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SPOTLIGHT REPORT

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Guide to CHIPS Act and Inflation Reduction Act Implementation

What's Happening: The Biden administration's signature legislative accomplishments – the CHIPS and Science Act, the Inflation Reduction Act (IRA), and the Infrastructure Investment and Jobs Act (IIJA) – are moving into the implementation stage.

Why It Matters: The first two years of President Biden's term were dominated by his ambitious legislative agenda, first the IIJA, then the CHIPS Act and the IRA. **The loss of Democrats' House majority has foreclosed the possibility of passing additional major legislation, leading the White House to focus instead on Biden's regulatory agenda and the execution of these three laws.** Successful implementation of the IIJA, CHIPS, and the IRA will allow Biden to begin building the case for his re-election next year. **Many projects funded by the IRA are going to red-leaning states and districts, which could help Biden in key battleground states like Arizona and Georgia in 2024 and potentially give a boost to endangered red-state Democrats like Senator Sherrod Brown (D-OH).** In addition to any electoral benefits, Biden's laws are also poised to have a major impact on climate policy and national security. In testimony at a Senate Foreign Relations Committee hearing earlier this month, Deputy Secretary of State Wendy Sherman cited the IIJA, CHIPS, and the IRA as a component of the Biden administration's "Invest, Align, Compete" approach to foreign policy. "Here's what that means: with your help, we are investing in the foundations of our strength on our shores, with funding from bills like the CHIPS and Science Act, the Bipartisan Infrastructure Law, and the Inflation Reduction Act," she said. In an Axios interview last week, Brian Deese, Biden's former director of the National Economic Council, described the three laws as "us[ing] public investment to crowd in private capital." The IRA offers tax credits, grants, and loan guarantees in order to "crowd in" private funding to speed the transition to Biden's vision of a greener economy. Federal efforts are paralleled by tax incentives to lure manufacturers on the state level, which included a record-high eight $1 billion subsidy packages offered by states in 2022, according to data cited by the Wall Street Journal. **In implementing these laws, the White House aims to leverage funding from the private sector in order to meet the president's goals of boosting clean energy and reinvigorating domestic manufacturing, creating opportunities for investors.**

> **What's Next: Per Axios, only five percent of federal dollars from the three laws has been spent to date. Implementation will be an ongoing process across the remaining two years of Biden's term.** Biden is likely to launch his re-election bid this spring and is expected to tout the progress made on implementing the IIJA, IRA, and CHIPS in his campaign. **The next high-profile IRA program guidance to be released by the Biden administration is likely to be rules for electric vehicle (EV) tax credits, which the Department of the Treasury has said would be issued in March.**

CHIPS Act

The Creating Helpful Incentives to Product Semiconductors (CHIPS) program consists of about $50 billion that has been appropriated by Congress to the Commerce Department to grow the domestic semiconductor manufacturing industry through direct funding. **$39 billion of this pot is to be used for subsidies for manufacturers and equipment makers and the remaining $11 billion is to support public-private partnership R&D programs.** Commerce has said that its intent with the subsidies is to primarily make "investments in leading edge manufacturing" and as such intends to devote about 75 percent of the subsidy pool, about $28 billion, to these projects. The remaining subsidies will be made available to back "new manufacturing capacity for mature and current-generation chips, new and specialty technologies, and for semiconductor industry suppliers." **$2 billion from the subsidy funds is set aside specifically for mature chips. In addition to this funding, the law created a 25 percent investment tax credit for semiconductor manufacturers.** This can be used toward the cost of new, tangible property built, reconstructed, or bought to outfit manufacturing sites primarily used to make semiconductors or semiconductor tooling equipment. The credit would sunset in 2027 cutting off for projects on which construction begins after December 31st, 2026 and would apply to property being put into use beginning in 2023 and construction costs for projects from 2023 onward.

