Impressive Growth for Air Quality & Emissions Event

The number of visitors to AQE 2017, the air quality and emissions event that took place in Telford during May, increased by 20% in comparison with the 2015 event. "We are obviously delighted with AQE's continued success," says organiser Marcus Pattison. "This was the 9th in a series of events that have grown year on year – in 2015 we achieved 9% growth in visitor numbers, so it is very gratifying to more than double the growth figure in 2017. The subjects addressed by the AQE events are highly specialised in nature, so we don't expect huge crowds, but the growing levels of participation are a clear indication of the vital role that monitoring performs in environmental protection."

Professor Rod Jones from the University of Cambridge Opening the IAPSC Conference

AQE 2017 took place on 24th and 25th May - immediately before the election and just after the government was forced to publish its air quality plans. Levels of uncertainty over the impact of Brexit on the UK's environmental regulations were (and remain) very high. "The political landscape affected almost every part of the AQE event," comments Marcus Pattison. "Lord Whitty provided a useful insight into the likely effects of Brexit on environmental regulations, and the Volkswagen scandal was referred to by a number of Conference speakers as a reminder of the importance of accurate and reliable monitoring.

"With the prospect of Local Authorities being given even greater responsibility for air quality improvements, many of the IAPSC air quality conference delegates raised concerns over the levels of funding for this.

"One of the air quality conference attendees asked the speakers to comment on the 'elephant in the room' – referring to the government's consultation on air quality. However, in response Prof. Rod Jones from the University of Cambridge commented that his initial thought was that the elephant was in fact indoor air quality, so I am sure that we will address this subject in more detail at future AQE events."

AQE 2017 attracted a wide variety of visitors, all of which shared a professional interest in air and emissions quality. Extremely positive feedback was yet again received for this event, with many of the visitors referring to the advantages of being able to see the whole monitoring sector at the same time. For example, Dr Lesley Sloss from the IEA Clean Coal Centre said: "Rarely do you get an opportunity to mingle with government agencies, utilities, equipment specialists and experts from around the world in one event," and Andrew Collins from Natural Resources Wales described AQE 2017 as "a great opportunity to network with and meet new contacts across the sphere of emissions monitoring and ambient air quality - ranging from regulation, local authorities, industry and manufacturing."

Lord Whitty Opening the Air Emissions Conference

Alan Crow from Hanson Cement said: "It was good to see all the major suppliers of air quality monitoring equipment under one roof," and David Graham from Uniper Technologies said: "This unique event is invaluable for keeping abreast of the most important and topical environmental issues related to both stack emissions and ambient air quality. In addition to the informative Conference sessions and Workshops, being able to access a wide range of the latest monitoring technologies at the Exhibition is very useful for plant operators."

David Shaw from Yorkshire Water said it was good to see "industry experts and the technologies available to resolve air emission problems and ensure regulatory compliance all in one place." Andrew Townsend from Tata Steel UK agreed, adding: "If you are involved in emissions monitoring then this is where the experts are."

Visitors from the air quality sector also responded very positively. For example, Alison Loader from Ricardo Energy & Environment described AQE 2017 as "an excellent and useful event," and Drew Hill from Transport Scotland described it as "an opportunity for learning, development, and skills refresh."

Outside of the AQE 2017 Conferences, registered visitors were allowed free access to an international Exhibition and a series of walk-in/walk-out Workshops that ran in four rooms located within the Exhibition Hall.

Industrial Emissions Conference – Monitoring Difficult Gases and Dust (Day 1)

The first day of the AQE 2017 conference addressed the monitoring of difficult gases and dust components in industrial emissions, with presentations from an international panel of experts. The conference began with a presentation by Lord Whitty entitled 'Environmental Protection Legislation in the Post-Brexit Era.' This was clearly a topic of major interest with standing room only in a packed conference hall. Lord Whitty is Chair of Environmental Protection UK (EPUK), and has held a number of senior governmental positions addressing issues such as environmental protection, climate change, science and technology.

Lord Whitty said that he had been hoping for a new Clean Air Act but regretted that this had not yet transpired. He then outlined the historical development of UK environmental legislation, reminding delegates that most of it had been derived from the European Union, and that the UK had been influential in its development. He speculated that environmental legislation, including emissions regulations, might not change to a large degree since any free trade agreement would require legislative equivalence, and the government had already indicated a preference for no diminution of environmental protection. However, he highlighted the difficulty of pushing more air quality responsibility onto Local Authorities which are already under considerable financial pressure. Concluding, Lord Whitty said: "Looking at the future of UK environmental legislation, I regret that I cannot offer you certainty, but I can assure you that the road ahead is long… and bumpy."

