

Episode 30 A

Aims of Episode 30, and Wendy and the West Coast

September 3, 2022. Mary, Noel, Wendy, Cameron, Audrey, Zach, Island, Gerda, Nasha, and Ishan decide to view the news through the lens of historical PM 2.5 monitor data and decide whether news showing decisions made and actions taken are done in recognition of the true level of particulate pollution in the air of near neighbors experiencing residential wood burning. Each of the ten believes decisions about residential wood burning should be made recognizing first and foremost the level of particulates generated by residential wood burning that threaten human health and life of near neighbors, since residential particulate pollution is hyper-localized, but like industrial wood burning threatens further escalation of climate change. Wendy noted that the prohibition in Arizona against wood burning included prohibition against use of indoor residential fireplaces. Wendy noted that on September 1, 2022, wood burning in residential fireplaces, chimeneas, outdoor fire pits, and similar outdoor fires is prohibited in Maricopa County. This includes individuals and businesses which have burn permits for open burning. Wendy noted that an Arizona article said 'Toasted skin syndrome' is a real condition from the age of wood-burning stoves, and another reason you shouldn't use your laptop as a laptop computer resting place. Wendy noted that an article about California was not about residential wood burning. Wendy noted that in California, in San Diego a beach bonfire ban would ban all wood burning fires not within city-installed fire pits. A letter to the editor states this would affect local businesses. Wendy noted that an article about the State of Oregon was not about residential wood burning. Wendy noted that, in Benson County in Oregon, a wildfire smoke preparation reminder was issued.

Episode 30 B

Mary and Georgia hyper-localized PM 2.5 monitors

Mary noted that this fight against industrial wood production producing wood dust in Georgia and producing particulates from wood burning in the U K is not a fight specifically about residential wood burning. However, news of particulate pollution in Georgia as a side effect of producing wood pellets is related to residential wood burning, because the pollution in both cases is from wood, and in both cases is PM 2.5 pollution. In Georgia, an activist urges people to buy PurpleAir PM 2.5 monitors with which to educate themselves. Wood burning is wood burning, whether it is on an industrial scale or on a residential scale. The difference is that particulate pollution is usually hyper-localized, and only those closest to the dust production or the particulates emitted from burning have the highest levels registered on PM 2.5 monitors. The quote about the "right to life, liberty and the pursuit of happiness, but how can we pursue happiness when we struggle to breathe?", resonates with neighbors of residential wood burners. The fact that one neighborhood is being pummeled and other communities can ignore the harm because they are not being affected to an equal extent, also resonates. The background of this fight in Georgia is that a group of residents and environmentalists are fighting to prevent the world's largest wood pellet plant from coming to a predominantly Black and Hispanic community in South Georgia. The Southern Environmental Law Center and Concerned Citizens of Cook County are asking a judge to revoke an air quality permit for the planned Adel plant on the grounds that the state Environmental Protection Division (E P D) did not take into consideration the serious health risks that the pollution would pose to those living closest to it. "It produces a ton of dust in this fine particulate matter that when you breathe it in can be dangerous," said Jennifer Whitfield, an attorney for the environmental law center. Treva Gear, a local native who founded Concerned Citizens of Cook County in 2020, said "Clean air is a civil right and the color of an individual's skin, their economic level or what side of railroad track they live on should not cause them to be overburdened by pollutants," Gear said. "Everybody has the right to life, liberty and pursuit of happiness but how can we pursue happiness when we struggle to breathe?" Madison County Clean Power Coalition is galvanizing people to submit comments to the E P D and participate in virtual public hearings on Aug. 30 for permits requested for two Georgia Renewable Power's plants. The E P D permit would cover emissions thresholds for sulfur dioxide, nitrous oxide, volatile organic compounds and carbon monoxide. Gina Ward, a leader of Madison's clean power group, says this is another way to inform the plant owners and local leaders that the people keep a watchful eye over the pollution coming from plants. Before the wood pellet plant opens in Cook County, Ward recommends residents get outdoor air quality monitors. While wood-generated electricity is not economically feasible in the U.S., it is more attractive in Europe where there are incentives for using this type of energy, Whitfield said. Whitfield argues that the air quality standards used by the E P D in Cook County violate the law and do not accurately reflect the harm to those who live closest to the plants. "They might say how does this one facility in this county affect the countywide air," she said. "What we want is for them to look at it on a smaller scale and think about why its this neighborhood that's just getting pummeled "

