



Inhalt

Editorial	1
Why EFCA on ships?.....	1
News from EFCA	3
EFCA Board Meeting 2020 held as virtual meeting.....	3
Ultrafine Particle Online Meeting.....	4
News from EFCA Members	4
How will a return to normality affect AIR QUALITY in Scotland?	4
Clean Air Day 2021.....	6
EPUK Annual Conference 2021.....	6
Biennial Conference of Croatian Air Pollution Prevention Association	6
New European Standards	7
News about Air Quality	7
Schools across Europe share results of their air quality projects	7
Shipping is a significant source of ultrafine particles in coastal areas	7
ZERO POLLUTION - for healthier people and planet.....	8
11th VERT Forum - e-conference.....	9
Calendar	10

Editorial

Why EFCA on ships?

by Andrzej Jagusiewicz, president of EFCA

Nice to cruise over the Mediterranean blue waves with a glass of wine and chatting with friends. But daily, cruise ships worldwide emit as much particular matter as a million of cars and a single large vessel emit over five tonnes of nitrogen oxides (NO_x) and 450 kg of ultrafine particles (UfP) into the air during the operating day. In terms of greenhouse gas emissions (GHG), data show that cruising emits almost four times more carbon dioxide (CO₂) per passenger than flying. However, much more serious environmental impact comes from international ship transport, which accounts for 80 % of global trade volume. Nearly 4 billion tons of goods are currently transported only throughout EU harbours. The world's merchant fleet is composed of almost 100.000 ships, of which 70 % are oil tankers and 13 % container ships. Its total marine fuel consumption, made from the dirtiest dregs of the barrel, is estimated for more than 300 Mt and grows constantly. In terms of emissions, maritime transport emits annually around billion tons of carbon dioxide and it is worthy to know that GHG pollution of the fifteen biggest mega-ships alone is equal to that of 760 million cars. Statistically, international shipping is responsible for less than 3 % of global climate forcer emissions annually. Worse is with other pollutants, let us say classic ones, where shipping is responsible on average for 25 % of the nitrogen oxide emissions (NO_x) and 9% of the sulphur oxides emissions (SO_x). 70% of all ship emissions occur along heavily frequented trading routes connecting ports and are less than

400km from the land. They can be easily transported hundreds of kilometres onshore and contribute not only to the local pollution, but also to the transboundary one. Important is that 85% of all ship pollution is in the northern hemisphere.

The origin of the marine pollution comes from the combustion of fuels in the boilers and motors used as main propulsion engines during cruise, and by auxiliary engines, used to provide power and services within vessels. That is why the volume of pollutants emitted depend primarily on the engine technology and the fuel speciation (bunker fuel oil, marine diesel oil, marine gas oil and gasoline).

What are finally the pollutants? First GHGs covered by the United Nations Framework Convention on Climate Change and then the other classic pollutants mentioned already before, including volatile organic compounds as fugitive emissions. The latter are quite significant, associated with the loading and unloading of bulk liquid cargoes. By chance, the other pollutants are widely covered by the UN/ECE Convention on Long-range Transboundary Air Pollution (The Air Convention), although not yet ships as their emitting sources. A quick look into the Air Convention and its protocols reveals the following mandatory requirements taken from the Amended Gothenburg Protocol (AGP):

- Limit values for emissions of sulphur from stationary sources
- Limit values for emissions of nitrogen oxides from stationary sources
- Limit values for emissions of volatile organic compounds from stationary sources and finally
- Limit values for fuels and new mobile sources.

On ships, the propulsion engines do not differ from that used on land and thus the Air Convention's requirements remain valid for ships. Just we miss an annex on emissions from ships in AGP. Shipping is a global business and ship emissions must be regulated globally, while the Air Convention is not yet a global treaty. Fortunately, there is the agency of the United Nations, in case the International Maritime Organization (IMO), mandated already with responsibility not only for the safety and

security of shipping, but also for the prevention of marine and atmospheric pollution by ships.

IMO must create the global standards or environmental performance of international shipping, which can be worldwide adopted and implemented. For this purpose, it uses the International Convention for the Prevention of Pollution from Ships adopted in 1973 (the MARPOL Convention). So far, it is worthy to mention one effective standard, called « the 2020 Sulphur Cap » to ensure that ships use onward fuel with sulphur content of not more than 0,5 % compared to 3,5 % as of before.

