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**Originator:**  
Paul D. Trott,  
Chief Executive, OPCC

**Decision number: D39-2017**

**Submitted to: Martin Surl, Police & Crime Commissioner for Gloucestershire**

**Subject: Carbon Management Plan and Invest to Save Budget**

**Executive summary:**

The report is an update on the energy performance of the Constabulary in line with the objectives of the Police and Crime Plan. This includes carbon reduction figures and projected savings on invest to save projects.

Energy consumption includes electricity for lighting, heating and equipment and gas for heating.

I also request approval of the "invest to save" budget of £60,000 for the following years of the 5 year Carbon Management Plan. The budget has remained at £60,000 since 2014

**Recommendation:**

- The Force continues to invest in new technologies.
- The principles of sustainability are embedded into day to day business
- The Force is committed to save carbon and as a result will make cost and cost avoidance savings. Utilities bills are predicted to continue to rise.
- An "invest to save" budget of £60k per annum for 2017/21 is approved.

**Outcome/approval by:**

Signature:

Date: 24 October 2017

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<p><b>Public access to information</b></p> <p><i>Information in this form and associated reports is subject to the Freedom of Information Act 2000 and the Elected Local Policing Bodies (Specified Information) Order 2011. Where it has been indicated that this is a decision of significant public interest, all of this form except Part Two will be made available on the website of the OPCC.</i></p> <p><i>Any information that should not be automatically available on request should not be included in Part One but instead on a separate Part Two form.</i></p>	
<p><b>Is this a decision of significant public interest?</b></p> <p><i>This includes a decision with any impact on the community, expenditure in excess of £50,000, or any decision that would be of obvious interest to the media or the general public</i></p>	<p><b>Yes</b></p>
<p><b>Is there a Part Two form?</b>  <i>This section should only include information that, if published:</i></p> <ul style="list-style-type: none"> <li><i>a) would, in the view of the chief officer of the police, be against the interests of national security;</i></li> <li><i>b) might, in the view of the chief officer of police, jeopardise the safety of any person;</i></li> <li><i>c) might, in the view of the chief officer of police, prejudice the prevention or detection of crime, the apprehension or prosecution of offenders, or the administration of justice; or</i></li> <li><i>d) is prohibited by any enactment.</i></li> <li><i>e) breaches commercial sensitivity</i></li> </ul>	<p><b>Not applicable</b></p>

<p><b>Originator checklist (must be completed)</b></p>	<p><b>Comments including who has approved the report if applicable</b></p>
<p>Has legal advice been sought on this submission if required?</p>	<p>Not applicable</p>
<p>Has the Chief Finance Officer been consulted, if required?</p>	<p>Yes</p>
<p>Have equality, diversity and human rights implications been considered, as appropriate?</p>	<p>Yes</p>

[Title of Decision Paper]

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How is the recommendation consistent with the objectives of the Police and Crime Plan?	The recommendations support the PCC's Approach and ambition for a "green and pleasant county".
Has consultation been undertaken with people or agencies likely to be affected by the recommendation?	Not applicable
Has communications advice been sought on areas of likely media, community, staff or partner interest and how they might be managed?	No
Have all relevant implications and risks been considered?	Yes

**Part One – For publication**

**1. Purpose of the report**

To provide an update to senior management on the proposed and completed projects and to request approval of £60,000 as an invest to save budget

The budget will cover projects in the carbon management plan which links to the plan on a page and to page 11 of the Police and Crime Plan and the environmental objectives set out in the plan.

**2. Background**

I am currently drafting the Carbon Management Plan which will pull together all the opportunities to improve our efficiency and make savings. It will include a more in depth analysis of the "invest to save" projects as demonstrated in our current plan.

The purpose of the Carbon Management Plan is to quantify our carbon emissions and to identify and integrate energy and fuel saving projects into a clear strategy which can be implemented over the next five years.

