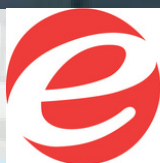


FEBRUARY 2023

CASE STUDY

LEADING SCOTTISH LOCAL
AUTHORITY UTILISES
TECHNOLOGY TO TACKLE
INDOOR AIR QUALITY



sustainable thriving achieving

East Dunbartonshire Council

www.eastdunbarton.gov.uk

EAST DUNBARTONSHIRE COUNCIL
IS LEADING THE WAY AND TAKING
A PROACTIVE APPROACH TO
MONITORING INDOOR AIR QUALITY
WITHIN THE COUNCIL'S SCHOOLS.

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THE GOLDEN THREAD: INDOOR AIR QUALITY IN THE CLASSROOM

East Dunbartonshire Council is leading the way and taking a proactive approach to monitoring indoor air quality within the council's schools.

The quality of the indoor environment has been proven to impact the health and well-being of workers, who mostly complain about poor indoor air quality and inadequate indoor temperature. Schools are not exempt from these issues, being places where pupils, teachers and support staff spend hours in an enclosed space.

According to a study from Harvard, increasing indoor carbon dioxide (CO₂) levels by 400 ppm could decrease cognitive functioning by 21%

Classrooms that are not adequately ventilated could have CO₂ levels reaching beyond what are considered to be healthy levels.



INTRODUCING THE ENVIRONMENTAL SENSOR



Real-time insights and data



Remain compliant with legislation

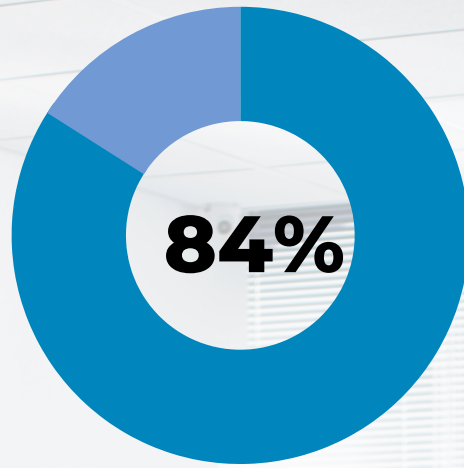


Creating Healthy environments

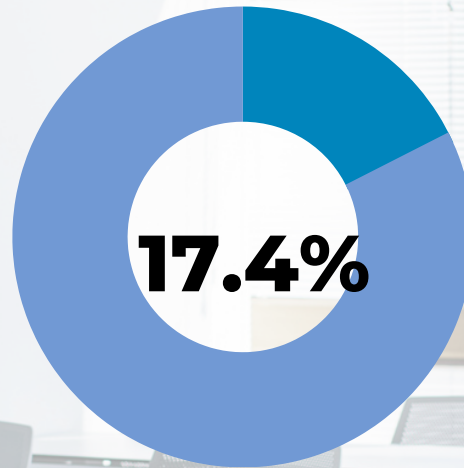


Reduce Spend

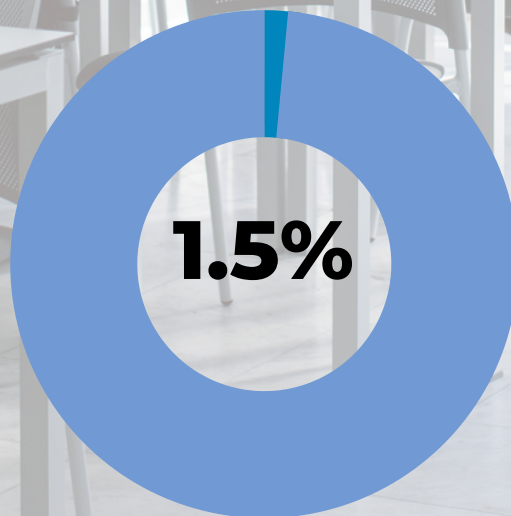




**of Classrooms
over 1,500PPM***



**of Classrooms
over 3,000PPM***



**of classrooms
over 4,500PPM***



THE CHALLENGE: AIR QUALITY IN SCHOOLS

This project's primary objective was to evaluate East Dunbartonshire schools' environmental conditions by monitoring their classrooms' indoor temperature, relative humidity and CO₂ levels from different building archetypes, sizes, orientations and occupancy.