Also, as a success is the creation of emission control areas (ECAs) for sulphur emissions (SECAs) and nitrogen oxides (NECAs) along the coasts. IMO has designated the Baltic Sea and the North Sea as SECA more than a decade ago and just recently as NECA starting from the beginning of 2021. Ships on these areas must comply with stringent standards e.g., sulphur content in SECA of not more than 0,1 % and use of control technology for NO_x emissions in NECA by some diesel engines. In general, a good quality fuel and stricter emission limit values for these pollutants must be observed in SECA and NECA when cruising, hoteling/docking and or manoeuvring in ports.

Needless to state that ECAs have an important impact on inland air quality and so far, have contributed to saving thousands of lives. And do not forget about the benefits of the EU legal framework, primarily the CAFE Directive setting air quality standards and the Industrial Emissions Directive imposing strict emission limit values for most of polluting sources, also existing on ships. Both directives may incite port authorities to act on their ambient pollution by greening their activity deployment, force the ship owners to reduce emissions at berth and finally invest into pro-environmental infrastructure such as LNG storage, electricity supply to the vessel to turn off the auxiliary engines or shore- or barge-based exhaust cleaning systems for ship emissions.

To sum-up, a large variety of efficient control techniques for ocean- or sea-going ships as well as for ports do exist and they are commercially

available. Although, needless to add that speed reductions are the easiest and most effective way to lower emissions, particularly those of carbon dioxide. Regardless the oil prices, so called « slow steaming » makes therefore sense not only environmentally but also economically.

The only problem is how to make synergy between IMO and its MARPOL Convention, the EU Directives, and the Protocols of the UN/ECE Air Convention.

The response seems to be quite evident. First, the long-term strategy for the Convention (2020–2030 and beyond) is enough flexible and wide to find a common approach on ships and serve as a frame.

Second, the decision to review the Amended Gothenburg Protocol has been adopted at the 39th session of the Executive Body (EB) in December 2019 and some preparatory works are already going. Just to mention, the work to assess information on emission abatement technologies for the reduction of air pollutant emissions, from shipping activities carried out by CITEPA within the new mandate of TEFTEI. Thirdly, the Global Forum for air protection worldwide has been launched at the same session of the EB and may easily include ships. Just one step to get an annex to the Re-amended Gothenburg Protocol (RGP).

The Annex, which will be sufficient, innovative in terms of alternative fuels and propulsion systems, effective on recommended control techniques, cover all ships and all operating moods regardless the ship location. Only then, it could harmonize local and international regulations so far introduced throughout maritime history and considered inadequate.

Finally, why EFCA on ships? It is quite simple. Because EFCA would like to contribute to the challenge and prepare a thematic session within “Air Protection 2021”, traditional biannual conference organised by the Croatian Air Pollution Prevention Association (CAPPA) on Istria in mid of September. Needless to add, that EFCA has always indicated the shipping sector as an aggressive source of UfP emissions and called for adequate response. Let us hope that the session could contribute to frame a policy proposal on controlling

emission from ships at least in the UN/ECE region and on the EU regional seas.

Time is running short as progress in energy storage may sooner or later transform shipping in carbon-neutral sector and pave the way for e-ships.

Utopia? Not at all, the “Ampere” the first e-ferry born in Norway lowers already its emissions by 95 % and costs by 80 %.

News from EFCA

EFCA Board Meeting 2020 held as virtual meeting

by Thomas Reichert, EFCA

On November 6th 2020, the EFCA Board held its annual meeting online. The meeting was necessary due to the ending election period for the presidency and the transfer of the secretariat and registration of EFCA to Pfingsttal, Germany, which is the location of the member GUS e.V.

The important decision to transfer the seat of EFCA was taken using a written voting procedure to reach the necessary quorum, and was reached unanimously. The President warmly thanked Joop van Ham for his many years of hosting EFCA in Delftgauw, The Netherlands. He gave his best wishes to the member association GUS and to Sabine Aref for running EFCA in a challenging future.