David Graham from Uniper then provided a regulatory update on the Industrial Emissions Directive including the Best Available Techniques Reference document (BREF) for Large Combustion Plant, and also the requirements of the Medium Combustion Plant Directive. With Increasingly stringent legislation driving down SO_2 emissions from many processes, Marc Coleman (NPL) discussed the challenge presented by the monitoring requirements for SO_2. Kristian Hentelä from Gasmet Technologies (Finland) then described the impact of new EN Standards on the acid gases HF and HCl, including an overview of the current status of test methods and currently available instrumental measurement techniques.

The two main NOx control strategies rely on the accurate dosing of NH_3 or urea, and Dr Barbara Marshik from Servomex explained the advantages of direct gas measurements with a feedback process loop for Ammonia slip monitoring that reduces NOx and Ammonium Bisulphate formation. Paul Firth from Tarmac in the UK then described the challenges and possible solutions to the calibration and measurement of particulates at low concentrations, highlighting work being conducted by the Source Testing Association with industry.

The afternoon sessions began with a presentation by Erkki Lamminen from Dekati in Finland, who described the eFilter™ which combines gravimetric PM measurement with real-time diffusion charging and current measurement. Indoor, outdoor and combustion source measurement studies were also described and compared with other instrumentation.

Following the US EPA regulations for coal and oil fired processes and cement kilns, process operators had to choose a mercury monitoring method – either sorbent trap sampling or continuous mercury monitoring. Shawn Wood from Ohio Lumex and Andy Curtis from AS Technical Solutions described how mercury monitoring has developed in the United States and related this to the European CEN that is currently being developed. Shawn claimed "the Method 30B sorbent trap procedure is the most reliable method for mercury measurement." Continuing the mercury monitoring theme, Mike Hayes said: "The Linde Group was the first company to offer gaseous mercury calibration standards for the monitoring and detection of emissions." He then provided a comparison between these calibration gas standards and other methods of calibrating analytical instruments.

In the final presentation of the first day, Heather Whittenbury from Johnson Matthey explained how, with the move away from solid fuels, gaseous and liquid fuels can be treated with fixed bed absorbents at ambient temperature to remove H_2S and mercury, and the absorption profile can be easily measured. She also described new monitoring methods.

Abstracts for the conference presentations are available at www.AQEshow.com.

The first day's conference was chaired by William Averdieck, Chairman of the Source Testing Association (STA). Speaking at the AQE Gala Dinner, he said:
"The AQE conference on Emissions Monitoring covered: issues core to the UK regulatory environment, technical challenges in relation to monitoring, and the interests of the Source Testing STA's broad membership.
"Over the next few years there is likely to be some delay in new environmental legislation in the UK, as resources are diverted post-Brexit to address the complexity of adopting the regulations emanating from various strands of EU directives as primary and secondary legislation. However the promise of a 'calm' approach from UK politicians gives a likely direction of travel of little change to environmental standards especially with constraints coming from the UK wishing access to free trade terms with the rest of the EU. Key issues remain though: who will be the enforcer of regulations in place of the European Court of Justice? What pressures will drive enforcement resources at the top level? For example, will local authorities responsible for clean air zones to meet EU NOx limits, be given the resources to do this job without the stick of the EU?
"While there is 'enforcement' uncertainty in the UK, our industry can find opportunity in solving unsatisfied needs in the emissions monitoring world, such as the increasingly important issues of monitoring low emission concentrations, associated with increasingly efficient abatement equipment and lower emission levels.
"In line with public and regulator expectations we should strive to reduce the uncertainty associated with monitoring results. Also, we should address the challenges of monitoring processes which have much more variability than the standard incineration and power plant base load applications. This has strong relevance to broader industrial processes such as the Cement industry where emissions are more dynamic, variable and transient. This would also be relevant to monitoring the start up and shut down of plant, which under current legislation is not required but surely will in the future.
"By solving these problems and influencing the evolution of future regulatory approaches in the UK, suppliers will continue to improve environmental outcomes, and by building technical expertise that is relevant to other parts of the world this innovative industry will continue to thrive."

