Electric Vehicles

Council Fleet, Car Park Provision and Charging Infrastructure

Ray Noble – APSE Advisor



The UK Problem

- Pollution from Transport and Buildings is killing people or making them ill
- Shortage of Energy Generation caused by lack of previous investment
- Complete new strategy required for both Transport and Buildings



Government moving to Electric

- Electric is the future for all aspects of Building Energy and Transport
- Environmental rules have killed Coal as an electricity generator
- Need to ween ourselves off Gas not a secure supply after 2030
- Nuclear is proving to be expensive
- Renewables now making a major impact, many being connected at the distribution end of the grid
- Battery Storage heading to be commercially viable
- Solar, Wind and Storage to be the cheapest form of generation and provide security of supply







Technology has the answer

- Electronics Industry lead development of batteries for Phones and Computers
- Lithium Ion provided small but high capacity batteries
- Motor Industry now using and developing the same technology to power Transport
- This same technology is now also a focus of the power industry, solves grid issues and shortage of generation
- All based, at present, around Lithium Ion battery technology







Batteries are a Global Industry

- Massive investment in mass production of Lithium Ion batteries, along with technology improvements, to supply the Global electronics and motor industry
- VW alone placing 5 year supply contracts valued around £20B
- As a result battery prices predicted to fall by a further 50% by 2020 and continue to fall to 2030
- Other battery technology being researched e.g Solid State Batteries (Porsche, Toyota & Dyson) with potential full charging times around 5 minutes
- Difficult to say where it will be beyond 5 years







Battery / Hydrogen

- Nissan Leaf was first to mass produce an EV, short range and created the term "range anxiety"
- Tesla delivered a 260mile range and supercar performance, changing image of the EV
- Now all Car Manufacturers are introducing EV's across their full range by 2019 – 2021 with 300mile+ range
- Dieselgate has caused the death of diesel and raised awareness of pollution issues
- Hydrogen Fuel Cell still being developed but battery technology now thought to be the ongoing answer









EV's are solutions to Pollution

- Ranges of 200 to 350miles are now possible (range anxiety will be dead!)-500mile being a target by industry
- Charging an EV every time it p[arks will no longer be necessary
- Some talking of the end of new fossil fuel car sales by 2025
- Full charging of EV's now 30mins but puts stress on the grid – grid needs reinforcement or further storage
- All city / delivery vans will soon all be electric e.g Amazon, Tesco, Council vehicles, etc







"Clean" delivery Vehicles

- No Diesel in Cities soon to reduce pollution
- All sizes of Electric delivery vehicles are being developed, many on pre sale test prior to mass production
- Even articulated trucks can be powered by batteries e.g Tesla Semi
- Council vehicles will need be electric
- Speak with your suppliers









Emissions and Pollution solutions

- Electric buses even double decker's are now running on battery power – not thought possible 2 years ago
- Hydrogen Fuel Cell buses may not be the answer – infrastructure being expensive to install.
- Hydrogen a bi-product of the fossil fuel industry!







Clean Fuel

- EV's are only "clean" with clean fuel
- Increased supply of "clean" Solar and Wind electricity is essential (on land and Buildings)
- EV's will be charged at home or locally (Car Parks, Supermarkets & Offices) with long runs topped up at Service Areas
- Grid will not cope with fast chargers unless Storage used as an interface
- Solar canopies over surface parking linked with Storage providing "clean" electricity
- Need to increase charging network





Smart technology





Provision for charging EV's

- New building regulations on their way
- Houses should provide EV charging points
- Retrofit program should be undertaken on existing houses with garages / drives
- Buildings should provide EV charging points in their car parks
- Fast chargers should be provided at Service areas with sources of "clean" energy locally
- Councils could provide the charging infrastructure and earn long term revenue







Time of use tariffs & Smart meters are coming

- Time of use tariffs are going to be standard across all users, even for domestic
- 4.00pm to 8.00pm is the highest charges (Red Zone)
- Using electric or charging EV's at this time should be avoided (smart controls)
- Storage provides a way of moving electricity and avoiding Red Zone costs
- Supply of electricity is getting smarter
- Smart technology will allow batteries to be charged for free when excessive electricity on the grid – increasingly likely with more renewables on the grid
- Speed of change is rapid







Start working out the opportunities

Cornwall's energy future

We will create an energy future that is cleaner and more affordable, retaining the social and economic benefits in Cornwall.



