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# Realizing the Full Potential of 24/7 Clean Energy Procurement

*Lori Bird, Renewable Energy Markets Conference  
September 15, 2022*

# SUPPORT FOR IMPLEMENTING 24/7 CFE PURCHASING

## WRI Supporting Cities with 24/7 CFE Implementation

- Assisting with identifying pathways to implementing 24/7 CFE purchasing
- 11 local governments participating
- Goals of the cohort workshops are to understand:
  - Assessing Hourly Loads and Coincidence with CFE
  - Exploring Supply-Side 24/7 Options and Firm Dispatchable CFE
  - Exploring demand side options
  - Verification and reporting
  - Pathways to implementation



# UTILITY 24/7 CFE OFFERINGS FOR LARGE BUYERS

## 24/7 CFE Utility Solutions with Institute for Electric Innovation (IEI)

- Workshops and dialog with utilities and customers on designing 24/7 CFE utility offerings
- Goals of workshops were to understand:
  - **customer demand** for hourly 100% CFE solutions;
  - the **attributes** of these solutions that matter most to customers;
  - key **challenges with scaling** CFE solutions to a wider set of customers;
  - possible **designs of CFE offerings** that electric companies could provide; and
  - the customer's need for easy access to specific **hourly customer and grid data** to implement and verify 24/7 solutions.

## Forthcoming Issue Brief on 24/7 CFE for Corporate Customers

- Working title: *100% Carbon-free Energy (CFE) Solutions for Corporate Customers: Preferences, Challenges, and Pathways Forward*
- Release in Fall 2022

# 24/7 CFE WEBINAR SERIES + RESOURCES PAGE

1

[An Introduction to 24/7 Carbon-Free Energy and Hourly Matching: What, Why, and How](#)

May 9, 2022, 3:00 – 4:00pm EDT

2

[Supply Products for 24/7 Carbon-Free Energy](#)

July 28th, 2022, 3:00 - 4:15pm EDT

3

[Tracking and Verifying 24/7 Carbon-Free Energy Purchases](#)

August 31, 2022, 10:00 –11:00am EDT

→

Want to learn more? WRI has developed a [24/7 CFE Resources](#) page with short descriptions and useful links to reports and resources

For webinar recordings, slides, and future webinar registration:



[tiny.cc/CFEevents](https://tiny.cc/CFEevents)



[tiny.cc/CFEresources](https://tiny.cc/CFEresources)



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**THANK YOU**

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IMAGE: FLICKR/MICHAEL MULLER

