

Coventry Warwickshire - Air Quality People's Chamber
(CW-AQPC)

AIR QUALITY CONFERENCE

Final Report

ZOOM Online Conference hosted &
sponsored by C4FF, Berkeley House,
Kenilworth CV8 1EB



Centre for Factories of the Future (C4FF)



OUTCOMES FOR CW-AQPC 2020 ONLINE CONFERENCE:

'THE AIR THAT WE BREATHE IN – HOW IT AFFECTS US'

2020 Air Quality Conference Report

CW-AQPC

Rapportuers: Tony Dalton and Monet Ellard

Zoom conference held on Friday, 3rd July 2020 at Centre for Factories of the Future, Kenilworth, UK

Professor Dr Reza Ziarati opened proceedings thanking everyone for attendings and the importance of young people.

He then gave an explanation of where we are and what is needed. The following are the summary of the points he presented:

- **The choice is stark! Carrying on with what we are doing and destroying the world or taking drastic actions and leaving a better world for our next generations**
- Human lungs breathe about 13,000 litres of air a day on a normal pace. Therefore, air quality is a very important factor for human body as Oxygen in the air is mixed with blood in the lungs. Contaminated and harmful air has a direct effect in damaging the respiratory systems and eventually, the whole body.
- **The results show the in-depth details of the adverse effects caused by Ozone (O₃) and PM_{2.5} in 2010. The UK contributes to 5.8% of the number of premature deaths associated with Ozone in the EU while for PM_{2.5} the UK contributes to 7.9% of premature deaths in the EU (RCP* 2016). If similar percentages are true for NO_x and PM₁₀, the air quality responsible for some 30% of all premature death in the UK.**
- No systematic mapping of pollution hotspot areas and non-existence or inaccurate means of measuring harmful pollutants
- Need to set up of local independent office in each region of the UK including Coventry and Warwickshire, with facilities and a technician to carry out measurements and producing reports in collaborations with the local councils to ensure reliability of data and readings and the adequacy of the measuring devices with a view to put an end to the misrepresentation of actual readings from existing stations and sensor locations.
- **It is essential to calibrate at least one of the low cost diffusion tubes used in many cities and towns such as Coventry and Leamington with the readings from the Government air quality monitoring stations such as those in Binley or Allesley. This will lead to more reliable data from the diffusion tubes.**

- **There is correlation between poor air quality and increasing admission to the hospitals for respiratory illnesses.**
- The actual measurements from sensors around some cities including Coventry shows that the data published for NO₂ are not valid due to the application of factors such as 'bias' and 'annulising' and then reducing these figures further by arguing that since these sensors/tubes are further from road then the level pollution must have been less. Studies by C4FF has shown that when sensors/tubes are closer to the roads the levels of pollution are higher and not less and that use of bias and annulisation is invalid and that only against calibration of sensors/tubes against more accurate devices any amendment to actual data should be permitted.
- During the lockdown the level of most pollutants dropped by some 50%. **What was concerning therefore was that the measurements, taken from the Government monitoring stations during the lockdown, of NO_x, PM10 and PM2.5, exceeded the Government own targets for all three pollutants several times in three occasion by some 30 to 40% for each of the aforementioned pollutants.**

Emails supporting the importance of the seminar were read out from:

- No 10 Downing Street
- Rebecca Pow, Parliamentary Under Secretary of State to the Dept for Environment, Food and rural Affairs
- Rt Hon Jeremy Wright MP

Matt Western MP:

- Lockdown has shown the benefits of reducing carbon emissions.
- **He is concerned about the impact of polluted air on children**
- **Explained that road traffic contributes 1/3 of all emissions.**
- Explained how Morocco and New York were monitoring emissions.
- **As a result of investment electric bike usage in Germany has gone up 20%.**

Taiwo Owatemi MP for North Coventry:

TBS

Lord Mayor of Coventry, Cllr Ann Lucas OBE:

The Lord Mayor spoke of the work already taking place in the city and her belief that Coventry could help to lead the way in improving air quality, stating that:

- **We have known for many years that action must be taken to improve the quality of the air we breathe, for our sake and for the sake of the planet and the generations to come.**
- If anything, that knowledge has been reinforced in recent months as we have seen our lives changed by COVID-19.
- We have been forced to adapt, to leave the car at home and to find other ways – and we have found that change is possible.
- In Coventry we are proud of the work we have done to make our city a cleaner, healthier place.
- **We have made the city centre greener, we are planting more trees and encouraging people to walk and bike to work and school.**
- **The city's two universities and major companies based in the city such as National Grid, Jaguar Land Rover and the London Electric Vehicle Company and of the pioneering work taking place in the fields of electric vehicles and very light rail.**
- **The work that has taken place to narrow roads, limit vehicle speed and improve public transport had helped in improving air quality.**
- Coventry is also about to take its place in the spotlight as the UK City of Culture – a platform that will help us to inspire and challenge others.

- **As a Council, we are trying to change our ways as well. We have reduced our office space and we have introduced pool cars – including electric ones – and bikes.**
- There has been a lot of good work already, but there is much more that needs to be done, and I am delighted that this conference is helping to get us all talking about an issue that affects each and every one of us.”

