



DLT in Smart Charging Applications

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OLI Systems at a glance

Founded by industry experts

- Founded 2016 in Stuttgart by Dr. Ole Langniß and Peter Vogel
- Goal: Developing blockchain-based solutions for the energy industry 4.0
- As of today, OLI hard- and software in use across Europe and in China
- >20 employees at two branches: Stuttgart (Baden-Wuerttemberg) & Harthausen (Rhineland-Palatine)
- Network of over 60 partner companies, research initiatives and universities
- Active in the sectors E-mobility, Energy, Real Estate & IT



Dr. Ole Langniß
CEO, Co-Founder



Peter Vogel
CEO, Co-Founder



Dr. Thomas Brenner
CTO

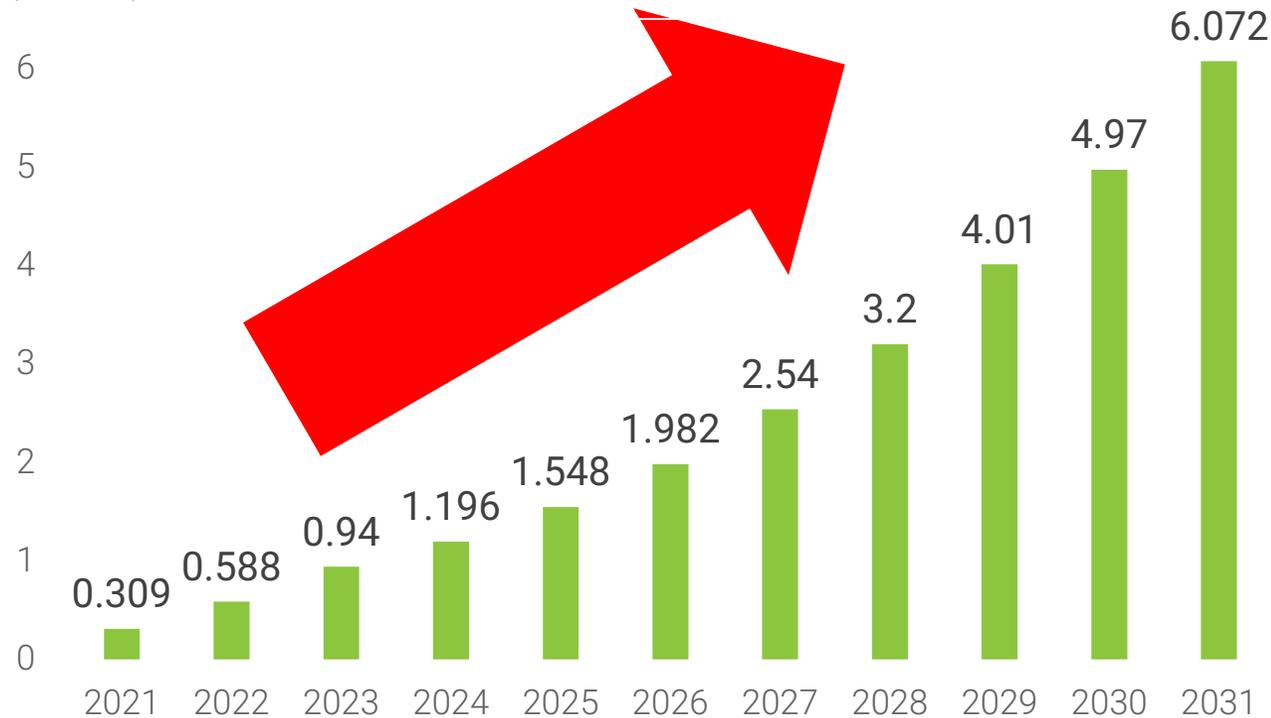


EVs on the rise: Forecast for Germany



x20 in ten years

of EVs (in Millions)



- Dynamically increasing market
- Increase in battery capacity
- Private interest increases
- Strongly growing demand for charging solutions

Where to charge?

Where EV's were charged in Germany in 2019



64,7%



Home

Wallboxes or chargers mostly 11kW-22kW or simply plugging in into household socket, owned and operated privately



15,1%



Public Charging Stations

Public or semi-public charging stations installed at public parking spots or fast chargers alongside highways



7,4%



Workplace

Charging stations connected to the commercial surrounding of a working place. Owned and operated by the employer

Vietnam: EVs and EV charging still in their infancy, BUT:

- 33 % of Vietnamese car buyers intend to buy an EV upon their next purchase*
- Car ownership is growing steadily over the years
- Vietnamese car maker starts to sell EVs (VinFast)
- Grid is in many cases not prepared for EV charging
- Charging parks are being installed (11.000 plugs as of June 2021)**



