HUMAX EV CHARGING

# Commercial Charger Platform

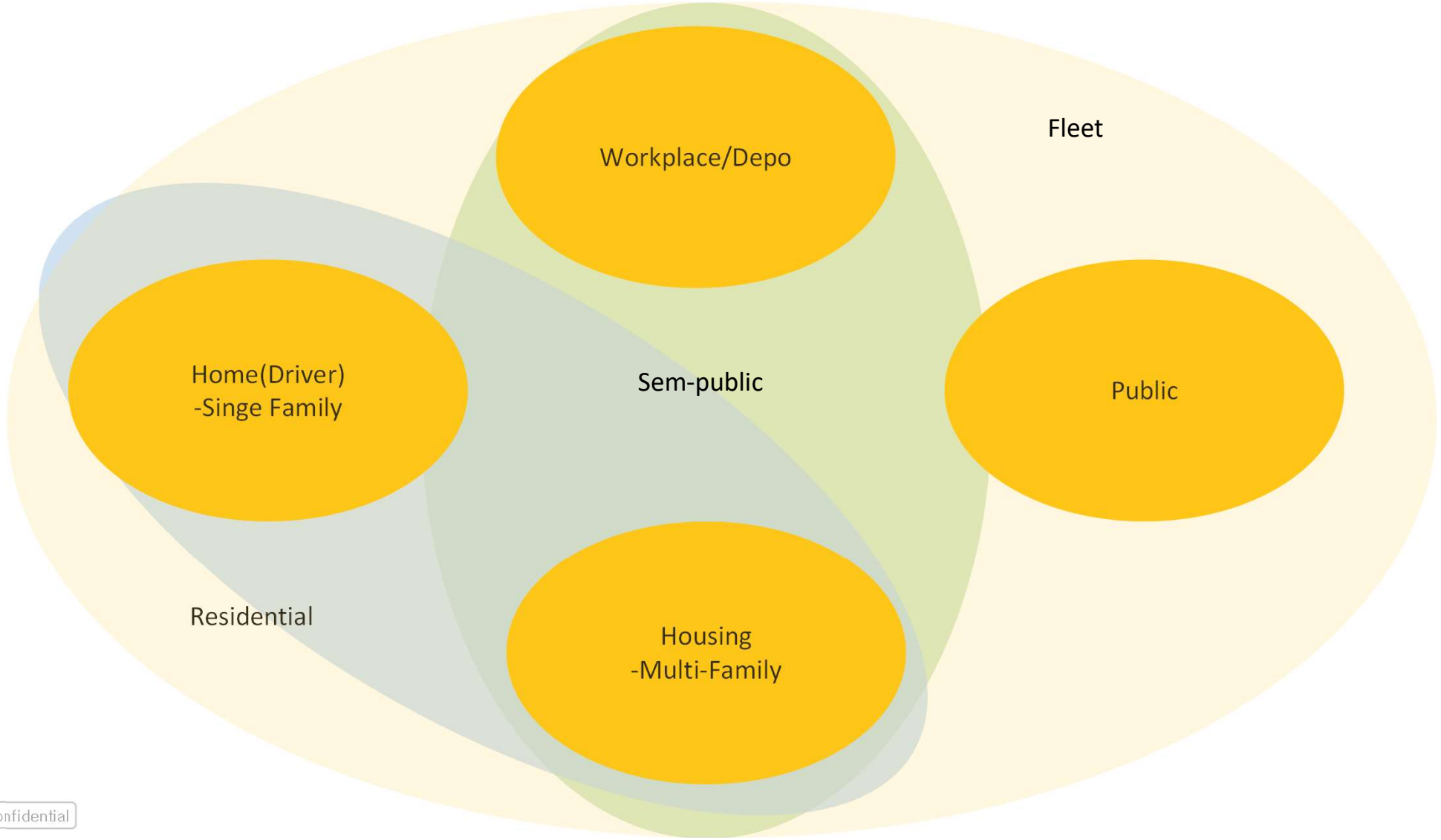
## Requirements & Features

Mar 2025

Product Planning

# Target Business segment





# Commercial - Business segment by product and requirement



| | | User | Product | B/E | Key features |
|---|---|---|---|---|---|
| Workplace | Office | Guest / Employee | AC Commercial | o | Commercial charging, Load balancing |
| | Depo | Driver | AC commercial | o | Commercial charging, Load balancing<br>Fleet Charging |
| Home | Private | End user | Home | x | Tariff, HEMS |
| | Company Car | Driver | Home | o | Cost Reimbursement |
| Housing association | Demised bay | End user | Home | o | Home charger + Commercial B/E<br>Load balancing |
| | Shared | End user | Home/<br>AC Commercial | o | Commercial charging, Load balancing |
| Public | Enroute | End user | DC/AC | o | CPO App |
| | Destination | End user | DC/AC | o | CPO App |