Episode 30 C

Mary and Iowa and North Carolina

Mary noted that an article is about open wood burning being banned, so this is not an article about residential indoor wood burning. Mary noted in Iowa, the city of Fairbank brush site at the end of Grove Street is too close to town to have open-burning there, the Iowa Department of Natural Resources wrote to the Mayor Pro Tem of Fairbank in an August 8th cease-and-desist letter.

Mary noted that the PM 2.5 exposure which is shown to cause harm in a statistical study of hemodialysis patients is just above what the E P A may lower its standard to after November 2022, 8 micrograms per meter cubed, to be closer to the World Health Organization standard of 5 micrograms per meter cubed. Mary noted that a National Kidney Foundation Study concluded that Long-term ambient PM2.5 exposure was associated with Cardiovascular Disease (C V D) outcomes among patients receiving maintenance in-center Hemodialysis (H D). Stronger associations between long-term PM2.5 exposure and adverse effects were observed among patients who were of advanced age, had Chronic Obstructive Pulmonary Disease (COPD), or were Asian. Exposure to particulate matter with a diameter of 2.5 microns (PM2.5) has been linked to [chronic kidney disease](#), [hospitalization](#), [poor transplantation outcomes](#), and [early death](#). Recent research finds that these air pollutants increase the risk for both fatal and nonfatal cardiovascular events in patients receiving hemodialysis.

Using 2011-2016 data from the US Renal Data System, investigators identified 314,079 patients receiving in-center hemodialysis (51% aged 65 years or older). They calculated PM2.5 exposure using the zip code of the dialysis clinic attended by each patient. The median annual PM2.5 exposure was 8.7 µg/m³.

Each 1 µg/m³ increment in annual PM2.5 exposure was significantly associated with a 2% increased risk for cardiovascular events and a 2% increased risk for death from cardiovascular causes, Ana G. Rappold, PhD, of the US Environmental Protection Agency in Research Triangle Park, North Carolina, and colleagues reported in the American Journal of Kidney Diseases. “Our findings add to the emerging evidence regarding the association between PM2.5 exposure and outcomes among [hemodialysis] patients and are consistent with previous results in this population,” the authors wrote. A 2021 study published in the American Journal of Nephrology also found that older patients on dialysis who lived in areas with high PM2.5 had higher mortality risk. Each 10 microgram per cubic meter increase in PM2.5 above the regulatory standard of 12 microgram per meter cubed was significantly associated with a 38% increased risk of cardiovascular mortality. In 2020, investigators published findings in the Journal of the American Society of Nephrology showing that [wildfires increase PM2.5 exposure and mortality risks in the hemodialysis population](#).

