

Episode 57DHXA July 1 2025 Bury Wood instead of burning wood An idea from San Diego to New York

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**1A** World PM two point five pollution Estimates temporal evolution and drivers of the global burden of cardiovascular disease ScienceDirect dot com Cardiovascular diseases CVDs are the most common non communicable diseases worldwide Fine particulate matter PM TWO POINT FIVE has emerged as a

**1B** World Heat Pumps Rotary Heat Pump Compressor Market to Reach 5 point 61 Billion Dollars by 2035 Driven by Energy Yahoo Finance According to a comprehensive market research report titled Rotary Heat Pump Compressor Market Size Share and Forecast 2025 2035 Growth Analysis

**2A** United States Government Heat Pump Rebates House Republicans Write Letter Pushing for Solar Tax Credit Extension EnergySage tax credit Section 25D phase out timeline to 2028 rather than ending it Heat pump icon Explore heat pumps the latest in clean heating **RAWSEP View** It is notable that Republicans spared dirty energy biofuels which include burning wood and producing PM 2 point 5 and Carbon Dioxide from that wood burning and which include the unnecessarily hazardous energy nuclear energy in their Megabill but cut funding for the truly clean renewable energy sources of wind and solar It is notable that Republicans who want to extend solar tax credits still plan on voting for the Republican megabill in its entirety based on politics not voting on the substance of what the bill will ultimately contain **Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization** Politico June 6 2025 13 House Republicans urge Senate to save green credits A letter Friday is the latest from Republicans eager to protect some tax incentives of the 2022 climate law which came from Democrats Thirteen House Republicans are urging Senate leaders to improve clean energy tax credit provisions in the House passed megabill Led by Representative Jen Kiggans Republican of Virginia the lawmakers said they remain concerned by aggressive phase down incentives of the 2022 climate law which came from the Democrats and strict new supply chain requirements The letter Friday from Kiggans and Representatives Brian Fitzpatrick of Pennsylvania Juan Ciscomani of Arizona and Andrew Garbarino of New York among others comes as Senate negotiators work on their version of the GOP tax cut energy budget package Most lawmakers on the letter supported the House megabill despite the tax credit dispute Garbarino slept through the early morning vote but said he would have supported the bill Even though the House passed bill rolled back incentives for renewable energy and hydrogen it spared credits for nuclear and **biofuels** Since January over 14 billion dollars in energy projects have been canceled or delayed with 4 point 5 billion dollars scrapped in April alone The House GOP effort will complement work already underway by Senate Republicans like Lisa Murkowski of Alaska and Thom Tillis of North Carolina to ease restrictions on the tax credits contained in the House bill

**2B** United States PM two point five pollution The legacy of the U S Clean Air Act at a crossroads Nature Globally chronic and acute exposures to elevated concentrations of ambient fine particulate matter PM TWO POINT FIVE represent a significant risk factor for

**2C** United States Government Heat Pump Rebates How to Stay Cool During One of the Hottest Anticipated Summers in the World GantNews dot com heat pump actually removes hot air from the home and pumps it outside rebates through the DOE Home Electrification and Appliance Rebate

**2D** United States Heat Pumps Lennox launches residential heat pump with space saving design pv magazine USA Lennox said its new EL18KSLV Side Discharge Heat Pump uses R 454B as the refrigerant and has a size ranging from 2 tons to 5 tons

**2E** United States Heat Pumps Top Heat Pump Installation Mistakes And How to Avoid Them ACHR News The increasing popularity of residential air source heat pumps also means increasing room for installation errors

**3A** Arizona Fort Defiance Wood Burning Pollution Smoke rises over St Michaels as Oak Ridge Fire spreads Navajo Times Strong winds aided by dry conditions overwhelmed fire crews battling the Wood Springs 2 fire on Sunday afternoon June 29 2020 In News Wood

**3B** Arizona RAWSEP View Bad Idea to haul wood to begin with Bad idea to burn wood to begin with Wood Burning is Pollution From the Headline Navajo Nation crews fight wildfire near Window Rock evacuations begin AZCentral What we know about Oak Ridge Fire burning in Navajo Nation forest in northeastern Arizona Evacuations underway Wood haulers reportedly sparked

**4A** California Fresno Wood Burning Pollution Breaking Wood Fire reported in Madera County on June 27 Fresno Bee Wood Fire has been burning on federal land managed by the Bureau of Indian Affairs There is no information on the containment of the fire and its

**4B** California Sacramento Wood Burning Pollution Breaking Wood Shop Fire reported in Trinity County on June 24 Sacramento Bee Wood Shop Fire has been burning on federal land managed by the United States Forest Service Currently there is no data on the containment status of

**4C** California San Diego Bury wood instead of burning wood Wood Burning Pollution Burying forest waste could slow heating of planet study finds FOX 5 San Diego burning of fossil fuels which release heat trapping chemicals like carbon dioxide So if we bury the wood 2 meters deep the wood can be

