

Episode 56ND December 15, 2023. Successful, cheaper residential heating with Heat Pumps in Minnesota and Norway.

Minnesota. Heat Pumps in Minnesota. <https://www.inforum.com/news/minnesota/heat-pumps-poised-to-accelerate-minnesotas-green-energy-transition> Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates. Minnesota has seen a surge in installations of heat pumps since 2019. A man installed a heat pump for his hardware store in Askov, Minnesota, last year to replace a propane boiler that failed. ASKOV, Minnesota. Last October, He did it to save money, and to get air conditioning for the first time. It was a bit of sticker shock when he got the quote for his new system, which included the heat pump, new ductwork, and a backup propane furnace. “But, if you’re saving two to three grand a year on propane, it don’t take very long to pay for it,”. his electric bill has increased only modestly, by about \$20 to \$30 per month. D&E Heating and Air Conditioning in Hinckley, installed his new system, and explained how efficient they are — and the financial incentives available. It is an easy sell, especially for customers who want to replace an air conditioner. “With the benefits, the tax incentives, the rebates, it doesn’t make any sense to put in a straight air conditioner.” technological improvements enable heat pumps to operate efficiently even in extreme Minnesota winters. Now, with additional federal and state incentives in the pipeline for 2024 that could reduce the cost of a heat pump by \$12,000 or even more. “you include all the available rebates and tax credits” said the owner of Twin Ports Custom Climate in Superior, Wisconsin. “Especially if you’re already putting air conditioning in your house, it should be a heat pump.” Moving heat. Every winter day in Minnesota, there are tens of thousands of tiny fires burning in homes and buildings around the state. Most are combusting natural gas, or propane, in furnaces and boilers, turning those fossil fuels into heat. A heat pump, in contrast, doesn’t create heat at all. It moves it. The technology has been around for decades. Even on cold winter days, there’s heat in the outside air. A heat pump extracts that warm air and moves it inside your home to heat it. Since an air pump moves heat, instead of creating it, “It can operate at 150 to 400 percent efficiency,” said an air-source heat pump initiative manager at the Center for Energy and Environment. Heat pumps do use electricity. But more and more electricity is produced from carbon-free sources like wind and solar. State legislators passed a law earlier this year to produce 100 percent carbon-free electricity by 2040. greenhouse gas emissions from Minnesota homes and apartment buildings have increased 14 percent in recent years. Buildings use about 40 percent of the energy created in Minnesota. For years, Minnesota’s frigid climate has held back air-source heat pumps from gaining a wider foothold. that’s changed over the past 10 to 15 years. “We’re seeing systems that are now rated down to negative 20 (degrees Fahrenheit), or even lower. there are some homes that are passively heated and extremely energy efficient and weather-tight that can get by with only a heat pump. But installers recommend keeping a backup, either electric heat, or a furnace or boiler, that in a typical scenario would provide about 10 to 20 percent of a home’s heat over the course of a year. “If something breaks, number one, it’s not an easy fix, usually. Number two, eventually Minnesota winters could overpower an air-source heat pump,” a standard heat pump can heat well down to about five degrees below zero. But the technology is improving rapidly. “It was only five to seven years ago we didn’t have anything that I would safely install that would run below the 20 degree (above zero) mark,” the up-front cost of installing a heat pump may run roughly 20 percent more than a standard natural gas forced air furnace. But homes that install a heat pump can expect about a 25 percent savings in yearly heating costs. For some, especially those that heat with efficient natural gas systems, they may not result in many cost savings. But experts say those who heat with propane, or with electric baseboard heating, can expect significant savings, up to 50 percent annually, according to the Minnesota Air Source Heat Pump Collaborative. An existing 30 percent federal tax credit allows customers to save up to \$2,000 on a system. Utilities currently offer rebates up to \$1,000 or more. the Minnesota Department of Commerce prepares to roll out additional state and federal incentives and rebates in 2024. Depending on income level, homeowners will soon be eligible for a federal rebate up to \$8,000, and a state rebate of up to \$4,000. Additional federal rebates will also be available for home retrofits that result in efficiency upgrades, including heat pump installations. “there’s been something of a delay from the federal side. look for a rollout we’re hoping sometime in 2024. It has to be rolled out by early 2025.” The installer interviewed believes heat pumps will be the majority heating source in the U.S. within the next couple decades. “if they’re utilized properly, set up properly and installed properly, they can take a huge bite out of our heating costs, and our carbon footprint.” RAWSEP View: The article below about Heat Pumps in the United States and Norway only refers to replacing fossil fuel home heating with Heat Pumps. RAWSEP would like indoor residential wood burning replaced with Heat Pumps whenever and wherever possible. Wood burning emits more CO₂ and PM_{2.5} than the fossil fuel coal burning. Wood burning emits 450 times more PM_{2.5} than natural gas burning. Wood smoke is 90% PM_{2.5}, particulate matter of 2.5 micrometer size, the perfect size to infiltrate the human lung, setting off a cascade of human health problems and early deaths. Norway. Heat Pumps in Norway.

