ON TRACK: KEY UPDATES AND INITIATIVES FROM RENEWABLE ENERGY TRACKING SYSTEMS

Jennifer Martin
CEO
Center for Resource Solutions

Ed Everson
CEO
Evident

Dece Marwil Falar
Market Development Senior Manager
Philippine Electricity Market
Corporation (PEMC)

Vinod Tiwari
Global Head of Business
Development and Partnerships
Powerledger

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Renewable Energy Markets™ Asia 2025

A bit about us

Who we are and what we do

About us

Powerledger was founded in 2016 developing world-first blockchain-based energy trading platform. **Today, our technology is available in fourteen countries, across five continents, with over 21,000 users — enabling the trading of cleaner, cheaper electricity, and greater grid stability.**

We believe the grid is only as good as the market behind it. Hence, we create software solutions using **blockchain to spin up marketplaces** that respond to the variable character of renewables, and unlock the potential of distributed flexibility.

14
Countries using
the technology

30+
Companies using the
technology

Forbes
5 Companies
spearheading blockchain
for renewable energy

EXTREME TECH
CHALLENGE

EY Entrepreneur
Of The Year®

FAST COMPANY

World
Summit
Award

Powerledger commits to UN 24x7 Energy Compact

24x7 EC commitment spans the Energy ecosystem:

Powerledger will be 100% 24/7 Carbon Free Energy by 2025.

Expand peer-to-peer energy trading networks to over three million prosumers by 2030.

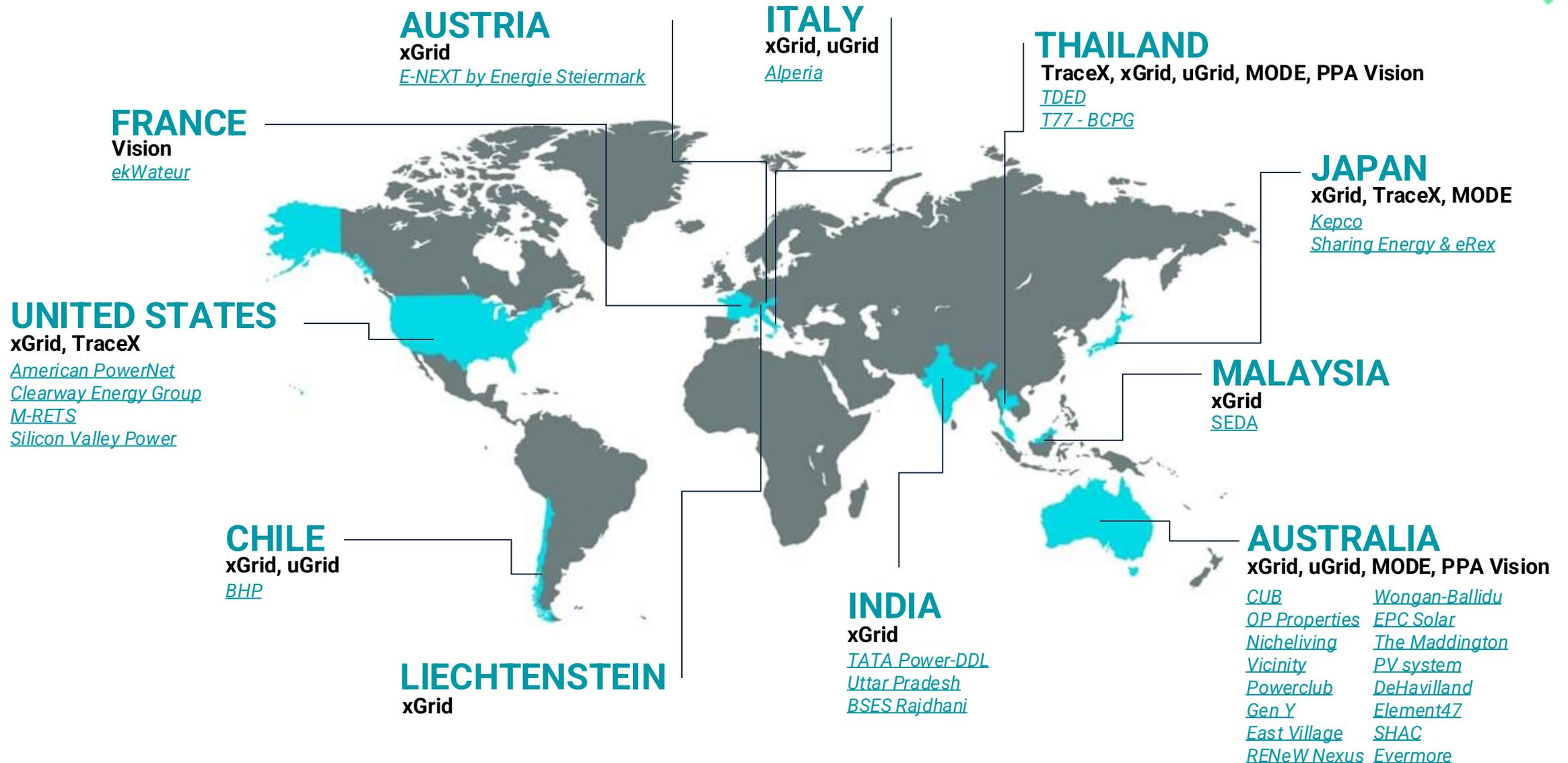Decarbonize 20 percent of global cryptocurrency by 2030.

Help digitization of 20 percent of clean energy markets by 2030.

Enhance the integrity of 20 percent of environmental commodity markets by 2030.

