

DISRUPTIVE TECHNOLOGIES IN THE DISTRIBUTION SECTOR: USE CASES FOR INDIA

Presented by
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Powerledger

About Powerledger



Australian software technology business founded in 2016.

We use blockchain for new applications, spinning off market places for enabling people and businesses to transact and trade energy. We support grid resiliency through flexibility services and trading of environmental commodities.



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smartEn
Smart Energy Europe

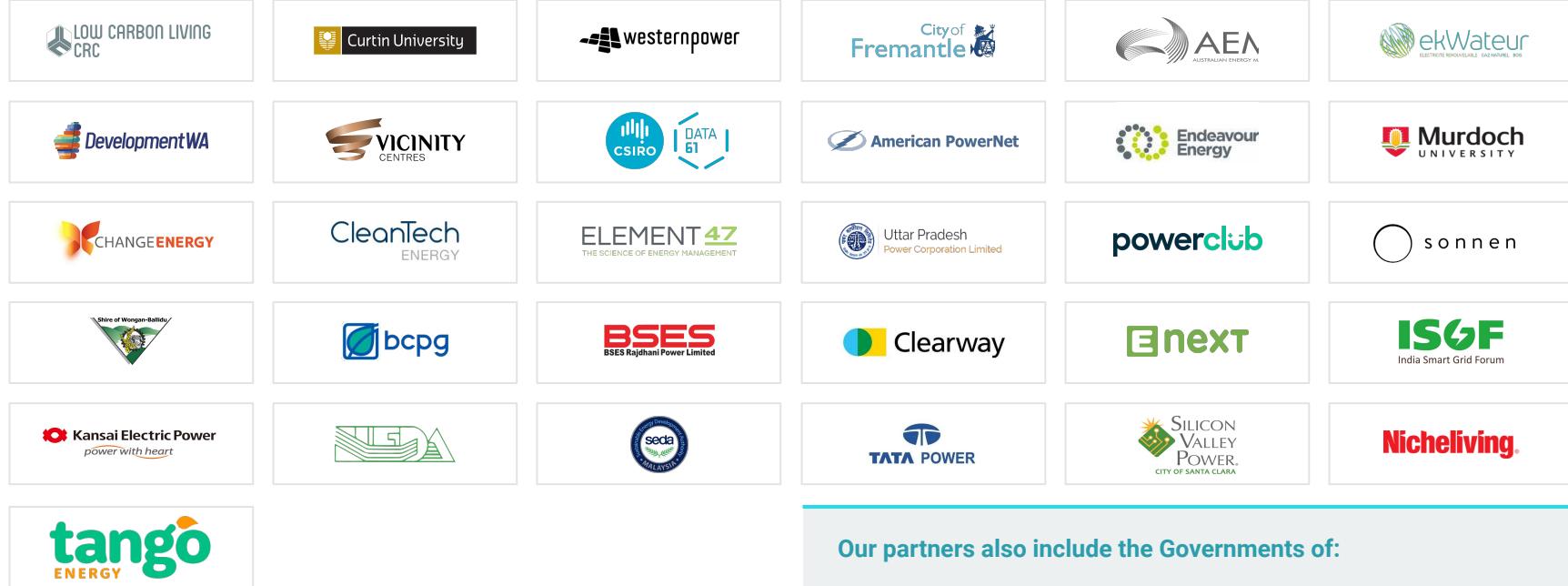


GBBC
Global Blockchain Business Council



EnergyTag

Powerledger is a partner of global brands



Our partners also include the Governments of:

Thailand

Malaysia

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Increasing demand for Powerledger's Platform



Powerledger's technology is available in eleven countries, across four continents – enabling the trading of cheaper, cleaner electricity, and the emergence of a greater level of grid stability.



The software we call our Platform features' works alongside the existing infrastructure of energy systems, enabling greater control and ownership for energy consumers and producers alike.

Our clients and partners are getting ready for the new electrical world. Their customers need stable grids and scalable renewable energy.

Customers want genuine renewable energy; they also want their Renewable Energy Certificates (RECs) to be matched against their load profile and demand – they want to know the provenance of every one of their kilowatt hours. And they expect to choose, track, trade and trace what's going on on a 24/7 basis.

