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U.S. Department of Commerce
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National Institute of Standards and Technology.
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CHIPS Communities United is a coalition organizing for the responsible and equitable implementation of the CHIPS Act, uniting communities with new and expanding semiconductor facilities. Our alliance includes labor, environmental, social justice, civil rights, and community organizations representing millions of workers and community members nationwide. Together we are fighting to ensure the CHIPS and Science Act benefits workers and communities.

We are submitting these comments on how the CHIPS Program Office (CPO) within the National Institute of Standards and Technology (NIST) can, through the collection and reporting of information, best ensure that CHIPS commercial research and development facilities funding invests in a skilled and diverse pipeline of workers as well as creates a sustainable semiconductor industry. We appreciate the opportunity to provide feedback to CPO and NIST about the importance of collecting and reporting clear, relevant information. In particular, we appreciate the Office's commitment to meeting sustainability and workforce development goals.

Good Jobs for All Workers in the Research and Development Enterprise

Jobs that are created or supported by CHIPS funding should be high quality union jobs for all workers, including permanent jobs that workers could hold for decades after Federal investments are made. CHIPS Communities United includes unions that represent manufacturing workers and workers in the research and development enterprise in the private sector and the public sector across the country. We believe the best way to ensure that companies who are receiving millions or billions of dollars in taxpayer subsidies commit to creating good jobs is to require them to sign a community benefits agreement (CBA). A CBA should include provisions to hire workers from local and disadvantaged communities, provide training programs to ensure that workers can succeed at their jobs, commit to environmental safety for the community, commit to pay the union prevailing wage in the industry or comparable industries, and respect the rights of workers to organize in order to receive funding.

Without a strong union presence in the industry—including in the research and development enterprise—worker safety, compensation, and job quality are key concerns.

Workers and Community Health & Safety

We appreciate the CPO's interest in creating a sustainable domestic semiconductor industry. Sustainability goals are particularly important in the semiconductor industry where, despite branding itself as a "clean industry" there exist various environmental and health safety concerns. From a sustainability standpoint, microchip manufacturing uses vast amounts of water, leaves a huge carbon footprint, and produces toxic waste. Semiconductor manufacturing is also highly dependent on the use of thousands of hazardous chemicals, including PFAS (forever chemicals), with little regulatory oversight in the US and even less so globally.¹ Among the 81 most commonly used chemicals in electronics manufacturing, 30 are known carcinogens, 40 are mutagens, 45 are reproductive toxins, and many have never been evaluated for their health effects.² Permissible workplace toxic exposure limits can be more than 1,000 times higher than what the bio-medical research says is safe.³ In the US and abroad, semiconductor manufacturing has exposed women of child-bearing age to thousands of workplace toxins, resulting in miscarriages, birth defects, cancer, and chronic illness.⁴ CHIPS Communities United strongly recommends that the CPO prioritize funding to candidates who commit sustainable practices in the construction, expansion, and modernizations of research and development (R&D) facilities.

Commercial R&D facilities have the unique opportunity to establish sustainable and safe processes and technologies when developing new semiconductor manufacturing technologies. In order to prioritize R&D applicants who utilize more sustainable processes and mitigate risk of exposure to hazardous materials for facility workers and their surrounding community, we recommend that the CPO collect sustainability plans with specific sustainability commitments. These plans should detail the applicant's plans and how they will impact workers, the local community and environment, and their plans to reduce waste in their engineering, piloting, prototyping, and experimenting processes. Additionally, these proposals should be reported and publicly available.

¹ The Impact of a Potential PFAS Restriction on the Semiconductor Sector," SIA PFAS Consortium, 4/13/23.

² This data was originally developed by researchers at Northwestern University, later augmented by researchers at Greenpeace International, and then incorporated into the PHAROS Project.

³ Taube, Ruth Silver. "Silver Taube: OSHA's limits for toxic exposure cause preventable harm to Silicon Valley workers" San Jose Spotlight. 5/11/2023.

⁴ Kim MH, Kim H, Paek D. The health impacts of semiconductor production: an epidemiologic review. Int J Occup Environ Health. 2014 Apr-Jun;20(2):95-114.