Earlier today, the Commerce Department released its first notice of funding opportunity (NOFO) for the incentives funded by the CHIPS program. A fact sheet can be found here and FAQ page here. **This NOFO is the first chance to access the $39 billion in subsidies provided by the CHIPS Act.** Later this spring, the Commerce Department intends to release another NOFO that will be focused on material suppliers and equipment manufacturers. Then in the early fall, it plans to issue a third NOFO to support the construction of semiconductor R&D facilities. This last initiative is expected to be supported by the $11 billion provided for the CHIPS R&D program. A white paper outlining the National Semiconductor Technology Center, part of this effort, is expected to be released before the end of March with a goal of finalizing details over the summer. The department is also aiming to more fully outline the other components in the R&D program on a similar timeline, to be able to release the related NOFO by early fall.

Application Process

Today's announcement is seeking applications "for projects involving the construction, expansion, or modernization of commercial facilities for the fabrication of leading-edge, current-generation, and mature-node semiconductors." The funds are available for "both front-end wafer fabrication and back-end assembly, testing, and packaging." Statements of interest are being accepted beginning today and are required to be submitted to be eligible to submit a pre-application or an application. This must be submitted 21 days before submitting either of these next steps. For leading-edge facilities pre-applications (optional) and full applications will be accepted on a rolling basis beginning March 31st, 2023. For current-generation, mature-node, and back-end production facilities pre-applications (recommended) will be accepted on a rolling basis starting May 1st, 2023 and full applications will be taken beginning June 26th, 2023. The pre-applications are technically optional in both instances, but the Commerce Department is likely recommending it for these projects given the lag time between then and when full applications will be accepted. **The pre-application also includes an environmental questionnaire that is intended to allow the agency to assess the likely level of review needed under the National Environmental Policy Act (NEPA) and to begin this process as early as possible.** Industry lobbyists have sought for companies to be granted a "categorical exclusion" from NEPA, but at least as of now it does not appear that such a waiver has been granted by the White House.

As part of this application process, Commerce provided definitions for how it will classify production as leading-edge, current-generation, or mature. Leading-edge facilities are defined as those that use below 5nm processes for logic, 3D NAND Flash Memory (200 layers or above), and Dynamic Random-Access Memory (DRAM) with a half-pitch of 13nm or below. Current-generation facilities are considered those producing logic, analog, or mixed-signal chips based on 5nm to 28nm processes. Then mature-node facilities are those producing logic or analog chips with process technologies above 28 nm, discrete semiconductors, optoelectronics, and sensors. All of these categories also have "other" categories available for applicants to describe their technology if it does not fit in one of the preset buckets.

Once full applications are submitted, the CHIPS Program Office will look to enter into an agreement on a non-binding Preliminary Memorandum of Terms, that will include recommendations for the award's amount and form. Next, the program office will be responsible for performing due diligence that will require the applicant to provide additional information on national security, financial, environmental, and other issues. After completing the due diligence process, the Department of Commerce will prepare and issue the award. **In the program's FAQ page, there is no proposed timeline for the application review process instead, saying it will "vary from project to project and depend on the nature and quality of each application." Our estimate is that the first approvals for leading-edge applications could be approved by the fourth quarter of this year. For other projects that are applying under this NOFO, approval may take until early 2024.**

Application Requirements and Evaluation Criteria

Unsurprisingly, the [program's top priorities]() that will need to be met in order to award funding is that the project will advance economic and national security objectives. When addressing economic security, the department is looking for "projects that meaningfully increase US semiconductor production and strengthen US and allied supply chains." **Applicants that aim to create "long-term commercial sustainability" will be favored.** Part of these goals is also to reduce the risks associated with supply chain concentration, particularly with back-end production facilities and so the program will look to "promote US competitiveness in advanced packaging." Other factors that will be evaluated include commercial viability of a project and the applicant's financial strength. **The Commerce Department will be looking for companies that are maximizing private-sector contributions. The NOFO goes so far as to state that the department "may decline to award CHIPS Incentives at the requested amount if the applicant has not demonstrated sufficient efforts to maximize the use of private-sector funds."** Part of this evaluation will include whether the applicant is maximizing the impact of the investment tax credit and whether it has been offered a state or local government incentive. Having been offered one of these incentives is a requirement to be eligible, but for most companies this should not be an issue as there is an active competition among most states and localities to offer the best incentive packages.