**4D** California San Diego Heat Pump Rebates Officials launch game changing initiative to give households cash for key upgrades The Cool Down The free water heaters also come with free installation Moreover the program offers up to \$3000 worth of rebates for heat pump water heaters and

**4E** California San Diego Wood Burning Pollution Breaking Ma shockey Fire reported in San Diego County on June 27 Sacramento Bee Ma shockey Fire has been burning on private land Currently Breaking Wood Fire reported in Madera County on June 27 Fires Breaking

**4F** California Sierra Wood Burning Pollution USDA Forest Service Sierra National Forest Fire Restrictions Notice USDA Forest Service Fires Wood and charcoal fires including wood burning stoves are generally prohibited unless outlined in Exhibits A and B Portable Stoves

**5** Connecticut Heat Pump Rebates Take advantage of these tax credits before Congress kills them Yale Climate Connections Solar water heating Fuel cells Geothermal heat pumps Small wind energy The residential clean energy tax credit amount is 30% of the cost of a

**6A** Massachusetts Heat Pump Rebates How proposed heat pump rates can save Massachusetts residents hundreds of dollars on Green Energy Consumers Alliance Incentives and Rebates · Pre Owned EVs · Environment and Health Get Involved Lower Bills Cleaner Heat How proposed heat pump rates can save

**6B** Massachusetts PM two point five pollution **New app** estimates health impacts of breathing smoke from wildfires Harvard SEAS These particles known as PM TWO POINT FIVE have diameters of less than 2 point 5 microns and are a potentially toxic form of air pollution that

**7** Michigan PM two point five pollution Chronic exposure to outdoor air pollution in youth linked to higher anti inflammatory markers Today at Wayne Wayne State University The researchers were surprised that higher exposure to PM TWO POINT FIVE an airborne particulate matter was associated with anti inflammatory lipid

**8A** Mississippi Jackson PM two point five pollution Study links air pollutant to year round respiratory health in Jackson EurekAlert! Black carbon is a component of PM TWO POINT FIVE air pollution pollutants whose particles are 2 point 5 microns or smaller which is approximately 30 times smaller

**8B** Mississippi PM two point five pollution Air pollutant linked to year round respiratory health in Mississippi Phys dot org Unlike black carbon PM TWO POINT FIVE was not linked to increased hospitalizations year round though springtime spikes did coincide with higher asthma related

**9** Montana Seeley Lake Wood Burning Pollution **RAWSEP View** It is a bad idea to label some wood smoke pollution better than other wood smoke pollution That is like encouraging people to burn hard wood and dry wood instead of soft wood and wet wood although that is not the intention here instead of telling people to just stop burning wood completely and just stop burning solid fuels for human health and for the health of the planet **From the headline** The Coming Smoke Epidemic in America The Atlantic They found that pinewood smoke was the most mutagenic suggesting that it might be more likely to cause cancer than other woods and that eucalyptus **Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization** The Atlantic June 26 2025 For 49 straight days everyone in Seeley Lake Montana was breathing smoke A wildfire had ignited outside the small rural community in Montana and the plume of smoke had parked itself over the houses Air quality plummeted At several moments the concentration of particulate matter in the air exceeded the upper limit of what monitors could measure An associate professor of immunology at the University of Montana saw an opportunity to do what few have ever done study what happens after people get exposed to wildfire smoke He drove out to Seeley Lake to get data That was in 2017 The researchers followed up with residents for two years after the fires checking on their lung function To their surprise the worst effects did not show up immediately despite the heavy dose of smoke Instead the lung function of people seemed to deteriorate later Right after the fires about 10 percent of the cohort had lung function that fell below the lower limit of normal By the one year mark about 46 percent did At the two year mark most of those people still had abnormally poor lung

