

dcbel



# Energy on your own terms

So you can live a life without compromise

BUY DCBEL

V2G : AC or AC ?

Laurent SCHMITT, Dcbel Head of European Developments & energy ecosystems

May not be distributed without dcbel's consent.

# Strong European commitments to reach netzero emissions

## Current energy crisis post COVID is a game changer

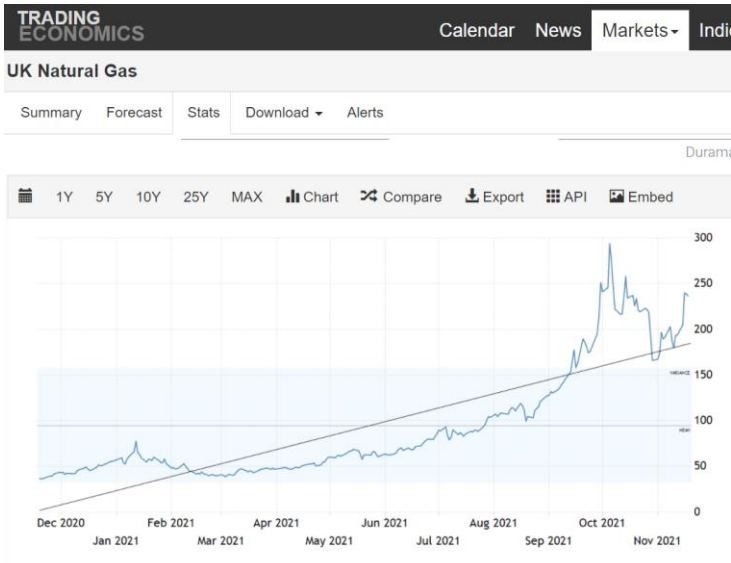
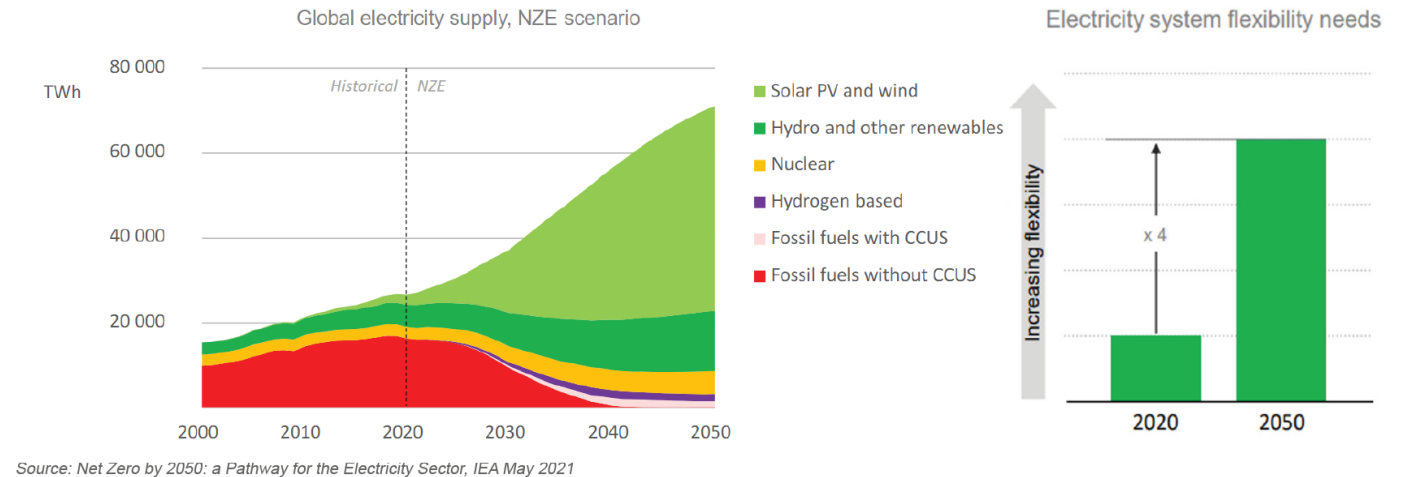


