



## **Akamai Technologies & Sustainability Roundtable, Inc. Evidence for SBTi Call for Evidence on the Effectiveness of Environmental Attribute Certificates in Climate Targets**

November 2023





# Akamai - Azure Sky Emissions Analysis

Prepared for: Akamai

Date: November 2023

# Executive Summary

RESurety analysed the emissions impacts of Akamai's 18 MW VPPA using its nodal, hourly locational marginal emissions (LME) data and hourly generation data.

The analysis found total emissions reductions of 25,000 metric tons of CO<sub>2</sub>e over the 16 months of the project's operational history.

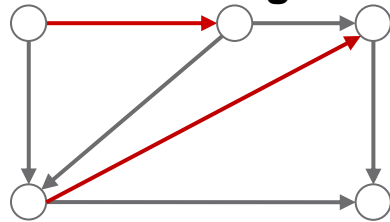
Approximately 75% of emissions reductions come from displaced gas plant generation, with the remaining 25% from displaced coal plant production.

# Background: Locational Marginal Emissions (LMEs)

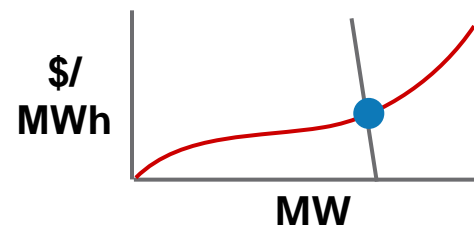
LME data provides a **high-resolution measurement** of the marginal emissions rate at each project on the grid in each hour. It measures the impact of incremental generation **at each project, in each hour, based on real-world grid operating conditions.**

Unlike zonal averages, which ignore real-time transmissions congestion, LMEs capture actual grid conditions at each project location.

**Transmission Network and Real-time Congestion**



**Offers and LMPs**

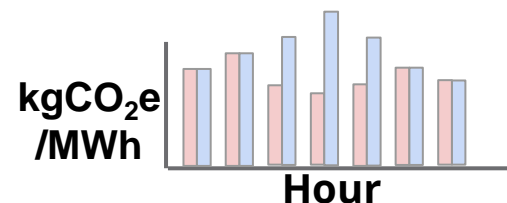


**Fossil Emissions Rates**



*LME calculation*

**LMEs**



# Why Granular Emissions Data Matters

Renewable energy is a means to an end: **decarbonization**.

To achieve that end, we must optimize in the relevant units: **tons of carbon, not MWh of electricity**.

Before 2021, when LMEs were first introduced, access to information on the locational impact carbon emissions at a given time **had been a barrier** to carbon-based decision making.

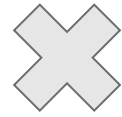
*“...not all renewable energy is created equal. Two projects with identical transactional details can have enormously different impacts. **Some renewable energy projects displace more fossil fuels than others.**” – Salesforce, Oct ‘20*

*“The REC from an additional megawatt-hour of wind generation in wind-saturated West Texas has the same “value” as a megawatt-hour of new solar in fossil-intensive Alabama, **even though the amount of carbon emissions avoided by each are radically different.**” – Clean Air Task Force, Feb ‘21*

*“To measure the impact of our projects, we need to be able to evaluate which source of electricity production this new asset would replace. **‘Marginal emissions’ is often viewed as the best metric to do this... However, as of today, this information is generally unavailable**” – Google, Feb ‘21*

REsurety estimated the avoided emissions in each hour as the product of hourly generation and nodal LME rates.

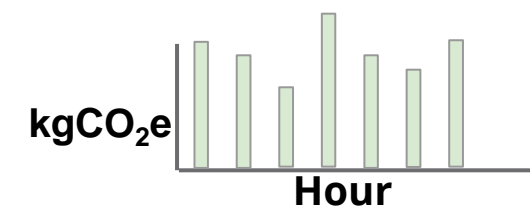
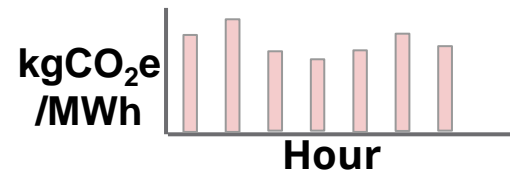
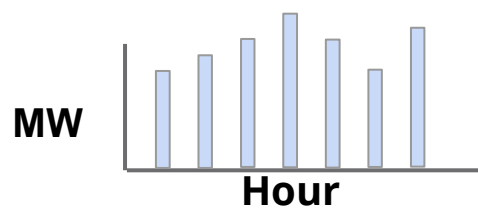
**Hourly  
Generation**