function. The researcher and his colleagues had intended to follow the residents for a third year, but then COVID hit. Instead, they tried exposing mice to wildfire smoke in a controlled lab environment. Their results pointed to a similar outcome. The worst effects took time to present. More frequent and intense wildfires are erasing or even reversing decades of gains made in American air quality in the majority of U.S. states. Across the country from 2012 to 2022, the number of people exposed to unhealthy air from wildfire smoke increased 27-fold; one out of every four unhealthy air days in parts of the country is now a smoke day. Plenty of research shows that respiratory distress and heart attacks spike in the event of smoke exposure; acute impacts of breathing smoke send people to the hospital and make them miss work and school. Those risks can linger for months afterward, or, in the case of the Seeley Lake cohort, for years. Now that more people are regularly breathing smoky air over their lifetime, though, the relevant concern may no longer be what happens when a person gets one big dose of smoke; rather, it may be what happens when they are exposed many times. The best model for assessing wildfire smoke exposure was developed only recently, because of satellite imagery and monitoring limitations, and goes back to only 2006. That means researchers have at most 20 years of data to look at in determining whether smoke could have contributed to the incidence of a particular illness in a population. Latency periods for plenty of diseases, including some cancers, can be longer. Plus, every fire is its own unique nightmare, chemically speaking. The Seeley Lake fire burned mostly trees. During the Los Angeles fires in January, which burned down entire neighborhoods, noxious compounds from burning plastics and other man-made materials swirled through the air. How long the smoke stays in the air may matter, too. Some research suggests that smoke becomes more toxic as it ages, which is bad news for people living downwind from smoke in parts of the U.S. during Canadian wildfires, for instance. Exposure to wildfire smoke is spiky, coming in bursts with pauses in between. That makes it hard to model in a lab. Is the health impact worse if a person breathes a very high level of smoke for three days, or if they breathe a lower level for three weeks? How does the point in life at which they are exposed—as an adult with asthma, a child whose lungs were still developing, a fetus in utero—change how the smoke affects them? In California in the summer of 2008, a researcher who studies pulmonary immunology and toxicology at UC Davis was in her office as wildfires sent smoke settling over the region. The air outside her office looked like thick winter fog. She suddenly thought about the rhesus monkeys she studied at the primate research center; they had been outside in their habitat the whole time. These primates were great models for human health, so they became a case study for what happens to a smoke-exposed body. In a 15-year study, monkeys that were exposed to wildfire smoke as infants became adolescents with smaller, stiffer lungs than their peers born the following year, which resulted in poorer lung function and worse immune regulation. When the researchers exposed blood samples from both populations of adolescent monkeys to bacterial infection, the samples from the smoke-exposed animals responded more weakly, indicating that their immune system was not working as well. The smoke-exposed monkeys also slept far less. Some research suggests that smoke can affect humans the same way. In 2022, a large study in China concluded that human children who had been exposed to air pollution early in life also had poorer quality sleep. High-quality sleep is important to neurodevelopment in children, and poor sleep is associated with a range of negative health consequences across a lifetime. Standard air pollution is known to have a negative impact on virtually all aspects of fertility, and for people who wish to conceive children, smoke may pose a hazard, too. After wildfires in Oregon prompted an air quality emergency in Portland in 2020, researchers looked at the sperm quality of 30 people who had their semen analyzed at a

fertility clinic before and after the fires The study was small but the trend was clear Motility how well the sperm swims went down for most of the participants Male firefighters are being enrolled in a study to learn whether their fertility is affected by their job which forces them to breathe much higher doses of smoke than the general population When Montrose and his colleagues exposed mice to a very high dose of wood smoke in a lab simulating what they estimate would be the equivalent of 15 years on the job for a wildland firefighter the mouse sperm was significantly altered at the epigenomic level where gene expression is altered without changing the underlying DNA sequence The researcher and his colleagues found changes at more than 3000 different sites reflecting about 2000 different genes If smoke can affect health early in life it also can affect the end of life Breathing smoke can cause inflammation which is a key pathway for many neurological disorders and research is now turning up associations between smoke and conditions that strike older people such as Parkinsons Disease Smoke also causes premature death More than 50000 people in California died prematurely from wildfire smoke between 2008 and 2018 according to one estimate and more than 11000 people in the U S do so each year according to another Climate change is only accelerating those dynamics As I have written before the National Bureau of Economic Research found last year that in a worst case warming scenario deaths from wildfire smoke exposure in the U S could top 27000 a year by the middle of the century That is smoke could kill 700000 people from now until 2055 Breathing regular pollution over a long period can accelerate heart disease by prematurely aging blood vessels and accelerating plaque buildup in the coronary artery at least one recent study found that human risk of heart failure and other serious cardiac problems can persist for months after smoke exposure If that is any indication fire smoke is a major heart hazard

**10** New Mexico [RAWSEP View](#) Bad Idea of hauling wood and Bad Idea of burning wood Wood Burning is Pollution [From the headline](#) Oak Ridge Fire burning on Navajo Nation grows to 6300 acres Source New Mexico Navajo Nation President Buu Nygren in updates posted on social media said wood haulers in the area may have started the fire though its cause is

**11A** New York Bard College [RAWSEP View](#) Good Idea monitor Wood Burning Pollution and prove the level of pollution [From the article headline](#) Kingston Air Quality Initiative at Bard College Reports After Five Years of Monitoring Bard Press Releases Burning wood is more polluting than burning oil gas or coal wood smoke pollution during several Ulster County wildfires in November 2024

**11B** New York Cornell [Bury wood instead of burning it](#) Wood Burning Pollution To slow global warming bury wood debris Cornell Chronicle Cornell University Managed forests typically used for logging produce large amounts of wood debris which is often burned or left to decompose emitting carbon dioxide

**12** North Carolina Heat Pump Rebates Energy Saver NC to Help Low Income Families with Energy and Cost Saving Measures WHKY rebate program The Home Electrification and Appliance Rebates program covers up to \$14000 for high efficiency electrical appliances like heat pump

**13A** Oregon Wood Burning Pollution Wildfire smoke as stressful to calves as weaning Ag UPDATE wood smoke was piped into In the studies the calves were tested before during and after the smoke exposure The theory is that the cattle

