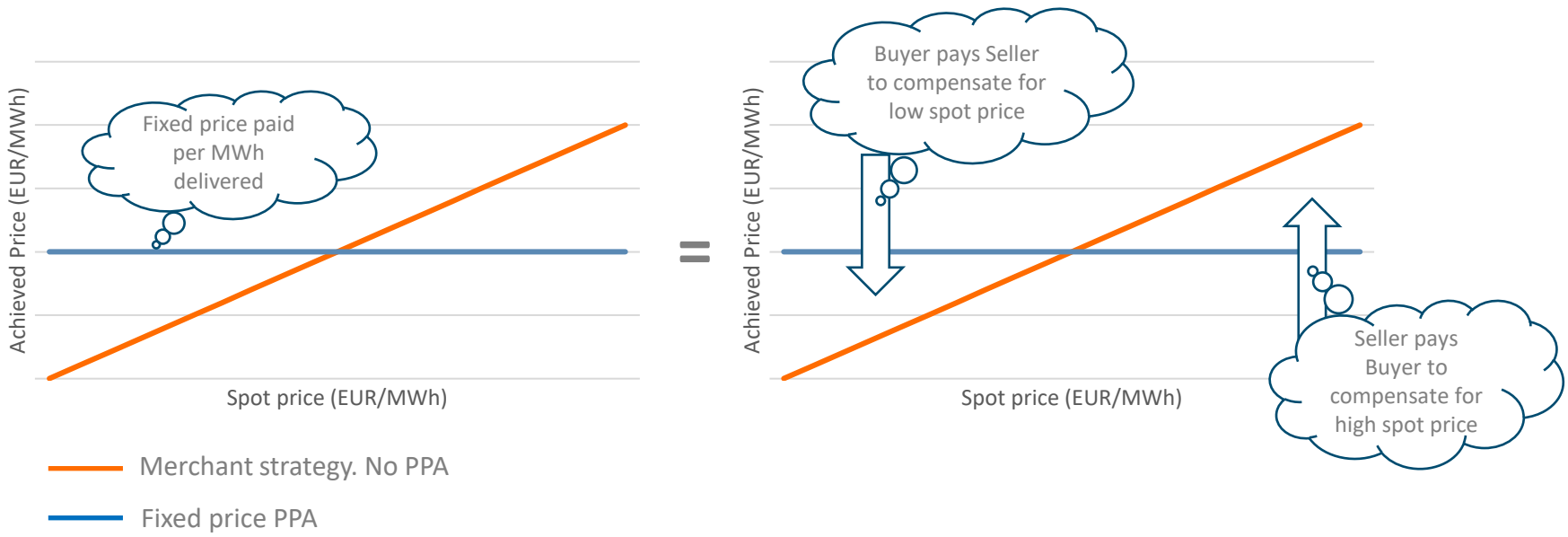
Physical delivery Virtual PPA

- Economically, there is no substantive difference between physical delivery and virtual delivery. Taking a fixed price PPA as a simple example:
  - With physical delivery, the Buyer will pay the Seller the agreed price for every MWh delivered
  - With virtual delivery, the Seller will receive the spot price from selling physical power into the market, and then a settlement will be carried out between Buyer and Seller such that Seller ends up receiving the fixed price
- This is true for all pricing mechanisms, whether a fixed price, a cap and floor, or something even more complex



