

Electric Vehicles and the Network

Stewart Reid

Head of DSO and Innovation

LowCVP Energy2017 Seminar

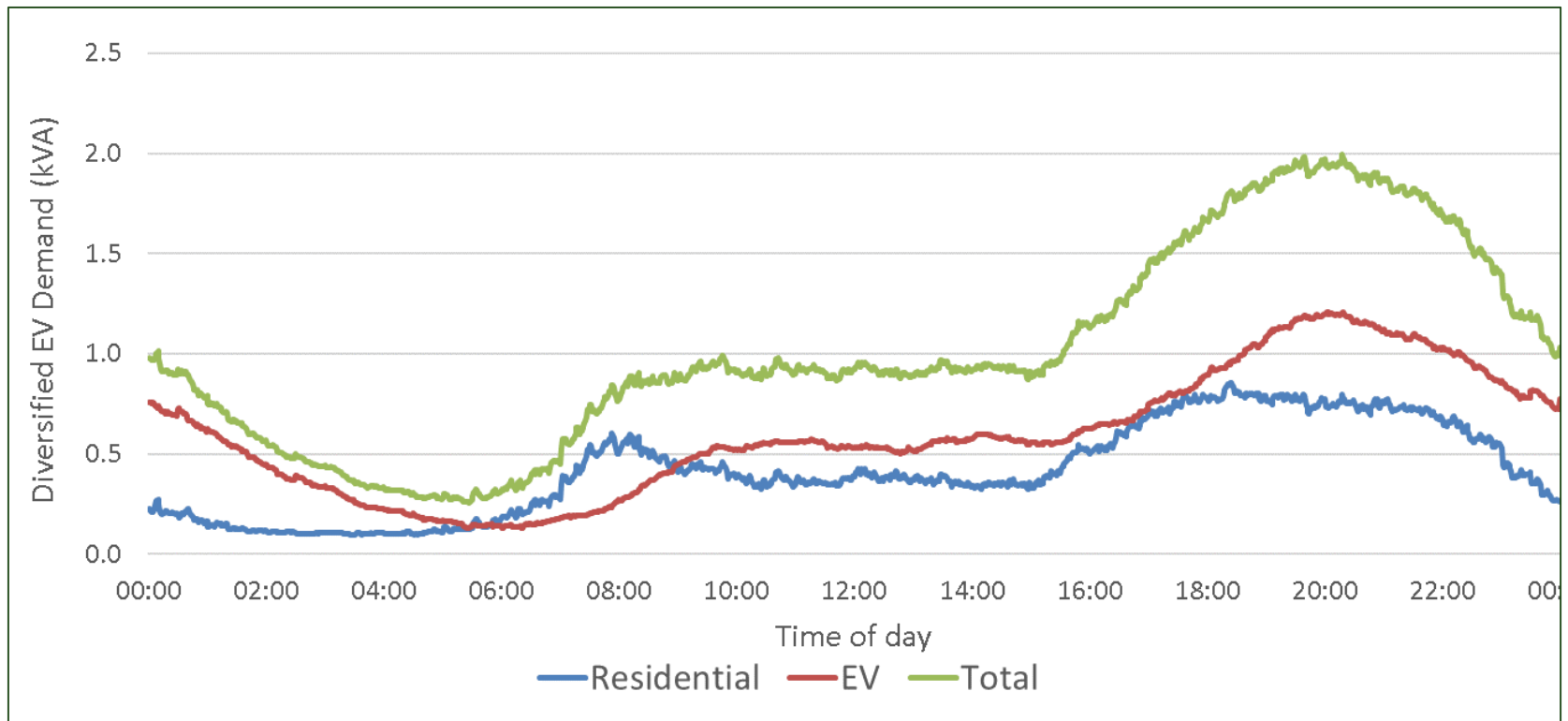
11th October 2017



Scottish & Southern
Electricity Networks

The Impact of Electric vehicles

200+ EV equipped homes



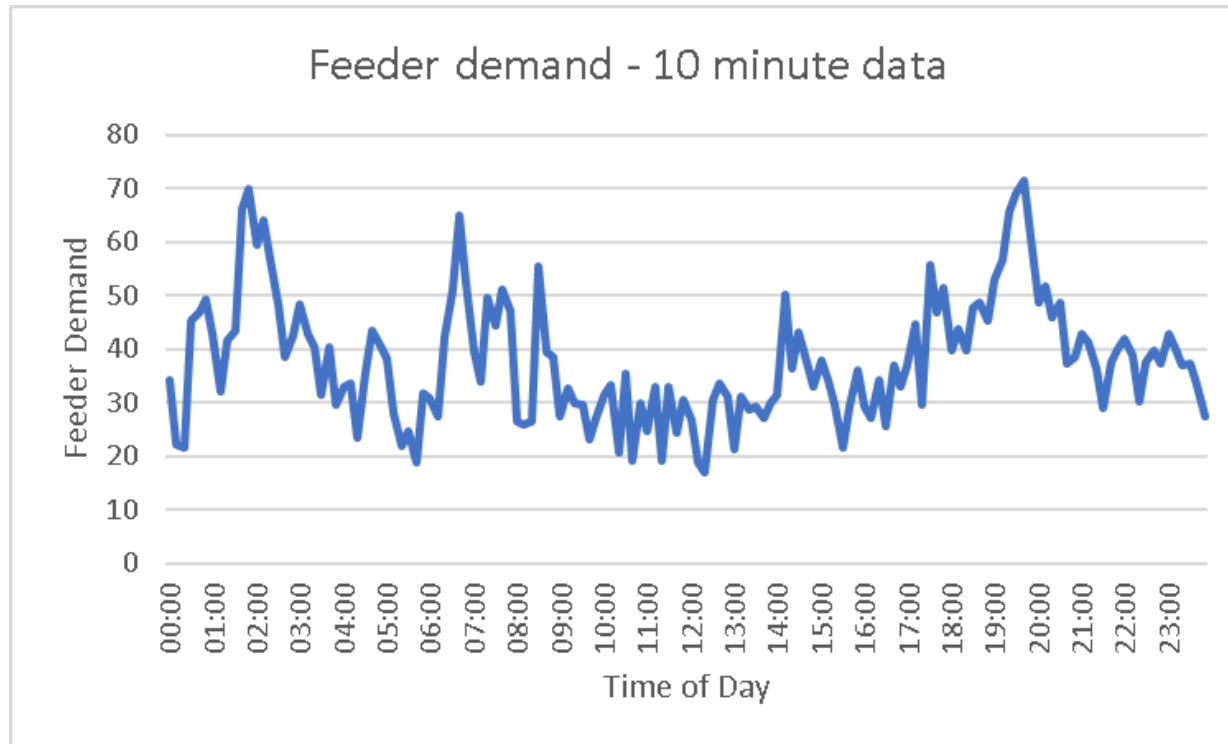


Historical design of LV networks

High levels of diversity are assumed. Typically designed for 2kw _{ADMD}



At a local level: No Law of Large Numbers



Plus Clustering

Who Pays?

Existing Domestic Properties

- Costs are socialised across all electricity bill payers

New Developments

- Connectee /Developer



Solutions



Traditional Network

- Upgrade existing cables
- New cable routes
- Re-balance phases
- Larger transformers
- Static Balancers



SMART Network

- Street storage
- Dynamic phase balancing
- Secondary transformer tap changers
- In-street Voltage Regulators
- Power Factor Management
- Street level Demand side management



IN THE HOME