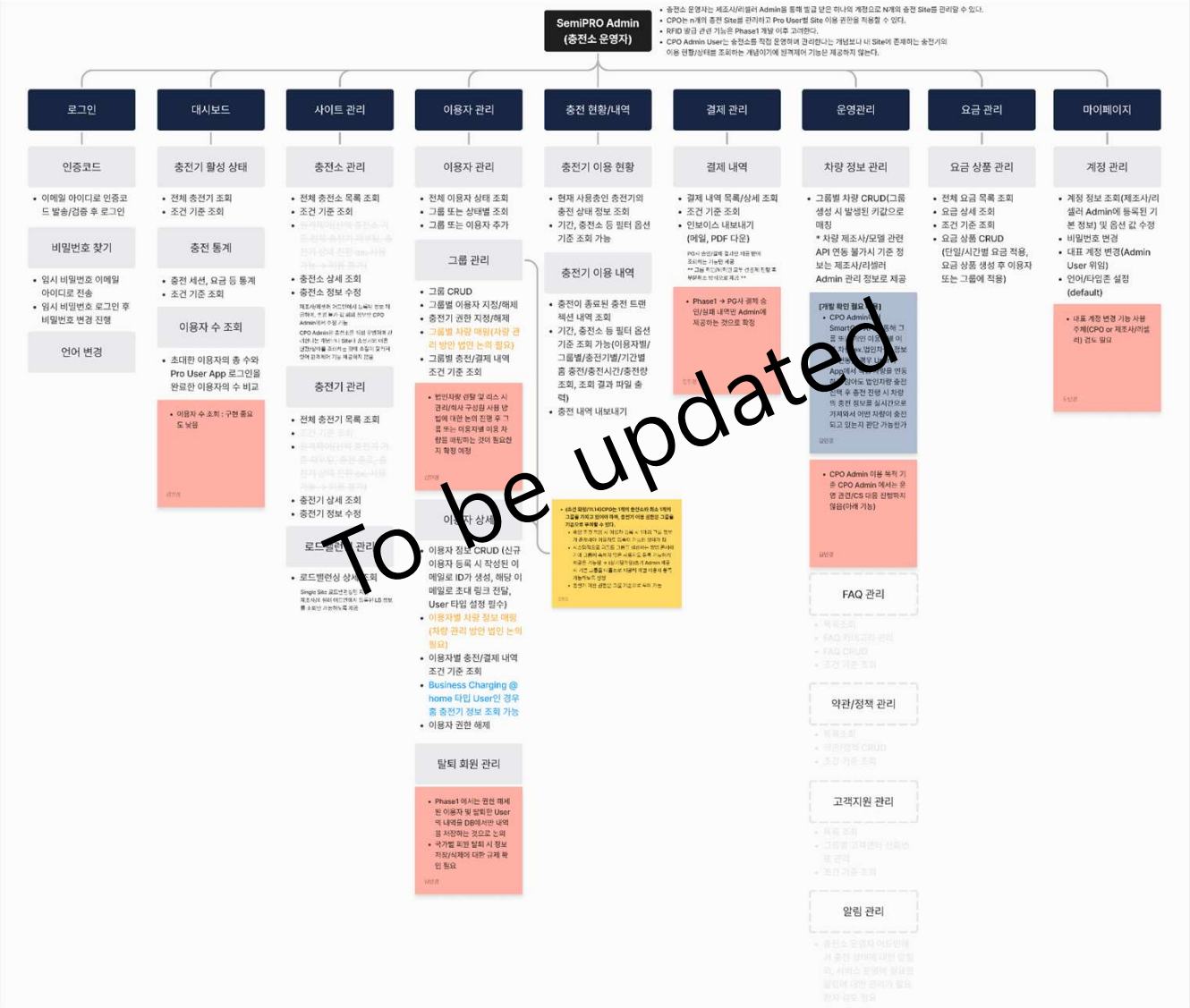
# Business Goals

- **To provide the turn-key E2E solution with favorable commercial models**
  - 대표적인 상용 플랫폼인 Monta / Fuuse 등의 경우 높은 기본 비용
  - Load Balancing과 같은 부가 기능에 대해서는 별도 비용 부과
  - 대부분의 고객들은 제공되는 기능들의 일부만 사용

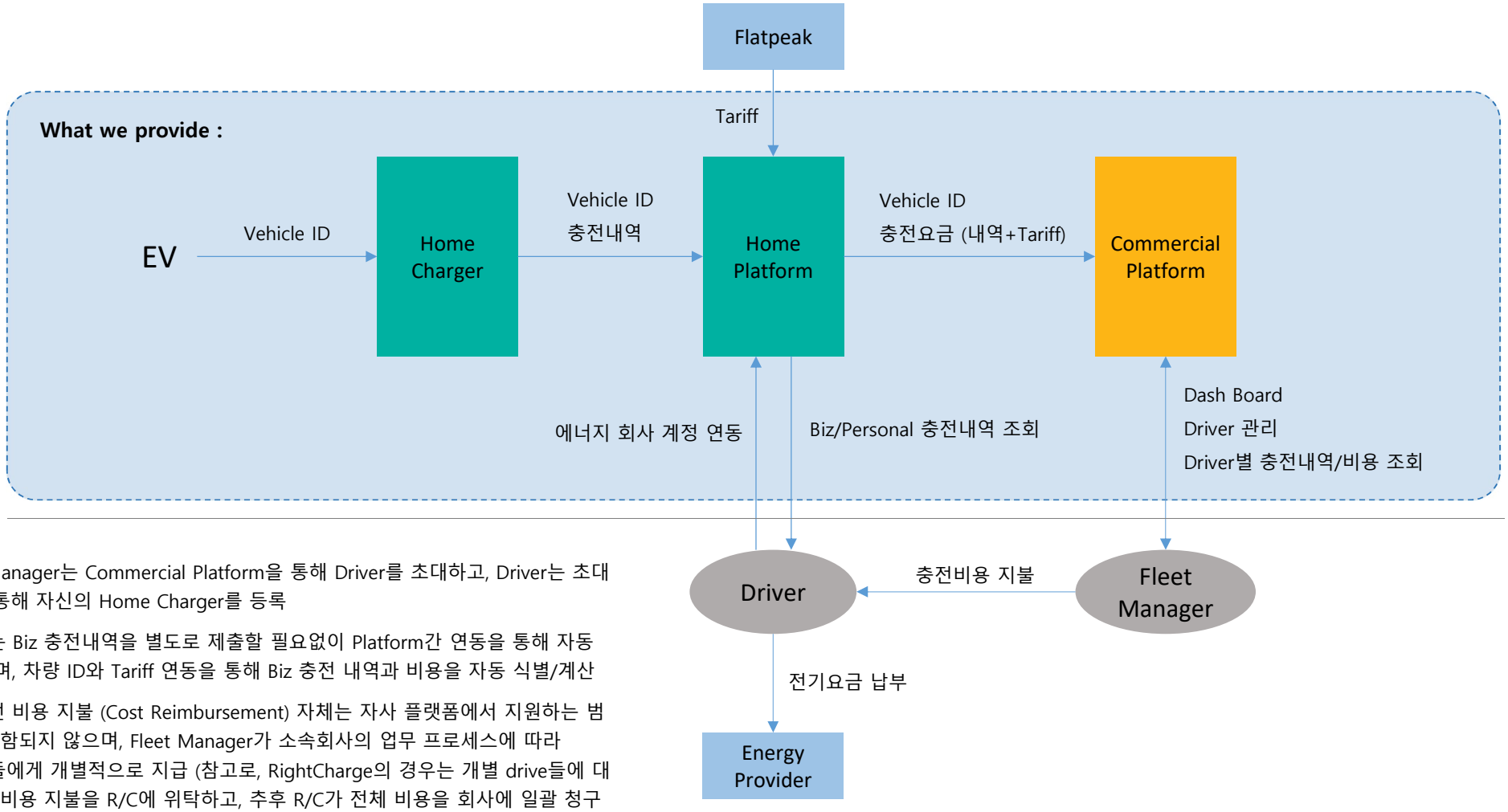
- **To provide tailored features to solve the unique problems of each customer groups**
  - Workplace, Multi-family home, Fleet 등 각각의 고객 segment가 갖는 pain point 해결 & 부가 기능 제공
  - 개별 고객들의 customization 요구 사항들에 대한 유연한 대응

