

Annual Progress Report (APR)



2020 Air Quality Annual Progress Report (APR) for
South Ayrshire Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2021

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Executive Summary: Air Quality in Our Area

South Ayrshire Council (SAC) has carried out a review of air quality within South Ayrshire which fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the report follows technical guidance LAQM.TG (16), (Reference1), issued by the Scottish Government to assist Local authorities in their Review and Assessment of air quality.

The report forms our 2021 Progress Report (PR) and includes latest available data up to the end of 2020. It also considers the conclusions of the previous rounds of Review and Assessment and any changes that have occurred since then that would have an effect on local air quality.

The report sets out the results of air quality monitoring carried out by South Ayrshire Council and considers the potential impacts from a range of sources such as road traffic and other transport emissions, industrial processes, commercial and domestic fuel use and fugitive emission sources.

The Progress Report concluded that concentrations of the various air quality objectives are unlikely to be exceeded.

A detailed assessment is therefore not required for South Ayrshire Council.

The next annual progress report will be submitted to the Scottish Executive by the end of June, 2022.

Actions to Improve Air Quality

During 2020, due to the pandemic we were unable to carry out any idling enforcement patrols throughout the district. We had planned to carry these out in an attempt to reduce drivers allowing their vehicles to idle unnecessarily. We are intending to recommence these patrols late 2021 should the pandemic conditions permit us to do so.

In 2019 we delivered a number of talks to primary school children on air quality and the importance of using active forms of travel where possible. We were intending to repeat that in 2020 but again due to the pandemic were unable to do so though if we are able to do so these will recommence late 2021.

SAC has no AQMAs or action plans.

Local Priorities and Challenges

The majority of the air quality pollutants arising within SAC are as a result of road traffic. Therefore, in order to reduce the impact, we intend to carry out vehicle idling enforcement over the coming year. With the assistance of funding from the Scottish Government in 2016 we fitted our two real-time TEOM monitors with PM_{2.5} inlets in order to assess the levels of that pollutant within SAC. Results of monitoring for that

pollutant are now available. We have recently received funding from the Scottish Government to update our two TEOM FDMS monitors to FIDAS monitors. This work will hopefully be carried out during the summer of 2021 which will then permit us to accurately monitor PM_{2.5} and PM₁₀ levels simultaneously.

How to Get Involved

Our website has links to the two real time monitors results for PM_{2.5} and NO₂. This can be accessed as follows:

<http://www.south-ayrshire.gov.uk/environmentalhealth/publichealth/airqualitylive.aspx>

Members of the Public Can Assist to Improve Air Quality by:

- using active transport or public transport where possible instead of driving. If it is necessary to drive, consider changing to a low polluting vehicle or using an electric vehicle
- ensuring if you do drive that you don't leave your engine idling any longer than necessary. In addition to polluting the air and producing greenhouse gases you could be served with a fixed penalty notice and make sure your car is well maintained
- avoiding garden bonfires – instead recycle or utilise your brown refuse bin for garden waste
- reporting badly polluting buses or lorries as follows:
<https://www.gov.uk/report-smoky-vehicle>
- using electric powered lawn and garden equipment instead of petrol.

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1. Local Air Quality Management

This report provides an overview of air quality in South Ayrshire during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) summarises the work being undertaken by South Ayrshire to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m ³	Annual mean	31.12.2010
Particulate Matter (PM _{2.5})	10 µg/m ³	Annual mean	31.12.2020
Sulphur dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m ³	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m ³	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

South Ayrshire Council currently does not have any AQMAs.

2.2 Progress and Impact of Measures to address Air Quality in South Ayrshire

South Ayrshire Council has taken forward a number of measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are: the introduction of electric vehicles and charging points to the council fleet and the introduction of an active travel hub at Ayr railway station.

South Ayrshire Council expects the following measures to be completed over the course of the next reporting year: the feasibility of a car club within South Ayrshire.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1.	Active Travel Hub project	Alternatives to private vehicle use	in partnership with ARA, Sustrans, Community Transport and others this initiative has promoted modal shift in particular to walking and cycling,	ARA				In particular NOX and PM	Operational ongoing project		actively reducing air pollution. Potential reduction in private vehicle use so this project is seeking to actively reduce air pollution
2.	Introduction of a car club	Alternatives to private vehicle use	The feasibility of a car club in South Ayrshire. Initial results are very positive and demonstrate that moving to a car club would reduce air pollution as it shows that replacing both council grey fleet miles and / or residential miles with car club miles would mean more efficient cars in terms of pollution (as well as safety and emissions) would be travelling those miles.	Sustainability section, Neighbourhood Services				PM and NOX	Report commissioned into feasibility. Feedback very positive	2021	<p>Analysis suggests that introduction would lead to an overall reduction in miles and the possibility that some people would no longer run a car or second car, which would also be positive for air quality</p> <p>A further business plan into this proposal was commissioned in 2018/19 utilising funding available through the Active Travel Hub. It is hoped findings will be considered and taken forward in the year ahead.</p> <p>The business plan / further feasibility report has been drafted and is currently with KD for consideration</p> <p>This action area was paused during the COVID pandemic however is now being picked up by way of new actions in the proposed Fleet Strategy which is due before Leadership Panel for approval this month.</p>

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
3.	Bicycle Rental	Alternatives to private vehicle use	the aim of having a hub in place at Ayr Station by July 2016 which will rent out bikes, and provide information about all forms of active travel and alternatives to private car use	ARA				PM and NOX	Complete		<p>The hub has been facilitating the hire of the abellio bike and go bikes however there are some outstanding issues regarding arrangements around this going forward. It is unclear at present how this will unfold however it is anticipated that bikes will still be available to the public for hire going forward.</p> <p>The abellio bikes are no longer being rented via the hub as the hub were asked to pay for providing this service. Abellio still have a contractual requirement to provide this bike service from the station, so it is hoped they will do so in future. Alternative ways to make the hub fleet of bikes / bikes generally available to workplaces and the public at other locations are now being investigated and arrangements being made through the hub project.</p>

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Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4.	Green Champions	Alternatives to private vehicle use	Within the Council our Green Champions Network continues to promote active travel and the council's travel hierarchy. Active travel is also being promoted to our 9 secondary schools through the Provost's School Footprint Challenge and to our primary schools through our joint work with the Energy Agency to provide energy lessons and run the calendar competition	Sustainability section, Neighbourhood Services					ongoing	ongoing	Although the pandemic has hampered many of the positive interventions listed below there has also been some benefits in terms of reduced travel and use of more sustainable modes during the pandemic. It is now hoped that the green recovery which the council has committed to can build on these positive trends and leave the negative ones behind.
5.	Promotion of renewable Energy	Promoting low emission plants	The Energy Agency, who we work in partnership with, have been working with us on the promotion of renewable energy and energy efficiency..	Sustainability section, Neighbourhood Services					ongoing	ongoing	<p>This contributes to a move away from the burning of fossil fuels and any air quality detriment associated with this</p> <p>The Energy Agency is now installing micro hydro on the River Ayr which will contribute towards this action area. There is also a live aspiration to take forward a Council Energy Strategy which would also promote reduced energy demand and use, renewable energy and self sufficiency.</p>