One of the other standards on which companies will have their applications judged is their strategies for workforce development, an issue the Biden administration is aiming to prioritize as part of the program. This includes commitments from "strategic partners" that can provide workforce training and the NOFO makes explicit that the strongest applicants will aim to secure these "with a wide array of additional strategic partners." **One of the more controversial parts of this factor is that companies that are requesting over $150 million in direct funding have to provide a plan for access to child care for facility and construction workers.** The child care plans will be assessed on their affordability, accessibility, reliability, and quality.

Lastly, the Commerce Department will be looking into what broader impacts the companies are aiming to have on the communities where they are building these projects. The particular dimensions that it will be looking for are commitment to future investment in the US semiconductor industry, upside sharing, support for CHIPS R&D programs, creating inclusive opportunities for businesses, climate and environmental responsibility, community investments, and domestic manufacturing and content. Preference will be given to companies that commit to refrain from stock buybacks for five years from the date of award. **One thing to highlight here is the upside sharing rules, which will require recipients of more than $150 million in direct funding "to share with the US government a portion of any cash flows or returns that exceed the applicant's projections (above an agreed-upon threshold specified in the award)."** This is only expected to be material "in instances where the project significantly exceeds its projected cash flows or returns, and will not exceed 75% of the recipient's direct funding award."

Types of Awards and Restrictions on Use

Under this NOFO, the Commerce Department will award direct funding (via grants, cooperative agreements, or other transactions), loans, and loan guarantees. **The funds will not be provided entirely upfront, but rather disbursed in tranches tied to project milestones.The direct funding available is up to $38.2 billion and there is $75 billion available for loans and loan guarantees. There is no cap on the size of an award, but anything over $3 billion will require certification to Congress, which creates an effective limit in our view.** Most direct funding awards are expected to be between 5-15 percent of project capital expenditures, but could be higher if the project is not eligible to benefit from the investment tax credit. There is similarly no limit on the amount of funding that can be awarded through loans or loan guarantees, but the size is expected to be comparable with what is available on the private market. **Projects can benefit from both direct funding and loans or loan guarantees and the Commerce Department estimates that the total amount of support will not exceed 35 percent of project capital expenditures.**

Winners of funding will face certain restrictions with respect to future expansion in China. **For a 10-year period beginning on the date of the award, they will not be able to "engage in any significant transaction involving the material expansion of semiconductor manufacturing capacity [in] any foreign country of concern, except under limited conditions."** This will allow companies to continue current operations, but it seems that they will not be able to upgrade or expand these facilities. Additional information, such as what constitutes a significant transaction, around these guidelines is expected to be released soon. This limitation is not new and was included in the original law, so companies planning to access the CHIPS money will have had time to prepare for this. Companies taking the funding will also have to comply with US export restrictions, cannot be "subject to the jurisdiction of a foreign country of concern, and cannot engage in R&D or licensing efforts with companies that are beholden to foreign adversaries."

IRA and IIJA

EV Tax Credits

The IRA's Clean Vehicle Credit (Section 30D) includes up to $7,500 for the purchase of new electric vehicles. The vehicle requirements include minimum battery size, final assembly in North America, MSRP price caps, and maximum weight. The $7,500 Clean Vehicle Credit is the combination of two different eligibility requirements: $3,750 for cars that manufacture or assemble 50 percent of battery components in North America, and $3,750 for cars that source 40 percent of critical minerals from the United States or countries with which the United States has a free trade agreement. These requirements increase gradually over time.

The Clean Vehicle Credit's mineral sourcing and American manufacturing requirements don't kick in until the Treasury Department releases guidelines, which Treasury announced at the end of 2022 would be released in March 2023. The current stipulations are a much lower bar, and it's possible that some cars that qualify for the credit now won't next month. A recent reshuffle of vehicle categories from the IRS has led to more crossover models being eligible for the higher credit level.

