

A photograph of a rooftop solar panel array. The panels are arranged in long, parallel rows, receding into the distance. The sky is bright with scattered clouds. In the background, a city skyline is visible, including several modern buildings and a construction crane. The overall scene is bright and clear, suggesting a sunny day.

CATALYZING LOCAL CLEAN ENERGY

A Roadmap for Maximizing Inflation Reduction Act Opportunities and Community Benefits

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Executive Summary

The Inflation Reduction Act (IRA) represents the largest federal climate investment in the history of the United States. It offers unprecedented opportunity to help U.S. local governments and their communities benefit in the transition to clean energy. Clean energy projects can help local governments meet their decarbonization goals, and they can also advance local economic development, energy security, environmental justice, public health, resilience, and equity.

This roadmap aims to help U.S. local governments harness the opportunities presented by the IRA. It explains the revised clean energy tax credits and identifies roles that local governments can play and strategies they can employ to accelerate the adoption of clean energy technologies broadly. It focuses on the use of available tax credits for renewables and clean electricity projects and a new means of delivering these tax credits to public and nonprofit organizations via elective pay. This roadmap identifies key considerations for local governments, but the journey of implementation will be ongoing as new guidance, implementation details, and learnings continue to emerge.

Understanding key IRA clean energy tax provisions

Much of the IRA's climate and energy incentives operate as tax credits. The IRA expanded both the scope of and the timeline for clean energy tax credits. The IRA modified the Investment Tax Credit (ITC) and Production Tax Credit (PTC), which have been key drivers for renewable energy investment in the United States for decades. The IRA extended both credits, expanded what technologies are eligible for each credit, and introduced a "base-and-bonus" structure. In addition to its base value, IRA offers bonuses for projects that meet certain domestic content, labor standards, and equity siting criteria to bring tangible benefits to low-income and historically disadvantaged communities. Local governments stand to benefit significantly from these bonus credits.

And the IRA created two entirely new pathways for organizations to take advantage of the tax credits: (1) Elective pay allows public and nonprofit organizations, including local governments, to directly access a dozen different IRA tax credits, including for newly eligible technologies. (2) Transferability allows entities not eligible for elective pay (such as for-profit companies and businesses) to transfer tax credits for which they qualify to third-party entities in exchange for cash payment. Through

elective pay, for the first time, U.S. local governments can receive cash refunds for the value of certain federal tax credits for the qualifying clean energy projects that they own and place in service. This opens a cost-effective pathway for local governments to own their own clean energy facilities to serve their needs.

Given these new incentives and opportunities for local governments to play a role in project ownership, this document addresses the following considerations for implementing clean energy projects using the tax credits:

- What factors should be considered for using the ITC versus the PTC for financing projects?
- How can local governments maximize the use of bonus incentives?
- What variables come into play for projects of different sizes?
- What is the process for local governments to claim elective pay?
- How can tax credits be used in conjunction with other incentives?
- What are considerations for partnership structures in using the tax credits and elective pay?
- What is the timeline for elective pay and what are the implications for financing projects?
- How might communities benefit from transferability for community wide projects?

Role of local governments in accelerating clean energy

Local governments can play myriad different roles in maximizing IRA opportunities. Perhaps most straightforwardly, local governments can lead on procuring clean energy assets to power municipal operations. Local governments can also serve as a connector and place-based expert, acting as the "glue" for complicated, multiparty projects, or targeting investments towards historically disadvantaged communities most in need of cleaner air and lower energy bills. Because the IRA provides elective payment to all tax-exempt entities and tax credit transferability to businesses, local governments can also play a leadership role, broadly encouraging clean energy development and helping eligible nonprofits and local businesses access these important incentives. Finally, local governments can act as a catalyst, supporting action from

local nonprofits, community groups, universities, and other eligible entities to advance clean energy projects and take advantage of elective pay.

Exploring the economics of potential clean energy projects

The roadmap includes examples of project economics using different tax incentives, financing structures, and bonus incentives to demonstrate key differences in implementation. Three hypothetical case studies demonstrate financial implications resulting from changes to clean energy tax credits introduced in the IRA.

- Case Study 1, a 100-kW solar project on multifamily affordable housing in Milwaukee, Wisconsin, shows how the introduction of elective pay can make direct ownership of energy systems an affordable and competitive option compared to third-party ownership structures (such as power purchase agreements).
- Case Study 2, a 2-MW solar installation on a municipally owned convention center in the Phoenix, Arizona, metropolitan area, shows how elective pay for tax credits can be applied to larger projects and how domestic content bonuses and requirements may play out in a project.
- Case Study 3, a 15-MW solar project for a municipal utility in the Charlotte, North Carolina, metropolitan area, explores the difference between the ITC and PTC, and shows how the addition of bonus credits can change the decision for larger projects about whether to select the ITC or the PTC.

Strategies that local governments can take to accelerate clean energy for municipal operations and within communities

The IRA creates opportunities for local governments to decarbonize their own operations as well as to accelerate community-wide clean energy deployment for the benefit of all residents. To advance clean energy deployment for municipal operations, local governments should start by assessing their municipal energy consumption and identifying opportunities for on-site solar, storage, electric vehicle charging, and other clean energy technologies at their public facilities. They can then evaluate project economics using IRA bonus credit opportunities and identify promising project financing options. These steps will help

local governments zero in on viable and impactful projects, for which to solicit development proposals on timelines that best leverage incentive opportunities.

To encourage community-wide clean energy adoption, local governments can take a number of steps to accelerate uptake. They can provide real estate for the development of innovative and equitable clean energy projects like micro grids and community solar or wind. They can explore new approaches for purchasing clean energy for the community such as developing a low-income solar program in which a local government owns solar panels on single-family residential rooftops while selling the electricity generated by the panels to the participating households. They can also remove barriers, for example, by amending their local permitting processes or zoning codes to make it easier and cheaper for community members to adopt clean energy.