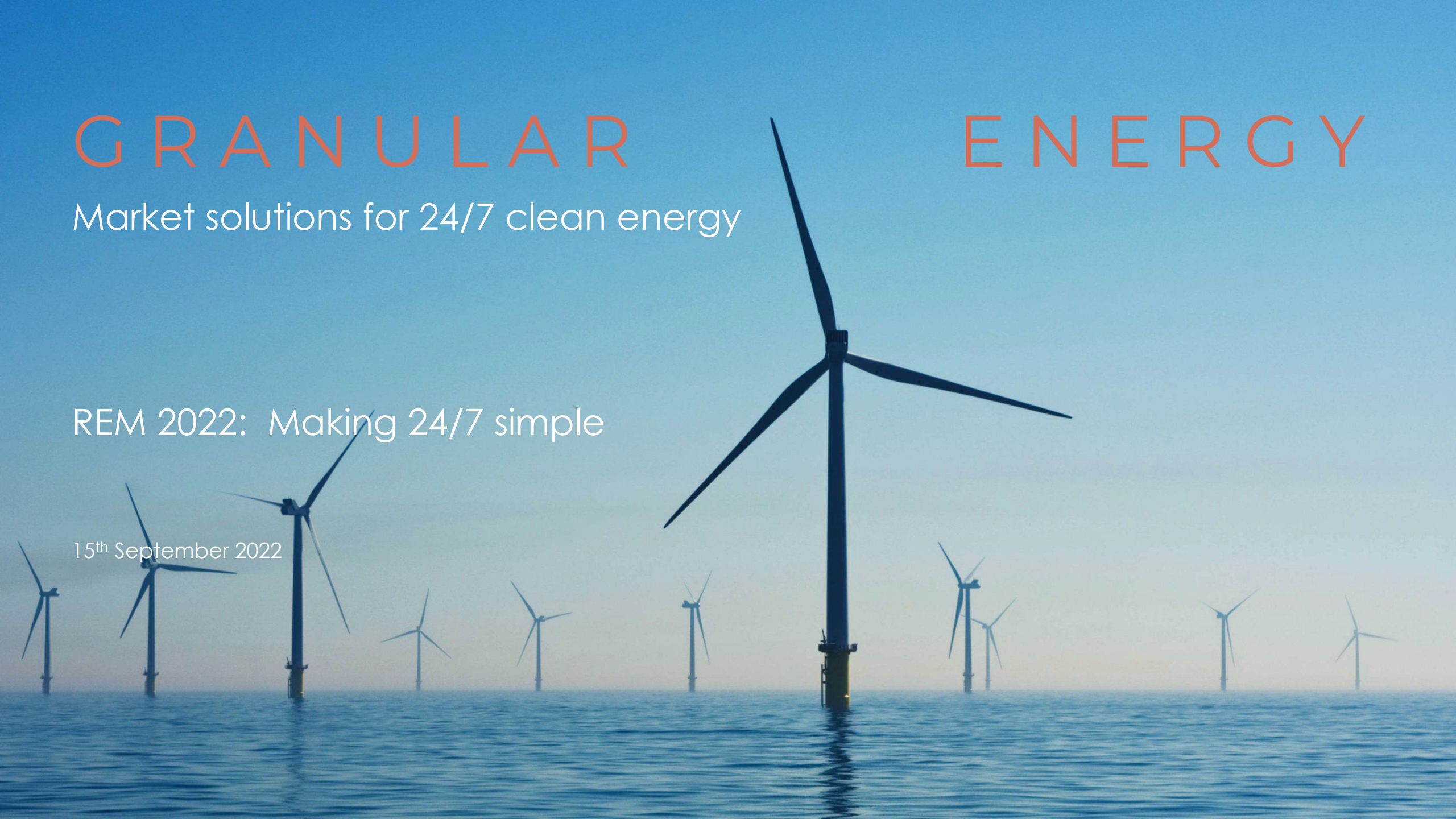
# GRANULAR

# ENERGY

Market solutions for 24/7 clean energy

REM 2022: Making 24/7 simple

15<sup>th</sup> September 2022

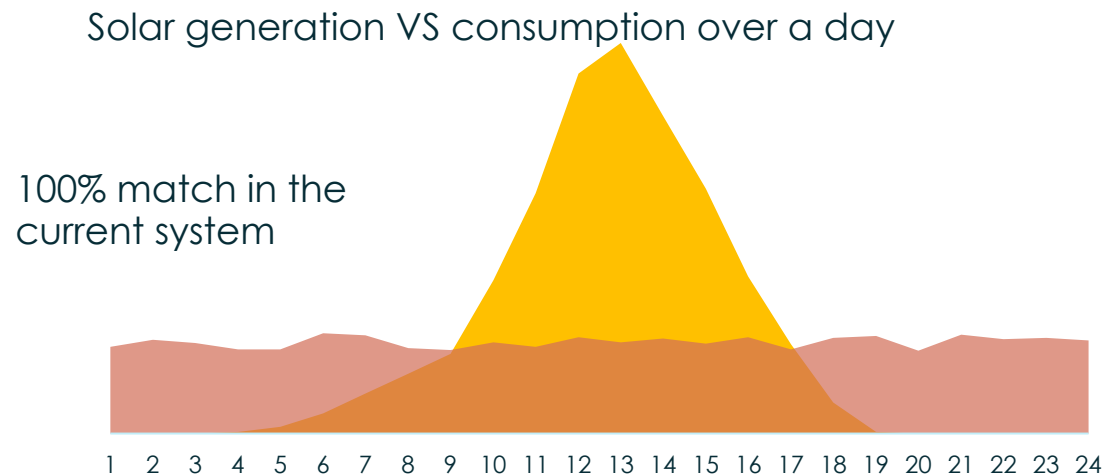


# Hourly RECs are an important development in the way energy markets work

## What are hourly RECs?

Time-stamped energy certificates that allow consumers to verify the source of their electricity in intervals of 1 hour or less.