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Thank You

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APSE

Vehicle Maintenance & Transport Advisory Group

NORMAN HARDING CORPORATE FLEET MANAGER LONDON BOROUGH OF HACKNEY



AWARDS WON 2017/18





• 2008 – 2017 FAME BIODIESEL

PAS

ISSUE	SOLUTION	
Fuel for Food	UCOME	
Bulk Storage	Non-Plastic Tanks	
	Consume Appropriately	
Quality	B20/30 - EN16709	
	B100 – EN14214	
Maintenance	Fuel Filter / Oil Drain Frequency	
Staff Objections	Excuses to fail	
Warranty	Negotiation	

• 2008 – 2017 FAME BIODIESEL

PAS

Year	Total annual CO2 produced if no biofuels used (tonnes)	Total annual CO2 produced using FAME biofuels (tonnes)	CO2 savings achieved from using FAME Biofuels (tonnes)	%
2010/11	2876.74	2843.32	33.42	1.16%
2011/12	2939.2	2798.76	140.44	4.78%
2012/13	3160.77	2973.09	187.68	5.94%
2013/14	3429.46	2884.12	545.34	15.90%
2014/15	3448.24	3094.56	353.68	10.26%
2015/16	3361.62	3054.08	307.54	9.15%
2016/17	3422.83	2572.88	849.95	24.83%



• 2017 HYDRO-TREATED VEGETABLE OIL

TRANŠITIC

HVO AS A TRANSITION FUEL

• 2017 HYDRO-TREATED VEGETABLE OIL

- No vehicle modifications
- No additional vehicle maintenance, and
- No storage issues.

FRANŠITIC

- Vehicle manufacturers refer to it as a 'drop-in' fuel and do not have issues with warranty.
- Widely accepted in USA and Europe.
- Reports suggest high savings of CO2, NOx, Particulates.

RANSITION	• 2017 HYDRO-TREATED VEGETABLE OIL				
	(g/km)	СО	NOx	CO2	PM
	Baseline - EN590	0.017	0.238	879.9	0.006
	нио	0.014	0.072	776.2	0.004
		-17.65%	-69.75%	-11.79%	-33.33%
	Significant?	No	Yes	Yes	No



• 2017 – 2025 ELECTRICITY

VEHICLES

FUTURE

- 43 X ON FLEET
- 45 Depot Based Charging Points Fleet Use Only
 - 40 X 7KWh
 - 5 X 22KWh
 - 13 X SITES
- 63 Street Based Charging Points Public Use
 - 3 Rapids Hackney Managed
 - 44 Source London Managed
 - 16 Lamp Column Hackney Managed



• 2017 – 2025 ELECTRICITY

FUTURE

ISSUE - VEHICLES	SOLUTION
Cost	Whole Life Assessment
Mileage / Load Reduction	Application
Charging Restrictions	Depot based charging infrastructure
Charging Time 80/20	
Noise (lack off)	External warning
Charging Cable Storage	
Manufacturer / Dealer Support	



•	2017	- 2025	ELECT	FRICITY
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ISSUE - INFRASTRUCTURE	SOLUTION
Back Office Management Data	???
Mileage input	
Data cost / hosting fees	
Connectivity signal	
Facilities management	???
Power Requirements	???
Procurement Specification /	???
Technical Standards development	



FUTURE









ELECTRIC VEHICLE FUTURE

VEHICLE BATTERY DEVELOPMENT

- Fast charging
- Range Improvements
- CLEAN ELECTRICITY GENERATION
- Wind
- Solar
- ON-SITE ENERGY STORAGE
- Recycled batteries
 VEHICLE TO GRID ENERGY TRANSFER
- Potential to sell energy back to the grid SUPPLY CHAIN CONVERGENCE

APSE

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Best Service Team of the Year: Transport and Fleet Maintenance Service



