

Carbon Reduction Resume for Stratford and Warwick District Councils

Overview

Climate Change and the impact on this from the burning of fossil fuels is the greatest worldwide challenge of the age. Stratford and Warwick District Councils have embraced the challenge and this resume looks at the means of reducing carbon usage in the assets that the councils have direct control of.

There are other initiatives being undertaken to look at via other departments and there may be some interchange between the assets and other teams in order to ensure maximum benefit from any proposed works. These initiatives range from installation of EV points in conjunction with Warwickshire CC to Working with local suppliers to provide PV electricity.

This resume looks at a wide range of possible areas within the assets held by the councils where works can be carried out to their buildings. Such works need to show a reasonable rate of return. This could be on the basis of cost or return on reduced carbon usage. This rate needs to be reviewed regularly.

In essence, we are looking at a 4 stage approach to reduce carbon usage within the overall district. These can be summarised as:-

Making every kWh count: -

There are numerous small changes that staff and managers can make which will make small savings. Initiatives such as turning heating down slightly, ensuring electric equipment is modern and turned off along with lights, when not in use

Quick Wins:-

Look at existing proven means of reducing carbon usage with minimal spend against maximum effect. Lighting, reviewing Building Management Systems (BMS) and reducing water flow are typically effective.

Alterations to assets:-

This will look at physical improvements to the structure and physical use of assets to improve heat loss by whatever means. Installation of PV units would be included in this.

Change from fossil to non-fossil fuel systems:-

Investing in new systems and to reduce fossil fuel for heating with changing heating systems, but also of looking at reducing the non-fossil fuel usage in other systems such as cooling systems.

1. Introduction

- 1.1. This is a brief overview of the council owned building of both Stratford and Warwick District Councils (SDC & WDC). The buildings subject of this review are limited to those where the respective council either has direct control over the building or where there is a good prospect that the council can liaise with the tenant/management organisation occupying the property.
- 1.2. The review will take into consideration not only the direct means of carbon reduction, but also items where the reduction is indirect or some way down the line from the council itself

but where actions by the council will have an influence over total environmental issues

2. Basis for Assessments

- 2.1. The data for major properties owned by Warwick DC are part of the Nottingham City Council Energy Services audit
- 2.2. Those for the remaining WDC and Stratford DC are taken from the various meter readings which are generally taken by staff on a monthly basis.
- 2.3. It should be understood that usage will fluctuate not only from month to month, but from year to year. However, it must be assumed that, in terms of percentage use, there will be less of a fluctuation.
- 2.4. Similarly, the cost of electricity and gas has risen over the last 12 months, but the percentage of each is unlikely to be significantly different as the rises have been fairly much the same for each.

3. Purpose

- 3.1. To set out the Councils' strategic approach to decarbonising its assets with a view to prioritising resourcing and being in the best possible position for future grants and other funding opportunities.
- 3.2. To look for the best way in which carbon reduction can be achieved within the built environment of WDC & SDC
- 3.3. Although cost is an important factor, we need to consider the overall way in which we can achieve the most reduction in the quickest time.
- 3.4. We also need to look at existing equipment, for example, if new units have recently been installed, then improvements to control might give better value results as a pose to immediate replacement.
- 3.5. It also need to be accepted that some of the possible changes will be much longer term projects needing a good deal of planning and consultancy costs.
- 3.6. Whilst it is true that both councils now use electricity from a 'Green' supplier, this in no way negates the overall universal need to reduce carbon usage wherever possible. Not only do we want to reduce our slice of cake, but help to reduce the size of the cake itself.

