

# Green on demand? Offtaker preferences for corporate power purchase agreements

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## ABSTRACT

Corporate power purchase agreements (CPPAs) have emerged as an additional instrument for accelerating renewable energy deployment. By facilitating the financing of projects, CPPAs offer numerous benefits to power producers and corporate offtakers. However, despite their growing popularity, risk allocation among these counterparties remains challenging. This study investigates risk perceptions and preferences for CPPA design based on insights from 91 corporate offtakers who made 860 hypothetical green-power-procurement decisions in the Swiss context. Our results show a strong interest in CPPAs with lower prices and shorter tenors. The latter is especially important for SMEs, who would be willing to pay considerably more for a five-year contract than a longer one. While large companies would pay hefty premiums for local power production, SMEs impute more importance to the type of technology. However, long-term commitments and the complexity of contractual obligations are major drawbacks. While our findings show that CPPAs have the potential to play an important role in complementing public support for renewables, they also point to the need to implement framework conditions that contribute to lowering risks and complexity for counterparties. Further, they highlight distinctive preferences within this consumer segment, which could inform CPPA negotiations and foster mutually beneficial agreements.

## 1. Introduction

The global share of renewable energy in total final energy consumption must increase from 18% (2020) to 82% by 2050 to limit global warming to 1.5 °C compared to pre-industrial levels (IRENA, 2023). Although the year 2022 recorded the largest growth in renewable energy deployment to date, with 295 GW in newly installed capacity added worldwide, this must be quadrupled on an annual basis to meet climate targets (IRENA, 2023). Historically, feed-in tariffs have played a key role in fostering renewable investment in Europe (Frondelet et al., 2010; García-Álvarez et al., 2017). However, several countries have now moved from administratively defined support schemes to competitive instruments like auctions to promote investment at the lowest possible cost to taxpayers, thereby introducing new risks for investors (Frondelet et al., 2010; Sendstad et al., 2022).

In response to these developments, renewable energy producers (REPs) are increasingly adopting Power Purchase Agreements (PPAs) (BNEF, 2022; Douglas et al., 2020). Renewable-based PPAs can be understood as bilateral long-term supply contracts concluded between

REPs and buyers (or offtakers) to trade electricity from specific installations. In this context, the price and quantity of electricity are often fixed during the contract term (Harada and Coussi, 2020). As such, PPAs offer revenue certainty to investors, contributing to making debt-financed projects bankable by reducing risks and capital costs (Botta, 2019; Ford, 2023). As a result, PPAs have been replacing public subsidies in certain markets such as in the United Kingdom (Iskandarova et al., 2021).

The global market for corporate PPAs (CPPAs) has been growing significantly since 2018 as companies seek to stabilise their energy costs or procure renewable power as part of sustainability strategies (Ghiassi-Farrokhfal et al., 2021; Kobus et al., 2021; Mendicino et al., 2019). A CPPA is a bilateral contract between a seller, typically a REP who owns the installation, and a private corporation that uses the green power for its own consumption (Trivella, 2018). In 2021, nearly 11% of the global new renewable energy capacity that was installed was covered by CPPAs – i.e., 31.1 GW, representing a 24% increase from the previous year (BNEF, 2022; IEA, 2021). While two-thirds of this volume was associated with deals in the U.S., the European CPPA market is also

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flourishing (BNEF, 2022). Since corporate demand for green electricity is growing, CPPAs could play a key role in facilitating the financing of new renewable energy projects (Harada and Coussi, 2020; IEA, 2023).

Despite the increasing interest in CPPAs, negotiating the allocation of risks among private actors in the context of CPPAs remains challenging (Bruck et al., 2018; Mendicino et al., 2019). With instruments such as feed-in-tariffs, price, volume, production profile, tenor, and credit risks were borne by the public entity providing the support. In the case of CPPAs, these risks are assumed by the counterparties (Dang et al., 2020; Karneyeva and Wüstenhagen, 2017). *Price risk* pertains to the risk that the contractually agreed CPPA price is higher than the electricity spot price at any point in time during the contract term, which would result in losses for the offtaker. *Volume risk* refers to the risk that the renewable electricity installation produces less or more electricity than expected. *Production profile risk* relates to the risk that the production profile on an hourly basis does not match the offtaker's consumption profile. *Tenor risk* refers to the risk that the offtaker is locked into a CPPA price above market price, which increases with contract length. *Credit risk* involves the risk that the offtaker may be late with payments for the delivered electricity or may default (Dang et al., 2020).

A growing stream of research investigates PPAs, with a few studies focusing on risk management (see Section 2). However, there is limited evidence about the preferences of corporate offtakers for CPPA. Gaining a better understanding of their risk perceptions and preferences is crucial to designing suitable contracts that could facilitate the deployment of renewable energy assets (Miller et al., 2017). This shortcoming leads to the following research question:

How do CPPA designs influence corporate offtakers' risk perceptions and willingness to pay for different features of green electricity procurement?

To address this question, we conducted a choice experiment with 91 corporate offtakers who made a total of 860 hypothetical green-power procurement decisions. This enabled us to clarify their preferences for different physical CPPA features (see section 2.2 for details) and shed light on key barriers to green power procurement. The sample included representatives from Swiss-based companies of different sizes, active in several industries. We selected Switzerland as case for three reasons. First, while domestic electricity production is associated with low carbon emissions (EDA, 2023), it only meets 30% of total national power consumption (BFE, 2021). To achieve its net-zero goal by 2050 whilst phasing out nuclear power, which represents 29% of domestic production, Switzerland needs to increase its renewable energy capacity to 39 TWh by 2050, mainly by constructing new solar and wind capacity (BFE, 2018, 2021). Second, Switzerland has a liberal, democratic and decentralised governmental system (Ladner, 2019). Hence, it can be expected that an instrument that works without government intervention, such as a CPPA, would be well received. Third, although CPPAs remain scarce in this market, their importance is likely to increase given the recent regulatory developments intended to foster the deployment of projects suitable for off-site CPPAs (BFE, 2018; Rosser et al., 2020).

This study contributes significantly to research on green power-procurement decisions by providing novel, empirical insights into the preferences of corporate offtakers for CPPA. Specifically, our results show a strong interest in CPPAs, with prices and tenors playing a key role in adoption decisions. Our findings underscore the need for frameworks that contribute to lowering risks for counterparties. This could be achieved by introducing government-backed (or private) financial guarantees that mitigate credit risk. Further, our results shed light on an important mismatch between the interests of corporate offtakers and REPs, highlighting the need for innovative business strategies that could help increase the liquidity of CPPA markets whilst reducing barriers to entry. Our findings could inform policymaking and CPPA negotiations and promote effective and mutually beneficial deals that contribute to the energy transition.

The remainder of this study is structured as follows: Section 2 reviews existing research and builds the foundations of the subsequent

analysis. Section 3 outlines the methodological approach. Section 4 presents and discusses the results of the choice experiment. Finally, Section 5 concludes by highlighting the main findings, policy implications, limitations, and avenues for further research.

## 2. Background

In this section, we first outline contextual factors influencing the adoption of CPPAs and then provide information about their different features. This groundwork is inherent to our subsequent analysis and discussion.

### 2.1. Drivers of and barriers to CPPAs

Several scholars have investigated the development of CPPAs from the perspective of REPs, with studies focusing on aspects such as increasing profitability, transparency and/or managing risks (Bruck and Sandborn, 2021; Gabrielli et al., 2022a,b; Ghiassi-Farrokhfal et al., 2021; Mendicino et al., 2019; Tranberg et al., 2020). However, only a few researchers have captured the drivers of and barriers to CPPAs through the lens of corporate offtakers (Brüggemann et al., 2022; Franke, 2023; Miller and Cariveau, 2021).

Drivers may include decarbonisation targets as part of corporate sustainability strategies, long-term cost visibility, and hedging against rising and volatile power market prices (BNEF, 2022; Ford, 2023; Tang and Zhang, 2019). Companies are facing increasing scrutiny regarding decarbonising their activities. Historically, firms have primarily used market-based approaches to abate their power-related carbon emissions, often by purchasing renewable energy certificates – e.g., Guarantees of Origin (GOs) (Wimmers and Madlener, 2020). GOs allow companies to claim and report the emissions from specific renewable energy plants (Brander et al., 2018). Certificates can be purchased on markets, independently from the company's actual power consumption (IRENA, 2018; Wimmers and Madlener, 2020). Given the absence of physical power delivery, the approach has been criticised since it may not result in local carbon emission reductions – see Brander et al. (2018) for details. In contrast, CPPAs help achieve corporate and national decarbonisation targets, particularly when funding renewable energy projects that would not have materialised through alternative financial instruments (Bjorn et al., 2022). Further, CPPAs can enable companies to purchase electricity below market prices on a long-term average (Brunnberg and Johnsen, 2019; Mendicino et al., 2019). This may explain why such deals are particularly popular amongst energy-intensive companies. Indeed, while CPPAs first emerged in the U. S. through large tech companies, these long-term contracts have recently attracted much interest from European organisations (Mendicino et al., 2019). The industries that conclude the most CPPAs in Europe tend to be highly energy intensive, including chemistry, pharmaceutical, automotive, engineering, and tech companies (Brüggemann et al., 2022). Finally, in light of the current energy crisis, hedging against rising and volatile power market prices has emerged as a key factor driving European CPPAs (Pexapark, 2023a).

Despite these benefits, several barriers to CPPAs remain. A survey conducted by PricewaterhouseCoopers (PwC) sheds light on the hurdles U.S. companies face in concluding such contracts (Favaloro et al., 2016). A lack of mandate or strategy that would justify a CPPA was found to deter the majority of respondents. Other bottlenecks include unattractive returns on investment and lengthy contract durations. Further, a report published by the European Investment Bank in cooperation with Baringa highlights three barriers for European corporate offtakers (Baringa, 2022). First, price risk was highlighted as a key hindrance, especially for companies with low margins. Second, a large number of energy-intensive companies are willing to conclude CPPAs but do not have sufficient creditworthiness to qualify as counterparties. To address this issue, Polzin et al. (2015) suggest implementing government loans or credit guarantees. The Norwegian Export Credit Guarantee Agency

contributes to reducing credit risk by providing counterparties with guarantees to support CPPA engagement (Đukan et al., 2023). Third, some companies prefer to purchase unbundled GOs on markets rather than concluding a CPPA (IRENA, 2018). Beyond these factors, the perceived complexity of contracts for companies with a limited understanding of energy markets is also an important barrier. To alleviate this hurdle, organisations such as the RE-Source Platform and consulting firms offer companies support with CPPA negotiations (Baringa, 2022; Douglas et al., 2020). Key CPPA features that can be subject to negotiations are presented in the following subsection.

## 2.2. Contractual features of CPPAs

There are two types of CPPA contracts: physical and virtual. In a physical CPPA, the electricity is physically delivered, with the power generation facility and the corporate consumer being interconnected within the same grid (Tang and Zhang, 2019). Hence, the regulatory framework needs to be designed to allow this connection. In contrast, a virtual CPPA is similar to a financial derivative. The cash flow between the counterparties solely depends on the variance between the CPPA price and the spot market price (Harada and Coussi, 2020; Mendicino et al., 2019). This study focuses on physical CPPAs, the most common type of contract in Europe (Pexapark, 2023a).

Key contractual features of physical CPPAs include the price, volume of electricity, commercial structure, tenor and renewable energy certificates (Mendicino et al., 2019). CPPA prices are typically calculated based on the levelized cost of electricity (LCOE), power prices in forward markets, and risk allocation amongst counterparties (Kanellakopoulou, 2021). Since LCOE calculations vary depending on the parameters used, scholars have proposed improvements in estimation techniques for REPs (García-Barberena et al., 2014; Mendicino et al., 2019; Miller et al., 2017). CPPA prices are often fixed during the contract duration (Tang and Zhang, 2019). However, pricing structures can also be designed to increase or decrease incrementally based on price forecasts or indexed to parameters such as inflation.

The CPPA volume and commercial structure depend on the risk appetite of the counterparties. In a baseload structure, the REP commits to delivering a pre-determined volume of electricity within a specific time interval that fits the production profile of the renewable energy plant (Brunnberg and Johnsen, 2019). The offtaker agrees to pay a fixed price per unit of electricity received for the duration of the contractual period. Since the volume is pre-determined, the REP is responsible for providing the remaining electricity if the plant fails to generate enough power to meet what was agreed upon contractually. In other terms, production profile and volume risks are borne by the REP. In a pay-as-produced structure, the offtaker agrees to purchase all or part of the electricity produced by the plant at a pre-determined price, regardless of the volume generated (Brunnberg and Johnsen, 2019). Prices under pay-as-produced arrangements tend to be lower than those for baseload structures, as the production profile, volume, and price risks are borne by the offtaker (Brunnberg and Johnsen, 2019). Nevertheless, as CPPA markets mature, a trend towards using baseload structures may be observed (Niklaus, 2023). Indeed, optimising CPPA portfolios by diversifying technologies and locations can mitigate risks for REPs and increase their financial performance (García-Álvarez et al., 2017). For instance, adding storage capacity to a CPPA can mitigate risks and facilitate on-demand power delivery (Gabrielli et al., 2022a,b; Jain, 2022).

