Episode 32: September 7, 2022

Episode 32 A

Mary noted In Ohio, concern about PM 2.5, which is 90% of emissions from residential wood burning. Mary noted an opinion writer in Columbus, Ohio, said Clean Energy is about more than just climate change. The opinion writer was concerned about a paper on the pollutant PM2.5, which are tiny inhalable particles that can end up in people's lungs and even bloodstreams. These particles can cause coughing, difficulty breathing, aggravated asthma, irregular heartbeat, heart attacks, and death for people who inhale them. Transition to alternative sources of power such as solar and wind will reduce particulate matter pollution in Ohio. This will lead to less individual exposure to particulate matter, thus reducing morbidity and mortality associated with exposure to particulate matter. The opinion writer said Climate change on its own is a reason to want to transition Ohio's energy economy. But clean energy will also help Ohioans breathe easier, right now and for years into the future. This gives us another reason to want to move into the next phase of Ohio's energy economy.

Episode 32 B

Wendy noted that a California valley, the San Joaquin Valley, experiences PM 2.5 pollution from residential wood burning. Regulation of residential wood burning and hyper-localized agricultural wood burning produces PM 2.5 pollution that can be largely preempted by direct regulation and enforcement of regulation, unlike wildfire burning. The EPA is being challenged in court to do more to reduce residential wood burning and hyper-localized agricultural burning. Rather than just incentives, regulation and or actual enforcement of existing law which could curb or stop residential wood burning and hyper-localized agricultural burning should be used. Challengers of the EPA, to do more, are turning to Biden's White House Environmental Justice Advisory Council. The San Joaquin Valley is a basin, as its name implies. Wood smoke descends into basins and valleys and causes more harm in those areas because the wood smoke remains in the basins rather than being swept away by winds. There are not enough hyper-localized air quality monitors, such as resident-owned PurpleAir PM 2.5 monitors in the San Joaquin Valley now. By the measurements of air quality monitors which are NOT hyper-localized the large area of the San Joaquin valley still shows high levels of PM 2.5. The San Joaquin Valley remains the only air basin in the United States that hasn't met the 1997 annual national air quality standard for particulate matter known as PM 2.5. It's a standard that has since become even more strict as scientific research links exposure to PM 2.5 to serious health problems. The Valley is also out of compliance with 2006 and 2012 standards. An estimated average of 1,200 people a year died prematurely from exposure to elevated levels of PM 2.5 in the San Joaquin Valley, according to 2014 to 2016 data from the California Air Resources Board. An effective way for the EPA to move forward, according to a Sierra Nevada Program Manager with the National Parks Conservation Association (N P C A) is for regulators and the EPA to start listening to community members and advocates who for years have called for "a suite of additional measures" beyond the incentive-heavy strategy that the air district has been relying on for so many years. To put it plainly, more sticks, less carrots. Those include increased restrictions on household burning (residential wood burning). Ultimately, the N P C A representative said he hopes Biden will "just pay attention to us." "This is an environmental emergency that is predominantly impacting people of color who've been left behind for decades," he said. "Give us more resources. Give us more attention. Because this could be a major victory. If you can get the Valley into attainment with federal Clean Air Act requirements, that would be a major victory for (President Biden's) environmental justice agenda."

Episode 32 C

Wendy read a story about loopholes and exemptions for residential wood burning, and hyper-localized agricultural wood burning. Wendy noted a story about two women living with Asthma while living amid high levels of PM 2.5 from residential wood burning and hyper-localized agricultural burning in California's San Joaquin Valley. Wendy noted that the first of two women who are asthma sufferers, the younger woman, uses multiple medications to manage her severe asthma, which she developed while growing up in a San Joaquin Valley agricultural (Ag) town with poor air quality. Long-term exposure to the particulate matter released by ag open agricultural burning causes health problems, and the communities most affected are majority-Latino. The first woman with asthma spends a lot of time thinking about breathing. At age 27, she manages chronic lung disease by juggling multiple medications, routine visits with doctors and by limiting physical activity. "I'm pretty sure a lot of young people aren't really thinking about their air intake and how the air quality will affect said air intake," the first woman said. If she can't get to her refrigerated medication on a bad-air day, symptoms of asthma "would probably land me somewhere in the emergency room." She's a lifelong resident of the