*<https://wieck-nissan-ao-production.s3.us-west-1.amazonaws.com/releaseInlinelImages/074b20d9e25174eab8146462b7be1932083d9d3a?response-content-disposition=inline%3B%20filename%3D%22The%20Futu.pdf%22%3B%20filename%2A%3DUTF-8%27%27The%2520Future%2520of%2520Electric%2520Vehicles%2520in%2520Southeast%2520Asia%2520-%2520A%2520Position%2520Paper%2520from%2520Nissan.pdf>

**<http://hanoitimes.vn/support-policies-for-evs-mapped-out-to-encourage-vietnamese-private-sectors-participation-318649.html>

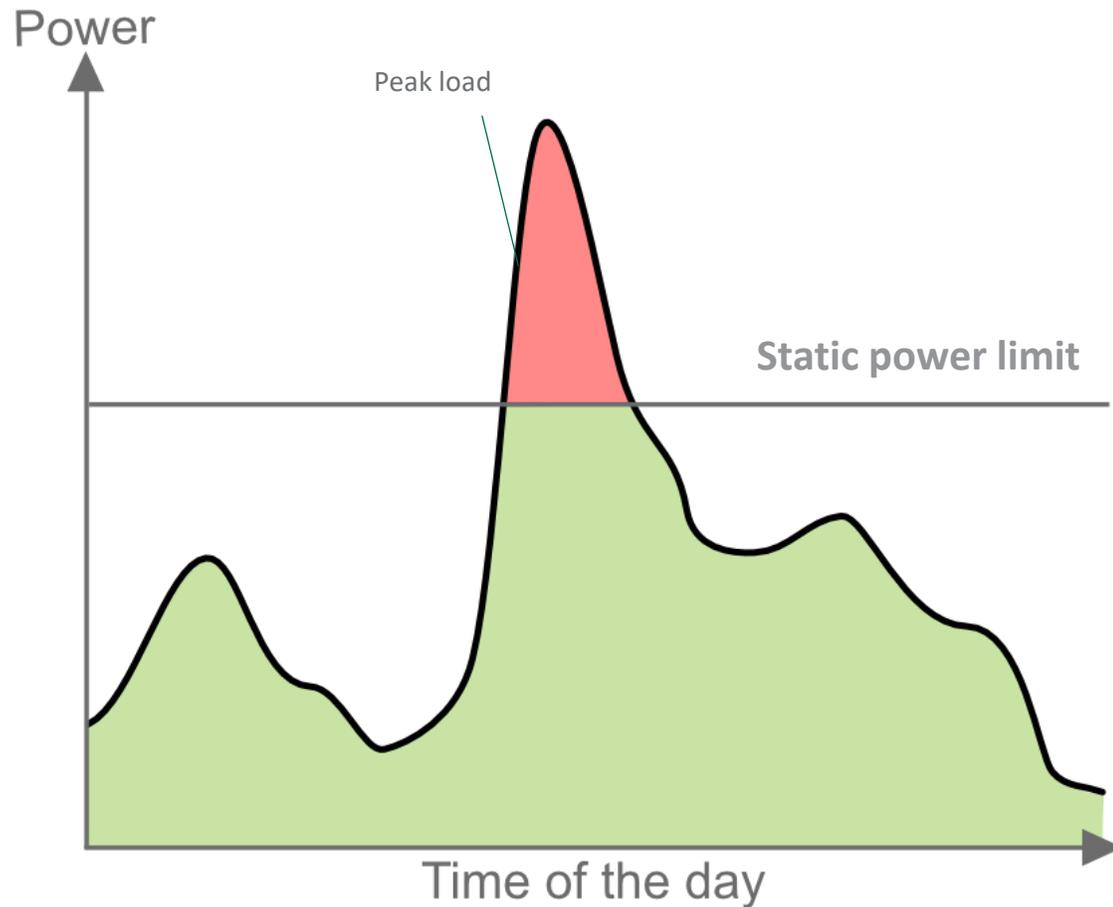
The same in Germany: Power issues

DIN 18015-1 (14,5 kW / housing unit)



Peaks through simultaneity

Peak loads troubles capacity of grid connection



Punctual peak loads

- Overloads happen through multiple charging requests at the same time
- Peaks can cause blackouts because attached load remains the same and is not reduced
- Ramping up capacity is cost intensive and requires expensive interventions into the grid connection
- With growing RE share, charging must follow RE patterns for economic and stable charging