Tenors usually range between 10 and 25 years (Harada and Coussi, 2020; Miller et al., 2017), although CPPAs shorter than five years have recently been observed (Brunnberg and Johnsen, 2019; Douglas et al., 2020; Miller, 2020). However, if an installation is financed through lenders, the latter often require a minimum tenor that matches the loan period (Miller et al., 2017). For offtakers, concluding a CPPA with a long contract duration at a fixed price can offer an opportunity to hedge against price risk (WBCSD, 2018).

Finally, CPPAs typically include GOs. Certificate prices must be agreed upon prior to concluding such agreements (WBCSD, 2018). Other CPPA features can include agreements on liability and insurance, billing, and clauses pertaining to default or premature contract termination – see Mendicino et al. (2019) for details.

## 3. Methodology

### 3.1. Methodological approach

This study applies a choice experiment to investigate the preferences of corporate offtakers for various CPPA designs and to quantify their willingness to pay (WTP) for contract features. Choice experiments have their theoretical roots in discrete choice and random utility theory (Lancaster, 1966; Manski, 1977). The underlying assumptions hold that individuals strive to maximise their utility when choosing a product composed of different attributes, each providing a certain part-worth utility. In a choice experiment, respondents are shown hypothetical yet realistic products described in terms of their most important attributes. The levels of the latter vary randomly to form different product concepts. Respondents are asked to choose between concepts in several choice tasks. Since the concepts are experimentally manipulated, it is possible to investigate preferences beyond past or present market arrangements (Holmes et al., 2017).

This approach first appeared in marketing research to explore the customer acceptance of newly launched products but is now frequently used in energy research to examine preferences related to clean energy investments (Azarova et al., 2019; Côté et al., 2022; Mihailova et al., 2022; Petrovich et al., 2021; Ruokamo, 2016). Choice experiments are particularly suitable for investigating product preferences in immature markets, where a lack of historical data makes the application of revealed preference methods unsuitable. Since CPPAs are not widely used in Switzerland, applying a choice experiment to investigate the stated preferences of offtakers for such contracts is desirable.

### 3.2. Survey structure

The questionnaire was programmed using Sawtooth Software's module SSI.<sup>1</sup> The survey and choice experiment were developed iteratively based on a literature review, a qualitative pre-study involving semi-structured interviews (see Subsection 3.4 for details), expert consultations, and several rounds of survey testing. The questionnaire was made available in German and French and covered three sections. First, respondents were asked questions about the annual electricity consumption of their company, their corporate sustainability orientation, and their experience with power procurement. Second, they were presented with a series of choice tasks to clarify their preferences for different CPPA features (see Subsections 3.3 and 3.4 for details). Third, the survey concluded with a set of socio-demographic questions.

### 3.3. Choice experiment design

The choice experiment consisted of two sections: an introduction followed by ten consecutive choice tasks. First, respondents were instructed to envision that their company intended to buy electricity from a specific renewable energy plant located outside their company site. They were asked to consider entering a long-term electricity supply contract (CPPA) with a local REP who owned the plant. Respondents were informed that the CPPA guaranteed the delivery of a fixed volume of electricity (baseload) at a fixed price and that the agreed quantity would be delivered to their company via the grid. Further, respondents were told that the CPPA would include the GOs associated with the electricity purchased from the plant. They were also informed that if the

<sup>1</sup> <https://sawtoothsoftware.com>.

plant could not supply the agreed volume, the REP would buy the remaining electricity and GOs on markets and deliver them to their company at the price agreed in the CPPA. Additional details about CPPAs were provided to respondents who had previously indicated that they were not familiar with this concept (see Fig. A.1 in the appendix for details). Concluding this part, respondents were told that their CPPA options varied according to the attributes and levels presented in [Sub-section 3.4](#).

Second, respondents were presented with ten consecutive choice tasks, each comprising three options characterised by randomised attribute levels. In each task, respondents were asked to select the CPPA option their organisation would most likely choose if these were real power-procurement contracts. To mitigate the risk of hypothetical bias, corporate offtakers were asked to make their choices as if these were real-life decisions and to think about potential impacts on their company's budget. In each task, we also asked respondents to indicate if they would likely choose the CPPA option they had specified over their existing power-procurement contract. Including this 'none' option in the choice experiment allowed us to collect information about the attractiveness of CPPAs compared to other power-procurement mechanisms. Fig. A.2 in the appendix provides an example of a choice task shown to respondents.

### 3.4. Selection of attributes and levels

When using choice experiments, it is important to find a balance between realistic features and testing potential product boundaries without overstressing respondents' imaginations ([Kubli et al., 2018](#)). Therefore, the attributes and levels were selected based on an extensive preliminary study to ensure their suitability. Findings from a literature review and six expert interviews were used to determine the most important CPPA features governing offtakers' decision-making. Interviewees included REPs, consultants, and corporate consumers in the Swiss market. The latter were shown a list of attributes and invited to evaluate their relative importance in CPPA decisions. For the attribute-level selection, three criteria were applied: 1) effect on decisions, 2) practicality of the levels, and 3) compatibility across levels ([Herrmann et al., 2009](#)). Further, the number of levels was kept symmetrical to avoid the "number-of-levels" effect, whereby attributes with more levels may be associated with higher importance scores than attributes with fewer levels ([Salm et al., 2016](#)). [Table 1](#) showcases the resulting attributes and levels presented to the respondents in this first section.

The *electricity price* attribute represents the amount offtakers must

**Table 1**  
Attributes and levels manipulated in the choice experiment.

Attributes	Description	Attribute levels
Electricity price	Fixed price per kilowatt hour (kWh).	<ul style="list-style-type: none"> <li>• 4 ct./kWh</li> <li>• 10 ct./kWh</li> <li>• 16 ct./kWh</li> </ul>
Contract duration	Length of CPPA contract (years).	<ul style="list-style-type: none"> <li>• 5 years</li> <li>• 15 years</li> <li>• 25 years</li> </ul>
Share of electricity consumption covered by the CPPA	Share of company's annual electricity consumption in Switzerland covered by CPPA (%).	<ul style="list-style-type: none"> <li>• 10%</li> <li>• 30%</li> <li>• 50%</li> </ul>
Location of renewable energy plant	Location of the clean energy installation.	<ul style="list-style-type: none"> <li>• Proximity to company site</li> <li>• In the same canton as company site</li> <li>• In Switzerland</li> </ul>
Technology type	Type of clean energy technology.	<ul style="list-style-type: none"> <li>• Solar PV</li> <li>• Onshore wind</li> <li>• Mix of solar PV and onshore wind</li> </ul>

pay per unit of electricity to obtain the volume and renewable energy certificates agreed upon within the CPPA. This attribute was fixed for the entire contract duration, as this is Europe's most common pricing structure ([Baringa, 2022](#); [Brunnberg and Johnsen, 2019](#); [Niklaus, 2023](#)). Levels were defined according to the CPPA price developments observed in Europe in the past four years and captured a broad range of prices, namely 4 ct./kWh, 10 ct./kWh, and 16 ct./kWh ([Franke, 2023](#); [Pexapark, 2023b](#)). Average European prices were used as an initial reference, as the Swiss CPPA market is too small to capture historical price data. Since the Swiss and European markets may differ in terms of prices, we tested the levels with experts active in the Swiss market. The resulting design enabled us to estimate the willingness of respondents to pay for different CPPA features, as defined by the other attributes.

The *contract duration* attribute corresponds to the CPPA tenor. Levels were selected to encompass a large range of terms observed in different European markets ([Pexapark, 2023a](#)) – i.e., 5 years, 15 years, and 25 years. While the early termination of a CPPA is possible, respondents were instructed to assume that early withdrawal was not an option. Early termination fees represent the penalty offtakers must pay to terminate the contract earlier than the agreed term to compensate the REP for revenue loss and related costs ([EFET, 2019](#)). These fees tend to be high, which generally disincentivises early exits. Thus, we used the non-exit option as a constant in our experiment for simplicity.

The *share of electricity consumption covered by the CPPA* specified the proportion of the company's annual power consumption in Switzerland covered by the contract. Since consumption varies depending on company size and industry, using absolute volumes in the choice experiment would not have been realistic for all respondents. Hence, this proxy attribute was chosen. Levels of 10%, 30%, and 50% were defined based on findings from a literature review and pre-study interviews ([IRENA, 2018](#)). Further, respondents were asked to assume that the electricity not covered by the CPPA would be exposed to price risk.

The *location of the renewable energy plant* attribute was designed to clarify whether companies differentiate between different sites. Scholars have shown that the location of renewable projects influences investment decisions, with familiarity sometimes acting as an investment catalyser (home bias) or inhibitor (NIMBY<sup>2</sup>) ([Blondiau and Reuter, 2019](#)). The siting of plants can be subject to debate or strong opposition, creating additional costs and delays for REPs ([Vuichard et al., 2022](#); [Wüstenhagen et al., 2007](#)) and reputational risk for both counterparties. Hence, we selected the following levels: a renewable project located in the proximity of their company site, in the same canton,<sup>3</sup> or elsewhere in Switzerland.

The final attribute, *technology type*, specified the type of clean energy technology producing the green electricity procured through the CPPA. Levels included a solar photovoltaic (PV) system, an onshore wind energy system, and a portfolio of solar PV and wind energy. These technologies are foreseen to be widely deployed in Switzerland to reach the nation's climate goals ([BFE, 2018](#)).

### 3.5. Data collection and sample

The targeted population consisted of corporate offtakers knowledgeable about electricity procurement from organisations operating in Switzerland. We selected companies considering their sector of activity, size, and region to echo the diversity observed nationally. The energy intensity of companies was also considered as energy intensive firms tend to be more likely to conclude a CPPA ([Brüggemann et al., 2022](#)). Consequently, our sample includes fewer micro companies (<9 employees), and a higher proportion of manufacturing firms compared to the national distribution, as the industrial sector represents about half of the total corporate energy consumption in Switzerland ([Taglia et al.,](#)

<sup>2</sup> NIMBY: "not in my backyard".

<sup>3</sup> Switzerland is organized into 26 federal states or cantons ([BFS, 2023a](#)).

2022).

Data collection took place in three phases between May and June 2023. First, four large disseminators – i.e., three energy utilities and an association of energy-intensive companies – sent a total of 55 survey invitations to their corporate clients and members via email. Second, we sent 99 survey invitations to relevant organisations through direct emailing. Potential respondents were identified through web searches using keywords related to electricity procurement positions, such as “Head of Procurement” or “Head of Facility Management”. Respondents whose email addresses were publicly available on company websites were contacted. Third, we recruited using a panel from a professional market research institute that distributed 435 survey invitations among its members (a filter question was implemented to ensure that the respondents were responsible for their companies’ electricity procurement). Respondents who completed the survey in the first two phases could participate in a draw to win a ticket to an event about renewable energy management. Respondents who completed the survey during the third phase received a financial compensation.

A total of 258 respondents accessed the survey. Respondents who did not provide sufficient answers, did not comply with our selection criteria or failed the attention check ( $N = 148$ ) were excluded from the sample. Following [Kremser \(2022\)](#), we applied a data cleaning method to eliminate ‘speeders’, and random answers and ensure data quality. The method consists of 1) generating a dataset with dummy responses using the Sawtooth Software; 2) specifying a Hierarchical Bayes model using this dataset; 3) determining the 80th percentile root likelihood score and using it as a cut-off point to exclude respondents with scores below this threshold.<sup>4</sup> This resulted in the exclusion of 19 respondents. [Table 2](#) presents the response funnel according to the data collection phase.

The final sample included the responses of 91 corporate off-takers, who collectively made 860 hypothetical energy-procurement decisions (response rate of 15.4%). A subset of eight respondents partially completed the survey but provided sufficient information to allow their inclusion in the sample. The median duration for completion was 12 min.