Powerledger's Projects Worldwide

AUSTRIA
xGrid
E-NEXT by Energie Steiermark

ITALY
xGrid, uGrid
Alperia

THAILAND
TraceX, xGrid, uGrid, MODE, PPA Vision
TDED
T77 - BCPG

FRANCE
Vision
ekWateur

JAPAN
xGrid, TraceX, MODE
Kepco
Sharing Energy & eRex

UNITED STATES
xGrid, TraceX
American PowerNet
Clearway Energy Group
M-RETS
Silicon Valley Power

MALAYSIA
xGrid
SEDA

CHILE
xGrid, uGrid
BHP

INDIA
xGrid
TATA Power-DDL
Uttar Pradesh
BSES Rajdhani

LIECHTENSTEIN
xGrid

AUSTRALIA
xGrid, uGrid, MODE, PPA Vision

CUB	*Wongan-Ballidu*
OP Properties	*EPC Solar*
Nicheliving	*The Maddington*
Vicinity	*PV system*
Powerclub	*DeHavilland*
Gen Y	*Element47*
East Village	*SHAC*
RENeW Nexus	*Evermore*

Industrial Partnerships

We contribute to different industrial associations with the learnings from our projects to help drive the transition towards a 24/7 renewable energy system:

- Founding member of the Smart Energy Council and Hydrogen Australia Zero Carbon Certification Scheme

- Global Blockchain Business Council (GBBC)

- European Association for Smart Energy (SmartEn)

- EnergyTag members and contributors

- Early signatories of the United Nations 24/7 Carbon-Free Energy Compact

- RE-Source - Eurelectric 24/7 RES Taskforce

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Pathway to 24/7 Carbon Free Energy

Transition towards a decarbonized future

More than 300 companies have joined the RE100 initiative setting 100% renewable energy targets.

Large energy consumers such as Google and Microsoft have gone a step further setting their goal on matching their energy consumption with carbon-free energy on an hourly basis, to more authentically reduce their carbon footprint and contribute to solving grid imbalances.

24/7 renewables sourcing enables a more precise matching between renewable energy production and consumption, encouraging consumption at times of high generation, hence eliminating the consumption of fossil fuels (instead of just offsetting it) and helping reduce grid instability.

Powerledger helps corporates and their retailers in that transition by providing a clear **visualization** of their energy procurement portfolio and the tools to act upon it **buying and/or selling renewables** and energy certificates.

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"We have committed to be 24-7 carbon free — that is every hour, every day around the world...

...it's a long shot, it stresses me out in terms of how to get there."

Sundar Pichai,
CEO, Google

"While we can't control how our energy is made, we can influence the way that we purchase our energy"
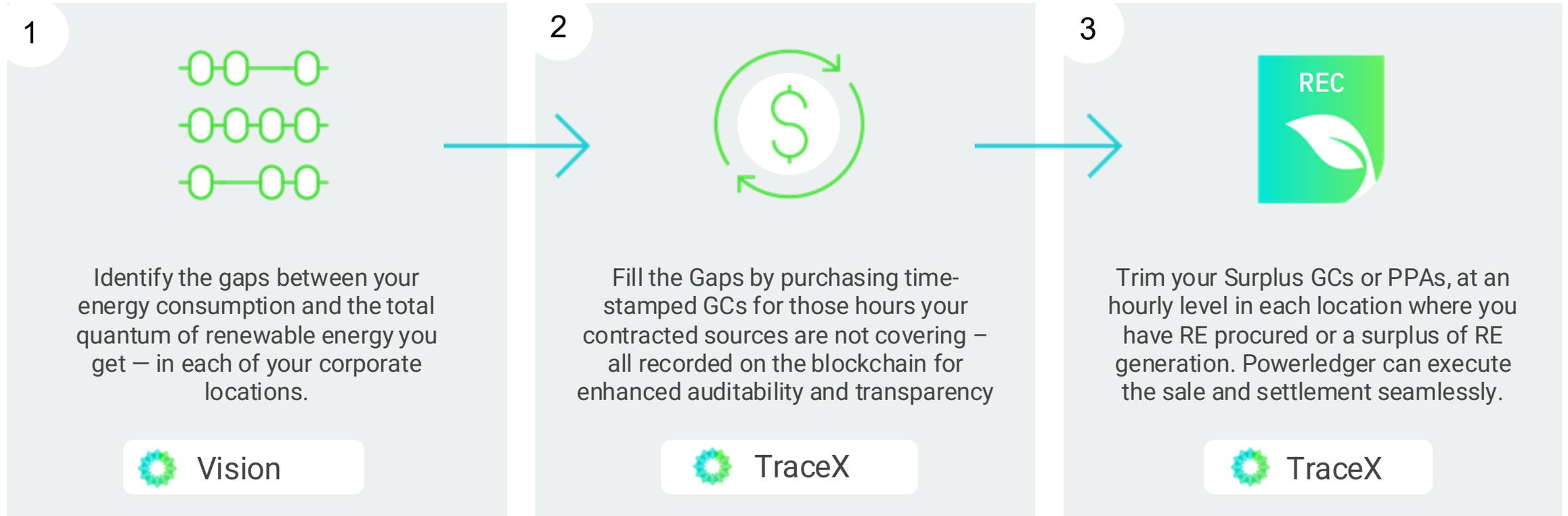
Dr. Lucas Joppa
Chief Environmental Officer, Microsoft

A simple end-to-end approach towards net zero emissions:

Powerledger provides a seamless end-to-end solution to cover the whole decarbonization process

Whether for hourly, monthly, or yearly 100% renewables, Powerledger offers the necessary tools to visualize and bolster decarbonize your consumption profile

1

Identify the gaps between your energy consumption and the total quantum of renewable energy you get — in each of your corporate locations.

Vision

2

Fill the Gaps by purchasing time-stamped GCs for those hours your contracted sources are not covering – all recorded on the blockchain for enhanced auditability and transparency

TraceX

3

REC

Trim your Surplus GCs or PPAs, at an hourly level in each location where you have RE procured or a surplus of RE generation. Powerledger can execute the sale and settlement seamlessly.

