



OCTOBER 2021

A Timely Match

Accelerating power system decarbonisation by moving towards 24/7 matching in corporate renewable electricity (RES-E) sourcing and market integration

Task Force on moving towards 24/7 matching in corporate renewable electricity (RES-E) sourcing

Task Force Members include:



Disclaimer:

This white paper is not a position paper and does not contain policy recommendations. The aims of the white paper are limited to exploring and raising awareness of the 24/7 RES-E matching topic, mapping out potential advantages, disadvantages and barriers and proposing areas for further investigation and analysis. Any move towards 24/7 matching must be voluntary and be seen as an optional enhancement, or addition to, existing sourcing strategies and not a replacement or competing framework.

Further detailed analysis is required to identify any potential unforeseen consequences before positions or wide-scale actions are taken.

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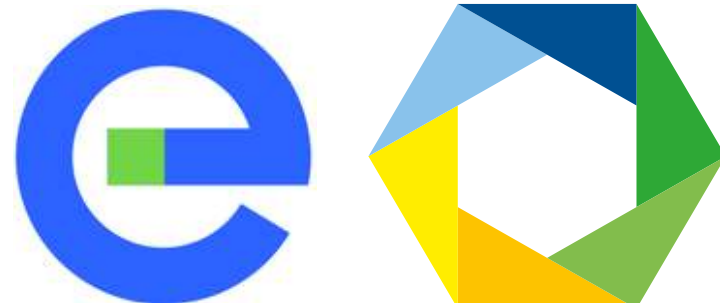
Objectives of the Task Force:

1. Boost the decarbonisation potential of corporate RES-E purchasing through innovative solutions
2. Facilitate increased transparency and level of detail (granularity) of RES-E sourcing
3. Maximise the impact on broader electricity sector decarbonisation
4. Do not undermine current corporate sourcing efforts.

Scope of the Task Force:

- Focus on RES-E procurement (not carbon-free)
- Focus on electricity (not energy/hydrogen)
- Focus on Europe (not global)
- Focus on businesses (not all consumers)
- Focus on increasing granularity towards 24/7 matching to align with the shortest time period for electricity trading in local electricity markets (rather than specifying daily or hourly matching).

For more information on the Task Force and details of the case studies, please visit: <https://247res.eurelectric.org/>



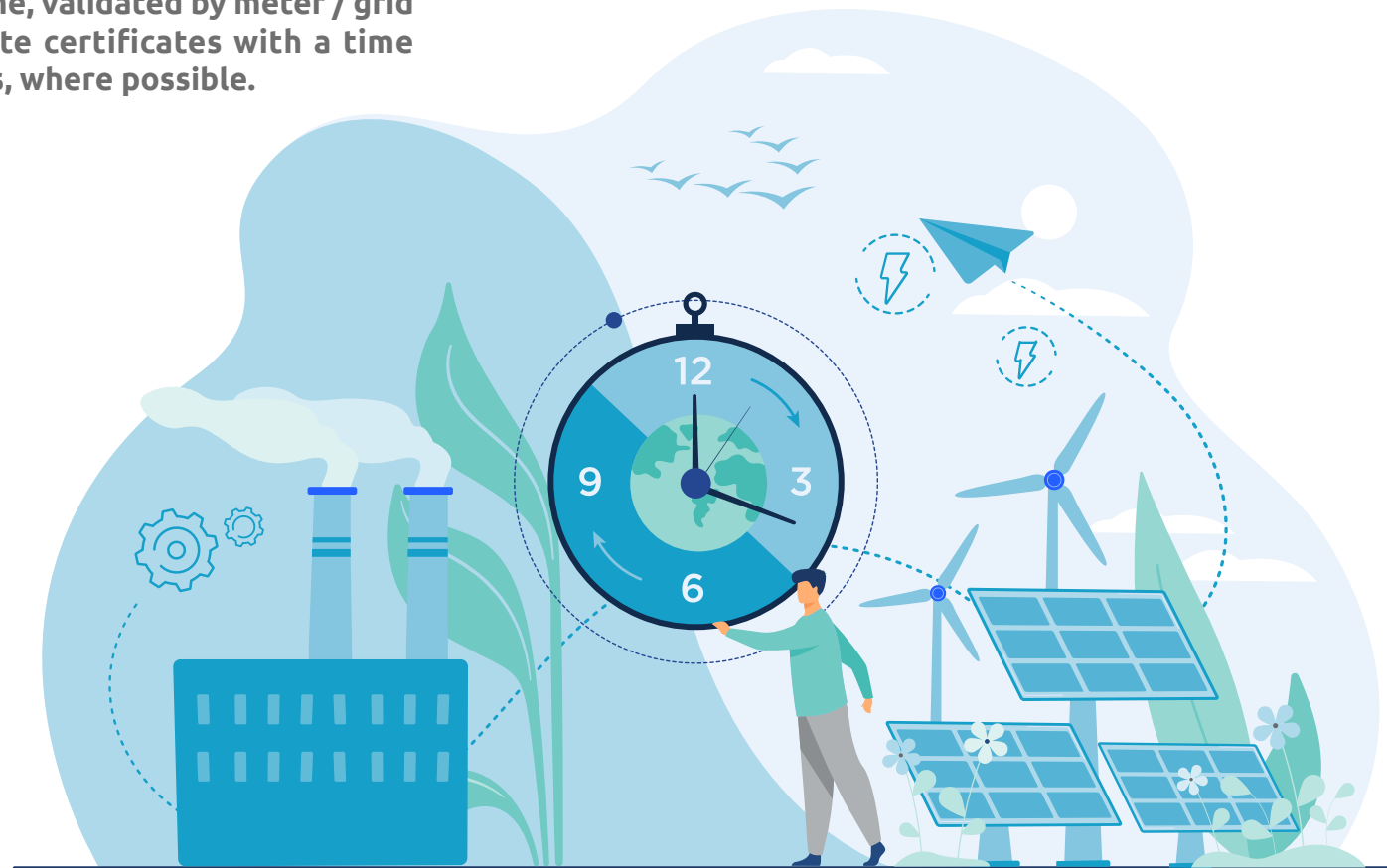
PROPOSED CONCEPT	5
EXECUTIVE SUMMARY	6
BUILDING BLOCKS	9
1. Flexibility	10
2. Data for 24/7 Matching	12
3. Measurement, Metrics and Certificates	14
CASE STUDIES	19
1. A 24/7 demonstration project in Norway	20
2. Achieving 100% renewable energy with 24/7 monitoring in Microsoft Sweden	21
3. Google and AES partner with world-leading 24/7 carbon-free energy solution	22
4. Mercedes-Benz producing cars with 100% renewable energy 100% of the time	23
5. A 24/7 corporate PPA in the Netherlands	24
6. Supplying real time electricity data to enable 24/7 carbon-free energy by 2030.....	25
7. Enabling 24/7 carbon-free energy solutions	26