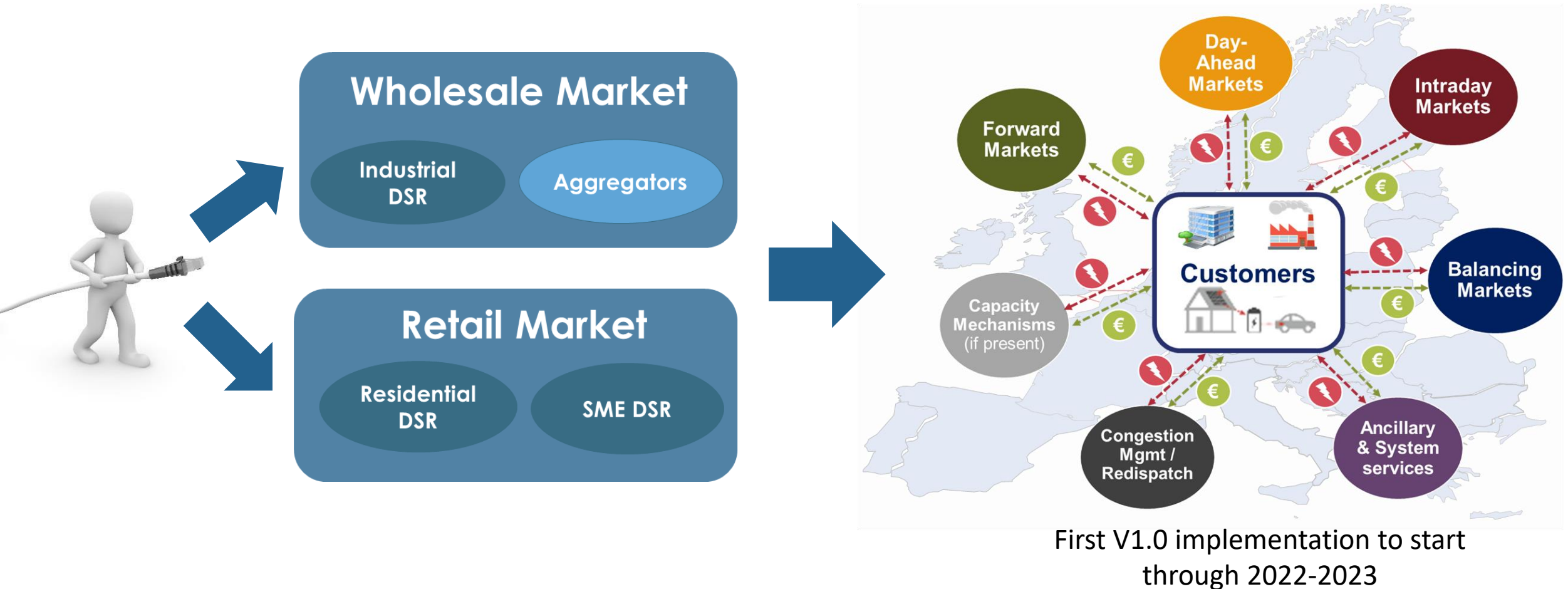
Figure 11: Outlook for global electricity generation and associated flexibility needs towards a 2050 net zero trajectory