The next important topic was the election of the EFCA President for the upcoming three years. Andrzej Jagusiewicz from our Polish Member PIGE was re-elected unanimously as EFCA President. The assembly thanked Andrzej sincerely for his work over the past years and wished him continued success in leading EFCA.

In the second election, Gordana Pehcec from the Croatian Member CAPPA was elected as vice-president, succeeding Vladimira Vadjic, who was retired. The president thanked Vladimira for her outstanding contribution to EFCA over the last decades. It is a great pity that we cannot honour

Vladimira at present. We hope to have the opportunity to do so soon.

In the final election, past-president Thomas Reichert was elected as the new treasurer of EFCA. The President was pleased by this decision and considers that the treasury management and the secretariat are in safe hands within GUS. Meanwhile, the budget transfer of EFCA's reserve from Delfgauw to Pfinztal was finalized and EFCA obtained a new bank account. With regard to the COVID-19 pandemic, the assembly agreed to reduce the membership fees in 2020 to the minimum.

Ultrafine Particle Online Meeting

Announcement from EFCA: Ultrafine Particle Meeting (KIT)

Due to the pandemic situation and its impact on planning and scheduling of conferences and gatherings in 2021 the traditional Ultrafine Particles Symposium, held in Brussels every second year, will be postponed to 2022. But to maintain the scientific and societal contact and exchange on that issue a very condensed three-hours online meeting of the community will be organized free of charge. Meanwhile all around the globe there is now enough experience with digital tools for teaching and conferencing. Nevertheless, this online meeting 2021 does not replace the Symposium in presence. The scientific focus of the 2021 online meeting will be on traffic and energy related sources of ultrafine particles, and mechanisms of the impact of ultrafine particles on the brain and the lungs. Exposure effects of recent lockdown episodes will be assessed.

<https://efca.net/?p=719>



EFCA



News from EFCA Members



How will a return to normality affect AIR QUALITY in Scotland?

*by John Bynorth, Policy and Communications Officer;
Environmental Protection Scotland (EPS)*

SCOTLAND is on course to resume the kind of normality not seen since before Christmas as COVID-19 deaths recede, but what effect will this have on air quality?

Over two million of Scotland's 5.4 million population have received at least one of their two vaccinations against the virus. The number of hospital admissions and deaths have declined to record lows.

On April 26th, Scotland's First Minister Nicola Sturgeon permitted shops, restaurants and bars to reopen, up to six people from two different households to meet up outdoors, and allowed people to travel anywhere in the UK for first time since mid-December. This will no doubt lead to large increases in the numbers of private vehicles on our roads, which is a concern for air quality, as road transport sources contribute to more than one-third of NO_x emissions in Scotland.

In the first COVID-19 lockdown that began in March 2020, streets that would have normally been busy with cars, vans and lorries in Edinburgh, Glasgow, Aberdeen and Dundee became deserted. Car journeys across the UK fell by 70 per cent at the start of the first COVID-19 lockdown in 2020 and contributed to large decreases in NO₂ in nearly all of the major cities in the United Kingdom. Ricardo Energy & Environment¹, which monitors air quality from roadside and other sites across the UK, found overall reductions in NO_x during the first few months of lockdown of almost 50 per cent, with the biggest increases in urban areas. It said the figure was incrementally higher, at 58 per cent, at its roadside air monitoring sites.

Ricardo's NO₂ figures also revealed a 40 per cent reduction during the first few weeks of the 2020 lockdown. However, the picture is more complex when other pollutants are examined. There were rises in O₃ in urban areas, although measurements of PM_{2.5} were slightly down in urban areas.

Transboundary air pollution too remains an important factor in Scotland due to its proximity to continental Europe. NO_x reductions in Europe as factories shut, people stayed at home and cities witnessed road transport reductions impacted on O₃ and PM_{2.5} levels in Scotland during 2020.

Transport Scotland, the public agency responsible for roads, publishes weekly analysis of the data about people's travel modes. It recently published data that showed car journeys were 20 per cent lower than during the same period before the pandemic began. It is expected to publish data in the next few days following the lifting of the latest restrictions.