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The problems that Powerledger's Platform solves



We solve
the time problem



We solve
the place problem



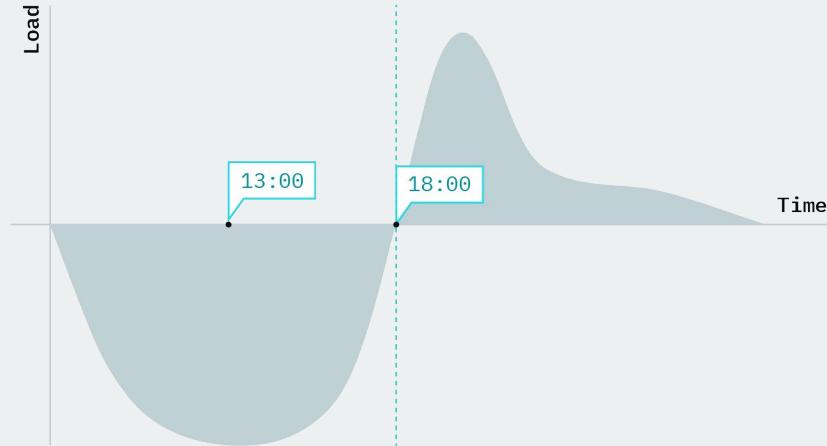
Both are needed to get to
24/7 renewable energy



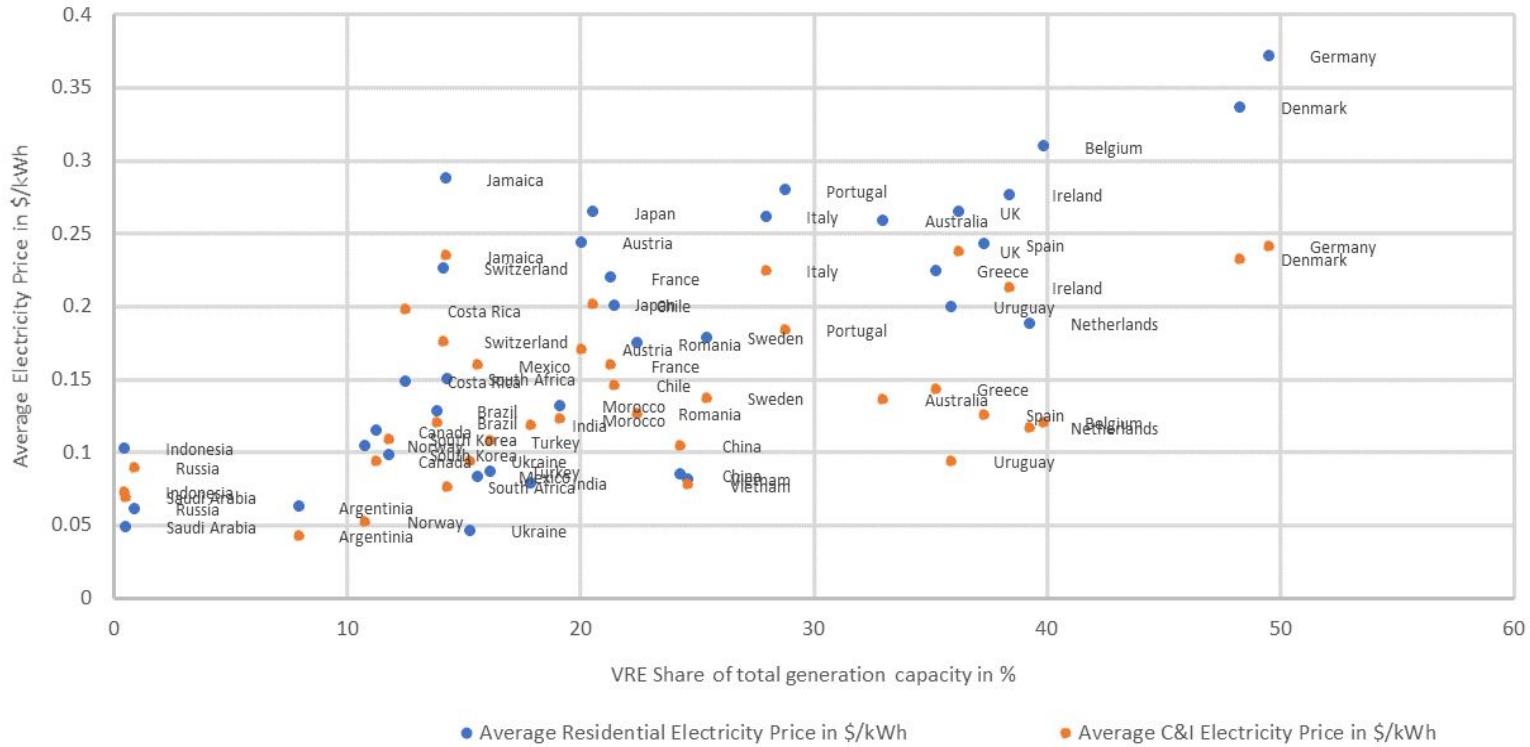
The time problem

Temporal grid problems, like the duck curve, are experienced every evening around the VRE world.