User centric solution

Involve and incentivize the user using blockchain



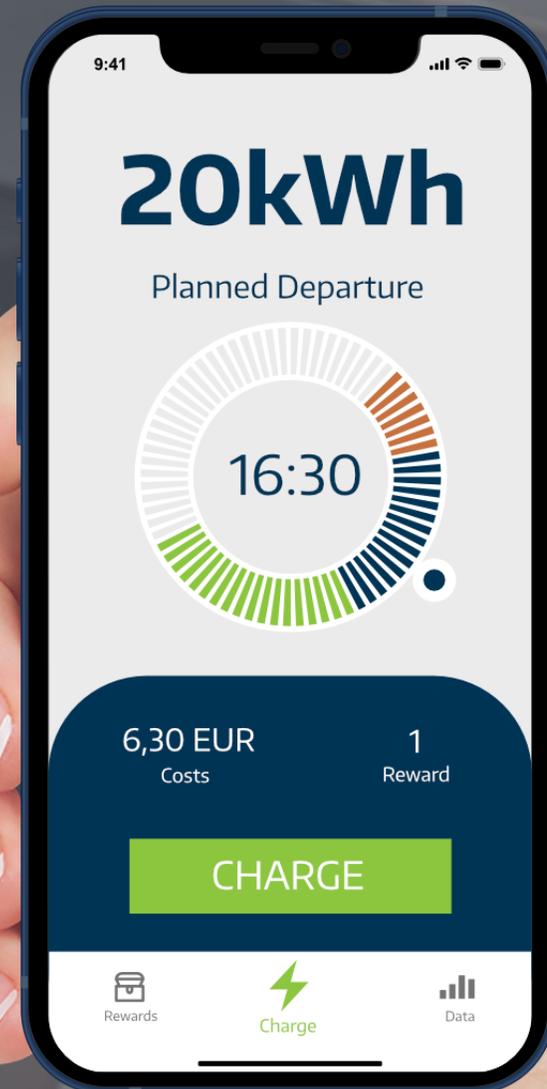
Dialogue instead of a one-way street

With OLI Move, charging an electric car becomes an interactive process that addresses the needs of the user.



Reward flexibility

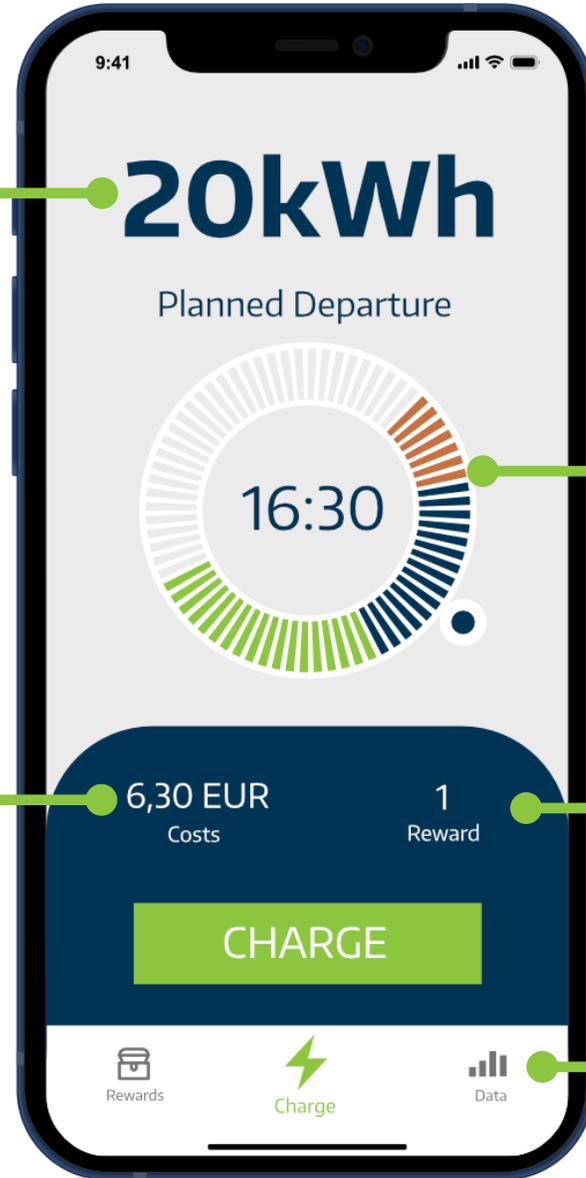
OLI Move rewards system-beneficial loading processes that correspond to the specification. In this way, the user can actively participate in the ideal use of the existing infrastructure and earn rewards such as "quick charges" through system-friendly behavior.



The OLI Move App

Requested kWh
User tells system how many kWh he would like to charge.