San Joaquin Valley and grew up in Lindsay, a majority-Latino community surrounded by the orange groves of Tulare County. It was common for farmers to burn piles of old trees that were no longer productive. She remembers seeing slash piles just down the road go up in smoke, contributing to the poor air quality that made her cough. She was 8 years old in the fall of 2003 when she was hospitalized for two weeks with bronchitis. That same year, state legislators passed a law to prohibit agricultural burning in the Valley, part of a larger effort to rein in agricultural (biomass, wood, hyper-localized, burning) emissions in the name of public health. "This package of legislation has passed because the people of the San Joaquin Valley are sick of air that's easier to see than it is to breathe," Gov. Gray Davis said in a statement at the time. "Cleaner air in the valley will better protect the health of the more than 3 million people living there, especially the children who have some of the nation's highest asthma rates." But that state law contained a critical loophole that enabled air regulators to issue sweeping exemptions, claiming alternatives to burning weren't economically feasible for farmers. The deadline to phase out ag burning came and went. Nearly 20 years later, state and local regulators continue to issue farmers permits to burn tons of agricultural debris in the Valley, and community members are paying the cost. While agricultural burning contributes a portion of the pollution emitted in the Valley, it more directly impacts neighboring residents, primarily in rural farm communities that are majority Latino. And unlike wildfire smoke, it is a source that regulators have the authority to control.

Episode 32 D

Wendy noted that with something like agricultural burning, people who are living closest to those fields that are being burned are going to be the most impacted. Not enough hyper-localized PM 2.5 air quality monitors, such as resident-owned PurpleAir monitors, are being used to monitor PM 2.5 effects on near neighbors of wood burners in the San Joaquin Valley, and residential wood burning is not regulated enough or not regulated at all by the EPA. Wendy noted that PM 2.5 levels in the San Joaquin Valley are high. When smoke gets in your lungs The San Joaquin Valley has some of the worst air quality in the nation and is severely out of compliance with several federal health standards. One of the main concerns is harmful particulate matter known as PM 2.5. These particles, which are smaller than the width of a human hair, can travel deep into the lungs or bloodstream and cause harm. No one can say whether a particular case of asthma is caused by a source of pollution. But it is clear that repeated exposure to elevated levels of PM 2.5 from smoke or other sources is linked to premature death, non-fatal heart attacks, aggravated asthma, decreased lung function and higher rates of low birthweight babies. An average of 1,200 people died prematurely each year in the San Joaquin Valley due to PM 2.5 pollution between 2014 and 2016, according to the California Air Resources Board. The American Lung Association recently published a State of the Air report that ranks the most polluted cities in the country. The top three cities listed as the worst for year-round particle pollution were in San Joaquin Valley: Bakersfield, Fresno, and Madera. Smoke from open agricultural burning is responsible for about 4% of all PM 2.5 released in the Valley, according to the chief of the Air Quality Planning and Science Division for the California Air Resources Board. Some years it's more. When farmers burned 900,000 tons in 2017 during drought, the smoke accounted for 13% of the region's PM 2.5 emissions. Smoke travels and can affect residents valleywide, but "with something like agricultural burning, people who are living closest to those fields that are being burned are going to be the most impacted. There's no doubt about that," Rural, majority-Latino communities are disproportionately burdened. Areas in south Madera County and south Fresno County, for example, faced an average of more than 70 tons of PM 2.5 emitted a year from agricultural burning from 2017 to 2019, according to a map by the San Joaquin Valley Air Pollution Control District. The area including the predominantly white community of Clovis, however, experiences an average of one ton a year.

Episode 32 E

Wendy noted that residential wood burning and hyper-localized agricultural wood burning produces PM 2.5 pollution that can be largely preempted by direct regulation and enforcement of regulation of hyper-localized wood burning, unlike wildfire burning. Agricultural waste could be removed and composted by the government, rather than the government allowing permits for hyper-localized burning of agricultural waste. Neighbors feel the effects of PM 2.5 pollution most. Wendy noted, in the San Joaquin Valley of California, a second, older, woman profiled in a recent article about San Joaquin Valley PM 2.5 pollution lives in Madera County. Wendy noted that the older woman's vision is affected, and her eyes hurt when wood is burned in neighboring areas. The older woman, her son, and parents all now have Asthma. Almond and Pistachio tree branches are burned, and neighbors feel the effects of PM 2.5 pollution most. The older woman lives among vineyards surrounded by almond orchards. Seventy-six percent live below the poverty line. Home air filters or air conditioning are not common. Ag burning is part of the landscape. In the last year, records show the air district issued numerous burn permits to farmers for vineyard removal or the clearing of almond and

