Somerset Waste Board meeting
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Report for decision

Approach to Partial Refleet
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Forward Plan Reference:	*22/05/07*
Summary:	Whilst most of SWP's fleet was bought in 2020 and is expected to last until 2030, 22 of SWP's fleet of vehicles used on the collection contract were bought in 2016. These are scheduled to be replaced in 2024 and with long lead times on vehicle production a decision is needed in the current year. This paper sets out the proposed approach to the refleet (including decarbonising it) and the proposed approach to funding it.
Recommendations:	**That the Somerset Waste Board:** **1) Notes the proposed approach being taken to the partial refleet** **2) Notes the proposed capital bid being submitted, including the intention to seek funding for 2 electric refuse vehicles** **3) Notes the progress in exploring Hydrogenated Vegetable Oil as a short term-option to decarbonise our operations**
Reasons for recommendations:	22 of our fleet needs replacing in 2024 and we need to commit to a purchase in this financial year in order to ensure we have a reliable fleet capable of delivering good service quality. Having already purchased 1 e-RCV SWP is seeking to maximise the number of decarbonised vehicles used to deliver services, but this is not viable for many of those vehicles we need to replace. Our contractor, SUEZ, is required to fund the vehicle replacement but is also required to offer SWP the opportunity to capitalise the vehicles in return for a discount – it is primarily a commercial

	decision as to whether it is in SWP's interests to take up this offer, other than where we are investing in vehicles in ways not originally envisaged by the contract (e.g. purchasing e-RCVs, which have much higher up-front costs). Globally progress in electrifying large (over 3.5 tonne) vehicles is much slower than progress on electric cars and much of SWP's fleet doesn't reach the end of its useful life until 2030, and hence SWP is exploring other options to decarbonise our fleet in the short term.
Links to Priorities and Impact on Annual Business Plan:	Section 4 of the Business Plan 2022-27 focuses on decarbonising our operations. Action 4.5 focuses on the Partial refleet noting that we will learn "from the trial electric refuse vehicle our trials and emerging technology will inform the partial refleet, as will future national legislative change and changes in tonnage/behaviour (to inform the number and type of vehicles we require)." Action 4.4 looks at piloting alternative fuels in our fleet and action 4.6 focuses on green infrastructure.
Financial, Legal and HR Implications:	The indicative costs are set out below but are potentially in the order of £3.3m. The default contractual position is that SUEZ fund the purchase and charge us through our ongoing contract, and this is what our revenue budget is currently based on. Should SWP/Somerset Council decide to capitalise fleet we would only do this if it either provided a saving to us (after allowing for loan repayments) or where we are doing something not envisaged in the contract (e.g. electric vehicles). Minor changes to the contract will be required should we refurbish some vehicles and procure electric fleet. Risk sits with the contractor in ensuring that the fleet procured is adequate to deliver the services. We have sought opportunities to enhance our fleet and provide the best environmental outcome by partial electrification and sought opportunities to reduce total capital expenditure where possible. There are no HR implications.
Equalities Implications:	An impact assessment has been undertaken and can be shared on request – no impacts were identified.
Risk Assessment:	Risk on vehicles sits with SUEZ – their contractual requirement is to deliver the services, and as such if vehicles do not perform as expected then this is at SUEZ's risk. If we do not commit to replacing our 2016 vehicles this year then the age of this fleet is likely to have a negative affect on service quality due to vehicle breakdown/failure. If we do not take the opportunity to replace vehicles with electric technology (where this is viable) we risk

	failing to deliver on the partner's climate emergency ambitions. Conversely, technology is rapidly changing so it may be that e-RCVs become cheaper/more effective in the future, and the use of significant amounts of capital to fund e-RCVs may have an opportunity cost in preventing the partners from implementing other measures which save more carbon per £ spent. There is a risk that we cannot cost effectively implement charging infrastructure, but given the low number of electric vehicles sought this is low risk. There is a risk that by not simply replacing all vehicles like for like, i.e. different from how our contract originally envisaged, that we do not secure optimal terms.

3. Background

3.1. SWP's fleet and what needs replacing

SWP's collection contract fleet is made up of 108 recycling vehicles (mostly Romaquips, but three are top loaders for communals and eighteen are smaller vehicles used to get to those hard-to-reach properties. We have forty-three refuse vehicles 25 x 26t but just under half of the fleet is made up of more specialist vehicles 6 x 7.5 tonne, 8 x 16 tonne and 4 x 26 tonne pod vehicles. The vast majority, (140) was renewed at the start of the contract in 2020 to ensure that we had the right fleet to deliver our environmental and service quality ambitions. The 2020 fleet is expected to last until 2030. They are located across 4 depots: Bridgwater (Colley Lane), Evercreech Junction, Williton (Roughmoor) and Yeovil (Lufton).