Samantha Jinks -Head of Passenger Transport &

Julia Richardson -Head of Business Development

APSE VEHICLE MAINT & TRANSPORT WORKSHOP

OXFORD

22nd March 2018



EXCELLENCE IN PUBLIC PROCUREMENT AWARDS 2017/18 Finalist

Part One- Our Services

- Provided transport services 30 years
- SEN Transport to over 1000 students a day
- AOPS 250 service users daily
- Coach Trips to over 5000 people weekly
- Including 3000 children & free travel to 241 elderly users
- 2884 meals a month to Vulnerable residents
- 50 cash collection pickups daily

Branching Out

- Competitive Framework in 2015
- Won contract started 1st Dec 2015
- 18 Routes/ 196 people a day



Area's of Focus

- Mobilisation of contract
- Modernisation and review of vehicles
- TUPE 48 Staff Members
- Training including CPC/Policy Changes

The Challenges

- Licence Status
- Union/Staff Privatisation
- Change in provider for end user

Efficiency Savings

- Saving over £143k on in-house provision
- Review of current delivery model
- Utilisation of vehicles and staff
- Use of Smaller vehicles

Introduction of New Technology

- Why
- Choosing the right software
- Consultation with users

How's it going

KPI Results

Running Total	Weekly		
	VEHICLE RELATED	ROUTE RELATED	STAFF RELATED
Expected	93%	100.00%	N/A
Achieved	99.09%	100.00%	N/A
	Monthly		
	VEHICLE RELATED	ROUTE RELATED	STAFF RELATED
Expected	86.00%	87.00%	100.00%
Achieved	100.00%	98.08%	98.62%

Survey Results

- 97% Happy with Service \bigcirc
- 95% Happy with customer © Service
- 98% Happy with Journey ☺ Times

"Only 60% of companies retain contracts in a rebid situation in many cases this drops to less then 50%" Find ways to promote your expertise that adds value above and beyond the standard scope of the contract and ensure that you forge a great client/contractor/customer relationship.

COMMUNICATE, COMMUNICATE, COMMUNICATE Don't confuse this with `selling'

REMEMBER these words!

Research suggests that for every <u>negative</u> experience we encounter...

it takes 10 POSITIVE experiences

to redress the balance

CUSTOMERS DON'T EXPECT YOU TO BE PERFECT. They do expect you to fix things when they go wrong. Donald Porter

WHEN WAS THE LAST TIME YOU WERE...

Wowed with the service you received



IF YOU WEREN'T IN THE ROOM...





Recognise that your people have different talents and that you know and value their strengths and weaknesses!





50% of training is "Scrap Learning" - learning that is delivered but not applied back on the job "Emotional intelligence is how you understand yourself and the people around you, and it is just as important as cognitive, or rational intelligence, to how we make decisions,"

El Kaliouby

Real Challenges

Challenge

- 80% of authorities have reduced their school transport provision since 2010
- 150,000 SEN children qualifying for free transport nationally, 14,000 in London
- Overall spend on SEN transport is circa $\pounds 620m$ against $\pounds 1,062bn$ so over 50%
- For pupils with special needs, the average cost is over £4,000 per year equivalent to nearly £11 per journey.
- Rising to nearly $\pounds 10,000$ per pupils in some London Boroughs.

Reaction

- Changes to the assessment of need reducing numbers by as much as 20-30%
- Local Authorities investing in travel training to promote more independent travel including apps for android phones to assist young people
- 26 have already introduced direct payment (personalisation) and nine others are considering to provide choice to parents and users
- Future funding cuts ahead are likely
- Post 16 Users being asked to pay via their Disability Living allowance

What's ahead- The Digital Age



- "There's been an explosion of use of data in transport across our cities.
- An ever-increasing number of sensors, services and systems across the globe are collecting data about movement through transport networks.
- 'The Internet of Moving Things', looks set to continue with smart, connected devices predicted to rise from 4.7 billion in 2014 to well over 50 billion by 2025."

The need to be inventive



- Offer advice/information to the client on how to improve service provision
- Digital Revolution/green agenda
- Consider other opportunities
- Continue to provide an A1 service and maintain that passion !



Any Questions? Email : <u>Samantha.Jinks@gsplus.org</u> Email : <u>Julia.Richardson@gsplus.org</u>