pistachio tree branches within a dozen miles of community homes. Regulators with the air district say they only allow burning on days with favorable weather conditions that reduce the health and air quality impacts of smoke. Public data show agricultural burning released an average of 79 tons of PM 2.5 emissions in the area. Residents say they see and feel the effects. Neighbors typically aren't notified when a farmer lights a fire, despite advocates asking for a notification system. When a burn ignites, residents who are sensitive to smoke often stay indoors with doors and windows closed. "We can just see the billows of smoke, so we can see how close it is. Even when it's in the area of Fresno or Madera, we can see the smoke," the older woman said in Spanish through an interpreter. "When I go outside, if it's smokey outside, my vision just hurts, and my eyes start watering and I start coughing a lot too." That same community is overburdened by increased particulate matter from trash burning and dust from mechanized almond harvesting. The older woman's son developed allergies as a child when they moved to the area. He was diagnosed with asthma and doctors prescribed inhalers. At 26 years old, "when he goes outside and the air is contaminated, then he has to come back inside, and he'll be coughing and coughing and his chest hurts. He just can't get enough air," she said. "That's why we really need some control on the burning." The older woman, who also developed lung damage and asthma as a child, said her family's livelihood is dependent on the agricultural industry, her mom works in packing houses and her dad picks fruit in the fields. Both her parents have asthma now too, which she blames on exposures to multiple sources of pollution like ag burning, and dust from fields. She doesn't think they should have to pay for their jobs with their health. "Our lives did depend on ag. But you know, ag also depends on us," When told that the air district now plans to phase out nearly all ag burning by 2025, the older woman's response wasn't optimistic. She said she feels dissatisfaction with local air regulators who have the power to make change. "What were these outside factors that contributed to you not making the effort for the people you serve?"

Episode 32 F

Wendy noted that two people were killed by wildfires raging across California Two people have died as a result of wildfires tearing through California due to soaring temperatures affecting the state. Several blazes have ignited across Northern California, Los Angeles and San Diego which firefighters are struggling to control. Homes have been destroyed and around 1,000 people were told to evacuate their homes, as the state governor Gavin Newsom declared a state of emergency last week. Some areas have seen temperatures push past 100 degrees F (38°C), with Burbank recording a new temperature record when temperatures reached 112 degrees F (44°C) last Wednesday. Heavy winds, dry vegetation and the sweltering heat have made conditions difficult for firefighters to work in, leaving seven suffering heat related injuries. According to reports, firefighters have achieved 25% containment of a fire near the Oregon border, while crews had contained 5% of a mountain fire in San Diego. The climate crisis has led to an increase in dangerous wildfires, according to a study by British universities, affecting regions across the globe. This has a profound impact on air quality, with research showing that wildfires in the US Pacific Northwest last year led to an increase in levels of carbon monoxide. Additionally, The University of Utah has shown that wildfires in the west of the US are producing taller plumes of smoke, spreading pollutants over greater distances.

Episode 32 G

Wendy noted that Montanans are coping with the smoke. Wendy noted that, in Helena, Montana, according to the Montana Department of Environmental Quality, the air quality has been technically at unhealthy levels for more than 24 hours in parts of the state. That means active children and adults, and people with respiratory issues should avoid prolonged outdoor exertion. Everyone else, especially children, should limit prolonged outdoor exertion. While the air is terrible outside, there are some ways to improve some of the air you breathe. Wildfire smoke concentration can vary widely by time of day. Cooler times of day are synonymous with worse air quality. As temperatures start going down in the evening, the wind typically eases and air begins to sink from the atmosphere to the ground. Smoke will almost act like a fluid, finding and settling into lower areas. If you're outside, those old Covid masks offer more protection and filtration against larger pm 2.5 smoke particles. But the best way to prevent breathing harmful particles in wildfire smoke is to stay indoors. Air conditioning would be ideal, but maybe you don't have it. If you have central ducted air conditioning, use recirculation mode to prevent outdoor smoke from getting in. Do not run swamp coolers or whole house fans. Close windows and doors, and avoid indoor activities like vacuuming that increase indoor pollution, at least you get out of that chore. You can even build a temporary air purifier with a box fan, a 20" by 20" air filter, and duct tape if you feel like MacGyver.

