

United States Senate

WASHINGTON, DC 20510

August 7, 2024

The Honorable Gina Raimondo
Secretary
United States Department of Commerce
Washington, D.C. 20510

Dear Secretary Raimondo,

The future of the U.S. economy depends on its ability to manufacture semiconductor chips safely and sustainably, with good, union jobs. As the Department of Commerce works to finalize its agreements to disburse \$53 billion in chip manufacturing grants under the *CHIPS and Science Act*, the Department has both an opportunity and a responsibility to correct historical wrongs linked to the semiconductor manufacturing industry, which include exposure of nearby communities to toxic chemicals, worker mistreatment, and climate pollution. In the ongoing “due-diligence phase”¹ of the grant distribution process, before agreements are finalized, the Department must impose clear and enforceable conditions on grantees to ensure that workers, community members, and the environment are protected and that the grantees fairly engage with any worker efforts to unionize. Commerce should also use its \$11 billion semiconductor research and development (R&D) program to prioritize investments that mitigate worker and community safety risks and the negative environmental impacts of the manufacturing process. Federal funding for chips manufacturing must catalyze worker and community safety, strong, union jobs, and environmental sustainability — not pose new harms to communities.

The chip manufacturing process is highly dependent on thousands of hazardous chemicals that pose significant health and safety risks to workers and local communities. During the industry’s rapid expansion from the 1960s to the 1990s, factory workers were exposed to dangerous chemicals — such as trichloroethene (TCE), ethylene-based glycol ethers, and 1, 1, 1-trichloroethane (TCA) — linked to cancer, miscarriages, and other health concerns.² In addition to direct worker exposure, these toxic chemicals also harmed neighboring communities by seeping into ground-water.³ It is no coincidence that Santa Clara County — the site of Silicon Valley and the original microchip boom — is home to more Superfund sites than any other

1 According to the Department of Commerce, during the due diligence phase “the Department will require the applicant to provide additional information on national security, financial, environmental, and other issues. . . . An invitation to the due diligence phase is not an assurance of funding. Negotiation of the key terms of the CHIPS Incentives Award will continue at this stage, and even if funding is ultimately awarded, the terms may end up differing from the non-binding Preliminary Memorandum of Terms depending on the negotiation, information uncovered during due diligence, program priorities, and the availability of funds.”

Nat’l Institute of Standards and Technology, *Funding Opportunity – Commercial Fabrication Facilities* (Mar. 19, 2024), <https://www.nist.gov/system/files/documents/2024/04/19/Amended%20CHIPS-Commercial%20Fabrication%20Facilities%20NOFO%20Amendment.pdf>.

2 Weisueh A. Chiu et al, *Human Health Effects of Trichloroethylene: Key Findings and Scientific Issues*, *Environmental Health Perspectives* (Mar. 2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3621199/>.

3 Justine Calma, *The Fight to Clean Up the Toxic Legacy of Semiconductors*, *The Verge* (Dec. 8, 2023), <https://www.theverge.com/23990525/semiconductor-biden-infrastructure-plan-toxic-chemicals>.

community in the country.⁴ Many American manufacturers pledged to phase out some of these dangerous chemicals in the 1990s, but after they moved plants overseas, foreign chip manufacturing workers have shown clear signs of being exposed to dangerous chemicals, with high rates of cancer and miscarriages.⁵ Given this history, as chip manufacturing returns home, communities are rightfully concerned about the health and safety risks of these new plants.⁶

Further exacerbating threats to human and environmental health is the semiconductor manufacturing industry's harmful effect on our climate. As a result of new construction spurred by the *CHIPS and Science Act*, the four largest semiconductor manufacturers are projected to require an additional 2,100 megawatts of electricity, creating significant new demand on the grid.⁷ Electricity demand from large semiconductor factories is already being used to justify increased investment in fossil fuel-fired generation, exacerbating climate and environmental injustice.⁸ Additionally, as the sophistication of semiconductors has increased, so has their environmental impact. Carbon emissions associated with producing the most advanced chips have more than doubled, and producing advanced 2-nanometer microchips, which are smaller than a strand of human DNA, requires more than twice as much water and three times as much electricity as producing 28-nanometer chips.⁹ As the demand for chips and domestic manufacturing capacity grows, the industry must be held accountable for its impact on the climate and environment.

Finally, the semiconductor industry must be a source of good, union jobs. Chip companies must be willing to recognize their workers' right to organize, and take a high-road labor position to allow workers the opportunity to do so without employer opposition and through a fair process. Unions deliver a wide range of economic, health, and safety benefits to workers. In a recent landmark study, the Treasury Department's Office of Economic Policy found unions deliver wages to their workers that are 10 to 15 percent higher than nonunion workers receive, improve racial and gender equity in the workplace, and boost productivity.¹⁰ Further, unions have historically partnered with community coalitions to protect the health and safety of both communities and workers — an especially important benefit of unions in the

4 Tatiana Schlossberg, *Silicon Valley Is One of the Most Polluted Places in the Country*, The Atlantic (Sept. 22, 2019), <https://www.theatlantic.com/technology/archive/2019/09/silicon-valley-full-superfund-sites/598531/>.

