

# AIR CONDITIONERS: THE HOTTEST WAY TO STAY COOL

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You'll get death threats," my writing partner joked as I shared my intention to argue against Columbia installing air conditioners in dorm rooms. And I get it—the university recently [announced plans to install air conditioners](#) in all freshman dorm rooms, and, had this news come earlier this fall, I would've been ecstatic; after my first night in Wallach, I'd woken up feeling extremely sticky and gross, the suffocating heat and humidity of my room leaving me grumbling all day about the lack of air conditioning in dorms.

However, my grumbling quickly ceased when I discovered that the absence of air conditioners may actually have been a good thing. Air conditioners, it turns out, are extremely harmful to the environment.

Air conditioners depend on substances called [refrigerants](#) to facilitate their cooling effects, but these refrigerants are typically highly potent greenhouse gases that are prone to leaking into the environment. For example, R-410A is one of the [most commonly used](#) refrigerants, and it has a global warming effect that is [two-thousand-times](#) stronger than that of carbon dioxide.

Air conditioners are also highly energy intensive, requiring great amounts of electricity to function. Because electricity is typically [generated from fossil fuels](#) which [emit greenhouse gases](#) when burned, the energy demand of air conditioners becomes a major source of greenhouse gas emissions; in fact, approximately [117 million metric tons of carbon dioxide](#) are released into the environment each year by the US alone as a result of air conditioner usage.

Thanks to the [greenhouse effect](#), this means that the very devices we use to stay cool are contributing to the rapid warming of our planet. Then, as the planet gets hotter, and it becomes even more important to stay cool . . . well, you can see the problem; air conditioning is not a sustainable solution to heat.

So, if air conditioning isn't the answer to staying cool, then what is? For starters, there are plenty of long-term, sustainable design features that Columbia could implement in dorm rooms that would decrease the need for air conditioning altogether.

For example, the school could install [energy efficient windows](#), windows that are specifically designed to prevent heat from moving in and out of places. These windows typically make use of insulating frames, special low-emissivity coatings, and multiple panes [separated by dense gases](#) to block heat from entering and cold air from escaping. On window exteriors, installing shading devices such as solar screens or retractable awnings could [block up to seventy-seven percent of the heat](#) from the sun that would enter our rooms otherwise.

In addition to window upgrades, another sustainable cooling initiative that Columbia could undertake would be to build [green roofs](#), which would involve planting a layer of vegetation to cover rooftops. Green roofs provide insulation for buildings, thereby reducing the amount of heat that travels inside. They also remove heat from the air through a process called [evapotranspiration](#), which has the potential to reduce ambient temperatures by [up to 5°F](#). And green roofs don't require much maintenance once they've been established, so there's really no reason not to build them.

Energy efficient windows and green roofs are both relatively quick upgrades that could be implemented over the summer while students are away from dorms. They're also unobtrusive changes (compared to other solutions like [passive solar design](#) that would require more drastic, modernist renovations), so Columbia wouldn't have to desecrate its beloved neoclassical architecture in order to apply them (did you know that Columbia once [transplanted a whole building](#) just to keep campus symmetrical?).

Us students come into the equation through using our voices to push for the university to adopt these sustainable cooling designs instead of installing more air conditioners in dorm rooms. We can also advocate for more responsible usage of the air conditioners that already exist on campus.

I've had to bring hoodies to lectures in Pupin, despite it being 90°F and sunny outside, because the building's air conditioning is always blowing at full force. I've seen students layering on sweaters in preparation to enter Butler for the same reason. These environmentally reckless practices can be addressed through policy changes that we, as students, have the power to call for.

Asking the university to change its policies isn't the only way for students to get involved, though. For example, if you're an engineering student, you could work to revolutionize air conditioning by researching and designing systems that don't rely on refrigerants to function. Or, if you're an education student, you could help suggest revisions to the Frontiers of Science climate unit curriculum to teach students about concrete steps they can take to decrease their carbon footprint, such as being more conscientious about air conditioner usage.