Over 90% of respondents reported having a managerial position, with 88% being responsible for the electricity procurement in their company, underscoring the quality of our dataset. The sample consists predominantly of males in their mid-forties, the majority having over 20 years of work experience. Specifically, it includes 53 representatives of small and midsize enterprises (SMEs) (i.e., companies with up to 249 employees) and 31 representatives from large companies (i.e., 250

**Table 2**  
Response funnel according to data collection phase.

	Phase 1 <i>Large disseminators</i>	Phase 3 <i>Direct emailing</i>	Phase 3 <i>Market research institute</i>	Total
	No. of units	No. of units	No. of units	No. of units
Survey invitation	55	99	435	589
Survey accessed	51	89	118	258
Invalid response	24	54	70	148
Failed quality check	1	1	17	19
Survey completed	26	34	31	91

<sup>4</sup> See [Subsection 4.2](#) for details on Hierarchical Bayes models and root likelihood scores and [Kremser \(2022\)](#) for further information.

employees or more). Further, 63% of respondents reported that their company was based in the German-speaking area of Switzerland, 28% in bilingual cantons, and 8% in the French-speaking area. Further socio-demographic insights can be found in [Table A.1](#) in the appendix.

## 4. Results and discussion

First, this section outlines descriptive findings about our sample of corporate off-takers. It includes information about their current power-procurement practices, corporate sustainability strategies, electricity market perceptions, and perceived drivers of and barriers to CPPAs. This allows us to better understand the factors influencing corporate procurement decision-making. Second, we present the results of the choice experiment and discuss preferences for different CPPA features by analysing part-worth utility estimates and attribute importance scores. Finally, we present insights about WTP for different CPPA features and highlight nuances among subgroups.

### 4.1. Descriptive results

#### 4.1.1. Electricity procurement practices and market perceptions

Our sample includes companies with a wide array of electricity consumption, procuring power from a variety of channels. Most large companies (97%) and the majority of SMEs (53%) indicated that their annual power consumption is above 100,000 kWh (see [Fig. A.3](#) in appendix). Since Switzerland has a partially liberalised electricity market, only consumers with annual consumption above this threshold are eligible to participate in wholesale markets and choose their electricity supplier freely ([BFE, 2020](#)). Hence, most large companies (65%) reported procuring power from markets, compared to only 32% of SMEs (see [Fig. 1](#)). Additionally, more than twice as many large companies owned a solar PV system compared to SMEs (77% and 36%, respectively). Over half of Swiss companies also disclosed having a power supply contract for a mix of renewable and non-renewable energy sources. However, the share of large companies that purchased GOs on markets exceeded that of SMEs by more than threefold (48% and 13%, respectively). Scholars have shown that companies that procure power from markets consider GOs a valid option for obtaining green electricity ([Bjørn et al., 2022](#)). In contrast, 100% renewable energy contracts appear to be more popular amongst SMEs. Since the latter tend to consume less than their larger counterparts, they may be unable to participate in deregulated markets and are less affected by the price premiums associated with green products. Finally, twice as many large companies as SMEs reported having a CPPA for a plant located on their company’s site (26% and 11%, respectively).

Similar shares of large companies (74%) and SMEs (78%) revealed that sustainability played a considerable role in their electricity procurement decisions (see [Table A.2](#) in appendix). However, while 78% of these large companies reported having a sustainability strategy, only 44% of SMEs had one in place (see [Table A.3](#) in appendix). The high sustainability consciousness aligns with market trends – an increasing number of companies are voluntarily disclosing progress on sustainability-related activities. This surge in environmental, social, and governance (ESG) reporting can be attributed to several factors, including regulatory reforms, a changing ESG reporting landscape, and pushing from investors. The latter, in particular, are increasingly demanding ESG disclosures to inform their decisions ([EY, 2023](#); [KPMG, 2022](#)). This mounting pressure might be felt more by large companies than by SMEs, who may have fewer resources and less know-how to develop such strategies. Nevertheless, 41% of SMEs suggested that their company planned to introduce such a strategy within the next two years, underscoring the relevance of aligning with sustainability goals to ensure long-term prosperity.

#### 4.1.2. Perceived drivers of and barriers to CPPAs

Our results show that hedging against price volatility is the primary

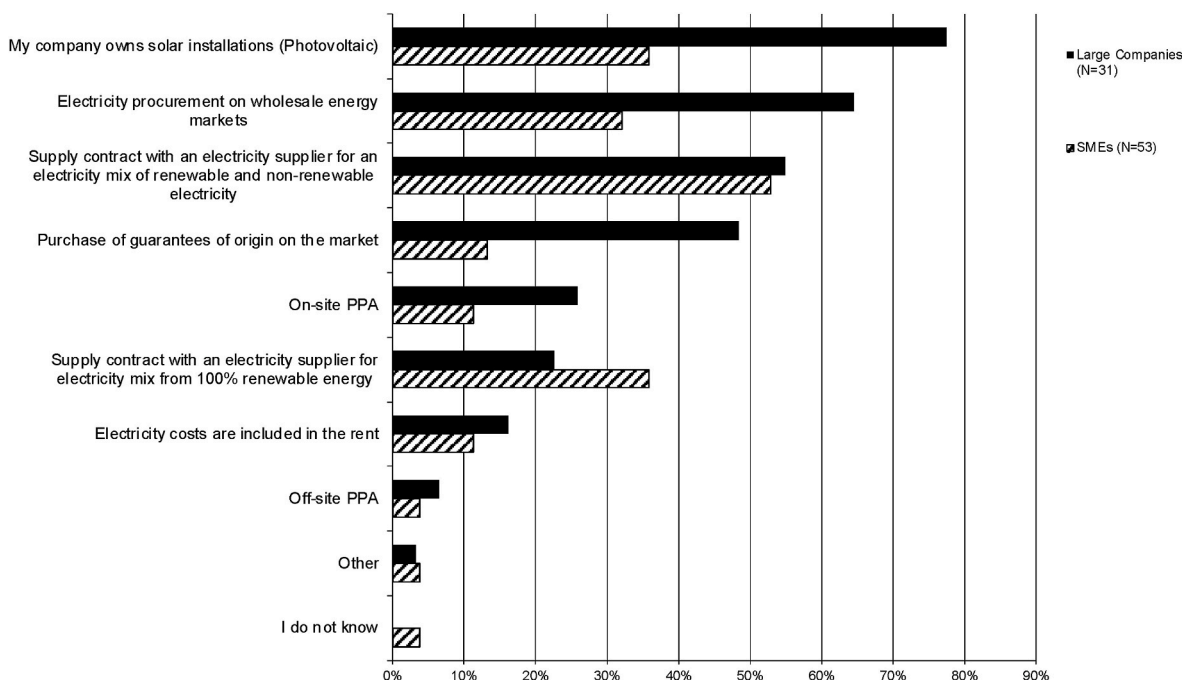


Fig. 1. Electricity procurement channels of Swiss companies (multiple answers possible, N = 84).

driver of CPPAs for Swiss companies, along with slashing costs, dependence on imports and contributing to the energy transition. Indeed, 97% of large companies and 73% of SMEs view hedging against price volatility as one of the main determinants of their procurement decisions (see Fig. 2). While large companies also see the potential of lower electricity costs as a key driver, SMEs appear to emphasise reducing their reliance on electricity imports more. These results align with studies showing that hedging against price volatility and securing lower-than-market rates have become the main motivations for engaging in CPPAs (Kanellakopoulou, 2023; Pexapark, 2023a). They also reiterate the importance of cost-related factors in power procurement decisions (Handfield, 2000; Tang and Zhang, 2019). Interestingly, contributing to the energy transition is both groups' third most prominent driver. This suggests that Swiss companies are well aware of the important role they could play in accelerating the energy transition.

Regarding barriers to CPPAs, long-term commitments and the complexity of contractual obligations were highlighted as two of the most important factors (see Fig. 3). Many SMEs (60%) view the latter as a bottleneck, suggesting a potential lack of expertise and resources. Indeed, while 74% of off-takers from large companies (N = 31) indicated having already heard of CPPAs or being familiar with the concept, 43% of SMEs (N = 53) reported having never heard of CPPAs. While concerns about market prices falling below the CPPA price were a major drawback for larger companies, SMEs placed more importance on investing in their own solar PV systems. These results suggest that large companies tend to be more sensitive to price risk than SMEs.

#### 4.2. Results of the choice experiment: preferences for CPPA features

We investigated the preferences of corporate off-takers for CPPAs by specifying Hierarchical Bayes (HB) models using the choice experiment data and Sawtooth Software. HB models comprise two levels: 1) multinomial logit models describe the choice probability of each individual respondent, and 2) a multivariate normal distribution, including a means vector and covariances matrix, indicates the respondents' diversity (Allenby et al., 2005). The modularity of this approach enables researchers to draw information from both levels, making it particularly well-suited for analysing smaller datasets (Rao, 2014). Average part-worth utilities are computed for each attribute level to determine

relative preferences for different CPPA features. Table 3 showcases zero-centred utility estimates, lower and upper 95% confidence intervals, and standard deviation results. Part-worth utilities were zero-centred to facilitate comparison within attributes. Two HB models were specified to highlight contrasts between the preferences of large companies and SMEs.

Following Côté and Salm (2022), we use the average root likelihood (RLH) parameter to assess the quality of the HB models. High RLH values indicate a good match between the models and choice data, with RLH = 1 being the highest possible value. In the choice experiment, respondents were presented with three CPPA concepts to choose from in each choice task. The predictability of choosing a concept based on chance is  $1/3 = 0.33$  (Sawtooth, 2023). Since the RLH values associated with the HB models are nearly twice that of the null likelihood ( $RLH_{Large\ companies} = 0.689$ ;  $RLH_{SMEs} = 0.640$ ), we can assume a good match between the models and datasets (Côté & Pons-Seres de Brauwer, 2023; Hille et al., 2018).

Unsurprisingly, our results show that the lowest level of the *electricity price* attribute is associated with the highest utility for both large companies and SMEs (see Table 3), suggesting that – all else being equal – companies prefer CPPAs with lower prices. In Europe, increases in CPPA prices driven by volatility in power markets and hikes in material, labour, and capital costs led to a 20% fall in signed PPA volumes in 2022 (IEA, 2023). This signifies the importance of reducing prices to resume CPPA growth, especially for larger companies. Prices could be reduced by alleviating risks for REPs. The drafted electricity market reform proposed by the European Commission in March 2023 attempts to move in that direction (EC, 2023). Notably, it mandates Member States to ensure that instruments such as government-backed credit guarantees are in place at market price to mitigate the risk associated with off-taker default. However, experts have warned that a lack of specificity regarding how such prices should be determined could lead to adverse selection and favour companies with poor credit ratings (Zachmann et al., 2023). To avoid this, they underscore the need for prices to reflect default risk and highlight the relevance of private guarantees.

Regarding *contract duration*, both large companies and SMEs prefer shorter agreements. Historically, PPAs have been concluded for time horizons spanning from 10 to over 20 years, with tenors varying based on off-taker and market. For example, in the Nordic market, heavy

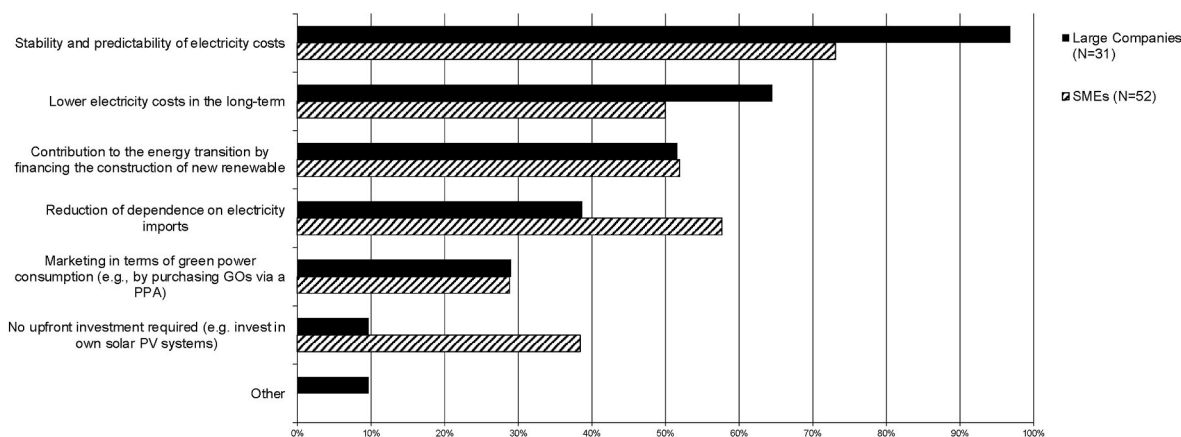


Fig. 2. Share of respondents perceiving an item as one of the three most important drivers for concluding a CPPA (three answers required).