Contents

Proposed Concept

The core concept of 24/7 RES-E sourcing is:

Matching a given volume of electricity demand with an equivalent volume of RES-E that is generated (injected) at the same time, validated by meter / grid data and energy attribute certificates with a time stamp of one hour or less, where possible.



Executive Summary

Renewable electricity (RES-E) is core to corporate decarbonisation strategies. An increasing number of companies are setting targets to buy 100% of their electricity from renewable sources.¹ Some companies are on their way to meeting or have already met their total electricity consumption with renewables on an average annual basis through a combination of power purchase agreements (PPAs) bundled with Guarantees of Origin (GOs), on-site generation (behind-the-meter), and unbundled GO purchases.

In addition to extending actions to their supply chain and customers, some companies are now revising their ambitions upward, aiming to maximise the impact of their energy procurement strategies on grid decarbonisation by matching their demand with clean electricity supply where and when it is needed. Several companies are seeking to match their demand with clean electricity production on at least an hourly basis, 24/7. Corporate buyers and utilities are taking different approaches to these more granular energy matching strategies, drawing on different portfolios of technologies, transaction criteria, and deal structures.

The potential benefits of moving towards 24/7 matching are:

- Increasing transparency of corporate sustainability claims and potential granularity of carbon accounting
- Increasing renewable energy investment
- Accelerating electricity decarbonisation by supporting the development of renewable energy assets to better reflect when and where RES-E generation is most needed
- Facilitating new business models and innovative technologies
- More closely aligning markets with the physics and economics of the grid and the variability of supply and demand.

The scope of this paper is limited to considering 24/7 matching strategies focused on procurement of renewable energy. The sourcing of 24/7 RES-E sits within a broader family of granular energy sourcing strategies known as 24/7 carbon-free energy, for which several companies and public sector consumers have already set goals.

Enabling greater adoption of 24/7 matching in a timely and cost-effective manner calls for rethinking the interdependencies between certificate schemes and electricity markets, products, and grid planning. This will entail digital solutions, demand-side response (DSR), flexibility procurement mechanisms, renewable production, storage, trading systems, carbon accounting, auditing and more.

At the same time, corporates will need to be able to monitor and certify their 24/7 RES-E matching. All solutions should be voluntary, be compatible with, and not undermine existing schemes, e.g. GOs. Any solutions should ideally be harmonised across European and other electricity markets, and be in line with laws and regulations.

The 24/7 RES-E Task Force, including more than 60 large energy consumers, producers, TSOs, DSOs, and related stakeholders, is working to identify what steps are required to move towards a more granular accounting of renewable energy on a timeframe of one hour or less. Several “building blocks” are needed for this enhanced procurement strategy. This paper will focus on three that have been identified as key in the short term: 1. Flexibility, 2. Data for 24/7 matching and 3. Measurement, metrics and certificates.