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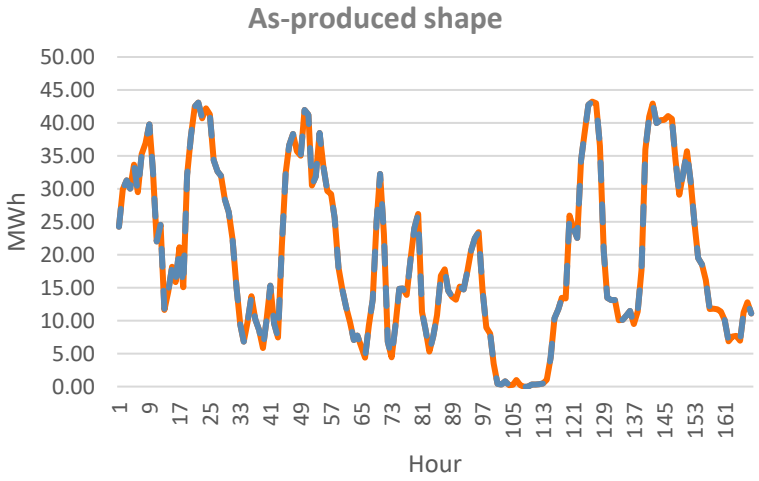
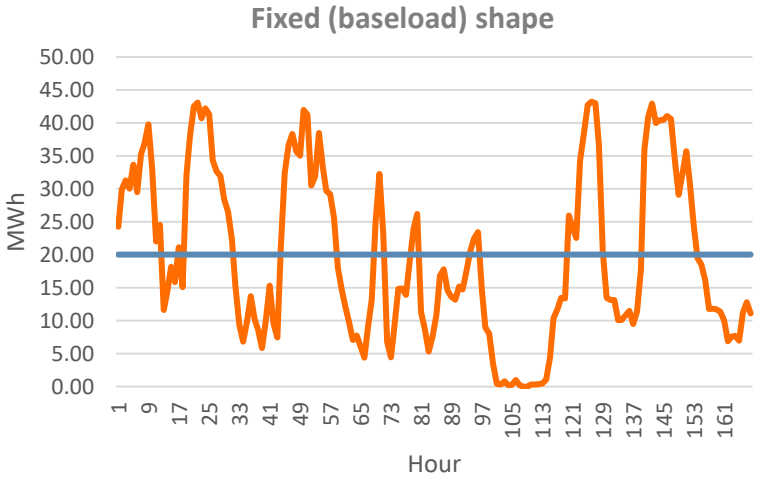
GoOs?

- **GoOs included or not (renewable/green or something else)**
  - Not all PPAs include GoOs in any form (after all, it is a **power** purchase agreement)
  - GoOs may be required to be from a specific power plant, or from a specific technology (with further definition of e.g. country of origin or age of plants, etc)
  - GoO deliveries may be monthly, or less regular.
  - The volume of GoOs required to be delivered is usually determined by another characteristic of the PPA (volume definitions)
  - Sometimes a primary source of GoOs is defined (e.g. a single power plant) with acceptable replacement sources (in case the plant is not able to deliver)

Shape of the delivery

- **As-Produced or Fixed Shape (volume definition per shortest settlement period)**
  - In each hour (or shorter, if a market operates with e.g. 15-minute settlement), will the amount of power delivered (or settled) depend on actual production or be agreed in advance to be a fixed amount?
    - A fixed shape can vary each hour (e.g. “solar shape”), rarely (e.g. “monthly baseload”, or not at all (i.e. “baseload”)
  - It can be complicated to structure an as-produced physical PPA between a project and a corporate buyer (since a utility, or multiple utilities/balancing parties, may be needed to deal with physical flows in real time)
    - To get as close to this as possible with slightly more ease, sometimes an “as-forecasted” or “as-nominated” structure is used, where the hourly volumes are set the day before delivery





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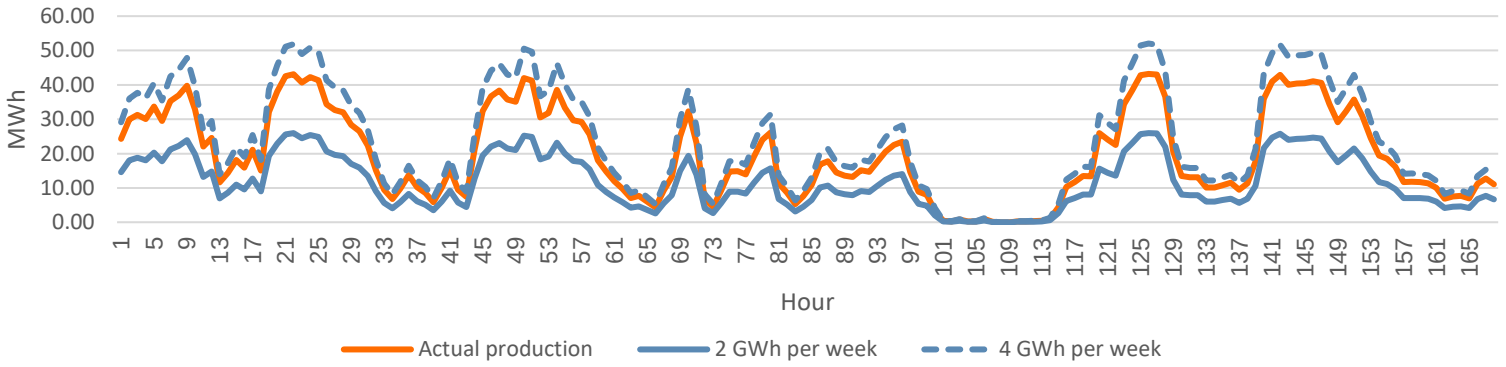
Volume of delivery