23 of our fleet date from 2016 and were not replaced at the start of the contract and are not due for replacement until April 2024. The long lead time on such fleet (exacerbated by the global semi-conductor shortage and the aftermath of Covid) means that to be confident of vehicles being ready for service in 2024 we need to place orders before the end of the 2022/23 financial year.

SWP have already replaced one of the 23 vehicles with the refurbished electric-RCV as previously agreed by the Board. The 22 vehicles which remain to be replaced are:

Size	**No.**	**Type**
7.5 tonne	4	Refuse vehicle
16 tonne	4	Refuse vehicle
26 tonne	10	Refuse vehicle
26 tonne	4	Pod vehicle*

* The Pod vehicle is a specialist vehicle used mainly on the schools service.

As set out in June, vehicle reliability has been a particular issue with the 2016 vehicles recently, which has been a causal factor behind some of the recent service quality issues. This is despite a refurbishment to the operating equipment, bin lifts, compaction equipment etc. on 9 of these trucks in the early half of 2021 in order to

make them operational. The faults now mainly relate to driveline/engine issues which were not part of the refurbishment and are likely to become more common as vehicles age but delays and some difficulty in getting parts are exacerbating this issue

3.2. Options explored

The Board will be aware that there is a rapid pace of technological change in vehicles, and that electric technology is less advanced for vehicles over 3.5 tonnes. This is particularly true for specialist waste vehicles where industry investment is focussed in the most common vehicle types (for commercial reasons) meaning that development of more niche vehicles (e.g. our Pod vehicles, 7.5 tonne or 16 tonne vehicles) lags behind development of electric 26 tonne refuse vehicles. Unlike a purely urban authority many of our vehicles cover large distances often over challenging terrain, and over a three weekly refuse cycle cover quite a range of routes. As discussed with the board in June, the uncertainty around future national legislation is also a complicating factor adding a degree of uncertainty into the picture.

3.2.1 Viability of e-RCV's

Suez have utilised the existing e-RCV across several rounds within Somerset. It has recently been fitted with the dual gearbox necessary to enable it to travel at speeds up to 50mph (at no cost to SWP) but did also require all its batteries to be replaced due to a fault. The purpose of the trial was to establish real world data and to stretch the vehicle to its operational limits in terms of range and numbers of collections. Driver feedback is good (less vibration and noise), so far it has mostly completed the rounds it was expected to, though it has not yet been tested on the full range of potential rounds across the County.

The refuse collection cycles in Somerset are three weekly basis. The way in which individual collection days are arranged means that some areas for collection require more travel distance, and inevitably they cover different types of terrain and service different numbers of properties. This means that whilst on some days many rounds are low mileage and suitable for the ranges that e-RCVs can comfortably achieve, across the full cycle this is much more challenging. Energy draw can vary seasonally - particularly within the winter due to additional energy usage through cab heating, demisting and wiping also reduces the efficiency and range of the vehicle, therefore it has been essential to factor in these variables when assessing route achievable for the e-RCV, as well as allowing for a degree of battery degradation over the useful life of the vehicle. The testing has been invaluable – it has highlighted that the desktop exercise in identifying potential routes needs validating through testing in the real world.

In June when we reported to the Board that the desktop analysis had indicated that

10 refuse vehicles could be electrified, the results of the testing mean that we are not yet confident in purchasing 10 e-RCVs. 6 of those vehicles would have been based in Evercreech and Lufton and we have not yet tested the vehicle on those rounds, and as such are not yet confident that those are suitable for e-RCVs. Of the 4 that we indicated could be used in the Bridgwater and Taunton area, the results of the testing indicate that we are only confident that 2 of those vehicles can be replaced with electric vehicles (i.e. all rounds over their whole three weekly cycle can be completed adequately). We did consider options to extend the life of a number of our current refuse vehicles in the hope that technology improves, but due to reliability issues on those vehicles and uncertainty on the pace of technological change this is not a recommended option.

