ENVIRONMENT OVERVIEW AND SCRUTINY PANEL – 11 MARCH 2021

PROGRESS UPDATE ON THE PROCUREMENT AND USE OF ENERGY EFFICIENT VEHICLES AND INFRASTRUCTURE

1. INTRODUCTION

1.1 The purpose of this report is to update the Panel on the progress of two separate but linked projects, which are:

- Use of EVs in NFDC's fleet and the impact on emissions reduction
- Expanding the charging infrastructure in Council car parks, for electric vehicle (EV) charging which has been accessible to the public

1.2 Four EVs were procured and put into service on 5th December 2019 and the Council has been monitoring the feasibility of these types of vehicles. It is suggested that in future the Council purchase EVs, for its smaller panel vans, as the default option for vehicles which park at Council depots, with a business case required for not having an electric vehicle.

1.3 Regarding charging infrastructure, the Council appointed a partner, JoJu, under the Hampshire electric vehicle charging point (EVCP) framework. JoJu have installed 25 fast chargers distributed in 9 of our NFDC pay and display car parks that ensures all the major towns are covered within the district. It is suggested that we continue to monitor usage before deciding on the type and location of further EVCP infrastructure.

1.4 The remainder of this report concerns the background to these recommendations.

2. ELECTRIC VEHICLES IN THE NFDC FLEET

Background

2.1 In 2018 the Energy Efficient Vehicles and Infrastructure Task and Finish Group was set up to explore options for reducing emissions such as CO^2, Hydrocarbons (HC), Nitrogen oxides (NO_x) and Particulate Matter (PM), which are seen as detrimental within the district and the wider environment. The procurement of more fuel-efficient vehicles was seen as good for the reductions of both emissions, and running costs.

2.2 Work was carried out by the Energy Savings Trust (EST), which is funded by the Department for Transport, who provided data on:

- CO^2 emitted (carbon footprint) by the Council's fleet activity
- Whether the Council's existing fleet provides opportunities for EV use; and
- The baseline costs, both financial and in terms of emissions, if EVs were introduced.

2.3 Data provided by the EST findings allowed the Working Group to explore the options for replacing existing frontline service diesel vehicles with low emission EVs. An electric vehicle is initially more expensive (i.e. to purchase) than its diesel or petrol

equivalent, but overall Whole Life Costs (WLC) were expected to be less. WLCs account for the purchase price (and depreciation), the estimated fuel costs for the life of the vehicle, the Service, Maintenance & Repair (SMR) costs and vehicle taxation. The EST identified 41 Council vehicles that might be suitable for EV replacement, 12 of which were parked overnight at the depots and which could be charged.

2.4 The potential financial savings were calculated by the EST, using two EV models that were available on the market. Replacing 12 of the existing fleet with EV's would save between £32,000 and £39,000, based over an economic life of 6 years.

2.5 It was recommended by the Environment Overview and Scrutiny Panel on 14 March 2019, that four Council vehicles should be replaced with electric equivalents.

2.6 Before any decisions were made the daily mileages were analysed to ensure that there would not be any range issues. On this basis, the four vans were allocated to the Council's Parking Enforcement team (2) and toilet cleaners (2).

Procurement

2.7 The invitation to tender (ITT) was issued in July 2019 via the Council's e-Tendering tool. The ITT closed on 6th August 2019. The evaluation process reviewed the cost of the vehicles and the cost of servicing the vehicles to understand the expected running expenses in future years. The make and model procured was the Renault Kangoo LL21 ZE.

2.8 The EVs were £17,827 per unit, which is a higher capital outlay than a standard internal combustion engine (ICE) of similar type, which is £11,250, based on a recent procurement exercise. The increase in the capital budget should be measured against the expected reduction in the revenue budget resulting from fuel and maintenance savings.

Results and performance information

2.9 EVs do not require MOTs and therefore take less time to service, as collection and delivery to the testing station is not necessary. To compare the WLC of the Renault Kangoo ZE (EV) and a Fiat Doblo (Diesel), a combination of the Council's asset write-down for depreciation, and industry datasets (from CommercialFleet.org) data was used. It showed, over the vehicles 6 year cycle the WLC is less for an EV (Table 1).