5 Cam Simpson, *American Chipmakers Had a Toxic Problem. Then They Outsourced it*, Bloomberg (Jun. 15, 2017), <https://www.bloomberg.com/news/features/2017-06-15/american-chipmakers-had-a-toxic-problem-so-they-outsourced-it>.

6 Madhumita Dutta, *Intel Will Add Jobs to Ohio. Will Costly Projects Also Dry Wells and Bring Toxins, Sickness?*, Columbus Dispatch (Mar. 21, 2024), <https://www.dispatch.com/story/opinion/columns/guest/2024/03/21/intel-in-ohio-how-the-project-might-hurt-people-and-the-environment/73039528007/>

Dennis O'Mara & Marcy Brandenburg, *Intel Plant Should Apply its 'Cutting-Edge' Technology to Air Pollution*, Albuquerque Journal (Mar. 3, 2024), https://www.abqjournal.com/opinion/opinion-intel-plant-should-apply-its-cutting-edge-technology-to-air-pollution/article_0c5f621e-d5b7-11ee-9dda-b748b917a8d5.html.

7 Gary Cook, *Clean Clicks or Dirty Chips*, Stand.Earth (Feb. 2024),

https://stand.earth/wp-content/uploads/2024/02/Clean-Clicks-or-Dirty-Chips-Feb-2024_230224.pdf.

8 *Id.*

9 Maria Garcia Bardon & Bertrand Parvais, *The Environmental Footprint of Logic CMOS Technologies*, EE Times (Dec. 12, 2020), <https://www.eetimes.com/the-environmental-footprint-of-logic-cmos-technologies/>.

10 U.S. Dep't of the Treasury, *Labor Unions and the Middle Class* (Aug. 2023), <https://home.treasury.gov/system/files/136/Labor-Unions-And-The-Middle-Class.pdf>.

semiconductor industry, given the past and present risks of toxic exposure.¹¹ Unfortunately, the industry, in the past, has been involved in anti-union activity, such as firings and factory closures in response to unionization efforts.¹² Unions' historic role in protecting the health of their surrounding communities and the clear intent of the *CHIPS and Science Act* to create strong jobs¹³ makes clear that a unionized workforce must be at the center of any future chips plants. The industry cannot adopt anti-union positions and policies while also receiving billions in taxpayer funds.

With the grants under the *CHIPS and Science Act*, the Department of Commerce has a unique opportunity to protect workers and communities from toxic exposure, mitigate the harmful environmental effects of semiconductor manufacturing, and support strong, union jobs. These safeguards are particularly important given other regulators' limited effectiveness. The Occupational Health and Safety Administration (OSHA), for example, has acknowledged that its limits for safe exposure to certain chemicals are outdated and inadequate for protecting worker health.¹⁴ Even where regulators have taken action — such as the Environmental Protection Agency's rule on exposure to per- and polyfluoroalkyl substances (PFAS) — the semiconductor industry has fervently resisted, calling efforts to prioritize worker and community safety “catastrophic” for the industry.¹⁵ The combination of regulatory limitations and the industry's resistance to safety regulation makes for a dangerous chemical cocktail. With the *CHIPS and Science Act* grants, Commerce must step in and ensure that taxpayer money is not being used to further harm American workers or communities.

Although the Department of Commerce has already encouraged manufacturers seeking grants to partner with unions, mitigate environmental effects, and promote worker and community safety,¹⁶ the Department must ensure that the companies maintain the highest standards across these areas. In particular, with Commerce now finalizing agreements with grantees through a “due diligence” phase, the Department should require companies to make the following commitments in order to receive a federal *CHIPS and Science Act* grant:

11 Robin Baker et al., *The Roles of Labor Unions*, Occupational and Environmental Health, 6th ed. (2011), <https://losh.ucla.edu/wp-content/uploads/sites/37/2023/01/Baker-Stock-Velazquez-The-Role-of-Labor-Unions-2011.pdf>.

12 David Bacon, *Up Against the Open Shop – the Hidden Story of Silicon Valley's High-Tech Workers*, truthout (Mar. 4, 2011), <https://truthout.org/articles/up-against-the-open-shop-the-hidden-story-of-silicon-valley-s-high-tech-workers-2/>;

272 NLRB No. 148, *National Semiconductor Corps* (1984), <https://apps.nlr.gov/link/document.aspx/09031d45801b48a5>; 307 NLRB No. 278, *Honeywell, Inc.* (1992), <https://apps.nlr.gov/link/document.aspx/09031d45800bd442>; 342 NLRB No. 119, *MEMC Electronic Materials, Inc.* (2004), <https://apps.nlr.gov/link/document.aspx/09031d45800076e0>; 352 NLRB No. 135, *Honeywell Electronic Materials* (2008), <https://apps.nlr.gov/link/document.aspx/09031d45801acdbd>.