¹ <https://www.there100.org/>

Summary of main proposals

- Optimise flexibility within each segment of the market: 1) Pair renewable energy with flexible assets to avoid congestion and shift energy to when it is needed through building more storage; 2) develop bundled procurement solutions via more friendly market and regulatory constructs, and 3) improve cooperation between transmission system operators (TSO), distribution system operators (DSO), and flexibility providers.
- Accelerate grid digitalisation and metering data access, alongside a framework to ensure all interested parties can access data with at least hourly granularity in a standardised format and as soon as possible after physical energy flow.
- Harmonise the GO scheme across Internal Energy Market countries to provide a clear and unambiguous foundation for voluntary 24/7 matching schemes and to facilitate the development of liquid markets.
- Update existing rules so that GOs are time-stamped.
- Retain the volumetric measure of a GO as 1 MWh and consider the implication of splitting or combining GOs to reflect the required volume of consumption for a given period of time.
- Investigate carbon reporting frameworks, which may need to be updated to support 24/7 matching, keeping in mind that thorough analysis needs to be carried out to avoid potential unforeseen consequences.
- There are potential benefits to limiting 24/7 matching to generation and demand located in the same region, country or bidding zone/balancing authority. However, consideration should be given to ensuring market liquidity for 24/7 certificates, as this can be maximised by facilitating matching over wider geographical regions. This issue needs further detailed analysis and discussion to avoid any unforeseen consequences.



Building blocks



The path to 24/7 RES-E matching will require several “building blocks” to develop this enhanced procurement strategy, including technology (existing and new), data (grid data, metering data, forecast data), transactions (PPAs, new 24/7 products) metrics, certification (GOs), GHG accounting, and policy and market developments. The Task Force has shortlisted three building blocks, where gaps were identified: 1. flexibility, 2. Data for 24/7 matching and 3. Measurement, metrics and certificates.

1. Flexibility

System enablers

Adapting the electricity system is a necessary, yet challenging, task to achieve the required reductions in carbon emissions. While all actors in the system are required for this change, there are different approaches to the design and cost allocation of this 24/7 transition. System operators will continue to source the flexible resources needed to maintain balance on the grid, redistributing these costs via appropriate TSO and DSO tariffs. By taking action to ensure their own supply-demand match, 24/7 minded buyers can support system operators by using their corporate procurement strategies to bring new flexible resources onto the grid.

In this white paper, we look at the range of possibilities and assume that all actors — buyers, corporations, suppliers, TSOs, DSOs and other market participants — are key to this transition.

At the system level, there are several enablers to support the role of flexibility in the transition towards fully decarbonised power systems:

- **Technology:** Reduce levelised cost of electricity (LCOE) on RES-E, storage and traceability systems
- **Finance:** Ensure level playing field across all power technologies, including removal of fossil fuel subsidies, and continued support for RES-E and storage when necessary
- **Regulation:** Consider RES-E and storage concerns, including GO framework, removal of interconnection and permitting barriers for RES-E
- **Markets:** Long-term transmission rights (LTTR) or equivalent hedging instruments, hourly GO market and capacity market mechanism to include RES. LTTR need more detailed analysis and discussion to avoid potential unforeseen consequences.

Key areas to analyse

When looking to improve the temporal and spatial alignment of renewable generation with buyers' loads (called flexibility herein), we can consider five different areas in the value chain:

- **Generation:** Produce more renewable power at the most beneficial time and location
- **Consumption:** Consume less power and, where possible, manage power consumption to be at a compatible time and location
- **Storage:** Use electricity storage to time-shift RES-E when generation and consumption are not synchronised, or there is temporary distribution congestion, whether through batteries or longer-term solutions such as pumped hydro and thermal energy storage or Power-to-X (where electricity is converted into another form of energy)
- **Transmission and distribution:** Delivering generation to consumption requires transmission capacity and congestion management with greater cooperation between transmission and distribution systems
- **Cross-segment aspects:** Develop bundled solutions (e.g. PPAs for RES-E plus storage and DSR) with appropriate markets and price signals.

Products and services across the five areas

Area	Products and services
Generation	<ul style="list-style-type: none"> Facilitated development of renewable energy, e.g. improved permitting and interconnection processes for wind and solar Conversion of existing fossil fuel burning thermal to RES-E through green fuels Increased flexibility of variable RES-E, e.g. coupling with batteries and PV panels positioning Corporate PPAs, e.g. on-site, off-site physical and virtual PPAs Development of dispatchable RES-E, e.g. hydropower, sustainable biofuels and green hydrogen fuel cells
Consumption	<ul style="list-style-type: none"> Solutions to increase energy efficiency Static or dynamic load shifting (on-site flexibility) Spatial load shifting (cross-site flexibility) RES-E sourcing, firming and shaping
Storage	<ul style="list-style-type: none"> New and repowered batteries, power to gas to power, hydro pumped storage Operation of storage with 24/7 incentive (in addition to commodity prices and ancillary services incentives)
Transmission and distribution	<ul style="list-style-type: none"> Short term and long-term cross-border transmission rights or equivalent hedging instruments TSO and DSO coordination Non-frequency ancillary services (inter alia: voltage control) local congestion management services, and grid capacity management services Other grid products/system services
Cross-segment aspects	<ul style="list-style-type: none"> Combined procurement solutions (PPAs for RES-E plus storage and DSR) Interoperability to allow for flexibility and efficient operation across different market segments

A path for the buyer

Many companies purchasing renewable power also see themselves as key actors in the transition. A buyer looking to orient its procurement to follow the 24/7 approach would:

1. Work towards efficiency in its electricity consumption

2. Procure electricity and GOs from a variety of RES-E assets

3. Procure storage

4. Dynamically orchestrate "generation + storage + transmission + DSR"

5. Promote the benefits of RES-E among its customers.

2. Data for 24/7 matching

Fragmented data access

Access to metering data is a fundamental need for companies wanting to get started on the 24/7 RES-E journey. For the purposes of this white paper, metering data will be defined as electricity production and consumption settlement metering data.