TraceX

Powerledger

Vision

Powerledger's Decarbonisation Solution

What is Vision

- Automated visualisation tool for energy consumption and carbon emissions reporting.
- Provides breakdown of energy types by location and time interval at meter level.
- Matches real-time energy consumption with available renewable sources.
- Calculates carbon intensity and assesses Carbon Free Energy score, emphasising Scope 2 emissions.
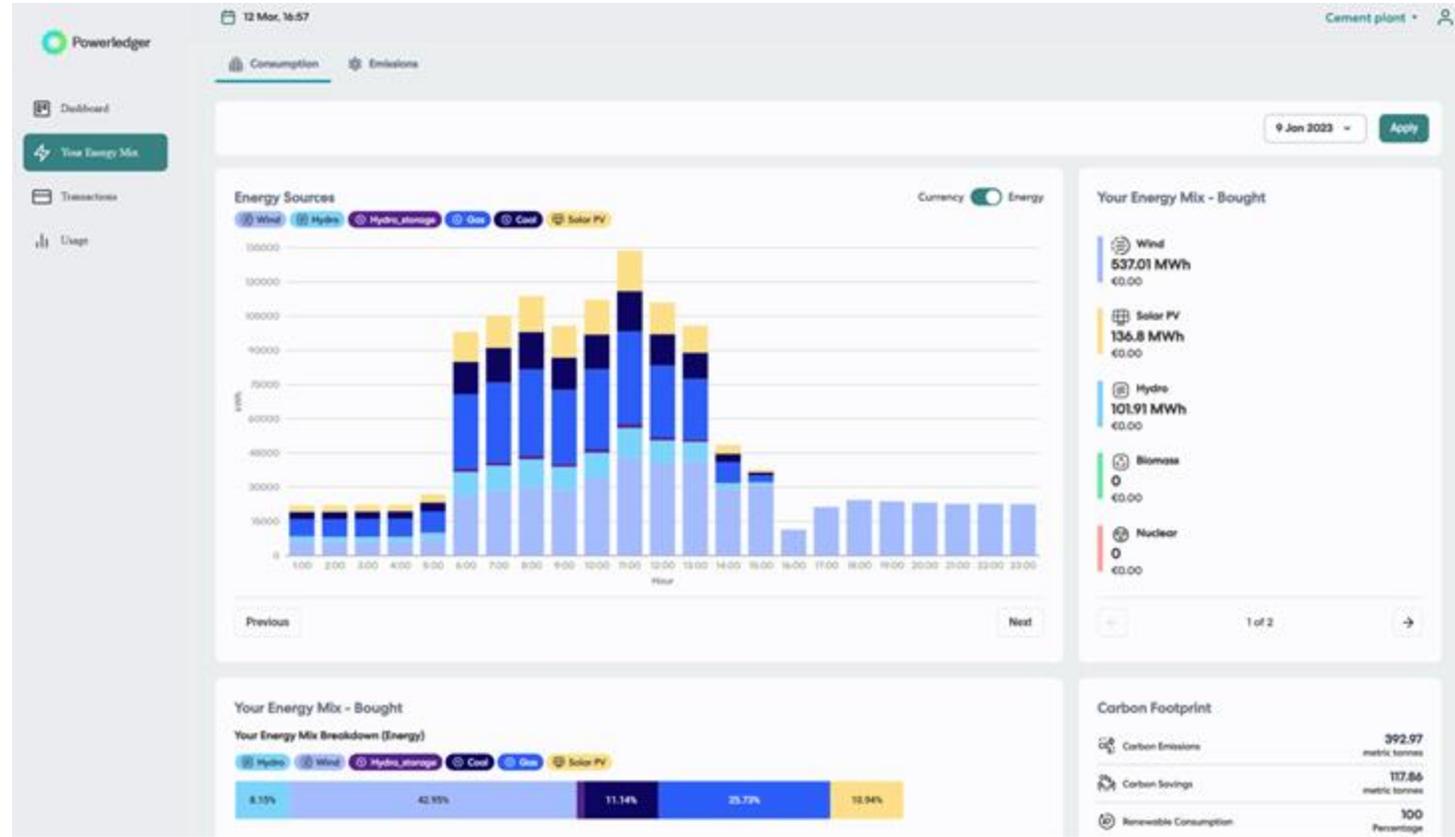
Screenshot of Vision user interface of platform from pilot. The dashboard visualises the energy consumed for an industrial site, providing a breakdown per hour, per energy type.

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Purpose of Vision

- Vision offers insights on Our Customer's asset synergy and demand fulfillment.
- Integrates grid and emissions data for hourly Scope 2 emissions estimation, aiding decarbonization.
- Incorporates pricing data for financial insights, informing decision-makers on arrangement performance.

Screenshot of Vision user interface of platform from pilot:

Top image shows how Ekwatuer RE vs grid energy fulfills an industrial client's energy demand.