Commercial R&D facilities sustainability plans should:

- Encourage processes to reduce greenhouse gas emissions (GHGs). The CPO should encourage and incentivize applicants to take steps in their plan to reduce greenhouse gas emissions.
- Identify all anticipated wastewater treatment methodologies/technologies and the final destination for all waste water.
- Explain how they intend to monitor the wastewater effluents for each waste stream including how often and to what level of detection do they monitor. How will these monitoring results be managed, stored and reported and how long will they be maintained?
- Describe the steps they anticipate taking to treat and purify the water supply they will use before it will be introduced into their facility.
- Provide details on how they will prevent the release of toxic chemicals, how workers will be educated and trained about the potential hazards and how to prevent potential hazards, and how downstream communities will be protected, including warning systems and the engagement in planning and training of emergency personnel.
- List all toxic, hazardous, or radioactive substances that will be used or produced by the proposed R&D facilities with their CAS ID and their anticipated chemical storage and transfer operations and infrastructure. Answers should include quantitative ranges and where feasible, the hazardous substances contained in commercial chemicals. At a minimum, these should include those for which there are state or EPA drinking water standards or health advisories, those listed in U.S. EPA's Toxics Release Inventory, and those listed in California's Prop 65. All PFAS should be listed, whether or not they are contained on the above lists.
- Describe the types and volumes of hazardous process gasses (such as arsine, phosphine, etc) that they anticipate their facility will use on a daily, monthly, and annual basis. For each such gas, describe in detail how each gas will be transported to the facility and from where - the amount, the route, and the frequency of each shipment.
- Provide an analysis of the proximity to existing or anticipated residential neighborhoods for these proposed transportation routes.
- Identify each of the hazardous air pollutants that they anticipate discharging from the facility by name, CAS # and volume.
- Describe the anticipated fugitive emissions per day and year.
- Describe the treatment systems that they intend to install to neutralize these releases and how they will measure their efficiency to remove and/or neutralize each emission.
- Provide details on how they will regularly monitor all of the air emissions from their facilities and if so, to what level of detection will they monitor, how frequently, and how will this data be managed, reported, and maintained?
- Describe the mechanisms that will be put in place for requiring suppliers of equipment and materials to identify hazardous substances in their products and to what degree

containment will be used to prevent exposures — inside or outside R&D facilities — to hazardous substances.

- Describe the assessment process that will be used to determine the relative toxicity of new technologies before they are introduced into the manufacturing process and the steps that will be taken to replace hazardous substances with safer alternatives. What protocol will the applicant use to measure and monitor occupational exposure to each of the chemicals listed? How will the results be made available to the workers on a regular basis?

We would also propose that workers are engaged in the design and execution of workplace safety and health programs that include a comprehensive analysis and management plan for all risks, including the prevention of exposures to the toxic chemicals. R&D sustainability plans should address how hazards will be identified and controlled; how open communication about safety and lessons learned will be encouraged; how workers will be protected from harassment and discrimination; how retention rates will be measured; and how worker and workplace concerns will be addressed. These committees should include representatives selected by workers, meet with management to share issues related to health and safety, and include whistleblower protections against retaliation. In many workplaces, workers do not have clear venues for raising health and safety concerns that arise in the workplace and fear retaliation for doing so. CHIPS funds could thereby encourage better communication between workers and management, promoting accountability and safety.

Workforce Development Plans

CHIPS Communities United believes that CHIPS investments must develop the skills of the local workforce which requires integrated workforce education and training. In order to meet these goals, we recommend that the CPO require applicants to provide a clear workforce plan that details how they plans to provide integrated workforce development training and education as well as how they plan to provide quality jobs, as defined by the [Good Jobs Principles](#) published by the Departments of Commerce and Labor.

We agree with the Office's goals and believe that providing inclusive and comprehensive access to workforce development programs is key to diversifying and building out a skilled domestic R&D semiconductor workforce. As it currently stands, the semiconductor industry is disproportionately white and male. A recent analysis of seven semiconductor manufacturing firms' Form EEO-1 reports found that Hispanic, Black, and women workers were underrepresented in the workforce, particularly at the management and executive levels, with Black and Hispanic workers concentrated in lower-paying and more dangerous blue collar jobs. And these inequities have only increased over time.

CHIPS Communities United believes it is good public policy and the intent of the administration to reward companies who make strong commitments around job quality. But the ability to ensure

quality jobs requires applicants to provide detailed plans around wages and benefits that are available for the public to review, coupled with a mechanism to hold them accountable to those commitments. Jobs to Move America's policy tool, the United States Employment Plan (USEP), encompasses these elements and should be a model for DOC to adapt.⁵

The USEP provides a model for tracking workforce development commitments. In fact, the CHIPS Incentives Program NOFO included many of the key provisions of the USEP and therefore we believe this tested program should be a model of reporting for the commercial R&D facilities funding with the CPO and NIST. The USEP has also been supported by policymakers and thought leaders around the country. In 2016, the US Department of Transportation (USDOT) endorsed the USEP as an innovative policy to create good jobs and approved it for use by major transit agencies when procuring rolling stock.⁶ The USEP has been recommended by other experts in workforce equity as well.