People in Scotland have endured more than a year of differing levels of restrictions, and it is understandable they will want to drive to see friends and relatives they have not seen several months. However, care is needed to ensure that we do not end up with thousands more possibly older, more polluting diesel and petrol vehicles on the roads. People may delay upgrading their vehicles from the most polluting, older vehicles with less efficient emissions as they face uncertainty over their jobs. If that happens, there is a risk having more of the most polluting vehicles on our roads at a time when a ban on the sale of new petrol and diesel cars is to be imposed from 2030 in the United Kingdom.

Last year UK Air Quality Expert Group, which supported by the UK Government's Department for Environment, Food and Rural Affairs (DEFRA), issued a call for evidence about the air quality impacts of the first COVID-19 lockdown.

Among the submissions to the evidence call was a report by Ricardo, which suggested that the effect of having more older, more polluting, vehicles on the roads could offset a reduction in emissions expected due to lower traffic levels.

But do people have the confidence to return to public transport amid fears they may catch COVID-19? The Scottish and UK governments have been propping up the private sector railway, bus ferry and bus companies with millions of pounds during the pandemic to keep services running.

There is early evidence that people do indeed have the confidence to return after the technology company Apple began sharing its 'mobility data' from people's devices with governments to help them plan for the recovery.

The Guardian² newspaper reported on April 30th records of requests to the 'Apple Map' service for directions to bus services and shows the number of trips taken on UK roads and public transport had increased to the highest level since summer 2020 in the last month.

So although rail journeys remain 80 per cent lower in Scotland compared to pre-pandemic levels, once the full effect of the easing of lockdown restrictions eases there is an expectation that use of public transport will rapidly rise.

This could only be good news for air quality as bus companies have invested millions of pounds in the latest generation of Euro VI buses to comply with Low Emission Zones planned for Edinburgh, Glasgow, Dundee and Aberdeen and need to start seeing a return on their investments.

In 2021, Aberdeen³ introduced the world's first hydrogen powered 'double decker' bus and a campaign to encourage people back onto buses post-COVID-19 will cut car use and benefit the environment, making cities more pleasant, less congested place to live and work. With a shift from public transport powered by fossil-fuel based vehicles to electric and hydrogen power and walking and cycling, now we have to 'lock-in' those 'lockdown' improvements in air quality.

Environmental Protection Scotland – EPS - is coordinating Clean Air Day in Scotland on behalf of the Scottish Government on 17th June.

Further reading:

1. <https://ee.ricardo.com/downloads/air-quality/life-after-lockdown-%E2%80%93-exploring-what-can-be-learned-from-the-impact-of-covid-19-on-air-quality>

2. <https://www.theguardian.com/business/2021/apr/30/uk-economy-rebounds-as-hopes-grow-for-end-to-covid-crisis>
3. <https://news.aberdeencity.gov.uk/worlds-first-hydrogen-double-deckers-to-start-their-routes-tomorrow-in-aberdeen/>



Clean Air Day 2021

by John Bynorth, Policy and Communications Officer; Environmental Protection Scotland (EPS)

Clean Air Day is taking place across the UK on Thursday June 17th.

Hundreds of organisations, including schools, communities and businesses are set to take part in the fifth national annual air quality campaign.

Environmental Protection Scotland (EPS) is coordinating the event in Scotland once again on behalf of the Scottish Government.

Clean Air Day in Scotland last took place in October 2020, and involved over 140 organisations and individuals which participated mainly in 'virtual' activities on social media due to the pandemic. The campaign urges people to consider a low polluting form of activity, such as cycling and walking, instead of using the car; use quieter, less polluted side streets whilst walking or cycling and to consider the purchase of an electric vehicle.

As we return to our normal daily lives, Clean Air Day will ask people to take the opportunity to build a healthy environment for our children.

<https://www.cleanairday.org.uk/>



EPUK Annual Conference 2021

Source: <https://www.environmental-protection.org.uk/events/>

The theme for our 2021 Conference reflects the importance of action at local level to deliver on climate protection and the need to harmonise this with action on air, noise and land quality. There will be a keynote address on the benefits of a combined approach to climate and environmental protection. Professor Jim Longhurst will provide an introduction and overview of the day.

This year it is planned to have two special sessions on priorities for: local action on environmental protection and climate change and on lessons learned for environmental protection from the Covid-19 pandemic.