Button image displays the estimated emissions time series

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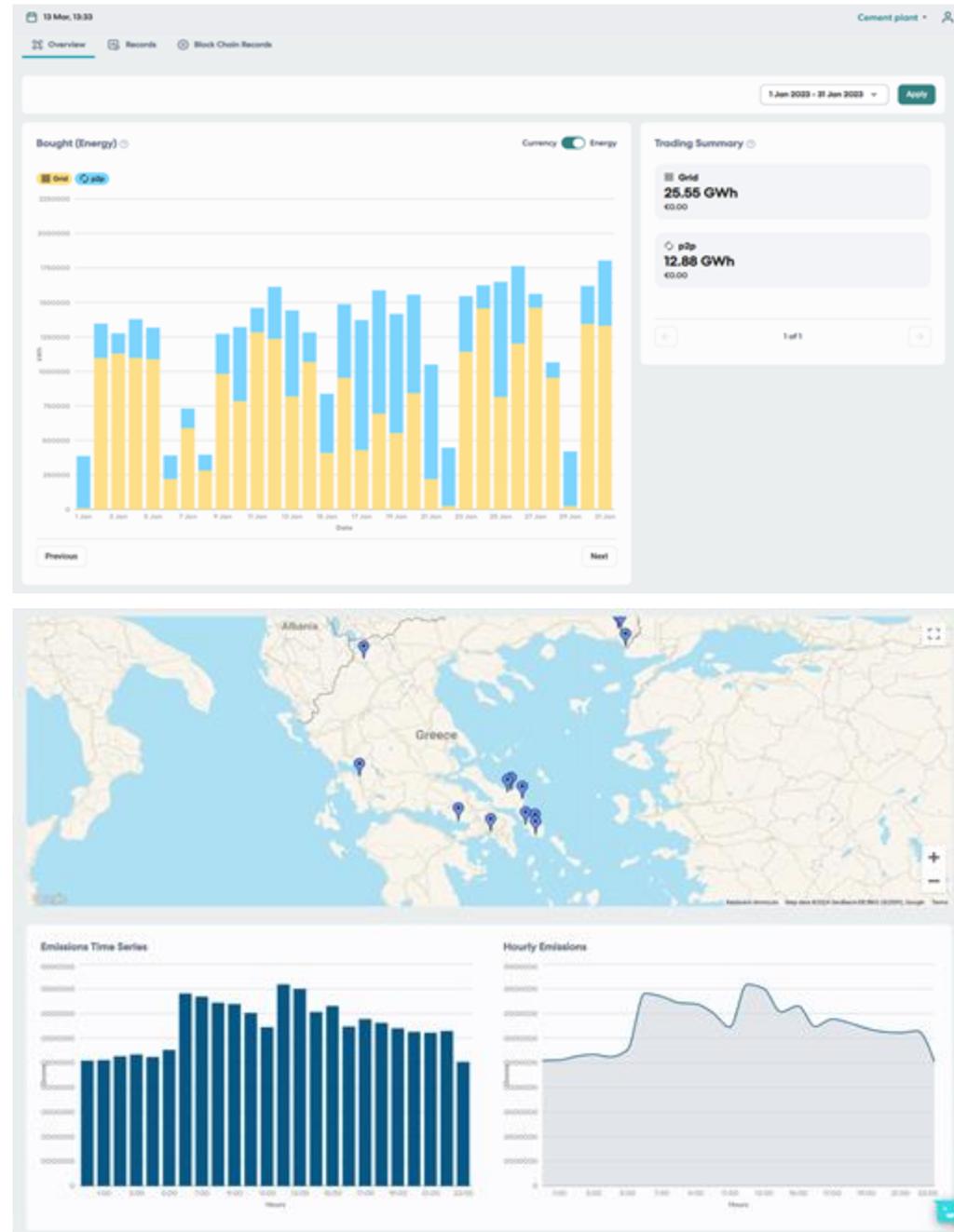
Vision: Portfolio Management Tool for municipalities and C&I clients

Generate different types of sustainability reports automatically on Vision's Reports site, for corporate reporting, environmental target tracking, audits or for internal visualization.

You can customize the content of your reports depending on their purpose and your reporting needs.

Reporting data can be exported and integrated in the retailer' system via our client API, or can be downloaded in CSV format. Besides this, multiple types of automatic reports can be generated in PDF format, for whichever selected time period.

All granular data recorded on the blockchain can be accessed in case more detail data is needed e.g. for auditing purposes.
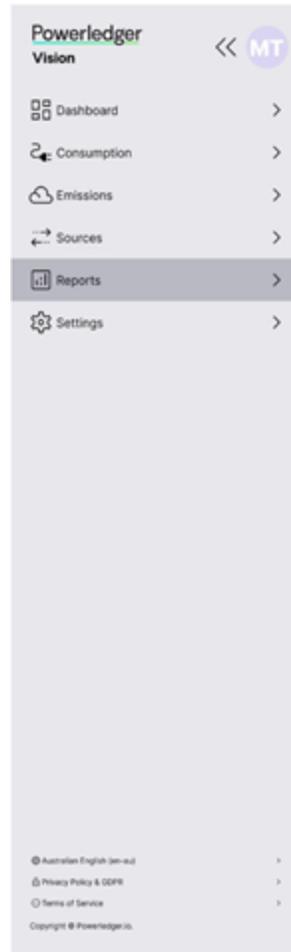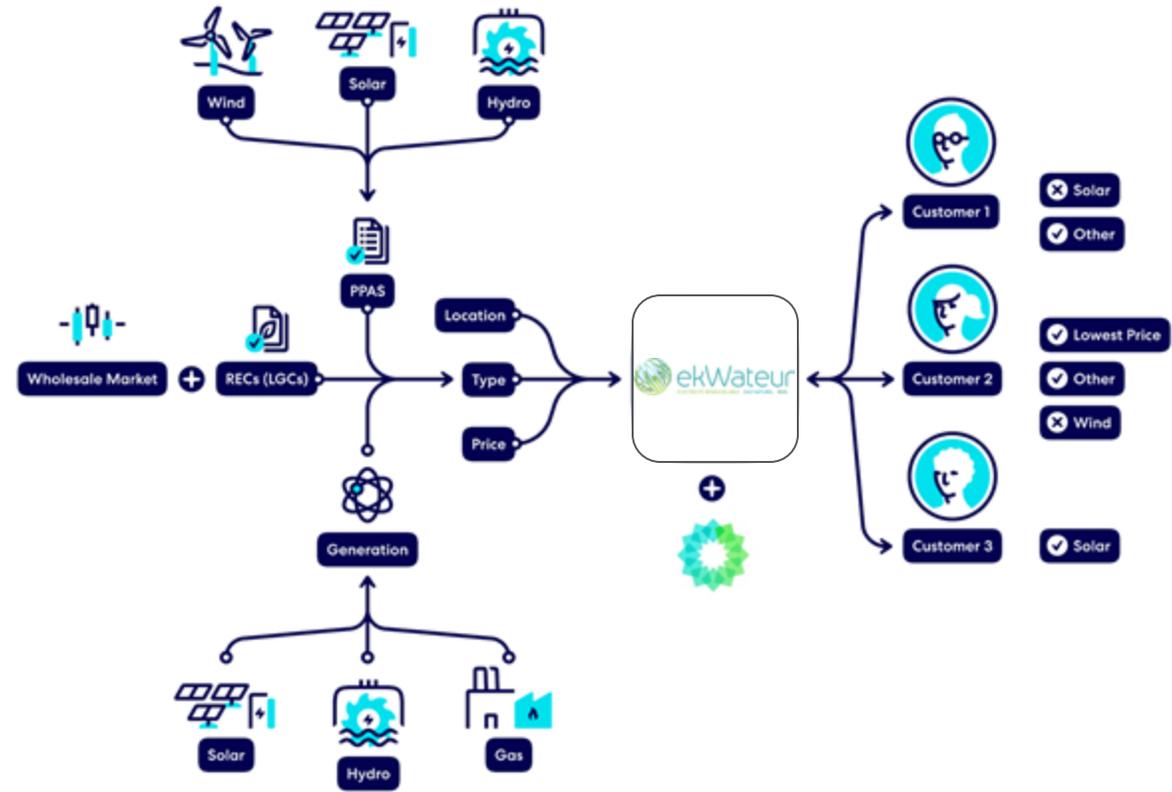

