



Promote, Incentivize, and/or Subsidize Air Purification Systems

Target	<ul style="list-style-type: none">• Promote, incentivize, and/or subsidize air purification systems.• Use only an approved product list of effective air cleaners.• Prioritize efficiency upgrades and clean air systems in Oregon schools.• Further prioritize schools that serve diverse or disadvantaged communities.
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Note: This policy was not assessed quantitatively; a qualitative assessment of the policy has been undertaken using the same framework. This assessment is based on our understanding of the policy intention and our best assessment of its impacts.

Indicators

1. GHG emissions	<div>— No change</div>	The impact on GHG emissions will be negligible
2. Economic impact-lifecycle abatement cost	<div>↓ Saves money per air purification system</div>	Installing portable air purification systems will generate a net positive benefit
3. Energy efficiency	<div>↑ Increases energy consumption</div>	The policy will increase energy consumption, but the impact will be small
4. Resiliency	<div>↑ Increase resilience</div>	Cleaning air in homes and schools will increase resilience against wildfires
5. Public health and air quality	<div>↓ Decreases health costs</div>	Health care costs will decline as a result of this policy
6. Household expenditures	<div>↑ Increases household energy costs</div>	Household energy costs will increase marginally

7. Economic impact-
employment

—
Employment

Employment impacts will be minor, depending on the scale of deployment

8. Social cost of
carbon

—
No change to the
social cost of
carbon

The impact on the social cost of carbon will be negligible

Discussion

1. GHG Emissions

The GHG impact is negligible, going from approximately 0.054 metric tons to 0.014 metric tons.

2. Economic Impact, Costs and Savings

The costs of wildland fire-related health costs in the U.S. are estimated to be tens to hundreds of billions of dollars per year.¹ Using a method to calculate health damages from wildfires,² the authors estimated that 2012 wildfire smoke in Oregon totaled \$2.1 billion (2018 dollars), including the costs of lost lives, medical care in emergency rooms and hospitals, prescribed medications, and lost wages.³ The cost of an air purifier capable of removing air pollutants from a 200 ft² room is approximately \$200.⁴ If 700,000 homes installed this type of air purifier, the total cost would be approximately \$140 million. A study in Southern California also found that the avoided health care benefits exceeded the costs of providing portable air cleaners and the benefit increases if the homes of elderly are targeted.⁵

3. Energy Efficiency

The introduction of air purification systems can increase electricity consumption. For example, an air purifier running continuously can consume 450 kWh per year in electricity for a home; using an Energy Star certified model can reduce this total to 120 kWh/year,⁶ which is similar to an efficient refrigerator.

4. Resiliency

Air purifiers increase the resiliency of households against wildfire smoke. Portable air cleaners can reduce PM_{2.5} concentrations in homes by 63% to 88%.⁷

5. Public Health and Air Quality

Smoke-affected communities are at increased risk of all-cause mortality and respiratory-related emergency room and doctor visits, hospital admissions, and use of rescue medication. Evidence suggests that smoke exposure is also associated with increased cardiovascular mortality, hospital admissions for ischemic heart disease, and out-of-hospital cardiac arrests. Emerging evidence also links wildfire smoke to reduced birth weight, increased systemic inflammation, and bone marrow effects.⁸

¹ Davison, G., Barkjohn, K. K., Hagler, G. S., Holder, A. L., Coefield, S., Noonan, C., & Hassett-Sipple, B. (2021). Creating clean air spaces during wildland fire smoke episodes: Web Summit summary. *Frontiers in Public Health*, 9, 508971.

² Limaye, V. S., Max, W., Constible, J., & Knowlton, K. (2019). Estimating the health-related costs of 10 climate-sensitive US events during 2012. *GeoHealth*, 3(9), 245-265.

³ Limaye, V. and Constible, J. (2019). Up in Smoke: Oregon Wildfires Cost Billions in Health Harms.

⁴ NY Times (2022). The Best Air Purifier. Retrieved from: <https://www.nytimes.com/wirecutter/reviews/best-air-purifier/>

⁵ Fisk, W. J., & Chan, W. R. (2017). Health benefits and costs of filtration interventions that reduce indoor exposure to PM 2.5 during wildfires. *Indoor Air*, 27(1), 191-204.

⁶ EPA. Air purifiers. Retrieved from: https://www.energystar.gov/products/air_purifiers_cleaners

⁷ Barn, P. K., Elliott, C. T., Allen, R. W., Kosatsky, T., Rideout, K., & Henderson, S. B. (2016). Portable air cleaners should be at the forefront of the public health response to landscape fire smoke. *Environmental Health*, 15(1), 1-8.

⁸ Ibid

People who are particularly vulnerable include:

- seniors
- pregnant people
- infants and young children
- people who work outdoors
- people involved in strenuous outdoor exercise
- people with an existing illness or chronic health conditions, such as:
 - cancer
 - diabetes
 - mental illness
 - lung or heart conditions

Children are vulnerable as they often spend more time outdoors, breathe more air relative to their body weight, are growing and developing and a higher proportion of particles can penetrate deeply into the lungs.⁹ The large population of children spending time in schools suggests that providing portable filtration is a potentially cost-effective intervention that could provide significant benefit.¹⁰

6. Household Expenditures

The economic impact of an air purifier is minimal, increasing electricity costs by approximately \$15 per year per installation.¹¹

7. Economic Impact, Employment

The impact on employment is negligible.

8. Social Cost of Carbon

The impact on the social cost of carbon is negligible.

⁹ Holm, S. M., Miller, M. D., & Balmes, J. R. (2021). Health effects of wildfire smoke in children and public health tools: a narrative review. *Journal of exposure science & environmental epidemiology*, 31(1), 1-20.

¹⁰ Ibid

¹¹ Ibid