REA - Waste Management Site Emissions - Day 2 (morning)

The second day of AQE 2017 also featured a Conference with an emissions monitoring theme. The Organics Recycling Group of the Renewable Energy Association ran a morning seminar on 'Controlling and Monitoring Emissions on Waste Management Sites.' Rupert Standring from the Environment Agency explained the new M9 Technical Guidance for monitoring Bioaerosols, and Catherine Rolph from the Open University outlined Worker Protection Strategies against bioaerosols. Paul Ottley from Odournet described the design and maintenance of biofilters for effective odour mitigation, and Jennifer Watts outlined the legal obligations of a site operator for emissions control and odour monitoring.
Investigation of Air Pollution Standing Conference (IAPSC) - Day 2
Developed in partnership with IAPSC, the air quality conference included three sessions covering: pervasive air quality monitoring; vehicle emissions monitoring and data management; and local air quality management and policy.
The first presentation, provided by Prof. Rod Jones from the University of Cambridge, described the large scale deployment of AQMesh sensors. Testing 'out of the box' performance he reported good R^2 values from the pods for NO_2 and $PM_{2.5}$. He showed data from 20 AQMesh pods deployed in Cambridge and explained that in conjunction with wind rose data it is possible to identify local and non-local issues. For example, if all pods show a similar increase in pollutant, it is likely to be derived from a distant source, but if the response is confined to one or two pods the source is likely to be local. Summarising, Prof. Jones said: "The important message from this work is that a network such as this can provide information on sources and therefore interventions – from a local authority perspective, it helps you figure out what it is possible to change, and what it is not."
Drew Hill from Transport Scotland then delivered a presentation in which he addressed the management of traffic in preparation for Low Emission Zones. His work involved a trial with 2 AQMesh pods and 2 mains powered particulate monitors. He said that whilst the AQMesh pods are very good for filling gaps in monitoring and rapid deployment, they do not replace reference stations. Exemplifying the flexibility of the AQMesh pods he referred to a phone call informing him that the Forth Bridge had been closed. He then quickly deployed the AQMesh pods on the bridge and on the diversion route which provided useful data and helped inform the public.

Following an emotional speech by Matthew O'Neill from Transport for Greater Manchester, a minute's silence was held in memory of the victims of the Manchester Arena bomb.
James Neasham from Envirowatch Ltd also gave a presentation on pervasive monitoring, referring to a network of E-Mote monitors in Newcastle upon Tyne. He said that this is providing an insight into air quality and the effectiveness of interventions in the city. For example, to avoid idling, Gosforth buses have been fitted with a device to ensure that they always meet green traffic lights, and the network is helping to measure the effectiveness of this initiative.
Jon Andersson from Ricardo UK delivered a presentation on Real World Emissions – the use of PEMS on heavy duty vehicles to assess the impact of technology and driving conditions on air quality in urban areas. Dr James Tate from the Institute for Transport Studies at the University of Leeds then described the use of telematics data to research traffic-related air pollution.
After lunch Dr Tom Stenhouse from AECOM presented a case study on the Kirklees Council Local Plan. He said that air quality had featured heavily in public engagement events, and that since the air quality assessment, the Local Plan team had been able to refer to it frequently. "This assessment," he said, "delivers confidence that development in the Plan should not affect air quality."
Matthew O'Neill then outlined the many initiatives that are being undertaken in Manchester to reduce air pollution.
Roger Pitman explained that TRL reviews Air Quality Annual Status reports in behalf of Defra, and offered advice on action plans and the new Defra reporting process. He said that there is now a greater focus on evidence based action plans, and that the Air Quality Plan should be integrated with the Local Transport Plan. "Local authorities should say what their monitoring ambitions are and if that necessitates more funding, the AQAS should say so," he advised.
In the final presentation, Chris Large from Global Action Plan described the initiatives underway in preparation for the National Clean Air Day on 15th June. He urged delegates to support the cause in a variety of ways such as engaging with social media, going car-free and holding events.
Visitors to the AQE Conferences will be pleased to learn that the CPD Certification service has confirmed that the further learning value and structure of the AQE conference presentations conform to CPD guidelines.

AQE 2017 Exhibition

With over 90 stands featuring most of the world's leading providers of monitoring equipment and service providers, in addition to regulators and accreditation organisations, the AQE 2017 Exhibition provided visitors with an opportunity to see the whole sector under one roof. Many of the exhibitors launched new products and services at the event, and feedback from the visitors indicated very high levels of satisfaction with the quality of the visitors.