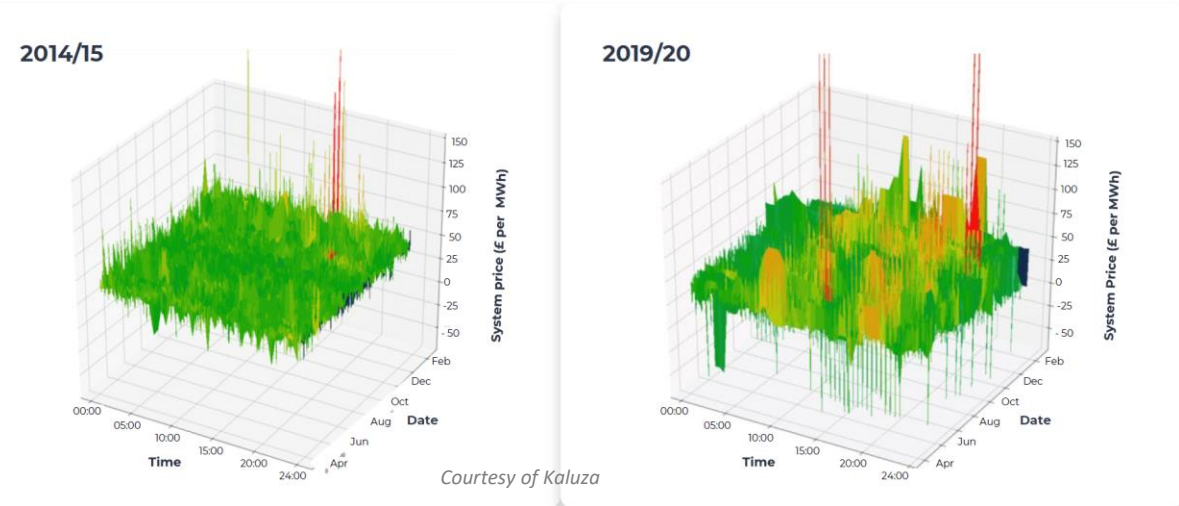
1. Significant growth of wind & solar capacity (x4 installations required/year)
2. New revenues from grid flexibility (x4 system flexibility needs)
3. Acceleration of Netzero Home deployments

# New consumer-centric interactions with the system

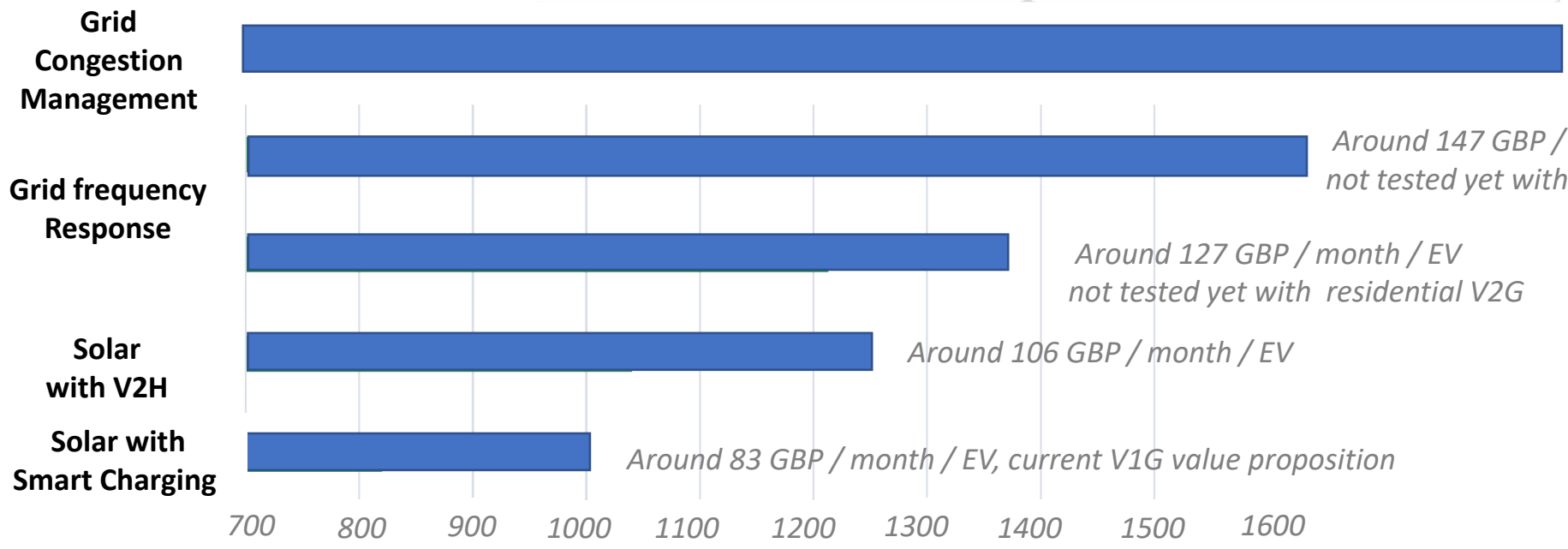
**Integrate wholesale and retail market, develop new services and enhance participation of all actors:** flexibility providers and flexibility users