Seizing the opportunity

The IRA presents a massive opportunity to help all U.S. communities benefit in the transition to clean energy. Many of the incentives and bonuses are structured to bring the benefits of clean energy, like cleaner air and lower cost electricity, to low-income and historically disadvantaged communities. The impact of the IRA depends on collective, effective, and equitable uptake of its incentives. By seizing the opportunity before them, local governments can play crucial roles in enabling the build-out of clean energy projects across the country, supporting decarbonization, revitalizing marginalized and disadvantaged areas, reducing air pollution, and creating new jobs.

Introduction

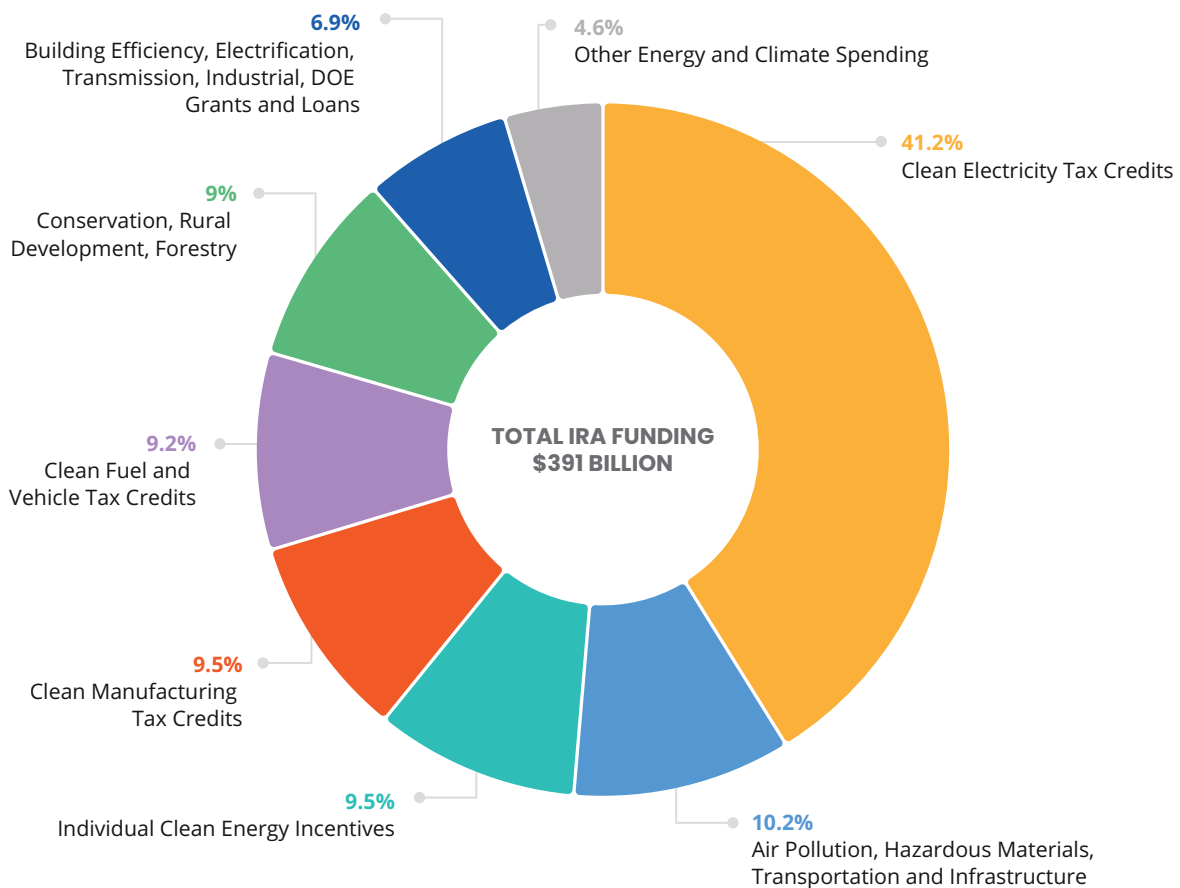
On August 16, 2022, President Biden signed the Inflation Reduction Act (IRA) into law, signaling by far the largest federal climate investment in the history of the United States. The IRA's energy and climate investments, with spending estimates ranging from \$369 billion (Congressional Budget Office 2022) to \$1.2 trillion (Goldman Sachs 2023), are designed to drive an equitable transition to clean energy (Gearino 2023). Communities are poised to benefit through development of clean energy projects that can provide air quality, health, resilience, workforce, and local economic benefits.

Seventy percent of the IRA's climate and energy incentives operate as tax credits, which can be leveraged throughout the next decade. The remaining 30 percent comprise

complementary tools designed to help communities, states, tribes, and other entities implement clean energy projects, including grants, specific programs for low-income and historically underserved communities, and support for financing through the Greenhouse Gas Reduction Fund.