Tradeable instruments that lead to price formation reflective of intra-day availability of clean energy, gradually aligning with wholesale electricity markets



## Potential benefits:

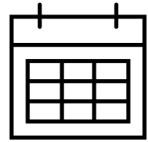
- Greater trust in claims based on RECs
- Support new carbon accounting methodologies
- Creates a price signal for energy storage and energy flexibility as well as new renewables
- Supports grid operators in integrating renewables

→ *harness consumer demand for clean energy to accelerate the transition to carbon-free grids*

Princeton Net-Zero Lab: Impact of Time-based Energy Attribute Trading and 24/7 Carbon-free Electricity Procurement

# Is 24/7 and hourly RECs complicated? Some new tools will be needed

## Legacy annual certificates



### Monitoring

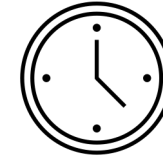
- Yearly MWh consumed = number of certificates bought
- No need for a dedicated tool

### Trading

- 1 trade / year
- Done through brokers



## Hourly certificates



### Monitoring

- Need to track matching on each of the 8760 hours of the year
- A dedicated tool is needed

### Trading

- Similar to power markets: high number of trades per year with increased complexity (hourly shape, blocks, etc.)
- Increased role of trading tools and central trading venues



# Granular Energy makes it easy for utilities, energy providers and others to manage and trade portfolios of hourly certificates and create '24/7' offers for consumers

Connect

Manage

Trade

3<sup>rd</sup> party GC registries



Suppliers & producers' systems



## Certificate Management Platform (SaaS)

*turnkey hourly certificate management solution for utilities and large consumers*

- Registry aggregation
- Assessment of CFE<sup>1</sup> matching, monitoring of key KPIs
- Portfolio & risk management: smart certificate allocation
- ESG and carbon emissions (Scope 2) reporting
- Green hydrogen (RFNBO<sup>2</sup>) specific features



## Marketplace

*Comprehensive trading platform*

- Bilateral or multilateral trading between platform users
- Short term optimization
- Long term hedging

<sup>(1)</sup> Carbon-Free Energy / <sup>(2)</sup> Renewable Fuels of Non-Biological Origin

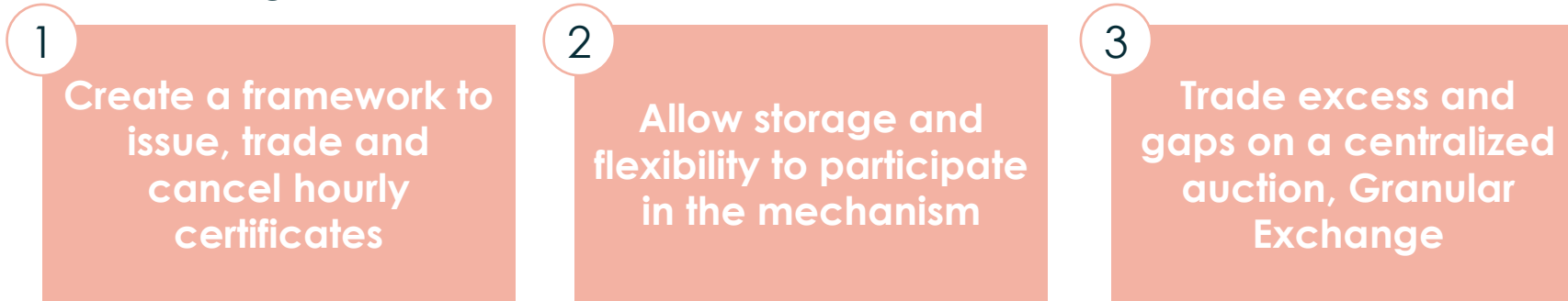
# UK Demonstrator



# The UK Granular demonstrator - objectives

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Granular is launching a **demonstrator in the UK**