Episode 30 D

Noel and Massachusetts, New Hampshire and Connecticut

Noel noted that this article about industrial biomass (wood-burning) subsidies ending in Massachusetts was not about residential wood burning. Noel noted that clean-energy advocates are hopeful Massachusetts’ leadership on fighting biomass pollution will drive change in other states and nations. The Bay State recently became the first in the U.S. to end renewable-energy subsidies for electricity from wood-burning biomass power plants as part of a [new climate law](#). Laura Haight, U.S. policy director for the Partnership for Policy Integrity, explained there is a mounting body of science showing woody biomass is bad for the climate and has serious health concerns. “The communities where these biomass power plants are built are frequently low-income communities of color with elevated health burdens, high rates of asthma and other health-related issues because they’re inhaling smoke,” Haight pointed out. “This is not healthy air that comes out of the stacks.” Back in 2012, Massachusetts adopted strict criteria for efficiency and fuels at wood-burning biomass power plants qualifying for the Renewable Energy Portfolio Standard. However, Haight said in 2019, Governor Charlie Baker pushed a proposal which would weaken restrictions and allow polluting power plants from Maine and New Hampshire to sell renewable-energy credits here. “Ratepayers subsidize these renewable-energy credits,” Haight emphasized. “The expectation is that extra money will go towards clean energy, not something that’s more polluting than fossil fuels.” New Hampshire’s governor is opposing new biomass subsidies and Connecticut is restricting eligibility of biomass plants. This fall, the European Union will consider a proposal to prohibit the combustion of primary woody biomass from counting towards renewable-energy goals.

Episode 30 E

Cameron and British Columbia, Canada and Industrial Wood Burning in the U K

Cameron noted that this article about industrial wood burning in the U K with wood provided from British Columbia, Canada, was not about residential wood burning. Cameron noted that, in Vancouver, British Columbia, a policy analyst

was asking the question, will Drax's claim that burning Canadian wood pellets is green go up in Smoke, in the U K? In April 2021, the United Kingdom's Drax Group purchased Pinnacle Renewable Energy, becoming the largest wood pellet-maker in British Columbia and Canada. The acquisition gave Drax control of the majority of pellet mills in the Canadian province of British Columbia, locking up a vital new raw-material supply for its massive thermal electricity plant in North Yorkshire, England. Drax claimed the purchase guaranteed it a "sustainable" supply of pellets from North America (the company holds assets in the southern United States as well) of nearly five million tonnes per year, which would meet roughly two-thirds of its present needs and half of its projected needs as it continues to transition away from burning coal to wood. Drax has long claimed that wood is a "renewable" resource that can be burned at its former coal plants in England for "carbon-neutral" electricity production – an assertion that may land it in hot water with the Organisation for Economic Co-operation and Development. The organization announced in late July it's reviewing a complaint about Drax's carbon-neutral claim. Drax and others involved in the pellet industry portray wood as a sustainable and "carbon neutral" resource. But hundreds of millions of trees are burning down in wildfires the world over, pumping massive amounts of greenhouse gases into the atmosphere, and B.C. is no exception. Claims that forest products of any kind are sustainable let alone carbon neutral is a stretch, especially when the product in question is destined to be burned. The policy analyst concludes by saying "With forests the world over under stress from logging and from climate change, Drax should fully account for every whole log entering its facilities. In its absence, there is a gaping hole in the company's claims to be the world's cleanest, greenest and most virtuous energy producer. "

Episode 30 F

Cameron and Vancouver, British Columbia, Canada residential wood burning restrictions

Cameron noted that an article about Vancouver, British Columbia, Canada was about indoor residential wood burning. But Cameron noted that these rules were not about replacing burning wood for residential heat with clean or cleaner heating methods. The old rules on safe burning still produce harmful levels of particulates. If PurpleAir PM 2.5 monitors were handed out for free to residents and if the data about levels of PM 2.5 in hyper-localized areas from PurpleAir PM 2.5 monitors were recognized as proof of harm to human health and contribution to climate change, the rules could be updated to be actually helpful and relevant. Residents could no longer intend to use wood burning for heat, because they would be fined if they did, and they could be provided with clean and cleaner alternatives to heating with wood. The words "clean burning" and "certified safe" are nonsense when discussing residential wood burning. They are assurances from the wood burning industry that have been proven untrue, time and time again, by PM 2.5 monitors of near neighbors of residential wood burners. This is not really work to improve air quality, it is half-measures to placate residential wood burners who are not taking advantage of the alternatives available to them. The only positive measure is providing the alternative of electric heat pumps in exchange for wood stoves. Special considerations for rural and off-grid residents, as well as for low-income households, for homes where wood is the primary source of heat, and during emergencies, allows people who are under duress to continue to experience the particulate pollution that has been proven time and time again to be hazardous to human health and to the planet. Noel thought it was interesting to note that the announcement included, "Residential wood burning contributes more than a quarter of fine particulate matter emissions across the region. When breathed in, these tiny particles penetrate deep into the lungs and bloodstream and can be harmful to health, particularly for infants, the elderly, and people with diabetes, lung disease, or heart disease. Metro Vancouver operates an extensive air quality monitoring network with 31 permanent stations and one mobile unit. The regional district sets air quality objectives, responds to air quality complaints, and enforces bylaws pertaining to air emissions from industry, businesses, and residences." Cameron wonders if the 31 permanent stations can detect hyper-localized PM 2.5 pollution, as a hyper-localized residential PurpleAir monitor of a near neighbor of a residential wood burner can detect harmful levels of particulates. He thinks the 31 permanent stations only grossly underestimate the hyper-localized pollution that near neighbors of residential wood burners experience.