Metering data is essential for companies to make informed decisions around 24/7 RES-E. As the adage goes: “If you can’t measure it, you can’t manage it.” Transparent, accessible metering data (i.e. with limited or no additional investment in hardware devices or complex interfaces for consumers) will accelerate the uptake of 24/7 RES-E by providing the data points needed to plan, purchase, adapt, match, certify and report RES-E production and consumption on an hourly basis.

With the wide-scale deployment of smart meters in Europe mandated by the Electricity Directive (2019/944/EC), several countries are starting to implement solutions to offer access to metering data. However, the systems and processes being adopted present several barriers, are unharmonised across borders, and, in some cases, they are poorly documented.

Europe’s high rate of smart-meter roll-out, along with data exchange infrastructures already existing or planned before 2024, makes it a world leader in metered data exchange according to a FlexiDAO white paper.² At the same time, service providers still experience several barriers that make the data consent and sharing process quite cumbersome, reducing the efficiency of market party communication.

The most common and recurring barriers are:

- Administrative: lack of legally appointed responsible parties and unified access points, lack of authorisation processes to grant third-party access, without having the VAT number or national ID of the country, no official documentation of the process

- Technical barriers: lack of availability of metered data through a digital data interface (i.e. API), lack of data standards for the energy sector to optimise interoperability, and differences in security and compliance requirements
- Information barriers: some businesses are still not aware that they can access their electricity consumption without having any device or hardware.

Entitled by Articles 20, 23 and 24 of the Directive (EU) 2019/944, the European Commission is already working together with DSOs, TSOs and many other stakeholders to adopt Implementing Acts in order to specify interoperability requirements and non-discriminatory and transparent procedures for access to data based upon existing national practices. The first act to be expected at the beginning of 2022 will enact a consistent European approach to data interoperability across different use cases, meaning that it will establish the principles for metering and consumption data, followed by implementing acts on data needed for customer switching, demand response and — more broadly — other services.

Key areas to analyse

A fundamental need is for regulated and non-discriminatory access to metering data through transparent, secure and digital consent mechanisms. These systems should be harmonised, and ultimately standardised, across Europe to allow market participants to share their metering data with any secure and trusted service provider they wish.

All metering data would need to have at least hourly granularity to support hourly matching of electricity production and consumption, be available as soon as possible after physical energy flow (a maximum of one month after physical energy flow) and without geographical limitations within Europe. Hourly matching will be a journey from the current annual matching periods used in most European countries, but hourly metering data must be available and accessible now to support this transition.

² “Mapping metering data access in Europe” describes the current status of hourly metering data access in Europe from the point of view of the end-users – data owners (i.e. consumers/producers) and service providers

Relevant data for 24/7 CO₂ accounting

This guide highlights the acceleration of the decarbonisation of corporate electricity buyers as the prime driver and benefit of adopting 24/7 RES-E. As we look to 2030 and beyond, more data points will become useful and necessary for companies to achieve their 24/7 matching and broader decarbonisation goals. Some of the challenges are highlighted in a section below on volumetric accounting.

Buyers should be able to access data enabling them to accurately calculate CO₂ emissions based on their consumption location, assess new long-term procurement deals based on the estimated impact in CO₂ reduction in a specific region, and shift their electricity consumption based on the forecasted grid-mix carbon content, among other functions.

Other data points that may become increasingly relevant to achieve this are:

- Hourly grid mix (total production volume of regions/countries, grid imports and grid exports (already available on ENTSO-E transparency platform³)
- Hourly grid residual mix – not currently available/may never be available
- Historical marginal emissions – available in certain circumstances
- Forecasted grid mix – available in certain circumstances
- Forecasted marginal emissions – available in certain circumstances

REsurety's and Brattle Group's white paper⁴ describes one potential solution that accounts for avoided emissions from power and focuses on the carbon abatement of renewables depending on the timing and location of the clean energy projects. In addition, their new locational marginal emissions calculation technology provides information on the carbon abatement value of renewable projects that could facilitate corporate buyers to focus on sourcing renewable energy from projects with the largest grid decarbonisation impact, in line with the time and location of the carbon emissions from their consumption.



3 <https://transparency.entsoe.eu/>

4 <https://resurety.com/wp-content/uploads/2021/05/REsurety-Locational-Marginal-Emissions-A-Force-Multiplier-for-the-Carbon-Impact-of-Clean-Energy-Programs.pdf>

3. Measurement, Metrics and Certificates

Embracing a harmonised scheme for energy certificates and reporting frameworks

Businesses aiming for reliable 24/7 matching are committed to achieving emissions reductions, and are seeking additional methodologies and new metrics to measure their efforts. The harmonisation of such methodologies and metrics can support companies in their efforts to report on their 24/7 RES-E matching progress. In this section we do not describe a standard definition of 24/7 matching, but an approach that we believe can help companies move towards 24/7 matching, where possible and appropriate.