# Key Features – Operators

# Key Features – Site Managers



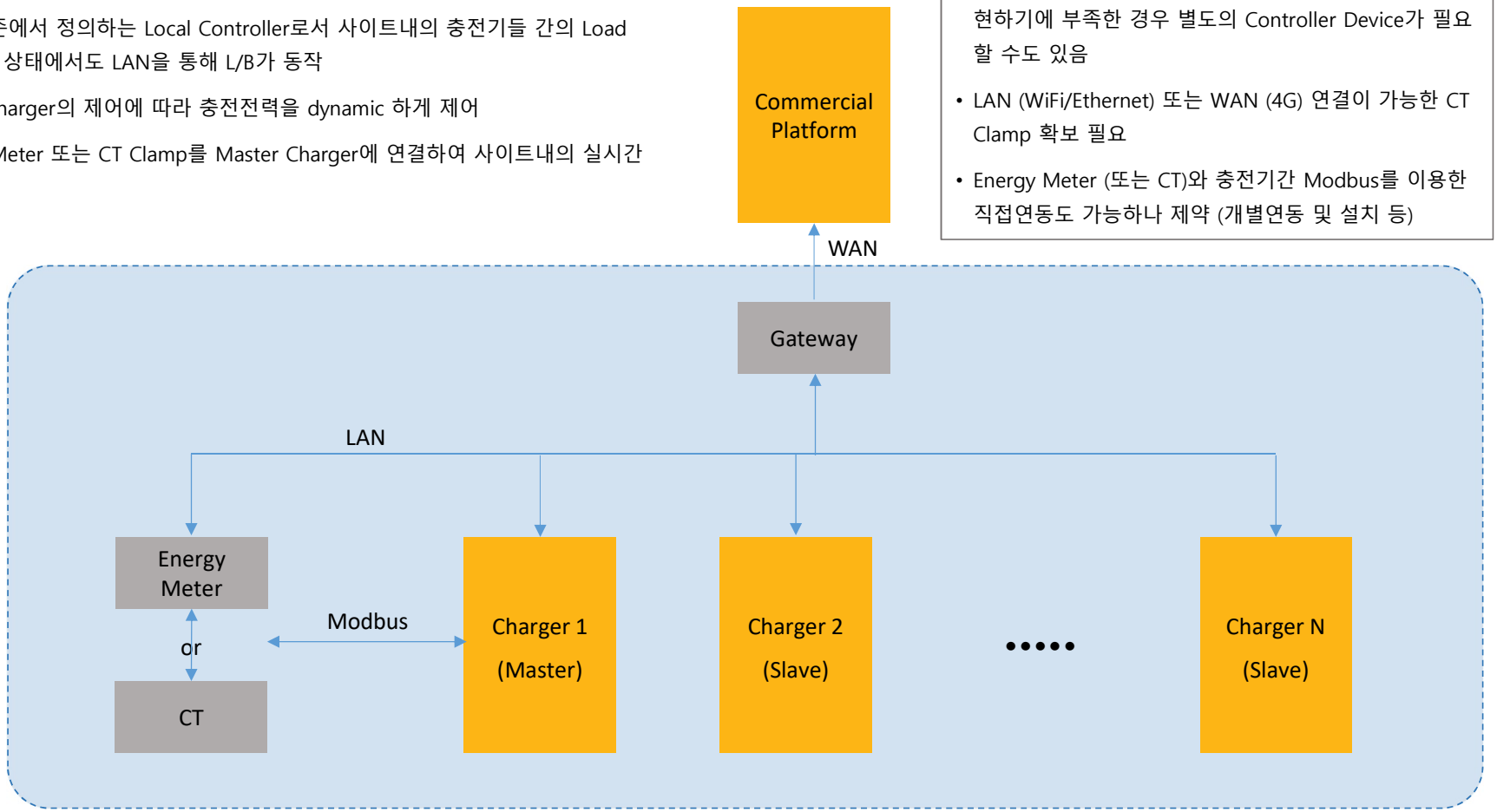
# Additional Features – Business Charging @Home




- Fleet Manager는 Commercial Platform을 통해 Driver를 초대하고, Driver는 초대 link를 통해 자신의 Home Charger를 등록
- Driver는 Biz 충전내역을 별도로 제출할 필요없이 Platform간 연동을 통해 자동 전달되며, 차량 ID와 Tariff 연동을 통해 Biz 충전 내역과 비용을 자동 식별/계산
- Biz 충전 비용 지불 (Cost Reimbursement) 자체는 자사 플랫폼에서 지원하는 범위에 포함되지 않으며, Fleet Manager가 소속회사의 업무 프로세스에 따라 Driver들에게 개별적으로 지급 (참고로, RightCharge의 경우는 개별 drive들에 대한 충전비용 지불을 R/C에 위탁하고, 추후 R/C가 전체 비용을 회사에 일괄 청구하는 형태)

# Additional Features – Dynamic Load Balancing

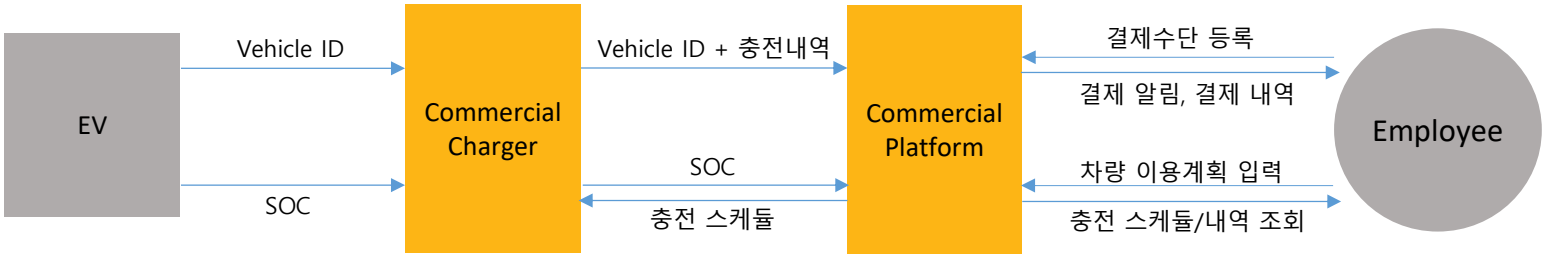
- 사이트 내의 충전기들은 Local Area Network을 통해 연결되어야 함
- Master Charger는 OCPP 표준에서 정의하는 Local Controller로서 사이트내의 충전기들 간의 Load Balancing을 제어함. Off-line 상태에서도 LAN을 통해 L/B가 동작
- Slave Charger들은 Master Charger의 제어에 따라 충전전력을 dynamic 하게 제어
- LAN 연결이 가능한 Energy Meter 또는 CT Clamp를 Master Charger에 연결하여 사이트내의 실시간 전력 소모량을 모니터링




- 충전기의 MCU 성능과 메모리가 Local Controller를 구현하기에 부족한 경우 별도의 Controller Device가 필요할 수도 있음
- LAN (WiFi/Ethernet) 또는 WAN (4G) 연결이 가능한 CT Clamp 확보 필요
- Energy Meter (또는 CT)와 충전기간 Modbus를 이용한 직접연동도 가능하나 제약 (개별연동 및 설치 등)