<https://medium.com/@danteran/our-investment-in-tetra-69d5f77cf76c> Excerpts edited by RAWSEP for brevity and

clarity and relationship to Residents Against Wood Smoke Emission Particulates. The 2022 Inflation Reduction Act (IRA) contains billions of dollars in incentives to accelerate the transition to a low carbon economy. In the US, [roughly 20%](#) of carbon emissions come from powering, heating, and cooling homes. The burning of natural gas and fuel oil accounts for more than half of that. The technology to decarbonize HVAC is not new. Heat Pumps were invented in 1856 and popularized in Europe in recent decades. Heat pumps extract heat from the air, and then transfer it where it is needed. Because the heat is being moved, not generated, heat pumps are far more efficient than any other technology. A common criticism of heat pumps is that they are ineffective in cold weather. This isn't true. Today, [two thirds of households in Norway](#), one of the coldest countries in the world, rely on heat pumps. Heat pumps are also less expensive to operate and safer than fossil fuel systems. Replacing older systems can save the average household up to [\\$1,000 a year](#), while eliminating the health risks associated with fossil fuels. Historically, heat pumps have had a higher up-front cost than fossil fuel systems. This is changing. The IRA will provide incentives of up to [\\$14,000 per household](#) for heat pump installation and related expenses, making them cost competitive for the first time. These incentives begin to roll out to states in 2024.