Granular Exchange is an **R&D project** aiming to trial a new market design with a centralized trading venue for hourly renewable energy certificates, **in partnership with Nord Pool**

**The product:** an auction for each hour, complementing the current framework on the European integrated electricity market, with ambitions to:

- prove that a market signal can arise and learn about the price dynamics of this market
- establish a price reference for hourly clean energy
- maximize liquidity and increase access to granular certificates for large and small players

**The long-term ambition:** accelerate the transition to clean energy by closing the gap between traditional power markets and certificate markets

# Partners

## GRANULAR

- Start up providing SaaS services to manage and trade certificates
- Role:
  - Pilot lead, overseeing the whole certification scheme
  - Provides certificate management platform to participant
  - Jointly develop the exchange with Nord Pool

## NORD POOL

- Nord Pool, Europe's leading power market, delivers efficient, simple and secure trading across Europe
- Role:
  - Exchange platform and auction development
  - Operate the exchange
  - REGO account trustee

## ELEXON

- Elexon manages the BSC, and the power imbalance mechanism.
- Role:
  - Support to design the certification framework
  - Expertise on GB metering and settlements
  - Exploring further roles in an enduring solution (e.g. metering, imbalance)



- European IT software company providing products and solutions in Energy and Utilities for TSOs, European initiatives, Exchanges, Energy Certificates, Power Trading, Flexibility, Electromobility and more.
- Role: provides the hourly certificate registry



- independent, not-for-profit innovation centre
- Role:
  - Expertise to design the certification framework
  - Support drafting the pilot reports
  - Support disseminating findings of the PoC

## Other supporters

- **NGESO**: supportive of the initiative, will participate to stakeholder engagement process and reports
- **PWC (in discussions)**: audit of the certification scheme

## Progress so far...

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**+12** utility/energy supplier participants

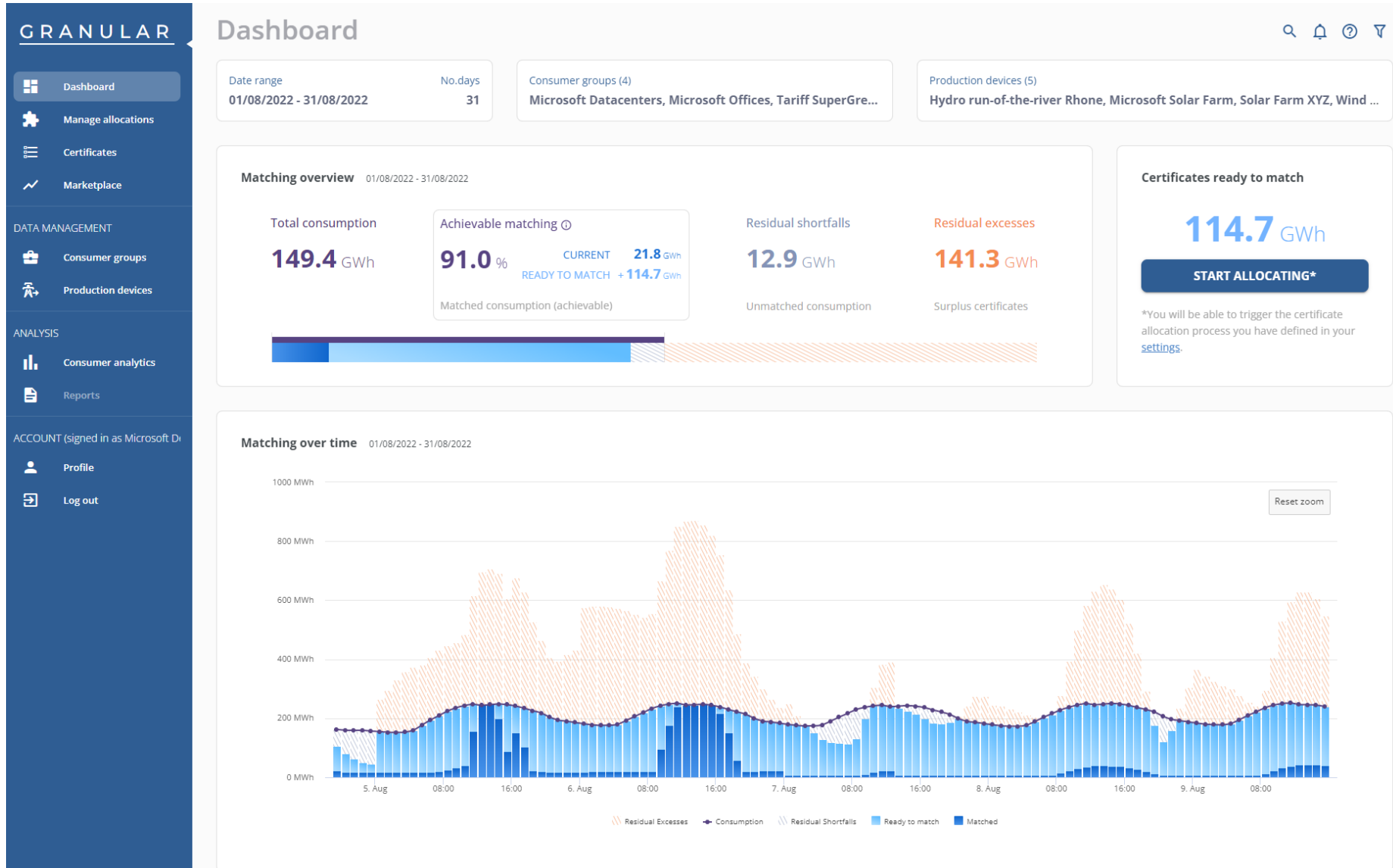
**+30** corporates and public institutions

