

Storage: What are your options?

- Fast moving industry and I will try to cover:
- Progress with batteries
- Applying the technology
- Related products and services
- **Ray Noble – APSE Advisor**

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Storage is a complete game changer
– let me explain

Progress with Batteries

- Battery technology developed by the electronic industry – Phones, Laptops
- Expansion of Battery Development now being driven by Motor Industry with enormous investment in manufacturing
- Lithium Ion is the choice of most and will be for at least 5 years with a further price reduction of 50% by 2020
- Solid State Batteries in development, Porsche, Toyota & Dyson, which can handle a 5 minute superfast charge
- China is the largest market for EV's and battery manufacturing in the World
- This growth based around control of pollution and CO2 reduction – **What strategy are you putting in place?**



EV's are a solution to City Pollution

- Deaths from pollution now published
- Ranges of 200 to 350miles are now possible (range anxiety will be dead!)
- 500mile range being a target
- Fast charging of EV's, now 30mins, puts stress on the grid - 5min charge time is target - how can the grid cope!
- Some Cities putting a ban in place on old diesels
- Some talking of the end of new fossil fuel cars sales by as soon as 2025
- New diesel car sales already suffering a drop of 30%
- Other clean city transport coming to the market – taxi's, delivery vans



“Clean” delivery Vehicles

- No Diesel in Cities soon to reduce pollution – **When are you going to impose constraints?**
- All sizes of Electric delivery vehicles are being developed, many on pre sale test prior to mass production – **No excuses not to plan for a change to electric vehicles - available soon!**



Public Transport

- Options available - Battery electric and Hydrogen Fuel Cell
- Both need a clean source of fuel, renewable electric or renewable hydrogen
- Industry gearing up fast.
- Price will be a driver – **What's your policy? Have you made a decision? Do you have a “clean” charging strategy?**



Are you EV ready?

- Most EV's will be charged at home
- Overnight Charging adequate to cover most journeys
- Long Journeys – Motorway / A road Charging Stations
- On Street Parkers will charge EV at a local “Charging Stations” – **Do you have a strategy?**
- Individual chargers will not satisfy the market – difficult to find, not maintained, always blocked – **Will be totally unacceptable? Do not waste money?**
- Business case difficult to provide a charging network, ahead of the market - but they are coming fast – **Will you be ready?**



Home Storage and Vehicle to Grid

- These predicted low cost batteries will impact building energy supply
- Nissan / Audi / Mercedes, etc offer a home storage system that also talks to the EV
- With car battery capacities of 100kWh (300miles+ range, but average daily mileage is 20miles, these vehicle batteries can talk to the house / grid
- Time of use metering for domestics on the horizon
- Putting clean Solar energy into battery storage during daytime is a no brainer – **Do you have a strategy?**



New Housing

- Government wants us to ween ourselves off gas by 2030 – **Do you have a policy?**
- For new housing all electric is the only answer but requires much greater levels of energy efficiency of the building fabric – **What's your policy?**
- Solar PV a must along with Storage, Smart controls and EV charging provision – **What do you ask for?**
- Strategies need to follow Zero Carbon and apply the “Merton Rule” – **What do you require?**
- 1 million additional homes required – we cannot go on with present strategies



Future energy provision

- Distributed generation / Smart Grids will be key to a successful future energy supply – **Have you a policy?**
- Can you be a generator - **Have you looked at your own land for local generation? How are you powering your own buildings and houses?**
- New Smart Homes and Buildings are a must – **What is your policy?**
- Existing Homes and Buildings need to be made more energy efficient – what happens when we run short of gas – **Do you have a strategy?**
- Car Parks – **Do you plan for them to be energy generators?**



Potential Services with Storage

- At present Battery Storage prices have not fallen enough to be economic in market applications – Global mass production drives down prices
- Presently Storage is providing Ancillary Services to National Grid where payments for these services are high.
- However as Storage becomes deployed at scale these Ancillary Services payments will diminish
- Pilot projects using battery storage are beginning now with market, linked to rate of price reduction, expected to develop at scale 2019 / 2020
- Multiple small scale Storage installations will be interlinked to provide both benefits for the owners with potential earnings from other services supporting the smart grid
- The market will move fast and the impact on grid / distribution system will constantly change, particularly around EV uptake together with the massive potential of vehicle to grid.

Storage Provides Opportunities

- Home systems allow time of use tariffs to be deployed
- Fuel Poor / Social Housing will need systems
- EV's need at network of Charging Centre's with Storage to support the grid
- More clean electricity, Wind and Solar, will be required
- Building Standards will have to dictate
- Planning Permission will have to dictate
- Carbon targets will come under greater pressure
- **Storage will transform Transport, Buildings & Energy**

The message is “Be Ready”

Thank You

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