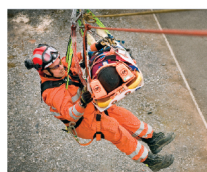




AVON
FIRE & RESCUE



Energy and Environment Report April 2019-March 2020

PREVENTING PROTECTING RESPONDING

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1. Performance indicators

Environment & Energy Performance indicators have been established to monitor and report on performance trends for Carbon Emissions, Energy Consumption, Renewable Energy Generation and Water Consumption. Figure 1 below summarises performance in 2019/20. Annual 5% reduction targets for carbon emissions and energy consumption were not fully met, as we focused on finalising the extensive programme of lighting and heating improvements undertaken in 2018/19 and planning for a further improvement programme from 2020. However we have significantly exceeded all longer term targets.

These targets are being reviewed to align with local and national targets, and will form a key part of our 10 year Environmental Strategy 2020-2030, currently under development. The strategy will outline our approach to protecting the environment, managing our impacts and addressing the climate emergency, including our Net Zero Carbon goal.

	Target	2019/20 Performance	Trend
Carbon Emissions	5% Reduction on previous year	- 3.4%	↓
	50% Reduction from 2008/09 by 2020	- 58.6%	↓
Energy Consumption	5% Reduction on previous year	- 1.1%	↓
	50% Reduction from 2008/09 by 2020	- 55.8%	↓
Renewable Energy Generation	20% from Renewable energy sources by 2020	87.3%	↑
Water Consumption	5% Reduction on previous year	- 22.7%	↓

Figure 1 – Environment & Energy Performance Indicators

2. Carbon Emissions

AF&RS-reported carbon emissions are made up of building energy consumption (gas, electricity and heating oil), fleet vehicle fuel, essential/casual and lease vehicle mileage claims, and water consumption), known as Scopes 1 and 2 emissions. This was the scope of emissions originally agreed with the Carbon Trust as part of the development of our Carbon Management Plan in 2010. As of 2020/21, we will also start to include all air and train travel into the carbon emissions calculations and consider which Scope 3 indirect emissions (e.g. employee commuting & supply chain) that we will include in future.

By the end of 2019/20, AF&RS has reduced carbon emissions by 59% since the 2008/09 baseline, exceeding both our sector-leading target of 50% and the government's public sector Emissions Reduction Pledge of 30% reduction by 2020. These reductions are due to:

- Energy efficiency savings made across our estate
- An increasing proportion of our electricity generated from solar PV systems on our buildings
- Delivery of cleaner energy sources and fleet improvements
- Changes in the national carbon factors¹ used to calculate carbon emissions as more mains grid electricity is renewably sourced and an increasing percentage of fuel station diesel is biodiesel