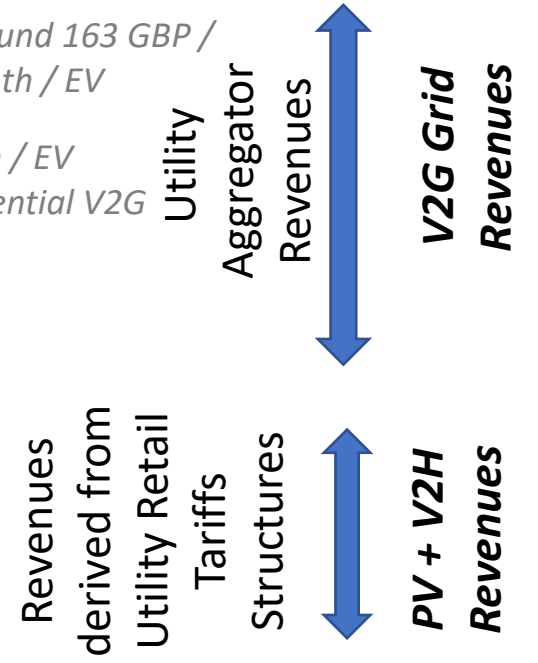
# Future V2H/V2G monetization needs revenue stacking across energy & grid ancillary service markets



*Balancing reserve price are highly volatile and so only indicative*



**UK Nissan Leaf with 4KW PV Self Consumption**





# New Home Energy Station for Netzero homes

Integrated Solar Inverter 2 x MPPTs of 7.6 kW  
*High efficiency Solar charging*

10.1" Color Screen  
*Instant prosumer engagement*

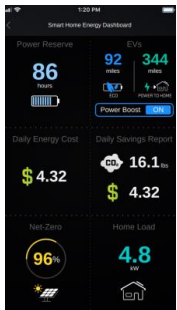
Unique thermal management design  
*Can be installed indoors / outdoors*

DC Charging (CCS or CHAdeMO), up to 15.2 kW  
*Ready for V2H & V2G*  
*Fastest charging: 1 mile / min*