CLlr Mattie Heaven - Prospective MP for Coventry:

- The spread of Covid-19 in the Philippines has been much lower, she thinks because they do much more walking and cycling.
- The lockdown had a positive impact on the school gates without children
- **She would like to set up a walk to school projects.**
- **She has learned that the pollution is three times higher at drop off and collection times, as parents keep their car engines running while waiting for their children, this could be reduced by a walk to school project.**
- Therefore, could we close roads near schools to encourage walking to school?
- Encourage parents to be educated and aware of the danger to their children
- **Basically, we need to educate everyone on this issue.**

CLlr Neale Murphy - Warwick Mayor:

- **Warwick is one of the most polluted towns in the UK.**
- **Can't get figures the right figures**
- Would like to encourage our children to embarrass their parents about the damage cars are doing to them.
- There are not enough bus routes, which means that people use their cars.

CLlr Susan Rasmussen - Leamington Spa Mayor

- **Leamington Town Council was responsible for the Neighbourhood Plan. 3 years consultation showed that overwhelmingly that people wanted active travel public transport prioritised. Air quality was a primary concern.**
- In Warwick District the main source of carbon emissions is traffic. **WDC want to achieve a net zero carbon economy by 2030 so changing transport systems is of paramount importance to them.**
- **Government policy is now to focus on active modes and public transport in built up areas, away from car dependence. The blocker is Warwickshire County Council who have been called “institutionally motorist”**
- **The Mayor at present cycles to engagements and will shortly be using a sponsored electric bike.**

CLlr Richard Dickson - Kenilworth Mayor:

- High pollution areas are Warwick Road and New Street,
- Level of car ownership is higher in Kenilworth than the national average.
- Kenilworth has a big problem with through traffic.
- **They are looking to put a 20mph speed limit on Warwick Road.**
- Local Plan has air quality included in it, with protections to reduce polluting traffic.
- **New Kenilworth station has resulted in many more people using it thereby reducing traffic into Coventry.**
- **The Council is encouraging bike riding and bike ownership is increasing.**

CLlr Susan Rasmussen then chaired discussions on councils' efforts to improve air quality

Air Quality Plan and Current Activities in Coventry

John Seddon, Head of Transport and Innovation, Coventry City Council:

- **The Council is planning to buy a series of electric vans that small businesses can try for 3 weeks to decide if that can replace their vans with an electric one.**

- **He explained the problems with shovel ready government initiatives, which still takes a long time to get started, he explained the procedures**
- He presented the local action plan to the meeting.
- Questions:
 - Discussion about spine cycle ways and that to work they need safe cycle feeder ways.
 - Explained the electric car loan system.
 - How will this effect will affect the 2021 City of Culture.

Air Quality – WDC Environment Portfolio

Cllr Alan Rhead, Environmental Portfolio:

- **Plan WDC to be carbon neutral by 2025 and the district carbon neutral by 2030.**
- **Plans for council car fleet to be 100% electric.**
- Installing charging points in car parks.
- Intro car sharing for council staff.
- Installing Park and Ride.
- Converting all taxis to electric.
- Investigating hydrogen as an alternative to electric.
- Introducing home working for Council staff.
- Buildings they are purchasing green energy, LED lighting, Solar PV on building and looking to create a Solar Panel farm.
- Looking at other heating systems on new buildings.
- Furthermore, are looking at introducing a mix of hydrogen/gas into gas pipes.

Air Quality and Health

Dr Habib Kashi:

- Showed us a presentation
- **Showing the effect of pollution on children – it is frightening.**
- **WHO considers 90% of children breathe in toxic air!**
- **Air pollution is greatest threat to our health**
- **In the UK annually there are already 36,000 deaths related to pollution**
- **The presentation is available** and should be seen and read.

Ian McDermott - Importance of Vegetation - Trees and Plants:

As a professional urban forester:

- Explained why we need more trees
- **Because trees remove 100% of Particular matter**
- **Explained that we have killed more people through pollution than all the people killed in all the wars last century**
- **Explained that every time we removed trees to put a cycle way, we are actually increasing pollution!**
- **Asked the question as trees eat pollution and are not expensive so why trees are not further up the agenda?**
- As trees are the only highway asset that increases as time goes by.
- They keep growing!