Market boundaries: European rule books

An overarching and consistent scheme of Energy Attribute Certificates (EAC) is essential for the development of 24/7 eligible certificates. EACs, such as GOs in Europe, are the only legal means of consuming energy from a specific source, as power cannot be traced through the power grids.

An EU requirement to disclose the origin of energy covers both European Member States and European Economic Area countries, but as implementation is left to the discretion of each country, some differentiation has occurred.

The Association of Issuing Bodies (AIB) created a voluntary scheme for GOs called the European Energy Certificate System (EECS) to standardise national GO schemes. But not all EU single market countries are members of the AIB and some AIB members are not single market countries, such as Serbia. Two more countries are likely to join by the end of 2021.⁵

Key areas to analyse

European Single Market countries should explore efforts to standardise and harmonise the GO system by joining the AIB and fully adopting the EECS rules. A clear and consistent European GO standard will provide a solid foundation for harmonised voluntary 24/7 matching schemes. Countries outside of Europe adopting the I-REC Standard also have discretion on how to implement it, but harmonisation could facilitate the development of liquid markets.

⁵ <https://www.aib-net.org/>

Market Boundaries: Proximity between generation and consumption points

Some market actors consider that the value of matching clean energy supply with demand is greater when generation and consumption are located in proximity.

Ultimately, electrons cannot be tracked through power grids regardless of the location of the generation and consumption points. However, location does matter with respect to real electricity grid constraints, and consumers that target hourly matching with generation on the same grid can simultaneously help with wider system balancing challenges, while also developing new renewable assets on the grids where buyers operate.

Key areas to analyse

The consumer has a voluntary choice of whether to carry out their 24/7 matching in a region, country, bidding zone/balancing authority or wider European area. There are potential benefits to limiting 24/7 matching to generation and demand located in the same region, country or bidding zone/balancing authority. However, consideration should be given to ensuring market liquidity for 24/7 certificates, as this can be maximised by facilitating matching over wider geographical regions. Further discussion and detailed analysis need to take place on the issue of geographic proximity between generation and consumption (however defined).

Overall, the liquidity of both electricity markets and EAC markets can and should be enhanced by upgrading and enhancing regional grids to manage increased generation from variable renewable sources.



Providing clear evidence of 24/7 matching: Issuing energy certificates with information that evidences the time when the energy was produced

A GO specifies the geographic location of the electricity generation asset, the type and capacity of the installation, but issuing bodies are free to define the production period.⁶ Most of the issuing bodies use monthly periods, labelling GOs with the first and last day of that month, but not the day, hour, or 15 minute balancing period.⁷

A requirement for 24/7 matching is for issuing bodies to “time-stamp” the GOs they issue to energy producers, stating the precise moment that the underlying unity of energy was produced. This level of precision is allowed but not required under current EU law, although the matter is under review.

Accurate and reliable smart meters at both the point of production and consumption can provide the data required to time-stamp GOs. A confirmation framework to ensure accuracy and veracity must be developed, which should avoid double counting. In the meantime, a voluntary system of Granular Certificates is emerging within the existing scheme, drawing from experience with existing Non-Governmental Certificates – voluntary certificate schemes operated on a commercial and non-legislative basis.⁸

Grid level energy storage can support 24/7 matching by taking variable renewable power generation and making it dispatchable. As with other points on 24/7 matching, once the relevant GOs are time-stamped, the underlying EAC scheme should govern the certification of power that goes through storage.

Key areas to analyse

Explore the updating of existing rules so that GOs are time-stamped, with a harmonised interim voluntary market for granular certificates that mitigates double counting. In Europe the limit could be a 15-minute window in line with Electricity Market Regulation 2019/943. The adoption of 24/7 matching is already happening through several demonstration projects, as detailed in the EnergyTag initiative’s white paper.⁹

6 Article 19 — Guarantees of origin for energy from renewable sources, Renewable Energy Directive (EU) 2018/2001 (RED II)

7 The Electricity Market Regulation 2019/943 (Article 8.4) states that: “By 1 January 2021, the imbalance settlement period shall be 15min in all scheduling areas, unless regulatory authorities have granted a derogation or an exemption. Derogations may be granted only until 31 December 2024”. Some countries in the EU have secured such maximum derogation and thus they are not obliged to implement the 15min settlement.

8 Examples include RECS Certificates and NGC EECS-Disclosure certificates - see <https://www.aib-net.org/certification/certificates-supported/ngcs-non-governmental-certificates> - and in some countries I-REC certificates (see <https://www.irecstandard.org>)

9 <https://www.energytag.org/>

Accounting systems that recognise and value moving towards 24/7: A fundamental question of volume or time

There is a clear benefit to having a standard volumetric unit of energy, set in Europe and all major EAC schemes at 1 MWh.¹⁰ The volumetric unit of GOs allows them to be easily traded in bundles of 100 GOs or more, reducing transaction and handling costs. The adoption of 24/7 matching poses a challenge to volumetric units by counting temporal units of less than one hour. A unit of energy generated by a given production site in an hour or less will contain a different kWh or MWh quantity of energy depending on the size and productivity of the production device at that specific moment. This difference could add to the challenge of 24/7 matching as those seeking to match their renewable energy consumption in every hour will have to find the specific GOs that cover their consumption for each hour of each day. This contrasts starkly with annual or even monthly matching where a consumer simply has to calculate their MWh of consumption over the relevant period and buy the same number of GOs - one for one. This is a fundamental issue which needs a lot more analysis and discussion.