**+4** large scale storage operators

Now active in the US

– looking for partners to run pilots...

# Portfolio management: KPIs and position monitoring



Monitor your matching levels on a hourly, monthly, yearly basis, track main KPIs and open positions

# Portfolio management: allocation

**GRANULAR**

- Dashboard
- Manage allocations**
- Certificates
- Marketplace

DATA MANAGEMENT

- Consumer groups
- Production devices

ANALYSIS

- Consumer analytics
- Reports

ACCOUNT (signed in as Microsoft D)

- Profile
- Log out

36.3 GWh of certificates will be allocated to 3 consumer groups

Allocation diagram

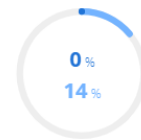


Include already allocated certificates in the diagram

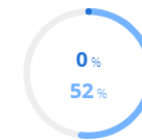
Consumer groups matching after allocations



Microsoft Offices



Tariff SuperGreen+ (B2C)



Microsoft Datacenters

BACK

ALLOCATE

Automated and smart allocation of production to consumption at the most granular level: per asset, per hour

# Consumer analytics and reporting

**GRANULAR**

- Dashboard
- Manage allocations
- Certificates
- Marketplace

DATA MANAGEMENT

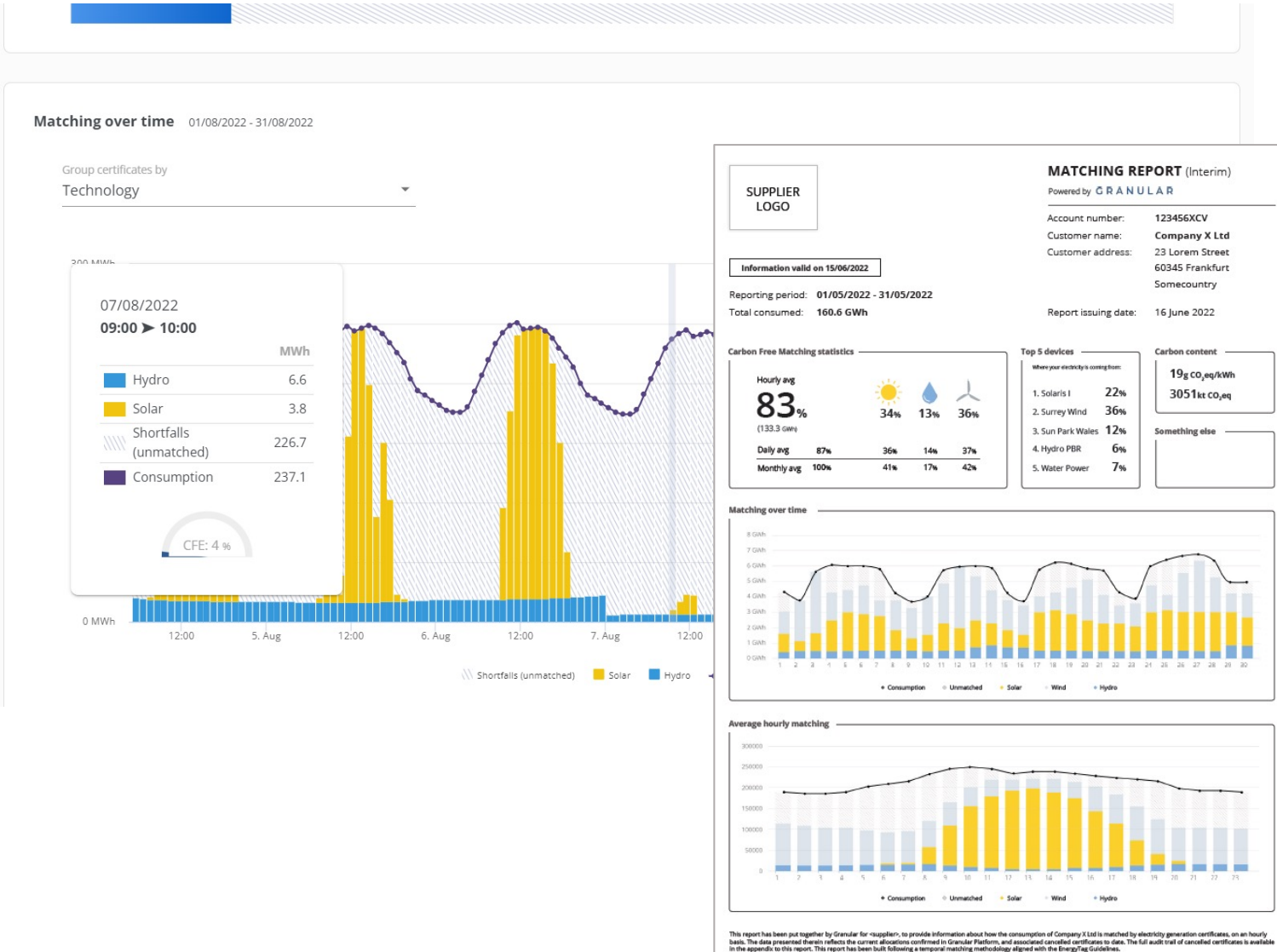
- Consumer groups
- Production devices

ANALYSIS

- Consumer analytics**
- Reports

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Generate high-quality reporting and insights for your consumers, with detailed metrics (hourly / asset-level)



# Trade

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- Connect to the market: trade and optimize
- Place orders on market venues to manage your long-term risks or optimize your matching closer to delivery



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# Realizing the Full Potential of 24/7 Clean Energy Procurement

**Don Bray**  
Director, Energy Services and Community Relations  
September 15, 2022

# SVCE is a Community Choice Energy Agency, formed in 2016 by thirteen Silicon Valley jurisdictions.

## Background

- Mission: carbon-free electricity at competitive rates, and innovative decarbonization programs
- 275,000 customers
- 4,000 GWh annual load
- Large commercial/industrial segment
- Aggressive state goals, complex/evolving regulatory environment



# A “Glimpse of the Future”

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On Saturday, April 24, 2021 at 2:30 PM California experienced a glimpse of the future. The California Independent System Operator (CAISO) reported that a record **95% of the instantaneous electricity demand was served by clean energy**. The grid did not fail, the lights did not go out, and people went about their day without realizing the fifth largest economy in the world was being powered almost entirely by clean electricity for that fleeting moment. That glimpse is the simple vision for the electricity system of the future: **Clean energy without even thinking about it.**

