

# Energy-from-Waste & Health Risk

## Do Emissions from EfW Present Health Risks?

Study after study have shown that living near an Energy-from-Waste (EfW) facility with modern air pollution control equipment does not have adverse impacts on health.

- A recent review of air quality health risk assessments and health surveillance programs surrounding EfW facilities done for Portland, Oregon determined that there was **not a predictive or actual increase in health issues**, including for those in vulnerable or sensitive “at-risk” populations such as children or the elderly.<sup>1</sup>
- Three years prior, a similar comprehensive review of published risk assessment, biomonitoring, and epidemiology studies, performed for Metro Vancouver concluded that modern EfW facilities “**do not pose unacceptable health risks to local residents.**”<sup>2</sup>
- Public Health England found negative health impacts associated with well-regulated EfW facilities likely to be very small, **if even detectable.**<sup>3</sup>
- Long-term biomonitoring near three Dutch EfW facilities found “**no potential risk** with respect to human consumption quality of the investigated crops and products in the vicinity.”<sup>4</sup>
- The Massachusetts Department of Public Health found prevalence of childhood asthma in the Merrimack Valley—where several EfW facilities are located—**was not associated** with emissions of particulate matter (PM10) or volatile organic compounds (VOCs) from the local stationary sources.<sup>5</sup>
- A 2019 UK study found **no evidence** that exposure to, and living near, a modern EfW facility in compliance with current standards was associated with any excess risk of adverse birth outcomes.<sup>6</sup>
- A health risk assessment performed for the Montgomery County facility in Maryland found a **very low chance** for occurrence of potential carcinogenic health effects, and no expectation of non-carcinogenic health effects as a result of facility emissions.<sup>7</sup>
- A biomonitoring study in Portugal that measured dioxin in both exposed and control population groups concluded that emissions from EfW **did not impact dioxin blood levels** of nearby residents.<sup>8</sup>

### How are Health Risks Studied?

The potential health risks of an emissions source, like an Energy-from-Waste facility, are typically studied in one of three primary ways:

#### **Biomonitoring**

Measurement of chemicals or their metabolites (products of chemical compounds that have been transformed in the body) in blood, urine, breast milk, or tissues. Measures actual uptake or accumulation of chemicals in a potentially exposed population.

#### **Health Risk Assessment**

A systematic process to provide quantitative estimates of potential human health impacts of predicted, modeled, or measured emissions.

#### **Epidemiology Study**

Assessment of documented health issues or events (e.g. birth outcomes, cancer incidence) relative to an air or other emissions source.

## Do Emissions from EfW Facilities Cause Asthma?

No one knows exactly what causes asthma.<sup>9,10,11</sup>

Allergies and asthma both tend to run in families, so genetics is suspected as a factor. Environmental factors, including respirator infections in infancy and early childhood, other allergies, and exposures to allergens, certain irritants, or exposure to viral infections as a child also likely play a role. Obesity is also a risk factor for the development of asthma.<sup>12</sup>

One theory is the "hygiene hypothesis", which postulates that our focus on hygiene and sanitation has reduced childhood exposures to infections and other environmental factors affecting the development of children's immune systems and increasing their risk for atopy and asthma.<sup>10</sup>



"The exact cause of asthma isn't known. Researchers think some genetic and environmental factors interact to cause asthma, most often early in life. These factors include:

- An inherited tendency to develop allergies, called atopy (AT-o-pe)
- Parents who have asthma
- Certain respiratory infections during childhood
- Contact with some airborne allergens or exposure to some viral infections in infancy or in early childhood when the immune system is developing

If asthma or atopy runs in your family, exposure to irritants (for example, tobacco smoke) may make your airways more reactive to substances in the air.

Some factors may be more likely to cause asthma in some people than in others. Researchers continue to explore what causes asthma."

**Source:** U.S. Department of Health & Human Services<sup>10</sup>

## References

<sup>1</sup> Olsson Environmental Health Management (2017) *Metro Health Impact Assessment Evaluation of Landfills and Waste to Energy Options for Managing Municipal Solid Waste*. [https://www.oregonmetro.gov/sites/default/files/2017/07/06/Metro\\_WTE\\_Landfill\\_HIA\\_Final\\_with\\_appendices\\_20170706.pdf](https://www.oregonmetro.gov/sites/default/files/2017/07/06/Metro_WTE_Landfill_HIA_Final_with_appendices_20170706.pdf)

<sup>2</sup> Intrinsic (2014) *Literature Review of Potential Health Risk Issues Associated with New Waste to Energy Facilities*. <http://www.metrovancouver.org/services/solid-waste/about/wte/PublicationsWTE/IntrinsicWTEReviewHealthIssuesMay282014.pdf>

<sup>3</sup> U.K. Health Protection Agency (Now Public Health England), *The Impact on Health of Emissions to Air from Municipal Waste Incinerators*, 2010. <https://www.gov.uk/government/publications/municipal-waste-incinerators-emissions-impact-on-health>

<sup>4</sup> van Dijk, C., W. van Doorn, B. van Alfen (2015) Long-term plant biomonitoring in the vicinity of waste incinerators in The Netherlands, *Chemosphere*, **122**, 45-51. <https://doi.org/10.1016/j.chemosphere.2014.11.002>

<sup>5</sup> Massachusetts Department of Public Health (2008) *Air Pollution and Pediatric Asthma in the Merrimack Valley* <http://www.mass.gov/eohhs/docs/dph/environmental/tracking/asthma-merrimack-valley-report.pdf>

<sup>6</sup> Ghosh, R.E. *et al.* (2019) Fetal growth, stillbirth, infant mortality and other birth outcomes near UK municipal waste incinerators; retrospective population based cohort and case-control study, *Environment International*, **122**, 151-158. <https://doi.org/10.1016/j.envint.2018.10.060>

<sup>7</sup> Rao, R.K. *et al.*, Multiple Pathway Health Risk Assessment and Multimedia Environmental Monitoring Programs for a Municipal Waste Resource Recovery Facility in Maryland, *Proceedings of the 12<sup>th</sup> North American Waste to Energy Conference, May 17-19, 2004*, ASME. <http://www.seas.columbia.edu/earth/wtert/sofos/nawtec/nawtec12/nawtec12-2207.pdf>

<sup>8</sup> Reis M. *et al.* (2007) Determinants of dioxins and furans in blood of non-occupationally exposed populations living near Portuguese solid waste incinerators, *Chemosphere* **67**, S224-230. <https://doi.org/10.1016/j.chemosphere.2006.05.102>

<sup>9</sup> American Lung Association. Webpage: What Causes Asthma? Accessed February 22, 2019. <https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/asthma-symptoms-causes-risk-factors/what-causes-asthma.html>

<sup>10</sup> U.S. Department of Health & Human Services National Heart, Lung, and Blood Institute. Webpage: Health Topics – Asthma. Accessed February 22, 2019. <https://www.nhlbi.nih.gov/health-topics/asthma>

<sup>11</sup> CDC National Center for Environmental Health (2014) *Asthma Prevalence in the United States*. [https://www.cdc.gov/asthma/Asthma\\_Prevalence\\_in\\_US.pptx](https://www.cdc.gov/asthma/Asthma_Prevalence_in_US.pptx)

<sup>12</sup> Centers for Disease Control & Prevention. Webpage: Asthma and Obesity. Accessed February 25, 2019. [https://www.cdc.gov/asthma/asthma\\_stats/asthma\\_obesity.htm](https://www.cdc.gov/asthma/asthma_stats/asthma_obesity.htm)