The world continues to produce a large surplus of electricity many hours before demanding that electricity in the evening. An agile market supports loadshifting — which is much cheaper than using batteries.



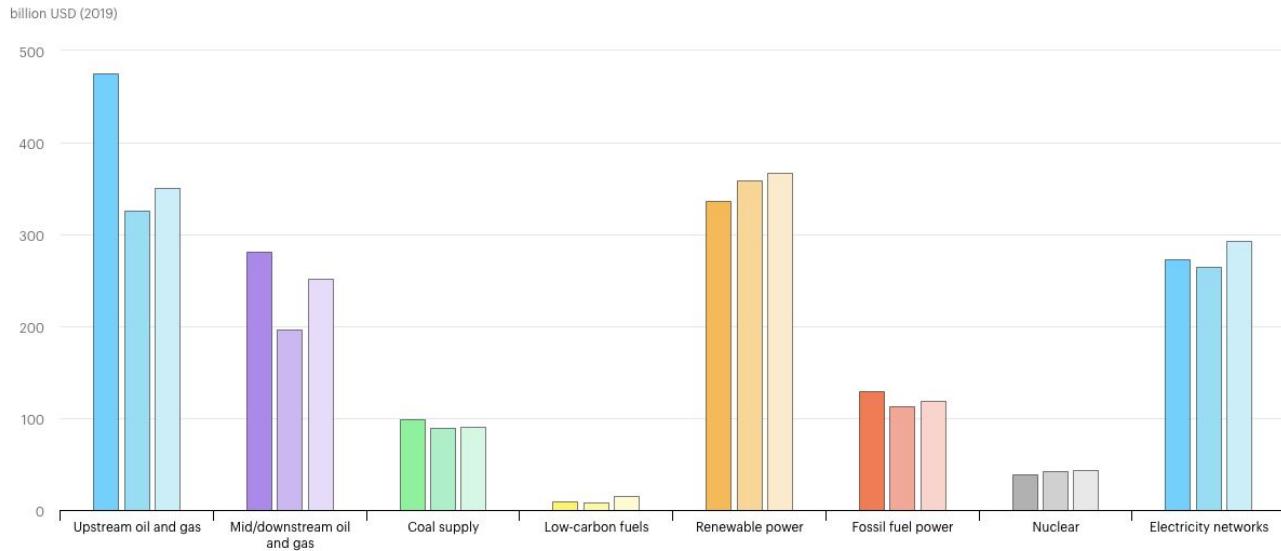
Average electricity retail price vs VRE generation capacity share



Global energy investment: Network spend driven by renewable energy spend

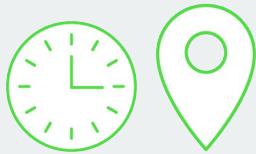


Source: IEA



Solutions

Powerledger's Platform



We believe the grid is only as good as the market that sits behind it.

Based on the tracking and tracing of energy, we spin up marketplaces for the trading of energy and for grid services.

Powerledger's Platform features: Blockchain and tracking layers



Our Platform features

Vision

This feature enables the tracking and tracing from the source and matching of 24/7 renewable energy — spinning up market solutions, all recorded on the blockchain.

TraceX

This works with Vision to enable easy trading of RECs which are time and place specific.