**13B** Oregon Heat Pump Rebates Oregon Department of Energy officially launches new heat pump program Oregon Public Broadcasting OPB Oregonians looking to install a heat pump can now apply to receive up to \$2000 in rebates through a new state incentive program

**14A** Canada Manitoba Heat Pump Rebates Manitoba offers up new incentives to shift to heat pumps ditches election promise CBC The Manitoba government wants homeowners to upgrade their heating and cooling systems to a geothermal pump it says could save up to \$1000 annually

**14B** Canada **RAWSEP View** Good Idea Heat Pumps **From the Headline** Heat pumps are cool The Community Press During the recent heat wave I was so glad that I have a heat pump installed in my house

**15A** Australia Canberra **RAWSEP View** Good Idea Stop Wood Burning Pollution **From the Headline** Act quickly on the A C T wood heater phase out before it gets to 2045 The Canberra Times Wood smoke from open fires and heaters is a major source of dangerous air pollution Why wait until 2045 for a Canberra ban?

**15B** Australia Victoria **RAWSEP View** If you merely have lungs then you are sensitive to wood smoke air pollution and it could very well shorten you life or be the reason your life ends prematurely It is a bad idea to describe Wood Burning as nice It is counter productive to ending wood burning pollution and it is untrue It appears that most solutions suggested in this article merely shunt the air pollution from your own wood burning area up a chimney to near neighbors Wood Burning Pollution **From the headline** Nice Warm Toes? Remember Where Smoke Goes Mirage News The Victoria environmental watchdog has some handy tips for everyone who has a wood burning heater keeping their toes warm this winter Nice Warm Toes? Remember Where Smoke Goes **Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization** Mirage June 30 2025 The Victoria environmental watchdog tips for everyone who has a wood burning heater keeping their toes warm this winter EPA Victoria says the condition of the heater the flue and the fuel you are using all contribute to more or less smoke from your chimney Have your chimney cleaned every year only burn dry clean wood and extinguish your fire before going to bed or leaving the house Wood heater owners have an obligation under the Environment Protection Act General Environment Duty to minimise the smoke from their wood heater EPA urges anyone burning wood to **consider the health of their neighbors** and seek alternative heat sources especially on calm days with not much wind If you suffer from heart or lung disease and you notice symptoms of smoke exposure take your regular medications rest and seek medical advice if the symptoms persist Avoid burning the wrong things

**15C** Australia Heat Pump Rebates Phase Shift The Rebate Rush Is No Time To Exploit Installers SolarQuotes Installers are working harder than ever to keep up with battery rebate demand here is why you should not squeeze them Heat Pump STC Calculator · EV

**16A** United Kingdom Gloucester **RAWSEP View** The good result was probably that people who intended to use wood burning a highly polluting method of home heating instead had to turn to clean energy home heating such as Heat Pumps that work down to 40 degrees below double as air conditioners and lower monthly electricity bills immediately In reality these people may have turned to another wood burning appliance salesman unless they were well educated on the air pollution from wood burning

in the meantime The Bad Idea of Wood Burning Pollution may have been thwarted in the short term and these people may have been educated on the naturally occurring greed of the wood burning industry

**From the headline** Gloucester man took thousands of pounds for wood burners then made excuses Gloucestershire Live wood burning stove but never doing the work Hatton maintained he always intended to complete the work but time and again failed to meet **Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization** MSN June 27 2025 A Gloucester man left customers thousands of pounds out of pocket after failing to supply wood burners as promised Trading standards officers first received complaints about Daniel Hatton who also used the business name D H Woodburners in July 2020 Their investigations revealed a pattern where Hatton met with potential customers between September 2019 and August 2020 taking a 50 per cent deposit to supply and install a wood burning stove but never doing the work

**16B** United Kingdom Heat Pump Rebates I can confidently say they do work Trial offers free heat pumps to heating engineers Business Green heat pump for an installer and the rebate from government grants Nesta said it will be supporting partners to reach installers through a

**16C** United Kingdom The Peak District PM two point five pollution Air quality is not just bad in cities Here is why and how we are tracking pollution from upland fires Phys dot org For around six hours levels of fine particulate matter known as PM TWO POINT FIVE tiny airborne pollutants known to harm human health exceeded 40 **RAWSEP View** This group monitors the pollution levels from prescribed burns even in rural areas Currently 95 percent of PM 2 point 5 monitors are located in urban areas and so PM 2 point 5 may exist but it and wood smoke from prescribed burns as well as residential wood burning can be largely ignored **Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization** Phys dot org June 30 2025 Early one October afternoon in 2023 thick gray smoke drifted across the western skyline of Sheffield As much of the city became blanketed residents turned to social media to complain about bonfire smoke while others were forced to leave the city due to breathing difficulties However this smoke did not originate within the city It was drifting in from the Peak District more than nine miles away where controlled heather burning was taking place on the moorlands For around six hours levels of fine particulate matter known as PM2 point 5 tiny airborne pollutants known to harm human health exceeded 40 micrograms per cubic meter of air micrograms per cubic meter and peaked at 70 micrograms per cubic meter well above the guidelines recommended by the World Health Organization This single incident points to the **wider and largely invisible problem of the routine burning** of the uplands of the UK This can be a serious source of air pollution but because most official air pollution monitoring concentrates on urban areas the effects are overlooked This is why we have started monitoring upland fires and the pollution they cause Prescribed burning is a longstanding land management practice often used to control vegetation **for grouse shooting or** livestock grazing It happens across a range of upland landscapes Many of the areas being burned sit on deep peat Around 70% of the drinking water of Britain comes from upland areas that are largely peatland and healthy peatlands help reduce flooding 80% of English peatlands are classified as degraded often through historic air pollution draining overgrazing and importantly **repeated burning** One hidden consequence of that burning is air pollution These burns are often viewed as **isolated rural events** but their effect on regional air quality can be substantial