Costs of charging
System calculates incurring costs of charging



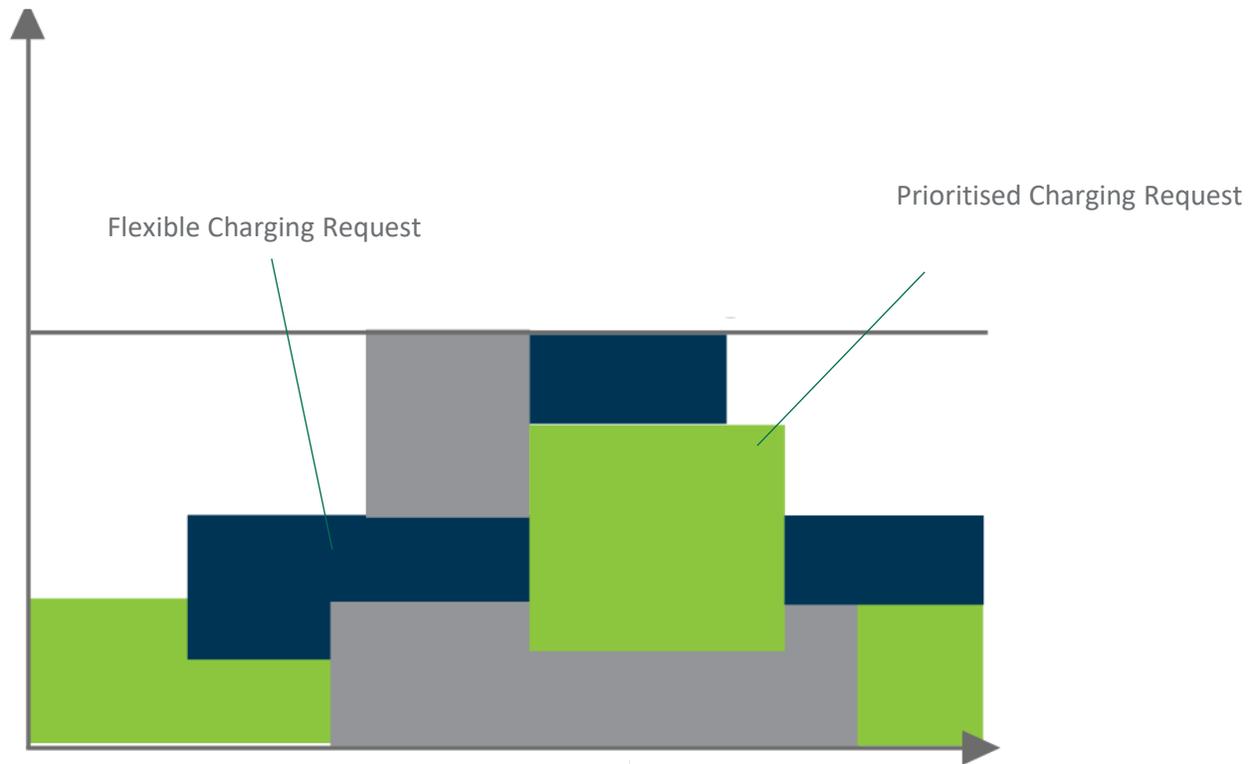
Planned departure
User informs the system of the earliest moment at which the desired amount of kWh should be fully charged

Reward token
User receives a reward token for system-friendly charging

Dashboard
Overview of past charging processes, total charged kWh and rewards

Intelligent “charging tetris”