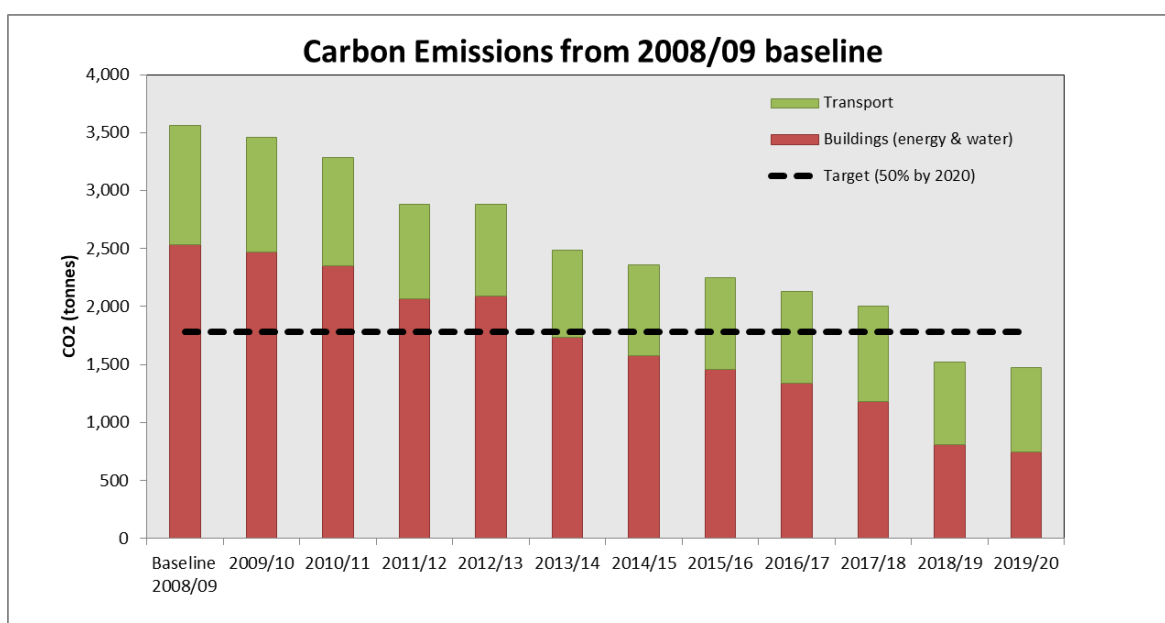


Figure 2 – AFRS Carbon Emissions

3. Energy Consumption

Over the past year, we achieved a 1% reduction in energy consumption (kWh) compared to the previous year, finalising the extensive programme of lighting and heating improvements undertaken in 2018/19 and planning for a further programme of works from 2020. Against our longer term target, of 50% reduction by 2020 from a 2008/09 baseline, we have now reduced energy consumption by 58.6%.

During 2019/20, measures to improve energy efficiency included:

- External lighting upgrades at Lansdown Control Centre and Yate Fire Station, replacing fittings with high efficiency LEDs and motion-detection controls
- A/C upgrades and heating upgrades at Nova Way Technical Centre
- Building fabric improvements including installation of solar blinds at Hicks Gate Fire Station and roof insulation at Nova Way Technical Centre
- Ongoing heating system improvements at On Call stations including new pipework, radiators and

¹ <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>

- controls at Paulton & Radstock Fire Stations
- Enhancement of the Building Management System to improve heating & hot water efficiencies across our larger sites

	2008/09	2011/12	2015/16	2016/17	2017/18	2018/19	2019/20
Total floor area (m2)	23,737	24,853	23,191	25,785	24,506	17,806	17,806
Energy consumed by floor area (kWh/m2)	329	262	189	173	163	196	194
Average DEC rating	F (139)	E (112)	D (76)	C (73)	C (68)	C (65)	C (62)
No. of buildings with DEC rating	6	6	11	22	25	24	24

Figure 4 – Building Energy Performance Improvement

Another approach is to look at the relative energy performance of our buildings, shown as energy consumption by floor area. As shown in Figure 4, this has improved significantly from 329 kWh/m2 in 2008/09 to 194 kWh/m2 in 2019/20. Similarly, the average Display Energy Certificate (DEC) rating for our buildings is now C (62) compared to F (139) in 2008/09s. DEC ratings are produced for all our buildings to give us a service-wide picture of our buildings' performance. Similar to energy ratings for white appliances, A represents the most energy efficient and G the least.

We expect to see a continued improvement due to the on-going works across our estate, focusing on sites rated D and E, and the low carbon, energy efficient design of the Investment for the Future new builds starting with Avonmouth Fire Station.

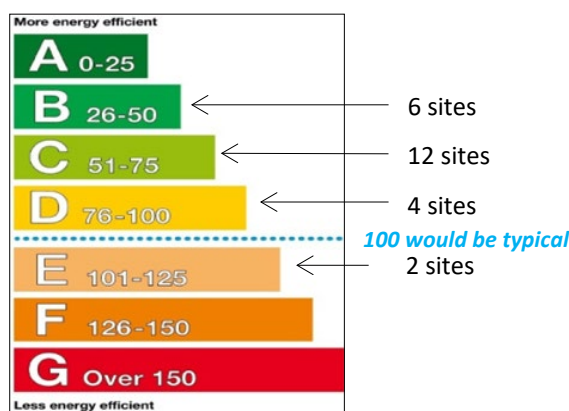


Figure 5 – Display Energy Certificate status

4. Renewable Energy

By the end of 2019/20, 87% of AF&RS' total energy demand was met by renewables (on & off site), well above our 20% by 2020 target. Generation capacity on our 9 sites with solar PV systems is 170kWp, providing a Feed In Tariff (FIT) income of over £11,000 per annum. The FIT scheme which provides payment for all electricity generated and exported back to the grid, is guaranteed for 20 years. AF&RS also benefits from any electricity generated that is used on site which displaces the cost of electricity that would otherwise be purchased from the grid. Pay back times for the initial cost of the systems ranges from 6-10 years.