On that day in Sheffield pollution levels briefly rivaled those seen across the city during bonfire night a well known peak in urban air pollution In response to that October event our research team launched a new pilot monitoring network across part of the Peak District national park This FireUp project combines air quality sensors satellite data and community observations to detect and measure pollution from upland fires By using a mix of technologies and local reporting we have documented spikes in PM2 point 5 pollution that would have otherwise been missed Our system offers a clearer picture of when and where fires occur and how far their smoke spreads opening the door for better planning and stronger protections for public health But the problem is not just a lack of data it is also a failure of regulation The current upland burning regulations in England are limited on four fronts Heather and grass burning regulations introduced in 2021 prohibit burning only on peat deeper than 40cm inside designated sites That means 60% of upland peat is excluded from these protections With more than 95% of PM2 point 5 monitors located in urban areas smoke from moorland fires in remote rural locations is rarely registered on official networks The resources for organizations responsible for enforcing regulations have shrunk over the last decade Natural England one of the statutory bodies of the government responsible for environmental protection has experienced a 4% decrease in funding for 2024 to 2025 compared to the previous year Prosecutions for illegal burning are exceptionally rare with satellite analyses pointing to a higher level of unlicensed activity than official records suggest In short narrow legal scope limited monitoring coverage and under resourced enforcement leave many prescribed burns undetected and unaccounted for along with the health and environmental risks they carry Our FireUp system improves fire detections and helps quantify the effects of air pollution from these burns Our next step is to develop a citizen science app that makes it easier for people to report peatland fire incidents and upland burning to help improve regulation and log the effects of changes in air quality

16D United Kingdom Heat Pumps Electric cars and heat pumps making progress UK climate advisers say BBC Heat pump being installed on a red brick wall by a man Line graph showing greenhouse gas emissions from four different sectors Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization BBC June 24 2025 More people are buying electric cars and installing heat pumps than ever before but those numbers need to increase even further according to the climate advisers of the government The independent Climate Change Committee CCC said that the government needed to make sure that households benefit from the switch to cleaner technologies through lower bills The government has made progress on a number of fronts including on clean power but they need to do more on making electricity cheap In response Energy Secretary Ed Miliband thanked the committee for its advice and said it was committed to bringing down bills By law the UK must stop adding to the total amount of planet warming greenhouse gases in the atmosphere by 2050 This is known as net zero Reaching net zero carbon dioxide emissions globally is widely seen as essential to limit further warming Previous political consensus around the target of the U K has broken down however with Conservative leader Kemi Badenoch branding it impossible and Reform using the phrase net stupid zero RAWSEP View By using this unhelpful and illogical phrase Reform in the UK seems to be mirroring the rhetoric of Trump in the the U S The Trump Method of Operation M O is to use the psychological term Projection If Trump feels that people view Trump as stupid Trump jumps in to call other people stupid first whether or not those people opposing him are intellectually brilliant Democrats or merely Democrats who put their

brains toward solving problems rather than creating problems in the manner that the intellectually and morally stunted Trump creates problems such as air pollution from sources that were being phased out but are now being phased in again by Trump in order to simply provide profits for the already rich at the expense of the health of people and at the expense of the health of the planet [Back to the article excerpt](#) But the CCC committee argues the switch to cleaner technologies is achievable and could lead to long term economic benefits Greenhouse gas emissions within the borders of the U K have already fallen by more than half since 1990 But that is mostly because polluting fossil fuels – particularly coal – have been increasingly replaced with renewable energy like wind and solar for electricity generation The biggest emitters in the U K last year were transport and [buildings which will also need to get cleaner to help reach net zero](#) The CCC sees signs of progress including a near doubling of the number of electric cars on UK roads in the past two years [Nearly one in five new cars sold in 2024 was electric](#) This has helped to reduce emissions from transport not counting planes and ships for the second year in a row even though traffic levels rose last year While new electric cars remain more expensive to buy than their petrol equivalents [the CCC expects them to cost the same in a couple of years](#) [Many second hand models are already as cheap and electric cars can be more economical to run too](#) We see these transitions happen surprisingly fast once they get going usually starting slowly and accelerating rapidly where falling prices and rising demand reinforce each other said the CCC head of net zero When that is combined with effective policy it really can lead to this rapid change Heat pump progress but a long way to go [Sales of electric heat pumps are growing quickly too up by more than half last year thanks partly to grants introduced under the Conservatives the CCC said](#) But they still remain well below target The committee also praised the new government relaxation of planning rules which it says should encourage more people to install heat pumps But even after grants they can be expensive to install and while they are much more efficient than a gas boiler they are not necessarily cheaper to run That is because the cost of electricity is so high something the CCC has repeatedly said needs tackling Make electricity cheaper The single largest reason for the rise in household electricity prices in recent years is the increase in wholesale costs driven by international gas prices the CCC says The only way to get bills down for good is by becoming a clean energy superpower and we continue to work tirelessly to deliver clean power for families and businesses argued Energy Secretary Ed Miliband But the committee adds that [electricity bills are artificially high because charges are added to them to support largely older renewable energy projects which were more expensive as well as energy efficiency upgrades](#) On Monday the government announced plans to remove these costs for some businesses Removing them from household electricity bills too would be a quick fix to the high prices in the U K making it much cheaper to run an electric car or heat pump the committee says But these costs would have to go somewhere potentially onto general taxation It would take about 200 pounds off the average household bill but at a cost of about 6 billion pounds per year to the Exchequer