# Additional Features – Workplace Charging

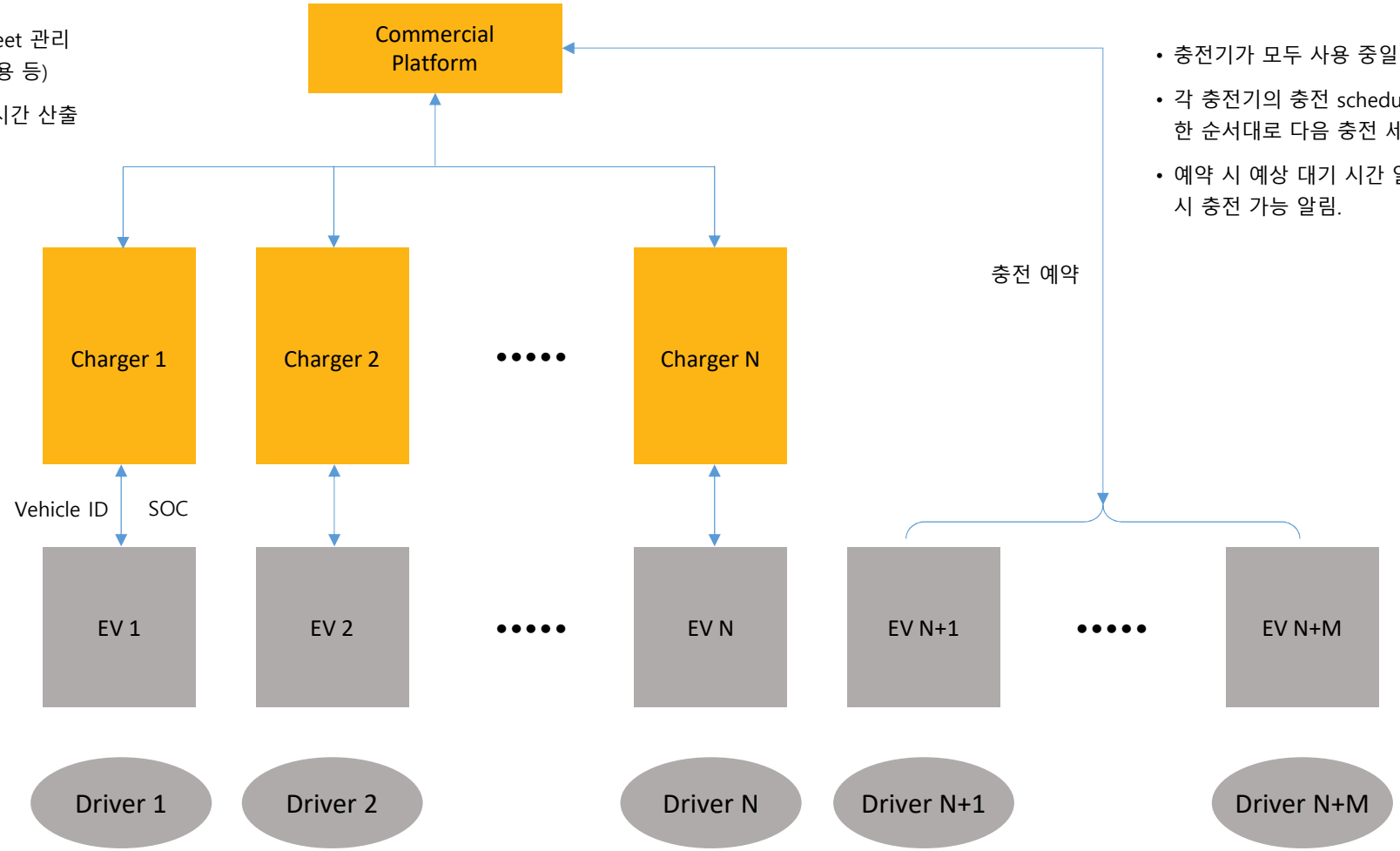
• Auto Charge – Vehicle ID 기반 차량 인식 및 충전비용 자동 결제 (QR 코드 스캔 등 결제 절차 불필요)




• Intelligent Charging – 차량 SOC와 차량 이용 계획에 따라 충전 schedule 최적화 (Home Charger와 동일 기능)

# Additional Features – Fleet Charging

- Vehicle ID 기반 EV Fleet 관리 (차량별 충전 내역, 비용 등)
- SOC 기반 충전 예상 시간 산출 및 Queue Scheduling




- 충전기가 모두 사용 중일 경우 대기 예약
- 각 충전기의 충전 schedule에 따라 먼저 예약한 순서대로 다음 충전 세션 예약 (Queuing).
- 예약 시 예상 대기 시간 알림. 예약시간 도래 시 충전 가능 알림.