Adam Tranter - Active Travel Cycling Ambassador:

The first Bicycle Mayor of Coventry

- His job is to explain the benefits of cycling

- He has to liaise with cycling groups with the aim of instigating change.
- He explained that because of lockdown only 6% want to go back to as we were.
- **In Amsterdam there are more bikes than people and they are all using the J K Starley bike, a design that originated in Coventry 150 years ago!**
- Coventry is not yet cycle friendly; we are at the start of a journey in the city where the bike came from!
- **An interesting fact that In Coventry 1/3rd people don't own a car.**
- In Coventry there will be cycle friendly routes, for example, the Hollyhead Road and Binley Road schemes.
- There are two missing ingredients
 1. Political will – as it takes time –he would like us to be like Leicester where they are building a mile a week and not waiting for Government money to come.
 2. **The creation of Low Traffic Neighbourhoods, very simply done by putting bollards in middle of rat runs.**

Tony McNally - Climate Change Solutions:

- Explained that we need to convince people to generate clean energy.
- A new project is building a windfarm that will supply 2M houses.
- The problem - the funding is coming from Scandinavia!
- **Green Energy has recently met 50% of our energy requirement**
- **Need to get to 100%, which will not be enough, as when we reach it the demand will increase again due to the needs of electric vehicles.**
- **Currently, no green power is being created to power electric vehicles.**
- **Electronic vehicles are not the biggest emitters of the carbon emissions, they are coming out of our homes through our heating systems.**
- The solution to this is green hydrogen – there are multitude of ways we can use this, the market needs to pick it up.

Tom Maidment - Coventry Green New Deal:

- The aim is to achieve decarbonisation in a rapid way.
- It is a big programme, which is expensive
- Coventry Green deal is a nonpartisan group trying to work with people.
- **Trying to organise communities to understand the effects of pollution.**
- Working on air quality – Tom doesn't think we are asking the right questions.
- He is currently looking at many areas to make certain that as we come out of C-19 our workers are trained for new green jobs.
- Currently looking at Green Bonds as a way to finance business.
- **Wind turbines may be expensive but once the original investment has been made the ongoing costs are very low, which means they are economical in the long run.**

Cllr Keith Kondakor, Air Pollution in Nuneaton and Bedworth:

- Nuneaton has not taken a lot of responsibility.
- **There are areas where the air quality is very high.**
- **Explained the problems with their recording systems and why they are failing.**
- **Basically, he is saying that the figures are being massaged so as to eliminate the problem.**

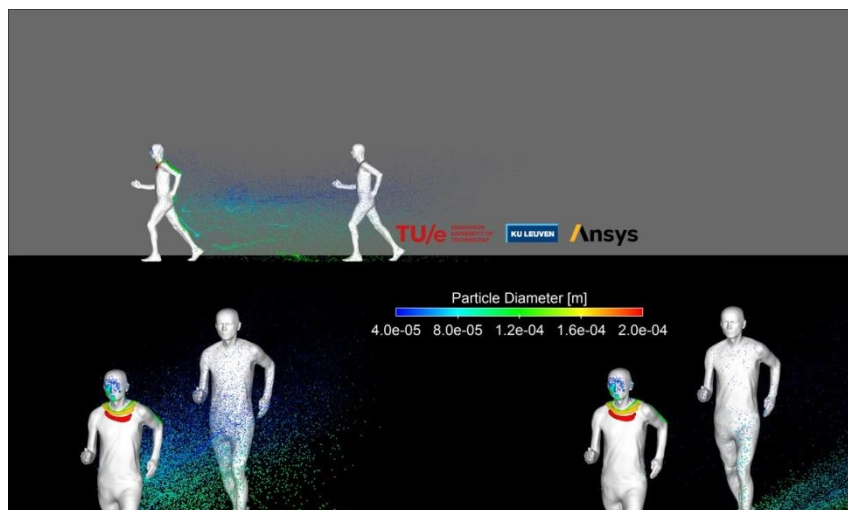
A Report on Pollution in Selected Locations and Sample Assessment

Professor Dr Reza Ziarati

- Coventry air quality performance is 52% hence low and the North Warwickshire 60% which is also a cause for concern. There is a lack of measurement in known pollution spots and focus is on Nox. There is a limited PMs Measurements and no known measurement of PM less than 2.5. **A study at C4FF has shown that there is correlation between NO_x and PM10 & PM2.5 and that an algorithm**

exists to predict PMs values from NO_x readings. This is an important finding.

- It is essential to calibrate at least one of the low cost diffusion tubes used in many cities and towns such as Coventry and Leamington with the reading from the Government air quality monitoring stations such as those in Binley and Allesley. This will lead to more reliable data from the diffusion tubes.
- **There is correlation between poor air quality and increasing admission to the hospital for respiratory illnesses. Mortality rates from respiratory disease', between 2014 and 2016, was 43.3 per 100,000 for Coventry and 33.8 per 100,000 for England**
- **One of the most important discovery by C4FF is that there is clear correlation between NO₂ emission and PM10 and PM2.5. To this end having a result for one it is possible to predict the results for the other two using AI tools.**
- There was a discussion as to where the monitoring stations are located.
- Therefore, what is needed is an independent organisation to monitor the readings from all sensors including the government monitoring stations.
- **A study explains as to why in times of COVID-19 you should not walk/run/bike close behind each other. It suggests that runners and cyclist should keep an 8 to 10 meters distance respectively.**
This is an important discovery and should be further investigated. It is also found that in an enclosed area a 2 meter distance is just about enough provided the room is well ventilated.



Tony Dalton's Comment

My take home from the event is that I have always been warned that there are lies, dam lies and statistics and that statistics are always used to support weak arguments.

Therefore, there needs to be an independent body to provide the true facts to all those authorities making these decisions to do so with the same facts.