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
6.	Vehicle fleet efficiency	Promoting low emission transport	Several electric vehicles are being procured for use by council staff. In addition a number of charging points are being installed throughout the district. We are now aiming to transition the small vehicle fleet to fully electric by 2025.	Fleet section, Neighbourhood Services	Vehicles will be phased in over the period up to 2025	Due to the drop in costs for EVs we are now not so reliant on grant funding and vehicles are now being financed through Departmental budgets in addition to grant funding.	Monthly mileage, no of trips per month and trips exceeding 100 miles recorded	PM NOX and CO2	As of 30 th April 2020 forty one vehicles have been put into service	Ongoing with the aim of having a fully electric small vehicle fleet by 2025.	New Fleet Policy at Leadership Panel May 2021 emphasising these targets and goals.
7.	Vehicle fleet efficiency	Promoting low emission plant	Electric bin lifting equipment where possible will be fitted to all RCVs. This results in the vehicle engine operating at lower revs (when lifting bins) which reduces fuel consumption, vehicle exhaust emissions and noise levels.	Fleet section, Neighbourhood Fleet section, Neighbourhood Services	All new RCVs will be procured with Electric Lifters where possible.	At present all RCVs on the Fleet have this equipment fitted.		PM10, NO2	Complete	Complete	Where possible Electric Bin Lift Equipment will continue to be specified for all RCVs.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8.	Vehicle fleet efficiency	Promoting low emission transport	Large Goods Vehicles (LGVs) over 3500kg GVW will also be fitted where possible with the latest technology to reduce fuel consumption and exhaust emissions. Certain vehicles will be fitted with in-cab heaters to stop the practice of vehicles idling in cold weather to defrost windows etc. This practice greatly increases fuel consumption and results in exhaust gases being emitted unnecessarily.	Fleet section, Neighbourhood Services	These items are now standard on any vehicle specification being prepared in this class.	Fully rolled out at present. Vehicle replacement ongoing.		PM10, NO2	On-going	Phased rollout	This fuel saving equipment is now standard requirement on all vehicle specifications in this class. And will continue to be fitted where possible.
9.	Vehicle fleet efficiency	Promoting low emission transport	HGV's will have engines which are all built to the latest European legal limits on exhaust gases (Euro 6) specification. Which will result in the vehicles emitting the lowest possible exhaust gases.	Fleet section, Neighbourhood Services	Latest emission standards only excepted for new vehicles procured.	Ongoing		PM10, NO2	Ongoing	Phased rollout	All new vehicles South Ayrshire Council procure will continue to be to the latest European exhaust emissions standards. Alternative fuel will also always be considered where possible.
10.	Vehicle fleet efficiency	Promoting low emission transport	Cars, minibuses, vans & pick-ups up to 3500GVW where possible will be fitted with speed limiters, rev limiters and stop/start technology to maximise fuel efficiency and reduce exhaust emissions. By 2025 it is hoped that all small fleet will be electric.	Fleet section, Neighbourhood Services	These items are now standard on any vehicle specification being prepared in this class.	Ongoing		PM10, NO2	Ongoing	Phased rollout	This fuel saving equipment is now standard requirement on all vehicle specifications in this class. And will continue to be fitted where possible. South Ayrshire Council now have 59 full EVs & 8 PHEVs on our Fleet.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
11.	Vehicle fleet efficiency	Promoting low emission transport	Departments be asked to use smaller vans to replace larger vans where practical and small vehicles will be transitioned to electric vehicles (EVs) between now and 2025. Although unfortunately at this time the infrastructure of charging points will restrict the number of EVs we can put into our fleet, however investment is being sought to address this with the aim of transitioning all small fleet to electric by 2025	Fleet section, Neighbourhood Services	As and when vehicles are due replaced	Ongoing		PM10, NO2	Ongoing	Phased rollout	Our Property Maintenance Service have recently added 12 EVs to their Fleet. These EVs have replaced diesel vans and cars. They have also committed to adding at least another 8 EVs in the latest Fleet replacement program which is ongoing at present.
12.	Vehicle fleet efficiency	Promoting low emission transport	Part of the Fleet Management Review is developing and putting in place a hierarchy of travel guidelines. This will advise our staff the most economical and environmental friendly way of travel mode. This should identify and reduce unnecessary journeys and again reduce the Councils carbon usage.	Fleet section, Neighbourhood Services	Policy now in place	Ongoing. Policy will be rolled out during 2019.		PM10, NO2	On-going	Phased rollout	
13.	Vehicle fleet efficiency	Promoting low emission transport	The vehicle tracking system has also help reduce our fuel usage by identify routes where vehicles were passing each other on journeys to jobs. In particular this applied to our Property Maintenance section. The system now allows the nearest vehicle to attend call-outs etc. The vehicle tracking system is being improved in 2020 which will further the benefits it can provide.	Fleet section, Neighbourhood Services	Ongoing	Ongoing		PM10, NO2	On-going	Phased rollout	Department to monitor and review journeys which overlap

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
14	Vehicle Idling Patrols	Promoting low emission transport	We received funding to repeat vehicle idling work which we carried out in 2019. Unfortunately, due to the pandemic we were unable to do this work but are hoping to resume late 2021 should pandemic controls permit. We did put out communications to social media reminding members of the public to switch off their engines when stationary for more than 5 minutes.	Environmental Health	Complete	ongoing	None	PM's and NO2	On-going	Ongoing	Well received by members of the public Main source of air pollution in SA is road traffic

2.3 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland’s legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at <https://www.gov.scot/Publications/2015/11/5671/17>. Progress by South Ayrshire against relevant actions within this strategy is demonstrated below.

2.3.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan. South Ayrshire Council is currently reviewing its corporate travel plan. Within it there will be a hierarchy for travelling starting off with “do I really need to travel at all” to walking, using public transport with driving as a last resort.

2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. South Ayrshire Council has an energy strategy which is included in Appendix F.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

South Ayrshire Council undertook automatic (continuous) monitoring at 2 sites during 2020. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at <http://www.scottishairquality.scot/>

Maps showing the location of the monitoring sites are provided in Figure 1 and Figure 2. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

South Ayrshire Council undertook non-automatic (passive) monitoring of NO₂ at 20 sites during 2020. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 3. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual pollutants

Appendices D, E and F display trends of monitoring and compare results with the air quality objective of 40µg/m³ for monitoring undertaken over the last 5 years

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B.

Figure 3 shows locations of NO₂ diffusion tubes.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

3.2.2 Particulate Matter (PM₁₀)

There were no exceedances of the air quality objectives for PM₁₀ within SAC for 2016. We ceased monitoring of this pollutant in 2016 and monitoring has not been carried out since then. Once our new Fidas monitors are installed later in 2021 we will have the capacity to monitor PM₁₀ and PM_{2.5} levels simultaneously and these will be reported in our 2022 Progress Report.

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the 5 years up to 2016 with the air quality objective of 18µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the 5 years up to 2016 with the air quality objective of 50µg/m³, not to be exceeded more than 7 times per year.

3.2.3 Particulate Matter (PM_{2.5})

Table A.7 in Appendix A compares the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years with the air quality objective of 10µg/m³.

Table A.7 in Appendix A compares the ratified and adjusted monitored PM_{2.5} annual mean concentrations for 2020 with the air quality objective of 10µg/m³.

There were no exceedances of the air quality objectives reported for PM_{2.5} in 2020 at either of our two continuously monitored sites.

3.2.4 Sulphur Dioxide (SO₂)

We did not monitor SO₂ concentrations during 2020 within SAC. We are not aware of any changes that have occurred in their status since submission of the previous report.

Previously, monitoring was by means of two eight port bubblers, one at Dundonald Activity Centre and the other at the Road Depot within Grangeston Industrial Estate Girvan. Analysis of the solution took place at Glasgow Scientific Services and no exceedances were reported.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

We did not undertake any monitoring for Carbon Monoxide, Lead or 1,3-Butadiene within SAC in 2020. We are not aware of any changes that have occurred in their status since submission of the previous report.

4. New Local Developments

We are not aware of any new local developments within SAC in 2020 that may affect air quality.

4.1 Road Traffic Sources

We are not aware of any new road traffic sources within SAC that have the potential to affect air quality.

4.2 Other Transport Sources

We are not aware of any new road traffic sources within SAC that have the potential to affect air quality.

4.3 Industrial Sources

We are not aware of any new industrial sources within SAC that has the potential to affect air quality.

4.4 Commercial and Domestic Sources

There are no new commercial or domestic sources we are aware of within SAC that would have the potential to affect air quality.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are no new developments we are aware of within SAC that would have the potential to produce a source of fugitive or uncontrolled particulate matter.

5. Planning Applications

There are no new planning applications in 2020 we are aware of within SAC that would have the potential to affect air quality.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

There were no exceedances of the air quality objectives identified within SAC during 2020.

6.2 Conclusions relating to New Local Developments

There were no local developments during 2020 in SAC that required consideration.

6.3 Proposed Actions

There were no exceedances of the air quality objectives identified within SAC in 2020. Therefore, there is no need to progress to a detailed assessment nor is there any need to consider air quality management areas.