Key areas to analyse

The volumetric measure of a GO certifying 1 MWh of energy should remain as the cornerstone of energy attribute tracking and purchasing. Even as the goal of voluntary 24/7 matching is taken up by more consumers, its complexity means that it may not dominate the market in the short to medium term.

A key part of supporting the development of 24/7 matching that is being explored in various EnergyTag demonstration projects will be finding a reliable way to use the volumetric units of GOs to match a specific time period. This could include splitting or combining GOs to reflect the required volume of consumption for a given period of time. A GO may only be split into several GOs for whole numbers of watt hours. It is possible that two markets will emerge, one for 1 MWh GOs and a separate market in sub-MWh GOs, with some form of clearing mechanism between the two.

Accounting systems that recognise and value moving towards 24/7

There are two main methods for accounting Scope 2 emissions: a location-based method and a market-based method. These methods differ in respect to the choice of emissions factor used for the allocation. Both methods are recognised by the GHG Protocol, and for reporting Scope 2 emissions in the CDP climate change questionnaire.¹¹

There are many complex issues to resolve in accounting the carbon abatement value of renewable energy and whether it is feasible to attach this value to a GO or renewable energy certificate. This issue needs a lot more analysis and discussion and could form part of future Task Force work.

¹⁰ DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the promotion of the use of energy from renewable sources (RED-2, Art. 19.2)

¹¹ CDP defines Scope 2 emissions as: Indirect emissions from the generation of purchased or acquired electricity, steam, heat, or cooling consumed by the reporting company.

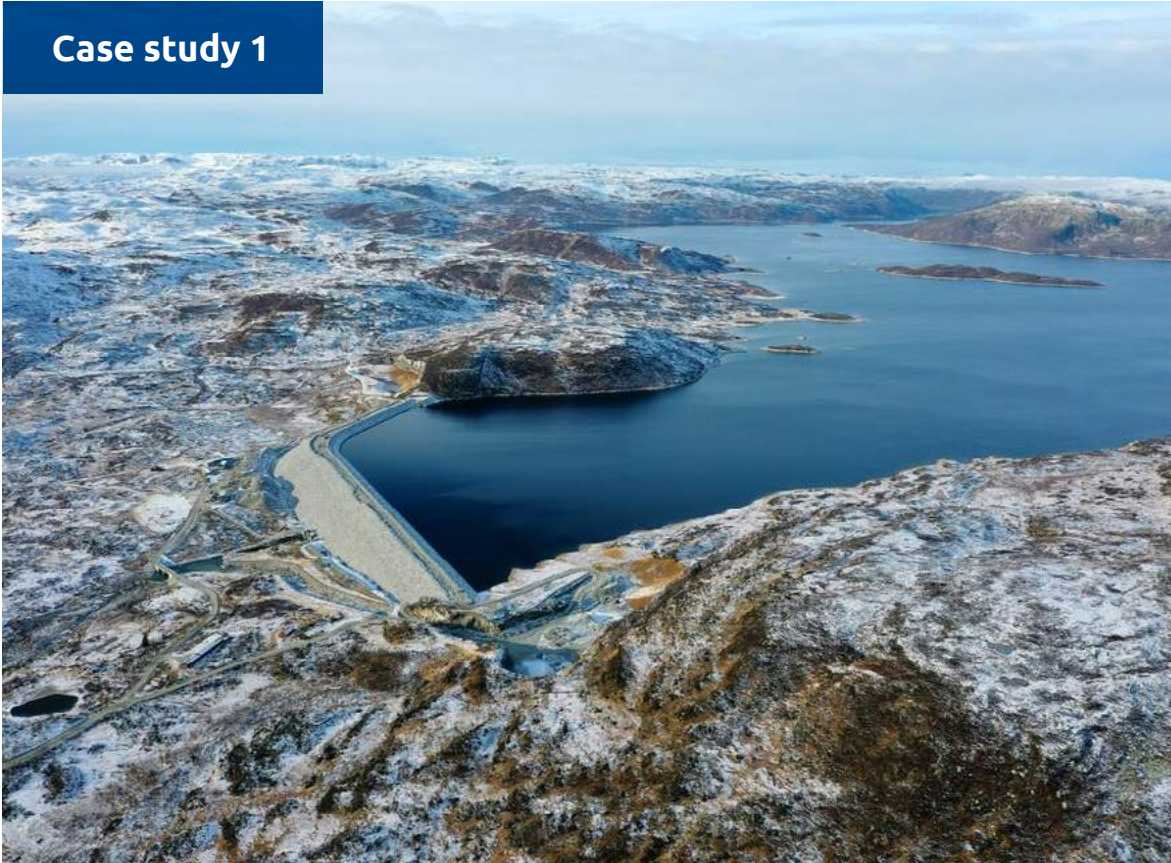


Case studies



A 24/7 demonstration project in Norway

Case study 1



Companies:

Statkraft, Statnett, Tibber, Unicorn

Description:

Through this demonstration project, Statkraft AS, Statnett, Tibber AS, and Unicorn aim to demonstrate the feasibility of issuing GOs with hourly granularity and matching them to the consumption profile of a chosen consumer and disclosing the renewable consumption. The project will prove the following:

- Hourly issuance and matching can be achieved within the EECS GO scheme
- Hourly GOs can work within the existing IT systems used by issuing bodies and the AIB hub

Building Block Category:

- Data for 24/7 Matching
- Measurement, Metrics, and Certificates

More details:

Visit the [24/7 Task Force website](#)



Achieving 100% renewable energy with 24/7 monitoring in Microsoft Sweden

Case study 2



Companies:
Microsoft, Vattenfall

Description:

In 2020, Microsoft announced that it would be the first hyperscale cloud provider to track hourly energy consumption and renewable energy matching in a commercial product using the Vattenfall 24/7 Matching solution for its new data center regions in Sweden, starting in 2021.

Through this solution, Microsoft Sweden is powered by renewable energy through the procurement of GOs, not just on a monthly or yearly basis, but on an hourly basis.

Building Block Category:

- Data for 24/7 Matching
- Measurement, Metrics, and Certificates

More details:

Visit the [24/7 Task Force website](#)



Google and AES partner with world-leading 24/7 carbon-free energy solution

Case study 3



Companies:
Google, The AES Corporation

Description:

In September 2020, Google announced its world-leading goal to operate on 100% carbon-free energy at all times by 2030. However, Google set this goal knowing that a 24/7 carbon-free energy solution, where demand in every hour of every day is met with carbon-free sources, didn't exist yet.

AES and Google partnered together to develop a first-of-its-kind 24/7 carbon-free energy solution, and AES committed to supply Google's Virginia data center campus with time-matched carbon-free energy for at least 90% of all hours.

Building Block Category:

- Flexibility
- Data for 24/7 Matching
- Measurement, Metrics, and Certificates

More details:

Visit the [24/7 Task Force website](#)



Mercedes-Benz producing cars with 100% renewable energy 100% of the time

Case study 4



Description:

In 2020, Mercedes-Benz and Statkraft inked a deal on an industrial scale enabling the procurement of 100% renewable power 100% of the time for Mercedes-Benz's production sites and offices in Germany starting in 2022.

This front-running concept for a 24/7 solution called "Pure Statkraft PPA" has been certified by an independent authority (TÜV) for its additionality components and the simultaneousness of generation and supply.

Building Block Category:

- Flexibility

More details:

Visit the [24/7 Task Force website](#)

Companies:

Mercedes-Benz, Statkraft Markets GmbH



A 24/7 corporate PPA in the Netherlands

Case study 5



Description:

This pilot project will match one of Microsoft's Amsterdam data centers' hourly energy consumption with Dutch offshore wind. Microsoft will be a flagship customer of the integrated 24/7 solution, which will enable Eneco's customers, including Microsoft, to have access to FlexiDAO's 24/7 renewable energy matching tools at scale. This pilot will specifically allow Microsoft to:

- Monitor and calculate the 24/7 synchronicity score of its corporate PPA
- Obtain all the GOs needed to submit yearly Scope 2 reporting
- Calculate the location-based and market-based CO₂ emissions hour-by-hour in line with the GHG Protocol Scope 2 guidelines

Building Block Category:

- Data for 24/7 Matching
- Measurement, Metrics, and Certificates

More details:

Visit the [24/7 Task Force website](#)

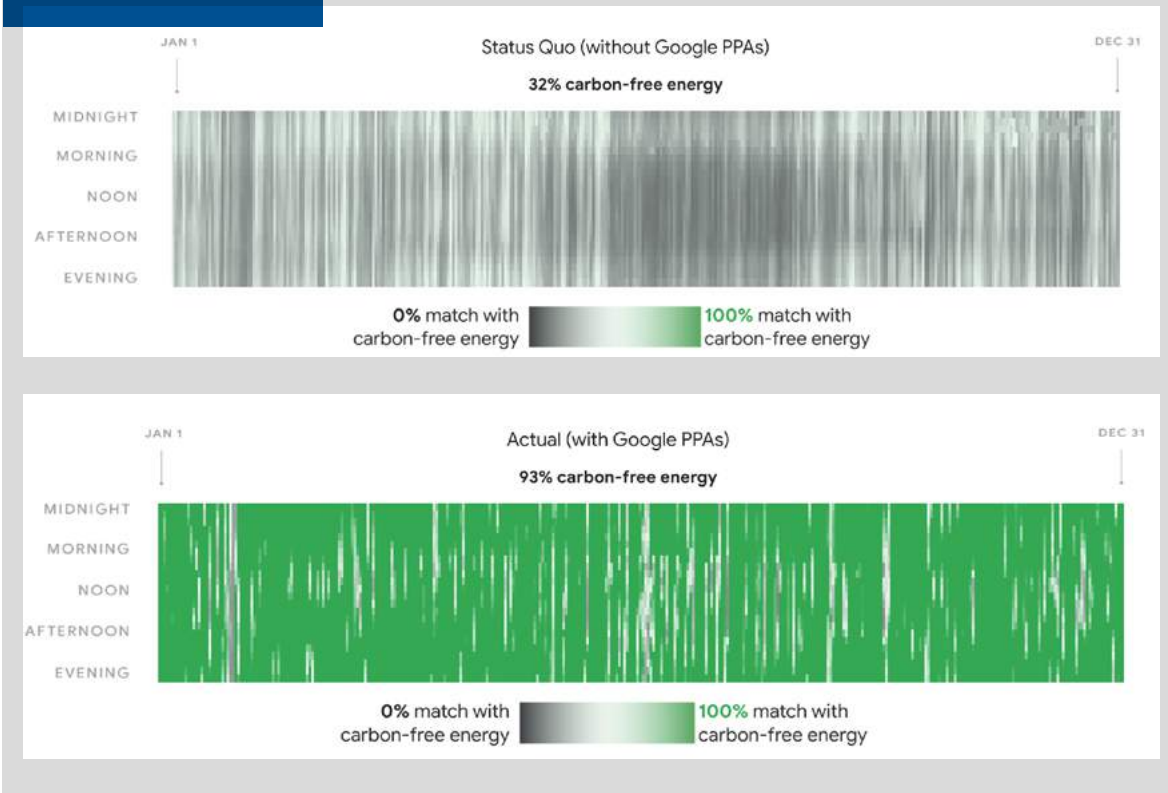
Companies:

Eneco, FlexiDAO, Microsoft, CertiQ



Supplying real time electricity data to enable 24/7 carbon-free energy by 2030

Case study 6



Description:

ElectricityMap supplies hourly consumption mix and carbon intensity to Google, enabling the company to assess its progress towards matching all operational electricity use with locally sourced carbon-free sources 24/7.

In 2020, 67% of electricity that Google consumed was matched with regional carbon-free sources, with stark differences between regions. This data-driven assessment reveals how to best focus efforts to reach 100% 24/7 carbon-free energy.

Building Block Category:

- Data for 24/7 Matching

More details:

Visit the [24/7 Task Force website](#)

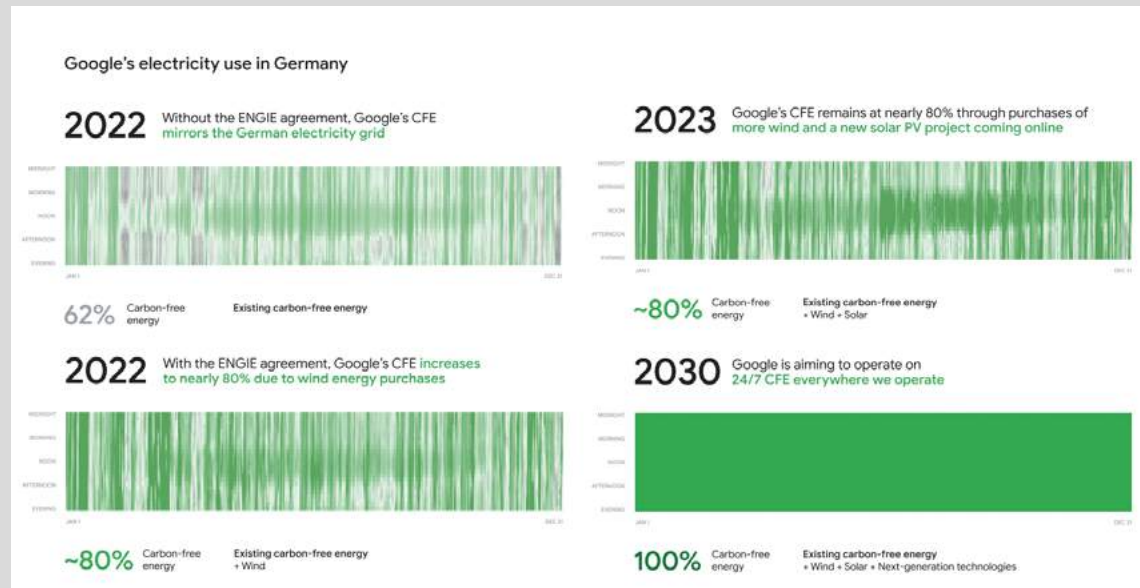
Companies:

ElectricityMap, Google



Enabling 24/7 carbon-free energy solutions

Case study 7



Hourly Carbon-Free Energy (CFE) heat maps for Google's electricity use in Germany, demonstrating the impact of this deal with Engie

Companies:
Engie, Google

Description:

In 2020, Google set the ambitious goal to decarbonise its electricity supply completely and operate on 100% carbon-free energy, every hour, everywhere, by 2030, spearheading the 24/7 carbon-free energy trend.

In 2021, ENGIE and Google signed a set of innovative agreements to supply Google's two new data centers in Germany with a guarantee of 80% carbon-free energy supply on an hourly basis. ENGIE will assemble and develop a carbon-free energy portfolio on Google's behalf with the ability to flex and grow as Google needs change in the region.

This partnership between ENGIE and Google paves the way to new solutions to decarbonise businesses. These solutions can be utilized not only for Google but for all the companies that want to go further towards Net Zero.

Building Block Category:

- Flexibility
- Measurements, Metrics, and Certificates

More details:

Visit the [24/7 Task Force website](#)