4. Overall Strategy

- 4.1. It would be easy to state that our overall strategy is to decarbonise the South Warwickshire area. This would be to ignore the reality of the situation. Any strategy must be based on real life and the possibilities offered at the time.
- 4.2. Part of our strategy is also to prepare full details and proceed as far as possible with all schemes so that they are in a state ready to go. The reason for this is that Government Grants become available at relatively short notice and applications need to be as fully prepared and costed as possible.
- 4.3. We need to match our strategy to the assets that we hold and to reflect the various ways in which decarbonisation can be achieved. It is not the case of 'One Size Fits All'.
- 4.4. Specific work streams can easily be looked at over the entire asset estate. So the replacement of light fittings to new with LED lights, alteration to BMS systems etc all have the same performance specification of delivery so can be carried out over the estate.
- 4.5. Due to the diverse nature of the Councils' assets, much of the other potential works are specific to the asset itself. This is particularly true of the major sites in Leamington. Thus each site will need to be considered as individual units. There may be some complimentary works, but these could be joined in a single contract.

- 4.6. In general terms therefore, our strategy for assets is:-
- 4.6.1. Look at Quick Wins especially where there is a communality across asset types.
 - 4.6.2. Look at building elements where there is a communality across asset types.
 - 4.6.3. Review longer term systems, especially heating which have high capital costs and high degrees of difficulty in making changes.

5. Properties to be reviewed

- 5.1. As will be appreciated, the public property portfolio of each council is quite different. WDC is a more urban council with significant urban populations whilst SDC is much more rural council with one main centre and several small towns.
- 5.2. In looking at properties, this review is concentrating on sites where the relevant council has total or significant control of the building. There are other sites such as Leisure Centres where it is believed that the council may have some influence.
- 5.3. The data analysis on a number of WDC buildings was carried out in 2019 and this includes information not only divided between gas and electricity, but also details various electrical use classes. These sites are:-
 - Riverside House
 - Town Hall
 - Royal Pump Rooms
 - Royal Spa Centre
 - Temperate House
 - Crematorium
- 5.4. The remaining properties or groups of properties listed below only have a division between gas and electrical use. However, we can guess, based on the type, the approx. split of use. Indeed many of these have only one or two uses, for example Multi-Story Car Parks will use electricity principally for lighting and to power any lift
- 5.5. The list of commercial properties follows.

Site	Type of info *	Services	Top 2 energy uses	Comment
Warwick				
Royal Pump Room	Detailed	Mains Gas Mains Electricity	Heating Lighting	Currently subject to bid works to carry out flat roof replacement including increased insulation.
Town Hall	Detailed	Mains Gas Mains Electricity	Heating Lighting	Subject to a potential Future High Street Fund project.
Crematorium	Detailed	Gas furnace with Biomass back-up Mains Electricity	Cooling Lighting	The gas furnace has a heat transfer system for heating and the Biomass system takes advantage of reduction in fossil fuel. Electric use only is to be considered.
Riverside House	Detailed	Mains Gas Mains Electricity	Heating Lighting	Action to be held until a decision is made about its future use. Some replacement of lighting is taking place at present
Royal Spa Centre	Detailed	Mains Gas Mains Electricity	Heating Lighting	Directly controlled by WDC
Temperate House	Detailed	Mains Gas Mains Electricity	Lighting Cooling	Currently subject to a bid under the Government Decarbonising Scheme for heating only. Part let out to catering company.
Pageant House	Partial	Mains Gas Mains Electricity	TBC	Leased to WTC with several users. WDC retain an office and common parts.
Newbold Pavilion	Partial	<i>Mains Gas Mains Electricity</i>	TBC	Held on Licence and will possibly be re-developed Gas readings only.
Althorpe Enterprise Hub	Partial	Mains Gas Mains Electricity	TBC	Modern building run by WDC
Edmondscote Track	Partial	<i>Mains Gas Mains Electricity</i>	TBC	Held on Licence. Gas readings only.
26 Hamilton Terrace	Partial	<i>Mains Gas Mains Electricity</i>	TBC	Occupied by WDC Gas readings only.
Arts Building (Spencer Yard)	Partial	<i>Mains Gas Mains Electricity</i>	TBC	Gas readings only.
Lillington Old Library	Partial	<i>Mains Gas Mains Electricity</i>	TBC	Held on Licence which is being reviewed. Gas readings only.