Avoid peak loads through smart charging

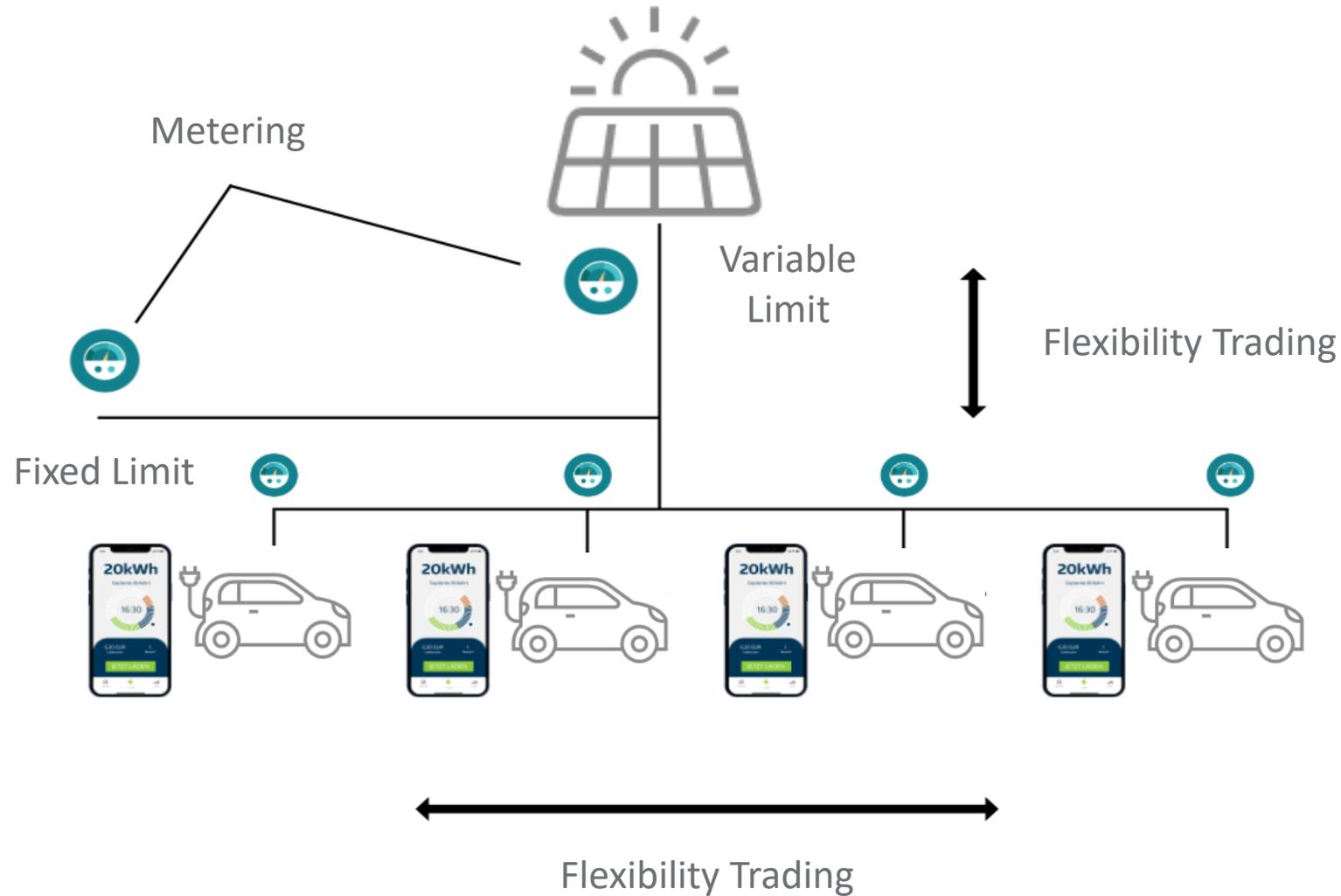


Intelligent OLI Optimizer

- Optimal utilization up to the load limit
- Intelligent detection of home consumption in real time
- Adjustment of the load limit along house consumption peaks and ad hoc consumption
- User-friendly charging with the inclusion of flexibility
- Blockchain based incentive system for users to provide maximum flexibility

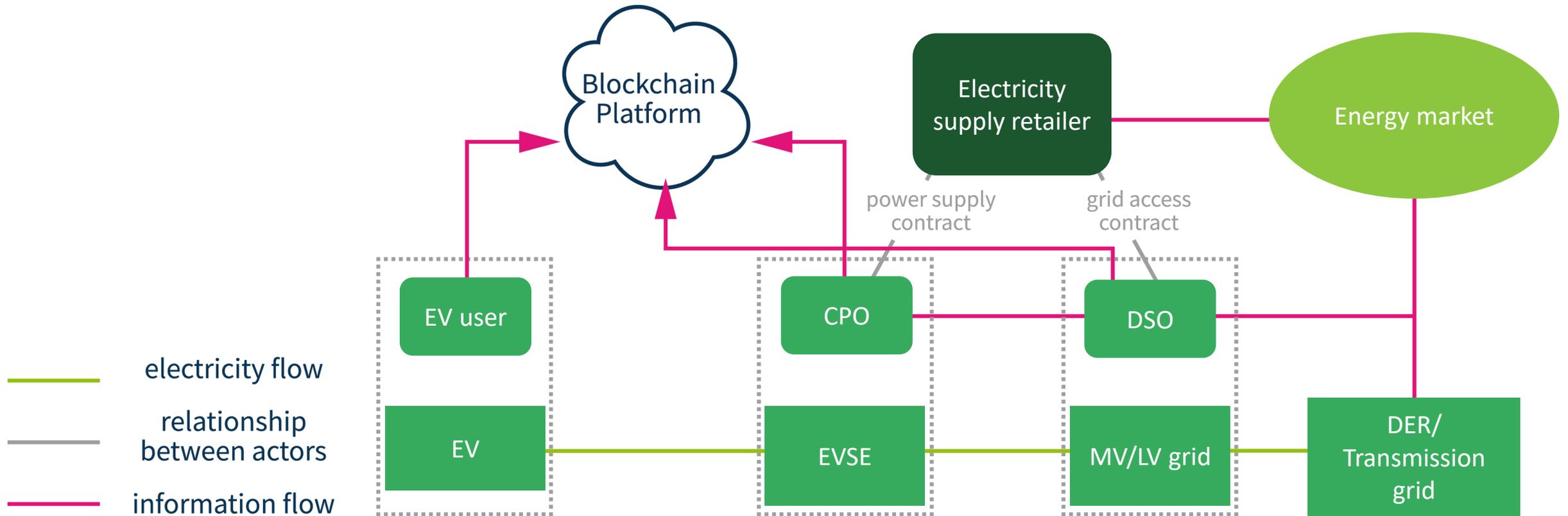
Flexibility rewards in a dynamic environment