xGrid/LEM: P2P energy trading across grids

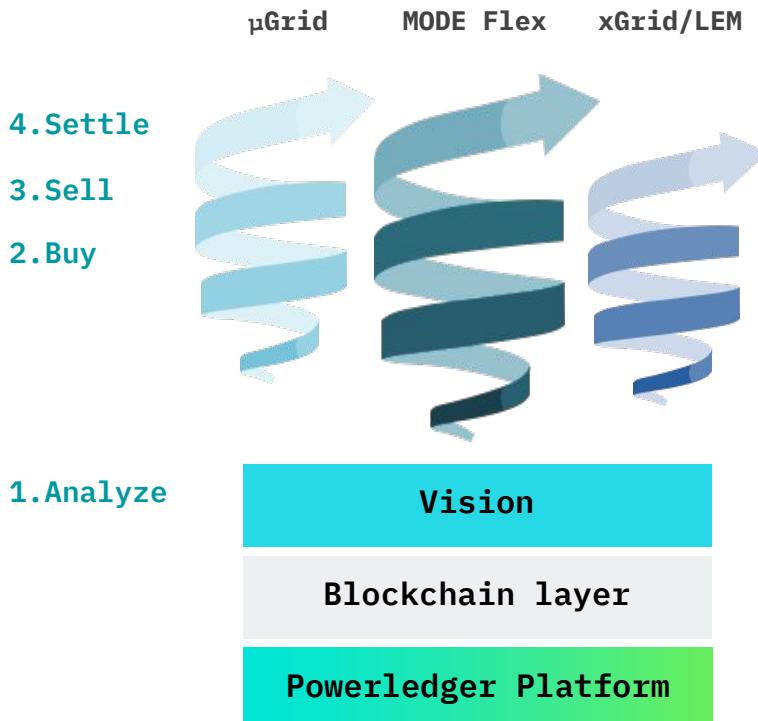
uGrid: P2P energy trading within microgrids

MODE Flex: Trading flexibility services to stabilise grids.

PPAx: Trading PPAs

Blockchain

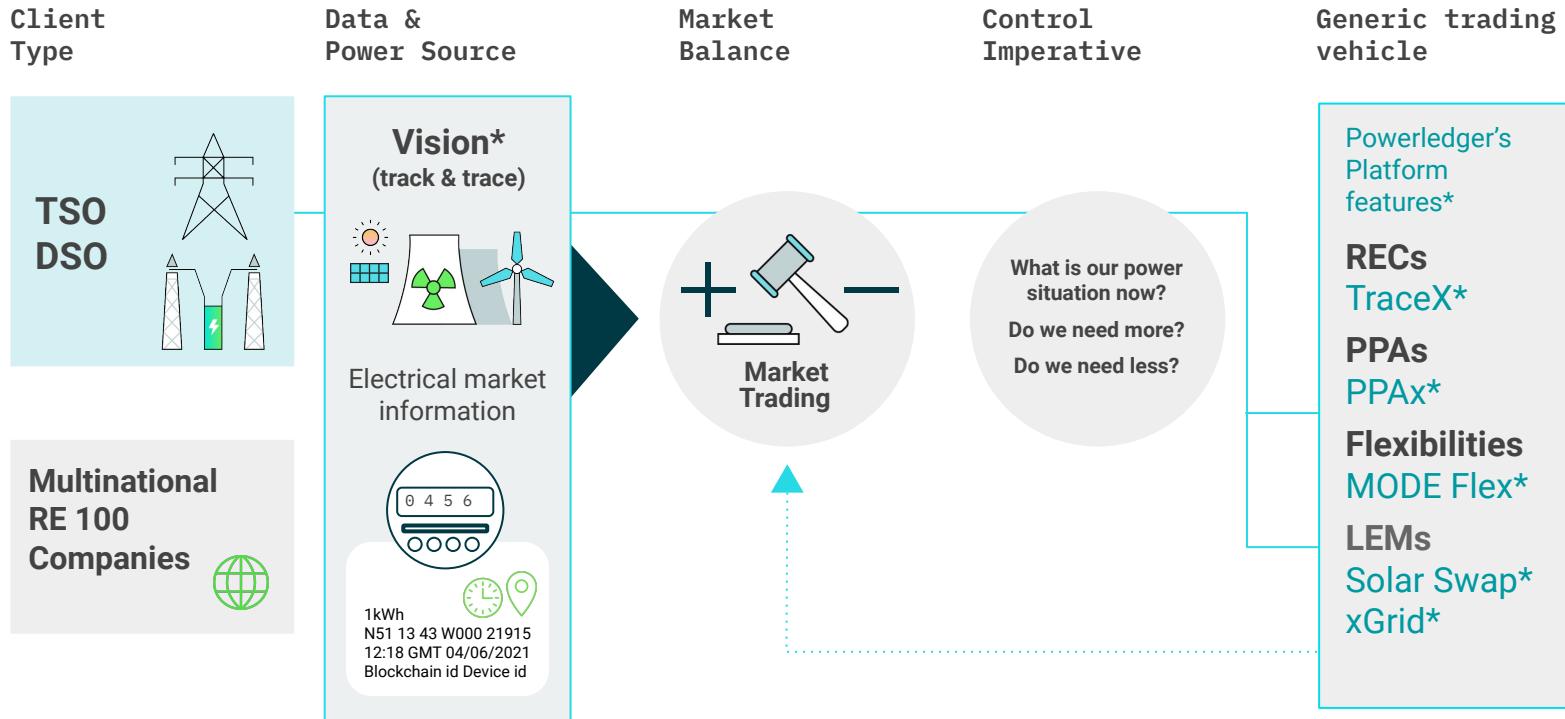
Records energy, time, place, device ID, blockchain ID, smart contracting settlement function.