However, as I understand politics, in this case with a small "p", many bodies will not like this, the real facts may not meet with what they are trying to achieve.

For this reason, it is essential that the recording body is not only totally independent, but seen to be independent, which could affect the funding for such a body.

Messages from CW-AQPC

Alan Marshall

There is an urgent need for the National Planning Policy Framework (NPPF) to undergo major changes to reflect, and contribute to, the government's legal obligation to achieve net zero carbon by 2050, and a revised

NPPF should ensure that house building plans:

- **incorporate adequate public transport to contribute to the zero carbon target;**
- **revise Section 106/Community Infrastructure Levy criteria to focus the funding on achieving zero carbon, and**
- **give much greater weight to brown field development to make more effective use of land which is mainly situated close, or closer to, town and city centers.**

There is a real opportunity to halt the significant trend of development on green belt sites around Coventry if Coventry City and Warwick District Councils in particular start now to urgently review their District Plans, which were approved under the current NPPF conditions.

Peter Maddock

We need to be able to understand the affects of poor Air Quality on our population. To do this, a starting point would be to be able to accurately measure the key components of the pollution i.e. particulates and NO2. The public health implications are as important as the economic considerations. We need strategies and actions to achieve a balance. We also need to involve young people more effectively; after all it is their future **When decided where you need to go, it is always important to be clear where you start from" Hence clear reliable measurements are vital.**

Ann Wilson

Trees are a significant part of reducing pollution along with multiple other benefits. The aim of Tree Wardens is to get this message across to everyone and to motivate a lot more planting and more protection of all trees, (especially from developers), now and in the future. **Scientific evidence is proving that trees are a crucially important, if not the most important, part of air quality control, they are vital to our health and well-being and as barriers crucial.**

Vaughn Owen

Importance of Monitoring in appropriate places, times and not in half terms
Short, medium and long term public transport strategy for a comprehensive re-vamping of the existing infrastructure ."

NOTES FROM CHAMBERS MEETING

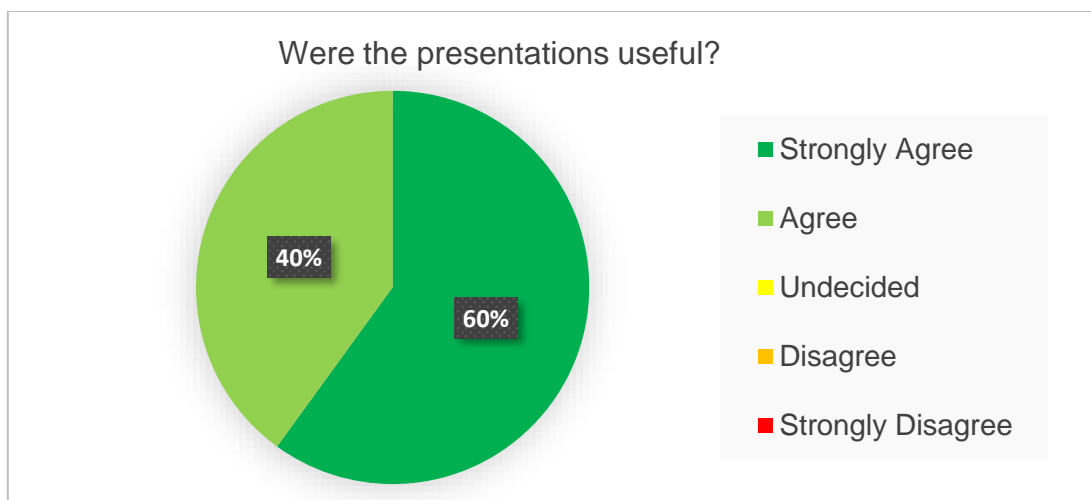
- Importance for real time accurate pollution monitoring. For academic and development purposes, to bring public awareness about air quality and its impacts to the public.
- Possible utilisation of council readings, not for use against them, but to make them available to the public. Displaying the information in strategic centres and expanding it throughout the area.
- There are serious health implications involved with poor air quality, which are only increasing over time. Let people know and give them the choice.
- Need for an independent monitoring organisation to provide figures to the public. Which is separate from governing bodies and not influenced by their funding.
- Potential for Burton Green to become a pilot centre to compare with other areas. Parish has funding is available, but a case would need to be put forward.

- Leamington has funds available for projects benefitting the community. A proposed location for displaying real time data on the ford factory that used to display the air temperature. Displays would need to be simplistic.
- If information is not being shared by the council due to inaccuracies, let our members calibrate it for public display.
- Further discussion is needed considering the costs of a project and potential funding avenues.

SURVEY RESULTS

Question 1: Were the presentations useful?

All respondents agreed that the conference was useful.