<https://www.environmental-protection.org.uk/event/epuk-annual-conference-2021/>



Biennial Conference of Croatian Air Pollution Prevention Association

by Gordana Pehnec, CAPPA

The Biennial Conference of the Croatian Air Pollution Prevention Association (CAPPA) will be held this year from 15th to 17th September as a mixed in-person and online meeting. It is open to EFCA members, and it is planned that there will be an EFCA sponsored session on emission from shipping. This will be in English and other sessions will have English language interpretation if necessary. Details of the meeting will be on the EFCA and conference website.

Informations soon on www.huzz.hr



New European Standards

by Rudolf Neuroth, VDI

- EN 16429:2021, Stationary source emissions – Reference method for the determination of the concentration of gaseous hydrogen chloride (HCl) in waste gases emitted by industrial installations into the atmosphere
- prEN 17628:2020, Fugitive and diffuse emissions of common concern to industry sectors – Standard method to determine diffuse emissions of volatile organic compounds into the atmosphere
- FprCEN/TS 17638:2021, Stationary source emissions – Determination of the mass concentration of formaldehyde – Manual method

www.vdi.de/krdl

News about Air Quality

Schools across Europe share results of their air quality projects

Source:

<https://www.eea.europa.eu/themes/air/urban-air-quality/cleanair-at-school>

More than 100 schools from eight European countries participated in the citizen science CleanAir@School initiative, organised by the European European Agency (EEA) and the European Network of the Heads of Environmental Protection Agencies. The results describe how schoolchildren measured pollution levels, learned about air quality and promoted actions for cleaner air.

The EEA and the European Network of the Heads of Environmental Protection Agencies (EPAs) organised CleanAir@School, a citizen science initiative to monitor air quality. From 2018 to 2020, pupils, teachers and parents engaged in the project used simple, low-cost devices to measure nitrogen dioxide (NO₂) levels around their schools. NO₂ is one of the key air pollutants harming human health

in Europe. Its main source is road transport and it is therefore a problem especially in urban areas.

Air quality was monitored using so-called passive NO₂ samplers, with one sampler on the road at the front of the school and one in a less polluted area such as the school backyard. School children in the eight participating countries measured pollution levels around their school, learnt about air quality and ways to improve it and made posters and videos.

The school projects also explored ways to promote walking, cycling and the use of public transport to get to school as an alternative to coming by car.

Aside from this educational aspect, the CleanAir@School initiative tested how citizen science might complement official air quality monitoring data. At a European level, such approaches support the zero pollution ambition and the efforts to promote the wider use of citizen science to complement environmental reporting and encourage citizens' engagement in air quality issues.

<https://www.eea.europa.eu/themes/air/urban-air-quality>

Shipping is a significant source of ultrafine particles in coastal areas

Source: <https://airmodus.com/shipping-ultrafine-emissions/>

Despite stricter regulations and lower fuel sulphur content, ships still emit considerable amounts of ultrafine particles. This was proven by scientists from Tampere University, FMI and VTT measuring at sea and in engine laboratories.

“Shipping is the main source of anthropogenic particle emissions in large areas of the globe, influencing climate, air quality, and human health in open seas and coast lines. Here, we determined, by laboratory and on-board measurements of ship engine exhaust, fuel-specific particle number (PN) emissions for different fuels and desulfurization applied in shipping”.

The research team measured emissions from a marine engine operating on low-sulphur fuels, natural gas, marine gas oil and marine diesel oil. They defined the particle number emission factor, size distribution down to 1 nm (1.2–414 nm) and volatility, electric charge, morphology, and elemental composition of the particles. The fresh exhaust particle size distributions were always bimodal, for all the fuels, with the nucleation mode concentrations much higher than the soot mode. Total particle number emission factors were of the order of $3 - 7 \times 10^{15} \text{ \#/kWh}$. Emissions of the test engine were lowest for natural gas and highest for marine diesel oil. The researchers showed that combustion of liquid fuel generated 4–12 times higher soot mode particle emissions than combustion of natural gas, and that lower engine load (40%) that is typical for harbour areas caused higher total particle number emissions than a higher load (85%).