[17](#) Denmark and Germany Esbjerg Denmark Berlin Germany Warsaw Poland Heat Pumps The giant heat pump in Denmark will heat 25000 homes with seawater EnergyTransition dot org Most observers think of heat pumps as small scale heating systems for houses businesses and apartment buildings But XXL heat pumps are already in service [RAWSEP View](#) The Esbjerg Denmark plant should ditch the wood and coal boilers that run in tandem with the clean energy Heat Pump so that air pollution from energy generation in Denmark will be terminated Even with a change in the German government the Christian Democratic Party continues development of its Heat Pumps although in

Neukölln Germany Heat Pumps run in tandem with air polluting wood burning and coal burning also  
Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke  
Emission Particulates a 501c3 nonprofit organization Energy Transition June 27 2025 Most observers  
think of heat pumps as small scale heating systems for houses businesses and apartment buildings  
But XXL heat pumps are already in service and doing the same job for whole city districts Their practice  
if successful will be an important asset in decarbonizing societies and economies The city of Esbjerg  
Denmark is out in front but not for long It boasts two industrial size heat pumps that provide the city of  
100000 with heat from a vast resource right off its coast namely the Wadden Sea The goal to replace  
the Esbjerg coal fired power plant at least in part and eventually in full The heat pumps extract heat  
from the seawater using carbon dioxide as a natural refrigerant to transport the heat and bring it to a  
higher temperature level The seawater heat pumps manufactured by the German company MAN have  
a combined heating capacity of 70 MW and since 2025 operate in tandem with a 60 MW wood chip boiler  
and a 40 MW electric boiler plant The mixed technologies minimize investment and operational costs  
and add to flexibility against fluctuating fuel and power market conditions They will supply domestic  
heating customers with approximately 280000 MWh of carbon free heat annually No heat pump has  
ever generated so much heat but the Esbjerg pumps will not remain top of the pile for long In Cologne  
MAN has another under construction that will have twice the capacity There is a consensus in Europe  
that heat pumps are critical to decarbonizing heat generation Even when using pure coal power for  
example a heat pump is much more sustainable than conventional boilers thanks to its outstanding  
efficiency as it only requires around a third of the primary energy of a boiler to deliver the same output  
The mega scale systems are unique and innovative in more ways than one they also serve as peak and  
backup load facilities This capability to operate flexibly it can ramp up from minimum load to maximum  
load and from hot standby to full load in less than 30 seconds makes them multipurpose systems They  
can readily balance the electrical grid by for example supporting the integration of weather dependent  
power generation like solar and wind The Danish pilot project demonstrates that large scale seawater  
heat pumps utilizing the non toxic natural refrigerant carbon dioxide are technically possible and  
economically feasible As Denmark has extensive district heating networks it believes that it will  
generate half of its heat by way of electricity by 2035 District heating concepts are also seen as a key  
measure for decarbonizing the German heating sector which the previous government of Social  
Democrats Greens and Liberals planned to facilitate by adding 100000 households a year to district heat  
networks The new government led by the Christian Democrats agrees that Germany should have more  
district heating but does not specific a per year figure More in Germany Germany already has several  
large heat pumps including one in Berlin Neukölln though they are not nearly the size of Heat Pumps in  
Esbjerg In Neukölln one of the 8 point 5 ton units is connected to several large scale boilers and seven  
combined heat and power CHP units are situated at the heating plant site The fuels used include fossil  
gas wood pellets hard coal biomethane and heating oil Alongside a planned CHP powered air cooling  
system further potential heat sources river water heat and geothermal energy will become available  
The heat from the pumps in Berlin Neukölln and adjacent Berlin Kreuzberg reaches around 55000  
connected households in the form of hot water The water releases its heat and flows back to the  
Neukölln plant through a circulation system By 2045 large scale heat pumps could provide 70 percent  
of the district heating supply and thus replace a very large proportion of the fossil gas used Stuttgart and  
Mannheim The largest German heat pump will soon be in Stuttgart constructed by EnBW where waste

heat from the cooling water drained from a CHP site will generate up to 24 MW for district heating In Germany in addition to Stuttgart there [are plans](#) to install large heat pumps in Berlin Neukölln Mannheim and Rosenheim which will be operative by spring 2026 all supported by the Federal Ministry for Economic Affairs and Energy Getting in on the superlatives Mannheim will boast the largest river based heat pump in the country using water from the Rhine River to heat 3500 households A climate neutral heat supply is crucial for Germany to hit its climate targets