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Core customers and how they can use Powerledger's Platform



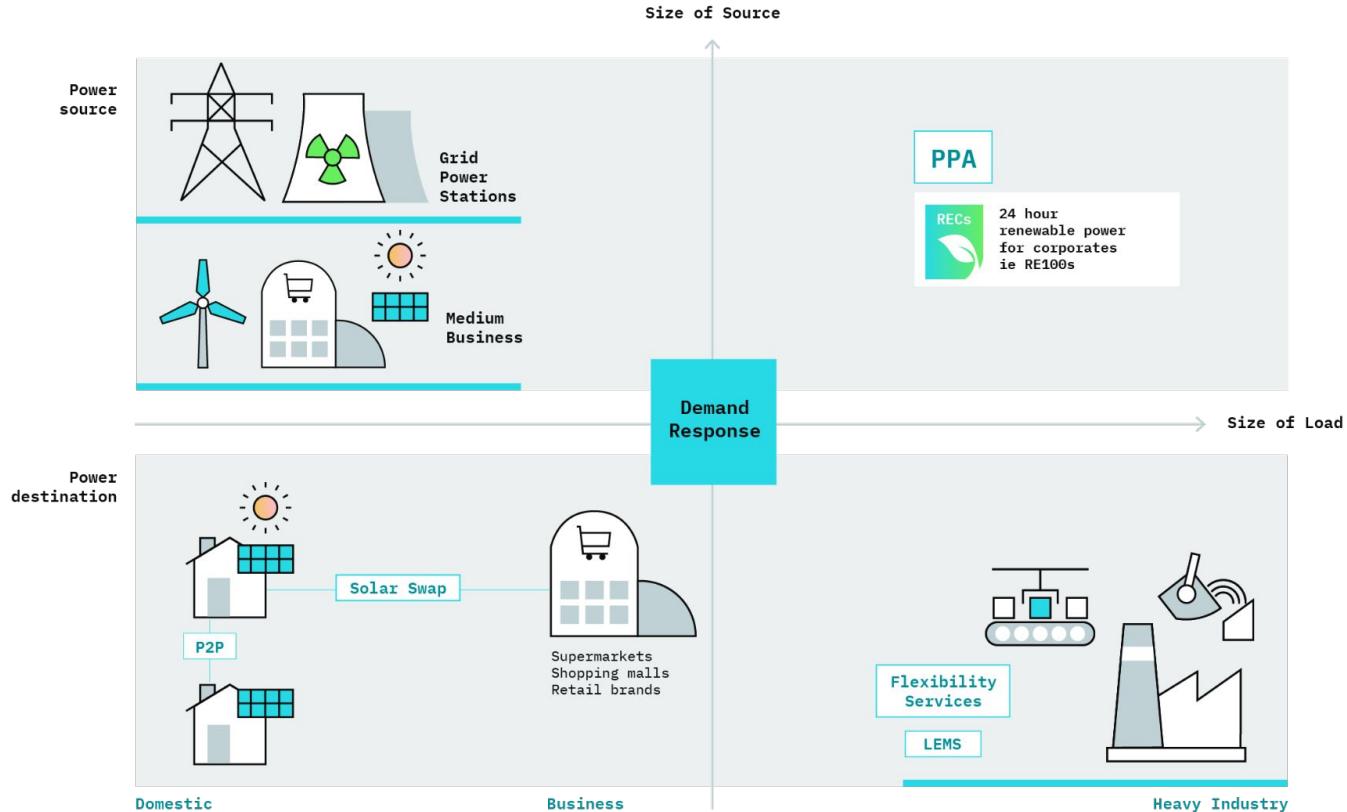
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These solutions address time and place needs for 24/7 renewable energy