Episode 30 G

Audrey and an Australian Climate Change Bill Amendment stating that wood burning is not "renewable"

Audrey noted that this article was not about residential wood burning. It was about what kind of wood used in industry would continue to be considered "renewable", or "carbon neutral" and therefore not as harmful as fossil fuel burning, although wood burning produces more particulates than the solid fossil fuel coal burning. Noel noted that as Australia's Climate Change Bill 2022 progresses through the Australian parliament, the Australian Senate Environment and Communications Legislation Committee has recommended the bill pass but with an amendment that the inclusion of electricity generated from native forest wood waste should not be designated as 'renewable'. The "renewable"

classification has been controversial since the federal government of former prime minister Tony Abbott moved to include native forest wood waste as a source of “renewable energy” in 2015. Conservation groups have strongly opposed the use of leftover logging wood for power generation since, claiming it is an incentive to continue cutting down native forests. Moreover, numerous groups globally have pointed out the carbon accounting which deems wood-burning “net zero” or “carbon neutral” is [highly dubious](#) since the practice has [emissions which may rival coal](#). The Australian Senate committee yesterday recognized this, citing the argument that burning biomass, a term used to describe any fuel derived from plants including wood and wood processing waste, as “in direct opposition to the requirements of the [Climate Change] bills to reduce emissions.” “It was argued that the use of biomass for energy generation—particularly from native forests was not only highly inefficient, but was also not ecologically sustainable, a source of greenhouse gas emissions and would destroy valuable forest resources that draw down and sequester carbon,”. Unlike other countries, Australia hasn’t historically relied on biomass for energy, and therefore has [avoided some of the problems which have plagued Europe](#) and the United States, where most woodchips are sourced. Solar and wind, as abundant as they are in Australia, remain intermittent. In 2021, Verdant Earth Technologies bought the mothballed Redbank Power Station in the New South Wales Hunter region. It plans to recommission the 151 MegaWatt power station, now called [Verdant Power Station, to run purely on biomass sourced from local sawmill offshoot, Sweetman](#). That same company, Sweetman, has also entered into a [\\$15 million deal with Singapore’s CAC-H₂](#) to construct Australia’s largest wood-fed hydrogen production plant. Continuing on the hydrogen track, Patriot Hydrogen is putting biomass at the centre of its production plans. [Its P2H units, as they’re named, are essentially modular, hydrogen](#) producing kits which run on biomass, with the company boasting they can be powered up anywhere, anytime. But there is a Push to amend Abbott’s amendment. The Abbott recommendations don’t seem to span the burning of all biomass energy but only that from native forests. But the report does seem to acknowledge the science behind the “carbon neutrality” of wood burning as suspect. Janet Rice, the Greens party spokesperson on forests, said the committee had heard evidence that “destroyed the false claim that biomass from native forests should be classified as renewable energy.”