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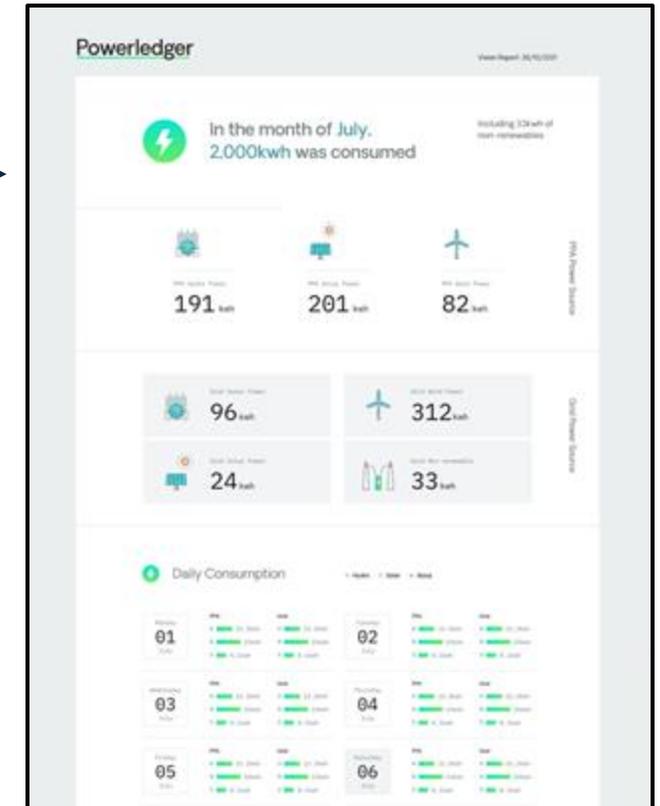
Value of Vision

Effective decision-making relies on data availability and the insights drawn from it. The first step towards 24/7 RE is a robust accounting system, this is what Vision offers.
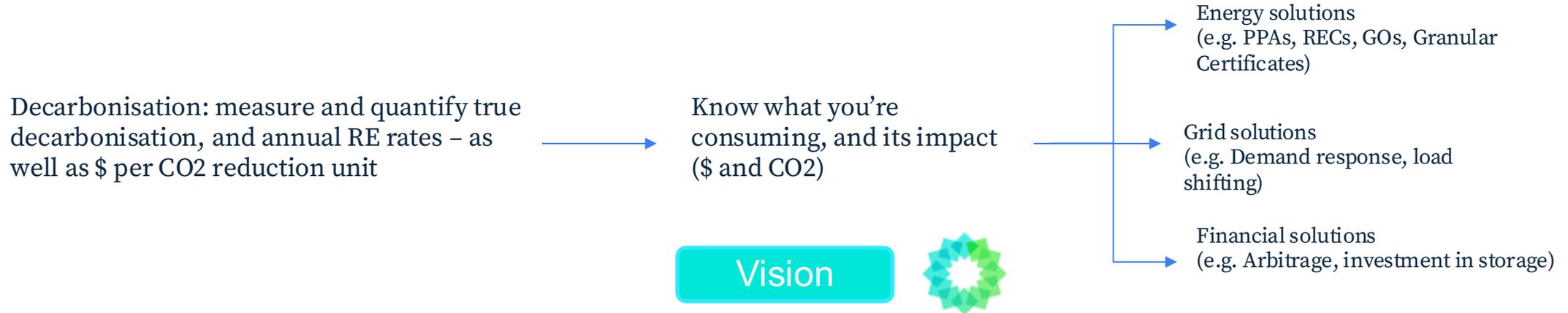
Blockchain technology enables an energy tracking system to operate more efficiently by using smart contracts to automate complex processes. At the same time, data stored on a blockchain offers an immutable, transparent and secure audit trail, which promotes trust and accountability. True decarbonisation is achieved by advancing towards 24/7 carbon-free energy, where every kilowatt-hour of electricity consumed is accounted for.

The main benefits Vision are:

- Provides visibility and transparency of energy usage, generation and costs
- Highly configurable energy matching algorithm
- Visualise carbon emissions breakdown and source
- Creates transparency in billing determinants for auditing

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Decarbonisation – with transparent traceability of emissions at its core

Decarbonisation: measure and quantify true decarbonisation, and annual RE rates – as well as $ per CO2 reduction unit

→

Know what you're consuming, and its impact ($ and CO2)

→

Energy solutions
(e.g. PPAs, RECs, GOs, Granular Certificates)

Grid solutions
(e.g. Demand response, load shifting)

Financial solutions
(e.g. Arbitrage, investment in storage)

Vision

An underlying platform to:
- Determine best service for Our Customer's client based on $ per reduced kgCO2
- Securely track and trace all energy supply
- Hourly and yearly RE matching
- Also allows tokenisation across services/ business units

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Vision current implementations

Shell in partnership with Powerledger has launched Vision as a PoC decarbonisation tool for their Micro-Grids and electrification businesses.

Shell sustainability team can trace and visualise in real-time and report to their commercial customers, where their energy comes from in near real-time, and track their carbon footprint granularly.

With Powerledger's technology, Shell can now effectively offset any consumption for their customers that is non-renewable and create an immutable/auditable trail or records using leveraging the power of blockchain.

- MYTILINEOS in partnership with Powerledger is introducing first time energy provenance tracking and tracing features in Greece through Protergia, its energy retail subsidiary.

- Protergia's consumers can easily trace and visualise where their energy comes from in near real-time, and track their carbon footprint granularly.

- With Powerledger's technology, MYTILINEOS can get an onestop view of their and Protergia's clients' entire energy portfolio, including onsite generation, PPAs and GOs, offering an efficient way of meeting energy targets at a low cost.