The researchers further compared emission factors to ship exhaust plume observations and estimated global aerosol particle number emissions from shipping. The research indicated that most particles in the fresh ship engine exhaust are in ultrafine particle size range.

Shipping emissions are localized and observed close to coastal lines, but emissions are significant also on open seas and oceans.

“The global annual PN produced by marine shipping was $1.2 \times 10^{28} (\pm 0.34 \times 10^{28})$ particles in 2016, thus being of the same magnitude with total anthropogenic PN emissions in continental areas. The reduction potential of PN from shipping strongly depends on the adopted technology mix, and except wide adoption of natural gas or scrubbers, no significant decrease in global PN is expected if heavy fuel oil is mainly replaced by low sulphur residual fuels.”

The research indicates that marine engines remain a significant source of anthropogenic aerosol particle number emissions, mostly due to the nano-sized particle emissions. Ship emissions should be considered in climate and health impact assessments. <https://airmodus.com/>



ZERO POLLUTION - for healthier people and planet

European Commission announcing EU Green Week 2021; 1st-4th June 2021

Source: <https://www.eugreenweek.eu>

Pollution affects everybody – through the air we breathe, the water we drink or the land we grow our food on. It is the largest environmental cause of multiple mental and physical diseases, and of premature deaths, especially among children, people with certain medical conditions and the elderly. But pollution does not affect everybody equally. People who live in more deprived areas very often live close to contaminated sites or in areas where there is a very high flow of traffic. Pollution is also one of the main reasons for the loss of biodiversity. It reduces the ability of ecosystems to provide services such as carbon sequestration and decontamination.

Nevertheless, it can be prevented. The EU Action Plan toward a Zero Pollution Ambition is a key action of the European Green Deal scheduled for spring 2021. It will help to create a toxic-free environment across the EU by better monitoring and, reporting, and by preventing and remedying pollution from air, water, soil, and consumer products.

It will also support the post-COVID 19 recovery by helping to rebuild a more sustainable EU economy, creating job opportunities and reducing social inequalities. The European Green Week 2021 will be dedicated to the ‘zero pollution ambition’. It will also look at other relevant European Green Deal initiatives, such as the climate initiatives, the upcoming Chemicals Strategy, as well as initiatives in the fields of energy, industry, mobility, agriculture, fisheries, health and biodiversity.

EU Green Week 2021 will be an opportunity to engage with all stakeholders and interested citizens on how we can work together to make the ambition for a zero pollution and toxic-free environment a reality.

If you have any questions write to ENV-GREENWEEK@ec.europa.eu

Source: <https://www.eugreenweek.eu>

11th VERT Forum - e-conference

Technologies and Policies towards Zero-impact Combustion Engines

The 11. VERT Forum was organized on March 25th 2021 as a virtual conference. This Forum made public how the industry can support the society with best available technology to clean the breathing air not only from soot nanoparticles but also from viruses. All presentations are available for download on <https://www.vert-dpf.eu>.

Calendar



Ultrafine Particles –Air Quality and Climate

2021 May 18th Online Meeting, 2 p.m. – 5 p.m. Central European Time

Registration on: <http://ufp.efca.net/>

See program below.



VDI/DIN-Kommission Reinhaltung der Luft (KRdL)-Activities 2021

www.vdi.de/krdl and www.vdi.de/veranstaltungen



United Nations Economic Commission for Europe

Convention on Long-range Transboundary Air Pollution

Working Group on Strategies and Review, 59th session

2021, May 17th - 20th; Geneva, Switzerland

<http://www.unece.org/info/events/meetings-and-events.html#/>



EU Green Week 2021

ZERO POLLUTION - for healthier people and planet

2021, June 01. – 04. June; Virtual High Level Conference

<https://www.eugreenweek.eu>



Clean Air Day, UK

17 June 2021

<https://www.cleanairstay.org.uk/about-clean-air-day>



International Day of Clean Air for Blue Skies

2021, September 7th

<https://www.un.org/en/observances/clean-air-day>

AIR PROTECTION 2021



12th Croatian scientific and professional conference with international participation

2021, September 15th-17th, Medulin, Croatia

More information soon at: www.huzz.hr

EFCA

President

Andrzej Jagusiewicz (PIGE, Poland)