Episode 30 H

Audrey and the Labor Party contribution to an Australian Climate Change Bill Amendment

Audrey noted that an Australian Guardian article was written examining the Australian Labor Party and Green Party contributions to the Parliament Climate Bill amendment adding that Burning native forest wood waste for electricity shouldn’t be classed as renewable energy. Labor and Greens senators on a committee that has been looking into the climate change bill have called on the Senate to pass the legislation. A Labor-led committee has recommended the government consider changing a controversial law classifying electricity from burning native forest wood waste as renewable energy after the Senate votes for its climate change legislation. The use of wood left over from logging for power generation is opposed by conservation groups, which say it is an incentive to keep felling native forests. The introduction of a transition authority to help communities affected by emissions cuts has been strongly backed by unions and [the Greens](#). Coalition members of the committee released a dissenting report that said the government’s consultation process had “failed to properly account for rural and regional perspectives” and the bill would “invite green activists to abuse our legal system for political purposes, challenging what they class as high emissions projects”. The committee report coincided with the release of the [national emissions data for the first quarter of the year](#). It showed carbon pollution increased 1.5% over the year to March, mainly due to the easing of Covid-19 restrictions. Emissions across the year rose by 7.4 million tonnes, reaching 487.1 million tonnes, due to increased pollution from transport, manufacturing industries and agriculture. Pollution from electricity generation continued to fall as coal power was displaced by renewable energy, but that drop was more than cancelled out by increases elsewhere. The climate change minister, Chris Bowen, said it showed the Coalition had no climate or energy policies and had relied on the pandemic and drought to cut emissions. National emissions were 20.6% below 2005 levels. Most of that fall was due to changes in the pace of land-clearing and the decline of the forestry industry. Emissions across other parts of the economy – particularly fossil fuel industries, but also farming and waste management – were down only 1.4% since 2005.

Episode 30 I

Island and Brighton, U K, and the cost of residential wood burning to human health and the climate

Island noted a news story has some relevance to residential wood burning. Wood burning stoves wood was blamed for the spread of Dutch Elm Disease in Brighton, England.

Island noted that wood burning was viewed as cheaper than other methods of heating by some in the U K. However, Island thought that the long-term effects on human health and the climate were more important yardsticks than short-term financial gain. And if wood became scarce, its price would rise also. The article stated that “Wood burning is on the rise as the E U faces energy price shock. Possible gas shortages this winter are driving public interest in wood-burning stoves. But air quality experts are worried the trend could do more harm than good.” The article was illustrated by a photo of a roaring log fire in Temuco, Chile, in June 2019, for some reason. The article went on to state “Air quality experts have warned a rise in wood smoke this year could have serious health impacts. “