Table 1 – Comparing Electric to Diesel vans

Renault Kangoo LL21 ZE (EV)	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	
Purchase Price	17,827	0	0	0	0	0	
Fuel	878	878	878	878	878	878	
Depreciation	2,971	2,971	2,971	2,971	2,971	2,971	
SMR	745	745	745	745	745	745	
RV	0	0	0	0	0	-4,848	
							WLC
	22,421	4,594	4,594	4,594	4,594	-254	**40,541**

Fiat Doblo Maxi 1.6 (Diesel)	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	
Purchase Price	11,250	0	0	0	0	0	
Fuel	2,640	2,640	2,640	2,640	2,640	2,640	
Depreciation	1,875	1,875	1,875	1,875	1,875	1,875	
SMR	1,205	1,205	1,205	1,205	1,205	1,205	
RV	0	0	0	0	0	-2,142	
							WLC
	16,970	5,720	5,720	5,720	5,720	3,578	**43,428**

Key: *SMR - Service, Maintenance & Repair*
RV - Residual Value (Expected sale at auction)

The estimated financial saving, using WLC of procuring an EV over a diesel equivalent, is £2,887 per vehicle.

2.10 To calculate savings in emissions, both EV and Diesel emissions were considered, between December 2019 and November 2020:

- Electric Vans are promoted as 'Zero tailpipe emissions', however the charging of the batteries is the calculation for the emissions produced. Based on vehicle mileages, the average CO^2 emissions were 368 KG per vehicle.

- CO^2 emissions for diesel vehicles are best calculated by litres. The fuel efficiency of four randomly selected diesel vans in the fleet was used to calculate the emissions that would have occurred if the four EVs were instead diesel-fuelled. This calculation indicates that the average CO^2 emissions would have been 2,900 KG.

2.11 The real emissions saving per vehicle by using electric, over the period December 2019 to November 2020, was 2,533kg per van, per annum (Table 2). This equates to a 10 tonne reduction in CO^2 per annum as a result of changing these 4 vans from diesel to electric.

Table 2 – EV comparison with diesel, Dec 2019 to Dec 2020

EV Registration Number	Miles	CO_2 Emissions (Kg, resulting from charging)		Diesel equivalent emissions (KG) at 0.28 kg/mile	Emissions saving (KG)
RE69OXF	12,706	451		3,558	3,107
RE69OXH	9,525	338		2,667	2,329
RE69OXJ	11,345	402		3,177	2,774
RE69UMU	7,858	279		2,200	1,921
Grand Total	**41,433**	**1,471**		**11,601**	**10,130**
Per Vehicle	**10,358**	**368**		**2,900**	**2,533**

Infrastructure and policy

2.12 Before the EVs were ordered, three additional charging points were installed at the Marsh Lane depot in Lymington, in addition to the two that were already in place. The objective was to create spare charging capacity to mitigate the risk of a charging point failing, resulting in an undercharged vehicle that could not complete its daily duties.

2.13 It is worth noting that the Marsh Lane depot is nearing its maximum load on all three phases on the current electricity distribution board. Any additional charging points, due to the expansion in EV use, would need to consider the current power infrastructure at the Council's properties.

2.14 Since making the decision and procuring the EVs, the Council released its latest Corporate Plan for 2020 - 2024, which has as one of its main priorities "Take action to reduce the impact of climate change locally" and one of its main actions being "improve the air quality of the area."

2.15 An internal policy has been developed to ensure that environmental issues are considered when procuring vehicles and plant, with alternative fuels and electric vehicles being the default for procuring smaller vans and some plant and small tools. It refers to improvements to battery life and reduction in size that could extend this desire for EVs to larger vans. The policy, which is an excerpt from a Vehicle & Plant Procurement Procedure, is shown in appendix I.

2.16 Some of the small panel vans, predominantly Fiat Doblos, are taken home, with the remainder parked on NFDC property. The vehicles parked on NFDC property can be changed, when they are due in the replacement programme, to their EV equivalent. There are four additional small panel vans that are parked overnight at the Marsh Lane depot that can be changed to an electric equivalent as the highest daily distance was 84 miles, with an average of 36 mile per day.

2.17 Additional charging points may be required, subject to considering the electrical load of the depots.

2.18 There are 35 other small vehicles with a maximum daily mileage under 100 miles that are currently taken home.

2.19 Larger vehicles such as refuse collection vehicles (RCV's) are not currently economically viable due to the cost, circa £420,000 compared to a normal RCV of

£150,000. In addition, the weight of the batteries will reduce the payload and therefore increase the number of trips to the tip, resulting in operational issues. As technology and take up increase the cost and weight will reduce. It is the intention to keep track on costs and, evaluate using WLCs, to take advantage of the potential reductions in emissions and costs when appropriate.

Conclusions

2.20 The advantages of changing to EV's for the smaller fleet are a reduction in costs and 2.5 tonnes of CO^2 per vehicle each year. Having a policy of EVs, for smaller vehicles, as default, will ensure that there is a reduction in emissions, which is currently 2.5 tonnes per vehicle per annum.

2.21 NFDC property infrastructure, in relation to electrical loads, should be considered with any EV expansion. Wholesale conversion of the van fleet to EVs will require a review of home charging options.