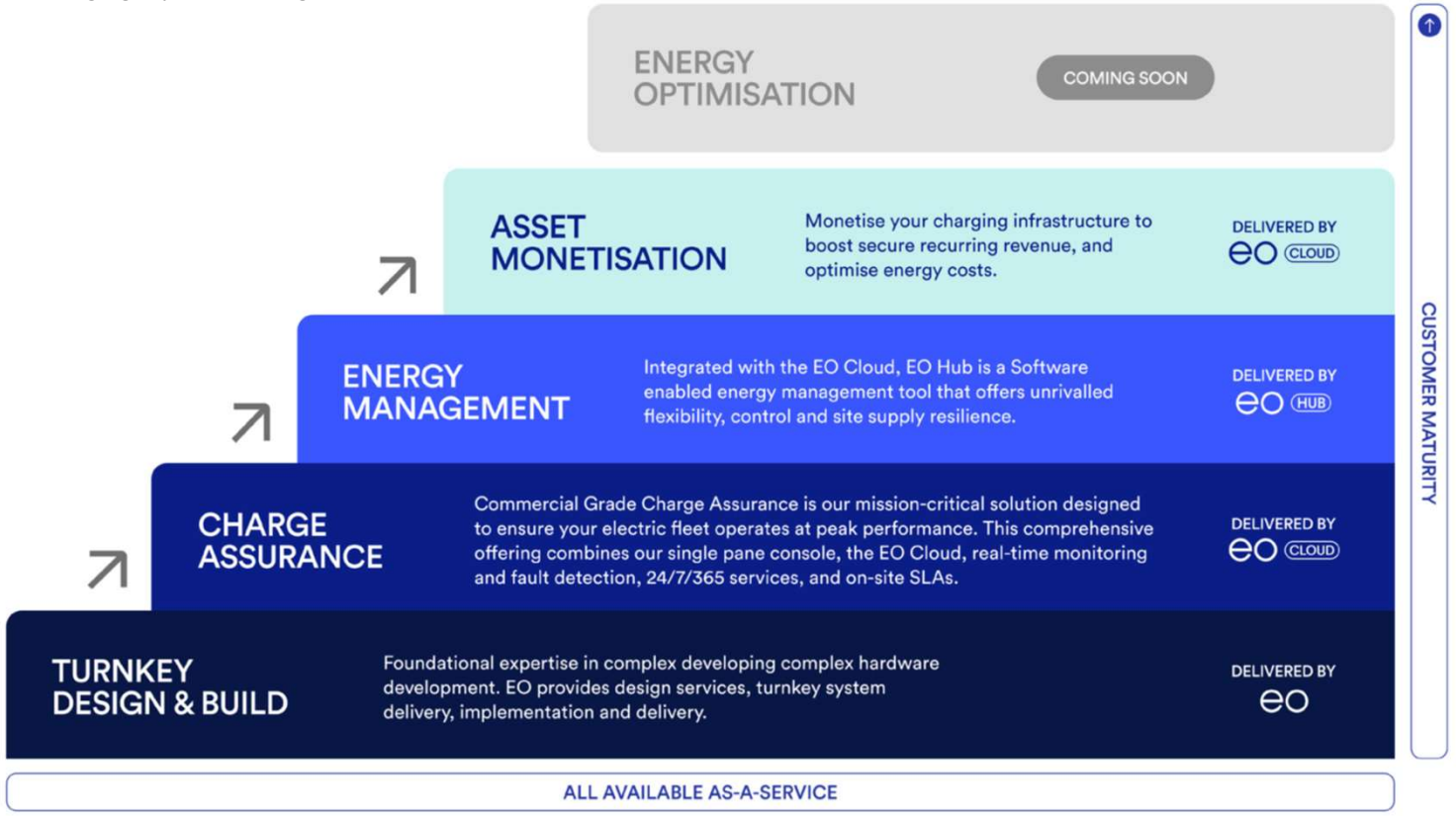
# 타사 Research – 충전기 제조사 중심

# EO

✓ AC Home/Commercial 자체 충전기 사업 + 다수의 3rd party DC 충전기 연동 기반 플랫폼 사업

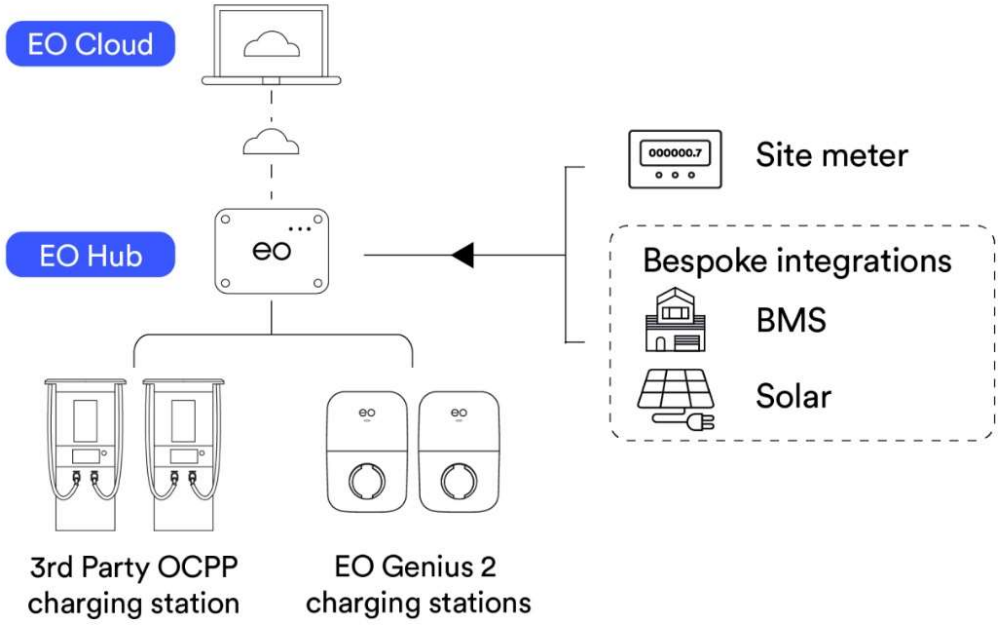
✓ Fleet Electrification에 집중 - Energy Management를 가장 중요한 요소로 봄

- EV Fleet 으로의 전환에 key issue는 site당 제한된 power를 적절히 manage 하는 것
- Site의 전력용량을 늘리지 않거나 최소로 증가시키면서 EV/Charger의 확충이 가능하도록 하는 것이 핵심
- Load management, site supply throttling, scheduled charging, dynamic charge allocation 등



# EO Hub

## EO CLOUD + EO HUB




eo HUB

**Energy management that puts power where you need it most.**

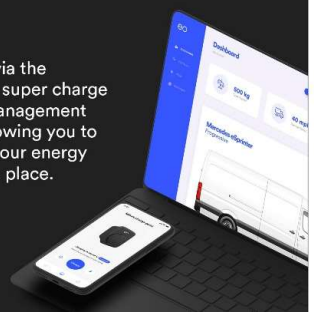
### FEATURES

- **Built for scale:** Built to manage an unlimited number of chargers.
- **Charger agnostic:** Compatible with any OCPP DC & AC charger.
- **Brain of the depot:** Intelligently directs available power to your vehicles that need it most.
- **Real time analytics:** Access live power and performance data from the EO Cloud.
- **Offline:** Actively protects your depot by regulating available power offline.
- **Integration:** Ability to integrate with other on-site renewables (solar, battery).

Visit 'eocharging.com' to learn more

### EO CLOUD

Connected via the EO Cloud to super charge your fleet management software allowing you to manage all your energy needs in one place.