Site	Type of info *	Services	Top 2 energy uses	Comment
Warwick				
Victoria Park Bowls Pavilion	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	TBC	Shared occupancy. Gas readings only.
Jubilee House	Partial	Mains Gas Mains Electricity	TBC	Variety of occupants inc Kenilworth TC, MP, Foodbank etc. There is a possible heating replacement scheme.
Alarms Control, Stockton Grove	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	Assumed Lighting Computer cooling	Gas readings only.
South Lodge, Parade	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	TBC	Held on Licence Gas readings only.
Community Centre, Saltisford Gardens	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	TBC	Held on Licence Gas readings only.
Community Centre 2,Beauchamp Road	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	TBC	Held on Licence Gas readings only.
Community Centre 1,Pickard Street	Partial	<i>Mains Gas</i> <i>Mains Electricity</i>	TBC	Held on Licence Gas readings only.
Leisure Centres		Mains Gas Mains Electricity	Heating Lighting	Leased, but Have influence.
Multi-Storey Car Parks	Partial	Mains Electricity	Lighting Lifts	Covent Garden and St Peters
Public Toilets	Partial	Mains Electricity	Lighting	
Stratford				
Elizabeth House	Partial	Mains Gas Mains Electricity	Heating Lighting	Action to be held until a decision is made about its future use
Information Centre	Partial	Mains Gas Mains Electricity	Heating Lighting	Modern building wholly used by SDC.
Greig Centre	Partial	Mains Gas Mains Electricity	Heating Lighting	SDC pay all electricity costs and re-charge to 4 users. The leisure centre pays its own gas bills for water heating
Other Leisure Centres	None	Mains Gas Mains Electricity	Heating Lighting	Held under management agreements with a single organisation.

Site	Type of info *	Services	Top 2 energy uses	Comment
Warwick				
Car Parks	Partial	Mains Electricity	Lighting Lifts	2 multi-story car parks located in Stratford. Other towns have flat car parks with lighting
The Grange Hall	None	Mains Gas Mains Electricity	Heating Lighting	Southam Town Council offices
Venture House	Partial	Mains Gas Mains Electricity	Heating Lighting	Modern building, refurbished recently but needs further works.
Avenue Farm Depot	None	Mains Gas Mains Electricity		Subject to re-negotiation of company running the contract.
Public Toilets	Partial	Mains Electricity	Lighting	

- * Detailed A complete breakdown of electrical use provided in 2019 by
 Partial Information available from meter readings in the financial year 2020-2021
 None No information obtainable, generally because the property is not run by the council
Italics Assumed Gas and Electricity but no electrical readings

6. Analysis of Information

- 6.1. In the first place, it is clear that there is a dichotomy between the amount of energy use against the cost of that energy. Putting it simply, in order to produce man made electricity, some other substance has to be heated so naturally electricity produced in this way ie in gas, coal or nuclear generators, will be more expensive. There is also the efficiency involved in the process to consider

Generating electricity by solar, wind or turbine has a lower cost though generally the capital cost per unit generated is higher than the tradition forms of generation.

- 6.2. In the short term then, reducing the use of electricity, whilst it will not cut the carbon use but will show a greater cost reduction per unit reduction
- 6.3. The following shows the %age of gas and electricity used together with the amount of energy saved if the electricity element were to be reduced by 50% (based on 2019 use and costs)

Site	%age Gas	%age Elec	Energy save if 50% cut in elec use	Kg of CO ² Emission saved	Cost saved if 50% cut in elec use
Pump Rooms	64	36	200,000 kWh/a	46,628	£27,500
Town Hall	65	35	70,000 kWh/a	16,319	£9,500
Crematorium	8	92	500,000 kWh/a	116,570	£26,000
Riverside House	43	57	310,000 kWh/a	72,273	£42,000
Royal Spa Centre	57	43	112,000 kWh/a	26,111	£15,000

- 6.4. Switching from Gas Heating to Electric Heating.
This is based on a ratio of 1:2.5 of kWh Gas to Electric.