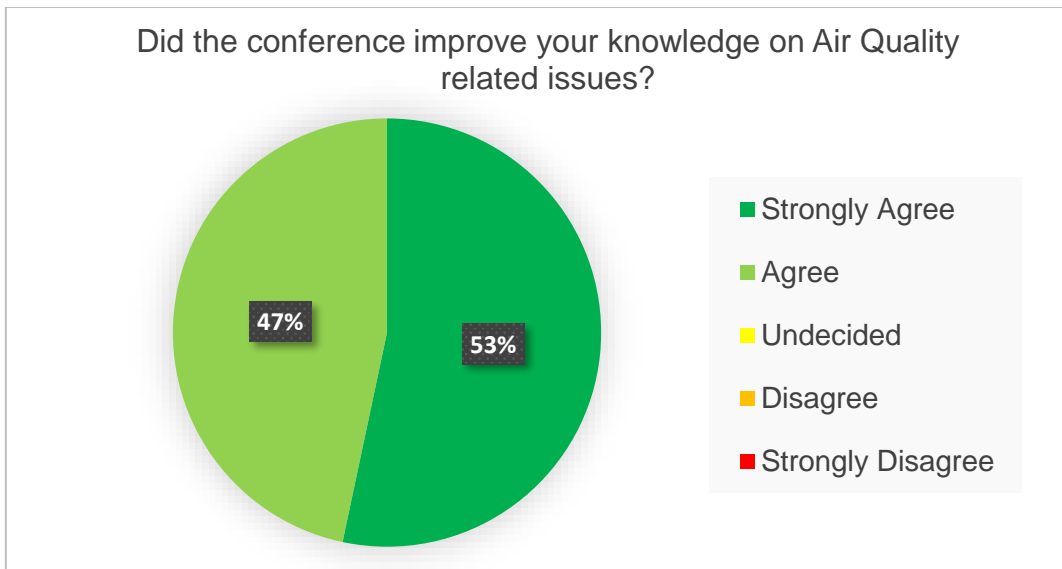
Question 2: What was the most interesting topic in your view?

The topics most of interest to respondents in order of frequency of answer. Percentage shows amount of answers which contained this topic.

- Information on Trees (47%)
- Air monitoring process and its disparities (40%)
- Need for open communication & education (27%)
- Health impacts of poor air quality (20%)
- Authorities plans for air quality (13%)
- All topics discussed were of interest (13%)
- Mayoral View (7%)

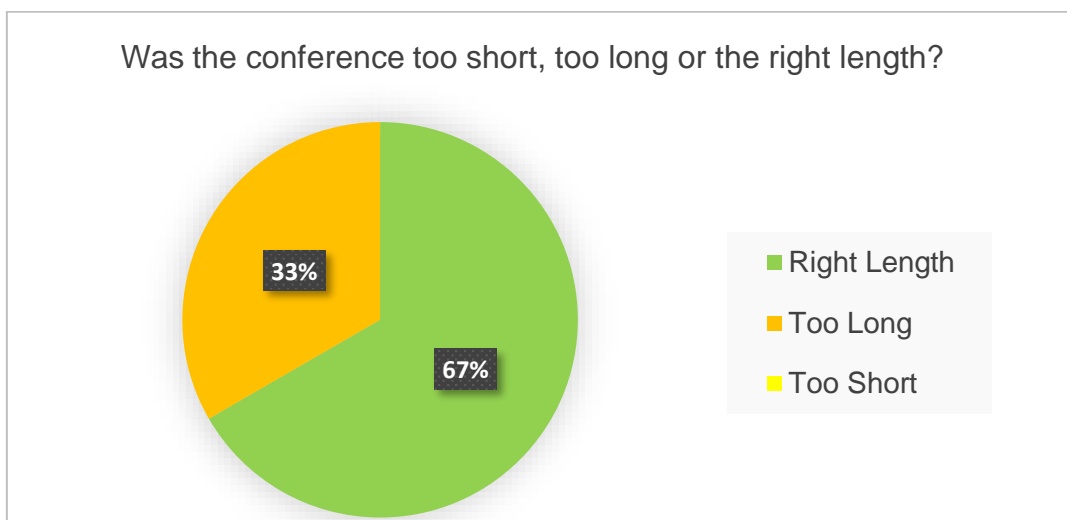
Question 3: Did the conference improve your knowledge on Air Quality related issues?

All respondents agreed that the conference improved their knowledge on air quality related issues.



Question 4: Was the conference too short, too long or the right length?

Most respondents felt that the conference was the right length however, some felt it was too long.