The IRA's "Made in America" requirement for EV tax credits has fueled concerns on the part of major US trading partners, including the European Union, Japan, and South Korea, who fear their companies are losing out, but the Biden administration is limited in how it can interpret the law. Biden is also facing domestic pressure to stick with a strict reading of the IRA. Last month, a coalition of labor unions and progressive policy organizations sent Biden a letter urging him to closely implement the IRA as written, not interpreting the law to address the concerns that US trading partners have with policies such as EV tax credits. Senator Joe Manchin (D-WV), who provided the pivotal 50th Senate vote for the IRA, has criticized Treasury's approach as insufficiently close to the letter of the law.

The New York Times reported last week that on the sidelines of G20 meetings in India, Treasury Secretary Janet Yellen said that the Biden administration is considering making deals with trading partners to address their concerns with eligibility for IRA tax credits. **"We've also discussed the possibility of forming critical minerals-free trade agreements that would enable Europe to qualify as a free trade partner," Yellen said. "It would be an agreement that would not require the agreement of Congress."** Getting a free trade deal approved by Congress would be a tall order given Republican hostility to the IRA and Manchin's opposition to broadening interpretation of the IRA. **If it gets done, a limited critical minerals deal could alleviate European concerns with the IRA, but negotiations on any international agreement are likely to take some time.** The next meeting of the US-EU Trade and Technology Council could be the most realistic best-case scenario for the announcement of such an agreement. A date has not yet been announced, but the joint statement from the previous meeting, in December 2022, said that the two sides planned to meet again in Europe in mid-2023.

EV Charging Stations

The EV transition can be considered a chicken-and-egg problem. What should come first: greater availability of EVs or a more robust charging network? **The IIJA includes two programs that seek to take advantage of private capital to support development of a nationwide EV charging network: the National Electric Vehicle Infrastructure Formula Program (NEVI) and the Discretionary Grant Program for Charging Fueling Infrastructure (CFI).** NEVI is $5 billion over five years allocated according to a state formula and the latter program is $2.5 billion total. The federal government assumes up to 80 percent of the total cost for both the NEVI and CFI programs. NEVI projects can only be built on Alternative Fuel Corridors (AFC) along Interstate highways, while CFI is half AFC-designated and half for rural or underserved communities.

Chargers must abide by guidelines released by the Department of Transportation this month. The federal standards require the Combined Charging System plug, four "pumps" per station, standard payment, transparent pricing and availability via an app, and chargers every 50 miles on interstates. The White House also announced that **Tesla (TSLA)** would begin opening up some of its famed constellation of pit stops to others:

7,500 chargers in total by 2024, of which half are Superchargers. As a result, Tesla will now become eligible for a slice of the $7.5 billion in government funding.

For NEVI, states submit plans every year to the Joint Office of Energy and Transportation by August that are approved by the Federal Highway Administration (FHWA) by November. The FHWA has already approved all 50 states' plans for FY23. Implementation varies by state, but funds will start moving as early as this quarter. Grant authority for CFI is derived from the Highway Account of the Highway Trust Fund. The FHWA on its website indicates that a notice of funding opportunity for the CFI program "will be coming soon," but the exact timing is unclear.

Greenhouse Gas Reduction Fund

The Environmental Protection Agency's (EPA) Greenhouse Gas Reduction Fund (GGRF), commonly known as a "green bank," is one of the IRA's most significant programs for leveraging private capital. This fund will provide $27 billion to support the development of clean energy projects and is divided into three components, two with an emphasis on environmental justice. The EPA will offer $7 billion in grants for zero-emission technologies in low-income and disadvantaged communities (including on residential rooftops), $12 billion in grants for projects to decrease emissions, and $8 billion in grants for projects that decrease emissions specifically in low-income and disadvantaged communities. In December, the EPA hired Jahi Wise as senior advisor to Administrator Michael Regan and acting director of the GGRF. According to E&E News, Wise previously served as a climate policy advisor in the White House and has worked for a group representing green banks and a startup active in making improvements to buildings to conserve energy.