Site	kWh/a Gas	Cost/a Gas	Potential Saving in kWh	Potential Kg of CO ² Emission saved	Potential cost difference
Pump Rooms	710,476	£14,422	426,286	99,384	24,625.76
Town Hall	262,993	£5,338	157,796	36,788	9,116.10
Crematorium LPG Gas	111,751	£15,354	67,051	15,632	-9,212.17
Riverside House	460,390	£9,345	276,234	64,401	15,958.03
Royal Spa Centre	298,807	£6,065	179,284	41,798	10,357.43

As can be seen, on the basis of a ratio of 1:2.5, there is a considerable increase in costs for using electricity for heating except in the case of the Crematorium where LPG is used whose cost per kWh is significantly higher than mains gas. The ratio needs to be in the order of 1:7.

- 6.5. Analysis of the various uses of electricity shows that, excluding the crematorium, the major use of electricity is to provide lighting. The %age figures are as follows

Use	%age exc Crem	%age inc Crem
Lighting	42%	26%
Air Handling Inc cooling	30%	35%
Refrigeration	1%	16%

IT	15%	12%
Kitchen equipment	9%	5%
Hot Water	1%	3%
Other	2%	1%

- 6.6. Whichever set of figures you take, clearly lighting and cooling are a major area of electric usage in the principal WDC buildings.
- 6.7. In the wider view, looking at carbon emissions over the larger range of units, we can see that here are some 25 locations where the total carbon emission exceeds 20k per annum. In WDC there is a mix of combined and electric only locations whilst in SDC, apart from Elizabeth House, all properties have electricity only.

7. Issues with Decarbonisation

- 7.1. Before looking at specific buildings within the WDC & SDC holding, it is Important to look at the issues involved in Decarbonisations. It is a complex area and involves areas such as :
- 7.1.1.Planning
 - 7.1.2.Building control
 - 7.1.3.Location of buildings
 - 7.1.4.Age and construction of building
 - 7.1.5.Ease of installation
 - 7.1.6.Ease of use/age of technology
 - 7.1.7.Cost/benefit
 - 7.1.8.Direct impact v indirect impact.
- 7.2. Looking at these in some detail, we start with:-
- 7.3. Planning.
In a number of buildings this is a significant consideration as they are either listed themselves or are in a conservation area. There is therefore both a time element and a cost element in making any changes to the external envelope. This means that some of the 'Easy Fix' item such as installing solar PV panels, altering cooling systems etc become more difficult or even impossible.
- 7.4. Building Control
Although not such an issue as planning, it must be born in mind that any significant alterations will need approval prior to commencement
- 7.5. Location of Buildings.
There are several issues to be considered here.
- 7.5.1.Does the building have any significant land around it? If so, then there will be space for providing easily accessible equipment such as heart pump units. Roof top installations are more difficult for many reasons including access, weight and visibility on Listed Buildings.
 - 7.5.2.Proximity of electrical supplies. If power is generated on site, then, unless there is battery storage, excess needs to be taken on the grid
 - 7.5.3.Power availability. If more electricity is required, then there needs to be sufficient spare grid capacity via the nearest sub-stations.
- 7.6. Age & Construction of building. Again there are a number of strands, mostly relating to the type of construction. For example, many large Regency or Victorian buildings have thick but solid brick walls but often very little floor or roof insulation. Improving these can be relatively expensive. Typical smaller non-cavity walls would need to be insulated either internally or externally, both significant projects. Finally, traditional sash windows are

notoriously difficult to insulate without changing the fenestration, very difficult/costly in listed buildings and often hard on others