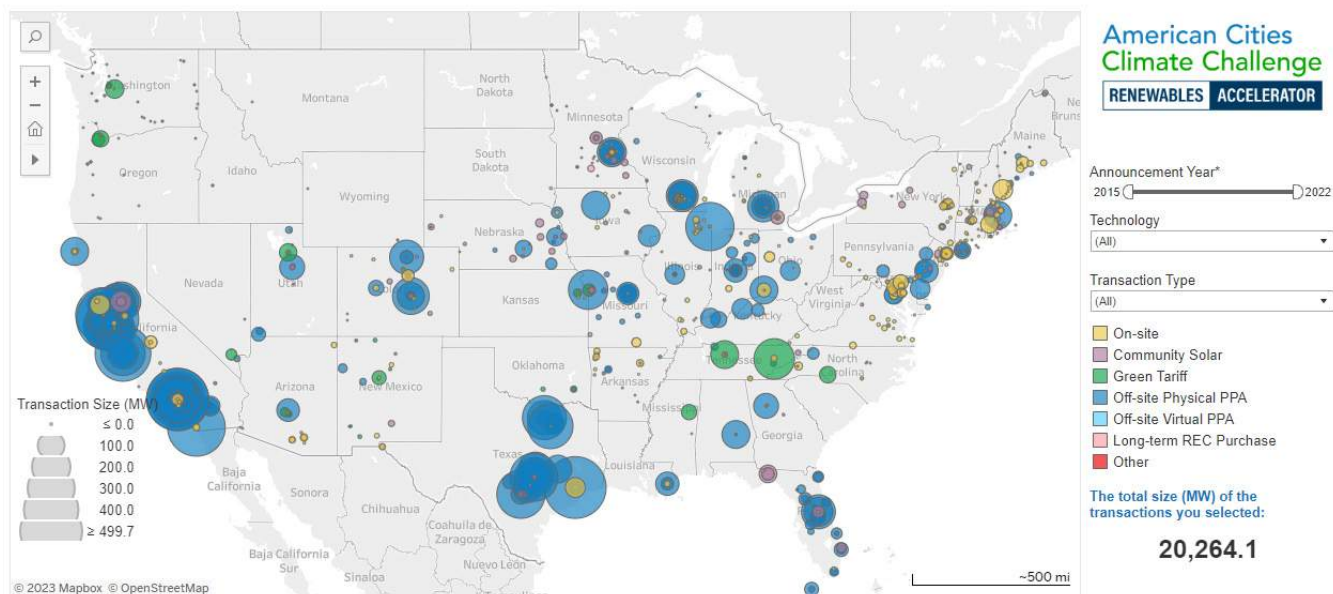
The IRA not only expands the scope and timeline of the available clean energy tax credits; it also expands access to them. The IRA changes the tax code to enable elective pay, commonly referred to as direct pay, which allows public and nonprofit organizations to directly access 12 different IRA tax credits, including for newly eligible technologies. Traditionally exempt from paying federal taxes, public and nonprofit organizations have not been able to directly take advantage of federal tax credits historically since they have

FIGURE 1 • Breakdown of IRA climate and clean energy spending across incentive type



Source: Congressional Budget Office 2022.

FIGURE 2 • American Cities Climate Challenge Local Government Renewables Action Tracker



Source: ACCC 2023a.

had no federal tax liability. Through elective pay, for the first time, U.S. local governments can receive cash refunds for the value of certain federal tax credits for the qualifying clean energy projects that they own and place in service. Local governments can also play a leadership role helping community partners forge ahead with clean energy projects and access these important incentives.

Elective pay, combined with the IRA's expanded tax credits, presents a tremendous opportunity for local governments to advance clean energy projects in ways that deliver meaningful benefits to their communities (Wimberger, et al. 2023). Clean energy projects can help local governments meet their decarbonization goals, but they can also advance local economic development, energy security, environmental justice, public health, resilience, and equity—goals that reverberate throughout the IRA (Jay, et al. 2022). With so much of the IRA's incentives delivered as clean energy tax credits, the IRA's potential clean energy investment—and its environmental and social impact—hinge upon the collective uptake of these incentives over the course of a decade. Local governments can seize this opportunity and ensure that all communities, particularly underserved communities, benefit.

Local governments have been driving substantial investment in clean energy projects, and the new IRA incentives can help accelerate these investments and enable more communities to benefit. For example, local governments have purchased or installed more than 16 gigawatts (GW) of renewable energy since 2018, with annual installations reaching more than 4GW in recent years (Gonçalves, et al. 2022).

With the new federal incentives improving the economics of clean energy projects even further, project installations are poised to take off and expand to more regions of the country.

This roadmap aims to help U.S. local governments harness the opportunities presented by the IRA. It focuses heavily on the clean electricity tax credits and the associated bonus incentives, as well as the new flexibility available to nonprofits through elective pay, given the array of new provisions and their complexity. Incentives for transportation and building electrification and new technologies are also very important for local governments but covered only briefly here. The roadmap identifies roles that local governments play and strategies they can employ to accelerate municipal and community-wide adoption of clean energy technologies broadly.

Understanding key IRA incentives

The scale and number of clean energy incentives introduced, updated, and expanded in the IRA is massive. Some of the largest of these changes were made to two long-standing energy tax credits, the Investment Tax Credit (ITC) and Production Tax Credit (PTC). Not only did the IRA extend the lifetime of the credits, it also introduced a suite of new bonus incentives designed to help build a clean energy workforce, support domestic manufacturing, and bring investment to disadvantaged and historically fossil fuel industry-dependent communities. Furthermore, the IRA created two entirely new pathways for organizations to take advantage of these and other clean energy tax credits: elective pay, where tax-exempt entities like local governments can receive tax credits as a direct cash rebate, and transferability, where developers can transfer tax credits to other entities that have the tax liability to use them. This section will describe these changes and other incentives introduced in IRA in detail, as well as explain their relevance for local governments.

Credits for clean electricity: The expanded and extended ITC and PTC

The renewable energy industry has seen enormous growth in the past 50 years, and currently generates around 22 percent of all electricity used in the United States (EIA 2023). Two of the key drivers of this growth have been the ITC (section 48) and PTC (section 45). These tax credits, which have existed in some form since 1978 and 1992 respectively, helped enable the explosive growth of the solar and wind industry and form the basis for modern renewable project finance. The ITC and PTC have different bases for calculation: The ITC acts as a rebate based on the total eligible costs of a project, while the PTC is calculated based on the actual amount of energy produced by the system in a year. These credits are mutually exclusive and have historically been associated with different types of renewable energy technologies.

BOX 1 • How are the ITC and PTC calculated?

The ITC and PTC are both long-standing and important tax credits that incentivize clean energy development. However, they are mutually exclusive and are calculated very differently.

INVESTMENT TAX CREDIT (ITC)

The ITC (sections 48 and 48E) is determined as a percentage of the total eligible project costs. The full amount of eligible project costs used for calculation of the credit is called the tax basis and includes many, though not all, expenses that may be associated with the installation of a renewable energy project. Generally, the tax basis will include costs directly attributable to a renewable energy system (generation equipment, racking, inverters, monitoring, balance of system equipment, etc.), installation costs, and associated energy storage systems. For more information on what expenses can be claimed as part of the tax basis, please consult a qualified tax advisor.

