The Benefits of Solar for Climate, Air Quality, & Health

Presented by Tracey Holloway, Ph.D
Air quality health advisory in effect Monday for Long Island

By Denise Civiletti - Jul 29, 2019, 12:11 pm

Code Orange Air Quality Alert In Effect For Metro Atlanta

A Code Orange Air Quality Alert was issued for Metro Atlanta on Monday. The outdoor air quality is likely to be unhealthy for some people.

By Kathleen Sturgeon, Patch Staff
Jul 29, 2019 10:28 am ET | Updated Jul 29, 2019 10:37 am ET

Hot Weather, Pollution Fuel Unhealthy Air Conditions in Chicago

Kristen Thometz | July 18, 2019 2:04 pm
Chicago, Illinois

No. of Exceedance Days

- Days >75 ppbv ozone
- Days ≥90°F

Year


Hot Days = Unhealthy Ozone

Patz, Frumkin, Holloway et al., *Journal of the American Medical Association*, 2014
Nearly 50% of U.S. population breathes unhealthy air
Clean Air Act + “end of pipe” technologies → cleaner air for all criteria pollutants
Satellites see $\text{NO}_2$ from space, due to vehicles, power plants, and industry.
... and see the major clean-up in air pollution due to policies & technology
How does solar energy...

• Reduce emissions from fossil fuel combustion?
• Improve air quality, especially on the dirtiest days?
• Help states meet air quality standards?
• Improve public health?

U.S. Greenhouse Gas Emissions
2016 EPA

- Transportation: 28%
- Industry: 22%
- Electricity: 28%
- Commercial & Residential: 11%
- Agriculture: 9%

- 81% SO₂ Emissions
- 55% NOₓ
- 28% NOₓ

https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#colorbox-hidden
Potential air quality benefits from increased solar photovoltaic electricity generation in the Eastern United States

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“What if.... ” there were more solar energy?  
*We modeled air pollution over the U.S. to answer that question*

Left: Summer PM$_{2.5}$ (Business-as-Usual); Right: % reduction due to 17% PV

Abel, Holloway, et al., *Atmospheric Environment*, 2017
Solar has the biggest benefits on the dirtiest days.
UW Study: Turning Off The Lights Reduces Both Economic, Human Costs
Reducing Pollution From Energy Production Can Have Tangible Health Impacts, Research Finds
By Mary Kate McCoy
Published: Thursday, April 4, 2019, 4:25pm

This One-Second Action Could Save Someone's Life
A quick and easy act could have ripple effects on health and the environment.

Psychology Today

Pollution Peaks When Temperatures Top Out

Under Climate Change, The AC Giveth And The AC Taketh Away

07/13/2018
Solar benefits health and air quality immediately... *A powerful motivation for low-carbon energy*

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