**18** Luxembourg Heat Pumps Why heat pumps are a more cost effective choice in the long term Delano dot lu Is investing in a heat pump a good or bad idea? Unless your home is very old and poorly insulated buying a heat pump is still a cost effective Heat pumps are a more cost effective choice in the long term because they offer long term savings in energy bills government incentives and environmentally friendly options [1 2 3 4 5](#) Although the initial cost may be higher the overall benefits make heat pumps a smart investment

**19** Italy Heat Pumps EDGE PRO the new high performance residential heat pump Heating and Ventilating Clivet has launched EDGE PRO the innovative air to water packaged heat pump from 4 to 16 kW ideal solution for new buildings and renovations

**20** The European Union Oslo Norway Ghent Belgium Bristol England Warsaw Poland Utrecht The Netherlands Milan Italy Wood Burning is Pollution [RAWSEP View](#) A half measure Just do not burn wood to begin with Use funds to shut down all residential wood burning and replace that with clean energy home heating which is usually a Heat Pump Do not expend any more funds on testing and retesting any wood stove including the Ecodesign Wood burning is dirty energy from the start Just do not burn wood to begin with Wood Burning is Air Pollution plain and simple In reality the European Union cannot continue to use solid fuel heaters as a back up energy without harming the health of their citizens [From the headline](#) Cities call for stronger EU rules on new wood burning heaters to tackle deadly air Eurocities pollution A new policy statement from Eurocities makes the case for more effective science based regulation of wood burning appliances which remain a significant but often overlooked source of air pollution in urban areas [Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization](#) Eurocities June 25 2025 As the European Commission undertakes a revision of its Ecodesign rules for solid fuel heaters European cities are urging a major step forward in ambition Across Europe the use of wood for residential heating has grown steadily rising by over 150% between 2006 and 2020 Yet wood smoke is a major contributor to harmful fine and ultrafine particulate matter in the air which the European Environment Agency links to over 240000 premature deaths annually Cities are on the front lines of this public health crisis deploying a mix of bans financial incentives and public awareness campaigns But their efforts are too often undermined by outdated EU level standards that allow polluting appliances to remain on the market Ghent like many cities must act fast to cut air pollution and meet the new air quality standards of the European Union said Filip Watteeuw Aldermen for Housing Environment Climate and Energy in Ghent Wood heating is a serious but often ignored source of pollution Even in cities it causes major harm to air quality both indoors and outdoors The European Commission must hold the line on its goal to halve premature deaths by air pollution by 2030 and set strict eco design rules for all wood burning appliances Better policy better air The Eurocities policy statement presented at a European Commission meeting by Tobias Wolf Chair of the Eurocities Air

Quality Working Group and Senior Advisor in the City of Oslo calls for a set of fundamental changes to the Ecodesign regulation. These include unifying the currently inconsistent measurement methods for particulate emissions which often fail to reflect real world appliance use. The statement advocates for a single comprehensive test cycle that includes start up, extinguishing and both low and high load usage conditions under which most emissions occur. The European Commission must hold the line on its goal to halve premature deaths by air pollution by 2030 and set strict eco design rules for all wood burning appliances. Cities also stress the need to regulate not only the mass of particles emitted but also their number, particularly when it comes to ultrafine particles which have been recognised as especially harmful to human health. The statement points to the need for stricter emissions thresholds for new appliances, phasing out the most polluting models and ensuring that only state of the art low emission devices can be placed on the market in the future. Automating airflow control is another key recommendation aimed at reducing emissions caused by user error which even the cleanest models can produce if operated incorrectly. Examples from the ground. These recommendations are not abstract. They reflect the lived experience of cities already grappling with the health impacts of wood heating and seeking regulatory solutions. In Warsaw for example a combination of strict bans and generous subsidies has led to the replacement of over 6000 solid fuel boilers since 2017 contributing to an 80% reduction in such appliances. The Warsaw anti smog fund has covered 100% of boiler replacement costs in its early years while also supporting a shift to cleaner technologies like heat pumps and solar panels. Oslo has also been proactive providing financial support to replace old wood ovens and running targeted communication campaigns during the winter to promote cleaner burning techniques. Importantly Norway applies its own advanced emission testing system which includes secondary particles and full burn cycles offering a model for what the revised EU regulation could look like. Elsewhere cities like Bristol have used national legislative tools to declare smoke control areas where only approved appliances and fuels may be used. Recently the city gained new enforcement powers including the ability to issue fines for visible chimney smoke. Utrecht is taking a longer term approach planning a general ban on wood burning from 2030 while Milan has already attempted to introduce a ban on biomass boilers although this is currently held up by legal constraints linked to EU internal market rules. Citizens in urban areas are especially exposed to air pollution and cities are leading the way in addressing this key health issue. Despite these efforts cities face limitations. Local bans and incentives cannot compensate for weak or inconsistent EU wide standards. Moreover many of the most polluting devices remain legally available for sale complicating the ability of cities to protect their residents. Next steps. Citizens in urban areas are especially exposed to air pollution and cities are leading the way in addressing this key health issue said Eirik Lae Solberg Governing Mayor of Oslo. In Oslo wood burning on cold days cause peaks in air pollution still wood remains a supplementary heating source for many European citizens. Therefore we ask for a high ambition level when revising the Ecodesign requirements to ensure that we can continue to use solid fuel heaters as a back up energy source also in the future without harming the health of our citizens. The Eurocities statement makes clear that this is not about banning wood heating altogether. By setting strict and realistic standards based on real world performance and the latest scientific understanding the EU can enable cities to do their part and deliver on the zero pollution ambition for 2030 and beyond.