- 7.7. Ease of installation. A matter of cost
- 7.8. Ease of use. Although some of the carbon reduction can be achieved by passive means, the major carbon use in our buildings is generally from the use of gas to heat them. Whether a heating system is updated or replaced, part of the savings will come from the way in which the heating is controlled. Thus, the control systems need to be easy for day to day management AND provide as much 'In Use' information as possible which should be in a way that the councils can easily analyse.
- 7.9. Cost/benefit. Any scheme for reduction needs to be fully analysed based on specific benefits which need to be designated by the council.
- 7.10. Direct v Indirect impact. When considering the impact of climate change and the councils' response, we need to look not only directly reducing our carbon usage directly by making changes to our buildings, but also of reducing the impact by looking at other means of helping the planet. These could include:-
 - 7.10.1. Facilitating the use of electric vehicles
 - 7.10.2. Reducing mains water consumption
 - 7.10.3. Ensuring materials used have as low an impact as possible whether looking at cleaning materials, desks or building materials

8. Possible means of Decarbonisation In WDC & SDC properties

- 8.1. The first point to make is that in decarbonising there will ultimately be an overall INCREASE in electricity use. How will this happen?
 - 8.1.1. Initially, works suggested below will seek to decrease the electric use and therefore carbon use.
 - 8.1.2. However at a later stage, the suggested way of reducing Gas use is to install heat pumps of relevant to the location.
 - 8.1.3. Industry standards indicate that the present rate of transfer for such units is 1:4 in other words for every unit of electricity 4 units of heat are 'generated'. However, this is a somewhat optimistic view and it is more likely that the ratio is 1:2.5 or 1:3
 - 8.1.4. This means that, in accordance with the 2nd law of Thermodynamics, you need to input power to create heat.
 - 8.1.5. In addition, installing EV points will add to the electric usage
- 8.2. Secondly, and to set against 1 above, clearly the carbon usage from gas will reduce, but not necessarily the cost.
- 8.3. Allied to carbon reduction, we also need to look at boosting our electricity generation. At present Elizabeth House is the main site where generation takes place via PV cell on the roof.
- 8.4. An extension to provide PV generation to other major buildings is contemplated via one of the following projects:-
 - 8.4.1. Partnership with a supplier
 - 8.4.2. Self-build
- 8.5. The details of this are subject to a separate detailed piece of work with the aim of reducing our overall spend on electricity.
- 8.6. Below is the list of buildings/sites where it is expected that either carbon use can be directly reduced, and/or where other systems can be installed in order to provide back-up power.
- 8.7. Riverside House and Elizabeth House have been excluded from this list as have buildings which relate to HRA, where other buildings whose future is in doubt and where the usage of carbon is below 20,000kWh/a.

- 8.8. It should be noted that this may include systems that reduce other usage such as water where the effect is not directly measured but which has an effect down the line by reducing treatment etc.
- 8.9. Some of the means of reducing carbon will mean that the council will need to take a more active role or sub-contract this to others. Instances of this would be:-
 - 8.9.1. BEM Systems Building Management Systems
 - 8.9.2. Water use controls which can reduce carbon usage directly and indirectly
 - 8.9.3. Other elements where indirect carbon reduction can be achieved.

Suggested works on the principal commercial assets. These are ranked in accordance with the following criteria:-

Criteria

- a. Cost
- b. Relative speed to initiate works
- c. Complexity of works
- d. Disruption to occupants/users
- e. Return

Ranks:-

- 1 Easy to carry out with low capital cost, good return on capital, minimal disruption
- 2 Some complexity/high cost but achievable without too much disruption
- 3 Work via a third party
- 4 High cost with low return on capital

Capital Cost Parameter	Value	CO ² Parameter	A possible saving per annum of Kg of CO ²
Low Cost	Cost of up to £200,000 or Ave of £30,000 per location	Low	A saving of less than 5,000 Kg of CO ² in total
Medium Cost	Cost of between £200,000 and £1.5m or Ave between £30,000 and £100,000 per location	Medium	A saving of between 5,000 and 50,000 Kg of CO ² in total
High Cost	Cost of over £1.5m or £100,000 per location	High	A saving in excess of 50,000 Kg of CO ² in total