The new energy paradigm: a two-sided distributed energy market



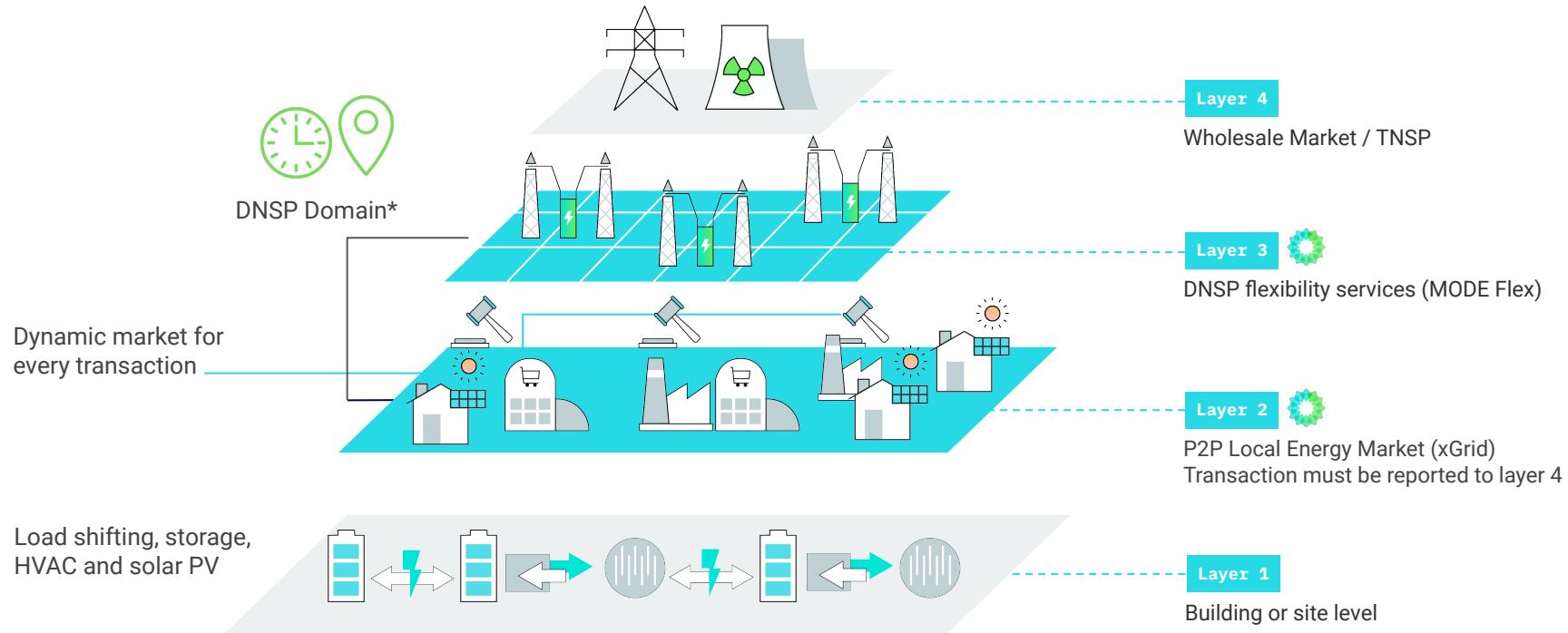
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RELEVANT USE CASES