These are just some preliminary suggestions—our campus is filled with some of our generation's brightest minds, so why not use those minds to create a more sustainable future? There's something that every one of us can contribute, even if that contribution starts out as simple as [reaching for the fan](#) instead of the air conditioner the next time things start to get hot (and hot, in NYC, [things will get](#)—anyone else remember the 60°F winter of 2023?). Though that may mean sleeping in a room that's just a bit less hot rather than completely chilled, I'd say it's a small price to pay for a healthier, cooler planet down the road—wouldn't you?

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## WORKS CITED

- “Air Conditioning.” *Energy.gov*, U.S. Department of Energy,  
<https://www.energy.gov/energysaver/air-conditioning>.
- “All First-Year Residence Halls to Have Air Conditioning Effective Fall 2023.” *Columbia Housing*, Columbia U, 2 May 2023,  
<https://www.housing.columbia.edu/news/all-first-year-residence-halls-have-air-conditioning-effective-fall-2023>.
- Bertrand, Savannah. “Fact Sheet: Climate, Environmental, and Health Impacts of Fossil Fuels (2021).” *Environmental and Energy Study Institute*, 17 Dec. 2021,  
<https://www.eesi.org/papers/view/fact-sheet-climate-environmental-and-health-impacts-of-fossil-fuels-2021>.
- “Climate Change Effects and Impacts.” *Department of Environmental Conservation*,  
<https://www.dec.ny.gov/energy/94702.html>.
- “Energy Efficient Window Coverings.” *Office of Energy Saver*, U.S. Department of Energy, <https://www.energy.gov/energysaver/energy-efficient-window-coverings>.
- Evans, Paul. “How Do Refrigerants Work?” *TheEngineeringMindset.com*, 20 Sept. 2017,  
<https://theengineeringmindset.com/how-do-refrigerants-work/>.
- “Green Roofs.” *U.S. General Services Administration*, 4 June 2021,  
<https://www.gsa.gov/governmentwide-initiatives/federal-highperformance-green-buildings/resource-library/integrative-strategies/green-roofs>.
- Gromicko, Nick. “Window Gas Fills: What Inspectors and Consumers Should Know.” *International Association of Certified Home Inspectors*  
<https://www.nachi.org/window-gas-fills.htm>.
- Hess, Brad. “HFC Refrigerants Used in Commercial Air Conditioning.” *AC & Heating Connect*, Copeland LP, 16 Apr. 2021,  
<https://www.ac-heatingconnect.com/facility-managers/hfc-refrigerants-used-commercial-air-conditioning/>.
- “A Little House with a Long History” *News from Columbia's Rare Book & Manuscript Library*, Columbia U Libraries Blogs,  
<https://blogs.cul.columbia.edu/rbml/2021/09/15/a-little-house-with-a-long-history/>.
- “Passive Solar Design.” *Sustainability*, Williams College,  
<https://sustainability.williams.edu/green-building-basics/passive-solar-design/>.
- “Refrigeration and Airconditioning - Consumers.” *Department of Climate Change, Energy, the Environment and Water*, 18 Oct. 2021,  
<https://www.dcceew.gov.au/environment/protection/ozone/rac/consumers>.

- Smith, Adam. "Air Conditioner Vs. Fan: Electricity Usage." *EcoEnergyGeek*, 20 Apr. 2022, <https://www.ecoenergygeek.com/air-conditioner-vs-fan-electricity-usage/>.
- "Using Green Roofs to Reduce Heat Islands." *United States Environmental Protection Agency*, 13 July 2022, <https://www.epa.gov/heatislands/using-green-roofs-reduce-heat-islands>.
- "Using Trees and Vegetation to Reduce Heat Islands." *United States Environmental Protection Agency*, 31 Oct. 2023, <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>.
- "What Is the Greenhouse Effect?" *The National Aeronautics and Space Administration*, <https://climate.nasa.gov/faq/19/what-is-the-greenhouse-effect/>.
- "What Is U.S. Electricity Generation by Energy Source?" *U.S. Energy Information Administration*, 29 Feb. 2024, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>.
- "Window Types and Technologies." *Office of Energy Saver*, U.S. Department of Energy, <https://www.energy.gov/energysaver/window-types-and-technologies>.

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