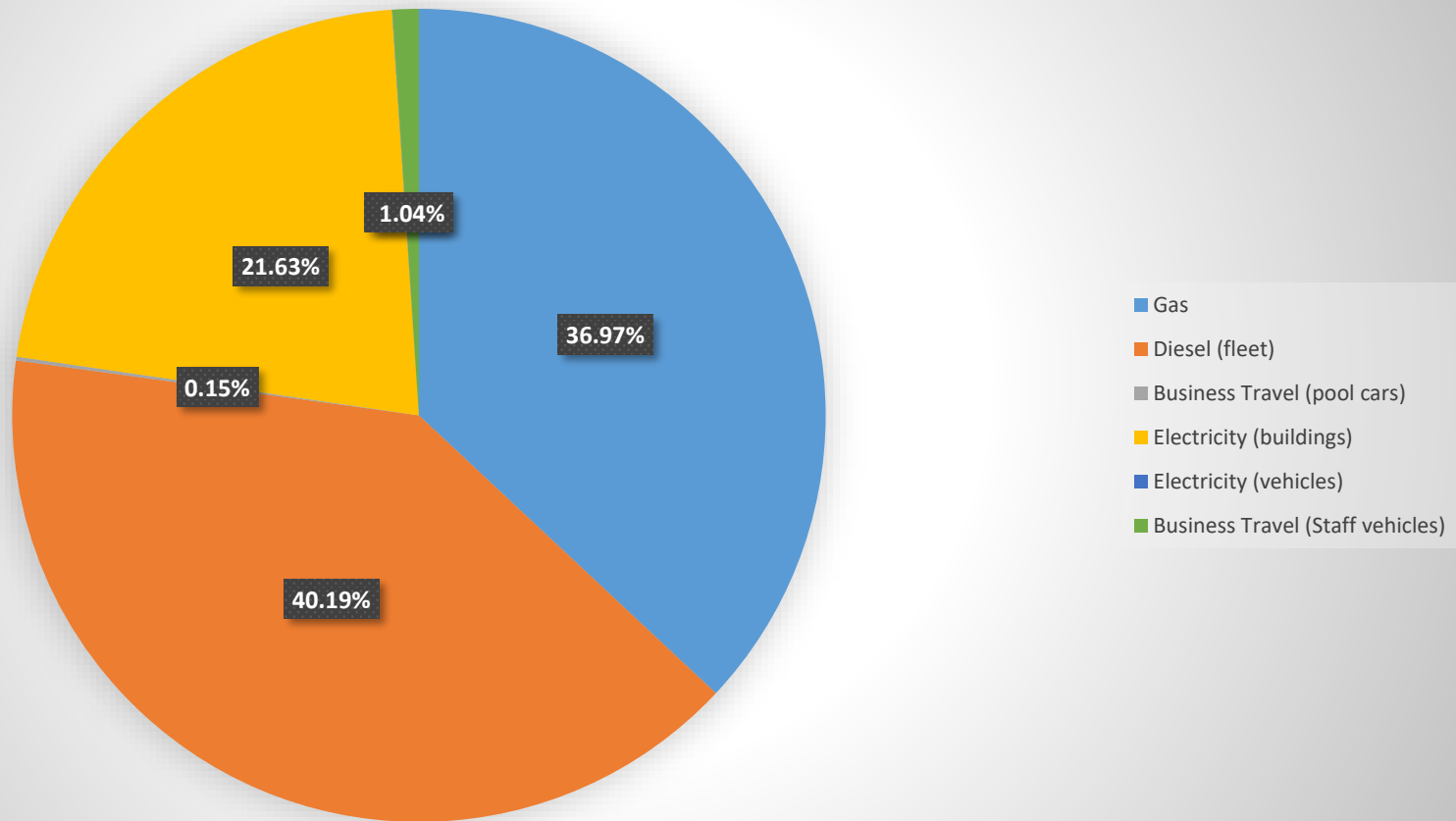


CARBON ZERO+ ACTION PLAN- Direct Operations

2018/19- 3018t of CO2

2030- net zero

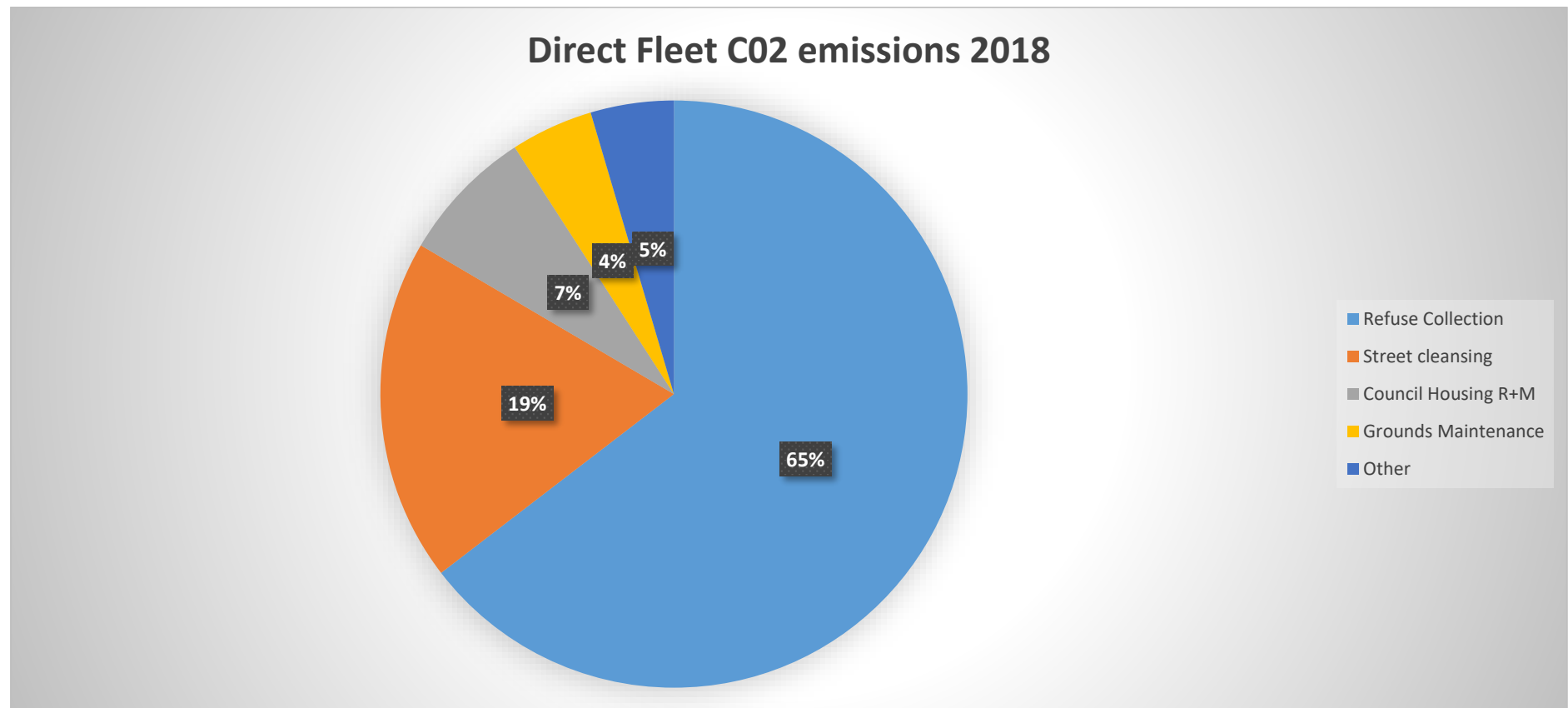
Council CO2 emissions 2018/19- Total 3018tonnes



LANCASTER CITY COUNCIL DIRECT OPERATIONS

TRANSPORT

In 2018 /19 Lancaster City Council's fleet used 453,130 litres of diesel in delivery of its vital services, resulting in 1,218 tonnes of CO2 emissions. A further 31.5 tonnes of CO2 were produced from business travel in staff owned vehicles.