- **As-Produced or Fixed Volume (volume definition over a certain period)**
  - Over a longer time period (e.g. a month or a year), will be PPA volume delivered (or financially settled) be exactly what a plant (or portfolio) produced, or will it be a pre-agreed volume
  - An as-produced volume PPA may include minimums/maximum volumes over the period
  - Generally, this characteristic of "volume over a longer period of time" is only needed for virtual PPAs.
    - For a physical PPA, the volume over time is simply the sum of what has been delivered in each hour. <u>You can't go back and change physical deliveries</u>
    - With a financially settled PPA, it is possible to define how much was "delivered" in a certain hour in the past based on what happened afterwards. For example, if a maximum yearly amount is agreed and that amount has been exceeded, the % of production sold in each hour could be reduced from e.g. 100% to 90% (and the PPA settlement can then be made). Or, if the PPA has a yearly fixed volume, the % of production sold in each hour can be calculated based on how much was produced overall in that year

Example of a fixed volume per week (with an as-produced shape). Actual production 3.3 GWh



Common (and some less common) types of PPAs

- **Baseload – fixed shape, fixed volume**
  - A fixed shape (every hour is the same) and a fixed volume (the total over a year is the sum of the individual hours, and is known in advance)
- **As-produced – as-produced shape, as-produced volume**
  - In each hour, the PPA volume will be a % of the actual production of a plant (or portfolio). The volume over a longer period of time will be a floating amount based on what is produced in the individual hours
- **e.g. a Solar/Wind Shape PPA – fixed shape, fixed volume**
  - The amount delivered in each hour is pre-agreed, but the amount is set in a way that is expected to reflect what the plant would normally deliver (e.g. a solar shape PPA will not deliver anything at night, and then it will ramp up in the morning, reach a peak and then ramp down in the afernoon).
  - This shape might be the same every day, or it could be more complex and defined for every 8760 hours of a year
- **Monthly baseload – fixed shape, fixed volume**
  - This is simply a baseload contract where the amount delivered is the same in each hour for a month, but the amount in each month may vary (e.g. a monthly baseload PPA designed to be sold by a wind producer may sell a higher baseload amount during winter months, and less during the summer)
- Less common (but still used) structures:
  - **Baseload shape, as-produced volume** (financial settlement is based on the baseload price over a period, but the volume on which the settlement is made, and GoOs delivered, depends on actual production)
  - **As-produced shape, fixed volume** (based on how much is produced over a month/year, the % of production covered by the PPA in each hour is adjusted so that the total settled volume in that period is exactly the agreed amount. The hourly shape of the delivery matches actual production perfectly)

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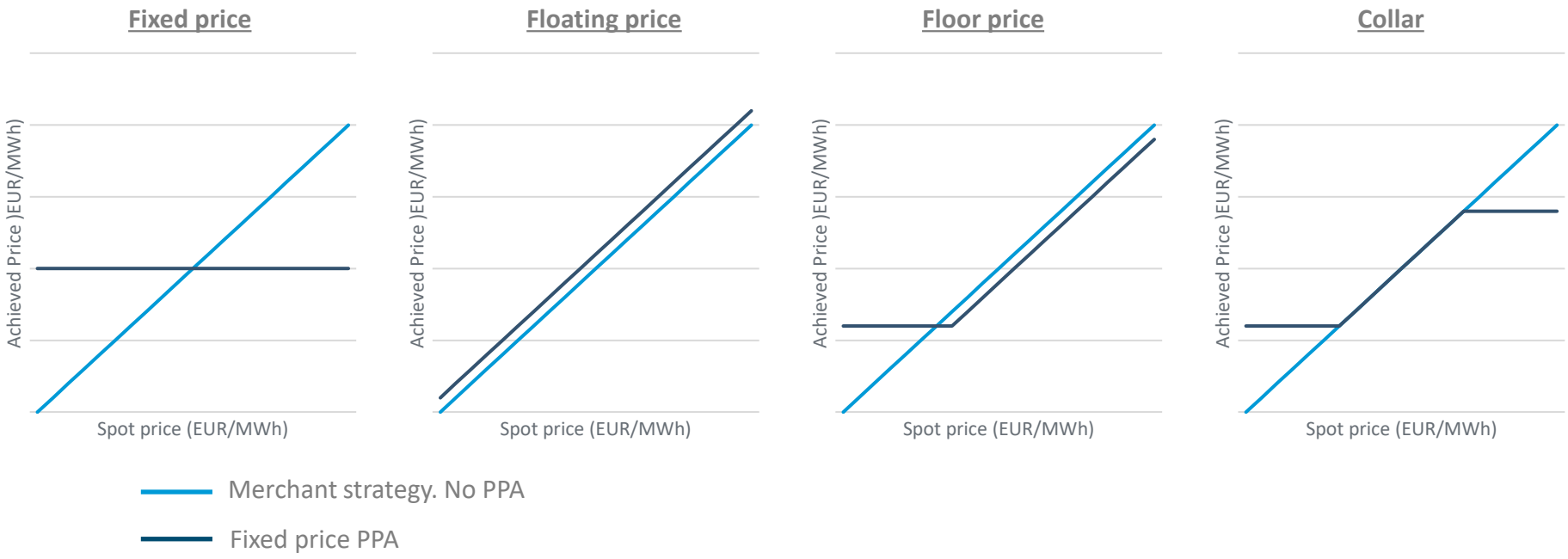
Pricing structures