-Governor Gavin Newsom, California's Electricity System of the Future, July 2021



# SVCE has now committed over \$1.8 billion to new/long-term renewable energy projects.

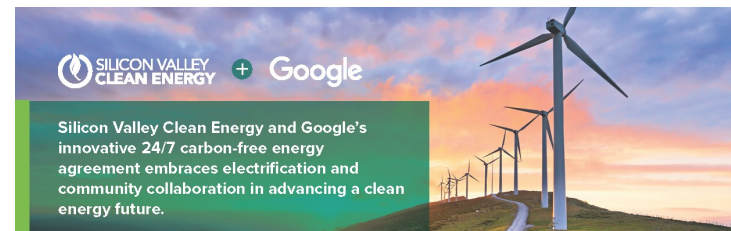


- 50 MW **Geothermal**
- 565 MW **Solar PV**
  - w/ 173 MW **Storage** (660 MWh)
- 111 MW **Wind**
- 20 MW **Long Duration Storage** (~140 MWh)
- Combined PPA Energy Mix:
  - 63% Solar/Storage
  - 21% Geo
  - 15% Wind

# SVCE is launching a '24/7 carbon-free' electricity service offering, with Google as a pilot customer.

## Key Elements

- Dedicated/optimized supply portfolio
- Hourly tracking per Google's CFE methodology
- 92% CFE target
- Demand-side load management opportunities
- 10-year term



Silicon Valley Clean Energy and Google share common goals for clean, carbon-free electricity on the grid, and switching from fossil fuels to clean electricity in buildings and transportation. Headquartered in Mountain View, California, Google is a long-time corporate leader in renewable energy procurement and is committed to operating its business on carbon-free energy (CFE) – at all hours and in every location by 2030. Silicon Valley Clean Energy (SVCE) is a public community choice energy agency formed in 2016 by thirteen Silicon Valley jurisdictions to provide clean, carbon-free electricity at competitive rates and electrification programs to reduce community-wide carbon emissions.

### Shared Motivations

As innovative, Silicon Valley-based organizations, SVCE and Google have joined forces to create a fundamentally new 24/7 carbon-free energy service for Google's offices in Mountain View and Sunnyvale. SVCE will match carbon-free electricity with Google's local demand for at least 92% of all hours in the year – from a tailored portfolio of renewable energy resources meeting additional requirements. On the demand side of the equation, Google will flex its building electric loads to further improve CFE and cost performance. And in this same spirit, Google is committing to ongoing electrification investments at their local facilities.

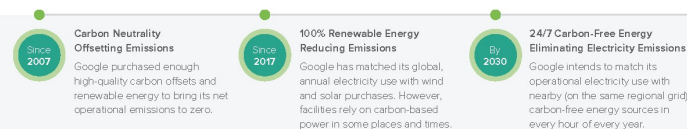
Taken together, the new services advances decarbonization locally and on the grid, provides a scalable model for others to follow, and demonstrates the power of community collaboration in accelerating the transition to a clean energy future.

### Google's History of Clean Energy Leadership

Google has been carbon neutral since 2007 through a combination of high-quality carbon offsets and renewable energy purchases that have brought its net operational emissions to zero.

In 2017, Google became the first major company to match 100% of its annual electricity consumption with renewable sources. Today, Google is one of the world's largest corporate purchasers of clean energy, responsible for more than 7 gigawatts of new capacity across roughly 60 wind and solar projects.

Yet while Google buys as much renewable energy in total as it uses over a year, there are still times and places when the wind does not blow, or the sun does not shine. During those hours, Google's data centers and office buildings often rely on carbon-based electricity.



24/7 carbon-free energy means having clean electricity available for every hour on every grid—completely eliminating carbon emissions associated with Google's electricity use. Google is now in the final and most ambitious phase of its energy journey: by 2030, Google intends to run on carbon-free energy everywhere, and at all times.