For projects that meet prevailing wage and apprenticeship requirements, the base amount of the ITC is worth 30 percent of the tax basis. If not, it is worth 6 percent of the tax basis.

PRODUCTION TAX CREDIT (PTC)

The PTC (sections 45 and 45Y) is determined based on the total amount of electricity a qualified renewable energy facility produces and sells to an unrelated party in a taxable year. This value is multiplied by a credit factor, which for 2023 is \$0.0275/kWh (2.75 cents/kWh) if prevailing wage and apprenticeship requirements are met and \$0.055/kWh if not. The value of the PTC credit factor is adjusted each year by the Treasury Department such that it is equivalent to \$0.015/kWh (1.5 cents/kWh) in 1992 dollars if prevailing wage and apprenticeship requirements are met or \$0.003/kWh (0.3 cents/kWh) in 1992 dollars if not. The PTC can be claimed for each of the first ten years after a project has been placed in service.

The IRA made substantial changes to these credits extending their reach and their impact. While in the past these credits suffered from uncertainty and short-term extensions that impeded project development, the IRA addressed this uncertainty by extending both credits to the later of 2032 or the calendar year in which the U.S. electricity sector’s greenhouse gas emissions are 75 percent below 2022 levels. Additionally, the IRA changed what technologies are eligible for each credit. Through 2024, solar photovoltaic (PV) energy generation, wind energy generation, and geothermal electricity generation are now all eligible for both the ITC and PTC. The ITC specifically has also been expanded to energy storage technologies, micro grid controllers, geothermal heat pumps, and interconnection costs for systems under 5 MW-AC in capacity (EPA 2023).

Starting in 2025, the current ITC and PTC are replaced with new technology-neutral credits, referred to as the Clean Electricity Investment Tax Credit (section 48E) and Clean Electricity Production Tax Credit (section 45Y) respectively.¹ These credits keep the same structure as their predecessors

but will apply to any resource with an estimated net greenhouse gas emissions rate of zero. Guidance on eligible carbon-free technologies is forthcoming by the end of 2024 from the Treasury Department pursuant to sections 45Y(b)(2)(C)(i) and 48E(b)(3)(B)(ii). Additionally, the Clean Electricity Investment Tax Credit will continue to cover energy storage technologies, and the section 48 Investment Tax Credit for geothermal heat pumps will continue until 2033.

Finally, the IRA introduced a “base-and-bonus” structure for both the ITC and PTC. The credits now start at 6 percent of eligible tax basis and 0.55 cents/kWh respectively. These credits are multiplied by five to reach their original value (30 percent and 2.75 cents/kWh respectively) if they meet prevailing wage and apprenticeship criteria. Projects under 1 MW-AC in nameplate capacity automatically receive the higher credit values. There are also bonus credits (explained further in the next section) for projects that meet certain domestic content, labor standards, and equity siting criteria. Leveraging these bonuses can be a key strategy for expanding equitable renewable energy deployment by local governments.

BOX 2 • Considerations for local governments: Investment and Production Tax Credits

- **The ITC has key advantages over the PTC for smaller projects.** The ITC is calculated based on actual project costs, which will likely be higher per-watt for smaller projects compared to large projects. Additionally, the PTC only applies to energy that is sold to an unrelated third party, meaning that projects that serve an entity’s own energy demands may not be eligible to receive the PTC.
- **The PTC will likely be worth more for utility-scale installations, while the ITC will be worth more for smaller-scale installations.** The extension of the PTC to solar and the ITC to wind means that organizations pursuing solar and wind projects must now decide which of these credits to take. Because of the methods by which each credit is calculated, the deciding factors will likely be the capital costs per-watt of the project and the amount of energy a project is expected to produce. An analysis in *PV Magazine* demonstrated that the ITC was more cost-effective for solar projects with higher per-watt capital costs and lower expected lifetime energy production, which tend to be smaller facilities. Additionally, the PTC was found to be better for solar projects with lower per-watt capital costs and higher expected lifetime energy production, which tend to be larger utility-scale installations (Weaver 2022).
- **The ITC has multiple administrative advantages over the PTC for local governments:**
 - The ITC is received as a one-time, lump-sum payment at the beginning of a project’s life, while the PTC must be claimed each year for the first 10 years of operation. This is critical when considering federal budget sequestration, which can be triggered when Congress fails to meet certain budget requirements. While it is very unlikely to occur, budget sequestration could potentially impact the ability for IRS to distribute elective pay tax credits to local governments and other tax-exempt entities. This would affect both the ITC and PTC, but local governments may mitigate this risk by claiming the more upfront ITC.
 - The ITC is based on actual project costs, guaranteeing a specific percentage discount in the capital costs of a renewable energy installation.
 - The ITC and Clean Electricity Investment Tax Credit have been extended to include energy storage, while the PTC and Clean Electricity Production Tax Credit do not cover storage technology.
- **Projects that claim the PTC must file annual reports to the IRS and therefore may pose a larger administrative burden on local governments.** All projects, whether they claim the ITC or PTC, will require pre-filing registration and an initial filing with the IRS once the project is completed or placed into service. However, because PTC projects generate revenue based on production, annual reporting of this revenue and filing with the IRS will be required for the lifetime of the project.

SHOWING THE POTENTIAL OF THE ITC AND PTC

The potential for cost savings and increased ambition in projects using the updated ITC and PTC is massive. However, it can be difficult to understand what this means for specific projects that local governments across the United States are interested in pursuing. The table below shows how the ITC and PTC can create significant value for illustrative projects across different geographies and system sizes. These calculated credit values and overall costs use real installed cost estimates taken from the Lawrence Berkeley National Laboratory's Tracking the Sun and Utility-Scale Solar reports.

This table demonstrates how the ITC and PTC can significantly reduce the costs of development across a wide range of system sizes and geographies. Note that the ITC provides a greater overall reduction in costs for all the 100 kW systems and two of the three 2 MW systems, while the PTC holds greater value than the ITC for the 15 MW solar arrays across all geographies. As noted earlier, the PTC will generate more value for larger projects with higher expected output. Additionally, while not shown here, bonus incentives can add significant extra value to both the ITC and PTC values.