Vice Presidents

Gordana Pehnec (CAPPA, Croatia)

John Murlis (EPUK, UK)

Past Presidents

Thomas Reichert (GUS, Germany)

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Sabine Aref (GUS, Germany)

Newsletter

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Website: <https://efca.net/>

Ultrafine Particles – Air Quality and Climate

Online Meeting 2021, May 18th | 2 p.m. – 5 p.m. Central European Time

Meeting Organization Information

Due to the pandemic situation and its impact on planning and scheduling of conferences and gatherings in 2021 the traditional Ultrafine Particles Symposium, held in Brussels every second year, will be postponed to 2022. But to maintain the scientific and societal contact and exchange on that issue a very condensed three-hours online meeting of the community will be organized free of charge. Meanwhile all around the globe there is now enough experience with digital tools for teaching and conferencing. Nevertheless, this online meeting 2021 does not replace the Symposium in presence.

Ultrafine Particles

Ultrafine particles (UFP), the Nano fraction of airborne particulate matter, are considered to be causing serious health problems and environmental effects. Combustion is a major source, also by producing volatile organic pollutants which are converted in the atmosphere through photochemical reactions. Increasing applications of man-made nanomaterials add to the problem.

A further interest results from their specific role in atmospheric processes such as cloud formation and precipitation and, in fact, in climate. The relation between UFP and human health and that of UFP and climate are both areas of active research and cross-links between these fields are found nowadays.

Scientific Focus of the 2021 Online Meeting

The scientific focus of the 2021 online meeting will be on traffic and energy related sources of ultrafine particles, and mechanisms of the impact of ultrafine particles on the brain and the lungs. Exposure effects of recent lockdown episodes will be assessed.

Chairman of the Meeting

Thomas Leisner, KIT

Register for Participation

Karlsruhe Institute of Technology | ufp.efca.net

Formal registration is mandatory and the number of participants is limited.



KIT | Karlsruhe Institute of Technology
www.kit.edu



EFCA | The European Federation of Clean Air and Environmental Protection Associations
www.efca.net



GUS | Gesellschaft für Umweltsimulation e.V.
www.gus-ev.de



CEEES | The Confederation of European Environmental Engineering Societies
www.ccees.org

Ultrafine Particles – Air Quality and Climate

Online Meeting 2021, May 18th | 2 p.m. – 5 p.m. Central European Time

Program

- 13.45** Opening of the ZOOM conference room
- 14.00** Welcome and Introduction | *Thomas Leisner, Chairman of UFP, KIT*
- 14.05** Greeting address | *EFCA President Andrzej Jagusiewicz*

Session 1: From emissions to impact | Session Chair: Harald Saathoff (KIT)

- 14.15** Effect of alternative fuels on UFP emission of aircraft
Prem Lobo, National Research Council, Canada
- 14.40** International Airports as Major Source of Ultrafine Particles in Urban Areas
Constantinos Sioutas, University of Southern California, USA
- 15.05** Lung toxicity of UFP and nanomaterials: Mechanistic insights | *Andrea Hartwig, KIT*
- 15.30** Quick Break

Session 2: Neuronal effects & discussion | Session Chair: Flemming Cassee (RIVM)

- 15.40** Interaction of UFP and the Brain | *Katja Kaninen, University of Eastern Finland*
- 16.05** UFP, neurotoxicity and neurodegeneration
Roel Schins, Leibniz Research Institute for Environmental Medicine, Germany
- 16.30** Open Discussion – Questions from Chat | *All Participants*
- 16.55** Closing remarks | *Karl-Friedrich Ziegahn, KIT*
- 17.00** End of Meeting

Meeting Organizing Committee

Symposium Chairman

Thomas Leisner | Institute for Meteorology and Climate Research, Karlsruhe Institute of Technology, KIT, Germany

Organizing Committee

Flemming Cassee | Dutch National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands

Thomas Reichert | Fraunhofer ICT and EFCA, President of CEEES, Germany

Karl-Friedrich Ziegahn | Karlsruhe Institute of Technology (KIT) and President of GUS, Germany

Harald Saathoff | Karlsruhe Institute of Technology (KIT), Germany

Klara Langer | Karlsruhe Institute of Technology (KIT), Germany