Flexibility can be rewarded by utility or other users



Blockchain based incentive mechanism

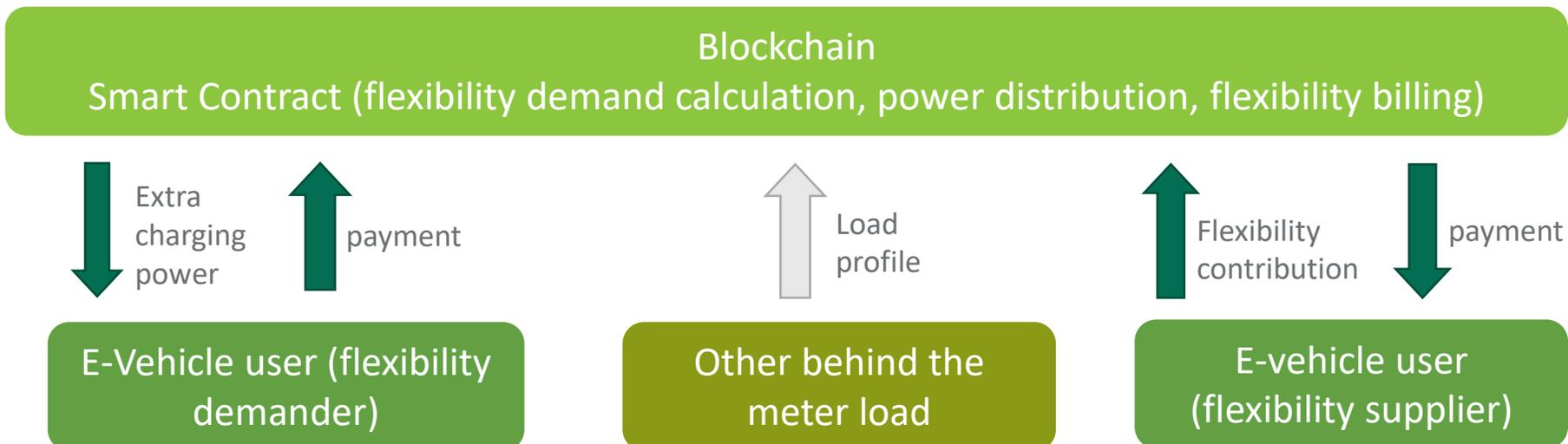
Blockchain platform as a neutral entity to reward flexibility



Token reward mechanism: Version 1

Avoid peak loads through smart charging

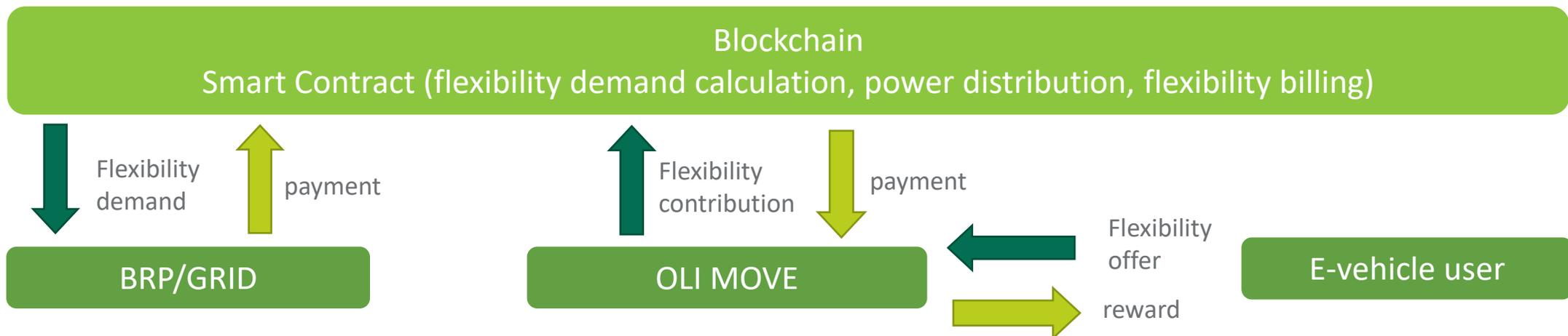
- The E-vehicle user indicates via an App his flexibility by stating required energy demand and time of disconnecting from the charging point
- When more E-vehicles are connected to the charging station, where based on uncontrolled charging, the total load demand is beyond the power capacity, the charging point operator demands for flexibility. Suppliers of flexibility trade in their flexibility by allowing temporal interruption/reduction of charging
- The supplier of flexibility is rewarded with a token valued on the extra income the charging station is generating through additional charging