TABLE 1 • Project costs and credit values for example projects

SYSTEM SIZE	MEDIAN INSTALLED COST (\$2021/ W-DC)	ESTIMATED TOTAL COST (\$2021)	ITC TAX CREDIT VALUE ^A	ESTIMATED LIFETIME PTC VALUE ^B	ESTIMATED TOTAL COST AFTER TAX CREDITS ^C
100 kW rooftop solar					
Phoenix, AZ	\$2.83	\$283,000	\$84,900	\$54,702	\$198,100
Milwaukee, WI	\$2.14	\$214,000	\$64,200	\$39,192	\$149,800
Charlotte, NC	\$2.82	\$282,000	\$84,600	\$43,752	\$197,400
2 MW on-site solar					
Phoenix, AZ	\$2.69	\$5,380,000	\$1,614,000	\$1,097,185	\$3,766,000
Milwaukee, WI	\$1.51	\$3,020,000	\$906,000	\$782,955	\$2,114,000
Charlotte, NC	\$1.53	\$3,060,000	\$918,000	\$1,095,110	\$1,964,890
15 MW off-site 1-axis tracker solar					
Phoenix, AZ	\$1.07	\$16,050,000	\$4,815,000	\$9,803,294	\$6,246,706
Milwaukee, WI	\$1.27	\$19,050,000	\$5,715,000	\$6,737,149	\$12,312,851
Charlotte, NC	\$1.54	\$23,100,000	\$6,930,000	\$8,021,188	\$15,078,812

Notes: Median installed cost data for each location is taken from Lawrence Berkeley National Laboratory's Tracking the Sun and Utility-Scale Solar market reports.

^ACalculated ITC values for the 2 MW and 15 MW solar installations assume that prevailing wage and apprenticeship requirements have been met, resulting in a tax credit worth 30 percent of eligible costs. ITC tax basis is assumed to 100 percent of estimated total cost.

^BEstimated lifetime PTC values were calculated by estimating the performance of the system using NREL's System Advisor Model using the PVWatts model and adding together calculated PTC values for each calendar year. Solar arrays are assumed to have a tilt equal to location latitude except the 15 MW 1-axis tracking example, which is estimated using a tilt of 0 degrees. All arrays are assumed to be facing due south. PTC is assumed to start with a value of \$0.0275/kWh in 2023 with an annual 3 percent adjustment in credit for inflation and ending after 10 years.

^CTotal cost after tax credits calculated by subtracting the greater of the calculated ITC or PTC credit values from the estimated total cost.

Source: WRI authors.

Bonus credits can increase the value of the ITC and PTC

In addition to extending and expanding the reach of the ITC and PTC, the IRA also introduced bonus incentives that make these credits even more valuable. Local governments are very well positioned to benefit from the new bonus incentives introduced in the IRA which align with common local government equity and environmental justice goals (see Table 2).

PREVAILING WAGE AND APPRENTICESHIP

The prevailing wage and apprenticeship requirements provide the largest bonus for the ITC and PTC, increasing their value and the value of associated bonus credits by five times. The prevailing wage requirement states that all laborers and mechanics must be paid the same or greater wage and benefits as others in their specific worker classification in the location where the facility is located. The apprenticeship requirements mandate that 12.5 percent of total labor hours on the project are performed by registered apprentices in Department of Labor certified programs (escalating to 15 percent by 2024) or that good faith effort be made to meet that threshold (IRS 2022). In addition to

TABLE 2 • Bonus credits available for ITC and PTC

BONUS CREDIT	VALUE	NOTES FOR LOCAL GOVERNMENTS
Prevailing wage and apprenticeship	For the ITC and PTC: multiplies the value of the credits by 5—from 6% to 30% for the ITC, and from 0.55 cents/kWh to 2.75 cents/kWh for the PTC.	These labor multipliers only apply for projects greater than 1 MW-ac; projects less than 1 MW-AC automatically receive the higher values (30% and 2.75 cents/kWh).
Domestic content	ITC: +10 percentage-point increase in percentage of eligible costs. PTC: 10 percent increase in dollars paid per kWh produced and sold (additional +0.3 cents/kWh). <i>If prevailing wage and apprenticeship requirements are not met, the bonuses are reduced to 2 percentage points for the ITC and 0.1 cents/kWh for the PTC.</i>	Phasedown in total value of credit for elective pay entities for projects greater than 1 MW-AC. Beginning in 2026, projects greater than 1 MW-AC claiming elective pay will get 0% of the credit if they don't meet domestic content requirements.
Energy community	ITC: +10 percentage-point increase in percentage of eligible costs. PTC: 10 percent increase in dollars paid per kWh produced and sold (additional +0.3 cents/kWh). <i>If prevailing wage and apprenticeship requirements are not met, the bonuses are reduced to 2 percentage points for the ITC and 0.1 cents/kWh for the PTC.</i>	Three categories of qualifying energy communities: <ul style="list-style-type: none"> Brownfields. MSAs/non-MSAs meeting fossil fuel employment/dependency and unemployment rate thresholds. Census tracts containing or adjacent to coal mines or power plants that have closed within a certain timeframe. Eligible areas will be updated annually.
Low-income community bonus credit	Only available for solar and wind facilities under 5 MW-AC in capacity claiming the ITC through 2024, additional guidance after. Indian land or low-income communities: +10 percentage-point increase in percentage of eligible costs. Qualified low-income residential building projects or low-income economic benefit projects: +20 percentage-point increase in percentage of eligible costs.	Capped amount available annually (1.8 GW-DC for 2023). Requires separate application process prior to filing for the tax election. Projects must be less than 5 MW-AC in nameplate capacity. Energy storage may be co-located with a qualifying solar or wind facility if it is charged no less than 50% by the associated generation facility.

