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Carbon Management Strategy – Conclusion and Future Plans

1. Purpose and summary
   1. Under the Government of Wales Act 2006, the Assembly has a statutory duty to promote sustainable development in the exercise of its functions. To this effect, on 25 November 2009, the Commission approved the Carbon Management Strategy and action plan for becoming a Carbon Neutral Assembly. The principle aims of the strategy were:

* to achieve a 40% reduction in energy emissions and 15% reduction in business travel emissions during the five year plan;
* to achieve carbon neutrality by 2015.
  1. The original aim of the five year plan supporting the strategy was to reduce our carbon emissions from energy use and business travel as far as possible to minimise the offsetting required to deliver carbon neutrality.
  2. As the plan progressed, the appetite for carbon offsetting diminished alongside encouraging progress and the aim of achieving the challenging emissions reduction targets became the only priority.
  3. Over the duration of the strategy, we have been successful in achieving a total energy emissions reduction of 35% against the 40% target. The Carbon Trust have cited this as ‘Public Sector leading performance in Wales’ and the Commission can be proud of the reductions achieved against an extremely challenging target. Total business travel emissions at the conclusion of the strategy represented a 4% reduction compared to 2008/09 despite an increase of 16% in mileage, signalling a reduction in the carbon intensity of travel but more importantly the emergence of smarter travel choices.
  4. The success of the strategy rests with a balanced approach to building improvements, a collective commitment and enthusiasm by all occupants to the sustainability agenda and the investment required to realise the savings achieved. Only recently, the Assembly was successful in winning a coveted award for the Most Sustainable Public Sector Organisation in Government across the UK by the Institute of Public Sector Estates Management which is testament to our hard work.
  5. The Carbon Management Plan has proven to be an invaluable catalyst for change in driving environmental improvement and ultimately reducing the impact of the Assembly’s activities. It has successfully laid the foundations for achieving the more significant gains required in reducing carbon emissions through the new investment programme that will take the Assembly forward to 2021.
  6. This report concludes the Carbon Management Strategy and provides a summary of progress made in 2013/14 of the plan together with our key achievements in respect of the corporate targets.

1. Recommendations
   1. The Assembly Commission is invited to:
2. Note the actions that helped achieve our carbon reduction targets:   
    - taken in 2013/14 (Annexed in Table A)   
    - and our key performance achievements throughout the plan (Annexed in Table B)
3. Note the Commission approved strategy for further reducing energy emissions (Energy Reduction Route Map) and proposed actions for developing additional targets for business travel, waste and water (Annexed in Table C).
4. Progress (2013/14)
   1. In 2013/14, our energy emissions reduced by 8.7% across the estate resulting in a reduction of 168 tonnes of carbon compared to the previous year. This was largely attributable to a mild, dry summer and warm winter in which the use of AC for cooling and gas for heating was lower over extended periods. Energy costs increased by £10,848 compared to the previous year and continued reductions in energy consumption will be key to ensuring our energy costs remain as low as possible in light of rising commercial energy prices. Despite energy costs rising year on year, following this reduction we have achieved indicative energy cost savings of £222,068 (33%) against the baseline year 2008/09 (based on the Assembly’s current electricity and gas prices).
   2. Business travel emissions have increased by 5% in 2013/14 compared to the previous year and this has been reflected by cost increases of 31% and an increase in total mileage of 4%. This is largely a result of increased private car use and air travel. However, despite these recent increases a cumulative reduction of 11% in travel emissions has been achieved since 2008/09 with a sustained use of low carbon forms of travel such as rail and coach becoming more prevalent. This reduction is set against peaks and troughs in business travel pursuant to the nature and patterns of Assembly business.
   3. Table 1 below shows our annual performance in reducing CO2e emissions (and resultant cost savings) since the plan’s inception in 2009.

*Table 1 Carbon and Cost Savings*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 2008/09 (baseline year) | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 |
| Energy (tC02e)[[1]](#footnote-1),2 | 2,680 | 2,463 | 2,214 | 1,882 | 1,952 | 1,784 |
| Energy costs (£) | £491,302 | £449,500 | £369,984 | £415,699 | £431,456 | £442,304 |
| Carbon Saving (tCO2e) | - | 217 | 249 | 332 | +70 | 168 |
| Cumulative carbon savings (tCO2e) | 896 tCO2e (-34%) | | | | | |
| Cost savings (£) | £222,068 (-33%)  (calculated using current energy prices applied  to energy use in the baseline year) | | | | | |
| Business Travel1,2 (tCO2e) | 310 | 237 | 169 | 270 | 262 | 276 |
| Business travel costs (£) | £150,303 | £248,785 | £164,537 | £265,217 | £266,576 | £349,775 |
| Carbon Saving (tCO2e) | - | 73 | 68 | +101 | 8 | +14 |
| Cumulative carbon savings (tCO2e) | 34 tCO2e (-11%) | | | | | |
| Cost savings (£) | +£150,474 (+23%) | | | | | |

For consistency all emissions values have been calculated using Defra’s conversion factors for greenhouse gas reporting as they are updated annually. In 2013-14, all prior year conversion factors were restated and all data has been restated to reflect this change. This has resulted in changes to all prior year and current emissions values.