**Hourly  
LMEs**



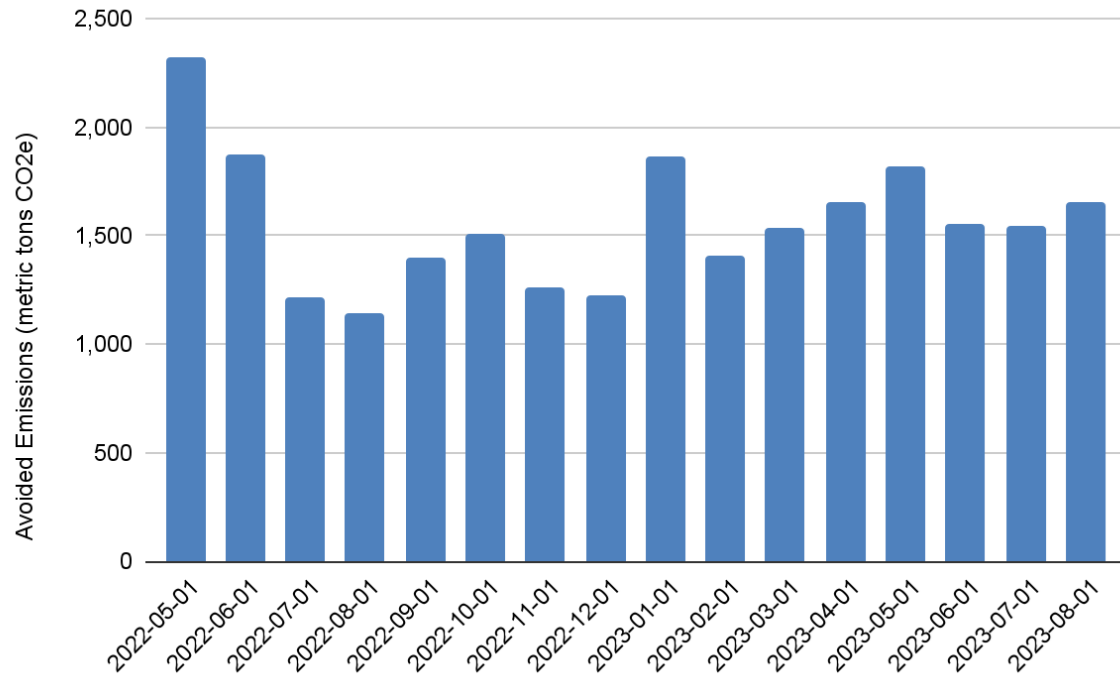
**Hourly  
Avoided  
Emissions**



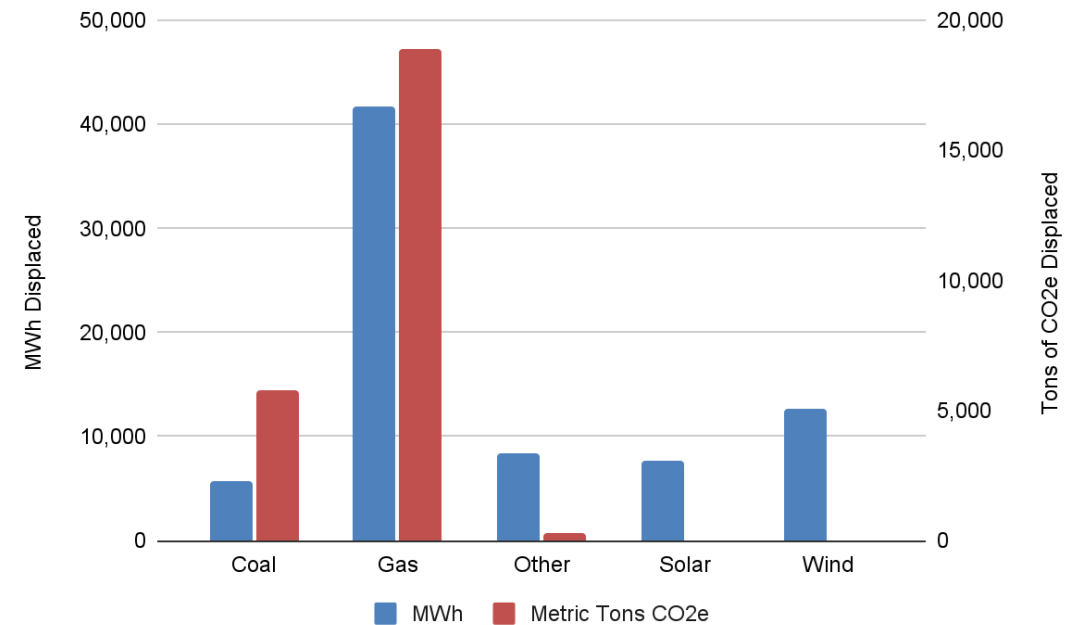
Note: multiplying hourly marginal emissions rates by hourly generation leads to a very good approximation of avoided emissions for relatively small interventions. For larger interventions, marginal emissions rates are still highly useful for attributing emissions impacts (and much more accurate than average emissions rates) but will not exactly match avoided emissions. For more information please see REsurety's [Making It Count](#) paper.

# The LME analysis found that the 18 MW PPA has avoided 25,000 metric tons of CO<sub>2</sub>e over the 16 months of operational history.

## Avoided Emissions Over Time



## Avoided Generation and Emissions by Fuel Source



The 18 MW PPA avoided 25,000 tons of CO<sub>2</sub>e by displacing nearly 50,000 MWh of total gas and coal generation. In some hours, the project led to increased curtailment of other wind and solar projects as a result of transmission limitations. The analysis found that the the rate of emissions abatement achieved by Azure Sky was representative of the average ERCOT wind and solar project.





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AKAMAI CASE STUDY

# 18 MW Wind VPPA Impact Analytics

November 2023



# Executive Summary

Sustainability Roundtable advised on procurement and Quantum Energy assessed the life cycle avoided emissions and benefits to public health and ecosystems of **Akamai's 18MW Azure Sky Wind VPPA**.

Avoided life cycle emissions and impacts assessed using TotalView Energy Platform™ with data from EIA, Enel Green Power, LCA databases, US EPA and World Bank.

Public health, ecosystem quality and economic benefits are quantified annually for year 2022 and projected over 12-year VPPA.