Source: WRI author summary of the Inflation Reduction Act, Pub. L. No. 117-169.

the ITC and PTC, other clean energy and climate-related tax credits are subject to prevailing wage and apprenticeship requirements, including the Alternative Fuel Vehicle Refueling Property Credit (section 30C), the Qualifying Advanced Energy Project Credit (section 48C), and the Energy Efficient Commercial Buildings Deduction (section 179D) (IRS 2023e).

Local governments will need to consult with their developers and their legal teams to ensure that these requirements are being met. This will be critical for all projects electing to use the ITC, PTC, or any other tax credit subject to these provisions in order to receive the largest benefit possible. For more information on these requirements, please consult the IRS' Notice of Proposed Rulemaking on prevailing wage and apprenticeship and the IRS FAQ on these provisions.

DOMESTIC CONTENT

The domestic content bonus credit provides an increase in the value of the ITC or PTC if certain thresholds for domestically produced materials are met, making it an important element for local governments to consider when exploring projects. There are two requirements for the domestic content bonus credit: one for steel and iron and one for manufactured products. The steel and iron requirement is met if all manufacturing processes with respect to any structural items made primarily of steel or iron used in a project take place in the United States. The manufactured products component requirement is met if a specific percentage of the total costs of all manufactured products for a facility are attributable to manufactured products or components mined, produced, or manufactured in the United States. This percentage rises over time, from 40 percent of the value of manufactured products in 2023 to 55 percent in 2027 (with lower values for offshore wind) (IRS 2023a).

Notably, for local governments and other tax-exempt entities, these domestic content rules affect the amount of a tax credit received as a refund through elective pay facilities for greater than 1 MW-AC in nameplate capacity. Starting with projects beginning construction in 2024, applicable ITC and PTC elective payments will be reduced if the steel and iron and manufacturing requirements outlined in the bonus credit definition are not met. If these domestic content requirements are not met, the value of the credit is reduced to 90 percent of its full value for projects starting construction in 2024; 85 percent for projects starting construction in 2025; and zero percent for projects starting construction in 2026 or later. This means that **elective pay projects larger than 1 MW-AC that start construction after December 31, 2025, and do not meet domestic content requirements will receive no tax credit payments for the ITC or PTC.** Table 3 contains an illustrative example of the domestic content phase-out provisions and how they apply to a theoretical project with an ITC tax basis of \$1 million.

The IRA allows elective pay entities to claim exceptions to these strict domestic content rules. This occurs in cases where meeting domestic content requirements would result in raising overall construction costs by more than 25 percent, or if “relevant steel, iron, or manufactured products are not produced in the United States in sufficient and reasonably available quantities of a satisfactory quality.” (Inflation Reduction Act, Pub. L. No. 117-169, Sec. 13101(g)(10)(D) and Sec. 13701(g)(12)(D)). However, as of September 2023, the IRS has yet to release guidance on how these exceptions will be calculated and administered. Critically, **these domestic content credit reductions do not apply for projects less than 1 MW-AC in nameplate capacity, a threshold under which many local government projects may fall.**

TABLE 3 • Phased domestic content requirement for elective pay

YEAR OF BEGINNING CONSTRUCTION	OVERALL CREDIT VALUE FOR ELECTIVE PAY ENTITY IF DOMESTIC CONTENT REQUIREMENTS ARE NOT MET	EXAMPLE OF FINAL ITC CREDIT VALUE FOR A \$1 MILLION DOLLAR PROJECT OVER 1 MW-AC CLAIMING ELECTIVE PAY
2023	100%	\$300,000
2024	90%	\$270,000
2025	85%	\$255,000
2026	0%	\$0

Source: WRI author summary of the Inflation Reduction Act, Pub. L. No. 117-169.

Local governments will need to work with developer partners and the legal team to determine how best to navigate domestic content requirements. For more information on these requirements, please consult IRS guidance on the domestic content rules.

ENERGY COMMUNITY TAX CREDIT BONUS

The Energy Community Tax Credit Bonus provides an additional incentive for projects located in specified “energy communities,” which include brownfield sites and communities affected by the fossil fuel transition. Under the ITC, the energy community bonus credit is equal to a 10 percentage-point increase in the base credit value. Under the PTC, the value of the energy community bonus credit is equal to a 10 percent increase in the value of the base credit, or an additional 0.3 cents/kWh. If prevailing wage and apprenticeship requirements are not met, the bonuses are reduced to 2 percentage points and an additional 0.1 cents/kWh for the ITC and PTC, respectively.

The IRA defines an energy community for the purposes of the ITC and PTC as an area that falls into one of three different categories (Inflation Reduction Act, Pub. L. No. 117-169):

1. **Brownfield sites** (as defined in certain subparagraphs of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980)
2. **Metropolitan statistical areas and non-metropolitan statistical areas** that
 - o have had one year since 2009 with 0.17 percent or greater direct employment or greater than 25 percent of local tax revenues related to extraction, processing, transport, or storage of coal, oil, or natural gas; and
 - o had an unemployment rate at or above the national average for the previous year.
3. **Census tract or adjoining census tract** in which
 - o A coal mine closed after December 31, 1999; or
 - o A coal-fired electric generating unit was retired after December 31, 2009.

The U.S. Department of the Treasury and the IRS have released guidance providing lists of areas that meet the different area thresholds and clarified what documentation is needed to meet brownfield site safe harbor provisions for projects under 5 MW-AC (IRS 2023d). In addition, the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization has released a

mapping tool to help identify which areas qualify under the coal and fossil fuel employment categories (Interagency Working Group 2023).

