



U.S. SENATE COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

FULL COMMITTEE HEARING
Borrowed Time: The Economic Costs of Climate Change
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Chairman Brown, Ranking Member Toomey, and Members of the Committee: Thank you for the opportunity to testify today.

My name is Shalini Vajjhala. I am an architect and engineer, specializing in the design and finance of resilient infrastructure solutions. For the past ten years, my firm *re:focus partners* has been working with cities and regions across the United States to develop projects to address both the physical and financial risks of climate change.

These issues have only grown more urgent over the last decade. The costs of climate change are already being felt across the country. This is not some distant future. The effects of more severe storms, heat, and droughts are visible in public budgets today.

Climate change will impact all parts of our economy. But counterintuitively, the costs of most climate-related events are site-specific *not* economy-wide.¹ A hurricane or wildfire doesn't hit the whole country at once. At the end of the day, the physical and financial impacts of disasters will be felt first and worst at the community level.

Recent OMB estimates put the potential federal fiscal impacts of climate inaction at up to \$2 Trillion dollars per year.² This is staggering. Having a better understanding of the total economic costs of climate change is essential, but we also need better ways of disaggregating these costs by peril, sector, and region to motivate local action to protect against the worst overall outcomes.

Three areas where this Committee can help break down the problem into more actionable pieces by looking more closely at three types of costs are: local revenue losses, reductions in asset lifetimes, and deferred infrastructure maintenance.

¹ <https://www.ncei.noaa.gov/monitoring-content/billions/docs/2021-us-billion-dollar-weather-and-climate-disasters-hazard-and-socioeconomic-risk-mapping-ams-washington-forum.pdf>

² https://www.whitehouse.gov/wp-content/uploads/2022/04/OMB_Climate_Risk_Exposure_2022.pdf



Revenue losses due to climate impacts cut across all sectors. Public utilities, including power, transportation, and water systems, are already experiencing disruptions and operational losses due to climate-related events.

The EIA estimates that severe drought conditions in California could reduce hydropower generation by up to 48% this year.³ Recent heat waves have resulted in operating restrictions and losses for passenger and freight rail systems nationwide and costly structural damages, including derailments due to buckling tracks and melted power cables in places with typically mild climates, like Portland, OR.⁴

In the water sector, sea-level rise has increased the risk of salt-water intrusion. This has costly implications for coastal agriculture⁵ and drinking water systems from Rhode Island to Alabama⁶ with financial risks that extend into the healthcare sector. These same acute and chronic stresses have resulted in property and income tax base losses with the potential for municipal bond downgrades and defaults.^{7,8}

This is not all bad news. Focusing on where we are losing money *today* offers an entry point for identifying where losses and liabilities are likely to increase. This approach also opens the door to new ways of financing cost-saving infrastructure investments, such as coastal protection projects and power and transportation system weatherization measures, that can be funded through direct savings, reduced insurance costs, and risk pooling.⁹

Climate impacts are already reducing infrastructure asset lifetimes.¹⁰ In many cases, the same events that result in revenue losses also have longer-term financial consequences. The impacts of flash floods and wildfires can result in damage to infrastructure systems that reduce their replacement lifetime. This poses major budgeting challenges for public works departments across the country who might see a road planned to last for 25-years become unusable in half that time. In the

³ <https://www.eia.gov/todayinenergy/detail.php?id=52578&src=email>

⁴ <https://www.bloomberg.com/news/articles/2022-07-21/-the-us-is-not-prepared-hot-temperatures-stress-transit-systems#xj4y7vzkg>

⁵ <https://www.climatehubs.usda.gov/index.php/hubs/northeast/topic/saltwater-intrusion-growing-threat-coastal-agriculture>

⁶ <https://www.nature.com/articles/s41467-020-17038-2>

⁷ <https://www.wsj.com/articles/paradise-the-wildfire-ravaged-california-town-warns-of-municipal-bond-default-11658493581>

⁸ <https://reader.elsevier.com/reader/sd/pii/S0264275118314100?token=247B5CA313F762B8BD0CDC5011EABB95E1C1A6EB6F41B738C43371F3EA18739002994F4DEF0DEB644F41302E863EC9B5&originRegion=us-east-1&originCreation=20220802175120>

⁹ <https://hbr.org/2017/08/how-the-insurance-industry-can-push-us-to-prepare-for-climate-change>

¹⁰ <https://www.mckinsey.com/business-functions/sustainability/our-insights/will-infrastructure-bend-or-break-under-climate-stress>



worst cases, this can result in the collapse of private insurance markets in specific sectors and regions.¹¹ Work by the Arizona Department of Transportation on life-cycle planning for extreme weather offers a national model for risk management.¹²

Deferred maintenance backlogs can also highlight where to intervene to prevent cascading failures. The devastating toll of both winter and summer power grid failures in Texas highlight where seasonal maintenance and timely infrastructure upgrades can prevent catastrophic failures down the line.¹³ Investing hundreds of millions of dollars now can prevent billions in losses in future, but these investments must be well coordinated. The Norfolk, VA and San Diego, CA naval bases offer excellent examples of how military installations can better protect against sea-level rise and storm surge. At the same time these facilities show where resilience measures can be undermined if adjacent roads and bridges are not also upgraded so essential personnel can reach high-priority sites during severe storms and floods.¹⁴ Better information about critical infrastructure weak links can help identify where short-term local trade-offs, like prioritizing emergency repairs over more robust upgrades, can have long-term national costs and consequences.¹⁵

No single individual, family, or region is concerned with the total economic costs of climate change. Everyone is concerned with their own physical and financial security. We need better frameworks to translate the big picture costs of climate inaction into levers for avoiding losses and reducing suffering.

The Infrastructure Investment and Jobs Act (IIJA) holds tremendous promise for addressing these challenges, as does the Inflation Reduction Act. Physical protections and financial protections from the worst economic impacts of climate change must go hand-in-hand. Breaking down the total economic costs can help identify opportunities to shape the next generation of infrastructure and make sure we move quickly to build what we need, not just what we had.

Thank you and I look forward to your questions.

¹¹ <https://www.americanprogress.org/article/regulators-should-identify-and-mitigate-climate-risks-in-the-insurance-industry/>

¹² <https://azdot.gov/sites/default/files/2019/07/Asset-Mgmt-Extreme-Weather-and-Proxy-Indicators-Pilot-Project.pdf>

¹³ <https://thehill.com/opinion/energy-environment/542067-texas-has-lessons-for-all-of-us-on-infrastructure-resilience/>

¹⁴ <https://www.defense.gov/News/News-Stories/Article/Article/2703096/dod-navy-confront-climate-change-challenges-in-southern-virginia/>

¹⁵ <https://www.brookings.edu/blog/the-avenue/2017/06/05/legacy-infrastructure-and-the-challenge-of-procuring-urban-resilience/>



Supporting Documents

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