TRANSPORT ACTIONS

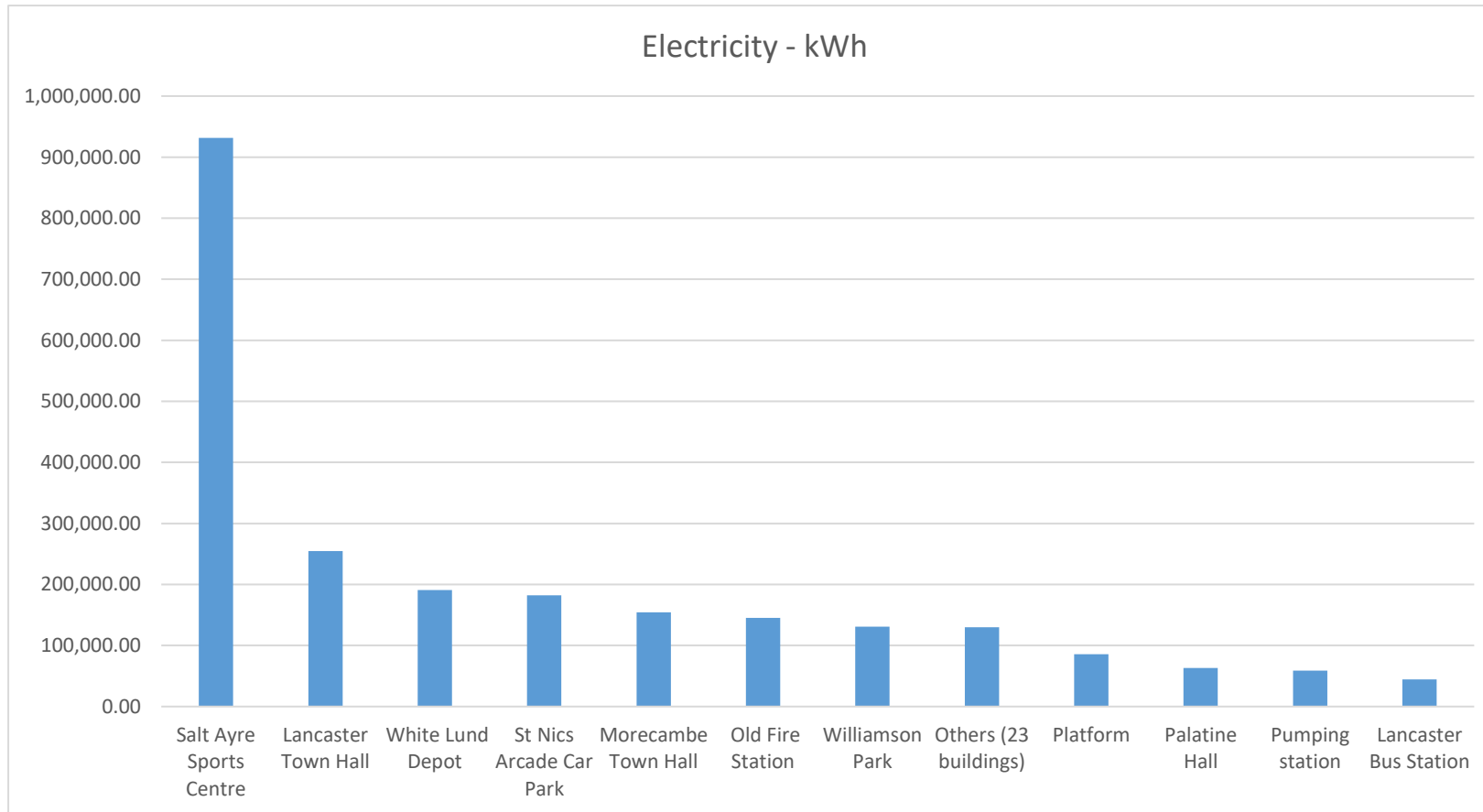
No	%c Cont.	Action	When	Estimated Additional Cost	Comments
1	5%	Small / medium vehicles replaced with electric vehicles in line with replacement programme	2019-2026	Within existing budgets	Requires additional charging infrastructure
2	2%	Convert 2 existing refuse collection vehicles to plug in electric to cover areas with the worst air quality	2020/21	£400K	Capital cost of conversion £200K / vehicle but will be reduced rev costs
3	23%	<p>Switch refuse collection fleet to hydrogen electric in line with replacement programme</p> <p>Refuelling station Tube trailers</p> <p>OR</p> <p>Switch refuse collection fleet to plug in electric in line with replacement programme</p> <p>AND</p> <p>*Assess feasibility of 2 collection shifts per day / introduce different collection arrangements. This will vastly reduce the capital costs and ongoing revenue costs</p>	2021-2030	<p>£3.6M *</p> <p>£1.0M £500K</p> <p>£4.45M*</p>	<p>Assume each vehicle costs £150,000 more than a diesel vehicle</p> <p>A joint bid between Lancaster Uni/ EDF Lancaster City Council has been submitted for to cover the hydrogen project.</p> <p>This project depends very much on the outcome of that bid.</p> <p>Allow £1M for charging facilities</p>