Emissions Monitoring

One of the largest stands was occupied by Quantitech, now a Gasmet company. Their stand featured the latest Gasmet MCERTS approved FTIR analysers in addition to portable and fixed MCERTS approved FID analysers, laser gas analysers and the Monicon industrial gas monitors. Quantitech also launched a new integrated CEMS capability at the event and MD Ken Roberts said: "The great thing about AQE is that visitors can meet all of the UK suppliers of air quality and emission monitoring products and services in one location."
Axetris launched a new laser gas module for measuring low range HCl, and Protea demonstrated the Dadolab range of isokinetic sampling equipment, in addition to new AIR-IQ software for the real-time determination of gas concentrations in FTIR or Mass Spectrum data. SW Technology sagl unveiled two new analysers for measuring ammonia and oxygen with hot CEMS extractive systems, and experts from Uniper met with visitors to discuss their range of environmental planning and permitting services. NPL launched a new 'Gases and Particulate Simulator' which simulates emissions at customisable gas and particle concentrations, flow, temperature and water content for instrument development and training.

Ambient Air Quality Monitoring

The Air Monitors stand featured new technologies for monitoring gases and particles in both indoor and outdoor air. New products on show included the FIDAS Frog and the Pegasor in addition to new Aethalometers. "We were delighted with the enquiries that we received," reports Air Monitors MD Jim Mills. "There was a great deal of interest in the new products that we launched and it was very pleasing to see the continued growth in the number of customers ordering AQMesh pods. Reports from field installations are showing excellent performance from these battery powered, wireless, cloud-based air quality monitors, and with pressure

growing for more monitoring sites, AQMesh seems to be the perfect solution."

Cooper Environmental launched a next generation multi-metals ambient monitor, and Horiba announced the release of their new continuous particulate and metals monitor for monitoring $PM_{2.5}$, PM_{10} and Total Suspended Particulate Matter as well as the elemental composition of dust.

EarthSense launched the new Zephyr air pollution monitor.

Enviro Technology's stand featured the latest technology for direct NO_2 measurement, particulates and ozone.

The company's 'Smogmobile' was also on display - a zero emission mobile air quality monitoring laboratory. Looking back, ET Managing Director Duncan Mounsor said: "AQE has a good exhibition and conference, and is in a great location. It is well organised and delivers an interesting mix of exhibitors and speakers."

Alan Taylor, Managing Director of Turnkey Instruments said: "AQE is a very good show for us; in fact it is so good that we held back the launch of a new product specifically for this event." Turnkey unveiled the iGAS internet gas monitor at AQE, a new instrument containing multiple gas sensors, suitable for both outdoor environmental and indoor air quality monitoring.

Workshops and Demonstrations

Operating from four rooms within the exhibition hall, free walk-in/walk-out workshops ran throughout both days of the event. The theme of the first day's workshops was ambient air quality with subjects covering new technologies, mobile techniques and the relationship between outdoor and indoor air quality. The theme of the second day's workshops was emissions monitoring, covering topics such as regulatory compliance, new technologies, portable monitors and problematic species.

The exhibition hall also contained a demonstration area featuring mobile air quality monitoring equipment and a 'stack' fitted with the latest emissions monitoring systems.

A Gala Dinner took place on the evening of the first day, during Ferrybridge MEL and the Wilton 11 EfW Facility were announced as joint winners of the 'Golden Stack Award,' sponsored by the Source Testing Association (STA). In addition, a new 'Golden (AQ) Site Award' sponsored by Air Monitors, was awarded to Bexley Council for the best ambient air quality monitoring site.

Looking back over the success of the AQE events Marcus Pattison says: "The first conference and a small exhibition took place in 2002, focusing on emissions monitoring. At that time, interest in air pollution was confined to regulators, academics, consultants, instrument manufacturers and certain staff at regulated processes. Since that time we have added ambient air quality monitoring to the event's remit and of course air quality is now riding high in the political agenda, so the need for accurate, reliable monitoring has never been greater. As a result, the prospects for AQE 2018 are really exciting and I am delighted to announce that the dates will be 21st and 22nd November 2018, and that the event will be run in Telford alongside the Water & Wastewater Environmental Monitoring event, WWEM 2018.

For more information visit www.AQEshow.com and www.WWEM.uk.com