CREDIBILITY

# Support for TotalView Energy Platform

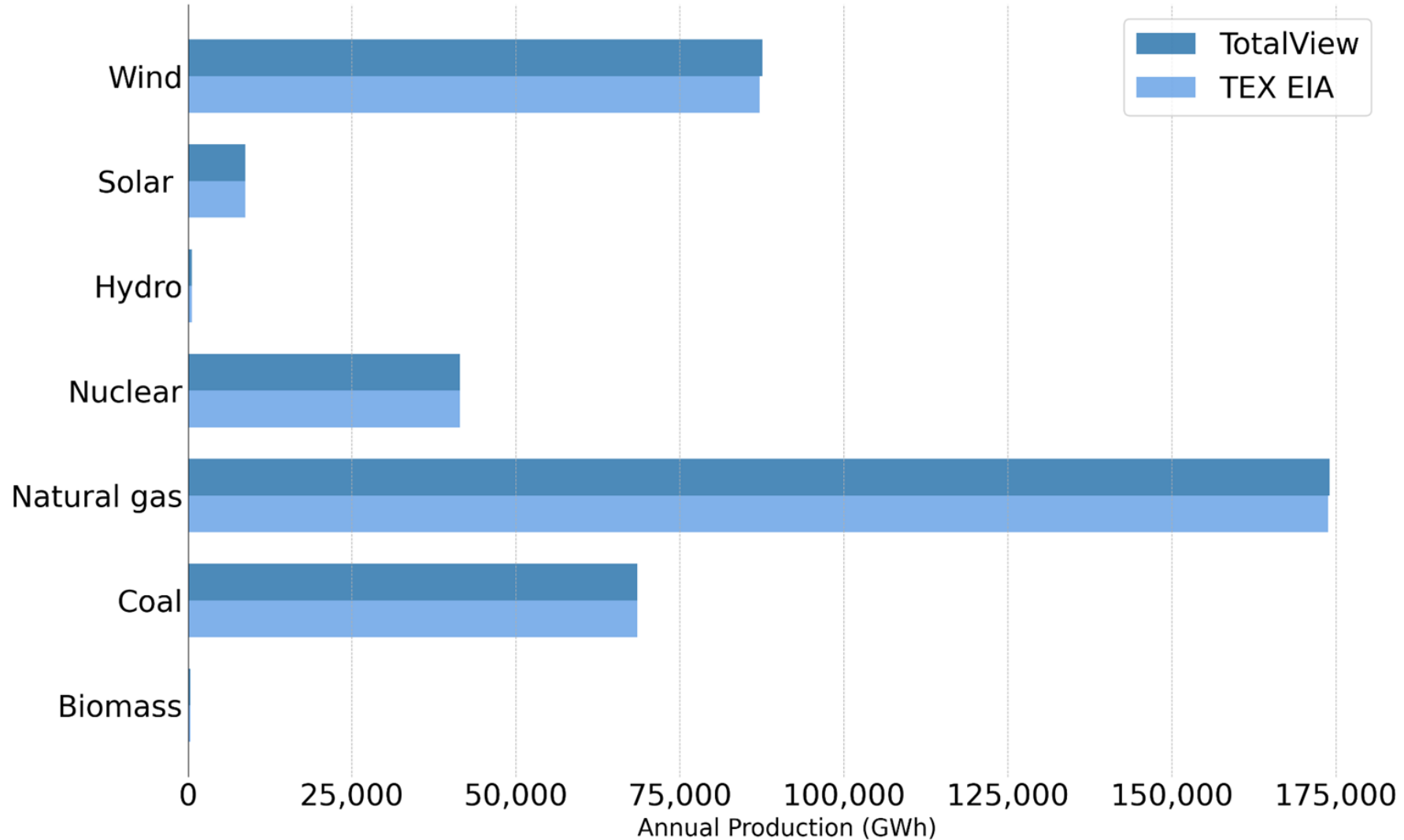


**America's  
SEED FUND**

**Cerulean  
VENTURES**