Episode 30 J

Gerda and the September 2022 Press Release of ROBIN WOOD in Hamburg, Germany

Gerda noted that a protest in Hamburg, Germany was against Industrial Wood Burning in power plants, but could have been just as easily against residential wood burning. Gerda noted that in Hamburg, Germany, in June, there was a spectacular protest called Don't burn our forests! There was a Video-projection on the Tiefstack coal plant in Hamburg. Environmental organizations protested against wood combustion and called for a climate-friendly heat transition. This was reported online on September 2, 2022 in a joint press release by ROBIN WOOD, Deutsche Umwelthilfe and N A B U . With a spectacular video-projection onto the Tiefstack coal plant in Hamburg last night, the environmental organizations ROBIN WOOD, Environmental Action Germany (Deutsche Umwelthilfe) and Birdlife Germany (N A B U) protested against burning wood in power plants. Together with an international coalition of non-governmental organizations (N G O), they are calling on Members of the European Parliament to oppose the industrial burning of wood in the upcoming vote on the Renewable Energy Directive (R E D) on September 13th. In addition, the environmental organizations are increasing public pressure on the Hamburg Senate to take action towards a climate-friendly energy transition and to stop all plans to convert the Tiefstack coal plant to wood combustion. Until now, the E U continues to subsidise the burning of wood for energy among member states. However, recent studies show that classifying wood combustion as renewable – and therefore emission-free – is not justified. Burning wood releases at least as much CO₂ per unit energy as burning fossil fuels and offsetting that impact takes decades to centuries. "The industrial combustion of forest wood is not renewable and does not help climate protection. It is high time that the EU Parliament corrects this enormous misconception and adapts the Renewable Energy Directive based on the latest scientific findings. Our forests are already suffering enough due to heat and drought. We cannot offer them up for the combustion chambers of power plants – we must protect them", says Sascha Müller-Kraenner, Executive Director of the N G O Environmental Action Germany (Deutsche Umwelthilfe, D U H). The city of Hamburg is also looking to bolster its carbon footprint by burning wood for energy. As part of a necessary coal-exit, the environmental authority plans to convert its Tiefstack power plant from coal to wood and gas. It will also use industrial waste heat and build two new river heat pumps. "The Hamburg environmental authority claims that only residual and damaged wood will be burnt", says ROBIN WOOD forest campaigner Jana Ballenthien. "But this doesn't solve the problem – burning any kind of wood for energy in power plants is fundamentally harmful to the climate. There are no useless residues in forests. Deadwood is an indispensable habitat, nutrient and water reservoir. Damaged trees, with their genetic memory, are also important to ensure the stability of future forest generations given the strains of climate change. In addition, it is difficult to control whether healthy logs end up in power plants." "Burning forests on a large scale in converted coal-fired power plants is not part of an innovative energy and heat transition, but a very bad idea. Intact forests are essential for climate and species protection. We need investments in real emission-free renewables as well as energy saving instead of counterproductive pretend solutions. The EU must no longer promote energy from forest wood as renewable energy – state support must only be available for truly climate-friendly technologies", says Leif Miller, Director of the environmental organisation Birdlife Germany (N A B U). The environmental organizations criticize the fact that even subsidy programs for "green" district heating, such as the federal subsidy for efficient heating networks (B E W), do not exclude the use of wood biomass. In this way, the federal government subsidizes large-scale industrial wood combustion and sets incentives for operators of heating networks that run completely counter to the goal of climate neutrality. "Wood combustion for energy production must be completely excluded from government subsidies. Otherwise, we are paying to set our future on fire", says Ballenthien. The Twitter hashtag is Stop Fake Renewables.

Episode 30 K

Gerda and the June 2022 Press Release of ROBIN WOOD in Hamburg, Germany

Gerda noted a June 16, 2022 press release titled Hamburg, it's time to phase out coal, gas and wood burning! Joint statement against ongoing climate damage caused by the Tiefstack combined heat and power plant. More than 30