Our global journey of
Democratisation of Power for
Sustainable Future

Two additional market layers in the new energy paradigm



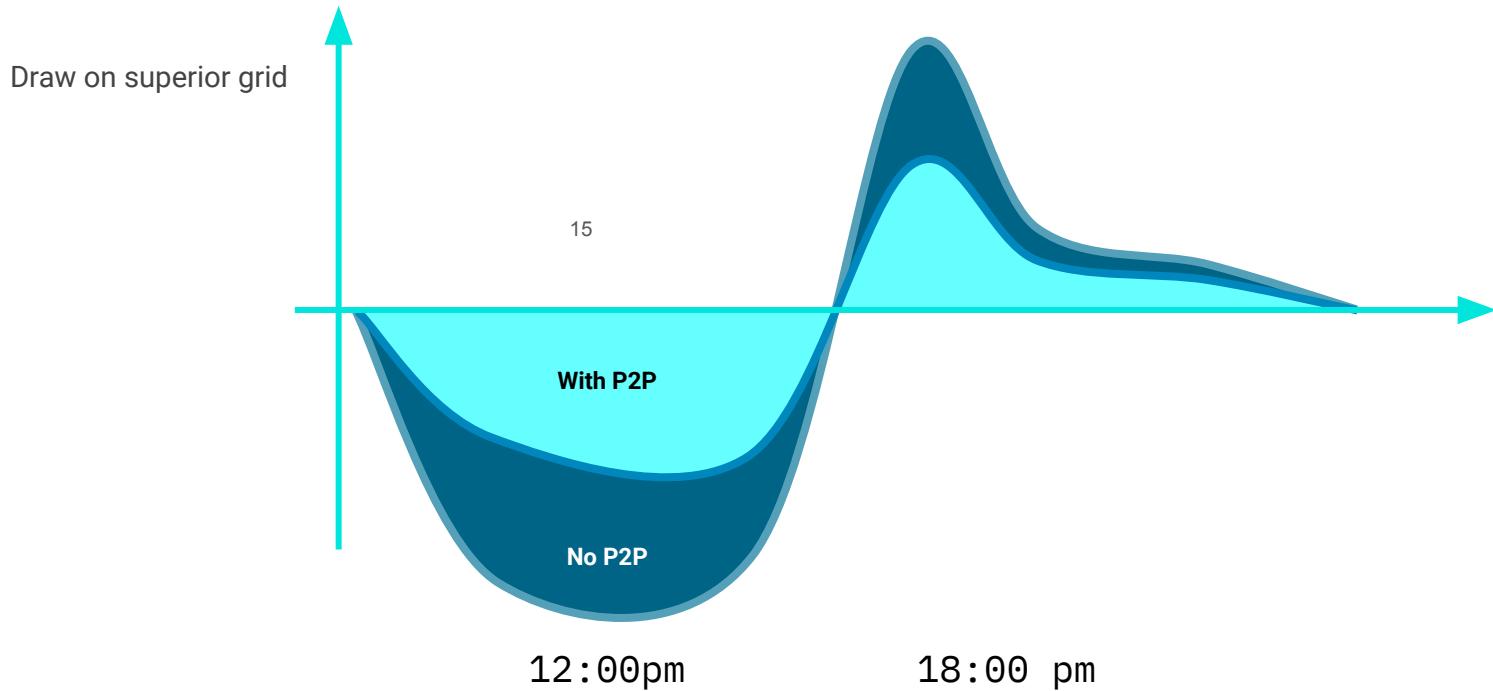
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* These solutions address time and place needs for 24/7 renewable energy