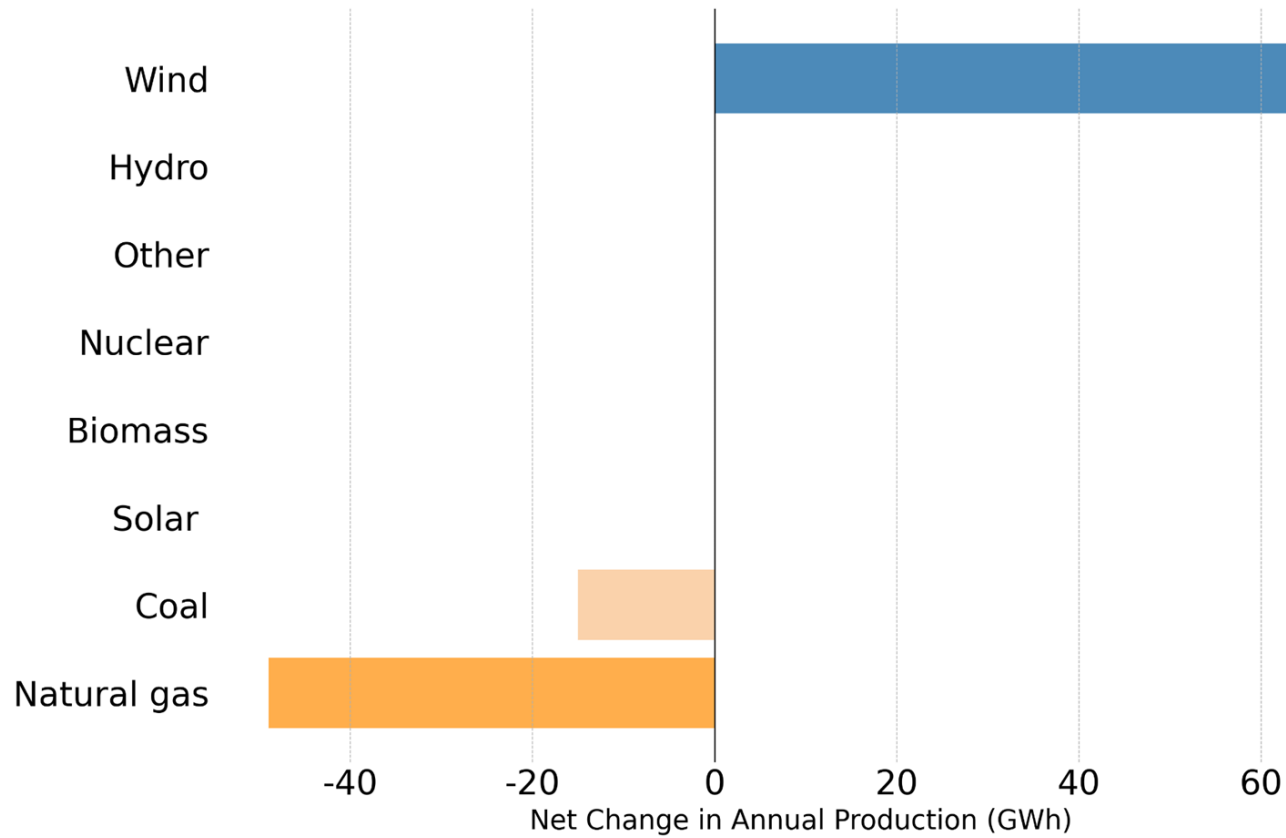
TEXAS GENERATION

# Simulation Accuracy within 1%





# Annual Changes With Akamai 18MW