- **Fixed Price, Floating Price, Floor, Collar, and/or other combinations (pricing mechanism)**
  - Fixed prices are possibly the simplest structure (a fixed EUR/MWh, which may or may not be indexed to e.g. inflation), but are not necessarily the most common in all markets at all times
  - Floating Price PPAs are not commonly discussed, but a simple sale of GoOs can be seen to be a PPA where the power component is sold a floating price (which would suggest that floating price PPAs are very common)
  - Floating Price PPAs will often include a Floor (minimum price) or a Collar (minimum and maximum price). There might also be “profit-sharing” structures above e.g. a Floor price



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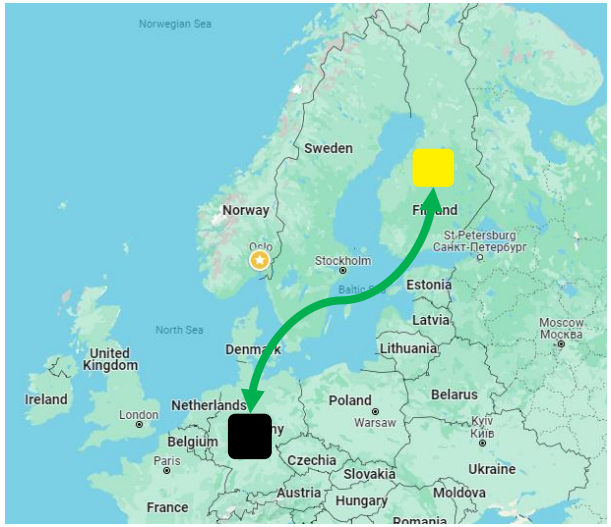
Delivery point and tenor

- **Local or cross-market, e.g pan-European (delivery point)**
  - Sometimes buyers do not consume power in the same market zone / country in which a seller is located, but they would still like to buy the GoOs (because GoOs are fungible across regions such as the AIB)
  - In such a case, either the buyer or seller (usually the buyer) will have to take the risk or delivering (or settling) the PPA in a market in which they do not naturally have the opposing position (basis risk)
  - Typically, cross-market PPAs would be settled financially to avoid having to move power across borders
  - Sometimes a utility/trader may be involved as a third party to take the cross-border risk, but not usually



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- **Short- or long-term (tenor)**
  - Many PPAs are 10 years long, but they could be as short as a few months, or even 29 years (or longer)

* Map. Source: maps.google.com

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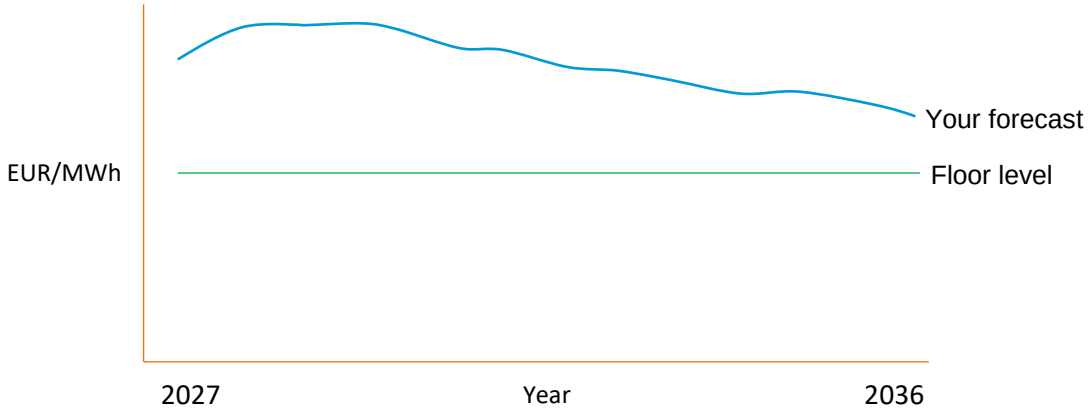
Why make it so complex?