Headlines. Burn bans are in place due to smoke pollution, so burning wood in your fireplaces or wood-burning stoves is prohibited in Maricopa County today. Arizona, Maricopa County. [Why Maricopa County declares 'no burn day' Wednesday and Thursday | Daily Independent](#). YourValley.net (Metro Creative Connection). Wood burning fireplaces are one thing the Maricopa County Air Quality Department is advising Valley residents to put. Maricopa County Air Quality smoke locally. Arizona, Phoenix. [What you need to know about 'No Burn Days' in metro Phoenix - YouTube](#). On these days, no wood burning is allowed in Maricopa County. Here's what you need to know. #azfamily #arizona #news #gmaaz #goodmorningarizona Arizona, Phoenix. [What you need to know about 'No Burn Days' in metro Phoenix - AZ Family](#). On these days, no wood. Arizona, Phoenix. [Maricopa County issues first 'No Burn Days' of 2023 - AZ Family](#). PHOENIX (3TV/CBS 5) California, Sacramento. [Looking to use your fireplace during cold temps? Make sure to check if it's a no-burn day](#). KCRA. "When you go outside, you smell that wood smoke. It is actually particulate matter that is going into your lungs," Vanderspek said. "It's fairly. Smoke from burning wood can also cause sensitive groups — like those with asthma, older adults and children — to go to the hospital more often. Check Before You Burn is in full swing this holiday season. On Wednesday, it's illegal to burn wood in a stove or chimney in the Sacramento. California, Sacramento. [Looking to use your fireplace during cold temps? Make sure to check if it's a no-burn day](#). YouTube. Check Before You Burn is in full swing this holiday season. On Wednesday, it's illegal to burn wood in a stove or chimney in the Sacramento region. California, Santa Cruz. [Spare the Air Alert issued for parts of Santa Cruz Mountains - KSBW](#). During the alert, residents are asked to refrain from burning wood, manufactured fire logs or any other solid fuels. Hawaii. [Weekly Kula Air Sampling Continues to Show Good Air Quality - Hawaii State Department of Health](#). Hawaii State Department of Health - Hawaii.gov The real-time monitors measure for PM 2.5, particulate matter that is 0.0025 millimeters and smaller in size (about 30 times smaller than the. Oregon, Eugene. [Weather Status | Eugene Daily News](#). Cottage Grove: The Air Quality Index is 50 in the Good category measuring Particulate Matter. Burning wood in wood stoves or fireplaces is allowed. Canada, British Columbia. [New rebates make healthier home heating more affordable | BC Gov News](#). Gov.bc.ca Facts about wood stoves and alternatives. The smoke from wood-burning stoves and fireplaces contains fine particulate matter and other pollutants. Canada, British Columbia, Bulkley Lakes. [Province offering rebates to replace wood stoves - My Bulkley Lakes Now](#). The rebates come through the Community Wood Smoke Reduction Program "Burning wood is one of the largest air-pollution sources affecting BC. Canada, British Columbia, Kamloops. [B.C. government increases heating rebates for cleaner heating options | CFJC Today Kamloops](#). Wood Smoke Reduction Program to ensure savings in a time of inflation. Funding is set to replace about 470 wood stoves across the province to. United Kingdom, England, Sandwell. [EarthSense project reveals the cost of air pollution-related healthcare in the Sandwell area](#). Air Quality News. particulate matter (PM1, PM2.5, PM10). Pollution measurements were supplemented by MappAir modelling data, which provides context for locations. China. [China solar panel costs drop 42% from year ago - report - Reuters](#). China accounts for 80% of the world's solar manufacturing capacity, according to the analysis by energy research firm Wood Mackenzie shared with. India. [Combating Pollution To Rejuvenate And Reimagine Indian Cities, Towns Villages - Times Now](#). For the uninitiated, particulate matter or PM is acronym for a mixture of solid particles and liquid droplets found in the air. PM 2.5 refers to. India. [Pollution Alert: 7 Cities from Bihar Among India's Most Polluted | Patna News - Times of India](#). There are various sources which contribute to the release of PM 10 and PM 2.5 matter into the atmosphere. Measures include sprinkling of water. India, Delhi. [City's Air Pollution Crisis Refuses To Abate Despite Efforts By Rmc | Ranchi News](#). The Times of India. The court also called for monitoring of additional parameters like PM 2.5, PM 10, NO, and SO2, and requested detailed affidavits from officials. Thailand, Bangkok. [Air quality in Bangkok and vicinity slightly better today](#). Thai PBS World. Mahachai sub-district, Mueang district, Samut Sakhon, 50.1µg. Tags: Bangkok. PM 2.5 · Thailand · the Pollution Control Department. Share Post. Thailand, Bangkok. [PM](#)

[urges action on PM2.5 - Bangkok Post](#) Bangkok is facing a critical surge in PM2.5, prompting urgent action from the government. The levels of fine particulate matter smaller than 2.5 Thailand, Pattaya. [Pattaya City tackles PM 2.5 air pollution issue](#) Pattaya Mail. PM 2.5. AQI is a comprehensive index that includes air pollutant: PM 2.5 Thailand, Pattaya. [PM 2.5 dust in Ang Thong rises to Thailand's 7th place - Pattaya Mail](#) PM 2.5 level of 71 micrograms per cubic meter. The air quality in Ang Thong province has reached the 7th highest level in the country for PM 2.5 dust.