Episode 32 H

Island noted that in Ireland, demand for firewood across Europe is leading to rising prices for wood in Northern Ireland. Suppliers have upped their prices for wood amid a crisis driven by Russia disrupting the supply of natural gas to Europe. One supplier is quoting a price of £58 for a wheelie bin, up more than £10. Prices are rising as demand increases across Europe. Gazprom, the Russian state-owned energy company, announced it was stopping the flow of natural gas through the Baltic sea pipeline indefinitely. Wood is used in stoves, some linked to boilers, and fires, by tens of thousands of households. Most of the kiln dried product, often silver birch, is sourced in eastern Europe, from the Baltic states. Some wood is available here, including the harder and longer burning ash, oak and beech, from old country estates. While cheaper, people do not have the time, energy or the proper storage area for wood for burning. There is an uptick in demand for wood burning stoves but there is not the supply to keep up, particularly in Germany.

Episode 32 i

Island noted that a residential wood burning stove emits more PM 2.5 than a U K truck. Island noted that a U K columnist wrote that health warnings aren't enough – we need a new Green Homes Grant too. The columnist said the dangers of burning indoors are apparent. Even eco-design wood stoves emit more particulate matter than a modern H G V. A Heavy Goods Vehicle (H G V), also called a Large Goods Vehicle (L G V) in the UK, is any truck over 3.5 Tonnes gross combination mass (G C M). As the UK experienced heatwaves this summer, the thought of lighting a fire in winter seems distant. With 55% of UK households in fuel poverty by January and the majority of people reducing natural gas and electricity, people may turn to domestic wood burning to avoid central heating. Burning wood indoors is a health risk. The U K Government needs to raise awareness of the health risk, and help households to improve energy efficiency, so indoor wood burning doesn't become normalised. Heating just one room using an indoor wood stove or open wood fire may save people money on their energy bills in the short-term. The potential long-term cost to their health and the environment is grave. Domestic wood burning releases dangerous particulate matter that has been found to cause asthma, strokes, lung cancer and even dementia. Domestic wood burning contributed to a quarter of fine particulate matter emissions in 2020. Even new eco-design wood stoves are found to emit 750 times more fine particulate matter than a modern H G V truck.

Episode 32 J

Island noted, in the U K, advocacy for Insulation and heat pumps in the U K, instead of domestic wood burning. Island noted, in the U K, the Department for Environment, Food and Rural Affairs (D E F R A) launched an information campaign about domestic wood burning in 2020. This campaign needs to be updated and expanded this year to urge people to reduce burning wood indoors for the sake of their health. The Government should bring back the scrapped Green Homes Grant Scheme to finance better insulation. The old scheme offered homeowners grants of up to £5,000 (and £10,000 for low-income households) to install insulation, heat pumps, and solar thermal water heating. The scheme has now been replaced by grants for heat pumps. Installing solid wall insulation in a semi-detached gas-heated house would save an average household £225 a year, cavity wall insulation another £165 and loft insulation £150. Overall, upgrading a home from an Energy Performance Certificate rating of D to C would save a household £600 on annual gas and electricity bills, on top of the £400 government fuel rebate for all households. Without this support, however, the Government risks a burgeoning public health crisis from people breathing dirty air this winter, if they turn to domestic wood burning for heat.