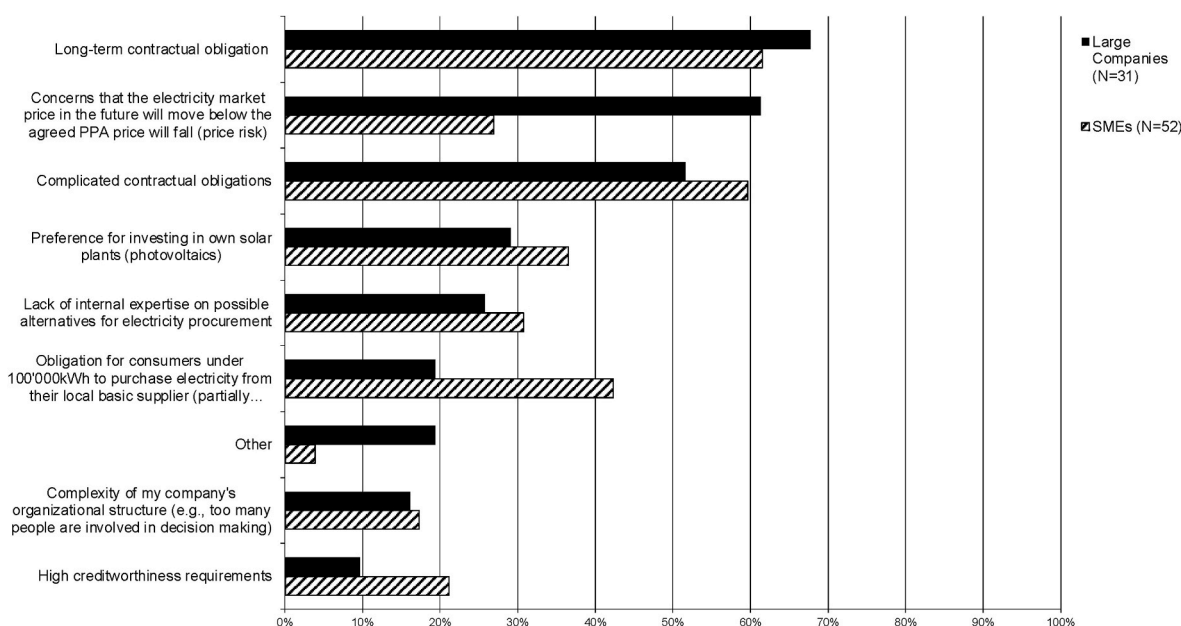


Fig. 3. Share of respondents perceiving an item as one of the three most significant barriers to concluding a CPPA (three answers required).

industrials such as aluminium smelters have struck deals stretching well beyond 20 years. In contrast, utilities active in the wind industry have leaned towards 10- to 15-year contracts, while tenors in the growing Iberian PPA market are reaching up to 10 years, partly due to a lack of liquidity in the forward market (Brunnberg and Johnsen, 2019). However, high price volatility exacerbated by the onset of the war in Ukraine has spurred a trend towards five-year deals (Hancock, 2021). Extreme backwardation<sup>5</sup> has also led to notable disparities between the pricing of long-term and short-term PPAs (Pexapark, 2023a). A shorter tenor can limit losses (or gains) for offtakers whilst reducing credit rating effects (Neuhoff et al., 2023). However, it also affects the revenue visibility and the bankability of projects, affecting REPs' capital costs and CPPA prices (Dominy and Zubair, 2021). While our results show a strong demand for short tenors, they also shed light on an important mismatch between the interests of corporate offtakers and REPs (Axpó, 2019). Finding ways to enable shorter tenors whilst ensuring adequate financing conditions for REPs will be key to meeting the needs of both counterparties.

While both groups prefer higher shares of electricity to be covered by the CPPA, large companies seem to differentiate more than SMEs

between agreements covering 10%, 30%, and 50% of their power consumption, as the spread between their part-worth utilities is larger. Since large companies tend to consume more electricity than SMEs (see Sub-section 4.1.1), their energy-related costs are higher. Hence, energy-intensive firms have a strong incentive to hedge themselves against price fluctuations by securing larger shares of electricity at a fixed price (Diaz et al., 2023).

As for the location of the renewable energy plant, the preferences of large companies and SMEs vary. Large companies tend to prefer procuring their electricity from plants located in the same canton as their company and are more inclined to conclude a CPPA for a plant situated in their proximity than for one located elsewhere in Switzerland. In contrast, SMEs do not differentiate much between plant locations as the spread between their part-worth utilities is very small.

Regarding technology, our results again show nuanced preferences between groups. While large companies appear to slightly prefer plants that integrate solar PV and onshore wind technologies, they are less reluctant than SMEs to enter deals that diverge from this configuration. In contrast, SMEs favour entering a CPPA associated with a solar PV plant and are less keen on deals involving a wind park. This may be because wind energy deployment is in its infancy in Switzerland, and projects are often opposed (Cousse et al., 2020). However, scholars have

<sup>5</sup> When futures prices are lower than spot prices.

**Table 3**  
Zero-centred utilities, lower and upper 95% confidence interval, and standard deviation.

Attribute	Attribute levels	HB model Large companies (N = 31)			HB model SMEs (N = 53)		
		Zero-centred utilities	Lower and upper 95% confidence interval	Standard deviation	Zero-centred utility	Lower and upper 95% confidence interval	Standard deviation
Electricity price	4 ct./kWh	103.43	[ 82.26; 124.60 ]	60.13	69.74	[ 53.45; 86.03 ]	60.51
	10 ct./kWh	-8.18	[ -17.76; 1.41 ]	27.24	17.83	[ 8.82; 26.83 ]	33.44
	16 ct./kWh	-95.25	[ -115.18; -75.33 ]	56.59	-87.57	[ -104.25; -70.88 ]	61.98
Contract duration	5 years	16.44	[ -2.77; 35.65 ]	54.58	19.58	[ -0.74; 39.91 ]	75.49
	15 years	12.16	[ 5.93; 18.38 ]	17.69	9.70	[ 1.86; 17.55 ]	29.15
	25 years	-28.60	[ -48.88; -8.32 ]	57.61	-29.29	[ -45.46; -13.11 ]	60.07
Share of electricity covered by CPPA	10%	-33.65	[ -49.25; -18.05 ]	44.32	-24.67	[ -33.62; -15.72 ]	33.24
	30%	2.27	[ -4.60; 9.13 ]	19.51	1.17	[ -6.43; 8.78 ]	28.24
	50%	31.38	[ 17.78; 44.99 ]	38.66	23.50	[ 15.67; 31.32 ]	29.06
Location of renewable energy plant	In proximity to company	4.21	[ -5.65; 14.08 ]	28.01	-1.36	[ -7.87; 5.14 ]	24.17
	Same canton as company	23.05	[ 14.70; 31.40 ]	23.72	0.34	[ -7.69; 8.38 ]	29.84
	In Switzerland	-27.26	[ -40.82; -13.70 ]	38.51	1.02	[ -6.27; 8.32 ]	27.10
Technology type	Solar PV	0.32	[ -6.53; 7.17 ]	19.46	11.08	[ 2.84; 19.32 ]	30.61
	Onshore wind	-3.46	[ -11.23; 4.31 ]	22.07	-9.42	[ -18.58; -0.26 ]	34.03
	Solar PV & onshore wind	3.14	[ -2.03; 8.31 ]	14.69	-1.67	[ -10.95; 7.62 ]	34.48
None		107.53	[ 46.40; 168.66 ]	173.64	94.42	[ 42.87; 145.97 ]	191.48

shown that combining solar PV and onshore wind could help balance power supply and demand due to the complementary generation profiles (García-Álvarez et al., 2017). The fact that large companies tend to prefer hybrid plants may reflect their greater energy-related expertise, as most reported owning a solar PV system.

Finally, the results of the second part of the choice experiment suggest a demand for CPPAs in Switzerland, with large companies and SMEs expressing similar levels of interest. Indeed, respondents who reported that their company did not procure electricity through a CPPA chose one over their current power-procurement contract in 59% of cases (N = 710).<sup>6</sup> This result underscores the importance of establishing adequate framework conditions for removing barriers to CPPA market entry. For example, simplifying contractual arrangements through standardization may facilitate market access for SMEs who see the complexity of CPPAs as a major impediment.

#### 4.3. Importance of CPPA attributes in power-procurement decisions

Average importance scores were estimated using Sawtooth Software to indicate CPPA attributes' relative weight in power-procurement decisions. Results show that the attribute *electricity price* is the most important factor for both large companies and SMEs – i.e., 41.8% and 36.4%, respectively (see Table 4). While *contract duration* is the second most important driver, SMEs assign significantly more weight to this factor than larger enterprises (25.5% and 18.8%, respectively). This could be explained by the fact that SMEs tend to have fewer resources to establish long-term relationships with suppliers and may not survive as long as larger businesses (Evans, 1987; Merckx and Chaturvedi, 2020). Further, large companies assign similar weight to the *share of electricity covered by the PPA* (17.3%) as its tenor. Energy-intensive firms are more incentivised to shield themselves against potential price surges by securing more volume at fixed prices. This attribute is also ranked third by SMEs, highlighting its relevance in power-procurement decisions. As for the *location of the renewable energy plant* and the *technology type*, the importance of these attributes differs. While large companies are more concerned by the location of a power plan than by its technology, SMEs consider the technology as being significantly more important.

<sup>6</sup> Here, “N” represents the number of times corporate offtakers chose between a CPPA or their current power-procurement contract (i.e., the number of choice tasks).

**Table 4**  
Average importance scores and standard deviations by attribute.

Attribute	Large companies (N = 31)		SMEs (N = 53)	
	Average importance	Standard deviation	Average importance	Standard deviation
Electricity price	41.8	19.8	36.4	17.0
Contract duration	18.8 <sup>a</sup>	15.3	25.5 <sup>a</sup>	14.3
Share of electricity covered by CPPA	17.3	12.1	14.1	9.1
Location of the renewable energy plant	14.2	9.6	10.9	6.6
Technology type	8.0 <sup>a</sup>	4.3	13.0 <sup>a</sup>	9.5

#### 4.4. Overall WTP for CPPA features

Following Salm and Wüstenhagen (2018), we computed implicit willingness to pay relative to the least preferred level of each attribute (see Fig. 4). Our results show that Swiss companies would be willing to pay, on average, up to 3.73 ct./kWh more for a five-year CPPA compared to one with a *contract duration* of 25 years, and 2.60 ct./kWh for a 15-year contract. These findings confirm that companies generally view long-term commitments as risky, as they would be willing to pay considerable premiums to avoid such lock-in. This may stem from concerns over the long-term prosperity of their companies (Miller et al., 2017), or apprehension over price and tenor risks (Yang et al., 2024). This concern may be amplified by the high level of uncertainty the current energy crisis has introduced. Relatedly, several large energy suppliers in Europe already provide tailored energy agreements to corporate clients, e.g. offering short-to mid-term fixed-price CPPAs based on a portfolio of renewable energy projects (Vattenfall, 2024; BKW, 2024; Axpo, 2024).

As for the *share of electricity covered by the CPPA*, Swiss companies would, on average, pay up to 4.39 ct./kWh more for an agreement where half of their electricity consumption is covered instead of one securing only 10% and 2.77 ct./kWh for a 30% contract. These results reiterate the importance of energy-cost stabilization using CPPAs (Yang et al., 2024; Heeter et al., 2017). They also align with O'Shaughnessy et al. (2021)'s suggestions for companies to use long-term agreements as a hedging strategy. Regarding the *location of the renewable energy plant*,

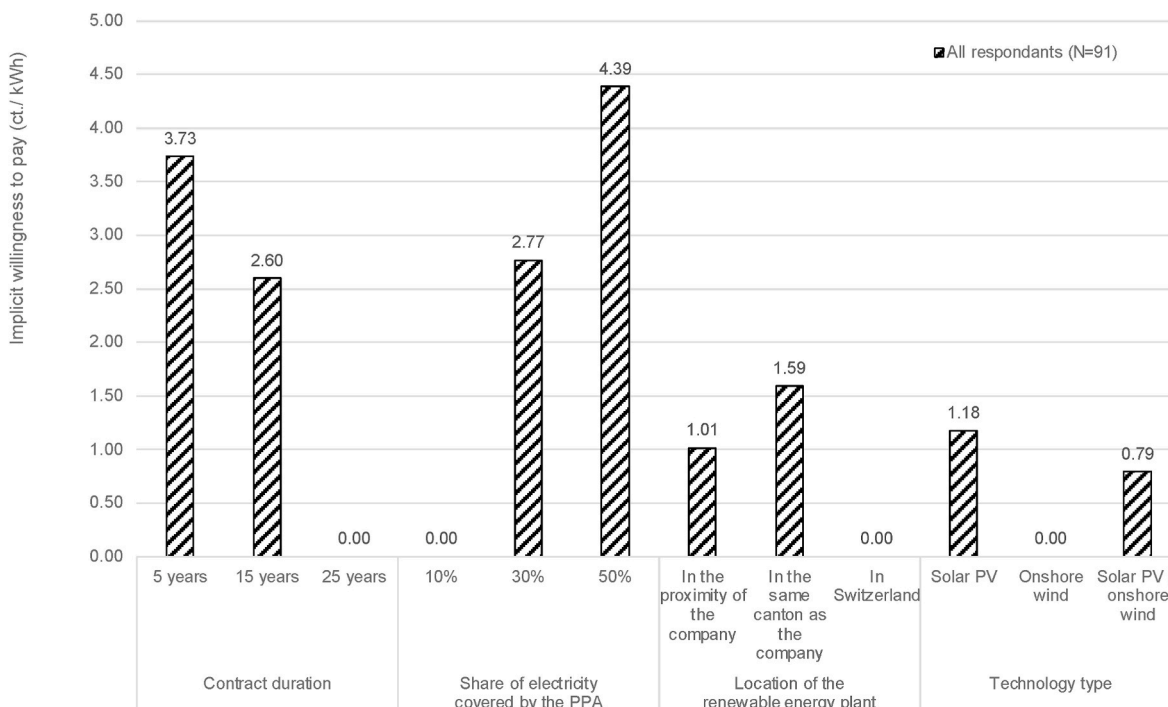


Fig. 4. Average willingness to pay of Swiss companies for different CPPA features (N = 91).