environmental organisations denounce the proposed conversion of the Tiefstack coal plant to fossil gas or wood, both of which cause similar harm to the climate as coal. The signatories demand investments in energy conservation and in climate-friendly renewable energy that must be developed in a socially just, democratic way. The appeal, initiated by ROBIN WOOD, has been signed by German and international N G O and networks, including Environmental Action Germany (Deutsche Umwelthilfe), BirdLife Germany (N A B U), Global Forest Coalition and Save Estonia's Forests. At a press conference scheduled for tomorrow, Hamburg's environment ministry (B U K E A) will be issuing a statement about the coal-phaseout plans for the Tiefstack plant. A further announcement by the supervisory board of the city-owned energy provider, Hamburger Energiewerke (Hen W), on this issue is also expected on 1 July. The civil society groups that signed the joint statement advocate a rapid coal phase-out which does not involve replacing coal with fossil gas or wood. A conversion to wood or 'natural' gas, they warn, would contradict Hamburg's climate commitments, given that both fuels are no less harmful for the climate than coal. "If the city of Hamburg takes its own climate goals and its self-description as a progressive and cosmopolitan city seriously, it must develop a truly sustainable heating concept. This includes funding for socially acceptable insulation projects for homes and other buildings, measures to reduce overall energy use, as well as the rapid expansion of genuinely low-carbon renewable energy for the heat sector. The climate-damaging and socially unjust burning of wood and gas, on the other hand, has no place in the future of heat generation," says Ronja Heise, Energy Campaigner from ROBIN WOOD. The groups point out that the use of industrial waste heat and large heat pumps powered by renewable energy would contribute to a climate-friendly energy transition. Due to methane leakages throughout its supply chain, which vary according to the methods and location of extraction, fossil gas poses a similar threat to the climate as coal. In view of the dramatically worsening climate crisis as well as geopolitical risk, a phase-out of all types of fossil energy is necessary. Wood is not an acceptable alternative either. Mary S. Booth, Director of American Thinktank PFPI and internationally recognised expert on the topic of biomass burning says: "Scientists have warned repeatedly that burning forest biomass increases greenhouse gas emissions compared to fossil fuels and that offsetting that carbon pollution takes decades to centuries. It doesn't make sense to create new infrastructure to burn forest wood when we so urgently need to protect and restore forests for climate and nature. To sell that as climate protection is a mockery. If Hamburg relies on wood combustion, the city is moving backward, ecologically and economically." So far, the public does not know how the city of Hamburg intends to generate heat and electricity at the Tiefstack site in future. The process for developing those proposals, launched by Hamburg's environment ministry, was designed in a non-transparent manner, excluding civil society from participating in developing Hamburg's strategy to transform heat generation. The far too sluggish coal phase-out as well as the conversion plans have long been met with widespread public criticism. As early as October 2020, there was a civil society statement against plans to burn bush wood from Namibia at the Tiefstack site in the future.

Episode 30 L

Gerda and getting Italy closer to the W H O PM 2.5 standard

Gerda noted that an article in the [European Public Health Alliance](#) by a distinguished expert from Italy, stated that the World Health Organization (W H O) Air Quality Guidelines should be used to set air pollution reduction targets in our cities. The W H O standard is 5 micrograms per meter cubed. The article stated "Decades of important scientific studies have revealed the strong connection between exposure to air pollution and adverse health outcomes like respiratory infections, heart disease and lung cancer. Both short- and long-term exposure to air pollutants has been associated with health impacts, and the International Agency for Research on Cancer (I A R C) has classified outdoor air pollution and particulate matter (PM) as carcinogenic to humans. As a result, the last decades saw an increase in policies aiming to reduce air pollution and improve air quality both at the European as well as Global levels, thus reiterating the urgency for action. In September 2021, the World Health Organization (W H O) updated its [global air quality guidelines](#) for particulate matter (PM 2.5) to better protect the health of populations. For instance, the WHO now recommends a maximum level of 5 micrograms per meter cubed for fine particulate matter (PM2.5) for long-term exposure to protect health. These Guidelines are addressed to all countries of the world and provide uniform targets for air quality. The new targets are much stricter than most national standards in force in many parts of the world, which in some cities would mean a more than threefold reduction in the current level of pollution. Exposure to fine particulate matter (PM2.5) caused approximately [307,000 premature deaths in 2019](#) in the European Union (E U) alone, despite its annual limit value for fine particulate matter (PM2.5) of 25 microgram per meter cubed set in 2008. This Ambient Air Quality [Directive 2008/50/EC](#) is currently under [revision](#) to, among other things, align the E U standards more closely with the W H O recommendations. Currently, air quality is categorised as good - for levels of fine particulate matter that do not exceed the annual guideline value of the World Health Organization of 5 micrograms per meter cubed, fair for