	Year of installation	Size of system (kWp) ²	Average annual income (Feed in Tariff)
Nailsea	2012	9.8	£1,560
Nova Way	2012	9.8	£1,630
Thornbury	2014	10	£1,770
Hicks Gate	2016	30	£300
Temple	2016	32	£1,260
Lansdown	2016	28	£1,800
Blagdon	2018	11	£440
Kingswood	2018	29	£1,740
Yate	2018	10	£620
Totals		170 kWp	£11,120

Figure 6 – Renewable Energy Installations and income

Measures taken during 2019/20 have included:

- Purchasing 100% renewable electricity and green gas (generated locally from the Geneco anaerobic digester plant in Avonmouth), supplied by Bristol Energy under a 2 year contract
- Feasibility work to connect Temple Fire Station into Bristol City Council's district heat network
- Developing renewable strategies in the project briefs for new build fire stations at Avonmouth, Bath and Weston. As well as solar PV, these include other low carbon technologies such as solar 'immersion switches', Air Source Heat Pumps and battery storage.

5. Water Consumption

Metered water consumption has fallen overall by around 55% since 2009. This is largely as a result of improved identification and management of leaks, a reduction in scheduled vehicle washing on stations and install of more water efficient fittings. We now have data loggers installed on water meters at the 13 highest-consuming sites and are alerted to any anomalies in consumption via an alarm system. Due to the significant savings made by early detection, data loggers will be installed at all AF&RS sites over the next 12-24 months.

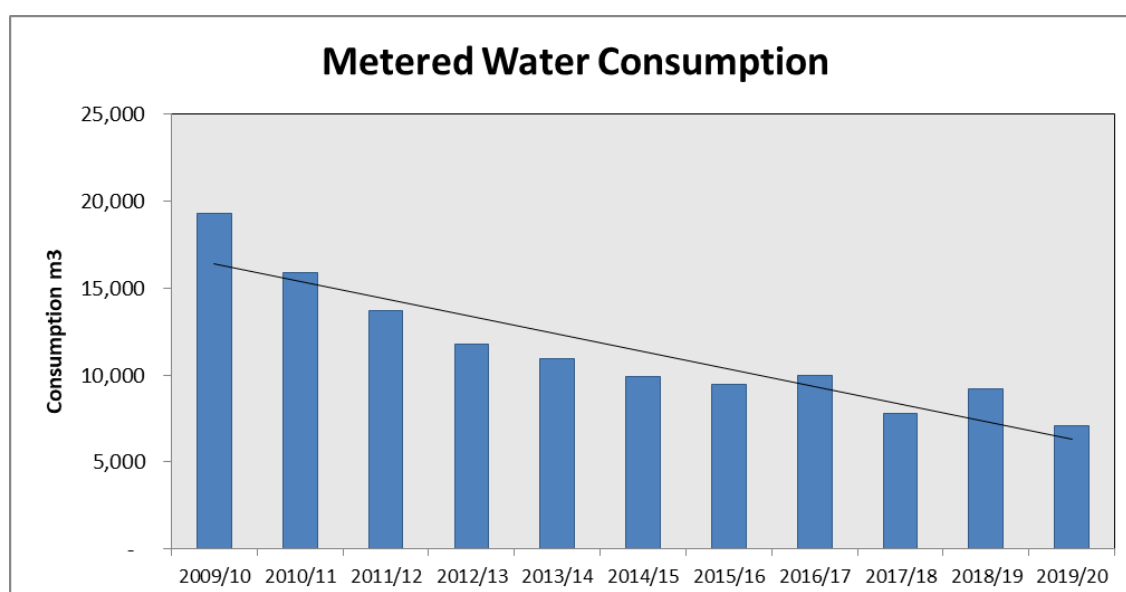


Figure 7 – AFRS Metered Water Consumption

² The power of a PV cell is measured in kilowatts peak (kWp), the rate at which it generates energy at peak performance in full direct sunlight during the summer.

6. Travel & Transport

Emissions for fleet transport fuel use and business travel (which includes lease, essential and casual car user mileage claims) are monitored quarterly. These now make up around 50% of AFRS' carbon footprint, with 70% from our frontline appliances and specialised vehicles, 14% from ancillary fleet vans and cars, and 16% from grey fleet (lease, essential and casual car users).

