

# Breath of Fresh Air: The ROI of Indoor Air Quality (IAQ) Monitors

This paper focuses on the return on investment of expenditures in indoor air quality improvements.



## INTRODUCTION

In the bustling landscape of corporate priorities, companies often grapple with the challenge of allocating budgets among various competing demands. Amidst considerations for workplace wellness initiatives and other amenities, one question frequently arises: What is the return on investment (ROI) of investing in indoor air quality (IAQ) improvements? This article aims to explore the business case for IAQ monitors by examining their potential ROI and the tangible benefits they offer to organizations.

Studies have consistently demonstrated the adverse effects of poor IAQ on employee health and productivity. A controlled study in office buildings revealed a direct correlation between low ventilation rates and increased short-term sick leave, resulting in an estimated **cost of \$480 per employee per year**. However, by investing in increased ventilation, companies have the potential to achieve **net savings of \$400 per employee annually**.<sup>i</sup>

Investing in better indoor air quality can significantly improve cognitive function and decision-making among employees, as demonstrated by a Harvard study.<sup>ii</sup> Green office environments and enhancements led to a remarkable **61% and 101% increase in cognitive scores**, respectively, compared to conventional conditions. Even small improvements, such as a 10% increase in productivity, equivalent to about **48 minutes per day for each employee**, can yield substantial returns. Calculating the payback for IAQ monitoring systems based on staff salary and benefits multiplied by the productivity increase provides a straightforward ROI assessment. Research indicates that poor indoor air quality can result in **productivity losses ranging from 3% to 7%**, translating to **nearly 100 hours of lost productivity per worker annually**.<sup>iii</sup> The benefit-to-cost ratios for enhancing ventilation rates and filter system efficiency stand at **14:1 and 8:1**, respectively, highlighting the significant ROI achievable through IAQ improvements.<sup>iv</sup>

## ROI OF INDOOR AIR QUALITY MONITORS

Research consistently highlights the negative impact of inadequate indoor air quality (IAQ) on employee health and productivity. This report provides a visual breakdown of the ROI of investing in IAQ improvements.

### EFFECTS OF POOR IAQ

Low ventilation rates and increased short-term sick leave costs<sup>1</sup>

**\$480** per employee per year

Poor IAQ can decrease productivity by

**3 - 7%**

which is nearly **100 hrs** of lost productivity per worker annually<sup>3</sup>



**Save \$400** per employee annually by investing in increased ventilation<sup>1</sup>



**14:1 and 8:1** Benefit-to-cost ratios for enhancing ventilation rates and filter system efficiency<sup>4</sup>



### INVESTING IN BETTER IAQ CAN:

lead to a remarkable

**61% - 101%**

increase in cognitive scores<sup>2</sup>

Doubling the minimum ventilation rate recommended by ASHRAE, at a cost of less than<sup>4</sup>

**\$40** per employee per year

can lead to an

**8%** improvement in worker performance or<sup>4</sup>



**\$6,500** per employee annually in employee productivity<sup>4</sup>



Overcoming illnesses related to poor IAQ can yield savings of<sup>7</sup>

**\$34** per square meter

Why invest in IAQ?



Substantial ROI



Foster healthier and more productive work environments



Long-term business sustainability

[References Link](#)

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Improving indoor air quality (IAQ) in buildings can have a substantial impact on productivity and visitor satisfaction. Studies indicate that poor IAQ can **decrease productivity by 6-9%** across various aspects of office work performance, with field validation studies showing higher effects.<sup>v</sup> For instance, doubling the minimum ventilation rate recommended by ASHRAE, at a **cost of less than \$40 per person per year**, can lead to an **8% improvement in worker performance**. This equates to a significant increase in employee productivity, estimated at **\$6,500 per employee annually**. Despite the modest investment required for enhancing ventilation rates, the returns far outweigh the costs. In fact, the additional costs per occupant are minimal, less than \$40 per year, compared to the substantial improvements in cognitive function, **exceeding \$6000 per year**, resulting from increased ventilation.<sup>vi</sup>

A recent study conducted by 75F demonstrates the significant financial benefits of improving indoor air quality (IAQ). Enhanced IAQ not only leads to increased revenues but also boosts productivity per worker and enhances employee morale and retention. Overcoming illnesses related to poor IAQ and improving worker comfort can yield **savings of \$34 per square meter**. The study suggests that improving IAQ could potentially result in **an 8-10% increase in employee productivity**. Even with a conservative estimate of a 5% productivity improvement due to enhanced IAQ, the financial impact is substantial, amounting to **\$410 per square meter**.<sup>vii</sup>

Furthermore, the US Environmental Protection Agency (EPA) underscores the importance of integrating IAQ management, preventive maintenance, and energy efficiency measures to ensure healthy and efficient learning environments. Preventive maintenance emerges as a particularly sound financial investment, with **each dollar spent yielding \$4 in savings** by preempting future repair or replacement costs of building systems. This highlights the significant long-term financial gains associated with proactive IAQ management and maintenance practices.<sup>viii</sup>

In conclusion, investing in IAQ monitors is not only a prudent financial decision but also a strategic investment in employee health, productivity, and organizational success. By prioritizing IAQ improvements and leveraging the insights provided by IAQ monitors, companies can reap substantial ROI while fostering a healthier and more productive work environment. As organizations continue to navigate the complexities of budget allocation, IAQ monitors emerge as a valuable asset that delivers tangible returns and contributes to long-term business sustainability.



<sup>i</sup>Milton DK, Glencross PM, Walters MD. Risk of sick leave associated with outdoor air supply rate, humidification, and occupant complaints. *Indoor Air*. 2000 Dec;10(4):212-21. doi: 10.1034/j.1600-0668.2000.010004212.x. PMID: 11089326.

<sup>ii</sup>Allen, J. G., MacNaughton, P., Satish, U., Santanam, S., Vallarino, J., & Spengler, J. D. (2016). Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: a controlled exposure study of green and conventional office environments. *Environmental health perspectives*, 124(6), 805-812.

<sup>iii</sup><https://reset.build/programs/ap/process/aptrainingair>

<sup>iv</sup>Fisk, W. J. (1999). Estimates of potential nationwide productivity and health benefits from better indoor environments: An update. *Indoor Air Quality Handbook*, 4.

<sup>v</sup>Wyon DP. The effects of indoor air quality on performance and productivity. *Indoor Air*. 2004;14 Suppl 7:92-101. doi: 10.1111/j.1600-0668.2004.00278.x. PMID: 15330777.

<sup>vi</sup>MacNaughton P, Pegues J, Satish U, Santanam S, Spengler J, Allen J. Economic, Environmental and Health Implications of Enhanced Ventilation in Office Buildings. *International Journal of Environmental Research and Public Health*. 2015; 12(11):14709-14722. <https://doi.org/10.3390/ijerph121114709>

<sup>vii</sup><https://www.75f.io/news/roi-of-indoor-air-quality-management/>

<sup>viii</sup><https://www.epa.gov/iaq-schools/indoor-air-quality-tools-schools-preventive-maintenance-guidance-documents#R3>