### TECH SPECS

**Dimensions:**
196mm (w) x 36.75mm (h) x 120.8mm (d)

**Processor:** Intel Celeron

**Memory:** up to 32 GB

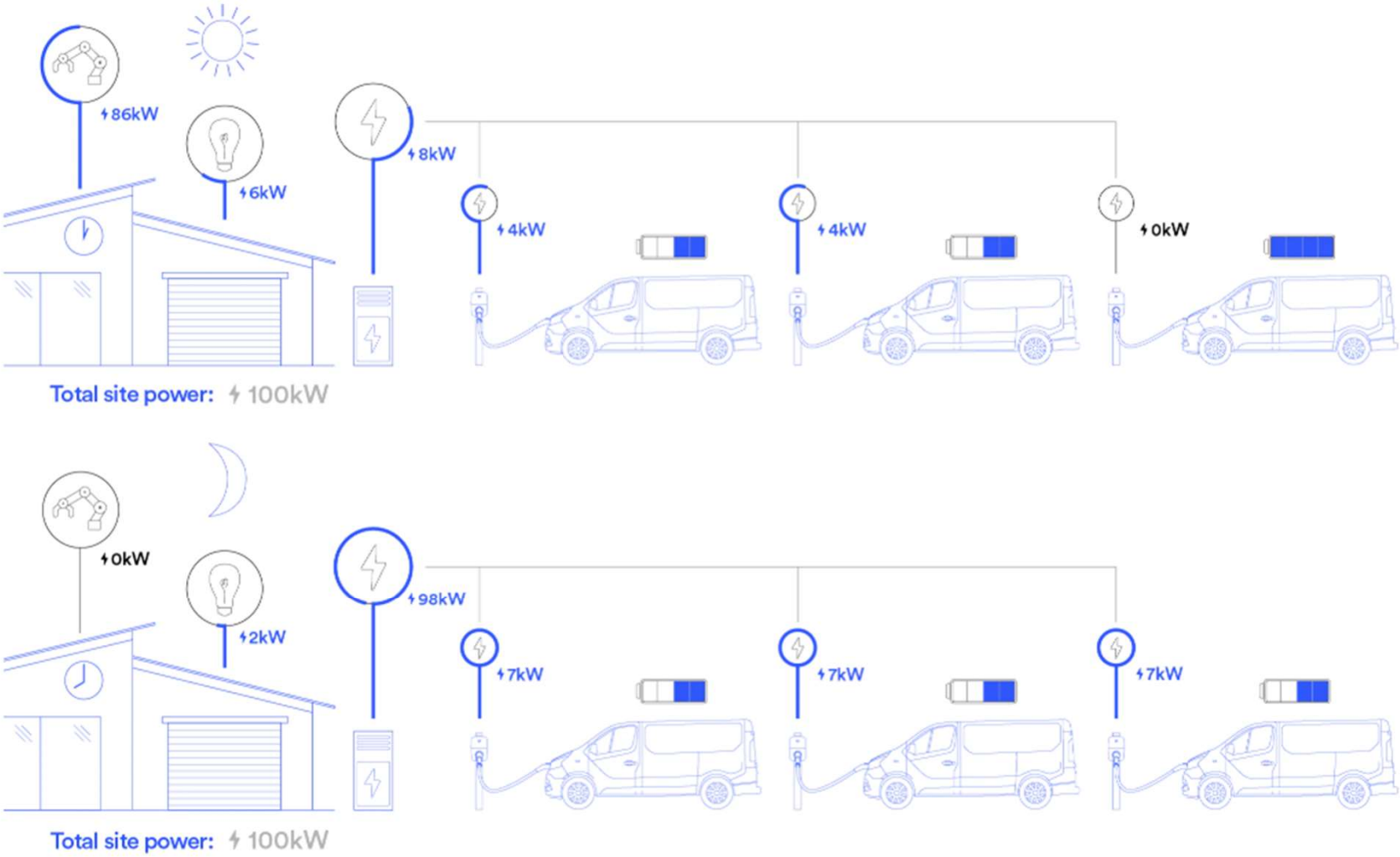
**Storage:** up to 64 GB

**Input Voltage:** 12~24 V

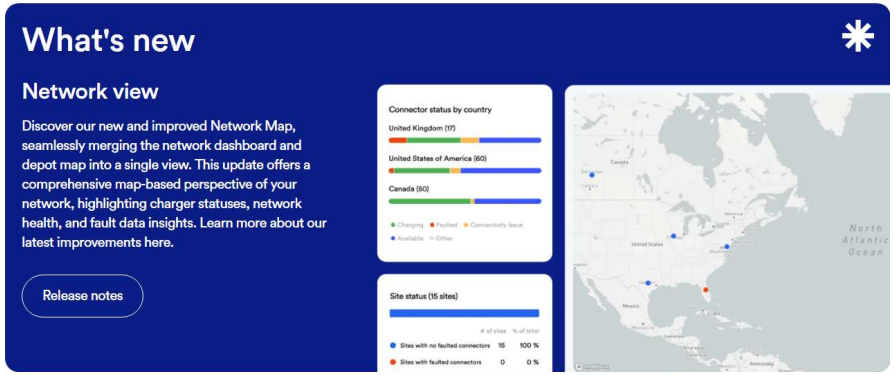
**Power Input:** 4-pin Terminal Block DC Jack

**Operating Temperature Range:**
0 ~ 50°C

# EO Dynamic Load Management

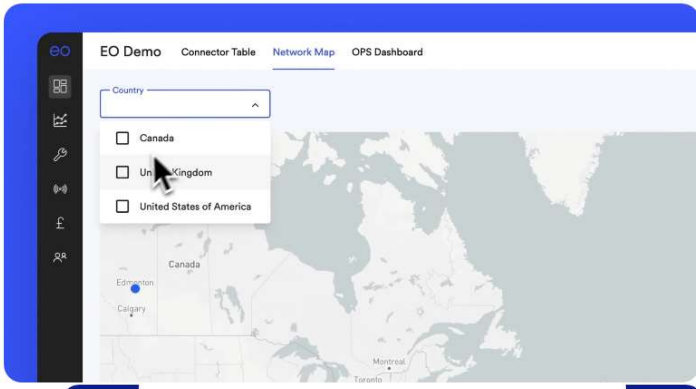


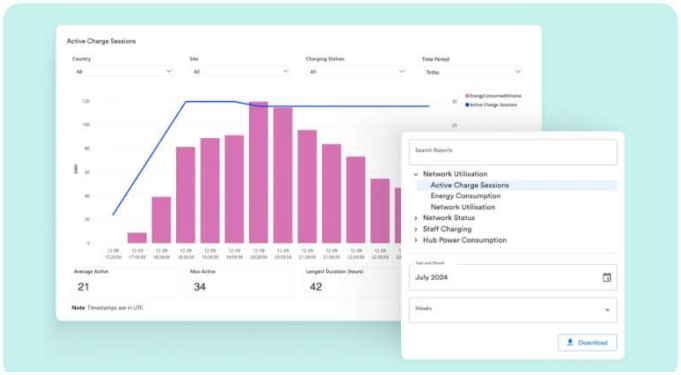
# **EO Cloud** - The World's Most Advanced Fleet Charging Management System




## Operational Overview

The one-stop-shop for all your EV depot management needs. Control your charging infrastructure remotely via the dashboard from various devices, both globally and locally whilst providing real-time monitoring of charging station network performance. Access automatic hardware fault detection as well as enhanced troubleshooting, all in one spot!



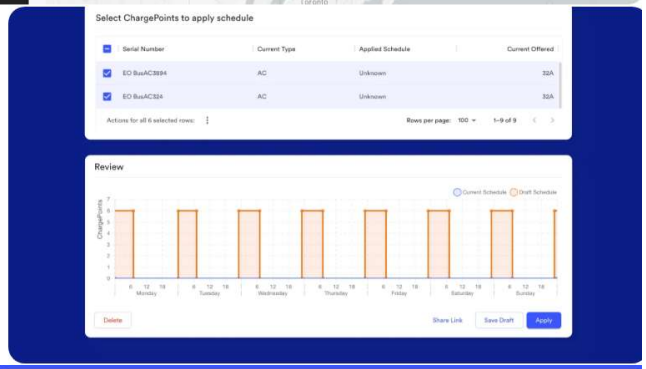



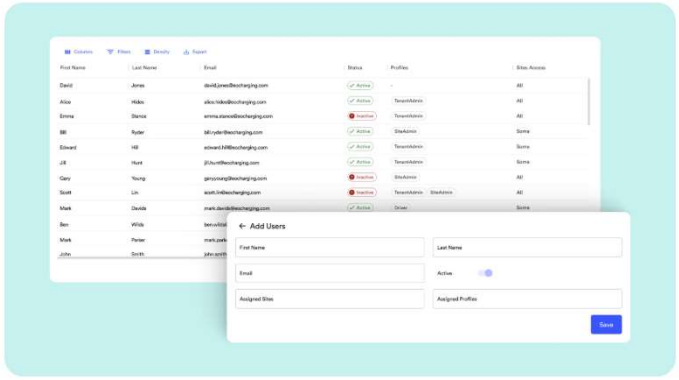
## Reporting

Offers built-in reporting providing users insights into network performance and usage. Optimises energy usage, total ownership costs with charging session data and seamless operational system integration. The reports tab of the EO Cloud houses an extensive collection of data including, historic energy consumption, charger status, network uptime, and much more.

## Charger Scheduling

Provides both manual and automatic scheduling for intelligent charging programs that meet your fleet needs, ensuring control over your total cost of ownership and a fully charged fleet.



## Account Management

Provides advanced access management, enabling admin users to assign profiles allowing you to cont information effectively. Giving you the ability to assign user profiles as well as restrict user access based on individual needs, add new users and deactivate existing ones to fine-tune the level of access per user.

## Automatic Fault Detection

Automatically detects charging station hardware faults and connectivity issues helping to streamline support team responses. The system not only monitors your charging station status for faults, it automatically alerts our EO Charging support team to address issues promptly and minimise on-site downtime.