The EPA announced guidance for the implementation of the program earlier this month. The agency will operate two grant competitions to allocate the funding. **Notably, the EPA will not directly fund clean-energy projects. The grants will first flow through non-profit entities, states, tribes, or local governments.**

Through the Zero-Emissions Technology Competition, the EPA will distribute $7 billion to states, tribes, local governments, and non-profits for rooftop solar, community solar, storage, and upgrades located in low-income and disadvantaged communities. The agency indicated that it plans to award "up to 60 grants" under this competition. Through the General and Low-Income and Disadvantaged Communities Competition, the EPA will distribute nearly $20 billion to nonprofits, who will work with other green banks, credit unions, and other community financial institutions to make investments in projects that reduce emissions and energy costs. The agency indicated that it envisions awarding "between 2 and 15 grants" under this competition. **In the announcement, the EPA estimated that it would begin accepting applications for the two competitions in "early summer 2023."** The agency also announced a Community Roundtable series to meet with stakeholders and become aware of potential projects that could be funded by the GGRF.

IRA Tax Credits

A provision of the IRA that may be of particular interest to investors is the new Advanced Manufacturing Production Tax Credit (Section 45X). The 45X tax credit applies to domestic manufacturers of components for solar, wind, inverters, battery components, and critical minerals. The amount of credit received will depend on the specific component. It is permanent for critical minerals and fully active for other components from 2023 to 2029 before phasing out between 2030 and 2032. **Notably, the 45X credit is eligible for direct pay – fully for tax-exempt organizations and up to five years for all other entities in tax years in which they produce eligible components if they make an election.** This credit is also transferable to a third party in exchange for cash.

Other significant tax credits include the Advanced Energy Project Credit (Section 48C) and the Zero-Emission Nuclear Power Production Credit (Section 45U). The 48C credit covers energy projects such as carbon capture and has a cap of $10 billion, of which $4 billion must go to defined energy communities. The base credit is six percent of the energy investment, but an additional 30 percent credit is available if prevailing wage and labor apprenticeship standards are met. This credit cannot be combined with the 45X credit. **The 45U nuclear credit is aimed at keeping existing nuclear power plants operational and will be available from 2024 to 2032.** The base rate is 0.3 cents/kWh, which will be adjusted for inflation in future years and can be reduced under certain circumstances. Compliance with a prevailing wage requirement can allow for a bonus of five times the base credit. If a taxpayer receives other federal, state, or local nuclear subsidies, the credit received under Section 45U will be lower. **As with the 45X credit, both the 48C and 45U credits are transferable and eligible for direct pay.**

The IRS is expected to release guidance with more details on implementation of these tax credits in the future. The agency has issued requests for comment on the 45X and 48C credits and the 45U credit, as well as a request for comment on direct pay.

DOE Loan Programs Office

The Department of Energy's (DOE) Loan Programs Office (LPO) received a major boost from the IRA. **President Biden's climate law appropriates $11.7 billion for the LPO to make new loans, which increases the agency's loan authority by $100 billion.** This increase includes an expansion of loan authority under the Title 17 Innovative Clean Energy Loan Guarantee Program by $40 billion through FY26, backed by an appropriated $3.6 billion. The director of LPO, Jigar Shah, will oversee the office's expansion under the IRA. Per his DOE bio, Shah has a background in clean energy financing and prior to his government service was the co-founder and president of Generate Capital.

The IRA also eliminated the $25 billion cap on loans made through the LPO's Advanced Technology Vehicles Manufacturing (ATVM) Direct Loan Program. The IRA appropriated $3 billion through FY28 to support this program, which the LPO estimated is sufficient to back about $40 billion in additional loan authority, bringing the total loan authority available under ATVM to an estimated $55.1 billion.