A smart city project involving three campuses and and 142 buildings, leading to 30% renewable energy autonomy. 13MW of solar, and 1.2 MWh of battery capacity across the campus.

Energy source tracking, matching and P2P trading across the campus buildings and faculties.

Granular carbon emissions intensity tracking and visualisation.

Overall reporting and governance on energy consumption.

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Vision for retailers: transparency and trust

Vision creates visibility, verifiability and trust over the energy retail process, provides price signals to produce more energy where and when it is needed and gives customers a voice in their energy sourcing

It introduces the concept of feedback information flow into your relationship with customers. **Customers can choose their mix and verify if their mix was delivered.** Naturally, all customers will be informed that their 'order' is subject to availability.

Vision has proved to improve customer engagement and acquisition. Read how French green energy retailer Ekwateur offers more visibility and choice to their customers here.

What our clients say:

"Our customers want the control and oversight over their mix of energy and with Powerledger, we can give them just that."

Julien Tchernia
ekWateur Co-founder and CEO

TraceX

TraceX is a digital marketplace that can efficiently handle the trading of renewable energy certificates, carbon credits and other environmental instruments.

Seamless trades

Users are able to place orders for renewable energy certificates (RECs/GOs) against those already available in the market dashboard or raise their own buy order using the purpose built UI. Anonymised orders become visible for all market participants as soon as they are placed, and when matched are executed with on-platform payments.

Registry integration

TraceX is fully integrated with the largest voluntary REC registry in North America — the Midwest Renewable Energy Tracking System (M-RETs). Users are able to link their M-RETs account and import RECs to the marketplace once the link is established. Successful purchases in the marketplace are updated directly through to their MRETs account.

Solid audit trail

Being blockchain-enabled TraceX captures data pertaining to imports, exports trades and retirements events of environmental attributes on a proprietary distributed ledger — providing an immutable and verifiable audit trail.
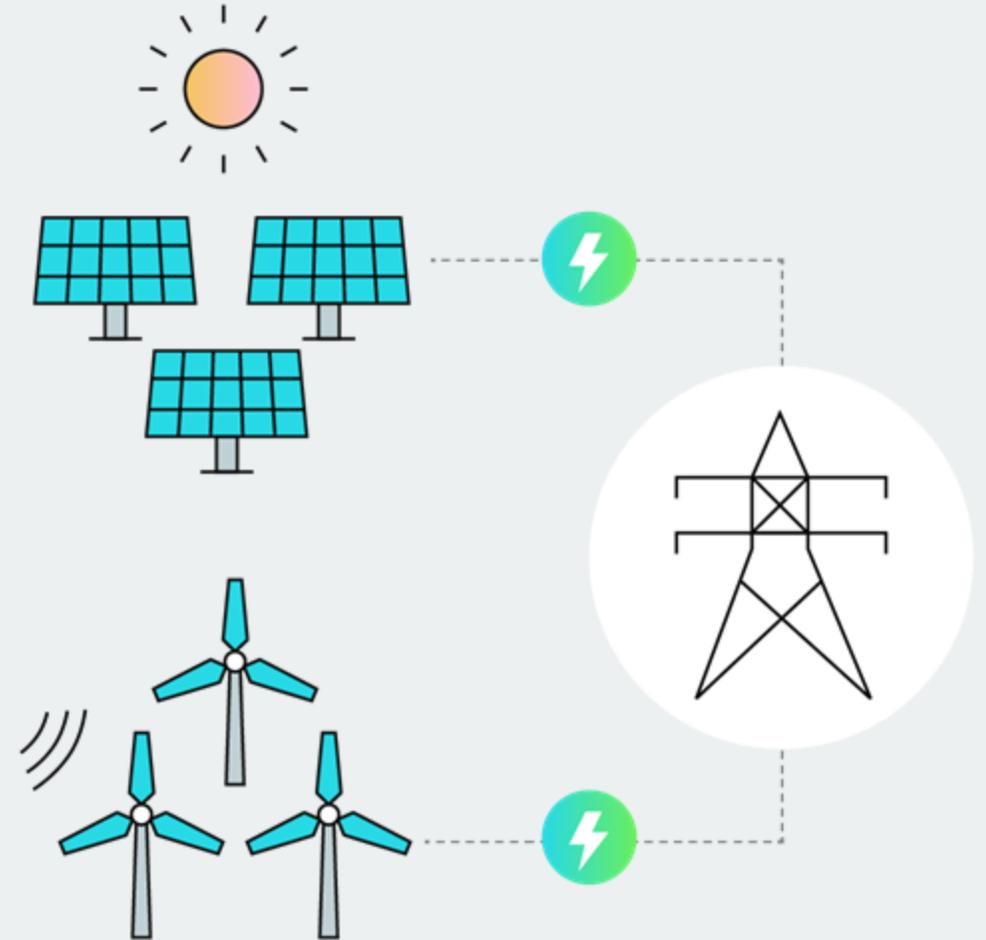
TraceX^{TM}: Visualize and manage your REC/GO portfolio, trading and retiring RECs/GOs

Powerledger has digitised the full Renewable Energy Certificates (REC)/ Guarantees of Origin (GO) lifecycle, by automating each stage of a heavily manual process

From renewable energy reporting to enable faster REC/GO issuance, through to a digital marketplace for the trading, settlement and retirement of RECs/GOs.

Our proprietary blockchain technology allows us to track energy from your renewable asset, at point of creation, through REC issuance and storage, across trading and settlement and finally retirement.

TraceX ensures the trading of environmental commodities and renewable energy credits is more transparent, liquid, secure and efficient.

More information about TraceX can be found here.

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TraceX - 24/7 Granular Certificates

Configuration #1

- **GC system evolves out of GO system:** The GC system is the evolution of an existing GO system, such that the currently appointed GO Issuing Body evolves into a GC Issuer (e.g. MRETs in US Market)

Configuration #2

- **GC system supplements GO System:** The GC system is an extension of an existing GO system and is managed by verified and approved third-parties. (I-REC Model, ROW)

- Tasks and responsibilities related to the GC system are performed by third-party entities in compliance with the rules and oversight of the existing GO system and GO Issuing Body.

