

# Electric Vehicles Workshop Issues and Responses

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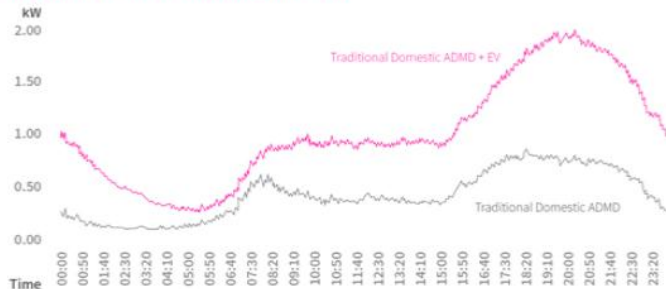
# The impact of EVs – a sense of scale

## Power

- We have seen that 3-3.7kW chargers add 1kW to the evening peak (Low Carbon London - UKPN, Customer-Led Network Revolution - NPg)
- Roughly 30 million cars in the UK, so 30GW
- Hinckley Point C (due in 2025) is 3.2GW which is around 1.5-3 million EVs depending on charger size
- 30GW extra load represents around a 60% increase in the UK peak loading

### DOUBLING THE LOAD

THE AFTER-DIVERSITY-MAXIMUM-DEMAND (ADMD) TRADITIONALLY USED FOR DOMESTIC PROPERTIES IS 1KW; WITH THE INCLUSION OF AN EV THIS NEEDS INCREASING TO 2KW.



## Energy

- Taking that lower Hinckley Point C figure of 1.5m EVs...
- ...each covering 8000 miles pa...
- ...at 3.5 miles/kWh...
- ...gives 3.4TWh/annum
- Around a 1% increase on the UK's energy consumption of circa 350TWh/annum
- Or equal to the energy generated by solar generation in Q3 of 2016<sup>1</sup>
- For 5% of the expected EVs

1. [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/579527/Renewables.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579527/Renewables.pdf)

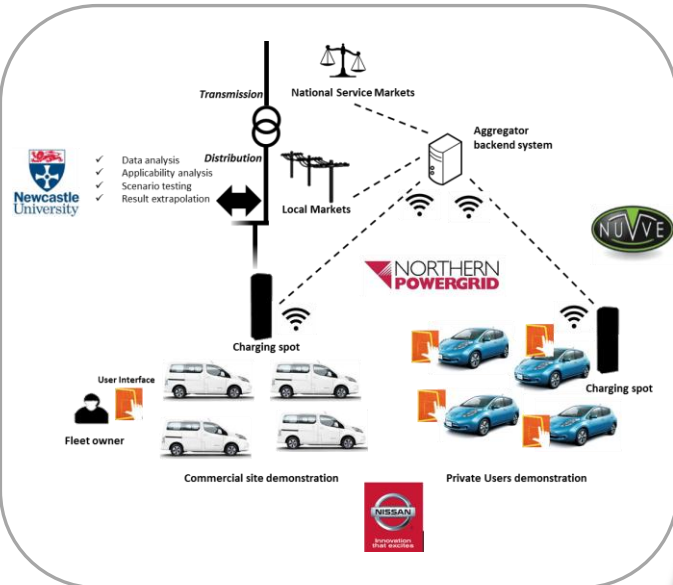
# Is a 60% rise in peak a problem?

- Probably...
- OLEV are supporting both home and work charging – so perhaps it is only 30-40%
- And our peak has dropped by over 10% in the last 10 years
  - That is a 1% per annum fall leaving us needing 20-30% rise over what we know the network can do
- So 20-30% rise over say 20 years is 1-1.5% rise per annum
- But will the underlying fall continue?
  - If so it is up to 0.5% rise per annum
- That is probably manageable without managed charging, smart charging etc.

# Slow or fast?

- The last example assumed slow(ish) charging at home and work
- Fast charging may concentrate charging in the evening rush hour
- Slow charging will require a minimum of extra infrastructure
  - Last slide's calculations or smart / managed charging
- Fast charging precludes smart / managed charging and V2G
  - Extra infrastructure?
- But is fast needed?
  - Motorways – Yes.
  - Otherwise – No, not given distances driven
  - And battery size doesn't really affect this
- Do some with vested interests want fast because of the infrastructure opportunities?
- Fast charging may concentrate charging in the evening rush hour

# Our response – V2G, SilentNight, Cockle Park Farm



Newcastle University



# Low Carbon Connections Gateway



- Developed in response to stakeholder requests
- Notify or apply?
- Your feedback will help us improve and develop this
- [www.northernpowergrid.com/get-connected/low-carbon-connection-gateway](http://www.northernpowergrid.com/get-connected/low-carbon-connection-gateway)