Each e-RCV requires 600 volts DC/40 kW to charge it at a rate that would allow it to operate effectively. The current e-RCV uses a mobile charger (as we are testing it at different depots across the County), but permanent connections will be required if an e-RCV is to be permanently based at a depot. A DC charger is expected to fully recharge an e-RCV in 9 hours (and AC charger could take 16 hours, which may cause operational difficulties) – costs appear to have reduced recently from £18k to £15k for a charger which can charge two vehicles, but clearly these are significantly more expensive than a standard domestic electric vehicle charger. The two identified rounds where a e-RCV can currently be operated from are based at Colley Lane in Bridgwater – the latest feedback from Western Power is that a new sub-station (at a cost of c£40k) may not be required however, further work is required to validate this so we are still making a provision to allow for this potential cost.

The up-front cost (excluding infrastructure costs) of an electric vehicle is £471k compared to their diesel alternative (£193k) partly offset by expected lifetime revenue savings of £120k – so over the full expected life of the vehicle it costs £186k more, but delivers 760 tonnes of carbon saving.

- Cost of e-RCV £471k (gross)
- Infrastructure Costs £28k (per vehicle)
- Saving: diesel RCV £193k
- Annual fuel saving £10k per annum (noting that electricity and fuel process are very volatile, and further sensitivity analysis is needed)
- Annual m'tce saving £2k per annum (subject to commercial negotiation between SUEZ and their maintenance provider)
- Financial case £186,000 (i.e. extra cost over lifetime of the truck)
- Annual co2 saving 38 tonnes (380t over its useful life)
- Cost of co2 saving £489.4 per tonne of CO2 saved

With no accepted benchmark for what an acceptable cost per tonne of carbon saved is, SWP have compared to the figures developed by SALIX nationally for the Public Sector Decarbonisation Scheme. The first phase of the Public Sector

Decarbonisation Scheme had a £500 per tonne of CO_2e threshold. The latest phase (Phase 3) had a £325 per tonne of CO_2e threshold (over which match funding was required) – and on this basis e-RCVs do not yet deliver particularly good value for money compared to other potential carbon saving options. Note that the 1 e-RCV that SWP has already purchased and is using around Somerset was a refurbished model and therefore the financial case was different.

3.2.2 Proposed approach for 7.5 and 16 refuse vehicles and 26 tonne pod vehicles

SWP have worked closely with Suez to explore the best options and to trial options, in addition to exploring opportunities to reduce capital expenditure.

7.5 Tonne Vehicles

Within the existing fleet procured in 2020 there are 4 SWP owned 7.5t Recycling vehicles. These vehicles were deployed on the recycling service and have not been as effective as originally anticipated. An opportunity has been identified to retrofit a waste compaction units onto their chassis, this would negate the need to purchase wholly new vehicles.

The existing 4 x chassis were procured in 2020 and their depreciation is aligned to contract end. In this proposal the compaction unit would be fitted to the chassis and the compaction unit depreciated over 6 years to align to life of the contract. To replace the recycling vehicles earmarked for conversion Suez propose the purchase of 4 Panel Vans depreciated over a 10-year period – experience has shown these operate well on very hard to access streets. The panel vans would be considered as non-contract assets wholly in Suez's ownership.

A key benefit of this proposal is a capital saving of £153K compared to the purchase of new fleet (taking account of the cost of the new refuse backs and the panel vans, compared to purchasing new refuse vehicles). Additionally, Suez advise that the lead in time for 7.5t refuse vehicles is long and hence we avoid this risk. This approach is more contractually complex, but we believe is the most appropriate and cost-effective approach.

16T Vehicles

As the board are aware, SWP and SUEZ have been exploring various options – normal width bodies rather than narrow, Rotopress rather than compaction, slightly different tonnage vehicles. The conclusion from these trials is that Suez have identified 18t vehicles that have a greater payload whilst operating on the same footprint and turning circle as our 16t vehicles. There are advantages over having a greater payload, primarily prolonging the operational hours of a round and reducing tip frequency and eliminating unnecessary mileage. The price difference

per vehicle is £6k – i.e. £24k additional capital in total.