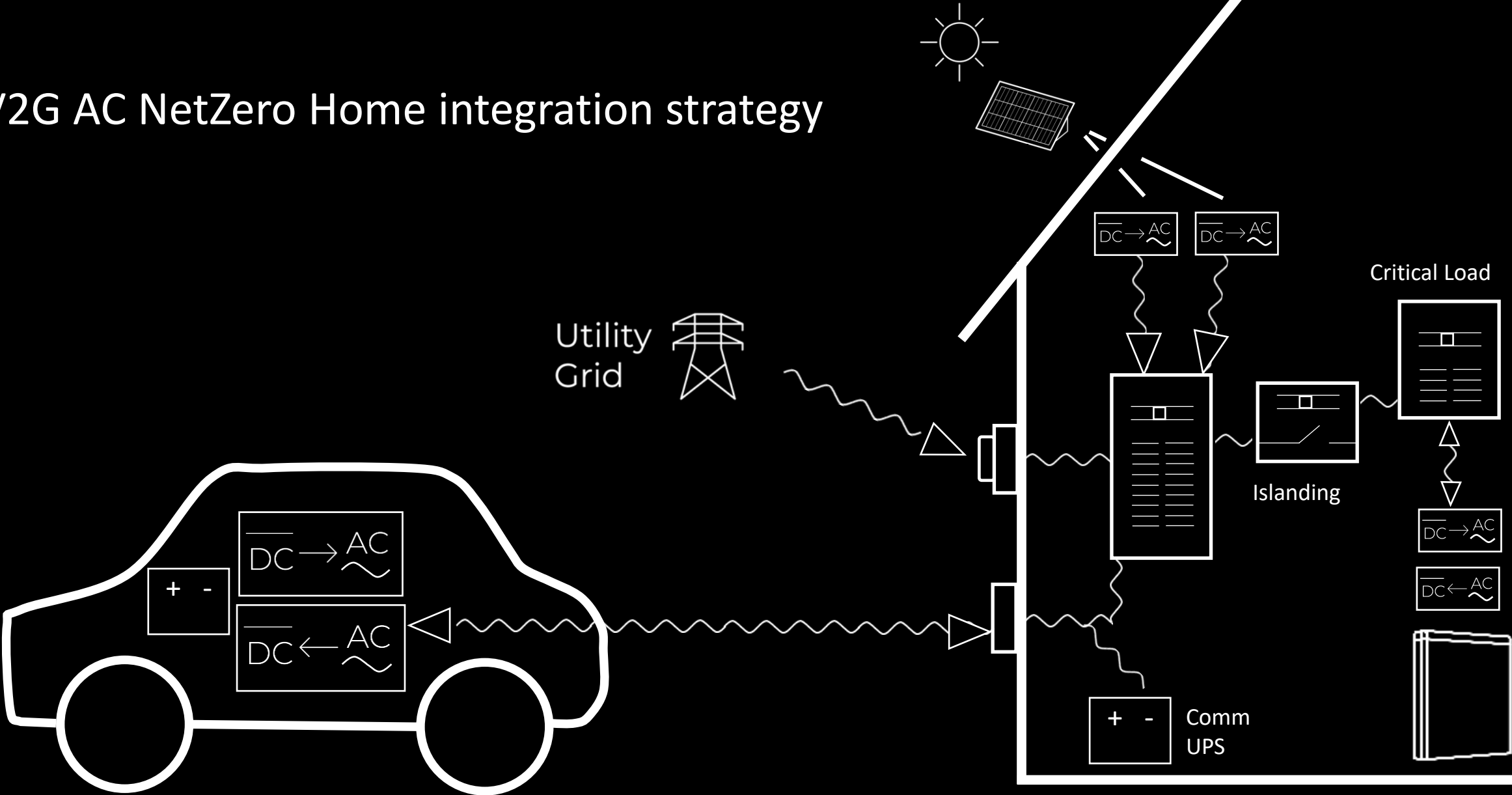
AC Charging (SAE J1772), Level 2 AC  
*Embedded V1G AC Charging*

Home Energy Storage Integration  
*Maximize Charge Speed, Grid connection and storage capacity available*