No	%c Cont.	Action	When	Estimated Additional Cost	Comments
4	7%	Switch cleansing vehicles to plug in electric in line with replacement programme. Note the 7.5tonne sweeper is due for replacement now. No electric version is available. Replacement with an electric version will take place in the next replacement year of 2025.	2019-2028	£1.5M	Includes provision for charging
5	3.5%	In line with technological advances switch other specialised vehicles (eg ride on mowers) to electric in line with replacement programme	2019-2030	TBA	
6	4%	Use lean systems thinking and technology (vehicle tracking / route optimisation) to generate efficiency and therefore reduce mileage.	2019-2030	TBA	Aim for 10% reduction in mileage
7	1%	Provide sufficient plug in electric cars for the operational needs of services and consequently remove the need for staff to use their own vehicles And Provide electric pool bikes for staff to use	2020-2021 2019	£50K one off additional amount for infrastructure	Requires additional charging facilities hence £50K one off. (May attract OLEV funding)
8		Develop Council Travel plan	2020-2022	Within existing budgets	

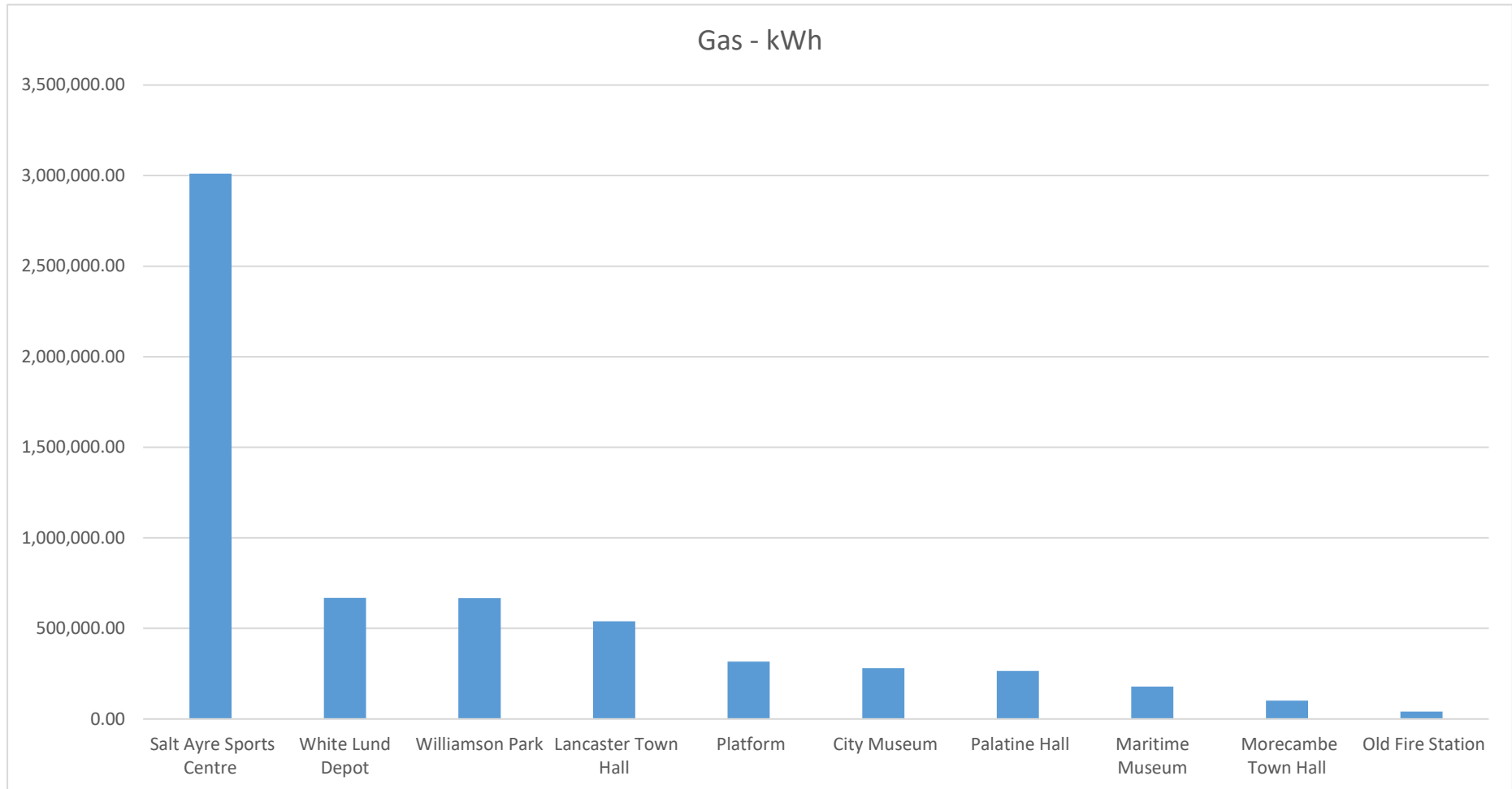
ENERGY/ BUILDINGS

Across the Council's direct estate (excluding Council housing)

In 2018/19 the Council consumed 2,371,423 kWh of electricity. This resulted in 671.28 tonnes of CO2 emissions



In 2018/19 the Council consumed 6,067,684 kWh of gas. This resulted in 1,102.72 tonnes of CO2 emissions



(NOTE- The Council already owns a number of solar installations across its estate (including Council Housing) in 2018/19 these generated 247,006 kWh of renewable electricity.)

ENERGY ACTIONS

No	%c Cont.	Action	When	Additional Cost	Comments						