Episode 32 K

Gerda found an article about Estonia, written in February 2022 titled Carbon Neutrality is a Fairy Tale, about wood burning in Estonia. Wood pellets are falsely sold as a clean alternative to coal. What happened in Estonia demonstrates how the subsidised industrial wood burning boom accelerated the climate crisis. An Estonian Man stands on a bald patch of land in the heart of Estonia's Haanja nature reserve and remembers when he could walk straight from one side of the reserve to the other under a canopy of trees. The man has lived in the uplands in the southern county of Võru in Estonia for more than 10 years. His closeness to the forest has shaped his life as a carpenter and the fortunes of the surrounding villages, with their handicraft traditions – a substitute for farming on the poor arable land. Upcountry, travel literature promotes the region to city dwellers, promising its ancient woodlands as a place to rest and reinvigorate the mind. But in 2015, the Estonian government allowed what is known as clear-cutting in some parts of the Haanja nature reserve. The practice involves stripping entire areas of mature forest and removing whole tree trunks. This relaxation of the logging rules came as international demand for Estonian wood soared because of an unlikely culprit: Europe's renewable energy policies. "Sometimes I can't bear to go outside," the Estonian man says, standing by the stumps left

on land stripped by the logging company Valga Puu. The firm is a subsidiary of Graanul Invest Group, Europe's biggest producer of the wood pellets which are burned on an industrial scale for heat and light in many of Europe's former coal-fired power stations. Forests cover more than half of Estonia. Natura-protected zones are managed under the legally binding provisions of the 1979 EU birds directive and the 1992 habitats directive. Environmental campaigners say that by allowing intensive clear-cutting in Natura 2000 sites, Estonia is in breach of the habitats directive and undermining the EU's climate goals. A representative of the non-profit Estonian Fund for Nature (E L F) doesn't just blame the Estonian government. He says there is a direct connection between the subsidised growth in the biomass industry encouraged by EU renewable energy policies and the acceleration of unsustainable Baltic tree-felling. Intensification of logging is driven by higher demand for biomass for heat and power," says a report by ELF and the Latvian Ornithological Society.

Episode 32 L

Gerda noted that Estonians regard nature as sacred. Logging has led to protests or what the Estonian media calls the "forest war". Residents of Saku, a small town 16 miles south of Tallinn, fought to save a forest that was scheduled to be cut down this year by R M K, the state forest management company, which manages around half of Estonian forests. "We convert our trees into pellets and sell them to energy plants in your countries," says one of the Saku campaigners. "This is considered to be sustainable, but we suffer." Sustainability goes to the heart of the European renewable energy debate. Replacing coal with cleaner sources of power, is a top priority in the fight against climate change globally. A switch to burning wood in the form of pellets appears to offer a simple in theory carbon-neutral alternative because trees take up carbon dioxide from the air as they grow. However, that process of carbon take-up can take many decades. And in the furnace, burning wood releases more carbon dioxide per unit of energy than burning gas, oil, or even coal. By accelerating carbon dioxide emissions in the short term, burning wood for electricity could be fatal for states' ability to meet the Paris Agreement goal of keeping global heating to well below 2 degrees Centigrade by 2050. Demand for energy from wood as an alternative to coal in power stations took off from 2009, when the first EU renewable energy directive obliged member states to source 20% of energy from renewable sources by 2020 and classified wood burning energy as carbon-neutral. A flaw in the legislation meant that woody biomass was fully categorised as renewable, even if it came not just from wood residues or waste, but from whole trees. This meant that companies could directly harvest forests for pellets – rather than making pellets from the by-products of timber cut for other uses – in the name of sustainable forest management.

Episode 32 M

Gerda noted that Industrial wood burning is achieving the opposite of what it was meant to do. Gerda noted that Drax in the U K, and companies in The Netherlands practice industrial wood burning and are subsidized by their governments. Electricity from wood pellets would not be financially sustainable without public subsidies: the British government paid Drax €2.4 million a day in 2019. Drax will have received more than €11.2 billion from the U K government since its conversion to industrial wood burning in 2012 until subsidies run out in 2027. The UK is now the biggest subsidiser of industrial wood burning in Europe, spending more than 1.9 billion British pounds in 2019 to pay for burning imported wood at Drax, according to new research by the Natural Resources Defence Council (N R D C) and Cut Carbon Not Forests. Britain is no longer bound by E U renewable energy targets post-Brexit. Britain has set a new target of cutting emissions by 68% by 2030 and is committed to the E U goal of net-zero carbon by 2050. Other European governments are following suit. In the Netherlands, the government has promised energy companies R W E, Uniper and Onyx (formerly Engie) more than €3.5bn in subsidies to use industrial wood burning, making the country one of the biggest importers of wood pellets in Europe. Campaigners are anxiously watching Germany, where Onyx Power, a subsidiary of the US hedge fund Riverstone, is examining the possibility of converting coal plants to industrial wood burning. "Industrial wood burning only exists at the scale that it does because of subsidies," says an associate fellow at the London-based thinktank Chatham House. "We're effectively paying to increase carbon emissions in the atmosphere, which is an absurd use of public money." The fellow says that the 2009 EU renewable energy directive triggered a raft of subsidies for renewable power generation. "But since then solar and wind have really crashed in price. Now is the time to stop subsidising industrial wood burning." "There's huge infrastructure employing people and spending money, all based on subsidies," says a representative of the European Academies' Science Advisory Council (E A S A C). "The original simplistic idea of bioenergy from sustainable forestry suddenly blossomed into an industry achieving the opposite of what it was meant to do."