offtakers would, on average, be willing to pay up to 1.59 ct./kWh for a CPPA associated with a power plant located in the same canton as their company and 1.01 ct./kWh for a plant in their proximity. Finally, firms would be willing to pay a solar premium of 1.18 ct./kWh relative to a wind CPPA and up to 0.79 ct./kWh to procure power from both solar PV and onshore wind. These insights support findings from Favaloro et al. (2016), who showed that 96% of companies preferred solar energy for CPPAs, while 69% opted for wind power. This trend further aligns with studies focusing on Switzerland which indicate that social acceptance of rooftop solar PV is higher than that of wind energy (Cousse, 2021; Wissen Hayek et al., 2019).

#### 4.5. Differences in WTP between large companies and SMEs

Next, we explored differences in WTP between large companies and SMEs through a segmentation analysis using the approach described in Subsection 4.4. Group-specific WTP estimates are shown in Fig. 5. Our analysis shows that, aside from the *share of electricity covered by the CPPA* attribute, interesting nuances can be observed between the two groups.

While both groups would hesitate to conclude a 25-year agreement, SMEs would be willing to pay considerably more than their larger counterparts to reduce this *contract duration* to five years (3.73 ct./kWh and 2.72 ct./kWh, respectively). Further, SMEs appear to differentiate more between mid- and short-term contracts than larger companies, who would, on average, be willing to pay a similar premium to move to a 15-year and 5-year contract. SME's preference for short-term CPPAs can be explained by their typically greater financial constraints compared to large companies (Vermoesen et al., 2013). The latter tend to have better financial resources, while SMEs tend to rely heavily on bank debts, making them more vulnerable to market changes (Nicolas, 2022; Crovini, 2022). As for the *location of the renewable energy plant*, large companies would be disposed to pay up to 3.04 ct./kWh for local electricity production, whereas SMEs would pay almost the same amount, regardless of the plant location. The preference of large companies for proximity aligns with findings from Heeter et al. (2017) which indicate that corporate offtakers in the U.S. seek renewable energy projects close to their high-energy-consuming facilities. Finally, SMEs would be

willing to pay a solar premium of up to 1.56 ct./kWh compared to a wind CPPA, whereas large companies slightly prefer a mix of solar and wind over a single technology. This aligns with previous research by Miller (2020), which shows that some large companies tend to diversify their renewable energy technologies to tap into their complementarity, allowing a better fit with their consumption pattern (García-Álvarez et al., 2017). Further, since a small share of SMEs owns a solar PV system or have an on-site PPA contract, our results highlight the high potential of solar contracting for this consumer segment.

#### 4.6. Limitations

There are some limitations in our study that represent avenues for future research. First, we applied a stated-preference method, which relies on hypothetical scenarios to elicit the preferences of corporate offtaker for CPPA designs. While this enabled us to investigate risk perceptions and WTP for certain CPPA features, future research could use revealed-preference methods to test our findings once real-world data is available. Additionally, our dataset is specific to the Swiss context. While the preferences of Swiss companies may be similar to those of corporations worldwide, a comparative analysis with firms active in other CPPA markets may provide valuable insights into how preferences for CPPA and barriers to market entry vary across different countries. This could increase understanding of global CPPA dynamics and their role in advancing the energy transition.

## 5. Conclusions and policy implications

Considerable investment in renewable energies is imperative for combatting climate change. CPPAs have become increasingly popular in financing new projects, as they offer stable returns to REPs while providing a source of clean electricity for corporate offtakers. Nonetheless, risk allocation among these counterparties remains a significant challenge in CPPA negotiations. While a growing stream of research investigates CPPAs, there is limited evidence about the preferences of offtakers for different contract features. To address this issue, we conducted a choice experiment with 91 corporate offtakers who made 860

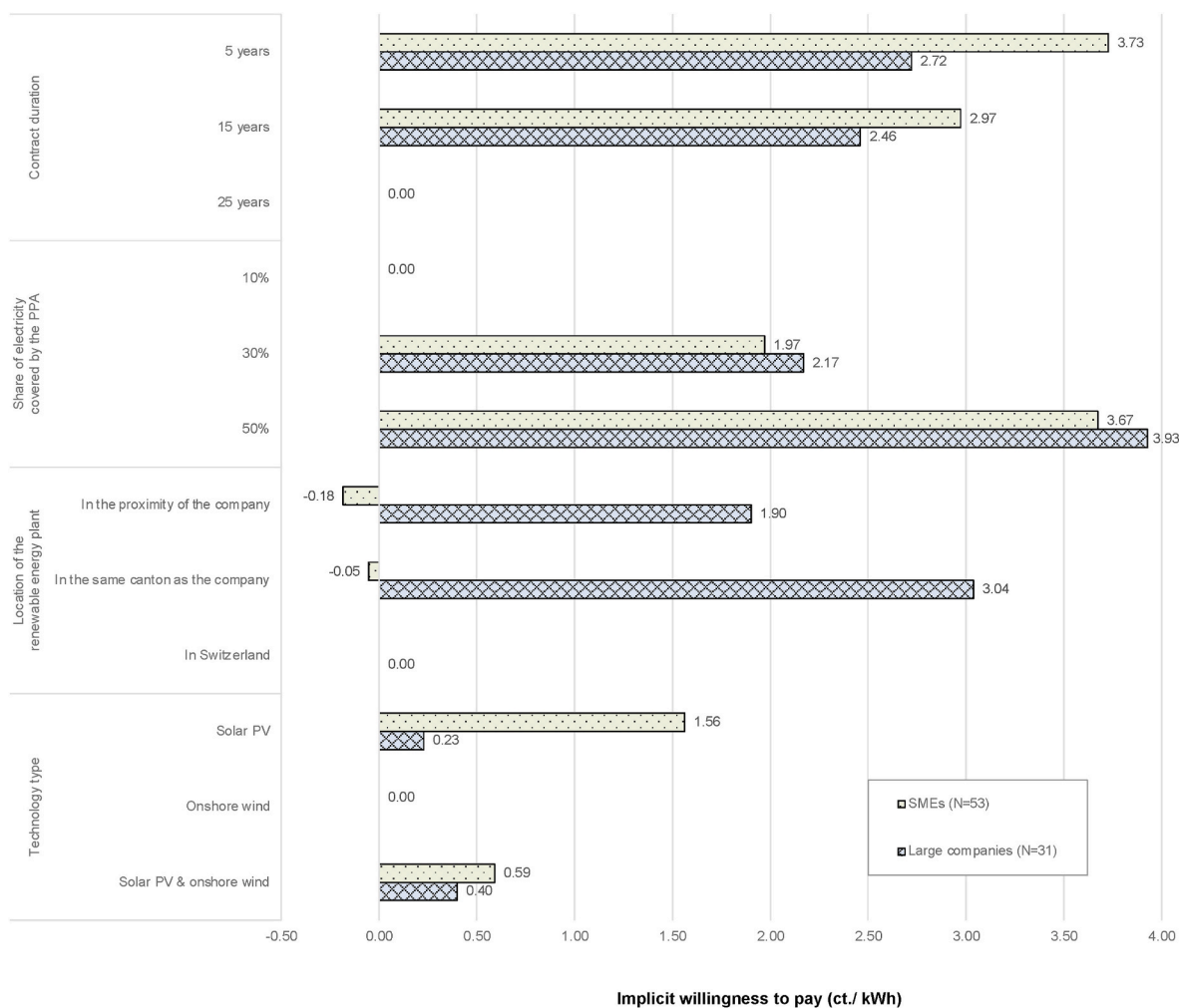


Fig. 5. Average willingness to pay of large companies and SMEs for different CPPA features (N = 84).

hypothetical power-procurement decisions within the Swiss market. This allowed us to gain valuable insight into their risk perceptions and enabled us to identify CPPA designs that could facilitate the deployment of renewable energy assets.

Our results show that Swiss companies are motivated to conclude CPPAs primarily to hedge against price volatility, tap into lower electricity costs, and reduce dependence on energy imports. Contributing to the energy transition was also highlighted as a key driver, with sustainability playing a pivotal role in power-procurement decisions. However, long-term commitments and the complexity of contractual obligations represent significant drawbacks, especially for SMEs with less expertise and resources to conclude such agreements.

Nevertheless, the results of our choice experiment suggest a strong interest in CPPAs, with corporate offtakers favouring such agreements over their current power-procurement contract in 59% of cases. Off-takers prefer CPPAs with lower prices and shorter tenors. The latter is especially important for SMEs, who would, on average, be willing to pay considerably more than their larger counterparts to move from a 25-year contract to one with a five-year tenor. Further, both large companies and SMEs favour CPPAs that cover more of their electricity consumption. This is particularly important for larger companies with higher energy intensity, making them more vulnerable to price fluctuations. Interestingly, while large companies would be willing to pay a hefty premium for local power production, SMEs seem to place more importance on the type of technology. The latter exhibit strong preferences for solar CPPAs, as opposed to large companies that appear to only have a slight preference for hybrid plants that combine solar PV and onshore wind

technologies. The fact that these companies lean towards hybrid solutions may reflect their greater energy-related expertise, provided that many already own a solar PV system.

Three key implications for policymakers and REPs are derived from these insights. First, since price is the most important factor governing CPPA decisions, policymakers could consider implementing framework conditions that lessen risks for counterparties. For example, by ensuring that government-backed, or private, financial guarantees are available to mitigate counterparties' credit risk. Similarly, the Spanish Export Credit Agency provides financial support in the energy-intensive sector, contributing to making Spain a frontrunner in the CPPA market. The Spanish government has also been advocating for the European Investment Bank to provide such support at a European level to counter the effect of the energy crisis on power consumers (Recessary, 2022). However, pricing techniques should be clearly specified to ensure off-takers' default risks are factored into prices (Zachmann et al., 2023). Second, while offering CPPAs with shorter tenors may be desirable for a broad range of corporate offtakers, this could negatively impact the financing conditions of REPs. Our results shed light on an important mismatch between the interests of corporate offtakers and REPs, which can lead to low liquidity in CPPA markets. To address this issue, REPs could consider pooling assets with CPPAs of different tenors in portfolios, rendering shorter contracts more appealing to financiers who are increasingly pursuing portfolio investment strategies (Pexapark, 2023a). Establishing a designated marketplace could also facilitate CPPA trading (Zachmann et al., 2023). Such a platform could pool projects associated with different technologies and locations into one designated

marketplace. It could also aggregate many corporate offtakers in search of deals. As such, these platforms could foster market liquidity whilst providing standardised information and support, reducing complexity for corporate offtakers who view this aspect as a major drawback. Alternatively, an intermediary could manage this process by concluding multiple agreements with several REPs, and aggregating these contracts into a single CPPA with an offtaker. Third, CPPAs may play an important role in complementing public support for low-cost renewables in Switzerland. Our results highlight the strong potential of solar contracting, especially for SMEs willing to pay hefty premiums to conclude solar CPPAs, regardless of the plants' location. In contrast, large companies would be willing to pay a considerable premium for local electricity production and do not differentiate much between technologies. REPs may wish to consider these important distinctions when negotiating CPPAs to cater for the preferences of a broad range of corporate offtakers.

#### CRediT authorship contribution statement

**Sabrina Mili:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Elizabeth Côté:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation.