2.22 The market for larger vehicles is still cost and product prohibitive, however, manufacturers are beginning to offer more hybrid and electric models that have a greater range. Any larger EVs (which naturally have a lower range) would need to consider arranging work around the vehicle range rather than the vehicle around the work, which may be operationally inefficient.

2.23 Small plant and tools are being replaced with Electric, with the advantage of reducing Hand Arm Vibration and emissions.

2.24 Technology is improving range and power output, and will need to be regularly reviewed.

3 Charging Infrastructure in Council car parks

Background

3.1 The Energy Efficient Vehicles and Infrastructure Task and Finish Group looked at all options for a rollout of electric vehicle charging points for public use, and their recommendation was to select a supplier-funded option using the Hampshire EVCP (electric vehicle charging point) framework.

3.2 This was viewed as the best option with no cost or risk to the council whilst enjoying the benefits of having a third party (JoJu) managing EVCPs in our car parks. The funder was initially a Swedish electricity company called Vattenfall who supply green electricity to the national grid.

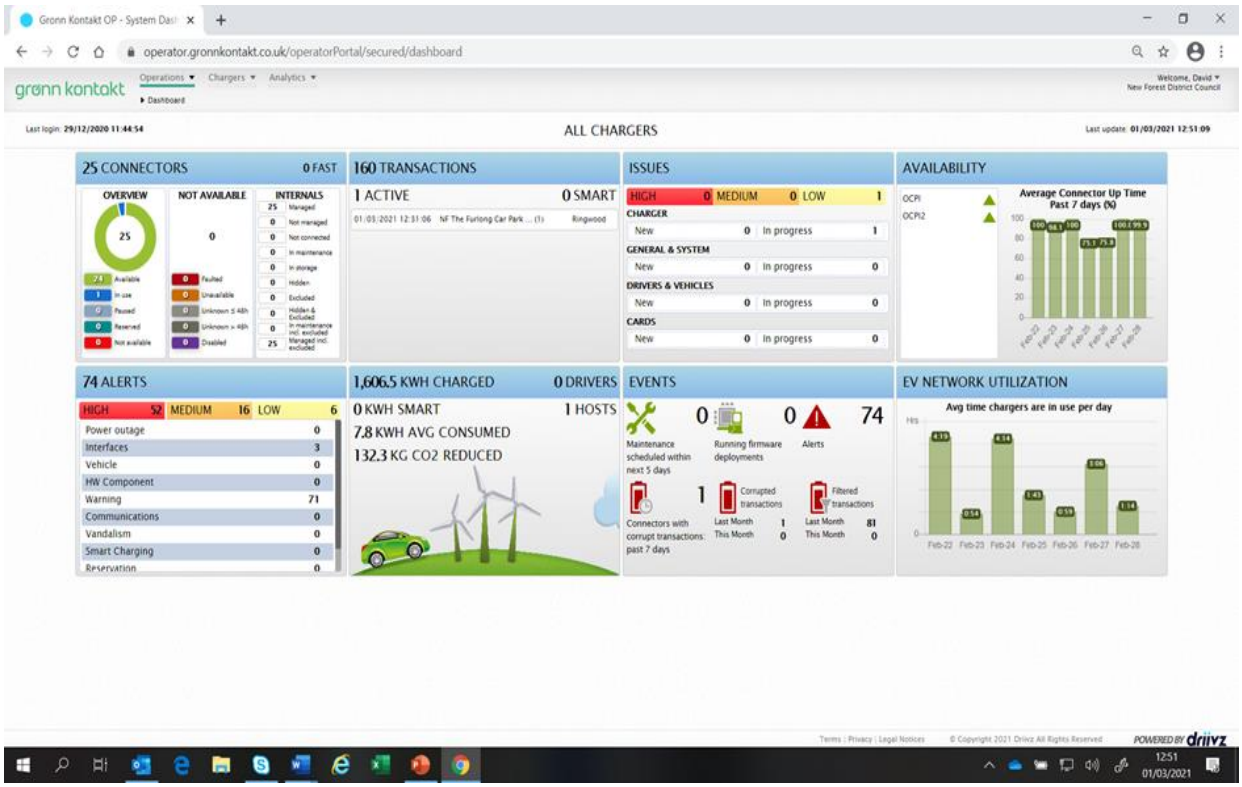
3.3 Phase 1 began with a 'Pilot' installation of a single and double EVCP's at Fordingbridge main car park in December 2019. This deployment was deemed successful. There was then a delay in early 2020 caused by the funder - Vattenfall - selling their interest to Norwegian green electricity company Gross Kronstadt who took over the funding of the project with JoJu.

3.4 There are now 25 fast (22Kw) electric vehicle charging points operational in the district in 9 car parks. They are all supplied with green electricity supplied to the grid by Gross Kronstadt. A further 4 EVCP's are due to be installed in Lyndhurst car park in late spring this year.