8	8.4%	Salt Ayre Leisure Centre consumes over 1,000,000kWh of electricity pa. A 1MW ground mounted solar installation, with a 1MW battery and private wire would generate 896,940kWh of renewable energy	2020/2021	£1.4M	Represents an investment which will generate an ongoing income stream						
9	13.23% Offset up to +140%	<p>There is space on Salt Ayre tip to locate a 25MW solar farm This would need to be connected to the grid. The initial cost of grid connection is £1.4M so it makes financial sense to deck it out to the maximum</p> <p>The site could be decked in stages. 5MW would generate 4,484,700kWh pa of renewable energy.</p> <p>The eventual cost of a 25MW solar farm with a 10MW battery would be £24.3M and would generate 22,423,500kWh pa</p>	2022-2028	£1.4M (connection to grid) £24.3M	<p>Represents an investment which will generate an ongoing income stream</p> <p>Surplus / Offset</p> <table> <tr> <td>25MW solar farm</td> <td>22,423,500kWh</td> </tr> <tr> <td>Council requirement - Gas</td> <td>1,411,592kWh 6,067,684kWh</td> </tr> <tr> <td>Surplus</td> <td>14,944,244kWh</td> </tr> </table> <p>CO2 saved 4,230tonnes</p>	25MW solar farm	22,423,500kWh	Council requirement - Gas	1,411,592kWh 6,067,684kWh	Surplus	14,944,244kWh
25MW solar farm	22,423,500kWh										
Council requirement - Gas	1,411,592kWh 6,067,684kWh										
Surplus	14,944,244kWh										
10	37%	<p>Go off gas.</p> <p>The amount of renewable electricity being generated would provide the opportunity to convert to electric boilers or depending on the business case ground source heating, hydrogen etc</p> <p>There would of course be additional costs to this which would need further work to establish</p>	2025-2030	TBA	<p>Depends on heating system used</p> <p>Current cost of a 300KW fuel cell CHP system suitable for LTH would cost £1.75M- an external bid for this has been submitted as part of the joint hydrogen project with Lancaster Uni and EDF</p>						