26T Pod vehicles

In June we indicated to the Bord that we expected to rebody and refurbish these vehicles and share risk 50:50 with SUEZ on the failure of the engine/gearbox etc, with the work expected to extend the life of these vehicles by 2 years. A key factor in that was that we were awaiting changes to national legislation which may impact on the vehicles we require. Whilst that national legislation is still awaited, since June SUEZ have done much further modelling work on routing the schools service (in preparation for the rollout of Recycle More to schools), as well as fully rolled out Recycle More to communal properties. After careful review of the schools and communal service Suez believe that direct like for like replacement is the preferred option rather than refurbishment/replacing bodies. Difficulty in obtaining suitable replacement bodies is also a key factor in this decision. Whilst uncertainty remains over the EPR and Consistency legislation, SUEZ are now confident that POD vehicles dedicated to the schools service are the most appropriate vehicle. This lowers risk for SWP – SUEZ take the operational risk in having the right vehicles to deliver the service and SWP will not have to share the risk of drive train (engine, gear box etc) failures.

3.2.3 Exploring lower (but not zero) carbon interim solutions

Most of the vehicles due for replacement in 2024 cannot viably be replaced with electric and the majority of our fleet is expected to last until 2030. Accordingly, we are currently exploring using Hydrogenated Vegetable Oil (HVO) in our frontline vehicles – either across the contract or at one or more depots. This is not a long-term solution (it lowers emissions significantly, but is still based on an internal combustion engine) but it may significantly help us achieve our decarbonisation goals in the short to medium term.

HVO is made from raw materials such as food production residues and wastes, and assurance schemes exist to ensure that no fuel is sourced from energy crops. HVO can reduce CO2 emissions by up to 90% and will greatly reduce NOx and particulate emissions. It is a drop-in-fuel with no requirement for modifications to vehicle or maintenance regimes and can be added to existing fuel tanks at our depots. There is no need to modify any of our new/existing vehicles to use it. However, HVO is currently 20% more expensive than regular diesel and consumption compared to regular diesel is increased by c10% (i.e. you need to use more of it) and there are concerns about the reliability and robustness of supply of HVO made from waste (as opposed to energy crops).

This means that where we can't yet replace diesel with electric or hydrogen vehicles (either because the technology isn't there or because much of our fleet should last until 2030) we can significantly reduce carbon emissions – by up to 90%. Building on the successful trial of this fuel on depot-based vehicles at Evercreech, SUEZ and

SWP are currently trialling HVO on a range of frontline vehicles. This trial is being funded 50:50 by SWP and SUEZ from the SW:EEP fund, and emissions testing will be undertaken to verify the scale of carbon saving. The trial is ongoing but appears to be going well. With the exception of Lufton Depot all Suez collection depots have fuel bunkers on site and no capital investment would be required at depots other than Lufton. SWP are exploring options for Lufton depot with SSDC.

SWP is working with Suez to build a contractual mechanism to allow this fuel to implemented within the fleet. The financial arrangements would need to be premised on that Suez being no worse off therefore SWP would subsidise the additional cost should we expand use of HVO:

- SWP would fund the HVO consumption increase
- SWP would fund the difference in the price in fuel

At current HVO and diesel rates the expected cost per tonne of carbon saved is £294 pounds which is more cost effective than that achieved by electrification of fleet. As HVO can be used by all fleet, the total amount of CO2 that can be avoided is far higher compared to electric. As SWP would fund the increase in fuel required and the difference between the prices of fuel, then there are risks for SWP, should we use HVO, given the volatility of the fuel markets. As such the SWP is looking at mechanisms to fix this risk but have variable CO2 reduction.

The ongoing trials will ensure that the key assumptions on consumption and CO2 reduction are robust, and contractual negotiations will also continue in order to develop a full business case – a final decision is not yet being sought. Ahead of this, the table below gives an indication of the annual cost increase of using HVO and CO2 reduction at each of the suitable SWP depots at current rates fuel rates and using suppliers' assumptions for increase HVO consumption.

	Annual additional HVO Cost £	Annual CO2 Tonnes reduction (t)
Evercreech	£522,153	-1,760
Taunton	£199,063	-671
Bridgwater	£347,179	-1,169
Williton	£154,088	-519
SWP	**£1,222,483**	**-4,119**

4 Financing and next steps

4.1. Financing

The estimated potential total capital costs of the approach recommended

are set out below:

	Total cost estimate (£)
8 26t diesel replacements (£193k each)	£1,544K
2 electric fleet additional vehicle costs (additional up-front capital cost: £429k each)	£858k
Potential infrastructure costs for electric fleet (1 dual charger at £15k and £40k contingency for sub-station upgrade)	£55k
4 18t diesel replacements (£164k each)	£496K
4 Recycling Panel Vans (£25k each)	£100K
4 7.5 Tonne rebody (£30k each)	£120K
4 26 Tonne Pod replacement (£229k each)	£916k
Total capital costs	£4,089K
Estimated revenue saving over 10 years from electric fleet	*£120k*
Estimated carbon saving from 2 e-RCVs for 10 years	*1,520 tonnes*