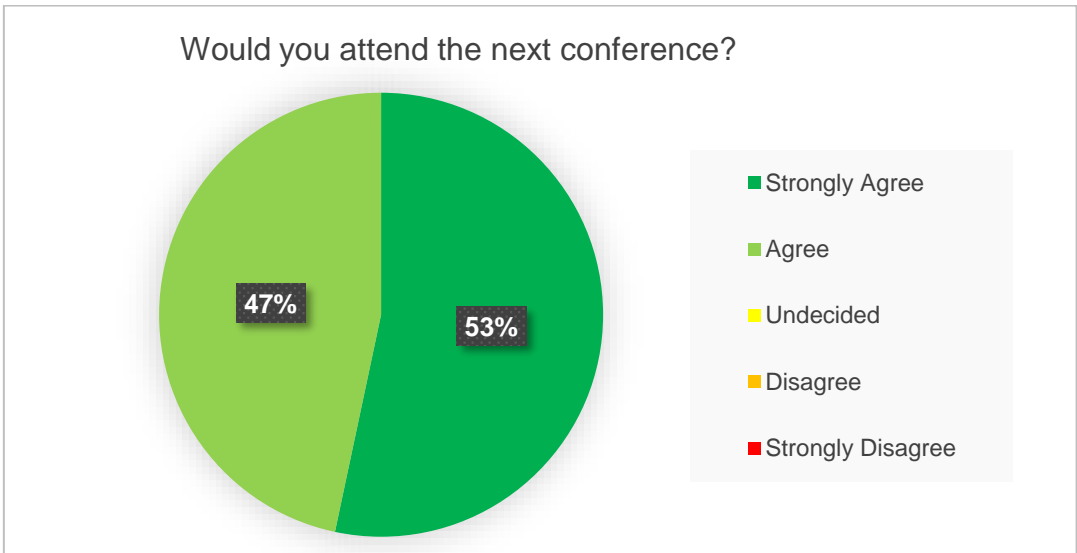
Question 5: What could we improve for the conference?

While some respondents felt the conference was fine (27%) and some gave no response (20%). The improvements suggested, in order of frequency are:

- The conference was too long or too many speakers were booked. (20%)
- Provide a place for all key information about air quality, useful contacts and what can be done by the community to combat poor air quality. (13%)
- Ask for written questions prior to the conference. (13%)
- Ensure all key speakers are available. (7%)

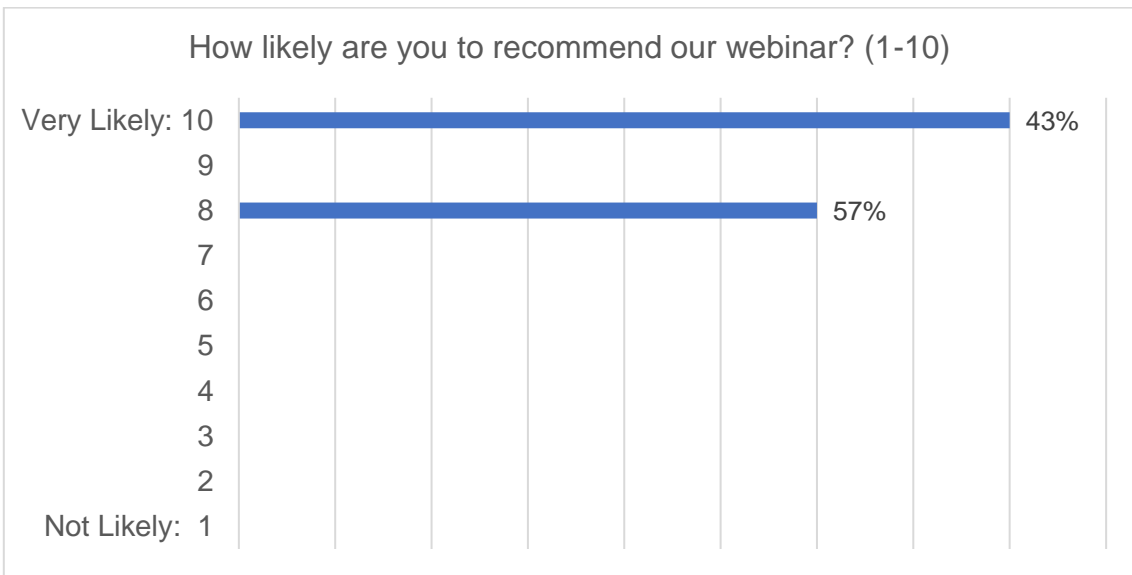
Question 6: Do you plan to attend the next conference?

All respondents agreed that they would attend the next conference.



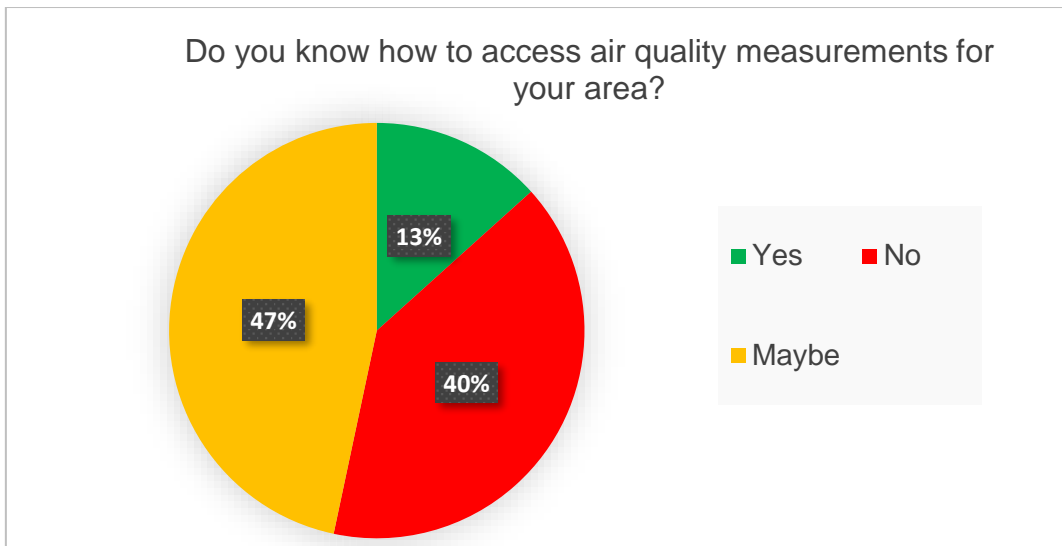
Question 7: How likely are you to recommend our webinar? (1-10)

On a scale from 1 – 10 all respondents said they were likely to recommend the webinar.