Our next Progress Report is due by the end of June 2022.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	High St Ayr	Roadside	337223	221162	NO ₂ ; PM _{2.5}	N	Chemiluminescent; FDMS	5	2	2.0
CM2	Taylor St (Harbour) Ayr	Roadside	233608	622750	NO ₂ ; PM _{2.5}	N	Chemiluminescent; FDMS	10	1	2.0

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT1	147 Whitlett's Rd Ayr	Roadside	234392	622366	NO ₂	N	20	1	N
DT2	Dundonald Rd Troon	Roadside	232588	631277	NO ₂	N	10	2	N
DT3	2 Portland St Troon	Roadside	232292	631235	NO ₂	N	10	2	N
DT4	2 Walker Rd Ayr	Roadside	234892	622730	NO ₂	N	5	1	N
DT5	3 The Cross, Prestwick	Roadside	235229	626228	NO ₂	N	5	2	N
DT6	141 Main St Prestwick	Roadside	235142	625816	NO ₂	N	2	2	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT7	Heathfield Rd/ P/wick Rd Ayr	Roadside	234641	624159	NO2	N	2	1	N
DT8	Station Taxi Rank, Smith St Ayr	Roadside	240194	624754	NO2	N	5	1	N
DT9	Morrison's Castlehill Rd Ayr	Roadside	234126	621201	NO2	N	5	2	N
DT10	39 Whitlett's Rd Ayr	Roadside	234605	622412	NO2	N	2	N/A	N
DT11	Tesco, Whitletts Rd Ayr	Roadside	235150	622528	NO2	N	10	2	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT12	King's St Ayr	Roadside	233830	622352	NO2	N	2	1	N
DT13	Town Buildings Ayr	Roadside	233691	622093	NO2	N	2	2	N
DT14	Pizza Hut, Liberator Dr Ayr	Roadside	236017	623568	NO2	N	10	2	N
DT15	6 Ayr Rd Prestwick	Roadside	234791	624856	NO2	N	10	2	N
DT16	Ayr Bus Station	Roadside	233576	621805	NO2	N	10	2	N
DT17	Rozelle Park Ayr	Urban Back-ground	233763	618944	NO2	N	10	N/A	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
DT18	Minishant Inn, A77	Roadside	232983	614277	NO2	N	10	1	N
DT19	133 Whitlett's Rd Ayr	Roadside	235099	622542	NO2	N	10	1	N
DT20	Roxy Bar Bridge St Girvan	Roadside	281549	598064	NO2	N	5	1	N

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2016	2017	2018	2019	2020
CM1	Roadside	Automatic	96	96	16	14	11	11	10
CM2	Roadside	Automatic	60	60	9	7	9	11	9
DT1	Roadside	Diffusion Tube	92	92	N/A	N/A	N/A	N/A	15
DT2	Roadside	Diffusion Tube	100	100	14	13	13	14	8
DT3	Roadside	Diffusion Tube	100	100	18	15	17	15	9
DT4	Roadside	Diffusion Tube	92	92	N/A	N/A	N/A	N/A	8
DT5	Roadside	Diffusion Tube	100	100	26	28	25	26	18
DT6	Roadside	Diffusion Tube	92	92	23	22	19	21	11
DT7	Roadside	Diffusion Tube	100	100	28	25	24	27	16
DT8	Roadside	Diffusion Tube	75	75	20	20	19	30	10
DT9	Roadside	Diffusion Tube	100	100	20	22	21	21	14
DT10	Roadside	Diffusion Tube	100	100	26	27	26	28	16

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2016	2017	2018	2019	2020
DT11	Roadside	Diffusion Tube	83	83	24	26	23	31	12
DT12	Roadside	Diffusion Tube	100	100	30	31	27	30	16
DT13	Roadside	Diffusion Tube	100	100	31	23	26	30	18
DT14	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	20	11
DT15	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	13	7
DT16	Roadside	Diffusion Tube	75	75	16	29	23	22	16
DT17	Urban Background	Diffusion Tube	75	75	4	4	4	4	4
DT18	Roadside	Diffusion Tube	100	100	21	20	15	16	11
DT19	Roadside	Diffusion Tube	83	83	N/A	N/A	N/A	23	13
DT20	Roadside	Diffusion Tube	100	100	26	32	24	23	14

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2016	2017	2018	2019	2020
CM1	Roadside	Automatic	96	96	0	0(70)	0 (746)	0 (57)	0
CM2	Roadside	Automatic	60	60	0	0	0	0	0 (54)

Notes: Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2016	2017	2018	2019	2020
CM1	Roadside	Not Monitored	Not Monitored	12	Not Monitored	Not Monitored	Not Monitored	Not Monitored
CM2	Roadside	Not Monitored	Not Monitored	13	Not Monitored	Not Monitored	Not Monitored	Not Monitored

Notes: Exceedances of the PM₁₀ annual mean objective of 18µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2016	2017	2018	2019	2020
CM1	Roadside	Not Monitored	Not Monitored	0 (16)	Not Monitored	Not Monitored	Not Monitored	Not Monitored
CM2	Roadside	Not Monitored	Not Monitored	0 (24)	Not Monitored	Not Monitored	Not Monitored	Not Monitored

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 7 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets.

Table A.7 – Annual Mean PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2016	2017	2018	2019	2020
CM1	Roadside	74	74	6	(8)	(7)	6	(4)
CM2	Roadside	79	79	5	(10)	8	7	6

Notes: Exceedances of the PM₁₀ annual mean objective of 10µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix G for details.

N.B. Monitoring was changed from PM₁₀ to PM_{2.5} in late September 2016 and it is still too early to see the emergence of any clear trend however it is pleasing to see the levels reduce from 2017 to 2020

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2020

Site ID	NO ₂ Mean Concentrations (µg/m³) (Bias Correction 0.96)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
DT1	25.1		6.1	6.1	30.2	14	4.5	15	20.7	6.6	14.4	31.4	15.83	15
DT2	13.8	10.1	1.3	1.3	6.4	7.0	7.4	6.0	4.6	10.6	7.8	19.4	7.98	8
DT3	13.7	12.8	0.5	0.5	5.9	11.8	2.4	10.7	14.5	12.2	6.8	20.9	9.39	9
DT4	9.6	12.3	3.4	3.4	6.1	5.6	4.2	7.4	10.0		7.8	19.8	8.15	8
DT5	33.4	25.6	8.5	8.5	13.8	14.1	6.3	12.7	26.1	27.9	9.1	37.2	18.60	18
DT6		18.4	5.7	5.7	7.8	12.4	4.9	10.6	15.2	9.0	8.1	26.7	11.32	11
DT7	25.6	26.4	2.8	2.8	6.4	19.5	11.4	14.9	24.7	15.4	19.1	25.3	16.19	16
DT8	12.7	15.3				9.4	3.1	10.1	15.2	6.8	10.7	10.0	10.41	10
DT9	21.8	19.5	10.6	10.6	11	14.2	3.4	12.3	19.3	9.7	13.1	26.2	14.31	14
DT10	21.9	25.4	8.4	8.4	7.9	17.2	8.7	13.0	27.6	14.8	12.7	36.2	16.85	16
DT11	14.5	19.4			13.3	12.4	8.8	13.2	18.6	16.1	11.7	1.4	12.94	12
DT12	31.2	31.9	8.3	8.3	9.2	18.3	8.8	25	28.4	16.8	17.8	2.1	17.18	16
DT13	30.1	25.8	0.6	0.6	11.4	17.2	6.8	33.1	23.1	29.5	18	31.1	18.94	18
DT14	18.3	16.9	0.5	0.5	8.2	14.3	6.0	8.0	13.6	13.9	16.6	15.0	10.98	11

Site ID	NO ₂ Mean Concentrations (µg/m ³) (Bias Correction 0.96)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
DT15	12.6	11.4	0.5	0.5	5.4	9.1	2.4	4.7	5.4	14.5	13.3	13.3	7.76	7
DT16	25.5	23				11.5	8.9	10.4	18.2	19	11.3	23.9	16.86	16
DT17	3	4.4				7.3	2	2	1.9	2.3	1.8	10.5	3.91	4
DT18	16.3	16.2	5.2	5.2	6.2	11.9	11.3	9.6	7.7	8.8	12.1	27.5	11.50	11
DT19	23.1	23.9	7.6	7.6	5.3		6.3	13.4	21.2	23.1	17.8		13.57	13
DT20	18.4	18.7	7.7	7.7	12.3	20.7	11.2	14.5	22.8	21.8	14.9	1.4	14.34	14

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Diffusion tubes are supplied and analysed by Glasgow Scientific Services which is operated by Glasgow City Council. The diffusion tube bias adjustment value of 0.96 was obtained from the LAQM Support website at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html> and was applied to all diffusion tubes.