#### Disclaimer

The research published in this publication was carried out with the

#### Appendix

A Power Purchase Agreement (PPA) is a long-term electricity supply contract between an electricity producer and an electricity consumer or "offtaker" (see illustration). A PPA can relate to a specific power generation plant (e.g., solar system) or several plants. The volume of the delivered electricity and the electricity price can be fixed for the entire contract term. A PPA can also include guarantees of origin (GO), i.e., certificates proving that the electricity consumed originates from renewable energy sources. GOs can be used by a company to prove that its electricity consumption is green. With a PPA, an electricity consumer can benefit from lower, stable and predictable electricity costs while reducing greenhouse gas emissions.

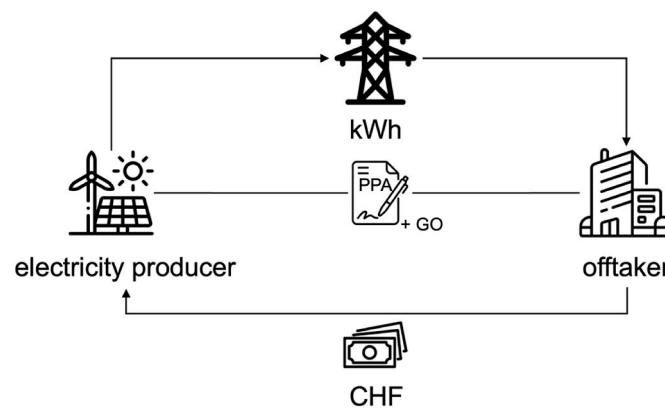


Fig. A.1. Explanation of PPA in the survey (authors' own illustration based on Freepik (2023), RE-Source Southeast Hub (2023)).

support of the Swiss Federal Office of Energy as part of the SWEET EDGE project. The authors bear sole responsibility for the conclusions and the results presented in this publication.

#### Declaration of Generative AI and AI assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT to improve the readability and language of parts of the manuscript. After using this tool, the authors reviewed and edited the text as needed and take full responsibility for the content of the publication.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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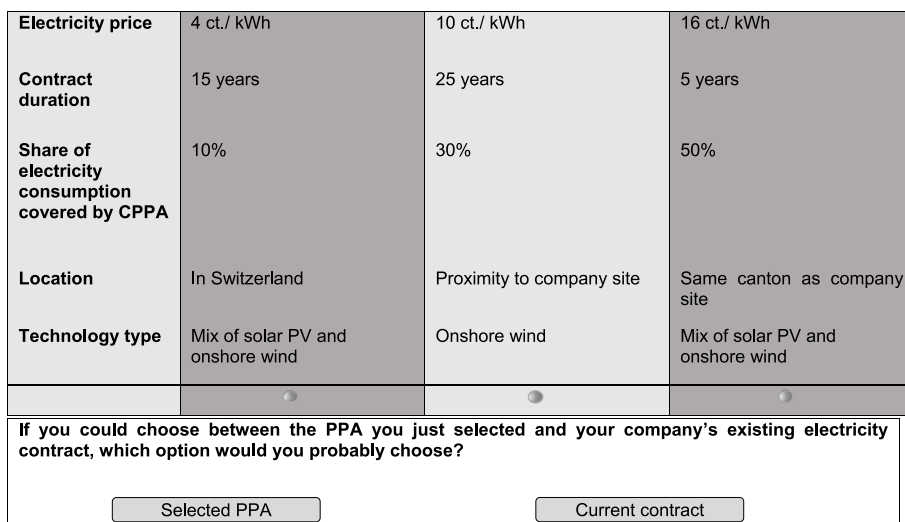


Fig. A.2. Example of a choice task in the choice experiment (authors' own illustration based on Sawtooth (2023)).

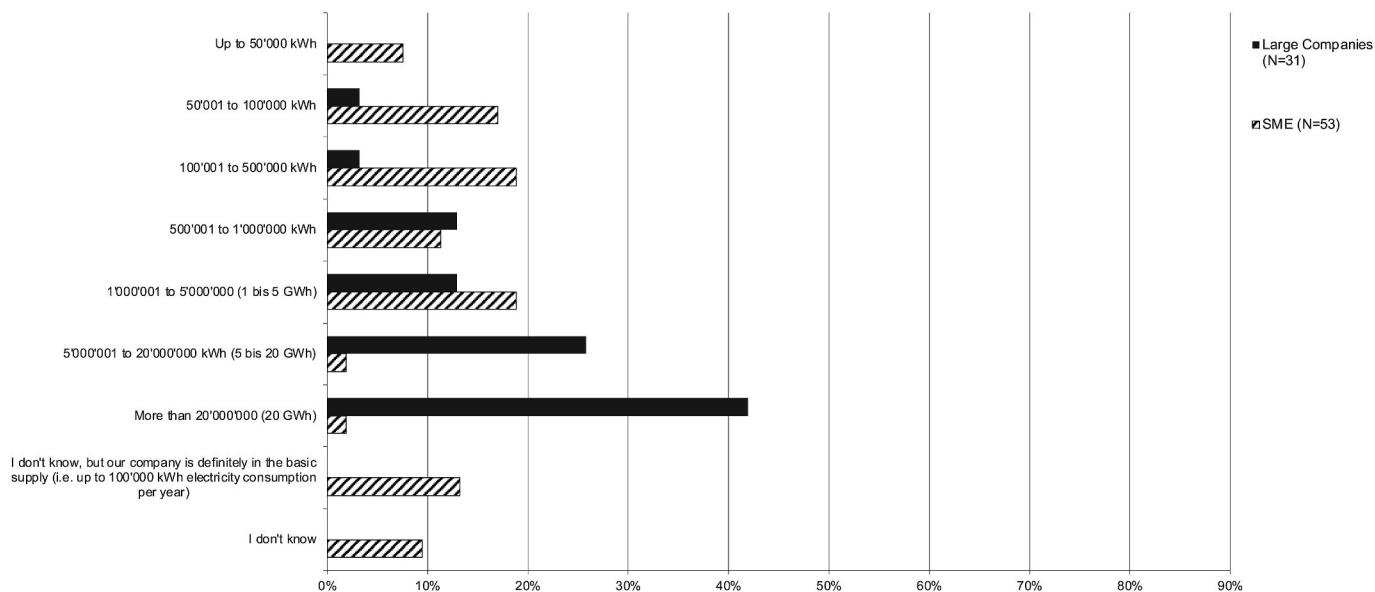


Fig. A.3. Annual electricity consumption of sample (N = 84).

Table A.1

Socio-demographic description of sample.

Variable name	Description	Large Companies (N = 31)	SMEs (N = 52)	Total (N = 83)	Switzerland (N = 574'258) <sup>1</sup>
Gender	Female	0%	14%	8%	
	Male	100%	84%	90%	
	Other	0%	2%	1%	
Age (years)	18–24	0%	4%	2%	
	25–34	10%	12%	13%	
	35–44	45%	23%	30%	
	45–54	14%	30%	24%	
	55–64	31%	25%	27%	
	65 or more	0%	6%	4%	
Work experience (years)	6–10	10%	15%	13%	
	11–15	14%	8%	11%	
	16–20	21%	19%	21%	
	21–25	14%	12%	12%	
	26 or more	41%	46%	43%	
Ability to influence energy procurement decision	Yes	90%	87%	88%	
	No	10%	13%	12%	

(continued on next page)

**Table A.1** (continued)

Variable name	Description	Large Companies (N = 31)	SMEs (N = 52)	Total (N = 83)	Switzerland (N = 574'258) <sup>a</sup>
Role	Managing position	86%	91%	89%	
	No managing position	14%	9%	11%	
Sector	Agriculture, forestry and fishing	0%	7%	4%	n.a. <sup>a</sup>
	Mining and quarrying	3%	0%	1%	n.a.
	Manufacturing, energy and water supply	23%	28%	26%	8%
	Construction	7%	7%	7%	9%
	Wholesale and retail trade; repair of motor vehicles	3%	7%	7%	13%
	Transportation and storage	3%	9%		2%
	Accommodation and food service activities	0%	2%		5%
	Information and communication	3%	4%		5%
	Financial and insurance activities	3%	4%		3%
	Real estate activities	0%	4%		8%
	Professional, scientific and technical activities & Administrative and support service activities	10%	8%		18%
	Public administration, defence & social security	3%	4%		n.a.
	Education	13%	2%		4%
	Human health and social work activities	26%	4%		13%
Arts, entertainment and recreation	0%	4%		4%	
Employees	Other service activities	3%	6%		8%
	1–9	0%	9%	6%	89% <sup>b</sup>
	10–49	0%	40%	25%	9%
	50–249	0%	51%	32%	2%
Region in Switzerland	250 or more	100%	0%	37%	0.3%
	Midland	28%	38%	29%	20% <sup>c</sup>
	Northwestern Switzerland	28%	19%	18%	12%
	Zurich	31%	15%	25%	18%
	Eastern Switzerland	10%	8%	11%	13%
	Central Switzerland	3%	19%	10%	11%
Lake Geneva Region	0%	13%	8%	19%	

<sup>a</sup> Number of active companies in Switzerland in 2021 (see note c).

<sup>b</sup> National distribution of active companies in Switzerland in 2021 in terms of sector (BFS, 2022).

<sup>c</sup> National distribution of active companies in Switzerland in 2021 in terms of size and region (BFS, 2023b).

**Table A.2**

Ecological considerations in electricity procurement (one answer possible).

To what extent does sustainability play a role in decisions about electricity procurement in your company (e.g., environmental aspects)?		
	Large companies (N = 31)	SMEs (N = 53)
very important	48%	40%
rather important	26%	38%
rather not important	16%	13%
not important	10%	9%

**Table A.3**

Sustainability strategy at companies (one response possible).

In the previous question, you stated that sustainability plays an important role in your company's electricity procurement. Does your company have a general sustainability strategy?		
	Large companies (N = 23)	SMEs (N = 41)
Yes, sustainability strategy in place	78%	44%
No, but it is planned in near future (within next 2 years)	13%	41%
No sustainability strategy in place, and not planned	9%	5%
I do not know	0%	10%

## Data availability

Data will be made available on request.

## References

- Allenby, G.M., Rossi, P.E., McCulloch, R.E., 2005. Hierarchical Bayes models: a practitioners guide. SSRN Electron. <https://doi.org/10.2139/ssrn.655541>.
- Axpo, 2019. Study on PPA market potential: demand increasing rapidly - betting on the right horse. Axpo [WWW Document]. <https://www.axpo.com/ch/en/about-us/magazine.detail.html/magazine/energy-market/betting-on-the-right-horse.html>. (Accessed 4 July 2023).

- Axpo, 2024. Strom: massgeschneiderte energielösungen. <https://www.axpo.com/ch/de/energie/energieloesungen/strom.html>. (Accessed 4 July 2024).
- Azarova, V., Cohen, J., Friedl, C., Reichl, J., 2019. Designing local renewable energy communities to increase social acceptance: evidence from a choice experiment in Austria, Germany, Italy, and Switzerland. Energy Pol. 132, 1176–1183. <https://doi.org/10.1016/j.enpol.2019.06.067>.
- Baringa, 2022. Commercial power purchase agreements. European Investment Bank. <https://advisory.eib.org/publications/attachments/commercial-power-purchase-agreements.pdf>.
- BFE, 2018. Energiestrategie 2050 nach dem Inkrafttreten des neuen Energiegesetzes. Bundesamt für Energie (BFE). <https://www.uvek.admin.ch/uvek/de/home/energie/energiestrategie-2050.html>. (Accessed 3 June 2023).