No	%c Cont.	Action	When	Additional Cost	Comments
11	TBA	Reduce number of buildings the Council operates from. This would increase efficiency and provide an income to invest in the programme described	2022-2025	TBA	
12	TBA	Assess feasibility of a Council owned wind turbine	2023-2025	Feasibility £500K	The feasibility costs of a development of a wind turbine project are considerable
13	TBA	Invest in energy management software in main buildings This will then help us develop carbon budgets for teams	2020/21	£50K	

CULTURE CHANGE

The most cost effective and efficient way of saving carbon are gained through reducing waste and inefficiency. Buy in from staff is key to this

No	%c Cont.	Action	When	Additional Cost	Comments
14	TBA	Set up staff working group to identify and implement practical ways of reducing carbon across the Council	2019	none	
15		Include mitigating climate change as an organisational value and provide staff training programme	2020	£20K	
16		Employ 'Climate Change Project Manager' to coordinate the work streams and support the Director	2019	£150K	3 yr funding
17		Identify a 'virtual' team of existing officers who will be required to significantly support this program	2019	TBA	Need to reprioritise in services and identify if additional resource is required to support day to day work
18		Develop communications plan	2019	TBA	

ESTIMATED ADDITIONAL COSTS

CAPITAL	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	28/29	29/30
Convert 2 refuse trucks to electric		£400K								
Switch Refuse collection fleet to electric / hydrogen				£5.1M						
Switch Cleansing vehicles to electric		£1.5M								
Switch to electric mowers etc		TBA								
1MW Salt Ayre Solar	£1.4M*									
25MW solar farm		£24.3M								
Different heating systems							TBA			
Wind turbine feasibility				£500K						
Million trees		£200K								
Pool car- infrastructure		£50K								

REVENUE	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	28/29	29/30
Energy Management software		£50K								
Staff training		£20K								
Additional staff resource	£40K*	£50K	£50K							
Pool car- infrastructure		£50K								
Citizens Jury	£40K									

* Denotes where already built into existing budgets

NOTES

- There will be 25 yr income streams from the investment in the 2 solar projects. The 25MW solar farm is estimated to generate £48.5M net profit (over 25 yrs). The 1MW solar farm is estimated to generate £3.6M net profit (over 25yrs)
- Vehicle replacement assumes equivalent numbers of vehicles as now. Different operating methods would aim to increase efficiency. There will be revenue savings from fuel and repairs and maintenance.

OTHER ACTIONS

More detailed action plans will be brought forward to show the indirect actions the Council will take following the Citizen's Jury. Good progress has been made-

- Launch of 1,000,000 trees project. The intention is to work with landowners, community groups, volunteers and other partners to plant an additional 1,000,000 trees on the District by 2030, as part of the Northern Forest project.
- Commissioning of Citizen's Assembly. This has now been commissioned and preparatory work is now taking place so that deliberations can begin in January.
- Council Housing stock. The Council has approximately 3,800 Council properties. Significant investment in energy saving works has already taken place. Following the declaration of the climate emergency officers are reviewing the capital programme to ensure that repair and maintenance programmes are prioritised to reduce carbon.