- Although PPAs do not have to be complex, they are often made quite complicated
- Why would someone choose something like a 10-year Floor PPA, especially in a country where they do not have consumption and especially when they make it as-produced (so that the supply depends on the volatile, and uncertain, production of renewable energy)?



- What PPAs can you get in the country where your operations are? Volumes? Prices?
- What are your views on signing 10-year contracts?
- How do GoOs play into this?
- What if unforeseen things happen?

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Components of a PPA strategy

- **Fundamental question: What are you trying to achieve?** Is the aim to:
  - Hedge power price risk?
  - Procure GoOs as cheaply as possible?
  - Procure high-quality / special GoOs?
  - Enable a new renewable project to be built, which you can then tie into your ESG communications and/or marketing strategies?
  - Diversify your pool of power procurement counterparties?
  - All of the above?
- Based on the answer to the above question, you (probably with a commercial advisor) will be able to define the the preferred PPA structure (based on the discussed seven characteristics) and start forming a PPA strategy
- As an example, if you are looking to hedge long-term power price risk as exactly as possible for a baseload-consuming unit in Germany, integrated into your existing supply contract, removing any volatility in power price, but you would also like that power to be from a renewable facility of some sort:
  - You will probably be looking for a long-term, local/German, physical baseload fixed price PPA with GoOs
- **When are you trying to achieve the goal by? What are your deadlines?**
- **Who are your internal stakeholders (CEO, CFO, CSO, CRO, etc) and project champions (who will run the project?) and external stakeholders (shareholders, customers, media, sustainability organisations, etc)?**
- With these three basic questions, you can define a detailed PPA strategy (the when, why, by whom and for whom); define not only what kind of PPA you are looking for, but how you will get from idea to execution and delivery
- PPA strategies are not easy – speak to the market, speak to stakeholders, speak to advisors, listen and learn

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Execution of a PPA strategy

1. Try to define the PPA strategy (with or without advisors) – talk to the market participants and iterate
2. Identify the support you will need, and engage advisors if needed
3. Define the PPA strategy
4. Ensure stakeholder alignment and acceptance, and define the project delivery team
5. Re-define the PPA strategy (if needed)
6. Start execution of the procurement strategy (you may know your counterparty and have a bilateral discussion, or you may run a very broad procurement process, after which you may even re-define your strategy again)
7. Negotiate commercial terms (often in a "short form" term sheet)
8. Negotiate the PPA contract
9. Execute the PPA contract
10. Manage the PPA contract
    - Will you be physically accepting power and paying invoices, or will financial settlement processes be required?
    - Where are you receiving your GoOs?
    - Are you following up the volumes being delivered, and then topping up somewhere else (or selling excess)?
    - What is the counterparty's credit situation?
    - Are there technical issues at the project site?
    - Will the project deliver by the date expected, or will there be delays?

- **Executing the PPA contract is only part of executing the strategy, after which the real delivery starts (for both parties), possibly for the next 10+ years**

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Quiz

- You might have seen this on LinkedIn prior to the course

- Do I have to have my operations in the same country as the project I sign a PPA with?
  a) Yes, always
  b) No, never
  c) No, as long as you can use the GoOs
  d) It depends

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Summary

- PPAs may be very complex, but they can also be very simple
- They are not a new invention, and have been around for as long as the power markets
- The type of PPA should be driven by your strategy and goals. There is no standard, so define what you need
  - Main question: What are you trying to achieve?
- The options for PPAs are almost infinite, but the main variables can be defined by seven main characteristics
- A PPA strategy will take time to define, and it will require input and acceptance from a broad range of stakeholders
- There is a large market of PPA players out there – talk to them
- There are advisors for every step of the way (commercial, legal, technical, etc). You will probably need at least some of them

- If you have any questions or want to discuss, never hesitate to contact Renewable Power Capital
  - RPCPowerMarkets@renewablepowercapital.com


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