**ANNUAL PROJECT SUMMARY**

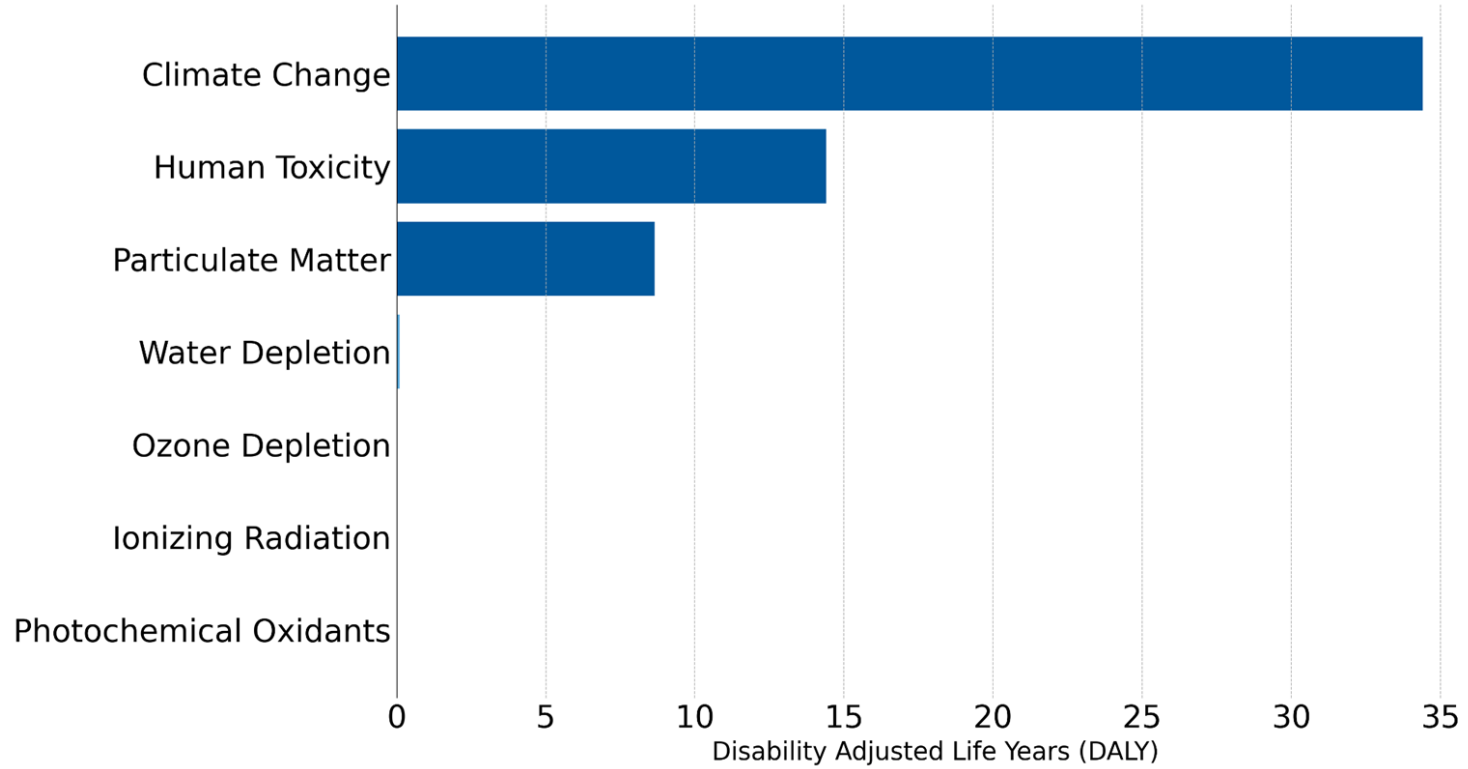
# From operational carbon to avoided life cycle emissions and co-benefits