**By reducing our carbon emissions through saving energy we can potentially realise significant cost savings, contribute to the governmental drive towards a low carbon economy and adapt to climate change**

The comparison below, from the current Carbon Management Plan, between 2015/16 and 2016/17 shows an overall increase.

**It should be noted the utilities prices are predicted to continue to rise and our efforts to reduce our carbon footprint will enable us to reduce the impact on ever increasing utilities costs.**

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Buildings 2015/16	Tons CO2	%	Cost	%		Buildings 2016/17	Tons CO2	%	Cost	%
Non operational	14	0%	£2,238	0%		Non operational	9	0%	£1,701	0%
SDU	59	1%	£10,737	1%		SDU	60	1%	£11,050	1%
Radio masts	23	0%	£4,325	0%		Radio masts	25	0%	£4,629	0%
Police Stations	1,312	24%	£237,990	15%		Police Stations	2,009	32%	£347,491	21%
Prism House	188	3%	£34,406	2%		Prism House	174	3%	£31,987	2%
SCIS buildings	8	0%	£1,409	0%		SCIS buildings	8	0%	£1,443	0%
Custody	390	7%	£70,865	5%		Custody	518	8%	£87,396	5%
HQ Waterwells	1,349	25%	£247,363	16%		HQ Waterwells	1,403	22%	£256,979	15%
<b>TOTAL</b>	<b>3,342</b>		<b>£609,333</b>				<b>4,207</b>		<b>£742,676</b>	
Transport 2015/16	Tons CO2	%	Cost	%		Transport 2016/17	Tons CO2	%	Cost	%
Response	1,044	19%	£468,823	50%		Response	1,090	18%	£489,534	53%
CID car	336	6%	£153,360	16%		CID car	344	6%	£156,436	17%
Hire/Pool Car	100	2%	£46,153	5%		Hire/Pool Car	100	2%	£47,472	5%
General Patrol	222	4%	£99,524	11%		General Patrol	82	1%	£36,901	4%
RPU	184	3%	£83,643	9%		RPU	176	3%	£79,594	9%
Specialist	210	4%	£94,607	10%		Specialist	257	4%	£115,441	12%
<b>TOTAL</b>	<b>2,096</b>		<b>£946,110</b>				<b>2,048</b>		<b>£925,378</b>	

**NB** There has been an increase in the tons of CO2 used by Police Stations. Police Stations include Hesters Way, Hucclecote and Quedgeley. The figures also include consumption at Lansdown Road. There has been a decrease in the tons of CO2 for general patrol which is likely to be due to the use of electric vehicles.

### 3. Recommendation(s) Projects

#### Energy audits and Carbon Management Plan

In line with one of the environmental objectives in the Police and Crime Plan energy audits have been completed on 10 sites and the remainder planned in for completion this financial year. The recommendations for options to save will form part of the Carbon Management Plan which is currently being reviewed and updated. There will be some minimal consultancy fees, £47 per hour, associated with this work.

#### LED Lighting upgrades(completed)

- Install at Stroud Police Station £20,760  
The 2<sup>nd</sup> and 3<sup>rd</sup> floors have been refitted with LED lighting. The payback for the lighting is on average three years.
- Install at Coleford Police Station – lighting was not included in the refurbishment project £9,750
- Barton Street – in conjunction with planned programme works to upgrade the facilities at Barton Street. The station has been fitted out with LED lighting for £10,545.
- Tri service control room – issues with lighting following one room project leading to high maintenance costs. These works are more costly £21,990 as the lighting has to be dimmable. The control room has been refitted with LED lighting, giving an improved working environment and a significant energy saving.
- Tewkesbury  
Lighting upgraded to LED costing £3360.

#### BMS (heating controls) upgrade

[Title of Decision Paper]

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Phase 2 to migrate Compass House, Tri Service Control Centre, Stroud and Coleford onto a server allowing access to the building controls from any computer has been completed. There are further works required to fine tune the system.