Figure 8 shows the annual variation in transport-related emissions, which have fallen by 30% overall compared to a 2008/09 baseline, due to fleet improvements such as upgrading vehicles, improved call-challenging, changes in our automatic fire alarm response based on better risk analysis, and our adoption of low and zero emission vehicles.

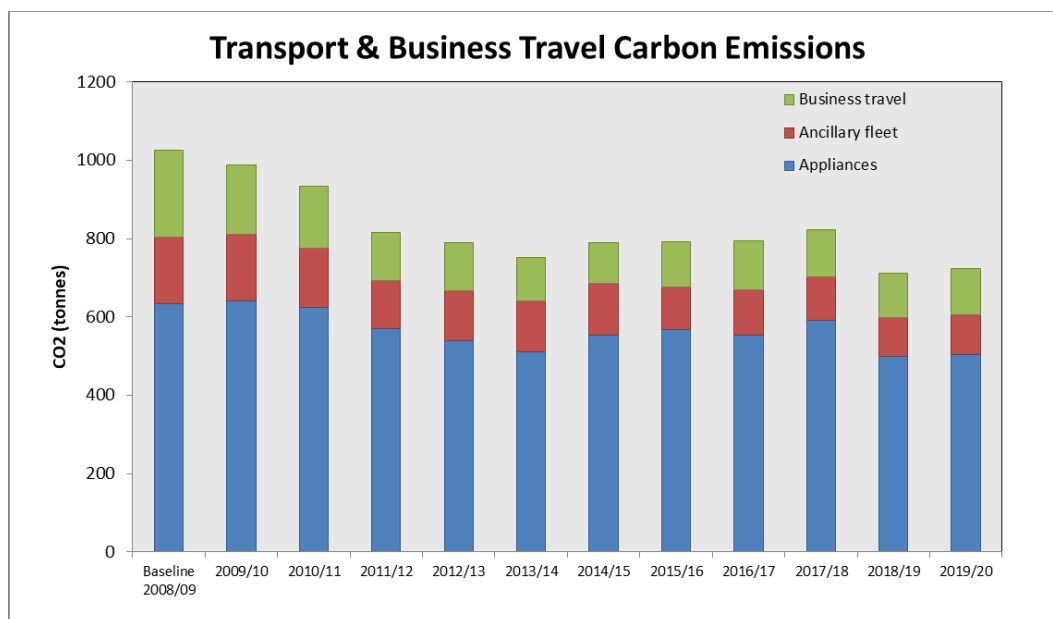


Figure 8 – AFRS Transport and Travel Carbon Emissions

Measures taken in 2019/20 have included:

- Deployment of 2 electric vans for use by the Community Fire Safety team
- Integration of sustainability in our new Fleet Strategy (2019-22) including alignment with Clean Air Zone requirements, whole-life costing and transition to a low/zero carbon fleet
- Consideration of different procurement routes for an electric vehicle charge-point infrastructure across the estate
- Initial installations of telematics in our fleet vehicles
- Trials of low/ultra-low emission vehicles to inform our fleet replacement programme
- Keeping abreast of & involved with low emission fire appliance developments

We have also continued to promote sustainable travel measures amongst staff, working with Travelwest to roll-out initiatives such as:

- Placing Emergency Bike Repair kits on stations
- Arranging for free bike servicing through the Dr Bike scheme
- Installing ground-mounted bike pumps at stations
- Taking part in the annual West of England Travel Survey
- Electric bike loan schemes at HQ and other AF&RS sites

7. Pollution Control & Environmental Protection

In line with our Environmental Policy, a range of measures have been taken to prevent pollution of land, water and air from our sites, training support services, and to reduce the environmental impact of operational response incidents. These include:

Operational incidents

A programme of work has been developed to address gaps identified in the Gap Analysis of the Environmental Protection National Operational Guidance (NOG) that was undertaken in 2018/19. This identified several improvements that are required in our operational procedures, training and equipment to meet best practice standards, such as upgrading environmental protection training for all operational staff and the incorporation of ecologically sensitive areas (notably Sites of Special Scientific Interest) into our command control system with the identification of appropriate response tactics.