13 See *supra* note 1.

14 Occupational Safety and Health Administration, *Permissible Exposure Limits – Annotated Tables*, <https://www.osha.gov/annotated-pels>.

15 Pat Rizzuto, *Semiconductor Makers Call EPA Chemicals Proposal ‘Catastrophic,’* Bloomberg Law (Aug. 11, 2023), <https://news.bloomberglaw.com/environment-and-energy/semiconductor-makers-call-epa-chemicals-proposal-catastrophic>.

16 See *supra* note 1.

1. **Transparency on Use of Chemicals:** Commerce should require grantees to be transparent with the Department, workers, unions, and the public about the chemicals and chemical combinations used in the chip manufacturing process. Although some manufacturers claim they cannot identify or disclose these chemicals, claiming such information is proprietary business information,¹⁷ that is an unacceptable excuse. The Department should require chip companies to identify the chemicals used at their plants; if necessary, the companies must work with their chemical suppliers to disclose and provide full transparency to the Department of Commerce regarding chemicals in use. This information will empower Commerce, workers, and communities to understand how to protect their health and safety before any long-term exposure to toxic chemicals occurs.
2. **Worker Health-and-Safety Groups:** Commerce should require grantees to establish worker-led, democratically elected health-and-safety groups where workers can express concerns free from retaliation. Since Commerce does not have direct enforcement power and OSHA standards are outdated, these groups can elevate safety concerns in real-time. Commerce and the National Institute for Standards and Technology (NIST) should include in their required periodic reporting to Congress concerns raised by these safety groups. These concerns should inform Commerce's current and future grant-making activities related to any companies that present systemic threats to their workers and communities and fail to take sufficient actions to provide protection. With health-and-safety groups, worker voices can be amplified to underpin federal actions on worker safety, from toxics to workplace conditions. Workers and communities deserve to know how they may be affected by projects. Especially as the chips industry continues to advocate for legislative exemptions for environmental reviews and as NIST adopts new categorical exclusions that would allow certain projects to avoid assessment,¹⁸ Commerce's engagement provides the final practical public venue to shed new light on this information. Furthermore, transparency regarding chemicals used in semiconductor manufacturing will provide insight into the potential dangers of semiconductor manufacturing, and support targeted R&D efforts to address the most dangerous and toxic aspects of the industry.
3. **Right to Organize:** Commerce should require grantees to adopt policies that defend workers' ability to organize. The Department has the opportunity to ensure companies adopt democratized, union-friendly policies that promote family-sustaining wages and safer workplaces. This could include labor peace agreements that require grantees to remain neutral in any unionization efforts at their company.¹⁹ The Department of

¹⁷ See *supra* note 5.

¹⁸ National Institute of Standards and Technology, Department of Commerce, *Adoption of Department of Energy Categorical Exclusions Under the National Environmental Policy Act* (Sept. 20, 2023), <https://www.federalregister.gov/documents/2023/09/20/2023-20303/adoption-of-department-of-energy-categorical-exclusions-under-the-national-environmental-policy-act>.

¹⁹ *First-ever Comprehensive Labor Neutrality Agreement in Semiconductor Industry Sets Historic New Precedent on Brink of \$52 Billion Allocation of Federal CHIPS Funding*, Communications Workers of America News (Nov. 27, 2023), <https://cwa-union.org/news/releases/first-ever-comprehensive-labor-neutrality-agreement-semiconductor-industry-sets>.

Commerce should also articulate consequences for violations of federal labor law by grant recipients, including violations of the National Labor Relations Act.