### **Proposed projects 2017/18 awaiting progression**

The projects below are on hold pending approval of the budget and could have been progressed had the budget been in place from 1<sup>st</sup> April. The sooner investment is made the sooner savings will be evident, for example replacing standard fluorescent tube fittings with LEDs decreases the lighting consumption by at least 50%.

#### Lighting upgrades

- Dursley – lights are beginning to fail so new lighting is required. Upgrade to LED quoted at £8150
- Hucclecote – full LED lighting upgrade quoted at £8080
- Bamfurlong – Tri force office LED lighting upgrade quoted at £945

There are further opportunities to upgrade the internal lighting at Bamfurlong, including Fosse House and Holland House which are being progressed.

#### BMS (heating controls) works

In our buildings the running of the heating plant is largely time-based, using time clocks or optimizers. This means it operates for most of the day, regardless of space conditions, with heat flowing to all parts of the building even when their temperature set points are satisfied.

Buildings Management Systems (BMS) are capable of making our building operate far more efficiently by implementing an entirely demand-led control strategy, they are able to ensure that the heating plant only ever operates when necessary.

Such a strategy would look at space temperature conditions in the heating zones and factors like room occupation as measured, say, by presence detectors.

Ever increasing energy prices and the mounting pressure on organisations to reduce their carbon emissions has meant that demand-led control is increasingly being specified when a BMS is first installed. Upgrading an existing system to apply it is not of course something that can be done overnight. It will involve a level of investment that is higher than simply re-configuring the system to perform the control routines described earlier. However, it will be an investment that can be justified by the additional savings that accrue.

These savings can be particularly large in today's well-insulated commercial buildings whose lighting, electrical/IT systems and occupants represent a major source of heat and where there may be separate plant for generating the domestic hot water. In such premises, the requirement for the boilers to run can be very low, even during spring and autumn, so the potential for cutting energy waste is even greater.

The Carbon Trust estimate the potential savings of a correctly programmed BMS is 10% to 20%. Further works are required to improve the BMS controls currently available on the Intranet. Quotes for works at £3,000.plus estimated a further £2,000 to fine tune the system.

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Additional buildings to be added to the system including upgrading at sites – such as Prism House, Tri Service Workshops, Holland House and Bamfurlong. The software and upgrades for these installations is estimated at between £3,000 and £10,000 per site.

Holland House boiler has to be replaced and that is the opportunity to upgrade the controls and link them to the Intranet.

It must also be noted that savings will be made in terms of resources when the buildings management systems are on the intranet. Monitoring the BMS can be carried out remotely, faults diagnosed and alterations made to ensure the systems run efficiently.

### New Technology

It should also be noted that emerging new technologies such as battery storage may lead to a change of plan regarding the spend in the latter years of the plan.

#### **4. Financial and resource implications**

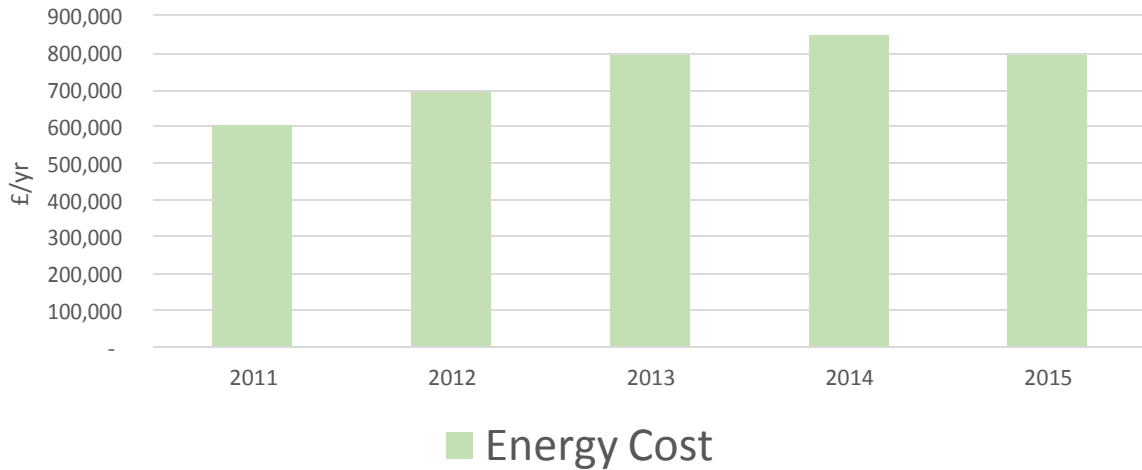
I request that a budget of £60,000 is allocated to me for 2017/18 in line with the requirements of our Carbon Management Plan (CMP) to invest in the LED lighting upgrades and, following the energy audits, improvements to heating controls as appropriate on the sites the Constabulary intend to retain.