3.5 The installation, management, servicing and repair is all the done by JoJu at no cost to NFDC for period of the term which is set at 15 years or when they reach a point where

they are in profit (currently estimated at 26 years in current usage), whichever is sooner. Once this happens the EVCPs are passed to NFDC who will run them and take all the revenue and pay for the back-office support and maintenance out of the income.

3.6 The back-office system allows us to see how the EVCPs are performing, whether they are in use or not and shows how much CO_2 has been reduced since they were put in. It also shows how many Kwh are used. An example below shows the 'dashboard' we can access, and it shows that as of the 1st March 2021 the EVCP's have led to a reduction of 132.3Kg's of CO2. The whole project has cost NFDC £1.00.



3.7 JoJu operate and manage the EVCP's and rebate 10% of the supply cost monthly to NFDC. All other income is retained by them. As an example, in the current lockdown we received £5.00 rebate for a month. Over time this will increase substantially, and as electric vehicle ownership increases so will our income. The trend is still for internal combustion ownership to stay high for the next few years, a trend fuelled by suspicion of EV range and re-sale values and questions over battery life and costs.

Conclusion

3.8 Income generation from this will be slow (more so due to Covid lockdowns) so it is not possible at this stage to get a true picture of usage or future revenue. The aim will be to install more EVCP's in our car parks to eventually achieve points in all car parks but the type and number of these needs careful consideration. The sale and use of Electric Vehicles will increase exponentially with the UK government stating it will legislate to stop the sale of internal combustion engine cars by 2030 (Plug-in Hybrids up to 2035). In time, all vehicles will use alternative power sources and the Council will need to adapt to these changes.

4 FINANCIAL IMPLICATIONS

4.1 Taking account for WLC's for the smaller vehicles – Purchase price; fuel, repair & maintenance, taxing, write down, and residual value – The EV's have less of a financial impact to the Council than diesel.

4.2 The current set up for supplier-funded EVCP's provides a small amount of revenue whilst not costing the Council money. In time the council may want to invest their own money in EVCP's and take more income, but the overheads make this financially unacceptable and high risk at this stage.

5 CRIME & DISORDER IMPLICATIONS

5.1 There are none.

6 ENVIRONMENTAL IMPLICATIONS

6.1 Reduction in CO^2, HC's, NO_x and PM's, which have a negative impact within the District and the greater environment.

6.2 Each small vehicle changed from diesel to electric could save 2.5 tonnes per year in CO^2 emissions.

6.3 The EVCP's are already having a positive impact on reducing CO2 and are supplied solely from green energy sources.

7 EQUALITY & DIVERSITY IMPLICATION

7.1 There are none.

8 DATA PROTECTION IMPLICATIONS

8.1 None.

9 RECOMMENDATIONS

9.1.1 That the Panel review the key conclusions of this report which are:

- That EVs can continue to be purchased as part of the Council's small van replacement programme where appropriate. Large scale introduction of vehicles with EVs will be dependent on continued assessment of technology and cost, and a review of home charging options.

- To continue to monitor the usage and revenue from the car park charging points once the public's car travel patterns return to normal, before considering the scale of further expansion across more car parks.

And present this report and it's findings to the Portfolio Holder and the Council's Executive Management Team.

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Background Papers:

None

APPENDIX ONE – Excerpt from Vehicle & Plant Procurement Procedure

Fuels & Alternative Options

A key factor in determining the asset replacement and acquisitions is the Council's commitment to reducing their emissions impact. Alternative fuels, along with other technical enhancements are reviewed as opportunities arise. This results in fuels savings, which in turn reduce the environmental impact. However, alternative fuels should not have a detrimental impact on the service delivery.

It is intended to standardise the fleet as far as possible on diesel over the short term whilst keeping hybrid development under review particularly for heavier vehicles which currently operate at very low levels of fuel efficiency. If opportunities arise to pilot such technology at reasonable comparable cost these will be explored, and decisions made on a case by case basis.

For the smaller van's, battery powered, electric vans (EV's) is the preferred option. However, this is contingent on where the vehicle is parked overnight. Many van users are required to drive their vans home, which is the point of their 'start of work'. This means that the charge points are not available. A vehicle parked on Council property, with the required charging points should be changed to an EV as default, after considering the daily mileage. A business case for not having an electric vehicle should be written for all small vehicles that are not to be electric.

For Plant, battery powered assets should be costed and WLC's compared with its diesel equivalent.

As battery life improves and the size reduces, larger vehicles should be included as default electric, which will be monitored.

Note: Modern diesel-engine vehicles are very efficient, generally clean and are capable of running on more eco-friendly biofuels.