Time is recorded on the blockchain for every generated transacted/ consumed Wh

Location is recorded on the blockchain for every generated/ transacted/ consumed Wh

Time and location stamping of energy generation and consumption is key for enabling the transition to a 24/7 renewable energy system

TraceX leverages data from Vision to fill deficits or sell surplus (Configuration #1)

Filling the gaps

If TraceX identifies deficit in your RE portfolio it will automatically suggest a buy order to fill this gap.

OR

Trimming your excess

When you have contracted excess RE, that is more than your consumption for any hourly interval, then TraceX suggests a sell order so you can instantly monetise the excess.

Broker fees, errors, legal costs, credit checks and counterparty risks all disappear with TraceX.

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TraceX exchange style market is highly automated and efficient. Greater liquidity, increased transparency and price discovery.

User's energy profile (contracted RE and consumption) can be uploaded onto the platform through the following options:

1. Manually by customer on predefined time basis; OR

2. Leveraging energy tracing & tracking tool. Power Ledger has capability to understand and track the consumption profile (Master meter) and the current portfolio of contracted RE

TraceX identifies Granular Certificate purchase and sale opportunities. Leveraging a users RE profile, it can identify Granular certificate deficit or surplus on an hourly basis for a defined time period and proposes purchase or sale for the customer to execute.

TraceX

Benefits

- **Faster and Cost Efficient**
  TraceX offers a standardized set of terms for all trades, meaning all marketplace participants are pre-qualified resulting in no back-office costs or legal fees. Trades clear in 1-3 business days vs upto 30 days* in OTC trades

- **Real-time price discovery, reduced transaction fees**
  TraceX users benefit from pricing transparency and save significantly on REC trades when compared to OTC trades. TraceX users save upto 15%* in transaction fees when compared to OTC trades

- **Future Proof**
  Scalable to facilitate over +50,000 transactions per second and digital currency ready

- **Mitigates Credit Risk**
  Participants payment account must be linked prior to trading. All buy orders are only accepted where there is sufficient funds in your nominated account

- **Mitigates Settlement Risk**
  RECs are encumbered on the originating registry during import process to prevent double-selling

- **Streamlined Procurement**
  TraceX Integrates with M-RETS to help you manage sell and transfer REC certifications in
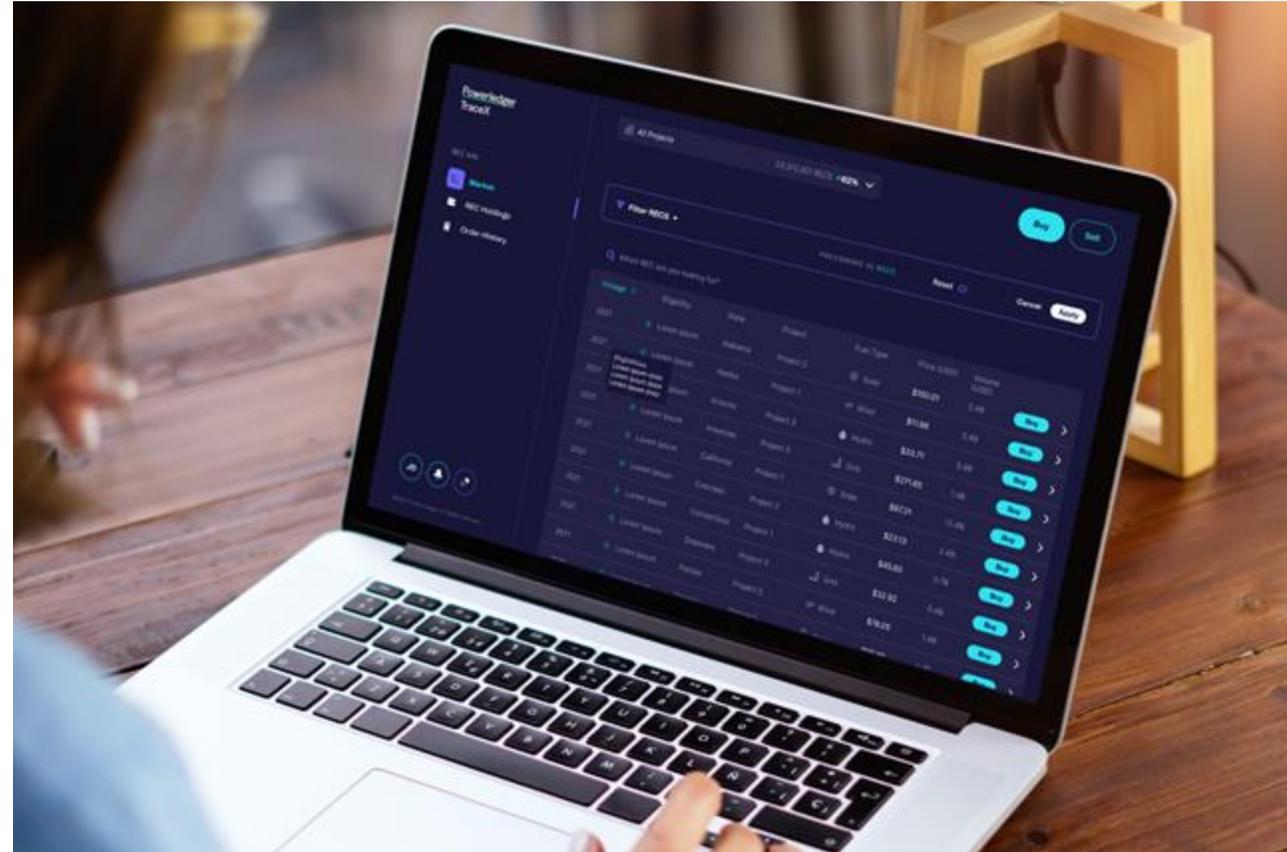
More Case histories

Some recent projects from our [client list](#).

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TraceX™ : Visualize and manage your REC/GO portfolio

M-RETS

Midwest Renewable Energy Tracking System (M-RETS)

M-RETS is the largest energy certificate register in the US, and tracks generation from renewable resources across all of North America.