I also request approval for a budget of £60,000 to be allocated for each of the following years of the 5 year CMP. The budget has remained at £60,000 for the life of the previous plan and provides sufficient year on year investment to improve a number of our buildings. However increased investment would provide increased savings and cost avoidance as our utilities bills increase.

Costings are attached as appendices. It should be noted that some projects are estimated in 2017/18 and quotes are awaited. The costings for the following years are all estimates based on experience of the costs of previous similar projects. Savings and paybacks are worked out using average utilities consumption and install costs. Savings for lighting upgrades includes projected replacement costs. A copy of an average payback calculation is at appendix b.

It is important to note that the installations carried out in previous years are providing savings. Quedgeley Police Station has shown a drop of 30% in annual consumption and Coleford 17% based on the same period last year. Savings are difficult to prove because of changes in occupancy and use and the fact that buildings are not sub metered.

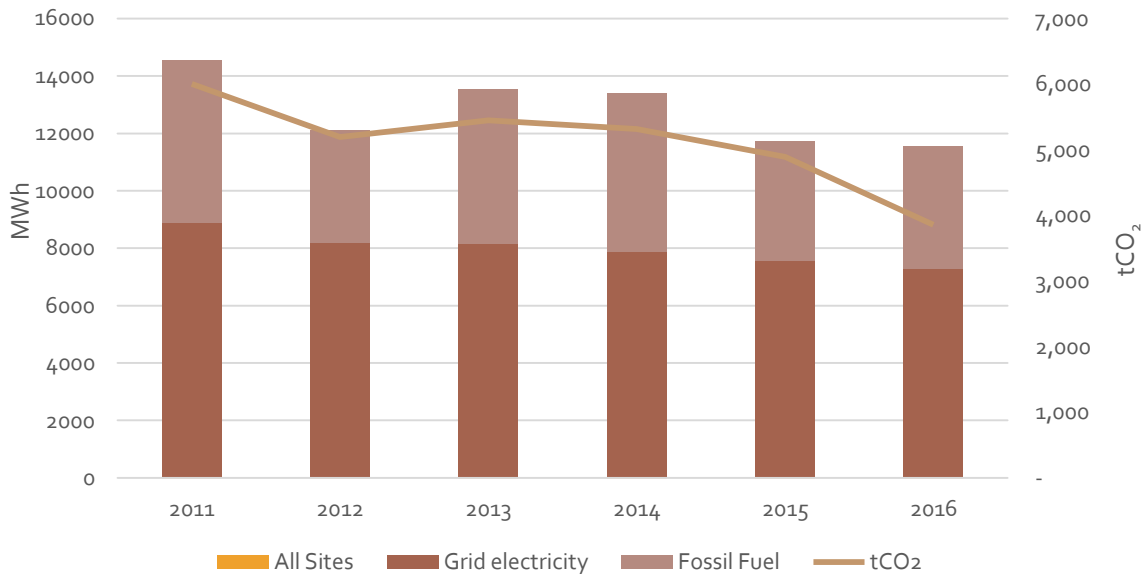
### Year on year totals



The main thrust of the Carbon Management Plan is to reduce our carbon footprint not only to realise saving but also to avoid ever increasing utilities costs.

