Smart Electric Urban Logistics

Freight in the City 2018
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Background: FREVUE

- 4.5-year EU-funded project
- 8 cities, 32 partners
- Deployed over 80 electric vans and trucks up to 18t
FREVUE: Local Grid Infrastructure Capacity

- Potential local constraints

- FREVUE partner UPS encountered grid infrastructure constraints when charging all EFVs at the same time

- Infrastructure upgraded to charge up to 63 vehicles

- Such infrastructure upgrade has proven:
  - Costly, lengthy and disruptive
  - Non-incremental
  - Requiring investment in 3rd party assets

Barrier to the large-scale deployment of EFVs
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- An additional 20 EFVs at UPS central London depot
  - Bringing the number above the maximum that can theoretically be charged
- Design and implement a sophisticated network capacity assessment tool developed
- Design and implement an innovative smart charging system with an energy storage system
Network Capacity Assessment Tool
Smart Grid System
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Night-Time Demand on 16-17 January 2016
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- Base Demand (kVA)
- 42 Vehicles (kVA)
Night-Time Demand on 16-17 January 2016

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- 63 Vehicles (kVA)
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Night-Time Demand on 16-17 January 2016

- Base Demand (kVA)
- 42 Vehicles (kVA)
- 63 Vehicles (kVA)
- Smart-enabled capacity (kVA)
The Smart Grid system that has been developed at the UPS site in Camden comprises of 4 core components:

1. High-speed power meter
2. Active Network Management system (ANM)
3. Energy Storage System (ESS)
4. Smart charge posts

Diagram:
- Secondary Substation 1.25MVA
- Depot building
- Ethernet Network
- LV Electrical Network
- 1. High-Speed Power Meter
- 2. Active Network Management
- 3. Energy Storage System
- 4. 170 Smart charge-posts
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Key learnings – Smart Charging

- Optimises the use of existing assets
- Reduces capital expenditure
- Can reduce operational expenditure, e.g. energy costs, earn revenues
- Smart-charging technology developing rapidly
- Business continuity is key
Thank you

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