The IRA also created a new Energy Infrastructure Reinvestment (EIR) Program with a cap of $250 billion in loans, which is geared towards 1) projects that replace or repurpose existing nonfunctional energy infrastructure or 2) projects that reduce emissions from existing energy infrastructure, including greenhouse gas sequestration. The law appropriates $5 billion through the end of FY26 for this program.

Given the scale of funds available, the LPO is poised to play a key role in the Biden administration's climate goals. **For the LPO's existing programs, implementation of the IRA's additional loan authority is likely to be fairly seamless as the infrastructure is already in place.** The LPO has already made two high-profile loan decisions that further Biden's efforts to promote onshoring of critical minerals for EVs. Earlier this month, the LPO announced that Redwood Materials, a battery recycling firm, would receive $2 billion in loans to finance a Nevada facility that will manufacture EV battery materials by recycling batteries and scrap. Yesterday, the LPO announced a $375 million loan for Li-Cycle US Holdings, Inc., which it identified as the largest lithium-ion sustainable pure-play battery recycling company in North America, to construct a lithium-ion battery resource recovery facility in New York state. **Building out the new EIR program will likely take longer. The LPO indicated that it intends to issue guidance and solicit public input for EIR in a forthcoming Title 17 rulemaking.** The LPO released a request for information on Title 17 last year.

In implementing the IRA, the LPO will likely have to contend with aggressive oversight by House Republicans. For the GOP, any failures by the LPO provide an opportunity to discredit Biden's climate policy in the runup to the 2024 presidential election. Republicans are likely to be watching closely for the next Solyndra, the solar company that filed for bankruptcy in 2011 after receiving $535 million in loans from the Obama administration.

Home Energy Efficiency Programs

The IRA includes two rebate programs aimed at improving home energy efficiency for consumers. The High Efficiency Electric Home Rebate (HEEHRA) is a $4.5 billion electrification rebate program available for ten years. It covers up to $14,000 for low/moderate-income households to electrify via stoves, heat pumps, weatherization, a breaker box, electric wiring, clothes dryers, heat pump water heaters, and more. Of the total, $275 million is allocated specifically to tribal governments. **The Home Energy Performance-Based, Whole-House (HOMES) Rebate is another $4.3 billion fund to improve home efficiency** with eligibility over the next decade. This rebate is available to all households, regardless of income. Residents become eligible after installing upgrades and improvements that measurably decrease energy usage. Single-family home retrofits with modeled energy savings of 20-35 percent can receive up to $2,000, and projects with modeled energy savings above 35 percent can receive up to $4,000 in rebates. Rebates are doubled for households making less than 80 percent of the area's median income. **Funding for both of these rebates is allocated via a formula and distributed by state**

energy offices. The Biden administration's Justice40 initiative mandates that 40 percent of funds go to disadvantaged communities.

The IRA's Energy Efficient Home Improvement Credit (Section 25C) offers taxpayers 30 percent of the cost up to $1,200 for certain home improvements (or up to $2,000 for heat pumps). Eligible projects include insulation, central air, heaters, boilers, furnaces, heat pumps, and more. This credit is active from 2022 to 2032.

These three energy incentives have the ability to stack on one another. The rebate funds have not been disbursed yet. The DOE is currently holding a public comment period on rules for the rebates ending March 3rd. Per the DOE, guidance is expected to be published in summer 2023 and Americans will be able to get the rebates "in much of the country in late 2023/early 2024."

Solar Low-Income Tax Credit

Even as the White House seeks to incentivize private investments to further climate goals, implementation of the IRA has not been entirely smooth sailing for the private sector thus far. The IRA includes a program that would boost tax credits for solar and wind projects by as much as 20 percent if they are in low-income communities. Earlier this month, the Department of the Treasury released guidance on these add-on credits. Politico reported that the program has raised concerns in the solar industry, as the guidance specifies that projects that begin service before receiving federal support will not be eligible and applications for a limited 60-day window will not open until the third quarter of 2023.