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### Year on year total energy consumption



The energy profile over the life of our first Carbon Management Plan is shown in the above graph. Fossil fuel (gas/oil) fluctuates due to winter weather, but can be normalised using degree day data. The initial savings made between 2011 and 2012 were the quick and easy wins and closure of a number of buildings. The grid electricity has reduced year on year since the "invest to save" budget was approved in 2014.

The level of investment will be assessed for each building depending on the length of time the Constabulary intends to retain it and the payback period of the technology.

Further time and investment will also be made on awareness raising and training to maximise the saving on our Utility bills.

[Title of Decision Paper]

**5. Risk assessment**

The risk is that with no budget the Carbon Management Plan cannot be progressed to reduce our carbon footprint

**6. Equality & Diversity impact assessment**

Not applicable

**7. Environmental impact assessment**

Is the subject of this paper

**8. Consultation**

Not applicable

**9. Discussed with Communications & Engagement**

Yes

**Departmental contact**

Mandy Gibbs – Facilities and Environmental Manager  
Estates and Support Services  
01452 752258

**Originator approval**

**Name:** Paul D. Trott

**Job title:** Chief Executive, OPCC (SRO for Estates)

**Signature:** 

**Date:** 19 October 2017

**Chief Executive approval**

I am satisfied that relevant advice has been taken into account in the preparation of the report and that this is an appropriate request to be submitted to the PCC.

**Signature:** 

**Date:** 19 October 2017



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APPENDIX A

INVEST TO SAVE F320 · CARBON MANAGEMENT 2017-2018

budget	0
•nusordered	-3,360
•nus in invoice (remaining)	-59,660
•nus in invoice paid amount	-3,360

Work Description	Pay back	Quotation	Estimated	Order no	Savings	Invoice Amount	Invoice Received	Total Finance (paid on system)
Replace lights with LED Panels Tewkesbury	3.2 years	£3,360		POLP011039	£1,402	£3,360		3360
Replace lights at Hucclecote	3.1 years	£8,080			£2,625			
Replace lights at Dursley	3.5 years	£8,150			£2,987			
Replace lights in Tri Force office Bamfurlong	2.7 years	£945			£346			
Replace lights at Holland House	3.1 years		£4,000		£1,298			
Upgrades improvements to BMS system for Stroud, Coleford, Compass House and GTEC		£3,000	£2,000		Fine tuning the existing systems on the intranet to ensure alarms and sensors are all performing at optimum levels			
Replace Trend at Holland House	Estimated 6 plus years		£10,000		Boiler has to be replaced (£30,000) so controls should be upgraded at the same time			
Replace lights at Bamfurlong admin block and Fosse House	2.8 years		£12,500			£4,257		
Handdryers for Crime Ops to replace paper towels		£625			Energy efficient hand drivers			
Upgrade heating controls Prism House (electric heating)	2 to 3 years	£7,000			£2,500 to £5,700 per annum			
		£31,160	£28,500			£3,360	Totals	3360

INVEST TO SAVE F320- CARBON MANAGEMENT 2018-2019

budget	0
•nusordered	0
•nus in invoice (remaining)	
•nus in invoice paid amount	0


Work Description	Pay back	Quotation	Estimated	Savings per annum	Order no	Invoice Amount	Total Finance (paid on system)
Replace lighting at Stow	3.5 years		£8,150	£2,987			
Upgrade controls at Bamfurlong	3 to 6 years		£14,000	£2,300 to £4,700 per year			
Upgrade controls at Barton Street	7 to 14 years		£4,000	£274 - £550 per annum			
Solar Panels Coleford based on costs and paybacks for Prism House	6.6 Years		£30,000	£4,500			
			£56,150				

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**INVEST TO SAVE F320 - CARBON MANAGEMENT 2019-20**