levels above 5 and not exceeding 10, moderate for levels above 10 and not exceeding 15, poor for levels above 15 and not exceeding 25; and very poor for levels at and above the European Union limit value of 25 micrograms per meter cubed. For example, for fine particulate matter (PM_{2.5}), [two Italian cities](#), Cremona, located to the north in the Po valley area, and Padua, to the northeast, exceeded the threshold of 25 micrograms per meter cubed in 2020 and 2021. Also, 23 Italian cities, such as Milan, Brescia, Bergamo, Pavia, Venice, Vicenza, Turin, etc. have poor air quality (between 15 and 25 micrograms per meter cubed). If the new W H O limits for PM_{2.5} were applied to Italian cities, most of them would exceed this limit. **Therefore, European air quality laws must comply with the limits proposed by the W H O.** A more ambitious European Ambient Air Quality Directive will push local authorities to increase sustainable mobility, reduce emissions of pollutants from traffic and heating, and a real expansion of urban green space in each city, with the planting of trees. This would reduce pollutants such as PM and nitrogen oxides (NO_x), and of course increase CO₂ sequestration. The revision of the Ambient Air Quality Directives is thus an opportunity to improve our cities and save many lives! “

Episode 30 M

Gerda and Lebanon, Ishan on India and Pakistan, and Island on U K PM 2.5 Indoor Monitors

Gerda noted that a civil society association in Lebanon has recently established a unique mill that allows farmers to produce their molasses from grapes using automatic and modern equipment instead of copper containers and wood-burning stoves. Lebanon's Ministry of Agriculture reveals that an area of 115 million square meters is planted with grape vines in Lebanon, producing around 22,000 tonnes yearly.

Ishan noted that over 99% of India's population breathes air that exceeds W H O PM 2.5 guidelines.

Ishan noted that, In Islamabad, Pakistan, a potential alternative to Teflon sheets for dust filtration is being explored. A potential Alternative to Teflon Sheets for Dust Filtration are Nanocellulose sheets developed for use as air filters using wood pulp.

Island noted that a U K technology review asked what air quality monitor do you use? The article goes on to say “While our cities aren't the deadly smog traps they once were, air pollution remains a serious issue around the U K. Poor air quality still causes around 40,000 early deaths a year in the U K, with fine and ultrafine particles linked to everything from breathing problems like asthma and emphysema to lung cancer, strokes, dementia, cognitive impairments and even liver disease. You can fight air pollution with fans, air purifiers and ventilation, but only if you know what you're fighting. This is where air quality monitors come in, giving you an accurate means of detecting and tracking levels of pollutants in your home, so that you can take action where you need to. Air quality monitors break down into two main types. We'll mostly be looking at indoor models designed to sit within one room and provide continuous monitoring of the air quality within that space, but there are also portable devices designed for indoor and outdoor use. They're often used by professionals or those with respiratory conditions to provide a quick assessment of air conditions wherever they are. Most air quality monitors track levels of fine particulate matter under 2.5 microns (or PM_{2.5}). Most air quality monitors are battery powered. They may require one or more long-life batteries or a rechargeable battery that needs to be topped up over a USB cable. Some use Bluetooth to communicate with a smartphone app, while others can hook up to a Wi-Fi connection, and even communicate with Apple Homekit or Alexa smart home hubs to control other supported devices, including air purifiers, and fans. As these are small devices you're usually either looking at a coloured air quality indicator or a small display, but smartphone apps give you more information and allow you to track air quality over time, which can be really useful if you're trying to keep an eye on wider trends. If you live in one of the UK's most-affected regions Air purifiers are now very affordable and can be used to improve air quality in the rooms where you spend most of your time. The Amazon Smart Air Quality Monitor is the best indoor air quality monitor if you use Alexa. The Temtop AQD-P200 is designed for handheld spot use in a range of environments rather than continuous use in the home, but it's a useful device for testing PM_{2.5} and PM₁₀ concentrations both inside and outside the house. It doesn't do anything beyond that, but it's quick to take readings, sensitive to changes and easy to use. Just turn it on and it'll detect the current levels, and you can pause and continue monitoring with a quick tap of a play/pause button. It's powered by three AA batteries, which should last for weeks of use, and the unit shuts itself off after around five minutes to preserve the charge.”