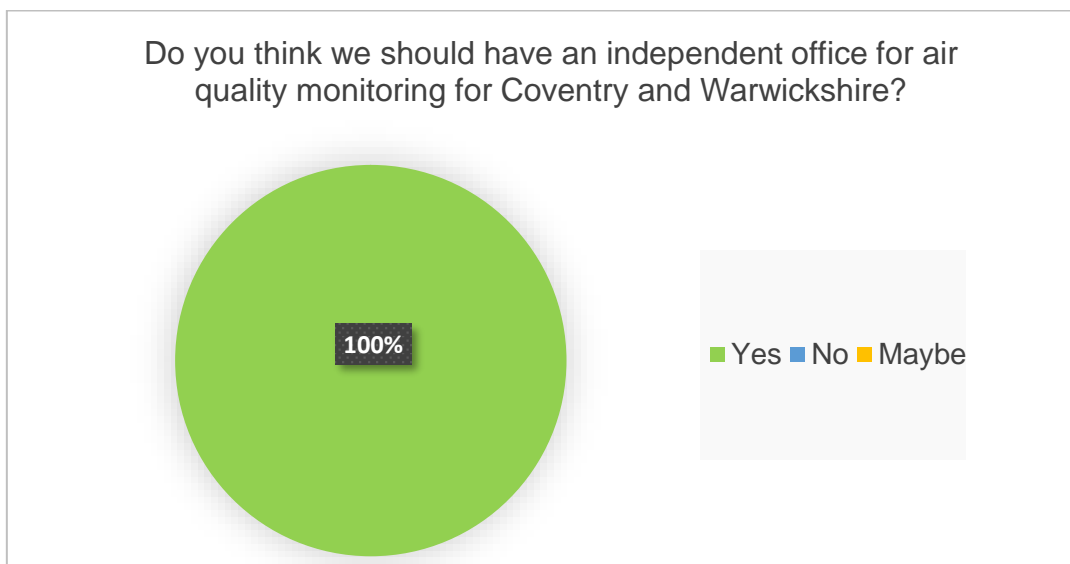
Question 8: Do you know how to access air quality measurements for your area?

Most respondents were unsure or did not know if they could access the air quality readings for their local area.



Question 9: Do you think we should have an independent office for air quality monitoring for Coventry and Warwickshire?

All respondents agreed that we needed an independent office for monitoring air quality in Coventry and Warwickshire.



Question 10: Is there anything else you would like to share about the conference?

While 33% of respondents provided no feedback to the question. These are the results from those that provided feedback.

- We ideally need an independent AQ office at a national scale not just for Coventry and Warwickshire.
- Excellent Conference. I agree with the last speaker Kings Hill is an example of how we could produce an example a perfect green future.
- The biggest issue seems to be lack of cooperation from the councils, especially in relation to planning issues. The officers and money rule.
- It was useful and thought provoking for an area where a school is about to be built directly next to a new bypass!

- For as far as I was able to follow (as I was working at the same time), I had the impression everybody was very engaged, and this was very positive of this seminar. Also, it connected the people in it to work together in the future, which we need to do urgently.
- Thank you for a very interesting morning.
- Now everyone at the conference is aware of the issues we need to find a way to get it out to the general public.
- Coventry politicians were largely absent, so opportunity lost to influence them.
- Still learning how to use Zoom and couldn't take a full part in it but still found it useful.

ADDITIONAL WRITTEN FEEDBACK

Cllr Angela Fryer:

- Thanks. Excellent day and learned a lot.
- As Finham Parish Councillor finds local plan for the area wrong. Need for extending green areas and protected trees and hedges.
- Diffusion tube discussion very important as CCC have not taken independent readings of air quality levels. They use the developer reading which they have found incorrect.
- Wishes for the slides to be made available to aid in explaining the issues raised during the conference to the Parish Council.

William Harris:

- Interesting conference. While a little chaotic and overlong. It's a problem that needs a good airing.
- Enjoyed presentation about trees and felt it was a doable strategy which would make a significant difference, particularly in the Coventry city centre.
- Found the presentation from the Coventry transport planner useful but wishes for further transparency and engagement with the public.
- After viewing Prof. Ziarati's paper and listening to the Nuneaton's green councillors' comments, feels Coventry and Nuneaton are inaccurately reporting air quality. As well as putting too much focus on the legal issues surrounding NO² rather than other emissions.
- Brings forward need for a campaign to encourage drivers to switch off their engines when vehicles are stopped.
 - Response: There are several student air quality project groups at Coventry University, the same should be done within Warwick University. C4FF/MarEdu/MariFuture are also working with schools on air quality assessments for their pupils, to engage them in climate action developments.