<b>budget</b>	<b>0</b>						
<b>Minus ordered</b>	<b>0</b>						
<b>minus estimate (remaining)</b>	<b>-£61,000</b>						
<b>Minus invoice paid amount</b>	<b>0</b>						

Work Description	Pay back	Quotation	Estimated	Savings	Order no	Invoice Amount	Total Finance (paid on system)
Upgrade controls at Hesters Way			£3,000	£274 to £550 per annum			
Upgrade controls at Hucclecote	12 to 20 years		£3,000	£116 to £232 per annum			
Upgrade controls at Fleet	5 to 8 years		£5,000	£570 to £1140 per annum			
Solar panels Holland House likely to be more expensive scaffolding required, Hesters Way	7 to 10 years		£50,000				
			<b>£61,000</b>				

**INVEST TO SAVE F320 - CARBON MANAGEMENT 2020-21**

<b>budget</b>	<b>0</b>						
<b>Minus ordered</b>	<b>0</b>						
<b>minus estimate (remaining)</b>	<b>-£60,000</b>						
<b>Minus invoice paid amount</b>	<b>0</b>						

Work Description	Pay back	Quotation	Estimated	Savings	Order no	Invoice Amount	Total Finance (paid on system)
Upgrade controls at Dursley	4 to 7 years		£5,000	£634 to £1269 per annum			
Upgrade controls at Phoenix House			£5,000	Figures incomplete data not available for a full year			
Solar panels - options Bamfurlong, Hucclecote, Quedgeley			£50,000				
			<b>£60,000</b>				

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APPENDIX B

		<b>Number of fittings</b>	<b>100</b>						
		<b>LED life time</b>	<b>50,000</b>	<b>hrs</b>					
		<b>SON life time</b>	<b>20,000</b>	<b>Hrs</b>		<b>Lifetime varies 12,000 hrs to 30,000 hrs</b>			
		<b>CFL lifetime</b>	<b>10,500</b>	<b>Hrs</b>		<b>Lifetime varies 6,000hrs to 15,000 hrs</b>			
		<b>LED lifetime at predicted usage</b>	<b>14</b>	<b>Years</b>					
		<b>No of ..... replacements for predicted usage</b>	<b>2</b>						
		<b>Existing System replacement cost</b>	<b>£11,000.00</b>			<b>Average cost of fitting £110</b>			
		<b>Additional Replacement cost for .....</b>	<b>£22,000.00</b>						
		<b>Additional replacement cost savings per year</b>	<b>£1,606.00</b>						
		<b>Capital Cost for LED replacment</b>	<b>£12,500.00</b>			<b>Average cost of LED fitting £125</b>			
		<b>Annual Energy Savings</b>							
		<b>Existing Lamp rating</b>	<b>158</b>	<b>W</b>					
		<b>LED Lamp rating</b>	<b>40</b>	<b>W</b>					
		<b>Annual hours run</b>	<b>3,650</b>	<b>hrs</b>					
		<b>Elec Saving</b>	<b>43,070</b>	<b>kWh</b>					
		<b>Energy Price</b>							
		<b>Current Energy Price</b>							
		<b>night time</b>	<b>0.054552</b>	<b>£/kWh</b>					
		<b>Day time</b>	<b>0.074535</b>	<b>£/kWh</b>					
		<b>New energy Price 12% higher</b>							
		<b>night time</b>	<b>0.061</b>	<b>£/kWh</b>					
		<b>Day time</b>	<b>0.083</b>	<b>£/kWh</b>					
		<b>Average</b>	<b>0.068</b>	<b>£/kWh based on 3 hrs day and 7 hours night</b>					
		<b>Annual Saving £</b>	<b>2921</b>	<b>£</b>					
		<b>Basic Payback</b>	<b>4</b>	<b>years</b>					
		<b>payback including replacement cost</b>	<b>2.8</b>	<b>years</b>					