GSS Scored the following results for 2020 in the laboratory summary performance for AIR NO₂ PT: Jan/Feb 100%, May/June and July/August have no results as round was cancelled due to pandemic. Sept/Oct 100%.

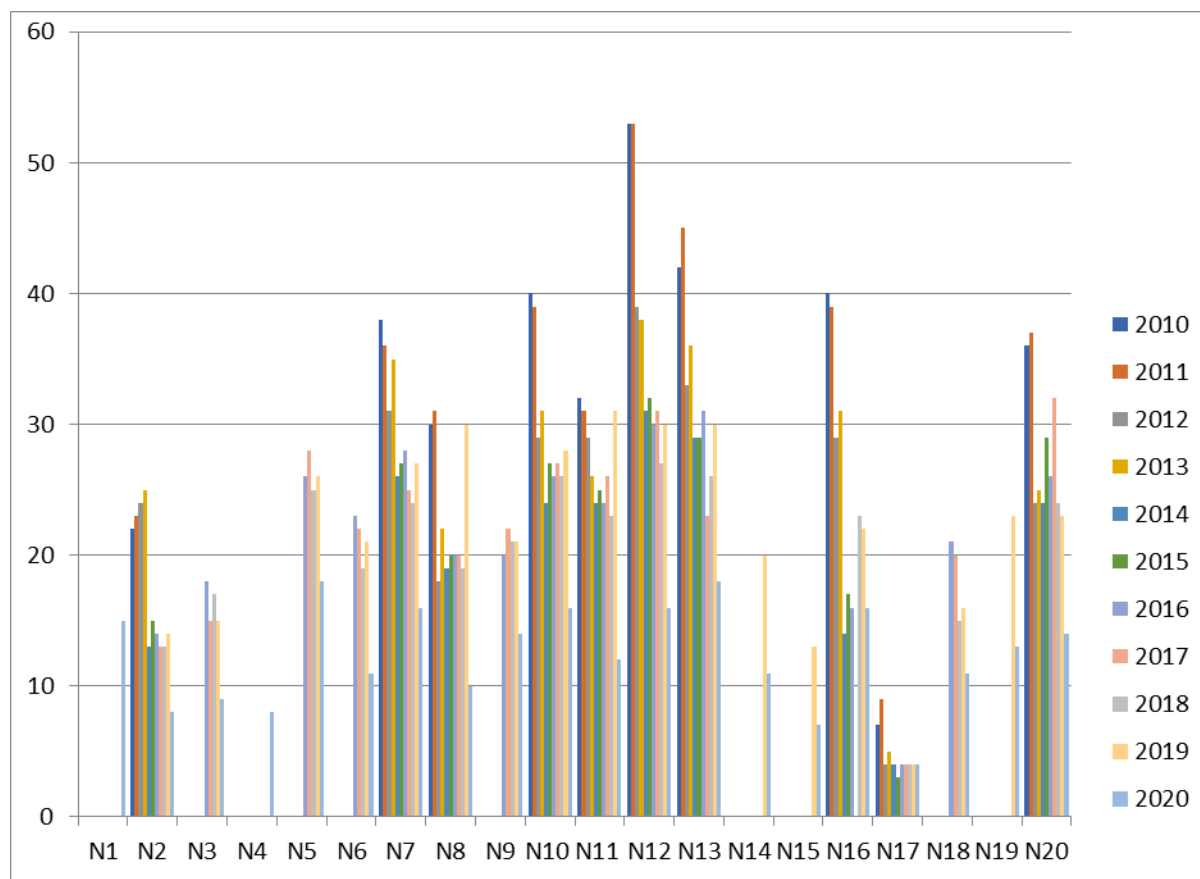
PM_{2.5} Monitoring Adjustment

No correction is required as both monitors are equipped with FDMS.

QA/QC of automatic monitoring

Both sites are part of the Scottish Air Quality Programme and are audited twice per year by Ricardo-AEA. All data is ratified and scaled by Ricardo before being finalised. Servicing and repair are carried out by Acoem UK.

Appendix D: Trend of Non- Automatic NO₂ Results 2010 – 2020

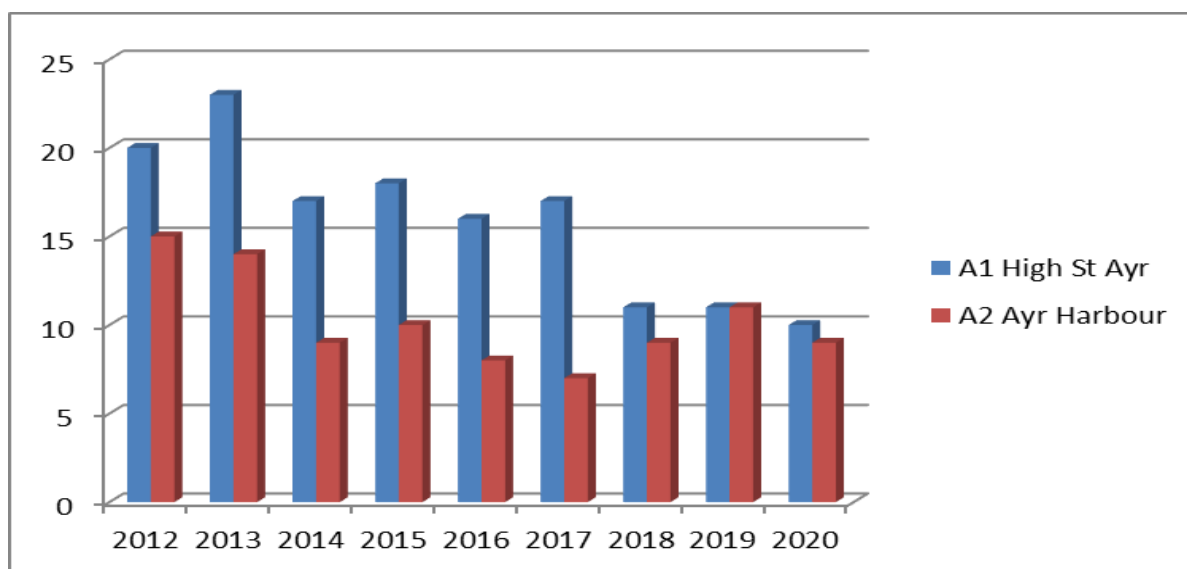


Levels of NO₂ are measured as an annual average and displayed in µg/m³ of air.

In general, there is a gradual downward trend in the NO₂ diffusion tube results but 2020 showed a large decrease at all sites. This is due to the greatly reduced volume of road traffic during the pandemic lockdown restrictions.

Not all records are displayed in the graph as the location of a number of the lower recording sites have been changed over the ten- year period.