Episode 32 N

Gerda noted that the French government has been spending lavishly, over 26 billion euros ($26 billion) since Russia's invasion of Ukraine to keep gas and electric bills affordable, and last week it announced that its cap on household energy bills would be extended until the end of the year. The moves to control energy costs, including the re-nationalization of the energy provider EDF, have helped give France one of the lowest inflation rates in Europe, at 6.5 percent. (The overall eurozone rate for August was 9.1 percent.) Companies will be required to cut their energy use by 10 percent or face enforced rationing of electricity and gas. Businesses will have to appoint an "ambassador of energy sobriety" this month, and present blueprints to the government for cutting their electricity use. This weekend, France's natural gas storage units were 92 percent full. Energy bills for households and businesses have soared, prompting European governments to resort to offsets that few thought possible before the Ukraine war. Germany, Europe's biggest user of Russian natural gas, reversed plans to shut down two of its three remaining nuclear power plants by the end of the year, and instead announced a $65 billion aid package to lower high energy costs on German citizens. Italy is looking to Algeria as a potential new supplier of natural gas instead of Russia. In Spain, the government has moved to improve energy efficiency in buildings and industry. France seems less vulnerable. France has the biggest nuclear energy arsenal of any European Union country, and is less reliant on Russian natural gas. But France faces an energy crisis of its own, as its nuclear industry addresses cracks, corrosion and other troubles that have forced EDF to temporarily shut down 32 of France's 56 nuclear reactors. The outages at EDF, which is also Europe's biggest electricity exporter, have sent France's nuclear power output plunging to its lowest level in nearly three decades. In addition, France's worst drought in 30 years this summer has lowered river levels, cutting supplies of hydroelectric power. France now faces rolling blackouts in winter and having to import power or resort to coal-fired plants to meet its energy needs. The crunch is already starting to force temporary shutdowns at energy-intensive companies, including steel, chemical and glass makers. On Friday, wholesale electricity prices for 2023 in France set a record, surging past €1,000 per megawatt-hour. Many French companies and retailers buy their electricity with three-year contracts that are set to expire, meaning they will have to be renewed at peak prices. President Macron, has focused on shielding households from rising energy costs. A 4 percent cap on increases to household electricity prices that began last winter will be extended until the end of the year, and will continue into 2023 for vulnerable families. The price ceiling is a stark contrast to an 80 percent increase in energy bills that households in Britain are expected to face next month. The French people are asked to not run washers at night, keep thermostats at 66 degrees Fahrenheit and increase use of public transportation. Public swimming pools across France have been closing more frequently to conserve energy. Cities are restricting public lighting, which can account for over 40 percent of electricity bills. In northern France, some high schools in Brittany will lower their thermostats, while the neighboring region of Normandy will experiment with using wood-burning furnaces for heat in some schools as an alternative to gas.