LOW-INCOME COMMUNITIES BONUS CREDIT PROGRAM

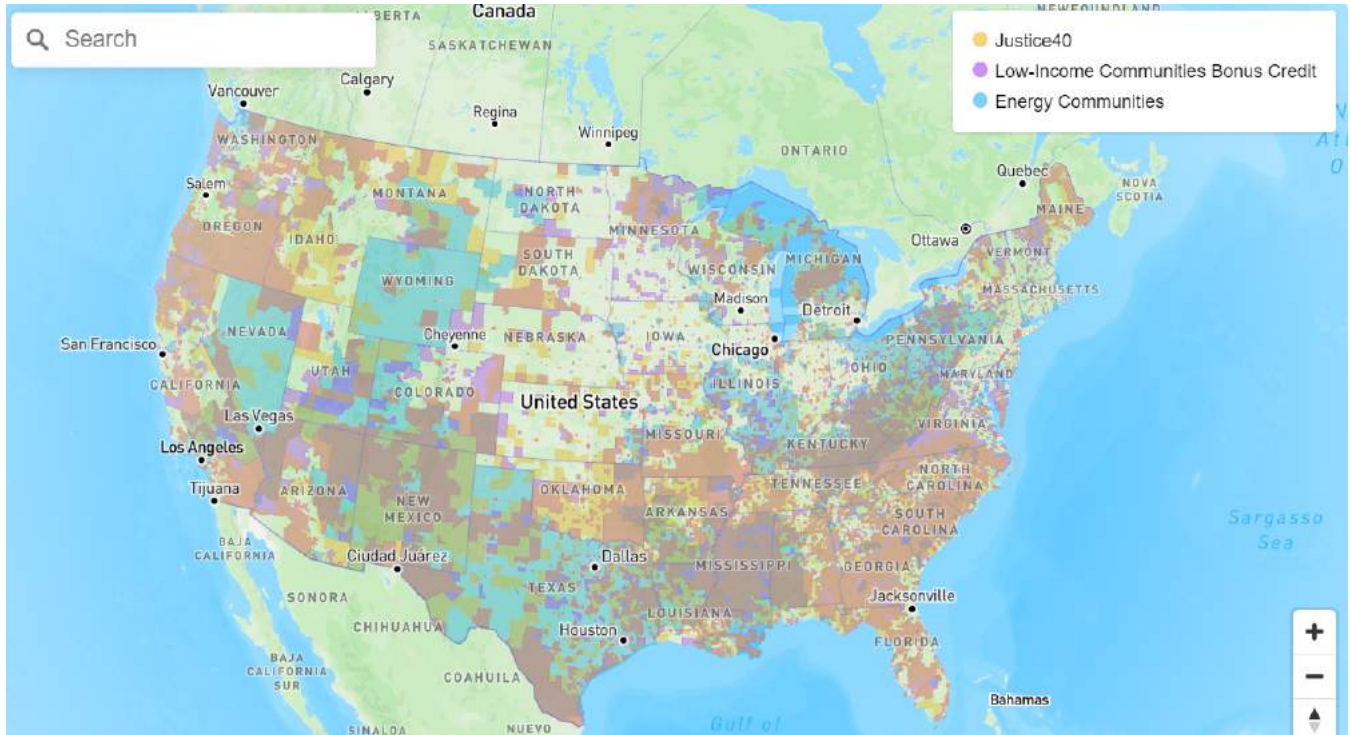
The Low-Income Communities Bonus Credit Program provides a 10 percentage-point increase in the ITC for projects located within low-income communities or on “Indian land,” and a 20 percentage-point increase for projects defined as “qualified low-income residential building projects” or “qualified low-income economic benefit projects.” Each project can only qualify under one category within the program.

Each category has a distinct definition and annual capacity limits.

- A “**low-income community**” is defined as a population census tract in which the poverty rate is at least 20 percent or in which the median family income is less than the greater of 80 percent of the statewide median family income or 80 percent of the metropolitan median family income.
- The “**Indian land**” category is defined in 25 U.S. Code § 3501(2)² and includes all land within an Indian reservation, pueblo, or rancheria, all land owned by an Indian tribe or Alaska Native Corporation, and any census tracts in which the majority of residents are Alaska Natives or members of a federally recognized tribe.
- A “**qualified low-income residential building project**” is a project installed on a residential rental building that participates in certain affordable housing programs.³ This includes public housing and buildings that receive Section 8 tenant- or project-based assistance.
- A “**qualified low-income economic benefit project**” is defined as a project where at least 50 percent of the financial benefits of the electricity produced by a facility are distributed to households with an income of less than 200 percent of the federal poverty level or less than 80 percent of area median income.

The incentives received through the Low-Income Communities Bonus Credit Program can be used along with the prevailing wage and apprenticeship, energy community, and domestic content bonus incentives. Only projects using solar PV and wind energy generation technology that have less than 5 MW-AC nameplate capacity are allowed to apply for and receive the bonus credit. Energy storage can be co-located with a qualifying project if the storage is

FIGURE 3 • America Is All In and WRI's IRA Bonus Mapper



Source: WRI 2023.

considered part of the same facility and is charged “no less than 50 percent by the other eligible property” (IRS 2023f). Projects that choose the PTC cannot participate in the Low-Income Communities Bonus Credit Program.

The Low-Income Communities Bonus Credit Program operates differently from the other bonus credits. **Unlike the ITC, PTC, and all the other bonus incentives, projects wanting to receive the Low-Income Communities Bonus Credit must file a separate application to demonstrate they meet the requirements of any of the four qualifying categories.** This application will then be reviewed by the Department of Energy, who will then make a recommendation to the IRS on whether to award the credit. Additionally, the IRA only allows the IRS to award a total of 1.8 GW of projects with bonus incentives under the

Low-Income Communities Bonus Credit in each calendar year starting in 2023, as measured in nameplate AC capacity. If the IRS does not give bonus incentives to a total of 1.8 GW of projects in a single year, the remaining amount of capacity allocation will carry over into future years until the total allocated capacity for all years is exhausted.