**Note that is no electric vehicles are purchased then the total up-front cost would reduce by £527k, i.e. £3,617k in total*

The costs provided are current list price, typically with fleet procurement the supplier is paid on delivery and no vehicle suppliers are prepared to guarantee vehicle prices given what is happening with inflation. With expected delivery dates during April 2024, it's possible that the delivery prices could be more than 20% greater than those stated – potentially another £819k. Unless SWP choose to capitalise the fleet this risk is borne by SUEZ.

In previous refleets it has made financial sense for SWP to borrow – the partner authorities can borrow more cheaply than a contractor can, and the contractor offers us a discount to reflect this. The discount usually more than covers the cost of borrowing. However, SUEZ are currently not willing to raise the discount they offer to reflect the fact that prices of vehicles have increased beyond what they submitted in their bid and may increase further. Our initial review therefore suggests that SWP funding for the total capital expenditure of the re-fleet is currently not in our financial interests, and where we can we would therefore be in a better financial position with lower risk if SUEZ purchase the vehicles and SWP pay the contract rates already agreed. At contract end SWP would be required to buy back Suez owned Contract Assets. It is calculated that the value of the partial refleet (excluding any electric vehicles we might capitalise) at contract end would be £1.3M,

and the vehicles would have 4 years useful life in them. This is still being reviewed and negotiated with SUEZ, however it is primarily a financial question and not one which impacts upon the service.

If SWP decide to purchase e-RCVs then we would have to capitalise this as SUEZ are not willing to fund the higher upfront costs. We cannot capitalise part of a vehicle so we would have to capitalise the full costs, with SUEZ offering contract discounts capped at those related to a like for like diesel replacement. In other words, despite capitalising £429K for each electric vehicle, the contract discount would only be applied on the value of the comparative diesel vehicle at £193K. Furthermore, the contract discount for the e-RCVs only equate to £18K per year, the implication of which over the 6 year period from Apr 24, only £97K per vehicle of capital would only be absorbed through contract. This will be a factor in the capital bid SWP intend to submit subject to the views of the board.

4.4 Next steps

The proposed next steps are (subject to views of the Board):

- Seek a steer from the Board on the e-RCVs and HVO business case, noting the difference in cost per tonne of carbon saved
- Continue to negotiate with SUEZ in order to see if a saving can be realised through partner/Somerset Council borrowing (it currently appears this is not the case) and to reflect minor contract variations linked to partial electrification of fleet and approach to 7.5 tonne vehicles
- Submit capital bids for 'like for like' replacement of fleet and a 'variant' bid for 2 electric recycling vehicles (£0.9m), noting that unless the financial offer from SUEZ improves it is unlikely to be in our interests to capitalise any more than we have to
- Continue to develop the business case for HVO

5 Options Considered and reasons for rejecting them

5.1. Options considered on different vehicle types have been set out above. Delaying replacing the fleet entirely is rejected as it is likely to have significant negative implications on vehicle reliability, with consequences for service quality, reputation

and commercial issues.

6Consultations undertaken

6.1. Monthly meetings of the Strategic Management Group (senior officers from each partner) have kept officers up to date with progress. SWP have discussed issues with SCC's energy, property, fleet and climate change experts, as well as linking closely with partner officer working on fleet alignment for the new unitary. SWP and SUEZ have met with other authorities who are also exploring different technologies to learn lessons.

7 Implications

7.1 Whilst it is disappointing that not all the 2024 fleet can be replaced with electric or hydrogen vehicles, this reflects the reality of the availability of this technology for a large rural county like Somerset. The interim conclusions do suggest however that where we can change to electric vehicles, we can save 38 tonnes of carbon from each vehicle each year and may be able to save 90% of carbon emissions from the remainder of the fleet by moving to HVO – however both come at considerable cost which is challenging given the partner authorities financial pressures.

7.2 Despite many of the technologies not being at a point where they can serve a large rural County like Somerset and, some e.g., hydrogen may prove to be a better option come 2030 when we replace the majority of our fleet. Battery technology is moving at a pace and electric will be at least part of the solution and infrastructure to support this will take time to develop and should form part of the fleet replacement strategy.

8 Background papers

a. None