Appendix E: Trend of Automatic NO₂ Results 2012 – 2020

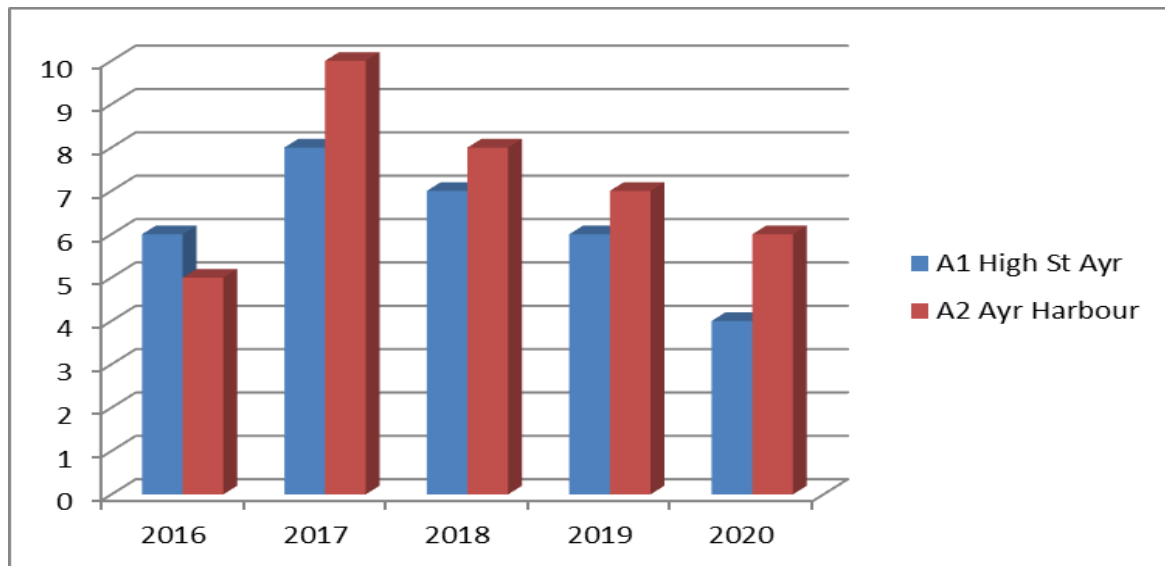


Levels of NO₂ are measured as an annual average and displayed in µg/m³ of air.

Monitoring commenced in 2012 at Ayr Harbour (Taylor Street Ayr). This was as a result of complaints from the residents of dust from the adjacent scrap yard. The scrap yard then closed in 2016

High Street showed an increase from 2012 to 2013 then a gradual reduction to 11 µg of NO₂ per m³ of air in 2018 which was repeated in 2019. 2020 saw a further reduction to only 10 µg of NO₂ per m³ of air. Ayr Harbour (Taylor Street) showed an initial drop from 2012 to 2014 but was hovering around the 10 or 11 µg NO₂ per m³ of air up to the end of 2019. 2020 saw a drop to 9µg of NO₂ per m³ of air. The pandemic lockdown was probably responsible for these low values seen in 2020 but future levels will see if that trend continues. All results since monitoring commenced in 2012 are well within the limit of 40 µg/m³ of air.

Appendix F: Trend of Automatic PM_{2.5} Results 2016 – 2020



Levels of PM_{2.5} are measured as an annual average and displayed in µg/m³ of air.

We commenced monitoring PM_{2.5} levels at our two real time monitoring stations in 2016. Levels increased slightly in 2017 and then reduced in 2018 and 2019. The lowest results were obtained in 2020. In all likelihood this was as a result of the pandemic lockdown but monitoring in future years will verify this. All levels were below the annual permitted level of 10 µg/m³ of air.

Appendix G: South Ayrshire Council Energy Strategy

SOUTH AYRSHIRE COUNCIL

ENERGY STRATEGY

August 2009

EXECUTIVE SUMMARY

South Ayrshire Council produces more than 25,000 tonnes of carbon dioxide as a result of its energy consumption in its buildings and outside lighting. The Council is committed to reducing these emissions and has signed up to Scotland's Climate Change Declaration, which commits the authority to a series of actions to both mitigate the effects of climate change and adapt to its consequences. The Council has developed a carbon management strategy and implementation plan covering the range of carbon emissions we have influence over. Good practice in energy management in buildings is key to reducing our carbon emissions and as such merits a strategy on its own.

Regulatory measures such as the Carbon Reduction Commitment and the Energy Performance of Buildings Directive are imposing additional pressures the authority to improve energy efficiency. The strategy has within it the following key elements:

Roles and Responsibilities – This covers the active senior management commitment, the specialist energy management group functions, the general responsibilities of all services and also highlighting some of the key services that have a major role to play in implementing best energy management practice.

Monitoring and Reporting – Effective management requires an understanding of energy performance which in turn requires the availability of good data which must be stored in a system that allows the production of suitable progress reports.

Investment Strategy – It is proposed the implementation of energy efficiency projects is prioritised by the amount of carbon saved over the life of the measure per £ invested.

Procurement – The procurement of energy, procurement of energy related services (e.g. PPP schools), energy consuming equipment and procurement of buildings (both new and refurbishment).

Development and Training – Energy specialists, non-energy specialists with specific energy management responsibilities (e.g. building managers, caretakers etc.) and general training for all staff. The fundamental premise of the strategy is that energy management is not simply something that the Energy and Resources Group does but it concerns the behaviour of the whole organisation. This is similar to people management or health and safety management – they are core to all parts of the organisation.

CONTENTS

1. Introduction
2. Energy Policy
3. Roles and Responsibilities
4. Monitoring and Reporting
5. Investment Strategy
6. Procurement
7. Development and Training
8. Maintenance
9. Building Energy Management Systems (BEMS) and Controls
10. Metering
11. Contacts and further information

South Ayrshire Council's estimated energy and water bill for 2008/09 will be over £5 million and we will emit over 25,000 tonnes of carbon dioxide (CO₂) as a consequence. Local authorities have a key role to play in achieving sustainable energy use in Scotland and in reducing CO₂ emissions both from their own activities and those of the communities they serve. The Scottish Government has proposed mandatory long-term target to reduce the country's greenhouse gas emissions by 80 Percent by 2050. Given that buildings account for around 50% of carbon emissions and that around two-thirds of existing buildings will still be in use in 2050, a significant challenge for South Ayrshire Council will be to substantially improve the energy performance of existing stock as well as ensuring that new buildings meet the highest standards. At the same time, regulatory measures such as the Energy Performance of Buildings Directive (EPBD) and the proposed Carbon Reduction Commitment (CRC) will impose additional pressures to improve energy efficiency.

All 32 of Scotland's local authorities are signatories to Scotland's Climate Change Declaration (SCCD), which commits each authority to a series of actions intended to both mitigate the effects of climate change and adapt to its consequences (see box).

Scotland's Climate Change Declaration

Amongst the key points to which Scottish Local Authorities have committed are to:

Produce and publicly declare a plan, with targets and time-scales, to achieve a significant reduction in greenhouse gas emissions from our own operations. Ensure that greenhouse gas reduction and climate change adaptation measures are clearly incorporated into our new and existing strategies, plans and programmes.

Publish an annual statement on the monitoring and progress of our climate change response, detailing targets set, actions taken, outcomes achieved and further actions required.

Collaborate with other organisations to promote good practice on climate change mitigation and adaptation.

Furthermore, the Local Government in Scotland Act 2003 places a duty on local authorities to secure Best Value. This requires all local authorities to continuously improve their performance, secure services of the highest quality at a cost that is acceptable to their local communities, and to discharge their Best Value duties in a way that contributes to the achievement of Sustainable Development.

Best Value and Sustainable Development:

For further information go to:

<http://www.sustainable-scotland.net/bestvalue/index.asp?pg=1>

South Ayrshire Council agreed its Carbon Management Strategy and Implementation Plan in April 2008. It is a systematic approach to address carbon emissions across the activities of energy use in buildings, street and road lighting, fleet and travel on business and for commuting and waste sent to landfill. It uses a strategic approach to embed carbon related issues at a senior level within the authority. It should enable operational and investment decisions to take carbon reduction opportunities into account. Within South Ayrshire Council energy use in council buildings accounts for over one third of carbon emissions. Hence within the Carbon Management approach energy management has a key role in delivery of carbon savings and merits particular attention through a specific energy policy and energy strategy that will complement the wider policies and strategies that address Carbon Management.

Within the context of this document, the term Energy Management refers to the management of energy use in council buildings, but excludes energy efficiency in housing, which is the subject of other policies and strategies. In practice the energy management function incorporates water, and so in this document Energy Management can be read to include management and efficiency of water use.

2 ENERGY POLICY

South Ayrshire Council Energy Management Policy

Statement of commitment by the Corporate Management Team:

The use of energy is vital in our operations and the provision of services to our community.

Rapidly rising energy costs and concerns over climate change mean that the importance of controlling our energy consumption and associated carbon dioxide emissions has never been so high.