2Energy and business travel emission values have been restated to include transmission and distribution losses (T&D) and well to tank (WTT) emissions.

1. Summary of overall performance
   1. All previous years’ performance have been reported based on the financial year. However, to broadly coincide with the inception of the Carbon Management Plan in November 2009, the strategy was concluded at the end of December 2014. A summary of our overall performance in relation to the corporate targets is illustrated in Table 2 below.

*Table 2 Summary of overall performance*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Reduction target (%) | Baseline Dec 2008 | Performance Dec 2014 | Savings |
| Energy emissions (tC02e) | 40% | 1951 | 1261 | -35.1% |
| Business travel emissions (tCO2e) | 15% | 2371 | 2291 | -4 % |
| Total emissions (tCO2e) | - | 2,188 | 1,490 | -32 % |

1 Does not include Members and AMSS business travel data for October – December as data is reported three months in arrears to coincide with the deadline for claims.

* 1. Since the beginning, the success of the strategy was predicated on investing significantly in the buildings across our estate and in particular our most energy hungry building, Tŷ Hywel. This investment has been a significant contributor to our performance achievements year on year and the strategic annual improvement plans proposed played a key role in maintaining focus and achieving such high carbon savings. As a result of the investment and the improved usage of the building, Tŷ Hywel alone has realised energy emission reductions of 39% compared to 2008/09. This has also been reflected in improvements to the Display Energy Certificate (DEC) for the building which is annexed in Table D.

Over the course of the strategy, there has been a gradual increase in the use of low carbon modes of travel such as rail and coaches that have contributed to a reduction in emissions, however necessary car and air travel still prevail as the primary modes that enable Members and staff to achieve the Commission’s strategic goal of promoting and serving the people of Wales. Encouragingly, all transport emissions have been offset by advancements in manufacturing that continue to contribute to a reduced impact on the environment. This achievement is all the more impressive as it is set against gradual improvements in data collection since the start of the strategy that have been added to the performance metrics when they have become available.

A future business travel target will need to account for the key activities of Members and Commission staff, the necessity for Members to travel in their roles, and in particular the choice of modes they have available to them with respect to their geographic spread across Wales.However, if a continued shift to low carbon modes of travel continues together with the decarbonisation of cars, air and rail travel, this can only contribute to further reductions in emissions.

1. Looking ahead
   1. The approval of the Energy Reduction Route Map in June last year clearly indicates the Commission’s appetite to lead by example and drive further efficiencies across the estate. This ‘route map’ challenges us to achieve a further 30% energy emissions reduction by 2021 compared to the 2012/13 baseline. If we are to achieve this goal, the continued improvement of Tŷ Hywel’s performance will remain the key priority. It was identified in the Route Map that to ensure we comprehensively manage all our main environmental impacts, new targets for waste, water and business travel would be developed to sit alongside the new energy target. This will provide a suite of targets that can be measured and monitored consistently on a like for like basis over the same time frame from April 2015. These targets will be provided for the Commission’s consideration in due course.
   2. As we look towards 2021, we have an opportunity to build on our success to date, work even harder to optimise the efficiency of our buildings and embed a truly sustainable work culture. However this will not be easy and will require even greater acceptance of change by the stakeholder groups using our estate. Yet, we will not lose sight of the key priority of ensuring we maintain a comfortable working environment for all occupants that supports the business of the Assembly and its Members.
   3. To ensure the future resilience of our buildings and operations in light of unpredictable weather conditions, rising energy costs and potential future supply volatility, we will consider all options available to us including the prospect of joining a Cardiff wide district heating scheme using energy from waste as the primary fuel, renewables and further efficiency gains through equipment and plant replacement.
2. External Factors

The published carbon conversion factor for electricity rose steeply in 2014 to its highest value in 5 years. This was a result of increased volumes of coal in the fuel mix that contributed to the calculation of the carbon factor for the year. This has had a significant detrimental impact on the gains realised through the savings we have made in electricity over the last year which in turn impacts our overall performance.

1. Conclusion
   1. Delivery of the strategy has produced significant reductions in carbon emissions, reductions that will be built on in coming years as the Commission’s Energy Reduction Route Map begins to deliver results. During a time when there has needed to be an even greater emphasis on the efficient use of resources the investment in carbon reduction has done much to offset energy use and manage costs.
   2. The recent award and our performance achievement at the conclusion of the strategy provides an ideal platform for further showcasing the work of the Assembly in promoting sustainable development more widely and setting an example for others to learn from and follow.