# ZAPTEC

- **Zaptec Sense**
  - 댁내 smart meter와 연동하여 현재 집/건물의 소비 전력량을 cloud로 올려주는 기기 (네덜란드의 P1 dongle과 동일 기능)
  - Local Controller로서 동작하지는 않음 (Offline일때는 L/B 동작하지 않음)
  - Meter기 연결 – P1, HAN 또는 별도의 CT + Energy Meter를 통해
  - Cloud 연결 – WiFi/Ethernet

- **Zaptec Portal**
  - Free Management Tool
  - Installer를 위한 installation tool – portal을 통해 charger 초기 configuration 수행
  - Manage chargers, track usage per user, update firmware remotely, control user access 등
  - Payment & Smart solution은 API를 통해 Monta/Tibber 등과 연동하여 해결

Mechanical and installation

| Paramenter | Description | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Weight | Including Micro USB cable | | | 97 | g |
| Altitude | | | | 2000 | m |
| Input cable | Custom Micro USB-B cable (Power supply + RS485) | | 1.8 | | m |
| | Unshielded CAT5e/CAT6 cable | | | 30 | m |

General

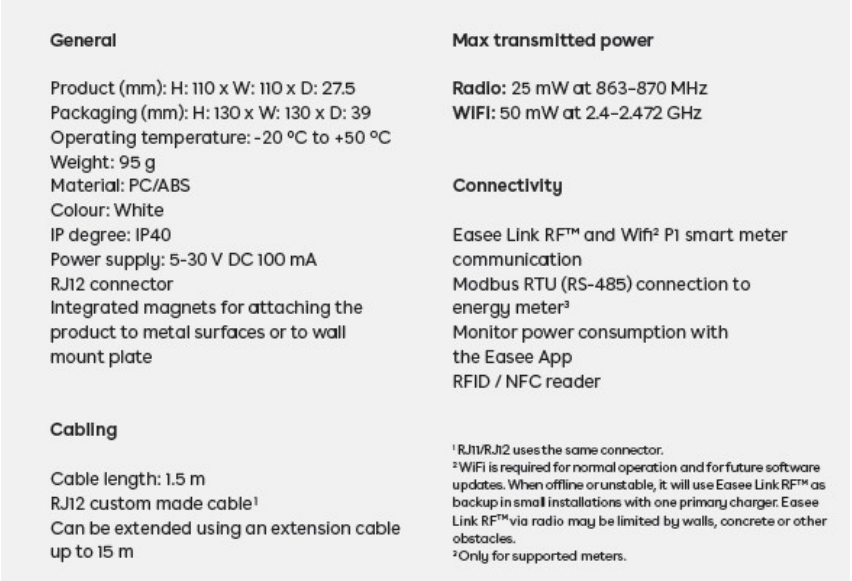
| Paramenter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Rated voltage | 4.5 | 5 | 5.5 | V |
| Rated current | 200 | | 750 | mA |
| Standby power consumption | | | 1.5 | W |
| Ambient operating temperature | -20 | | 40 | °C |

Connectivity

| Protocol | Supported standards |
|---|---|
| Wi-Fi | IEEE 802.11b/g/n (2.4 GHz) |
| Bluetooth | Bluetooth V4.2 (BLE) |
| Ethernet | ISO/IEEE 802.3u/az(10/100 Mb/s) |
| Modbus | 9.6 kb/s |

# EASEE Equalizer

- **EASEE Equalizer**
  - Automatic load balancing
  - Zaptec sense와 유사하나, local controller 기능도 함 (Offline일 경우도 L/B 동작)
  - Equalizer와 Charger의 통신 방식은 WiFi 또는 Easee Link Radio (868MHz) 사용
  - WiFi가 기본이며, 모든 충전기들 동일한 network 연결되어 있어야 함 (Commercial Case)
  - WiFi가 안되는 경우 Easee Link Radio가 사용하며 하나의 충전기와만 연결 (Home Case)



**General**

Product (mm): H: 110 x W: 110 x D: 27.5
Packaging (mm): H: 130 x W: 130 x D: 39
Operating temperature: -20 °C to +50 °C
Weight: 95 g
Material: PC/ABS
Colour: White
IP degree: IP40
Power supply: 5-30 V DC 100 mA
RJ12 connector
Integrated magnets for attaching the product to metal surfaces or to wall mount plate

**Cabling**

Cable length: 1.5 m
RJ12 custom made cable[1]
Can be extended using an extension cable up to 15 m

**Max transmitted power**

**Radio:** 25 mW at 863–870 MHz
**WIFI:** 50 mW at 2.4–2.472 GHz

**Connectivity**

Easee Link RF™ and Wifi[2] P1 smart meter communication
Modbus RTU (RS-485) connection to energy meter[3]
Monitor power consumption with the Easee App
RFID / NFC reader

[1] RJ11/RJ12 uses the same connector.
[2] WiFi is required for normal operation and for future software updates. When offline or unstable, it will use Easee Link RF™ as backup in small installations with one primary charger. Easee Link RF™ via radio may be limited by walls, concrete or other obstacles.
[3] Only for supported meters.

- **EASEE Control**
  - Charging station / site management tool
  - Manage one or more charging sites
  - Dashboard showing the status of the site
  - Complete control of every single EV charger
  - Track each person's electricity usage by having them register charging sessions with an Easee Key (RFID tag) or through the app (coming soon)
  - Set charging prices
  - Grant access and assign roles
  - Users can manage personal accounts and Easee Keys, and access personal consumption data
  - Generate consumption reports and export as PDF, Worksheet or CSV and more…
  - Monta/Fuuse/Tibber 등 payment, smart charging solution과 연동. Open API도 제공. (기본 기능은 자체 제공, 부가기능은 3rd party 연동을 통해 제공. Zaptec과 유사한 approach)

# Wallbox

- **Energy Management**
  - Dynamic Load Balancing – 건물내 AC 충전기 100개까지 only. (Online 상태에서만 동작 추정. 구체적인 구현 방식은 설명 無)
  - SEI (Sirius Energy Intelligence) – 보다 복잡한 환경을 위한 solution. AC/DC 구분없이 동작. PV 충전 및 bi-directional charging 까지 대응 (구체적인 설명 無)

- **Wallbox Business Portal (For private places - Condominiums, Workplace)**
  - Free management platform (Wallbox 충전기 전용 기본 관리 기능 제공)
  - Set up and manage multiple chargers, locations and users.
    - Add your chargers, individually or in bulk. Group chargers by location.
    - Onboard drivers by inviting multiple users. Create groups with unique access rights or payment rates.
  - Enable automated payments - Monetize to earn a profit or simply cover charging costs. (Pay per month, pay per charge, Apple/Google pay, credit cards, …)
  - Stay in the know - Access real-time status & statistics.