Token reward mechanism: Flex market

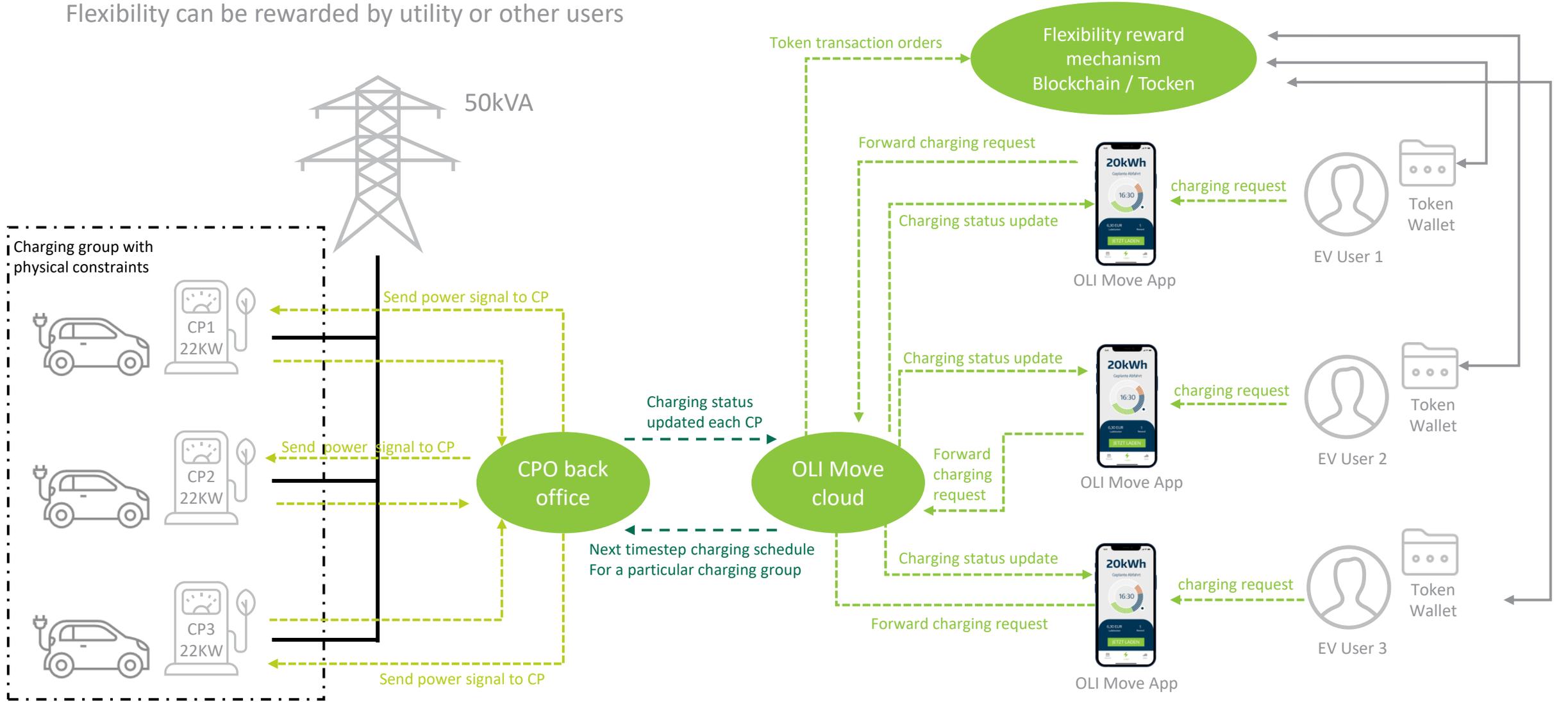
Avoid peak loads through smart charging

- Additionally to a usual power supply contract with the charging point operator the E-vehicle user concludes a second contract on flexibility via blockchain
- The E-vehicle user indicates via an App his flexibility by stating required charging load and time of disconnecting from the charging point.
- When the CPO identifies a grid congestion (load is higher than supply), it demands for flexibility to reduce the load. Suppliers of flexibility contribute by allowing temporal interruption/reduction of charging. The supplier of flexibility is rewarded with a share on the extra income.
- This can be further extended to a load flexibility market.