21A India Agricultural debris burning Wood Burning Pollution How farm fires intensify the Delhi post monsoon smog problem Air pollution The Guardian Related stories Homes with wood burners

since 2022 analysis finds May 1 2025 Map reveals residential wood burning hotspots in England and Wales April 17 2025 Analysis Background [RAWSEP View](#) The Happy Seeder in Wikipedia as of July 1 2025 [Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization](#) Happy Seeder is a proposed solution for stubble management after harvesting of the paddy crops It is similar to a Zero Till Ferti Seed Drill developed by National Agro Industries [Usually many farmers in Punjab and Haryana burn stubble which has a severe socioeconomic and environmental impact on the North Indian regions](#) Paddy stubble burning results in large emissions of greenhouse gases such as carbon dioxide CO<sub>2</sub> carbon monoxide CO nitrogen oxides NO<sub>x</sub> and methane CH<sub>4</sub> [as well as particulate matter PM10 and PM2 point 5](#) Issues Many farmers are reluctant to use Happy Seeder even when the government is offering up to 50% to 80% subsidy Some farmers complain that Happy Seeder is not an efficient machine to manage stubbles and leaves behind many particles which are not ploughed back into the field thus creating a problem in sowing and germination for the wheat crop For Happy Seeder to do its work efficiently a SUPER SMS Super Straw Management System is needed while harvesting paddy which cuts and spreads the residue evenly on the field [Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization](#) The Guardian June 27 2025 AI Summary Research confirms that agricultural fires primarily from farmers burning rice stubble in Punjab are the main cause of the Delhi severe post monsoon smog This extreme air pollution combined with high population density in the Indo Gangetic plain leads to substantial health harm including 1072 attributable deaths in Delhi and 259 in Kanpur during November and December The smog travels from Punjab gathering smoke and reacting with sunlight to intensify reaching Kanpur after 24 hours Other pollution sources include domestic burning industrial emissions and traffic while solutions like the happy seeder machine are being explored Analysis What Agricultural fires mainly from farmers burning rice stubble are confirmed as the primary cause of severe post monsoon smog in Delhi and the Indo Gangetic plain This pollution leads to [substantial public health impacts including hundreds of attributable deaths](#) in Delhi and Kanpur during November and December When The smog problem occurs during the post monsoon period specifically in November and December Fires are typically lit during mid afternoon in Punjab with the smog reaching Delhi overnight and Kanpur after 24 hours Where Delhi the Indo Gangetic plain Punjab origin of fires and [Kanpur affected city](#) Why [Farmers burn rice stubble](#) to quickly clear fields for planting wheat seed and achieving two crops a year This practice is partly caused by a transition to modern mechanical harvesting Other contributing factors include [burning of dung grass and wood for home heating](#) industrial pollution chemicals from plastics laminates adhesives e waste recycling and traffic pollution How A group of scientists led by a Professor and a Doctor investigated the causes Polluted air travels from Punjab towards Delhi gathering more smoke along the way Sunlight then causes pollutants to react forming further smog which then travels to Kanpur [21B](#) India PM two point five pollution Secondary particles contribute to one third of the India PM TWO POINT FIVE A call to strengthen the NCAP Centre for Research on Energy and Clean Air particulate matter PM TWO POINT FIVE pollution This widespread presence of ammonium sulfate has been observed across nearly all National Clean Air [22](#) Pakistan Islamabad PM two point five pollution Source oriented pollution characteristics and decay kinetics of environmentally persistent ScienceDirect dot com The decay lifetimes of EPFRs ranged in 43 point 5 to 63 point 0 days for PM TWO POINT FIVE and 38 point 4 to 51 point 6 days for PM2 point 5