- BFE, 2020. Öffnung des Strommarktes. Bundesamt für Energie (BFE). <https://www.uvek.admin.ch/uevk/de/home/uevk/medien/medienmitteilungen.msg-id-78665.html>. (Accessed 20 June 2023).
- BFE, 2021. Energiestrategie 2050: monitoring-bericht 2021 (ausführliche fassung). Bundesamt für Energie (BFE). <https://pubdb.bfe.admin.ch/de/publication/download/10774>.
- BFS, 2022. Bestand Aktiver Unternehmen. Bundesamt für Statistik (BFS). <https://www.bfs.admin.ch/bfs/de/home/statistiken/industrie-dienstleistungen/unternehmen-beschaeftigte/unternehmensdemografie/bestand-aktiver.assetdetail.23705205.html>. (Accessed 22 April 2023).
- BFS, 2023a. Die 26 Kantone der Schweiz. Bundesamt für Statistik (BFS). <https://www.bfs.admin.ch/asset/de/453856>. (Accessed 15 September 2023).
- BFS, 2023b. Kleine und mittlere Unternehmen. Bundesamt für Statistik (BFS). <https://www.bfs.admin.ch/bfs/de/home/statistiken/industrie-dienstleistungen/unternehmen-beschaeftigte/wirtschaftsstruktur-unternehmen/kmu.html>. (Accessed 17 March 2023).
- Bjørn, A., Lloyd, S.M., Brander, M., Matthews, H.D., 2022. Renewable energy certificates threaten the integrity of corporate science-based targets. *Nat. Clim. Change* 12 (6), 539–546. <https://doi.org/10.1038/s41558-022-01379-5>.
- BKW, 2024. Langfristige stromvermarktung (PPA). <https://www.bkw.ch/de/energie/dienstleistungen-fuer-grosskunden-und-energieversorger/energievermarktung/direktvermarktung-erneuerbarer-energie/direktvermarktung-deutschland/langfristige-stromvermarktung-ppa>. (Accessed 5 July 2024).
- Blondiau, Y., Reuter, E., 2019. Why is the grass greener on the other side? Decision modes and location choice by wind energy investors. *J. Bus. Res.* 102, 44–55. <https://doi.org/10.1016/j.jbusres.2019.04.043>.
- BNEF, 2022. Corporate Clean Energy Buying Tops 30GW Mark in Record Year. Bloomberg New Energy Finance (BNEF). <https://about.bnef.com/blog/corporate-clean-energy-buying-tops-30gw-mark-in-record-year/>. (Accessed 21 December 2022).
- Botta, E., 2019. An experimental approach to climate finance: the impact of auction design and policy uncertainty on renewable energy equity costs in Europe. *Energy Pol.* 133, 110839. <https://doi.org/10.1016/j.enpol.2019.06.047>.
- Brander, M., Gillenwater, M., Ascuí, F., 2018. Creative accounting: a critical perspective on the market-based method for reporting purchased electricity (scope 2) emissions. *Energy Pol.* 112, 29–33. <https://doi.org/10.1016/j.enpol.2017.09.051>.
- Bruck, M., Sandborn, P., 2021. Pricing bundled renewable energy credits using a modified LCOE for power purchase agreements. *Renew. Energy* 170, 224–235. <https://doi.org/10.1016/j.renene.2021.01.127>.
- Bruck, M., Sandborn, P., Goudarzi, N., 2018. A leveled cost of energy (LCOE) model for wind farms that include power purchase agreements (PPAs). *Renew. Energy* 122, 131–139. <https://doi.org/10.1016/j.renene.2017.12.100>.
- Brüggemann, B., Polster, N., Vlodrop, A.v., 2022. Accelerate accounting for power purchase agreements. Deloitte [WWW Document]. <https://www2.deloitte.com/de/de/pages/energy-and-resources/articles/accounting-for-power-purchase-agreements-ppa.html>. (Accessed 5 April 2023).
- Brunnberg, D., Johnsen, J., 2019. Power purchase agreement: European outlook. Aquila Capital [White paper]. [https://www.aquila-capital.de/fileadmin/user\\_upload/PDF\\_Files/Whitepaper-Insights/2019-11-15\\_Whitepaper\\_PPA\\_EN.pdf](https://www.aquila-capital.de/fileadmin/user_upload/PDF_Files/Whitepaper-Insights/2019-11-15_Whitepaper_PPA_EN.pdf).
- Côté, E., Dukan, M., Pons-Seres de Brauer, C., Wüstenhagen, R., 2022. The price of actor diversity: measuring project developers' willingness to accept risks in renewable energy auctions. *Energy Pol.* 163, 112835. <https://doi.org/10.1016/j.enpol.2022.112835>.
- Côté, E., Pons-Seres de Brauer, C., 2023. Preferences of homeowners for heat-pump leasing: evidence from a choice experiment in France, Germany, and Switzerland. *Energy Pol.* 183, 113779. <https://doi.org/10.1016/j.enpol.2023.113779>.
- Côté, E., Salm, S., 2022. Risk-adjusted preferences of utility companies and institutional investors for battery storage and green hydrogen investment. *Energy Pol.* 163, 112821. <https://doi.org/10.1016/j.enpol.2022.112821>.
- Cousse, J., 2021. Still in love with solar energy? Installation size, affect, and the social acceptance of renewable energy technologies. *Renew. Sustain. Energy Rev.* 145, 111107. <https://doi.org/10.1016/j.rser.2021.111107>.
- Cousse, J., Wüstenhagen, R., Schneider, N., 2020. Mixed feelings on wind energy: affective imagery and local concern driving social acceptance in Switzerland. *Energy Res. Social Sci.* 70, 101676. <https://doi.org/10.1016/j.erss.2020.101676>.
- Crovini, C., 2022. Crisis management and risk management in SMEs: towards an integrated early warning system. In: Durst, S., Henschel, T. (Eds.), *Crisis Management for Small and Medium-Sized Enterprises (SMEs): Strategies for External Crises*. Springer International Publishing, pp. 215–233. [https://doi.org/10.1007/978-3-030-91727-2\\_13](https://doi.org/10.1007/978-3-030-91727-2_13).
- Dang, D., Bartosik, M., Kimmins, S., Heinrich, M., 2020. Risk mitigation for corporate renewable PPAs. RE-Source. <http://resource-platform.eu/news/risk-mitigation-for-corporate-renewable-ppas/>. (Accessed 28 November 2022).
- Diaz, D.H., Enkvist, P.-A., Murray, K., Piot, Pawlowski, Pinheiro, G., Weenink, T., 2023. How Energy Sourcing Can Help Industrials Manage Record-High Prices. McKinsey & Company. <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/how-energy-sourcing-can-help-industrials-manage-record-high-prices/#/>. (Accessed 8 June 2023).
- Dominy, P., Zubair, S., 2021. Pricing Structures for Corporate Renewable PPAs. World Business Council for Sustainable Development (WBCSD). <https://www.wbcsd.org/Programs/Climate-and-Energy/Energy/REscale/Resources/Pricing-structures-for-corporate-renewable-PPAs>.
- Douglas, B., Brindley, G., Labordena, M., Dunlop, S., 2020. Introduction to Corporate Sourcing of Renewable Electricity in Europe. RE-Source [WWW Document]. <https://resource-platform.eu/buyers-toolkit/>. (Accessed 2 June 2023).
- Dukan, M., Gumber, A., Egli, F., Steffen, B., 2023. The role of policies in reducing the cost of capital for offshore wind. *iScience* 26 (6), 106945. <https://doi.org/10.1016/j.isci.2023.106945>.
- EC, 2023. Commission proposes reform of the EU electricity market design to boost renewables, better protect consumers and enhance industrial competitiveness. European Commission (EU) [WWW Document]. [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_23\\_1591](https://ec.europa.eu/commission/presscorner/detail/en/IP_23_1591). (Accessed 21 October 2023).
- EDA, 2023. *Die erneuerbaren Energien*. Eidgenössisches Departement für auswärtige Angelegenheiten (EDA) [WWW Document]. <https://www.eda.admin.ch/aboutswitzerland/de/home/wirtschaft/energie/die-erneuerbaren-energien.html>. (Accessed 2 November 2023).
- EFET, 2019. *CPPA standard*. European federation of energy traders (EFET). <https://www.efet.org/home/documents?id=26>.
- Evans, D.S., 1987. The relationship between firm growth, size, and age: estimates for 100 manufacturing industries. *J. Ind. Econ.* 35 (4), 567–581. <https://doi.org/10.2307/2098588>.
- EY, 2023. ESG Reporting. Ernst and Young (EY). [https://www.ey.com/en\\_us/esg-reporting](https://www.ey.com/en_us/esg-reporting).
- Favaloro, G., Carey, B., Gerstel, D., 2016. Corporate renewable energy procurement survey insights. IPP Journal. In: <https://www.ippjournal.com/energy-finance-investments-report/corporate-renewable-energy-procurement-survey-insights-pwc>.
- Ford, N., 2023. Solar, wind builders back EU contract reforms if steered by nations. Reuters [WWW Document]. <https://www.reuters.com/business/energy/solar-wind-builders-back-eu-contract-reforms-if-steered-by-nations-2023-04-28/>. (Accessed 2 June 2023).
- Franke, A., 2023. *Interview: European PPA market could see record deals in 2023: Pexapark*. S&P Global commodity insights [WWW Document]. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/electric-power/030223-interview-european-ppa-market-could-see-record-deals-in-2023-pexapark>. (Accessed 14 June 2024).
- Freepick, 2023. *Icons*. Flaticon [WWW Document]. <https://www.flaticon.com/>. (Accessed 11 November 2023).
- Frondel, M., Ritter, N., Schmidt, C.M., Vance, C., 2010. Economic impacts from the promotion of renewable energy technologies: the German experience. *Energy Pol.* 38 (8), 4048–4056. <https://doi.org/10.1016/j.enpol.2010.03.029>.
- Gabrielli, P., Aboutalebi, R., Sansavini, G., 2022a. Mitigating financial risk of corporate power purchase agreements via portfolio optimization. *Energy Econ.* 109, 105980. <https://doi.org/10.1016/j.eneco.2022.105980>.
- Gabrielli, P., Hilsheimer, P., Sansavini, G., 2022b. Storage power purchase agreements to enable the deployment of energy storage in Europe. *iScience* 25 (8), 104701. <https://doi.org/10.1016/j.isci.2022.104701>.
- García-Álvarez, M.T., Cabeza-García, L., Soares, I., 2017. Analysis of the promotion of onshore wind energy in the EU: feed-in tariff or renewable portfolio standard? *Renew. Energy* 111, 256–264. <https://doi.org/10.1016/j.renene.2017.03.067>.
- García-Barberena, J., Monreal, A., Sánchez, M., 2014. The BEPE – break-Even Price of Energy: a financial figure of merit for renewable energy projects. *Renew. Energy* 71, 584–588. <https://doi.org/10.1016/j.renene.2014.06.022>.
- Ghiassi-Farrokhi, Y., Ketter, W., Collins, J., 2021. Making green power purchase agreements more predictable and reliable for companies. *Decis. Support Syst.* 144, 113514. <https://doi.org/10.1016/j.dss.2021.113514>.
- Hancock, E., 2021. Power price volatility driving demand for shorter, more sophisticated PPAs. PV Tech [WWW Document]. <https://www.pv-tech.org/brevity-sophistication-and-novelty-drive-european-ppa-market/>. (Accessed 25 July 2023).
- Handfield, R.B., 2000. Cost analysis, for purchase negotiation. In: Swamidass, P.M. (Ed.), *Encyclopedia of Production and Manufacturing Management*. Springer US, pp. 126–132. [https://doi.org/10.1007/1-4020-0612-8\\_181](https://doi.org/10.1007/1-4020-0612-8_181).
- Harada, L.-N., Coussi, M., 2020. Power Purchase Agreements: an emerging tool at the centre of the European energy transition a focus on France. *Eur. Environ. Law Rev.* 195–205. <https://doi.org/10.54648/eeur2020043>.
- Heeter, J.S., Cook, J.J., Bird, L.A., 2017. *Charting the Emergence of Corporate Procurement of Utility-Scale PV* (No. NREL/TP-6A20-69080). National Renewable Energy Lab.(NREL).
- Herrmann, A., Heitmann, M., Morgan, R., Henneberg, S.C., Landwehr, J., 2009. Consumer decision making and variety of offerings: the effect of attribute alignability. *Psychol. Market.* 26 (4), 333–358. <https://doi.org/10.1002/mar.20276>.
- Hille, S.L., Curtius, H.C., Wüstenhagen, R., 2018. Red is the new blue – the role of color, building integration and country-of-origin in homeowners' preferences for residential photovoltaics. *Energy Build.* 162, 21–31. <https://doi.org/10.1016/j.enbuild.2017.11.070>.
- Holmes, T.P., Adamowicz, W.L., Carlsson, F., 2017. Choice experiments. In: Champ, P., Boyle, K., Brown, T. (Eds.), *A Primer on Nonmarket Valuation. The Economics of Non-market Goods and Resources*, vol. 13. Springer, Dordrecht. [https://doi.org/10.1007/978-94-007-7104-8\\_5](https://doi.org/10.1007/978-94-007-7104-8_5).
- IEA, 2021. Renewables 2021. International Energy Agency (IEA). <https://www.iea.org/reports/renewables-2021>.
- IEA, 2023. Renewable Energy Market Update: Outlook for 2023 and 2024. International Energy Agency (IEA). <https://build-up.ec.europa.eu/en/resources-and-tools/publications/iea-renewable-energy-market-update-outlook-2023-and-2024-published>.
- IRENA, 2018. Corporate Sourcing of Renewables: Market and Industry Trends. International Renewable Energy Agency (IRENA). [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA\\_Corporate\\_sourcing\\_2018.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf).
- IRENA, 2023. World Energy Transitions Outlook 2023: 1.5°C Pathway. International Renewable Energy Agency (IRENA). [https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2023/Jun/IRENA\\_World\\_energy\\_transitions\\_outlook\\_v1\\_2023.pdf?rev=b1d4be858ad549a9a750921d0f2b5d53](https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2023/Jun/IRENA_World_energy_transitions_outlook_v1_2023.pdf?rev=b1d4be858ad549a9a750921d0f2b5d53).