The Scottish Government has proposed mandatory long-term target to reduce the country's greenhouse gas emissions by 80 per cent by 2050. As a signatory to the Scottish Climate Change Declaration the Council has demonstrated its commitment to playing its part in mitigating the effects of climate change. Effective energy management is a key part of this commitment and the Corporate Management Team will ensure that:

energy management is fully integrated across all relevant decision making.
sufficient resources are in place to meet the objectives of this policy.
the training and development needs of energy management staff are met and that energy awareness of all staff is raised and maintained.
this policy document is made public and that progress against its objectives is openly reported on an annual basis.

Scope and objectives

This policy applies to all energy use within Council owned or operated buildings. The specific objectives of our policy are to:

reduce the Council's carbon emissions from buildings by 22% over the period 2006 to 2013.
reduce the Council's carbon emissions from travel by 10% over the period 2006 to 2013.
reduce the Council's carbon emissions from street lighting by 12% over the period 2006 to 2013.
ensure that we optimise the Council's position in respect of the Carbon Reduction commitment through appropriate early actions and high-quality data collection.
gain accreditation to the Carbon Trust Standard by 2011.

Achieving our objectives

Key to achieving our policy objectives is the development of an Energy Strategy and Associated formal systems. The Energy Strategy sets out the means and processes by which our declared policy objectives will be met and be a regularly reviewed 'living' document.

Policy review

This policy will be reviewed at least every 12 months by the Energy and Resources Group Leader and be revised as directed by the Corporate Management Team.

Approved by Date

Formal responsibilities for energy management do not reside exclusively with the Energy and Resources Group within the Sustainable Development team of Customer and Community Services. Every member of staff has a duty to be aware of where energy is being used and where there is scope for reducing it through their own actions or with the support of management or the Energy and Resources Group. Management, at all levels, has the responsibility of creating a culture of energy efficient behaviour as well as ensuring there are adequate resources available to meet the desired outcomes of the strategy.

The Chief Executive

The Chief Executive is ultimately accountable for the implementation of the energy policy, energy strategy and other public commitments made by the Council. The Chief Executive therefore has overall responsibility for ensuring that energy management is given the appropriate level of priority within the Council in order that energy policy objectives and commitments can be met.

In addition, the Chief Executive will:

- Provide active and visible support for the implementation of the policy and strategy.
- Ensure that they regularly receive and review appropriate energy performance reports.
- Proactively communicate with elected members on energy performance matters.

The Corporate Management Team (CMT)

All members of the CMT have adopted the carbon reduction targets set in the energy policy for their own directorates and are committed to support the necessary actions to achieve them. Each directorate has at least one nominated member on the Carbon Management Working Group.

Within the CMT the Executive Director for Development and Environment has lead responsibility for the delivery, review and development of the energy strategy. They provide feedback, strategic advice and guidance to the Energy and Resources Group.

Energy and Resources Group (ERG)

The ERG is the core group of staff responsible for the day to day delivery of the energy policy's objectives through the development and implementation of the strategy across the council. The ERG as a whole should encompass the following functions:

- Ongoing monitoring and reporting on energy use, energy cost and related carbon emissions through the use of appropriate energy metering, monitoring and analysis tools and systems.
- Using the same systems, benchmarking of building performance and the identification of exceptions in performance and the instigation of appropriate corrective actions.
- The management of energy supply contracts and connection agreements, in the context of centralised procurement of energy.

Validation of suppliers' bills.

- Provision of energy management services, support, training and advice to individual services.
- Identification of opportunities for reducing energy consumption and for using alternative lower carbon sources of energy.
- Maintaining a list of energy saving investment opportunities.

The driving forward of identified opportunities to implementation.

- Keeping abreast of and managing relevant regulatory or government policy requirements.
- Identification of sources of external funding for energy efficiency investment and support, and ensuring that the Council takes full advantage of such sources as appropriate.
- Specification of energy efficient features in maintenance operations, plant replacements, building refurbishments and in new builds.
- Ongoing liaison as required with other departments in furtherance of the objectives of the energy policy and implementation of the energy strategy.
- Keeping abreast of technical developments that may offer new opportunities for energy/carbon saving.
- Deliver the authority's energy awareness activity – including staff training, web site, Wire and publications.
- Develop the Site Energy Responsible Officer programme.
- Operate an Energy Help Desk.
- To operate the authority's Building Energy Management Systems (BEMS) ensuring that end users requirements are met at lowest energy use/cost.

Although energy procurement is now being carried out by Procurement Scotland the council still needs to provide data for the procurement process and needs to manage the resulting supply contracts and connection agreements. Although these functions should be secondary with respect to energy management they can be very time consuming and significantly distract effort away from the primary energy management functions of reducing energy demand. This is particularly true when transferring supplies at the end of one contract and the start of a new contract and also when suppliers change their billing or data provision systems.

The important thing is that staff within ERG have sufficient time, expertise and resource to discharge their energy management responsibilities effectively which, given the current staffing level of 3 FTE is not possible across the full range of responsibilities listed above.

All Services

Responsibilities for energy management do not reside exclusively with the energy management team. Like safety, energy management is everyone's responsibility. Each of the Council's Services has responsibility to:

- Recognise their role as energy consumers and accept responsibility for their energy performance.
- Manage energy consumption through good housekeeping and investment.
- Make a departmental commitment to energy efficiency.
- Designate energy responsibility to key personnel with one person identified as the responsible officer for each operational property.

- Promote energy efficiency through their core activity.
- Work proactively with the energy management team, in particular:
- Ensure departmental project teams engage fully regarding proposed projects.
- work with the energy management team to provide relevant information as requested.
- Seek advice from the energy management team.

Asset Management/Property

A definition of Asset Management is “the optimum way of managing (physical) assets to achieve a desired and sustainable outcome” (PAS 551). As such, Asset Management encompasses Facilities, Estates, Maintenance, and Capital Works must:

- Take full account of the opportunities for energy savings that arise out of the rationalisation of the estate or of individual buildings.
- Seek to go beyond legal requirements when designing new buildings, or refurbishing existing buildings.
- Ensure that energy efficiency options are fully appraised on the basis of whole life cycle costing.
- Review options for low carbon/renewable/sustainable energy supplies.
- Provide practical support to building users to enable them to be energy efficient.
- Opportunistically improve existing assets to improve their energy performance.
- Keep informed of developments in energy efficiency.
Ensure energy efficiency as a part of all relevant maintenance schedules/procedures.
- Ensure all direct and indirect staff have a relevant competence in energy efficiency.

Finance

supporting energy management by the provision of timely relevant financial information.

- Identifying where energy management input is required in decision making.
- Involving the energy management team in the development of budgets.
- Providing clear guidance, assistance and support on funding mechanisms.
- Establishing and developing a ring fenced energy investment fund.
- Encouraging the use of life cycle costing.

Procurement

- Ensuring energy efficiency is used as procurement criteria where relevant.
- In partnership with the energy management team establishing appropriate procurement/purchasing guidelines and policies that „integrate” energy into the procurement process.
- Encouraging suppliers to offer energy efficient alternatives/options where available
- Including energy criteria/performance in service contracts.
- Encouraging energy efficiency in the supply chain: i.e. favouring suppliers that are active themselves in improving their overall energy efficiency.

IT Department

- Considering and responding to the energy demand implications of IT decisions.
- Specifying low energy rated equipment – e.g. Energy Star.
- Publicly Available Standard (PAS) 55, Asset management. *Specification for the optimised management of physical infrastructure assets*. Developed by the Institute of Asset Management and BSI - <http://www.bsi-global.com/en/Shop/Publication-Detail/?pid=000000000030077936>
- Ensuring energy saving features of equipment are understood, enabled and used.
- Supporting specialist IT applications for energy management.
- Involving the energy management team in all projects to ensure energy issues are fully addressed.

Human Resources

- Providing energy awareness as part of induction training for all new staff.
 - Support the energy management team in awareness raising campaigns.
 - Developing job specifications for the posts in the energy management team.
 - Training needs identification.
 - Recruiting, training and retaining sufficient staff with appropriate skills to deliver the energy policy and strategy.
 - Managing energy training and development as part of individual's overall development.
 - Succession planning for key energy posts.
- Including energy performance criteria in job descriptions where relevant.

Janitors/Caretakers/Cleaners/Council Officers

- Being energy aware in their working.
- Reporting issues, failures, incidents that may lead to energy waste.
- Policing shut down procedures.
- Looking for obvious energy waste and reporting it.