| AREA OF IMPACT            | AVOIDED EMISSIONS & RESOURCE USE | PUBLIC HEALTH BENEFITS (LIFE YEARS SAVED) | ECOSYSTEM BENEFITS (LOCAL SPECIES SAVED) | ECONOMIC BENEFITS (\$) |
|---------------------------|----------------------------------|---|--|------------------------|
| Climate Change            | 38,000,000 kg CO2-Eq             | 34.4                                      | 0.11                                     | \$6,600,000            |
| Human Toxicity            | 4,400,000 kg 1,4-DCB-Eq          | 14.4                                      | N/A                                      | \$2,100,000            |
| Particulate Matter        | 18,000 kg PM10-Eq                | 8.7                                       | N/A                                      | \$1,300,000            |
| Photochemical Oxidants    | 46,000 kg NMVOC                  | 0.0                                       | 0.0                                      | \$1,000                |
| Ionising Radiation        | 85,000 kg U235-Eq                | 0.0                                       | N/A                                      | \$0                    |
| Ozone Depletion           | 2 kg CFC-11-Eq                   | 0.0                                       | N/A                                      | \$0                    |
| Terrestrial Acidification | 72,000 kg SO2-Eq                 | N/A                                       | 0.02                                     | \$230,000              |
| Terrestrial Ecotoxicity   | 2,000 kg 1,4-DCB-Eq              | N/A                                       | 0.00                                     | \$0                    |
| Freshwater Ecotoxicity    | (1,700,000) kg 1,4-DCB-Eq        | N/A                                       | 0.00                                     | -\$20,000              |
| Freshwater Eutrophication | 10,000 kg P-Eq                   | N/A                                       | 0.01                                     | \$88,000               |
| Marine Ecotoxicity        | (1,600,000) kg 1,4-DCB-Eq        | N/A                                       | 0.00                                     | \$0                    |
| Marine Eutrophication     | 3,800 kg N-Eq                    | N/A                                       | 0.00                                     | \$0                    |
| Water Depletion           | 45,000 m <sup>3</sup>            | 0.1                                       | 0.00                                     | \$15,000               |