Power Ledger's is partnered with M-RETS the largest REC registry in North America. M-RETS validates the environmental attributes of energy for over 122 million RECs p.a. to serve as a trusted centralized gateway to environmental markets. TraceX is fully integrated with the registry, enabling customers to buy and sell RECs seamless using on-platform payments. Successful purchases in the marketplace are updated directly through to their MRETs account and ownership transfer updated on the blockchain.

"M-RETS' partners were seeking a mechanism to support the transactional process associated with REC marketing and settlement. Powerledger's technology was clearly the best solution; its success has been proven in a number of energy markets and their technology is already in use in North America."

Benjamin Gerber,
M-RETS Executive Director

Powerledger

Choose Your Energy Mix, France

A world first application of blockchain to do energy matching for 24/7 renewable energy

Customers can choose their energy mix, based on the type of renewable energy, location, time and type of the generation — from rooftop PV to large generation.

The Platform tracks, traces and provide irrefutable transparency giving the customers control over the energy mix they buy.

Launching this new product to 300,000 electricity meters across France.

Customers joining this innovative retailer because of transparency and choice.

EkWateur use case on the eurelectric 24/7 RES taskforce:
https://247res.eurelectric.org/powerledger/
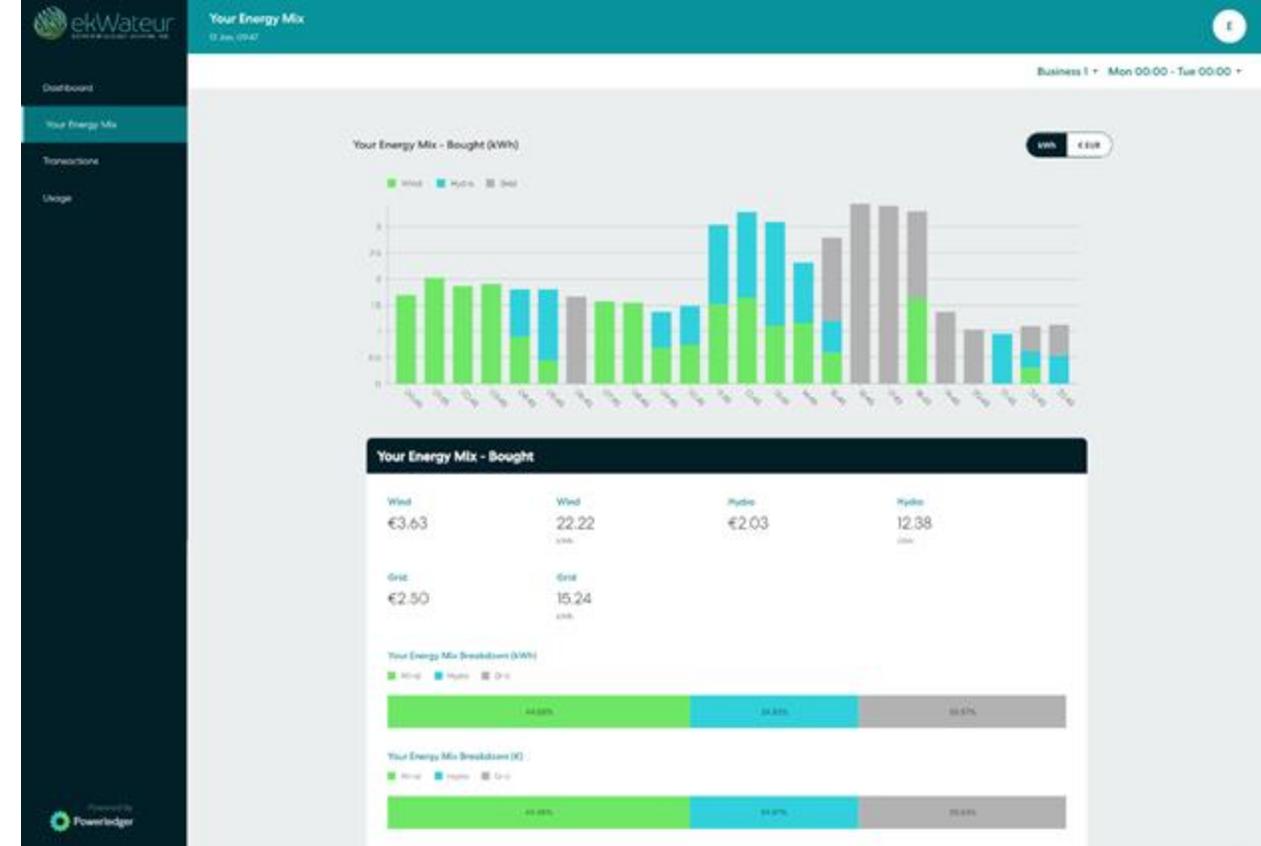
Vision™: Track and Visualize your energy generation and PPAs via Blockchain

Smart City at Chiang Mai University, Thailand

A smart city demonstration project involving three campuses and 142 buildings, leading to 30% renewable energy autonomy.

13MW of solar, and 1.2 MWh of battery capacity and EV charging across the campus.

Powerledger applications in use:

Energy source tracking and matching

P2P trading across the campus buildings

Carbon footprint and carbon intensity tracking

Green Energy for EV charging

Battery for grid resiliency

Why Powerledger?

1

Strong energy market experience, delivering solutions that solve real problems to add value for our customers.

2

Advanced software development experience in delivering simple solutions that leverage blockchain tech to solve complex issues.

3

We aspire to build the best user experience, ensuring all participants are well supported and able to easily navigate through our platform.

4

Deep experience with rapid prototyping to adapt to nuanced software requirements.

5

Proven track record in delivering platforms to support large volumes of micro-scale transactions and settlements between parties.

6

Proven track record in delivering platforms to track and trace environmental attributes on an auditable distributed leger.

Powerledger

Thank you

For partnerships please contact:

🌐 www.powerledger.io

🐦 @powerledger_io

📘 facebook.com/powerledger

✈ t.me/powerledger

Vinod Tiwari

Global Head of BD & Partnerships

vt@powerledger.io

+61 419 923 241

Perth, Australia

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