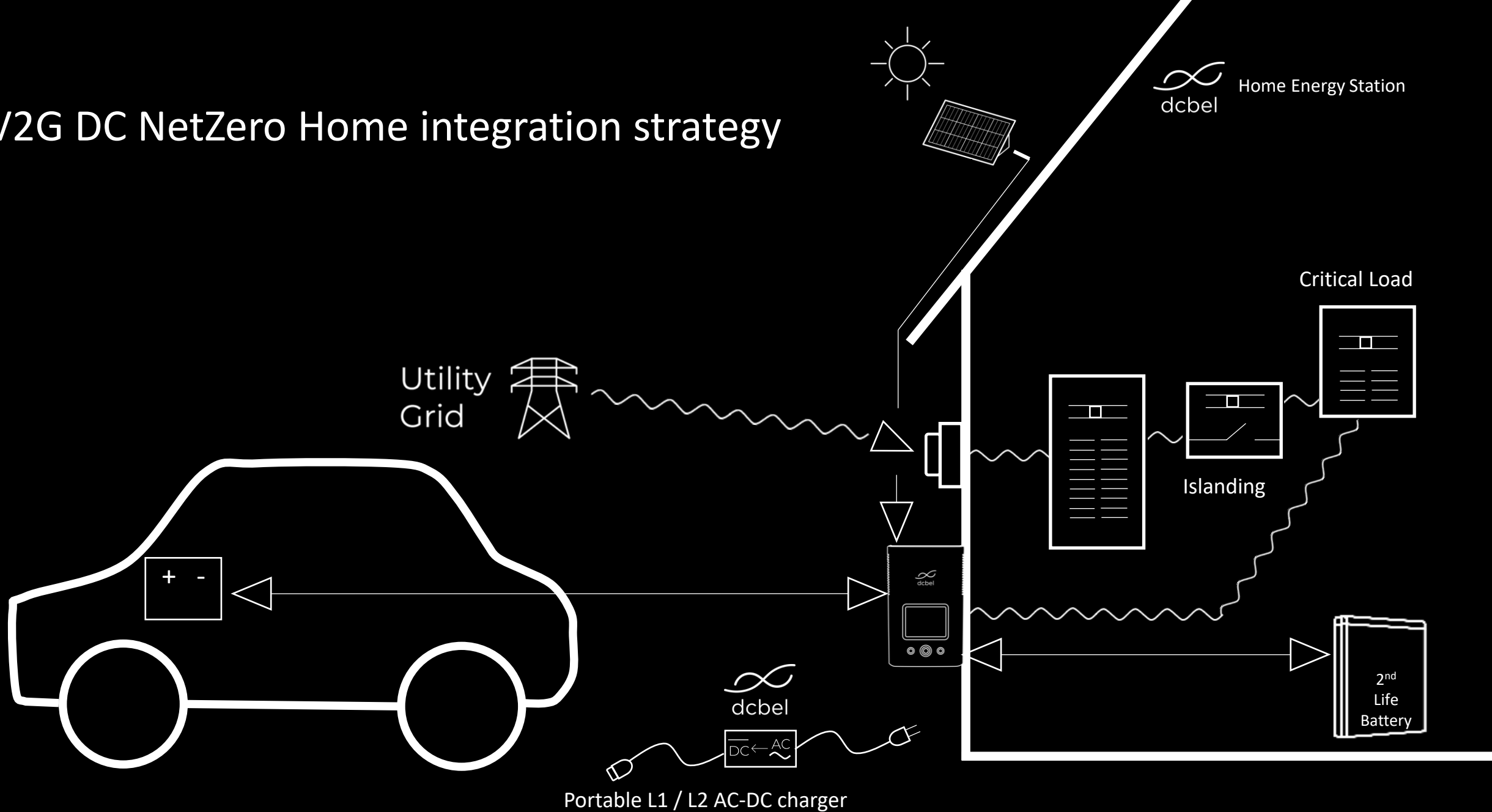
Real-time connectivity  
*Integrated Home Energy App*  
*Over the Air upgrades*  
*DERMS/Virtual Power Plant Interface (IEEE 2030.5)*