Economic development, planning & building control

- Promoting energy efficiency, low carbon energy, sustainable energy where possible through means of regulation, advice and support.
- Showcasing authority achievements.

Effective energy management requires formal systems to be in place for the reporting of progress and performance to a number of stakeholders:

The Corporate Management Team receives quarterly reports on progress in implementing the energy strategy and meeting policy objectives.

The Carbon Management Working Group that meets quarterly will receive reports for monitoring progress. Heads of Service will receive reports regarding the energy performance of their departments and progress on specific initiatives. All staff should be informed about the council's progress and performance.

Reports for external bodies such as the Scottish Government and Audit Scotland Reports for inclusion in external communications such as the Council calendar and Update publication.

These reports are largely be produced by the Energy and Resources Group. As well as providing the mechanism for the ongoing review of progress against the strategy and policy objectives, they also help to maintain ownership of, and engagement with, the recipients of the reports.

The understanding of energy performance and its effective reporting relies on the availability of good data. This requires an effective energy monitoring and targeting system that allows the easy production of suitable reports. Until now the reports have relied on data extracted from suppliers' bills which is inadequate for energy management purposes due to billing errors, estimated reads and the time lag in becoming available. Automatic metering (AMR) systems have developed significantly in recent years and are becoming more and more cost effective where consumption data can be downloaded the following day. The Council has recognised the importance of this good quality timeous data and is investing in the deployment of AMR. One of the "early action" criteria in the proposed Carbon Reduction Commitment, which can help organisations gain an advantageous position in the CRC league table, is the deployment of AMR. Irrespective of AMR, the CRC will put fairly stringent data collection and reporting requirements on local authorities, which need to be addressed. Accurate energy data provision from local authorities is also critical to the success of national procurement of energy in Scotland.

The Council has invested in energy management software to allow automatic monitoring and the production of reports on energy consumption and carbon emissions from an individual property level up to a Service, Directorate or Corporate level. Reports are available to staff over the internet at www.systemslink.com/webreports. Access is arranged through the ERG and can be requested by e-mailing carbonsaving@south-ayrshire.gov.uk. An annual Carbon Management report covering emissions from energy use in buildings, street lighting, travel and waste is publicly available on the Council's website.

The Council has a rolling Central Energy Efficiency Fund of £325,000 for investment in measures with less than a five year payback. Any investment from the fund is paid back out of the annual energy savings until the sum is repaid. This fund was established through funding from the Scottish Government.

Larger projects or those with a payback of longer than five years are generally funded through the Council's capital programme. The Scottish Government recommends under Best Value that whole life cycle costs, including any revenue savings or additional costs, are taken into account when comparing competing demands on capital. It is also recommended that consideration be given to a Council policy incorporating the cost of carbon in investment appraisal once the impending CRC comes into force from 2010.

Competing demands for energy efficiency projects should be ranked according to the

cost per tonne of CO2 saved over the life of the measure.

There are three main aspects of procurement that are relevant to energy management:

Procurement of energy

Procurement of energy related services (e.g.PPPs) and energy consuming equipment Procurement of building design and construction services.

Energy

As a result of the McClelland report energy procurement for the whole of the public sector in Scotland has been centralised. South Ayrshire Council has just signed an agency agreement for Procurement Scotland to procure electricity on our behalf at the end of our current contract from 1st April 2010. It is intended that they will also procure gas on our behalf from this date. It is still the responsibility of the ERG to maintain an accurate database of all the Council's energy supplies across all its operational properties for an effective procurement process and the subsequent management of these contracts during a transfer of supplier, new connections and disconnections and the validation of bills.

Services and Equipment

The energy performance of services and equipment must be taken into account when procurement decisions are made. All staff involved in procurement should be made aware of this requirement and that they can consult with the ERG over purchasing decisions

The Council has a low energy lighting policy of not using standard tungsten bulbs and not installing low frequency fluorescent light fittings. Any lighting procurement should be carried out in consultation with the electrical technician within Property and Neighbourhood Services

Whenever a boiler or heating system is renewed then the feasibility of wood-fuel must be considered.

IT equipment should be selected using energy consumption as a key consideration and any low energy features should be enabled

A print strategy is being developed to reduce the large number of inkjet printers installed and increase the use of multi-functional devices.

It is recommended that the Energy and Resources Group Leader has a formal role in the procurement decision making process for strategic items with sign off requiring the procurement is consistent with the objectives of the Council's energy policy.

Procurement of Buildings

General

The procurement of buildings refers to not only new build projects but refurbishment projects where there is investment in the existing building stock. Please refer to the latest Sustainable Design and Construction guidance (see section 12).

For new build projects the feasibility of achieving an Excellent rating on the Building Research Establishment Environmental Assessment Method (BREEAM) for new build should be carried out with the aim of achieving this standard. The rating should be certified by an independent BREEAM assessor. For major refurbishment or new build projects (e.g. over £250,000 budget) the design team should develop a Sustainability Action Plan in partnership with colleagues from South Ayrshire Council's Sustainable Development section and others which should be reviewed on a regular basis (e.g. monthly meetings) throughout the design and construction phases.

The whole life impact costing of materials and systems should be taken into account. Consider the design for future changes in the building function.

Design & Layout

Ensure that the design / layout takes cognisance of anticipated climate change impacts e.g. flooding, increased stormy rainfall and that consideration is made with regard to the topography of the site with respect to meteorological effects and energy consumption.

Where possible ensure new development utilises a brownfield site.

Give consideration for the development to incorporate Design for Deconstruction and Secured by Design features.

Give consideration to the incorporation of a green roof in the development – may not only assist in relation to setting this build into the landscape but will assist in water management, biodiversity and insulation of the build.

Waste

A waste management plan should be developed to minimise the quantities of waste and maximise the amount of waste that is recycled. Provide a monthly report on the quantities of waste produced and amounts recycled for major projects.

Ensure that the design has factored in external space for accommodating facilities for recycling i.e. segregated waste collection, taking into account H&S and insurance requirements.

If the development requires any demolition on site that as much as possible is recycled on site and where this is not possible that demolition waste is recycled as far as possible therefore limiting waste to landfill.

That the internal design considers how segregated waste is dealt with internally e.g. space for bins in class rooms; school office; kitchen Materials

Ensure timber is from sustainable and legal sources from a Forest Stewardship Council (FSC) source. Aim for 100% certification for all timber (including hording) and where possible for finished timber products (e.g. furniture).

A minimum of 20% of the total value of materials used is to be derived from recycled and reused content in the products and materials selected. In addition identify the top 10 quick win opportunities (for further information see WRAP) to increase the value of the materials derived from recycled and reused content.

Design to use locally (Ayrshire/Scottish) sourced materials and services wherever reasonably practicable within the financial parameters set.

Energy

Evaluate the future energy and water costs and carbon emissions for the building and aim to minimise these costs through low carbon design principles.

In line with the requirements of Scottish Planning Policy 6 (SPP6) at least 15% reduction in CO₂ emissions beyond the 2007 building regulations CO₂ emissions standard must be met through on-site low or zero carbon equipment for developments over 500m² floor area.

Comfort standards – overheating to be limited to 28°C for a maximum of 10 occasions per annum. CO₂ levels are not to exceed 1500 ppm at peak and 1000ppm average on peak days.

All proposed new and replacement heating systems must establish the feasibility of a wood-fuel boiler as the lead boiler (in line with the agreed Council policy). If another fuel source is used then the reasons for this must be documented.

If gas or oil systems are to be installed then condensing boilers must be used.

See section 9 for the control of heating and hot water systems.

Automated meter reading (AMR) meters should be installed as the main utility meters for electricity and gas. Contact the Energy and Resources group for the procedure for installing any new meters or removing existing ones.

Maximise the use of natural daylight / passive solar gain

Maximise the use of natural ventilation and cooling systems

Water

Low water consuming appliances should be considered including waterless urinals, spray percussion taps, low water content dual flush toilets, percussion showers, presence detection flush control for urinals and feasibility of grey water and rainwater recycling.

Reduce discharge to natural water courses or sewers through Sustainable Urban Drainage (SUDS) principles.

Prioritise walking, access to public transport and cycling. Provide on-site showers and lockers for cyclists. Provide secure storage for cycles.