The USEP works to create good jobs because it requires employers to:

- Describe the number and location of U.S. jobs they plan to create or support. It's important to know the location of the jobs since we understand many semiconductor jobs can be done remotely and therefore will not provide an economic benefit for the targeted geography.
- Detail the minimum wages and benefits they plan to pay for each job title on the project. Pay can vary greatly among different job titles; while the semiconductor industry claims that it provides high paying jobs. There is also a need to break out the specific value of benefits to understand the net benefit to the worker, factoring in any premiums or other out-of-pocket costs, and not just that a benefit is offered to workers.
- Commit and describe their plans for recruiting, hiring, and training workers who face multiple and significant barriers to employment, or workers who are typically underrepresented in the manufacturing workforce. Examples of targeted hiring could include women, people of color, veterans, formerly incarcerated individuals, people who live in rural areas, workers formerly engaged in providing energy-intensive goods and services.

The USEP is a proven model and since its implementation, it has resulted in the creation of thousands of direct family-supporting jobs not just at manufacturing firms that have won public agency bids, but likely along the supply chain for those companies as well.⁷

In addition to the reporting of commitments made as part of the workforce development plans, recipients should also report on federal- or state-mandated administrative and national policy requirements. The CHIPS Incentives Program NOFO listed multiple administrative requirements, including workforce related ones like adhering to prevailing wages for laborers and mechanics under the Davis-Bacon Act, and compliance with federal employment and labor laws (including but not limited to the Civil Rights Act, Fair Labor Standards Act, Occupational

⁵ ⁶ <https://www.regulations.gov/comment/DOC-2022-0001-0168>

⁶ U.S. Department of Transportation, Feb. 18, 2016, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/S10-160211-003_F.pdf.

⁷ <https://jobstomoveamerica.org/resource/u-s-employment-plan-2/>

Safety and Health Act and the National Labor Relations Act). The commercial R&D facilities funding application should also list these administrative requirements and additionally recipients should be required to include in their CHIPS Act reports any reports required under those statutes (such as firm level EEO-1 Component reports and OSHA 300 logs), and report any violations and their overall compliance with all federal employment and labor laws.

Transparency & Accountability

It is necessary for CPO and NIST to create accountability and transparency standards around the workforce development commitments. The USEP template requires regular quarterly reports regarding compliance with the plan commitments and grants the contracting agency the authority to access additional information necessary to determine contractor and subcontractor compliance. The reports include, among other things, total number of U.S. employee Full Time Equivalent (FTE) work performed in that quarter by job type and demographic information; minimum wages and benefits paid by job title; information for each new person hired during that quarter; descriptions of workforce development, apprenticeship, and training programs; and, if any report shows deficiencies in achievement of commitments, it must include a corrective action plan designed to achieve those commitments.⁸

The CPO should articulate clear monitoring and reporting requirements to its applicants in order to assure that implementation will meet the stated goals of sustainability. The monitoring data should be publicly available to assure credibility and compliance. The CPO has both the authority and obligation to ensure that its investments in accelerating the domestic capacity for advanced packaging substrates and substrate materials protect human health and the

To complete the foundation of a strong workforce development programs, the CPO and NIST need to have the ability to impose penalties for non-compliance, or rescind any other benefits the recipient may have earned related to these commitments. The Large Scale Facilities NOFO provided certain clawback provisions for failure to achieve construction target dates, around technology sharing with foreign entities, and recipient expansion into prohibited foreign countries. We recommend that all funding agreements, including for commercial R&D facilities, contain enforceable, transparent environmental language, including monitoring to confirm compliance.

It is also important that all commitments and reporting requirements are made publicly available. Communities deserve to know how public funds are being spent, and workers deserve to know what commitments were made about their jobs. Access to that information will enable them to work with the government to hold private companies accountable to the workforce and other job quality commitments they make.

⁸<https://jobstomoveamerica.org/resource/u-s-employment-plan-2/>

Monitoring should be done on a regular basis and reported to the CHIPS office as public information. We encourage the CHIPS office to establish a publicly accessible website as a portal for the companies who are the recipients of the CHIPS funding to routinely post their regular monitoring results in a template developed by the CPO.

We appreciate the opportunity to comment and welcome further opportunities to provide feedback or assistance. We firmly believe that the public and national interests are best served by an industry that pays and treats workers well, is a community and environmental steward, and runs on clean electricity so it faithfully and consistently contributes to the energy transition.

Sincerely,
CHIPS Communities United