Cllr Mattie Heaven:

- Thanks. Events like these are very effective and necessary.

Dr Habib Kashi:

- Enjoyed the meeting. Thanks. Attended last year's meeting and wished we had created this forum sooner.
- Is happy to communicate with anyone who wishes to develop this forum further.

Peter Maddock:

- Good conference well organised. Need for accurate and independent measurement and recording.

- Council's consultations lack the health perspective, economic issues are predominant. A balance is required.
- Coventry do not have an Air Quality plan they have a traffic management plan. Trees and open spaces must be part of any solution.

Tony McNally: - Congratulations a successful conference.

Vaughan Owen: - Good Conference and wished to join in.
- Suggests a campaign for a standard to specify the best position for pollution sensors. Research into manufacturers recommendations.
- Notes that government should ensure developments allow for trees and bushes in their green space rather than just grass. Allowing for a counterbalance from household emissions.

Howard Warrener: - Thanks. Range of speakers was excellent and was very informative.

Ann Wilson: - Interesting day and well done all.

QUESTIONS-

There were many questions asked by our panellists and audience they can be broadly grouped into sections covering:

- Links between travel and air quality
- The reporting and monitoring of air quality
- The impact of trees in relation to air quality
- The impact of COVID on air quality
- Alternative technologies
- Health impacts due to air quality

For full list of questions see Appendix.

APPENDIX-

All questions asked during the CW-AQPC 2020 Online Conference.

Questions relating to travel and air quality

- Is the government considering scrappage of old vehicles in exchange for public transport credits as well as for the purchase of new vehicles?
- Is the EV loan available to businesses in Tile Hill for example?
- The technology to recognise the vehicles and charge them isn't there yet, how will you deal with that?
- What is Coventry City Council doing to engage with local employers, like one of its two universities, to nudge them to reduce the air travel of their staff?
- If the way we work is fundamentally changing, is HS2 still relevant? As businesses are waking up to different ways of working, I don't see how the business case stacks up (if it ever did)?
- People using cars by default is very much due to driving being a cultural norm. The effect is that cyclists and pedestrians are very much second-class citizens in the collective consciousness. Whilst segregated bikes lanes etc are essential and very welcome, a nationwide change of attitude would dramatically affect the take up of active transport. Are there plans to try to tackle this via "marketing" or getting a new message out there that walking/cycling is the best/nicest way to travel?
- How successful has the CCC scheme of lending electric cars to people (i.e local traders) been and has it been taken up?
- Will there be a charging zone scheme or a ban from roads that register as suffering from bad pollution in CCC district?
- Can money be spent on improving cycle lane infrastructure, connecting existing lanes together.

Questions relating to air quality monitoring and reporting.

- Will Coventry 2021 present any special challenges to CCC in terms of air quality and, if so, how do you plan to deal with them?
- How is the modelling for future years being validated? The DfT's Pollution climate Model [PCM] considerably underestimates the actual measured levels in the base years. If it is underestimating, how can we have confidence that the solutions proposed will actually get pollution levels down to breathable levels?
- Different maps have been presented by Atkins of areas of pollution exceedance. It looks like the most favourable one is being put online and the worse ones are not published. Are you giving us the fair and full picture?

- At one conference I heard that Plume offered an air quality monitoring device that people could buy. What does the panel think?
- Are council's willing to engage with the public more and put more information into the public domain?
- Unless you can accurately monitor what going on with all pollutants and that information is presented accurately, fairly and made available to population. How can you consult the population on solutions if they do not understand the problem?

Questions relating to the impacts of trees on air quality.

- The WMCA has a 4m tree planting project will Kenilworth not participate?
- Nuneaton has No Tree officer, Warwick has no TO, Kenilworth & Leamington are the same. Greenest town in the WMCA is Birmingham with 12 TO's, coincidence?
- Ian, are you involved in WDC's scheme to plant a tree for every resident in the District? If so, what are they doing that others could copy?
- How many trees and woodlands and enormous carbon sink will be lost to HS2?
- Why aren't the local authorities valuing trees in their solutions in air quality action plans?

Questions about COVID-19 in relation to air quality.

- What effect has the air quality on COVID-19 virus in Coventry?
- Any lessons from COVID Lockdown?
- There seems not to have been any changes to plan post COVID is this the case, if not what has changed.

Questions about alternative technologies.

- Given that China is a major source of raw materials for electric vehicles, to what extent should we be considering the geopolitical issues when looking at the merits of electric versus (say) hydrogen?
- Are solar power panels any good these days?
- How do you introduce Hydrogen into the gas system?

Questions about the health impacts relating to air quality.

- The Health case is compelling, but at local level it is overshadowed by Economic arguments, how do we get a stronger Public Health Input?

- When we talk about deaths due to air pollution, can we quantify it in terms of a person-years impact? For example, 100 people living 1 more year is 100 person-years?