- Iskandarova, M., Dembek, A., Fraaije, M., Matthews, W., Stasik, A., Wittmayer, J.M., Sovacool, B.K., 2021. Who finances renewable energy in Europe? Examining temporality, authority and contestation in solar and wind subsidies in Poland, The Netherlands and the United Kingdom. *Energy Strategy Rev.* <https://doi.org/10.1016/j.esr.2021.100730>.
- Jain, S., 2022. Exploring structures of power purchase agreements towards supplying 24x7 variable renewable electricity. *Energy* 244, 122609. <https://doi.org/10.1016/j.energy.2021.122609>.
- Kanellakopoulou, M., 2021. Corporate power purchase agreement: how is it priced? Pexapark [WWW Document]. <https://pexapark.com/blog/corporate-power-purchase-agreement-how-is-it-priced/>. (Accessed 8 June 2023).
- Kanellakopoulou, M., 2023. A data-driven preview of 2023's PPA landscape. Pexapark [WWW Document]. <https://quote.pexapark.com/#/ppa-times/16>. (Accessed 8 November 2023).
- Karneyeva, Y., Wüstenhagen, R., 2017. Solar feed-in tariffs in a post-grid parity world: the role of risk, investor diversity and business models. *Energy Pol.* 106, 445–456. <https://doi.org/10.1016/j.enpol.2017.04.005>.
- Kobus, J., Nasrallah, A.I., Guidera, A.J., 2021. The role of corporate renewable power purchase agreements in supporting us wind and solar deployment. Center on Global Energy Policy. <https://www.energypolicy.columbia.edu/publications/role-corporate-renewable-power-purchase-agreements-supporting-us-wind-and-solar-deployment>.
- KPMG, 2022. Key global trends in sustainability reporting. KPMG [WWW Document]. <https://kpmg.com/dk/en/home/insights/2022/10/key-global-trends-in-sustainability-reporting.html>. (Accessed 13 July 2023).
- Kremser, M., 2022. How to improve your survey data quality. Sawtooth [WWW Document]. <https://sawtoothsoftware.com/resources/blog/posts/Improve-Survey-Data-Quality-With-Root-Likelihood>. (Accessed 8 November 2023).
- Kubli, M., Loock, M., Wüstenhagen, R., 2018. The flexible prosumer: measuring the willingness to co-create distributed flexibility. *Energy Pol.* 114, 540–548. <https://doi.org/10.1016/j.enpol.2017.12.044>.
- Ladner, A., 2019. Society, government, and the political system. In: Ladner, A., Soguel, N., Emery, Y., Weerts, S., Nahrath, S. (Eds.), *Swiss Public Administration: Making the State Work Successfully*. Springer International Publishing, pp. 3–20. [https://doi.org/10.1007/978-3-319-92381-9\\_1](https://doi.org/10.1007/978-3-319-92381-9_1).
- Lancaster, K.J., 1966. A new approach to consumer theory. *J. Polit. Econ.* 74 (2), 132–157. <https://doi.org/10.1086/259131>.
- Manski, C.F., 1977. The structure of random utility models. *Theor. Decis.* 8 (3), 229–254. <https://doi.org/10.1007/BF00133443>.
- Mendicino, L., Menniti, D., Pinnarelli, A., Sorrentino, N., 2019. Corporate power purchase agreement: formulation of the related levelized cost of energy and its application to a real life case study. *Appl. Energy* 253, 113577. <https://doi.org/10.1016/j.apenergy.2019.113577>.
- Merckx, G., Chaturvedi, A., 2020. Short vs. long-term procurement contracts when supplier can invest in cost reduction. *Int. J. Prod. Econ.* 227, 107652. <https://doi.org/10.1016/j.ijpe.2020.107652>.
- Mihailova, D., Schubert, I., Martinez-Cruz, A.L., Hearn, A.X., Sohre, A., 2022. Preferences for configurations of Positive Energy Districts – insights from a discrete choice experiment on Swiss households. *Energy Pol.* 163, 112824. <https://doi.org/10.1016/j.enpol.2022.112824>.
- Miller, G., 2020. Beyond 100 % renewable: policy and practical pathways to 24/7 renewable energy procurement. *Electr. J.* 33 (2), 106695. <https://doi.org/10.1016/j.ej.2019.106695>.
- Miller, L., Carrievau, R., 2021. Corporate renewable energy procurement: comparison of the market in Canada versus the U.S. To enable CPPAs in Canada. In: Ting, D.S.K., Vassel-Be-Hagh, A. (Eds.), *Sustaining Tomorrow*. Springer Proceedings in Energy. Springer, Cham. [https://doi.org/10.1007/978-3-030-64715-5\\_6](https://doi.org/10.1007/978-3-030-64715-5_6).
- Miller, L., Carrievau, R., Harper, S., Singh, S., 2017. Evaluating the link between LCOE and PPA elements and structure for wind energy. *Energy Strategy Rev.* <https://doi.org/10.1016/j.esr.2017.02.006>.
- Neuhoff, K., Ballesteros, F., Kröger, M., Richstein, J.C., 2023. Contracting matters: hedging producers and consumers with a renewable energy pool. DIW Berlin Discussion Paper No. 2035. <https://doi.org/10.2139/ssrn.4391536>.
- Nicolas, T., 2022. Short-term financial constraints and SMEs' investment decision: evidence from the working capital channel. *Small Bus. Econ.* 58 (4), 1885–1914. <https://doi.org/10.1007/s11187-021-00488-3>.
- Niklaus, A., 2023. What is a PPA? The guide to power purchase agreement. Pexapark [WWW Document]. <https://pexapark.com/solar-power-purchase-agreement-ppa/>. (Accessed 7 June 2023).
- O'Shaughnessy, E., Heeter, J., Shah, C., Koeblich, S., 2021. Corporate acceleration of the renewable energy transition and implications for electric grids. *Renew. Sustain. Energy Rev.* 146, 111160. <https://doi.org/10.1016/j.rser.2021.111160>.
- Petrovich, B., Carattini, S., Wüstenhagen, R., 2021. The price of risk in residential solar investments. *Ecol. Econ.* 180, 106856. <https://doi.org/10.1016/j.ecolecon.2020.106856>.
- Pexapark, 2023a. European PPA market outlook 2023. Pexapark. <https://pexapark.com/european-ppa-market/>.
- Pexapark, 2023b. Pexa euro composite. Pexapark [WWW Document]. <https://quote.pexapark.com/#/market-view/ppa-trends/1>. (Accessed 4 April 2023).
- Polzin, F., Migendt, M., Täube, F.A., von Flotow, P., 2015. Public policy influence on renewable energy investments—a panel data study across OECD countries. *Energy Pol.* 80, 98–111. <https://doi.org/10.1016/j.enpol.2015.01.026>.
- RE-Source Southeast Hub, 2023. *What are PPAs?* RE-Source Southeast Hub [WWW Document]. <https://resource-southeast.eu/what-is-ppa/>. (Accessed 9 November 2023).
- Rao, V.R., 2014. *Applied Conjoint Analysis*. Springer Berlin Heidelberg, Berlin, Heidelberg. <https://doi.org/10.1007/978-3-540-87753-0>.
- Recessary, 2022. Spain calls on EU to provide financial guarantees for long-term PPA. Reccessary [WWW Document]. <https://www.recessary.com/en/news/announcement/Spain-calls-on-EU-to-provide-financial-guarantees-for-long-term-PPA>. (Accessed 15 November 2023).
- Rosser, S., Schwer, P., Müller, M., Kupfahl, A., 2020. Investitions- und Planungsbeiträge für Windenergieanlagen. Bundesamt für Energie (BFE) [WWW Document]. <https://www.bfe.admin.ch/bfe/de/home/versorgung/erneuerbare-energien/windenergie.html>. (Accessed 10 October 2023).
- Ruokamo, E., 2016. Household preferences of hybrid home heating systems – a choice experiment application. *Energy Pol.* 95, 224–237. <https://doi.org/10.1016/j.enpol.2016.04.017>.
- Salm, S., Hille, S.L., Wüstenhagen, R., 2016. What are retail investors' risk-return preferences towards renewable energy projects? A choice experiment in Germany. *Energy Pol.* 97, 310–320. <https://doi.org/10.1016/j.enpol.2016.07.042>.
- Salm, S., Wüstenhagen, R., 2018. Dream team or strange bedfellows? Complementarities and differences between incumbent energy companies and institutional investors in Swiss hydropower. *Energy Pol.* 121, 476–487. <https://doi.org/10.1016/j.enpol.2018.04.046>.
- Sawtooth, 2023. *Glossary of terms*. Sawtooth [WWW Document]. <https://sawtoothsoftware.com/resources/knowledge-base/general-issues/glossary-of-terms>. (Accessed 6 October 2023).
- Sendstad, L.H., Hagspiel, V., Mikkelsen, W.J., Ravndal, R., Tveit, M., 2022. The impact of subsidy retraction on European renewable energy investments. *Energy Pol.* <https://doi.org/10.1016/j.enpol.2021.112675>.
- Tang, C., Zhang, F., 2019. Classification, principle and pricing manner of renewable power purchase agreement. *IOP Conf. Ser. Earth Environ. Sci.* 295, 052054. <https://doi.org/10.1088/1755-1315/295/5/052054>.
- Taglia, C.D., Sommer, S., Chalimourda, A., Madonna, E., Doytchinov, S., 2022. *Energieverbrauch in der Industrie und im Dienstleistungssektor: Resultate 2021*. <https://pubdb.bfe.admin.ch/de/publication/download/11220>.
- Tranberg, B., Hansen, R.T., Catania, L., 2020. Managing volumetric risk of long-term power purchase agreements. *Energy Econ.* 85, 104567. <https://doi.org/10.1016/j.eneco.2019.104567>.
- Trivella, A., 2018. *Decision Making under Uncertainty in Sustainable Energy Operations and Investments*. Technical University of Denmark [WWW Document]. <https://findit.dtu.dk/en/catalog/5bdc82a8d9001d01db30b201>. (Accessed 28 April 2023).
- Vattenfall, 2024. Green corporate PPAs. <https://energysales.vattenfall.de/en/renewables/green-corporate-ppas>. (Accessed 4 July 2024).
- Vermoesen, V., Deloof, M., Laveren, E., 2013. Long-term debt maturity and financing constraints of SMEs during the Global Financial Crisis. *Small Bus. Econ.* 41 (2), 433–448. <https://doi.org/10.1007/s11187-012-9435-y>.
- Vuichard, P., Broughel, A., Wüstenhagen, R., Tabi, A., Knauf, J., 2022. Keep it local and bird-friendly: exploring the social acceptance of wind energy in Switzerland, Estonia, and Ukraine. *Energy Res. Social Sci.* 88, 102508. <https://doi.org/10.1016/j.erss.2022.102508>.
- WBCSD, 2018. *Innovation in power purchase agreement structures*. World Business Council for Sustainable Development (WBCSD). <https://www.wbcsd.org/Programs/Climate-and-Energy/Energy/REscale/Resources/Innovation-in-Power-Purchase-Agreement-Structures>.
- Wimmers, A., Madlener, R., 2020. The European market for guarantees of origin for green electricity: a scenario-based evaluation of trading under uncertainty. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3830442>.
- Wissen Hayek, U., Spielhofer, R., Salak, B., Hunziker, M., Kienast, F., Thrash, T., Schinazi, V.R., Luthe, T., Steiger, U., Grêt-Regamey, A., 2019. *ENERGYSCAPE – Recommendations for a Landscape Strategy for Renewable Energy Systems*. <https://www.aramis.admin.ch/Default.aspx?DocumentID=50875&Load=true>.
- Wüstenhagen, R., Wolsink, M., Bürer, M.J., 2007. Social acceptance of renewable energy innovation: an introduction to the concept. *Energy Pol.* 35 (5), 2683–2691. <https://doi.org/10.1016/j.enpol.2006.12.001>.
- Yang, H., Xu, S., Gao, W., Wang, Y., Li, Y., Wei, X., 2024. Mitigating long-term financial risk for large customers via a hybrid procurement strategy considering power purchase agreements. *Energy* 295, 131038. <https://doi.org/10.1016/j.energy.2024.131038>.
- Zachmann, G., Hirth, L., Heussaff, C., Schlecht, I., Mühlenpfordt, J., Eicke, A., 2023. The design of the European electricity market. European Parliament. [https://www.europarl.europa.eu/RegData/etudes/STUD/2023/740094/IPOL\\_STU%282023%29740094\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/740094/IPOL_STU%282023%29740094_EN.pdf).