4. **Interagency Expertise for Wage and Benefits Standards:** The Department of Commerce should intimately involve the Department of Labor during the due-diligence phase to ensure that grant recipients are adhering to the “Good Jobs Principles” that the Department of Labor and Department of Commerce agreed to cooperatively promote.²⁰ These principles can set the standard for *CHIPS and Science Act* grant recipients to create jobs that are safe and fairly compensated. The Department of Labor has expertise and capabilities that will be vital to ensuring grant recipients meet these standards. Together, the two agencies must ensure grant recipients make specific commitments related to job quality, minimum wages, and benefits; require companies to provide regular data on these commitments broken down by job classification; and subject these commitments to transparent quarterly public reporting with strong certification requirements. These data will help Congress understand whether taxpayer dollars are being used to create good-paying jobs at semiconductor companies or if these companies are undercutting workers while taking federal resources. The final set of terms should provide that violations of federal law will result in consequences to the grant recipients related to their grant funding. The final contract and reporting regime must also outline penalties for non-compliance with workforce, environmental, and community commitments and ensure those penalties are commensurate with penalties for non-compliance with other commitments that are already outlined in the Notice of Funding Opportunity.
5. **Community Benefit Agreements:** Commerce should require grantees to adopt policies that protect community health and defend communities’ ability to engage in health- and safety-related organization, such as through Community Benefits Agreements (CBAs) between fenceline communities and grantees. If done correctly, companies can make a variety of commitments through CBAs, including to protect fenceline communities from toxic chemical exposure; hire and provide training programs for workers from the surrounding and disadvantaged communities at the union-prevailing wage in the industry or comparable industries; and develop renewable energy infrastructure. We believe tools like CBAs are consistent with 15 U.S. Code § 4652, which requires recipients of *CHIPS and Science Act* funding to invest in surrounding host communities.²¹
6. **Renewable Energy Commitments:** Commerce should require grantees’ power chip manufacturing operations with new dedicated renewable energy, located nearby or onsite, to mitigate their impact on air quality and the climate. This clean energy must also be used at the same time it is produced. Although many major semiconductor manufacturers have committed to produce chips using 100 percent renewable energy, the industry — unlike other large tech companies with similar energy footprints²² — has made few

20 Memorandum of Understanding Between the United States Department of Commerce and the Department of Labor (Jun. 21, 2022), <https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/2022/06/OSEC%20DOC%20MOU.pdf>.

21 15 U.S.C. § 4652 - Semiconductor incentives, <https://www.law.cornell.edu/uscode/text/15/4652>.

22 See *supra* note 7.

investments in large, renewable energy projects. Instead, the industry relies on the purchase of unbundled renewable energy credits (RECs) — financial products sold by third-party retailers that do not supply the electricity to the buyer — to meet their renewable energy commitments.²³ Companies buy these credits, which ostensibly fund renewable energy generation, and count them towards their renewable energy commitments; however, these credits often fail to add new renewable energy capacity to the grid and do not mitigate the impact of chips operations on local air pollution, water use, and energy grid strain.²⁴ Instead of purchasing ineffective credits to meet renewable energy goals, chips manufacturers should invest in *actual* renewable energy infrastructure. These investments will ensure chips manufacturers can meet their climate goals and, importantly, limit the environmental harms imposed on neighboring communities.

Finally, although Commerce can take the above immediate actions to protect communities and mitigate risks to workers, we will need innovations in technology and manufacturing to produce truly green and clean semiconductors. The Department of Commerce has a tremendous opportunity to spur this innovation with \$11 billion in research and development grants authorized under the *CHIPS and Science Act*. The semiconductor R&D program should prioritize research focused on improving reductions in greenhouse gas emissions, air pollution, and water reuse. Research investments must also prioritize occupational health and safety in the semiconductor ecosystem, including detection and measurement technologies, remediation strategies, and alternatives to toxicants in the semiconductor manufacturing process. One way to ensure these investments are prioritized is by including worker voices and environmental health and safety experts in R&D governance bodies, such as the Industrial Advisory Committee, the National Semiconductor Technology Center Board of Trustees, and Natcast executive leadership.²⁵ These perspectives will ensure that safety and the environment are a top priority for R&D. With safer chemical alternatives still in early development, R&D grants must help accelerate these timelines and drive innovation.

Congress pushed all its chips to the center of the table when it invested \$53 billion in reshoring the semiconductor industry to the United States. The Department of Commerce has strongly communicated that these investments must be paired with strong protections for workers and community members. Now, as the Department finalizes its grant agreements and completes the due diligence process with awardees, the agency must turn these promises into action. The Department must prove that it is “all in,” not only on reshoring the industry, but also on worker, climate, and environmental justice. We urge the Department to impose additional conditions on grantees’ awards to protect worker safety, community health, and the climate and prioritize R&D that will create a cleaner, greener chips manufacturing industry.

²³ *Id.*

²⁴ Anders Bjorn et al., *Renewable Energy Certificates Threaten the Integrity of Corporate Science-Based Targets*, *Nature* (June 9, 2022), <https://www.nature.com/articles/s41558-022-01379-5>.

²⁵ White House Task Force on Worker Organizing and Empowerment, Report to the President, <https://www.whitehouse.gov/wp-content/uploads/2022/02/White-House-Task-Force-on-Worker-Organizing-and-Empowerment-Report.pdf>.

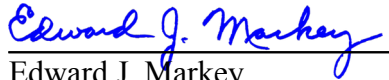
The Honorable Gina Raimondo

August 7, 2024

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We thank you for your efforts to protect workers and communities and look forward to working with you on these important issues.

Sincerely,



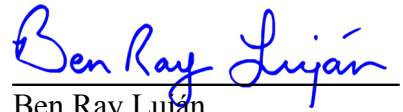
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