- Dynamically charged energy storage.
- Dynamically charged energy storage with micro renewables.
- Demand side management.

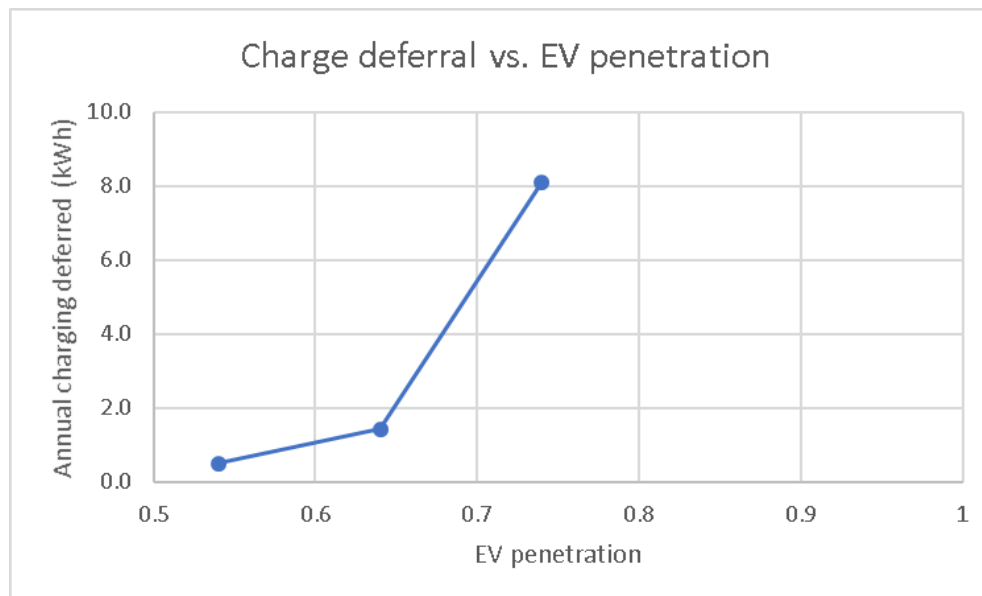


Scottish & Southern
Electricity Networks

Impact Quantification of Local DSM



- Using Circuit 2 to demonstrate:
 - First rating breach at 54%
- For a 20% increase in EV penetration
 - Each customer would be curtailed 19 times
 - Per annum the amount of charge “moved” would be 8.1 kWh or just over an hour for a 7kW car/charger



Getting the value from DSM

1. EV owners embracing the societal benefits of Demand side management.
2. EV owners accepting the principles of DSM.
3. Accessible Open standards.
4. The industry delivering the data and control signals necessary
5. Communications infrastructure
6. Products and services to support and build on the value of DSM.
7. Trust. (Data privacy, cybersecurity, motives, reliability etc)

Thank You

Search “SSEN Innovation” online.



Scottish & Southern
Electricity Networks