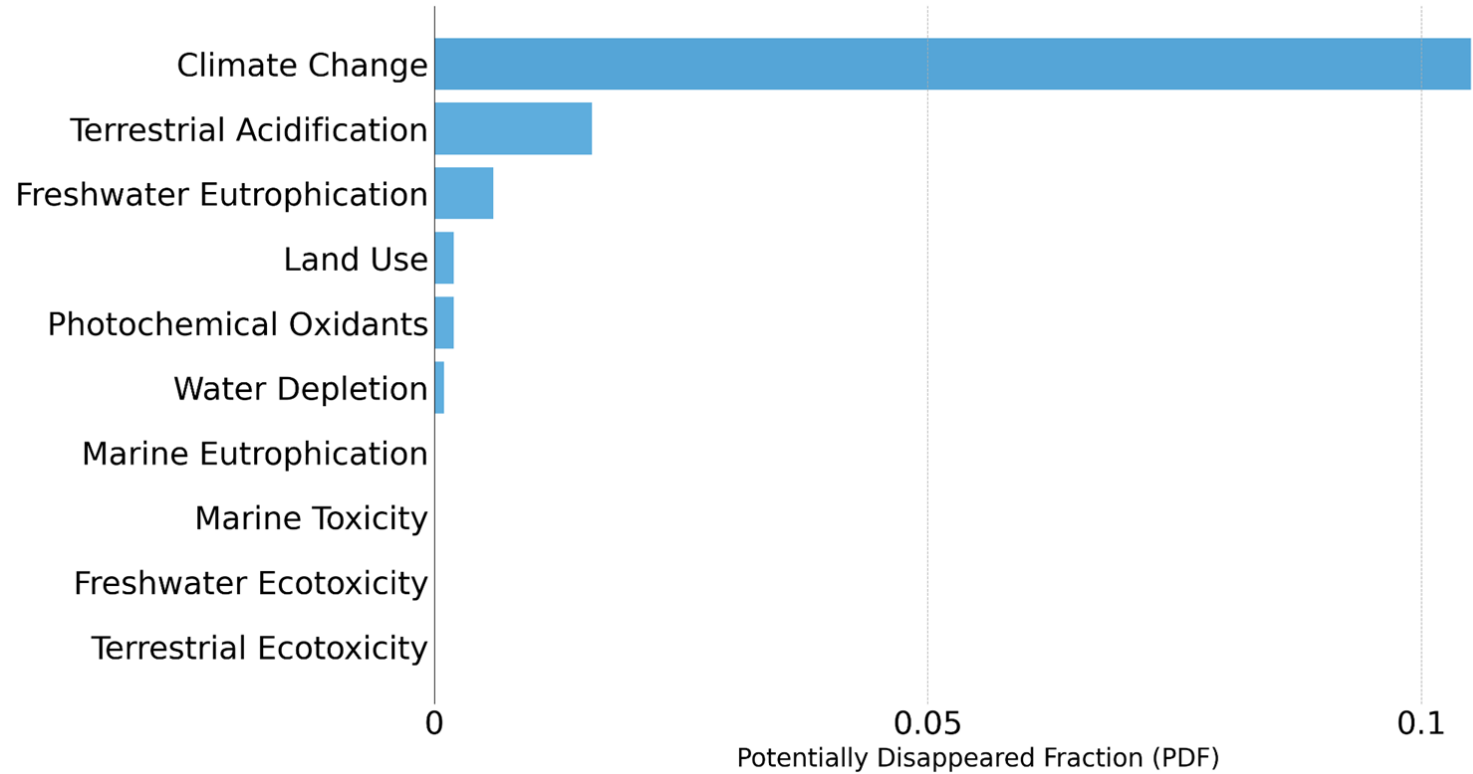
**PUBLIC HEALTH BENEFITS**

# Years of Life Saved Annually



ECOSYSTEM BENEFITS

# Local Species Saved Annually





12 YEAR VPPA PROJECTED ESTIMATES

**Maximize ROI  
with credible,  
robust full-impact  
storytelling.**



**691**

**Life Years Saved**

**\$101M**

**Public Health Benefits**

**\$23M**

**Ecosystem Benefits**

## TESTIMONIAL

**"As a corporate buyer of renewable energy, we believe it is essential to understand the impacts from our procurement activities. With the TotalView platform from Quantum, Akamai can now see the positive impact a renewable procurement can have while providing a sophisticated translation from a public health and biodiversity perspective for the surrounding community and the world."**



**Mike Mattera**

DIRECTOR OF CORPORATE SUSTAINABILITY AND ESG OFFICER  
AKAMAI