# V2G AC NetZero Home integration strategy

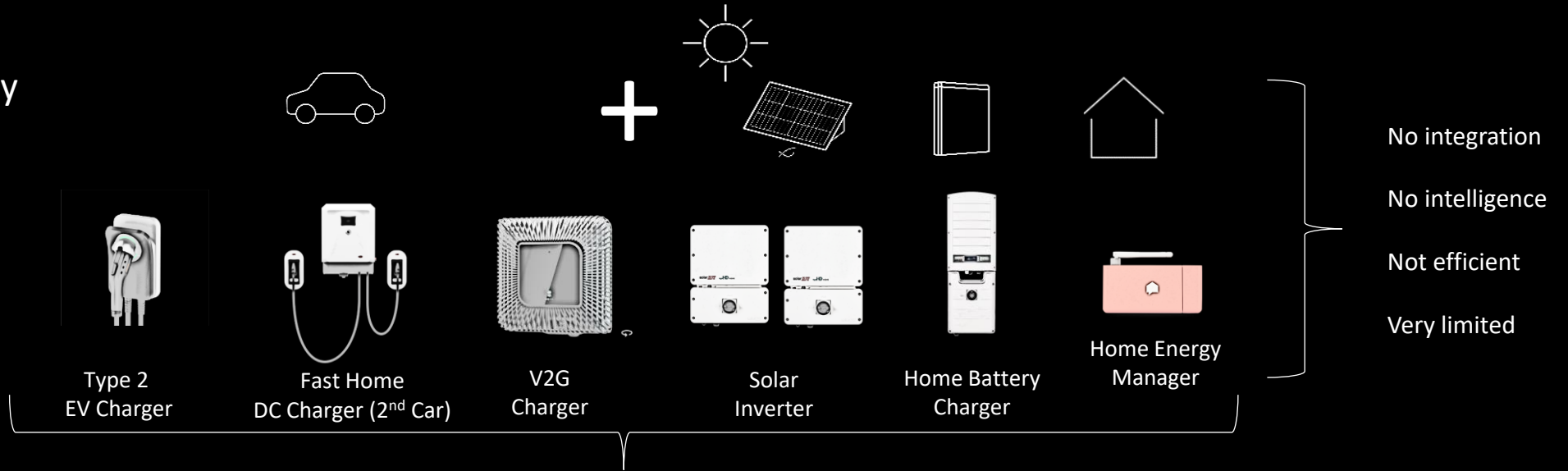


# V2G DC NetZero Home integration strategy



# V2G DC significantly simplifies NetZero home integration & installation

## Current Home Energy Hardware



## Future Netzero Home Architecture (Hardware + Software)

The future architecture is presented as a unified system. On the left is the dcbel logo. In the center is a white dcbel hardware unit with a digital display. To the right is a smartphone app interface titled 'Smart Home Energy Dashboard' showing metrics like Power Reserve (86 hours), EVs (92 miles, 344 miles), Daily Energy Cost (\$4.32), Daily Savings Report (\$4.32), Net-Zero (96%), and Home Load (4.8 kW). Further right is the CHORUS logo and the text 'Intelligent Distributed Energy System' with a list of features: Home Energy Management System, Grid Services, and App Store.

dcbel  
From \$4999

CHORUS  
Intelligent Distributed Energy System

- Home Energy Management System
- Grid Services
- App Store



# DC versus AC V2G/H comparison



## AC V2G/H (CCS)

## DC V2G/H (CHAdeMO or CCS)

Time to market

(-) 2025 pending IEC15118-20 Standards & home safety regulations

(+) 2022 leveraging Chademo standards and safety standards

Complexity

(-) Missing safety requirements (V2H/V2G switching)  
Difficulty to manage modulated charging while maintaining charging/discharging efficiency (60% range)

(+) Exhaustive UL Safety requirements available today  
(+) Flexibility to manage modulated charging while maintaining charging/discharging efficiency (90% range)

Cost

(+) Marginal additional cost over AC onboard  
(-) External Islanding & Safety protection required at home

(-) More expensive EVSE DC charger (5KE)  
(+) Power electronics hardware bundle across PV, Home Storage & CCS  
Dc charging (30% cheaper installation)  
(+) Embedded islanding & safety protection  
(+) Plug & Play installation (from 2days to 0,5day)  
(+) Lower system installation footprint

Revenue opportunities

(+) Day Ahead & Intraday Home Energy Arbitrage

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(+) Solar PV self consumption / Home Fast charging  
(+) Dual car modulated charging  
(+) Grid balancing & frequency reserve  
(+) Home Black Out Power  
(+) 4 quadrant Voltage & Reactive Power control

Monetization model

Charge/discharge controls through the EV communication  
(-) Connection compliancy to be demonstrated by EV

Charge/discharge controls through the EV communication  
(-) Connection code compliancy to be demonstrated by EVSE  
(-) Lower EV costs / Reduction of car weights  
(-) Faster and easier adaptations to connection code changes