

## Ed Norris

There are other issues with refrigerants, too. I've had my ground source heat pump for 9 years now, and in the first eight years, running it off unusually clean electricity (solar and gen 2 nukes), it saved upwards of 100,000 pounds of CO2 I would have generated if I still heated with oil. Maybe a bit less had I switched to propane (methane not an option where I live).

But last winter, it went on the fritz, and a technician found there was a leak and a malfunctioning part. Nearly all of the refrigerant had leaked out. Basically, all 81 ounces. About \$300 worth. But that was not anywhere near the real problem, even with the labor to repair it and replace the part, which were about as much as a winter's worth of oil would have cost me. Without any signs of a bad smell, and no alarm to warn of a loss of pressure, my refrigerant, at a GWP (global warming potential, equal to CO2) of 2008, that zeroed out almost all of last winter's emission savings. Those 5 pounds were like burning something like 450 gallons of heating oil. But I'm back on the horse, hopefully for another 10 years without further problems, and another 100,000 pounds of CO2 equivalent saved.

These heat pump units **\*REALLY\*** need alarms on them, when they begin to lose pressure, and leak away. We can't afford the kind of global warming potential floating away like that. The manufacturers won't add those features unless they are regulated, or motivated to offer them. We have to do better.