Revenue Cost Parameter	Implication over time
Decrease D	Revenue cost should reduce by more than 20%
Equal E	Revenue cost should not alter by more than 20% either way
Increase I	Revenue cost should increase by more than 20%

Site	Council	Potential Projects	Rank	4 Stage ref 1 - 4	Capital Cost	Revenue Cost	Saving of Kg of CO ²	Comment
Royal Pump Room	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Reduce water flow and temperature	2	1	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
		Improve Insulation	4	3	Low	D	Medium	Insulation to roof now underway. Review other elements
		Change air cooling system	2	4	Medium	E	Medium	Possible change to an evaporation system.
		Alter Heating system	4	4	High	I	High	In a 'Land-locked' site, changing to non-fossil fuels will be very challenging
Town Hall	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Reduce water flow and temperature	2	1	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
		Improve Insulation	4	3	Low	D	Medium	Look particularly at windows and roofs.

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		Change air cooling system	2	4	Medium	E	Medium	Possible change to an evaporation system.
		Alter Heating system	4	4	High	I	High	In a 'Land-locked' site, changing to non-fossil fuels will be very challenging
Crematorium	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Install electric car charge points	2	3	Low	E	Medium	Possibly in conjunction with WCC
		Change from LPG to another form of fuel	4	4	High	I	Medium	Recently installed system, the carbon footprint is reduced by the use of a gas treatment system.
		Improve Insulation	4	3	Low	D	Medium	Look particularly at windows and roofs.
		Reduce water flow and temperature	2	2	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
Royal Spa Centre	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
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		Alter Heating system	4	4	High	I	High	In a 'Land-locked' site, changing to non-fossil fuels will be very challenging
Temperate House	Warwick	Change lighting to LED systems with PIR and daylight management system	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Reduce water flow and temperature	2	1	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
		Alter Heating system	4	4	High	I	High	Heating of the main glazed area by any means will be difficult and the heat may need to be reduced to significantly reduce the carbon use Separate steps will need to be looked at for the café area.
Pageant House	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally

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Althorpe Enterprise Hub	Warwick	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Reduce water flow and temperature	2	1	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
		Improve Insulation	4	3	Low	D	Medium	Look particularly at windows and roofs.
		Alter Heating system	4	4	High	I	High	Even in a situation such as this, changing to non-fossil fuels has significant challenges
Leisure Centres inc SDC at Greig Centre	Warwick and Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.

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Public Toilets	Warwick and Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Reduce water flow and temperature	2	1	Low	D	Low	Reducing temperature of water to taps will cut heating and reducing flow will reduce usage.
Information Centre	Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Improve Insulation	4	3	Low	D	Medium	Insulation to roof now underway. Review other elements

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Multi-Storey Car Parks	Warwick & Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
The Grange Hall	Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
		Install PV Panels to roofs	3	3	Medium	D	High	Currently looking at the best way forward to maximise benefit.
		Install electric car charge points	2	3	Low	E		Possibly in conjunction with WCC
		Alter Heating system	4	4	High	I	High	In a 'Land-locked' site, changing to non-fossil fuels will be very challenging
Venture House	Stratford	Change lighting to LED systems with PIR	1	2	Low	D	Medium	An easy change to make generally
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		Alter Heating system	4	4	High	I	High	In a 'Land-locked' site, changing to non-fossil fuels will be very challenging
Avenue Farm Depot	Stratford	Install PV Panels to roofs	3	2	Medium	D	High	Currently looking at the best way forward to maximise benefit.

