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Company Energy Management System for Optimising EV Charging: Integration of V2V Technology and Real-Time Control

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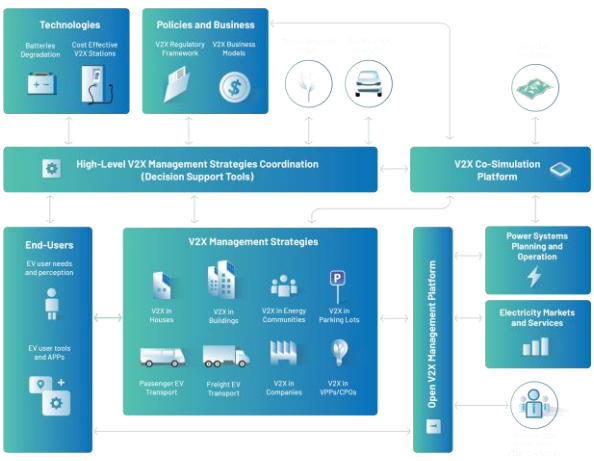
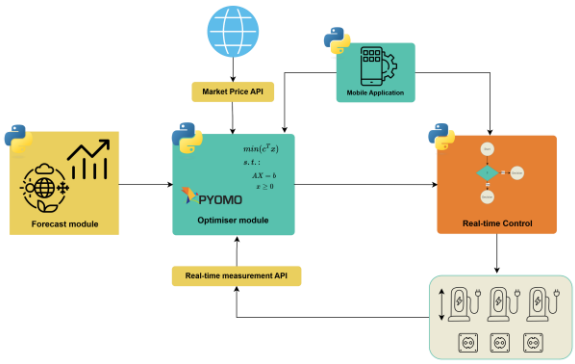
EV4EU Framework

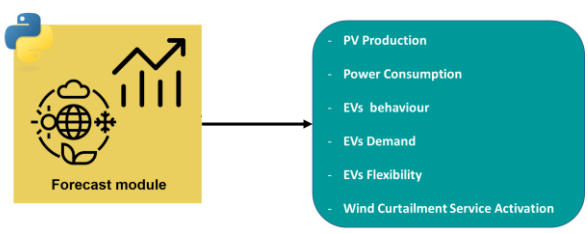


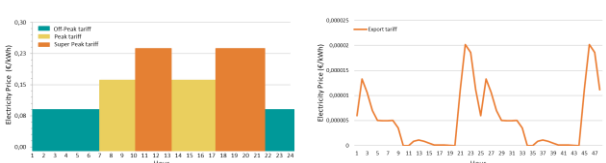
Company Management Framework



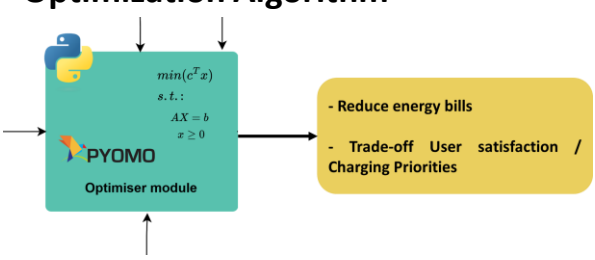
- A transformer with a 75 kVA operational limit
- Typical corporate load profile
- Six available connectors
- Three connector with smart charging
- Three non-controllable (on/off)
- 1 with V2X available

Forecasting Algorithm



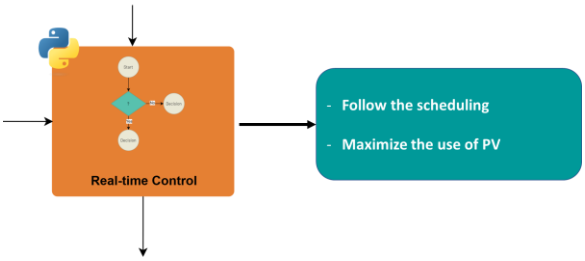


Optimization Algorithm



- CEMS integrates both controllable (smart) and non-controllable (on/off) ports to handle diverse charging needs.
- Super-priority (Directors) and high-priority (Fleet) users are served first during peaks; medium- and low-priority (Employees, Visitors) are allocated power based on remaining capacity
- In standard operation, the CEMS algorithm achieved a 27.62 % reduction in energy tariff costs by shifting charging to off-peak and super-off-peak periods.
- Even with the transformer limit halved, the system reallocates charging to unconstrained hours, meets user requirements, and maintains target SoCs to protect battery health.
- Vehicle-to-vehicle energy transfers and real-time market price inputs optimize costs, reduce grid reliance, and boost overall system adaptability.

Control Functions



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