There are three categories of staff to consider in the context of energy management training and development:

Energy specialists – i.e. those within the Energy and Resources Group

Non-energy specialists with specific energy management responsibilities.

All other staff

Energy specialists

Increasing energy costs and pressures on organisation to respond to climate change are leading to greater general demand for energy management skills and consequently difficulties in retaining experienced staff. The stability and available skills of energy management teams are key to ensuring that local authorities are able to meet their energy policy objectives.

Staff skills, development and rewards are therefore important factors. Staff grading should properly recognise the qualifications, skills and experience of individuals if stable and effective teams are to be maintained. There should be properly structured and resourced professional development opportunities for energy management staff, including:

- Access to relevant external courses and related qualifications.

- In house training and on the job development.
- Membership of professional bodies and networks.
- The training up of suitable but inexperienced staff as an alternative to recruitment.

Non-energy specialists

Those with specific energy related responsibilities, such as the identified responsible officer for energy for each council property, are likely to require a certain amount of on the job training to ensure that the context and reasons for their energy management duties are appreciated and that they have the knowledge to discharge those duties. This sector also includes janitors and cleaners. There is overlap here with any ongoing general energy awareness and engagement programme (see Other staff below), but specific training will also be important.

Other staff

The behaviour of all staff and users of buildings has an impact on energy performance. An ongoing awareness and engagement programme is in place. All new staff receive training from the ERG covering:

- The environment and climate change
- South Ayrshire Council's targets, commitments and potential for reducing costs
- How individuals can make a difference and what actions they can take.

This is backed up by a section in the employees handbook and available to all staff on the Wire. The Wire section gives clear information on:

- What individuals can do (and should not do) and why.
- Mechanisms for staff to input ideas and comments
- Mechanisms for staff to become more actively involved.

When reactive maintenance is required on building fabric and services then the energy efficiency of the building should be maintained or, preferably, enhanced. For example:

- Controls - if a lighting or heating controller fails then it must be replaced with an equivalent or better controller and not simply bypassed/removed.
- Heating systems - If valves or pumps on LPHW systems are being replaced the connecting pipework and the valves should be insulated. Any short sections of uninsulated pipework identified should be insulated at the same time.
- Lighting – If fluorescent lighting is to be replaced then high frequency fluorescent fittings must be installed (this is a Council agreed policy)
- Loft insulation – If any works require the moving or removal of loft insulation (e.g. plumbing or electrical works) then the loft insulation must be replaced up to a depth of 250mm minimum.

Any new heating controls should be included in the annual planned maintenance arrangements. Heating control systems should have an annual service visit and the time and temperature settings checked against the previously agreed settings for each system. Systems that are not maintained run the risk of heating for longer hours and/or higher temperatures which increases costs and carbon emissions. The systems that control the flushing of urinals should have an annual service to

check they are still operational and any problems fixed at the time. The installed cost of one urinal flush controller is generally repaid within 6 months or less. The savings from maintaining these devices in reduced metered water supply and waste water charges far outweigh the cost of an annual service check and repair.

The Council operates a network of building energy management system (BEMS), connected via ethernet communications, to enable remote monitoring and control from Burns House or Newton House. There are currently 20 sites connected to this network with a combined heating and hot water bill of approximately £630,000.

There is currently no capacity within the ERG to regularly monitor the sites connected to the BEMS system and actively control them. It is often the case in organisations that once a BEMS system is installed and commissioned it is not then looked at until a noticeable fault develops. It is estimated that the potential energy savings from actively monitoring and controlling sites through a BEMS system can lead to savings of between 10 and 15% off the heating and hot water bills. It is recommended that the Council invest in recruiting a member of staff to carry out this work.

Any new heating control system on a gas or oil fired system should normally be upgraded to be included on the BEMS network if it is more than a domestic sized system. The control strategy should be demand led so that plant is switched off at periods when there is no requirement for heating, ventilation or cooling.

The installed system should provide:

1. Optimum start/stop of heating (adjustable time settings) based on internal and external air temperatures.
2. Space temperature control of heating pumps and boiler (adjustable set point).
3. Weather compensation control of heating (adjustable slope).
4. Boiler sequencing with automatic boiler sequence control rotation.
5. Pump over-run 5 minutes (adjustable period).
6. 3-Stage frost protection: Pumps operate when outside air temperature is at or below 1°C (adjustable set point); Boiler and pumps operate when return water temperature below 50°C (adjustable set point); Boiler and pumps operate when inside air temperature below 50°C (adjustable set point).
7. Outside air temperature heating hold off at 16°C (adjustable set point).
8. Control of DHW storage temperature to 60°C (adjustable set point).
9. Time control of primary and secondary DHW pumps (adjustable time settings).
10. Push-button for extending the heating period with on/off monitoring light and cancel facility (adjustable period) suitably labelled.
11. Push-button for extending the DHW with on/off monitoring light and cancel facility (adjustable period) suitably labelled.

For small sites that do not have internet capability and have a wet heating system the minimum control should be time controlled with a seven day time clock with the facility for programming holidays. These systems should also be fitted with a frost protection facility by either an internal or external tamperproof thermostat to bring the system on at any time. Hot water provision should have its own time control independent from the heating times.

Storage heaters should be weather controlled (e.g. by a Pactrol controller or equivalent) and time controlled with the facility to programme off periods for holidays.

METERING

Any works that require new electricity or gas supplies to be connected or existing supplies to be disconnected must be notified through the ERG. This is necessary to ensure an accurate inventory is maintained for monitoring carbon emissions and ensuring supplies are supplied by the correct utility supplier at the correct contract rates and not a default rate that can be significantly more expensive than contracted rates. Requests for new supplies to be made live should be made to the ERG at least 28 working days in advance of the requirement. The minimum information required with a request is the new supply reference number (MPAN for electricity and MPRN for gas) and an estimate of peak load and annual consumption. Disconnections can take up to 6 weeks to complete.

The Council has a policy of installing Automated Meter Reading (AMR) equipment on electricity supplies where the annual consumption will be greater than 20,000 KWh per annum and 50,000 KWh per annum for gas supplies. AMRs communicate using GSM signals to allow remote reading of consumption data and meter registers. This results in the elimination of estimated reads with the benefit of more accurate bills. It also allows for more accurate and automatic monitoring and reporting of consumption data and carbon emissions. This has increasing importance with greater demands for accurate reporting on internal carbon emission reduction targets and for reporting to external agencies, not least for the Carbon Reduction Commitment which has significant financial implications if accurate data is not available in time and financial incentives for having AMR"s.

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Sustainable Design and Construction Guidance. South Ayrshire Council document for clients and construction professionals. Draft available from the Energy and Resources Group.

APPENDIX H

Annualising of 2020 Data for
Continuous Monitoring StationsAnnualising
Continuous Monitoring
Data for CS1 Ayr High
Street PM_{2.5}

Background Site	Annual Mean 2020 (Am)	Period Mean 1/8/2020 – 30/09/2020 (Pm)	Ratio (Am/Pm)
Glasgow Townhead	5	4.5	0.9
NAC Irvine High Street	6	5.5	0.92
Renfrewshire Johnston	6	5	0.83
Average Ratio	0.88		
Annualised PM _{2.5}	(Measured level x average ratio) 5x0.88 = 4		

Annualising
Continuous Monitoring
Data for CS2 Harbour
Site, Ayr NO₂

Background Site	Annual Mean 2020 (Am)	Period Mean 1/7/2020 – 30/11/2020 (Pm)	Ratio (Am/Pm)
St Marnock St Kilmarnock	15	17.4	1.16
NAC Irvine High Street	6	6.4	1.07
Renfrewshire Inchinnan Road	20	22.8	1.14
Average Ratio	1.12		
Annualised PM _{2.5}	(Measured level x average ratio) 8x1.12 = 9		

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

Reference1: Technical guidance LAQM.TG(16), issued by the Scottish Government.

Reference 2: Policy Guidance LAQM PG(S) (16), issued by the Scottish Government

**Figure 1: Map showing Location of High Street Ayr
Real Time Continuous Monitoring Station**



**Figure 2: Map showing Location of Taylor Street, Ayr
Real Time Continuous Monitoring Station**



Figure 3: Map Showing Location of NO₂ Diffusion Tubes