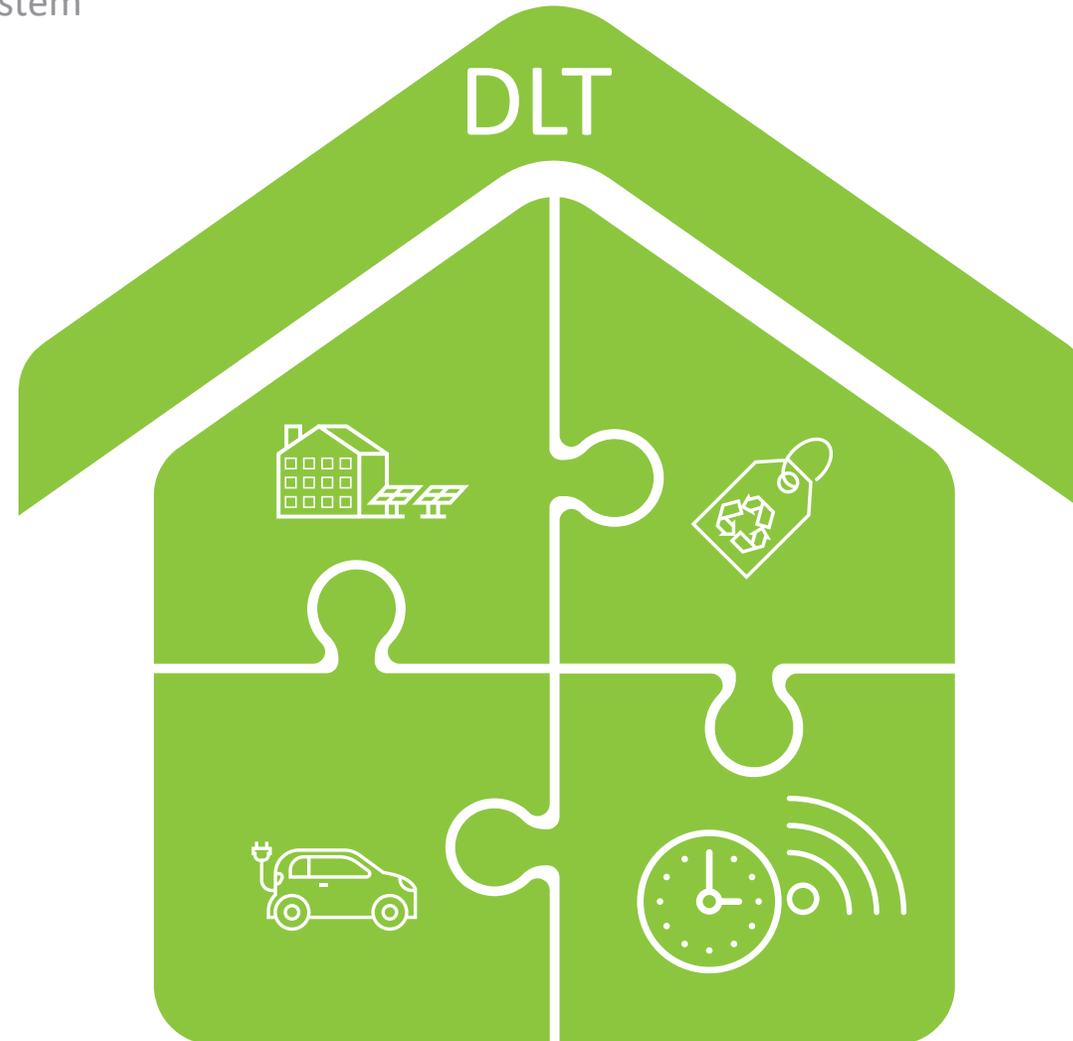
How to incentive users to provide flex data

Flexibility can be rewarded by utility or other users



OLI ecosystem

How DLT leverages a smart ecosystem



Trade electricity

Directly sell electricity at its place of origin through blockchain based solutions.



Smartly charge EV's

Charge EV's without costly ramping up the existing infrastructure.



Guarantee of origin

No „Greenwashing“. 100% real green energy by identifying its origin via blockchain.



IoT meets DLT

Reading out IoT devices remote. Forgery proof and decentralised protocol via blockchain.



Blockchain. Energy. Solutions.

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