- **Evectrum (For Fleet)**
  - 3rd party 충전기 포함 범용 management platform (특정 sector별 부가 기능)
  - EV Fleet Management Platform – Delivery fleets / Company fleets / Rental fleets / Trucks & Buses
  - Universal charging access – Empower your drivers to charge anywhere: at home, at work, or at any of the 410,000+ charging points across Europe.
  - Detail cost tracking – View energy costs clearly by monitoring your vehicle ' s charging expenses.
  - Real-time monitoring – Check the status of your chargers in real time to ensure your infrastructure is always ready.
  - Network scalability – Quickly expand your network by connecting any OCPP compliant charger with your charging management platform.

# Wallbox

- **EVectrum (For public place - CPO, Retail & Hospitality, Parking Lots)**
  - All in one solution for intuitive charging management – Hotels & Restaurants, Malls & Markets, Airports, Car Dealership
  - Monetize your charging network - Create customized tariffs and leave the billing to us. We ensure direct user billing and consistent monthly revenue transfers to your bank.
  - Manage charging with ease - Set up chargers and user permissions fast and intuitively.
  - Ensure maximum uptime - Maximize your charge points' uptime thanks to real-time monitoring and remote diagnostics.
  - Expand your network effortlessly - Connect chargers from any brand to our platform using OCPP, making scalability a breeze.
  - Bring in EV drivers - Make your chargers available to millions of EV drivers, across dozens of platforms and apps.
  - Easily integrate your chargers - Integrate our backend functionalities with your parking management software using our API.
  - Ensure maximum uptime - Maximize your charge points' uptime thanks to real-time monitoring and remote diagnostics.

- **Cosmos**
  - Remote support and advanced telemetry platform
    - Improve efficiency by reducing issue resolution time.
    - Proactively identify and address charger issues.
    - Reduce onsite interventions thanks to remote troubleshooting.
    - Get data-driven insights that go beyond OCPP capabilities.

- **Software Integration**
  - 고객의 SaaS나 ERP에 API를 통해 연동하여 Wallbox charger를 제어 가능 – DR program을 launch 한다던가, HEMS를 구현하는 등...

# Pod Point

## With Pod Point's Workplace Charging solution you can...

Chargers

**Provide universal charging.**

Pod Point chargers are compatible with all plug-in brands and we offer a *full suite of charging options*.

Load Balancing

**Let your staff plug in and get on with their work.**

Designed for workplace behaviour, with our *smart Array Charging technology*.

**Boost your benefits offer for staff.**

Cleaner air, emissions reduction, happier workforce.

CSMS

**Reduce your business's vehicle emissions to zero.**

The *Site Management Service* will monitor and calculate the positive impact you've made by switching to EVs.

**Track costs & enable recovery.**

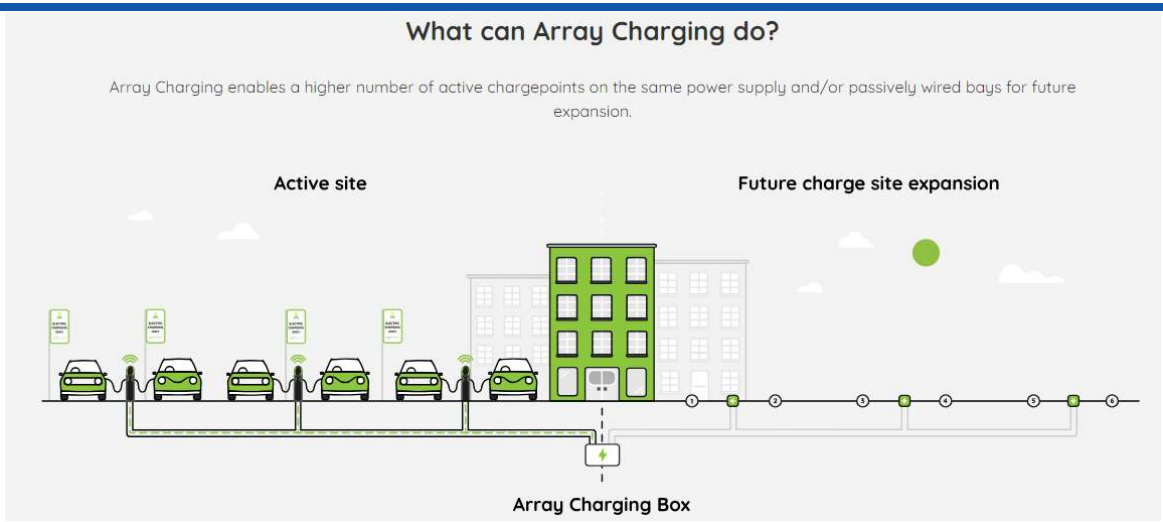
Record every charge by kWh consumed and its associated cost *through our Site Management Service.*

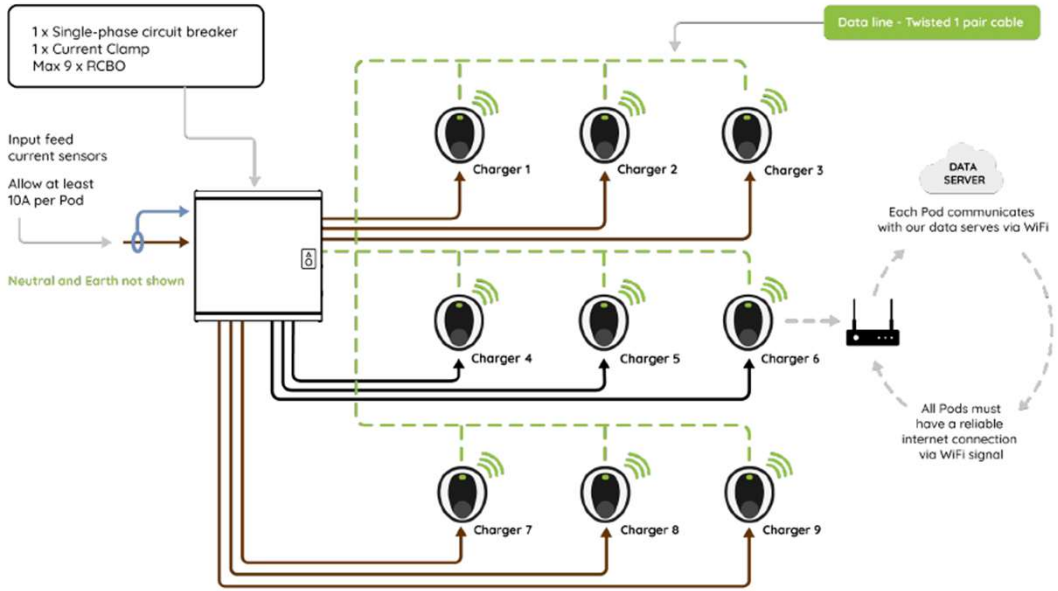
CSMS

You could save on installing EV charging infrastructure through **existing government grants and schemes**. Our team will help you through the process.

# Pod Point – Array Charging

- 2030년 신차 EV 의무화 roadmap에 따라 site future proofing 관점의 접근
- 타사의 L/B Hub 기능에 더해 차단기를 포함한 distribution box 개념의 solution
- Pod Point 충전기로만 시스템 구성 가능
- Array charging Box와 충전기들은 WiFi 로 연결되어야 하나, 반드시 internet으로 연결될 필요는 없음. Offline 상태에서도 L/B 정상 동작



# EoD