Drainage

An extensive programme of works required to repair and improve drainage systems at many of our sites was completed in 2019/20. We are now putting into place a 3 year drainage maintenance contract and will continue to install of vehicle wash systems that comply with Wessex Water's requirements for trade effluent discharge consents. We have successfully applied for consents on 8 sites. Due to the condition and age of the drainage on a number of our sites, achieving full compliance at all sites is likely to take 2 years to complete at a significant level of expenditure.

8. Waste & Recycling

A 3 year contract is in place to collect and process general waste and mixed recyclables from each site. Based on actual bin weights, the proportion of our waste recycled is 86%, with 10% recovered for energy production in the Energy for Waste Incineration plant (at Avonmouth) and just 4% ending up in landfill. During 2019/20 we also extended food waste collections to all whole-time stations and a number of offices.

In addition to the main waste collections, other waste streams include electrical and electronic equipment (WEEE), hazardous waste, interceptor clearance, general skips, batteries, toner cartridges, scrap metal and depolluted vehicles for training; all of which are disposed of in compliance with necessary regulations. The waste hierarchy is applied where possible, in order to reduce waste at source and to find opportunities for re-use. For example, a group of corporate staff have undertaken measures to reduce the levels of printing and laminating at AF&RS, with a 15% reduction achieved over the past year. Waste reduction is also being integrated into new procurements by the Supplies and Procurement team, such as stipulating reduced packaging, recyclable content and end of life take-back schemes.

9. Environmental Strategy & Management

Underpinning the specific measures taken to reduce the environmental impact of our activities, a range of additional initiatives have been developed to improve our environmental management and to ensure environmental practices are embedded across the organisation including:

Environmental Management System (EMS)

In 2019/20, we have continued to develop the key components of an ISO14001 compliant EMS, including the development of a 10 year Environmental Strategy in consultation with departments across the service. As detailed in previous sections, we have also undertaken work on a range of issues where we are currently partially compliant such as: drainage management and liaison with the Environment Agency to ensure we are following best practice guidance at incidents with regard to environmental protection.

Another key step in 2019/20 has been to integrate sustainable procurement into AF&RS' Procurement Strategy as one of the four strategic themes: 'Embedding Social Value and Sustainable procurement practices and principles'. With an annual spend of approximately £14million, this presents many opportunities for resource efficiencies, lower whole life cost of goods and improved performance. A full programme of work will be developed in 2020/21, however the Supplies and Procurement team have already started to incorporate environmental and sustainability criteria in new procurement tenders, such as those for vehicle parts, drainage maintenance and fleet telematics.

Networking and Collaboration

We continue to work in partnership and network with other FRS, local authorities and other organisations to maximise opportunities for joint initiatives and to share experience and best practice. For example:

- We continue to roll-out an e-learning training module developed jointly with London Fire Brigade, to raise awareness of environmental issues pertinent to FRS sites. Over 70% of AF&RS staff have now undertaken the module and provided valuable feedback for future revisions and training.
- Now in its 3rd year, AF&RS have again taken part in an national inter-FRS 'Energy Champions' competition to reduce energy consumption over the winter months. In 2019/20, 3 AF&RS stations came in the top 10 of 67 participating stations nationally, with Thornbury station in 3rd place.
- We have continued working with Avon and Somerset Police and South West Ambulance Service (SWAST) on potential areas for collaboration and shared sustainability initiatives.
- AF&RS are members of the Emergency Services National Environment Group as well as maintaining regular contact with the NFCC communities for Sustainability, Property Management and Procurement, and other public sector organisations through the Carbon Trust Public Sector network.

Staff engagement

Initiatives to involve staff and raise awareness have included regular Bulletin and Intranet articles, Cycle to Work scheme, travel surveys and support for Wellbeing Spaces at our sites. These provide areas for staff to unwind and relax, and are a key element of the mental health programme. 6 spaces have now been completed with the projects led by station staff who have undertaken the majority of work, including hedgerow planting along the boundary of Patchway Fire Station in partnership with One Tree Per Child and a local primary school. 7 further spaces are currently in development at AF&RS sites

10. Planned measures: 2020/21

Alongside the Environmental Strategy (2020-2030) currently under development, we will be producing an Action Plan to be reviewed and updated annually. The strategy will also establish a suite of targets for all areas of environmental improvement and management. We will track and report on progress against targets quarterly, including overall progress towards our Net Zero Carbon target which is a corporate Key Performance Indicator, as well as reporting annually to the Service Leadership Team and Avon Fire Authority via the Performance Scrutiny & Review Committee.