Poor air quality within the Classroom can lead to:

- Negative effects on cognitive performance, poor concentration and even nausea
- Spread of airborne diseases

To evaluate the Indoor Air Quality (IAQ), an assessment of the ventilation rates of the rooms can be undertaken. Measuring metabolic respiration-evolved CO₂ concentrations in occupied rooms has historically been a good proxy for ventilation assessment. Since background (ambient) CO₂ level is relatively stable and indoor excess CO₂ is usually only from living beings' exhalation, measurements of indoor CO₂ concentration by sensors can be a good indicator of ventilation adequacy.

While it is paramount to ensure good ventilation in schools, the comfort of the occupants is also essential. It is therefore necessary to monitor the classrooms' indoor climate, including indoor temperature and relative humidity. Thus, monitoring indoor temperature, relative humidity and CO₂ concentrations have become the guide to ensure a safe indoor environment.

According to current regulations, the indoor temperature in Scottish classrooms should be kept above 17°C. There is a close physical relationship between air temperature and relative humidity levels, which makes the control of humidity in naturally ventilated spaces difficult through simple ventilation measures alone. There is currently no mandatory legal requirement to control relative humidity, and the relative risk posed by this parameter alone has yet to be entirely ascertained in research.

However, some studies have identified the relative humidity 'sweet spot' between 40% and 60%; adding too dry air would allow viruses to thrive and be more active.

SOLUTION: THE AICO PROPOSED SOLUTION

East Dunbartonshire Council has installed innovative sensing technology across its entire school portfolio to ensure its facilities are healthy places to learn and work.

Over 1,000 classrooms across 45 sites have Aico's revolutionary HomeLINK environmental sensors installed. These sensors monitor CO₂, relative humidity and temperature. They provide a healthy return on investment as they do not require battery changes due to being powered by a ten-year lithium-sealed battery; they do not require Wi-Fi, which is often unreliable. They work using GSM connectivity that enables data to be accessed remotely through an online portal, which again represents cost savings as operatives aren't having to record data manually. The sensors transmit the data to the cloud portal using a GSM gateway every 15 minutes to ensure real-time data is accurate.

Keeping healthy IAQ in schools will help students stay healthier, more focused and more productive; it will help reduce health and well-being issues among pupils and teachers while maintaining a comfortable and healthy working environment to enhance pupils' learning. The well-being of pupils, teachers and all school support staff is paramount to the council's deployment of this technology.



Furthermore, schools are known to be places where viruses can spread quickly, from noroviruses to the seasonal flu, due to occupants being near each other. The SARS-COVID-19 virus is no different, being an airborne virus and thriving in dry and crowded places.



Ensuring our schools are a world-class place to learn and work is a priority for the council. The support on offer, both pre and post installation from Aico and HomeLINK, has been second to none and has helped ensure that the project has been a resounding success. The council's in-house tradespeople installed these sensors, and the installation process is simple. All the data I need is available at the touch of a button, including historic data so if we make any changes we have before and after readings to ensure the success of any work undertaken; this technology will ensure we have a firm understanding of the health of our buildings.

Laura Gold, Health & Safety Manager, East Dunbartonshire Council



THE FUTURE: ENSURING HEALTHY ENVIRONMENTS

Many Educational Institutions have begun introducing initiatives to improve the quality of their indoor environment. Aico has connected over 1,000 classrooms with sensors in over 50 schools to help monitor CO₂ levels in classrooms.

With this powerful real-time data, institutions will be able to adjust spaces positively, making for healthier environmental conditions that will not only increase performance but will reduce the risk of spread of airborne diseases whilst identifying allergens, mould and indoor air pollution.



It's encouraging to see the approach East Dunbartonshire Council has taken to improve the environment within their schools. They are leading the way in Scotland through their strategy and approach to monitoring classrooms. The installation of sensors will help identify poor ventilation, and improvements can be made if needed. Obtaining data is the first challenge.

Tony Boyle - National Sales Manager, Aico



Find out more about Healthier, Safer Indoor Spaces here - www.aico.co.uk/technical-support/guides-and-publications