**Table A**

Actions 2013/14

|  |  |
| --- | --- |
| Details of selected actions | Progress |
| Continue roll out of PIRs across Tŷ Hywel. | The majority of the lights in Tŷ Hywel have now been changed to motion sensors. There are a few smaller meeting rooms/offices on the ground floor corridor that are left to change. Funding has been given by the Investment and Resourcing Board for this and we intend to carry out these in the next few months. |
| Develop a more robust and inclusive approach to energy management and carbon reduction. | Through the investment of dedicated energy monitoring software, we are developing a clear picture of energy performance across the estate together with a strategy for energy management that will assist with identifying key areas for improvement. |
| Assess the feasibility of assessing the base load of Senedd IT and electronic equipment to identify opportunities for energy reduction. | We have undertaken a base load assessment of lighting systems within the Senedd and are exploring the feasibility of replacing high level lights with LED replacements delivering significant efficiency savings, the same quality of light and short paybacks. |
| Improve occupant’s sustainability behaviour through targeted environmental communications. | A suite of measures are being developed that can target our wide stakeholder base and these include sustainability dashboards, green advisors, a cycle group and periodic ‘factoids’ about sustainability. |
| Undertake further trials with solar film on areas with high solar gain. | Following the successful trial of the solar film, this has now been rolled out to all windows effected by solar gain in Tŷ Hywel following funding approval from Investment and Resourcing Board. |
| Consider options to upgrade and/or replace the building management system as part of the new FM contract. | The BMS has been tendered and awarded with a targeted installation completion date of April 2015. |
| Investigate feasibility for installing solar PV panels to provide renewable electricity. | To be considered as part of the new Energy Reduction Routemap. |

**Table B**

Key performance achievements over the life of the strategy 2009-2014

|  |
| --- |
| Details of key actions |
| ***Energy*** |
| Comprehensive rollout of motion sensors on over 3000 lights across Tŷ Hywel. |
| Installation of variable speed drives on boiler pumps reducing fan speeds by 75%. |
| Replacement of perimeter and parking lighting with LEDs. |
| The replacement of inefficient radiator valves with new centrally controlled alternatives. |
| Replacement of existing PCs with 750 Energy Star rated PCs that automatically hibernate after 15 minutes of inactivity |
| Building management system optimisation and controls |
| Modification to chiller operations to run on demand rather than time schedules |
| Daylight linked lighting in areas of Tŷ Hywel that receive sufficient natural light to light the space |
| Installation of high performance solar film on windows in Tŷ Hywel subject to excessive glare and solar heating. |
| Installation of four buffer vessels in the Senedd biomass boiler to improve efficiency of operation and minimise the need to use natural gas. |
| Night flushing of Tŷ Hywel in the summer to cool the building reducing the demand for air conditioning in the daytime. |
| Installation of a comprehensive sub-metering network enabling us to proactively identify and manage energy ‘hot spots’ across the estate. |
| Replacement of obsolete R22 refrigerant gas equipment with new more efficient units (approximately 50% efficiency gains). |
| Optimisation of heating systems using dedicated set points in all areas and switching off unnecessary radiators in transition areas. |
| Refurbishment of the Tŷ Hywel entrance to improve occupant comfort and reduce the need for excessive heating as a result of draughts. |
| Removal of redundant NHS server room and reconfiguration into office accommodation reducing energy loads. |
| Changed time schedules on air handling units in the Senedd to reduce electricity consumption resulting in immediate savings. |
| Installation of a glycol free cooling system in our main server room that draws cold air from the undercroft of the building reducing the air conditioning load. |
| ***Travel*** |
| Introduction of a low emission pool car displacing the need to use private cars and hire cars. |
| Low carbon hire car contract which specifies small cars as standard and limits fleet car emissions ratings to a maximum of 140g/km. |
| A fleet ‘outreach’ bus that runs on bio-fuel. |
| Cycle to work scheme with over 50 participants. |
| Improved availability and reliability of video and tele-conferencing facilities. |

**Table C**

**Proposed Future Actions**

|  |
| --- |
| Details of proposed actions |
| Investments might include:   * Strategic phased replacement of the air conditioning equipment across the estate in accordance with legislative requirements (mandatory). * Consideration and feasibility of costs and energy generation capacity of solar panels for Tŷ Hywel. * Replacement of the water boilers in Tŷ Hywel with more efficient condensing water boilers or solar water heating (subject to outcome of district heating feasibility assessment). * Phased replacement of field based controllers around Tŷ Hywel to support and enhance operation of the building management system. * Development of strategic targets for reducing the impact of waste, water use and business travel. |

**Table D**

**Building Display Energy Certificates1**

|  |  |  |
| --- | --- | --- |
| Building | DEC rating – 2008 | Dec rating - 2014 |
| Ty Hywel | **G (164)** | **E (112)** |
| Senedd | **C (70)** | **C (57)** |
| Pierhead | **C (67)** | **C (53)** |

1Display Energy Certificates (DECs) rate the actual or operational energy performance of a building against established benchmarks and take into consideration the ways in which occupants use the building. The operational rating on a DEC illustrates how efficiently the building is using energy, A being the most efficient and G being the least efficient.

1. [↑](#footnote-ref-1)