Site	Council	Potential Projects	Rank	4 Stage ref 1 - 4	Capital Cost	Revenue Cost	Saving of Kg of CO ²	Comment
		Install electric car charge points	2	3	Low	E	Medium	May be installed as part of contract with street cleaning contract

9. Next Steps

- 9.1. From the above information, it can be deduced that there are two main strands of work to be followed.
- 9.2. Strand one is to look at relatively simple and easily undertaken works. In essence, these are works which:-
 - 9.2.1. Do not require significant specialist input ie which the property professionals of each council can undertake themselves.
 - 9.2.2. Can be carried out relatively easily and so do not require significant consultation with numerous stakeholders/third parties
 - 9.2.3. Do not require planning or other applications other than those that are self-certifiable.
 - 9.2.4. Still give good reductions in carbon usage
 - 9.2.5. DO not have excessive pay-back periods.
- 9.3. Strand two has two sub-sections
 - Phase 1 - Work to the fabric which will improve insulation and reduce heating costs.
 - Phase 2 – Works involving changes to the heating systems.In both cases, these projects will:-
 - 9.3.1. Deal with whole building solutions.
 - 9.3.2. Involve consultations with other stakeholders
 - 9.3.3. Are complex projects requiring specialist consultants to appraise, design and to cost.
 - 9.3.4. Require longer term planning and will involve consents such as Listed Building etc with long potential delays.
 - 9.3.5. May need advice when making any future grant applications
- 9.4. It is recommended that the councils proceed with both strands simultaneously but with the knowledge that the works in Strand 2 will take a good deal longer to come fruition.
- 9.5. Strand 2 works will also be significantly more expensive both in cost of preparatory works, Consultant fees etc, and also in capital terms
- 9.6. It is important that work is done to prepare for expenditure on both strands since we have not been able to make an application in the Phase 2 scheme as none of the potential projects were anywhere near ready to present.
- 9.7. As it is never know very much in advance when any new initiatives are put in train by the government, it is important that we have schemes well worked up in preparation.

10. Conclusion

Below is a matrix of works to be undertaken in order to

- 10.1. An immediate start is needed to put together the easiest items of works in the following order:-
 - 10.1.1. – Review and change all lighting units to all properties to LED systems with, where appropriate either daylight and/or motion sensor controls.
 - 10.1.2. - Review easily achievable means of reducing heat loss
 - 10.1.3. – Undertake a programme of installation of PV Panels on as many buildings as appropriate
 - 10.1.4. – Review heating controls and look at simple upgrades/renewals as appropriate.
 - 10.1.5. - Look at changes to Cooling systems
- 10.2. At the same time, engage with a specialist consultant to look into ways of improving/altering heating systems to change from gas to alternative supplies
- 10.3. All improvements will need to have a cost benefit/payback associated with them and the council will need to decide what rang will be acceptable for any proposed project
- 10.4. As both the present HQ buildings are at present not included in this process, we must be mindful of the work that is required should a new single HQ building be acquired

by whatever means. It would need to incorporate significant system to ensure minimal carbon usage and this means that time will need to be spent on this in the planning stage

Priority	Item	Work by	Procurement	Cost	Potential Saving
1	Review and change lighting units to all properties to LED systems with, where appropriate either daylight and/or motion sensor controls.	Specialist Contractor via a Design and Build contract	From Framework	Medium	Med/High
2	Submit report on the provision of PV units on significant properties	Design and Build contract	TBC	Low	
2	Review water use and means of reducing flow and heat	Specialist Contractor via a Design and Build contract	From Framework	Medium	Med/High
3	Install/have installed PV units on main units	Dependant on results of item 2			
3	Review and look at changes to cooling systems from active to passive evaporation units	Specialist suppliers with their nominated/approved contractors	Tender	Med/High	Med/High
1	Review control systems This would include heating, lighting and any other control systems. It would also include	M&E Contractors	From Framework	Low	Medium
4	Appoint consultants to look in detail at potential changes to heating systems to up to 10 buildings in the WDC area.	Specialist consultants	From Framework		
4	Following on from above, put works out to tender based on recommendations on a building by building basis	Main Contractor	Framework/Tender dependant on	High	Med