Episode 32 O

Gerda noted an article written by a group of authors including Gerda Thunberg (pronounced Tune-berg), the young climate activist from Sweden. The article is a message to the European Union urging them to vote for the change away from wood burning in the European Union, and urging members to vote for the E U change in classification for wood burning from renewable and carbon neutral to being seen similar to and judged by the same standard as coal burning, seen as particulate polluting and harmful for human health and the environment. The vote by the European Parliament is scheduled for September 13, 2022. Greta Thunberg of Fridays for Future Sweden co-wrote this article with others from Sweden, Finland, the Netherlands and Denmark. The article said "Next week the future of many of the world's forests will be decided when members of the European parliament vote on a revised EU renewable energy directive. If the parliament fails to change the EU's discredited and harmful renewables policy, European citizens' tax money will continue to pay for forests around the globe to literally go up in smoke every day." Europe's directly elected representatives now have to choose: they can either save the EU's "climate targets" with their legislative loopholes or they can begin saving our climate, because right now, that is not what EU targets are working towards. Increasing volumes of wood pellets and other wood fuels are being imported from outside the EU to satisfy Europe's growing appetite for burning forests for energy. This is an appetite that the existing EU renewable energy directive incentivises. It does this by classifying forest biomass on paper as zero-carbon emissions when in reality, burning forest biomass will produce higher emissions than fossil fuels during the coming decisive decades. Members of the European parliament have a precious window of opportunity and a duty. They have until 1pm on Wednesday to table an amendment to remove forest biomass from the renewable energy directive. They can vote this change through on 13 September. They have 48 hours to do the right thing. If they fail, they will lock in decades of increased carbon emissions, biodiversity loss and human rights violations.

Episode 32 P

Ishan noted that, in India, the Center for Science and Environment (C S E) analysis of PM 2.5 pollution has included 332 real time monitoring stations active in 2021 in India, spread across 172 cities in 27 states and Union territories. It has relied on data that is publicly available on the CPCB website. All six megacities registered a drop in their annual PM2.5 levels in 2020, but pollution bounced back everywhere except in Chennai. Ishan also noted that India's national pollution control board's assessment is flawed as it focuses on only PM 10 levels for disbursing of funds. The latest performance assessment of National Clean Air Program (N C A P) cities by the Central Pollution Control Board (C P C B) has considered only PM 10 data, largely coarse dust particles, for the disbursement of performance-linked funds, and ignored PM 2.5 data. There is barely any difference in overall particulate matter (PM) 2.5 trends under the National Clean Air Program (N C A P) and those outside its ambit, shown in the report by the non-profit Centre for Science and Environment (C S E). PM2.5 are ultrafine particles suspended in the air that have a diameter of 2.5 microns or less, while PM 10 particles have a diameter of 10 microns or less. The NCAP has set a national target of 20-30 per cent reduction in PM2.5 and PM10 concentrations by 2024 from the 2017 base year. CSE looked at data for 43 NCAP cities and 46 non-NCAP cities for 2019-21 to construct PM2.5 trends. A large number of NCAP and non-NCAP cities need a substantial reduction in PM2.5 levels to meet the national ambient air quality standards in all climatic zones, the analysis found. "While it is encouraging that funding of clean air action is linked to performance and the cities' ability to demonstrate improvement in air quality, dependence on only manual monitoring of PM10 evidently creates a bias in spending," said the executive director, of research and advocacy at C S E. The government shifts focus more towards dust control and detracts attention from composite action on industry, vehicles, waste and solid fuel burning (wood burning), she added. The N C A P covers 132 cities. 82 cities have been funded by N C A P, while 50 cities have received funds from the 15th Finance Commission.

Episode 32 Q

Ishan noted that, in Singapore, researchers at the Nanyang Technological University (NTU) invented a technology that can now protect wood from fire and save buildings! An invisible char coating when fitted on the wood makes it fireproof. The coating material is transparent and is just 75 thousandths of a millimeter in thickness, which makes it impossible for the human eye to see. Companies use concrete, steel, and glass for construction purposes due to their resistive nature towards fire, but this mass-timber coated with a char layer makes it an ideal candidate to resist fire. The process is extremely cheap, with little to no impact of carbon footprint on the environment as wood is readily available from natural resources. When being modified after coating it with a char layer, the wood becomes a masterpiece to be used without the fear of catching fire as it becomes fireproof. Also, in the case of any fire, the coating material expands and is transformed into a material that is thicker by up to 30 times of its original value. The material is also resistant to smoke, meaning that whenever it is exposed to any fire, there will be little to no smoke, which will also help people in their evacuation from a fire situation. An Associate Professor at the Nanyang Technological University (N T U) School of Materials Science and Engineering said, unlike this new char coating, "Most timber or wooden panels are not designed to withstand high heat." "In our coating, we used technology to lock certain compounds and interact with the resin. They will actively participate in the chemical reactions in a systematic manner when exposed to high heat, thus leading to the formation of char."