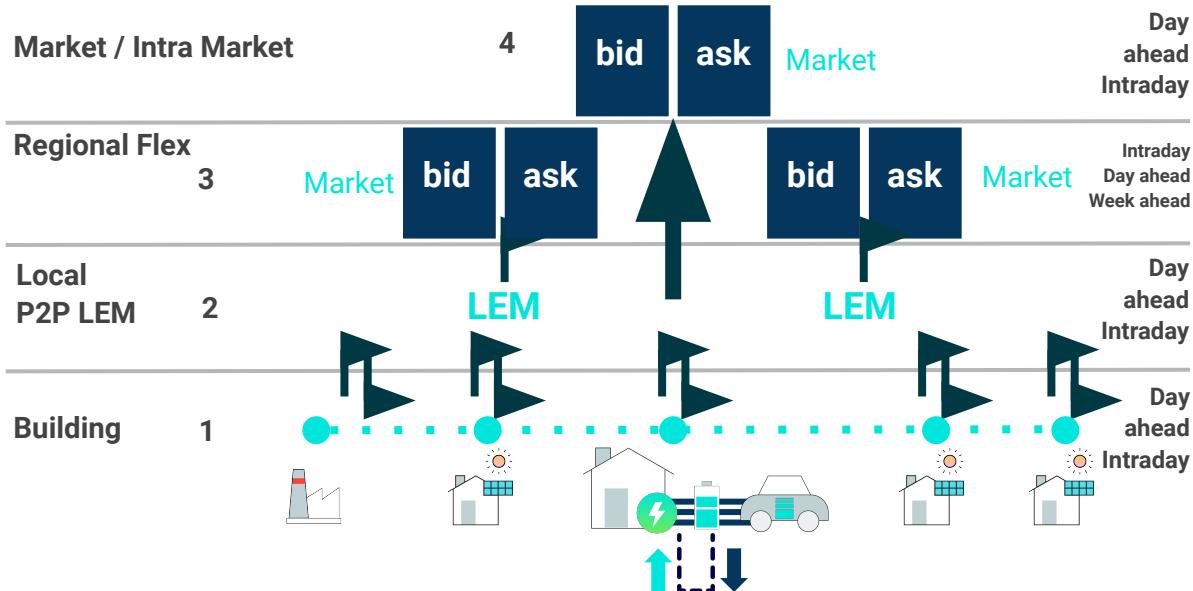
P2P can flatten the duck curve



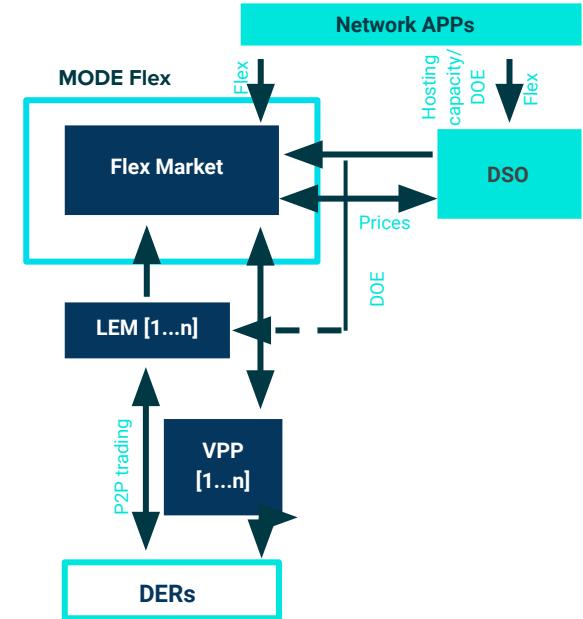
Transactive Energy Systems for Market-Grid interaction



MODE Flex and LEM enablers of market – Grid interaction



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Local Energy Markets in Delhi

Demonstrates benefits of **peer-to-peer energy trading** for TPDDL and their customers across Delhi as an **alternative** to Net Metering.

The project includes a combination of TPFFL owned sites and real customer sites - both **prosumers** and **consumers** - in total **approx 145 sites** trading excess solar energy.

This includes a **1MW solar PV plant** owned by Tata Power. An **EV charger** is also included to demonstrate tracking the usage of green energy in the TPDDL EV fleet.

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Local Energy Markets in Uttar Pradesh

Powerledger, in **partnership** with ISGF, was selected to assist Uttar Pradesh Power Corporation Limited (UPPCL) and UP New and Renewable Energy Development Agency (UPNEDA) to introduce **blockchain technology** to enable **P2P trading of solar energy** in India.

The **UP government** is one of the **first** in the world to formally recognize blockchain as a mechanism to make energy markets more efficient. This partnership led to **legislations** to mandating **P2P trading of solar energy** in the **biggest** state in India.

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Local Energy Markets: Bangkok, T77 Precinct



Began in **2018** as the largest commercial P2P energy trading project in the world.

700kW solar being traded across **six sites**.

In Q4 **2021**, 077 precinct added bringing additional **1.2MW** in size with **10 commercial buildings** in the marketplace.

Success of this project led to the **partnership** between Powerledger & TDED.



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Local Energy Markets T77 Precinct



Maximize the **utilization** of community building rooftop.

Create **sharing** economy.

Sell excess electricity beyond PPA to **community**.

Reduce Congestion in local grid.

Reduce average electricity generating **cost** for community.

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Local Energy Markets Smart City at Chiang Mai University

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

12MW of solar, and 1.2 MWh of battery capacity across the campus.

8MW going live Q3 - Q4 2021.

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



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Silicon Valley Power - RECs



Connected to the **second largest** Electric Vehicle (EV) **charging station** in California, which is powered by solar.

Powerledger's platform **automates** the process to request Low Carbon Fuel Standard credits issued by the California Air Resources Board.

Helping **renewable infrastructure** owners to not leave any money on the table.



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Carlton & United Breweries - Solar Swap



Victoria Bitter Solar Exchange is a world-first. Households with **solar** sell their excess power to the brewery, in exchange for cartons of beer.

The exchange rate is 1MWh = 96 cans (4 cartons).

Participants can **track** how much **energy** they have generated and how much beer and when the next delivery of the carton of beer is expected.

The program is oversubscribed and demonstrates **brand engagement** opportunities.

This project shows how some day, all companies could be **powered** by their **own consumers** in an environmentally **sustainable** way.

Earned media reach 331m people globally.



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MRETS - RECs

Powerledger has partnered with the Midwest Renewable Energy Tracking System (M-RETS) to launch a **Renewable Energy Certificate (REC) marketplace** in the United States.

M-RETS tracks generation from renewable resources across all of North America, serving as a trusted centralized gateway to **compliance** and voluntary **environmental markets** to make it easier to track **RECs** through one system.

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ekWateur - Vision

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 Q4 2021.

Customers joining this innovative retailer because of transparency and choice.



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The mega trend: 24/7 renewable power

Google



“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

Microsoft



“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

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We welcome the
opportunity
to partner with
you!

Thank you

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November, 2021

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