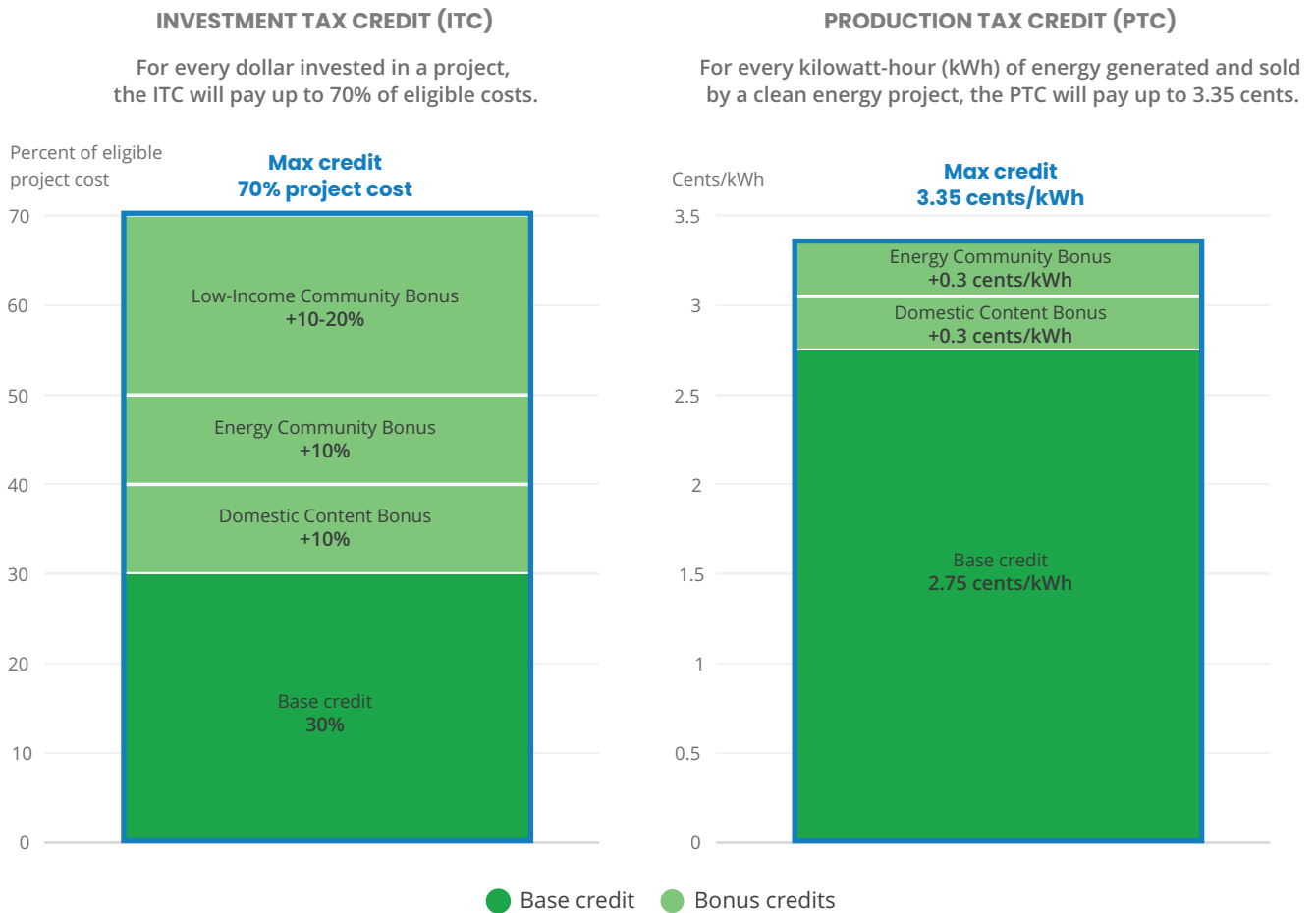
For more information, please reference published proposed IRS guidance on the Low-Income Communities Bonus Credit Program. To see if an area is eligible for the program in the “low-income community” or “Indian land” categories, local governments can visit American Is All In and WRI’s IRA Bonus Mapper.⁴

The bonus credits discussed in this section can potentially bring down the cost of projects significantly while delivering benefits to historically disadvantaged communities.

BOX 3 • Considerations for local governments: Bonus credits

- **Local governments stand to benefit significantly from bonus credits.** These credits encourage clean energy development in ways that align with common local government public policy goals. Additionally, they incentivize specific geographic areas which cities may have direct control over (such as brownfields and covered housing program buildings) or with which cities have important connections (such as retired coal plants and low-income communities).
- **The definition of an “energy community” is far-reaching and can shift over time.** Local governments should check to see if areas in their community qualify as an energy community, even if they are not typically regarded as a historically fossil fuel-producing area. According to a recent World Resources Institute analysis, energy communities can be found across 46 states, Puerto Rico, and the U.S. Virgin Islands, and contain almost 20 percent of the entire U.S. population (Shrestha et al. 2023).
 - Local governments should be particularly aware of brownfields and any retired coal plants in or near their communities and make that information public to encourage development. Many major cities, particularly in the Southeast and Midwest, have recently retired coal plants near them.
 - Local governments should also check whether they meet or exceed certain thresholds of fossil fuel industry employment and unemployment rates. As of September 2023, this category covers large areas of the United States. These areas will also be updated each year and can also shift if fossil fuel employment or unemployment rates change.
 - To see a map of all non-brownfield energy communities, please visit the U.S. Department of Energy’s energy community bonus tax credit mapping tool (DOE 2023c).
- **Local governments should be deliberate about which projects might be eligible for the Low-Income Communities Bonus Credit Program.** Unlike the domestic content and energy community bonus incentives, the Low-Income Communities Bonus Credit Program is limited in what size and type of project can qualify and in the total amount of capacity IRS can give out per year. In addition, the program requires a separate application apart from the regular tax return filing needed to claim the ITC, PTC, and other bonus credits. Local governments should therefore carefully consider which of their projects may be eligible for the Low-Income Communities Bonus Credit Program and not rely on receiving this bonus for all their deployments.
- **Smaller projects have exceptions that make obtaining bonus credits easier.** Projects under one MW-AC automatically receive increased ITC and PTC rates under prevailing wage and apprenticeship requirements and are exempt from the domestic content requirements for elective pay. Local governments will therefore likely find it easier to work with these smaller installations and receive qualifying bonus credits. This strategy allows local governments to build portfolios of smaller installations and receive maximum tax credit benefits without being subject to domestic content requirements.

FIGURE 4 • IRA bonus tax credit illustration



Source: WRI author summary of the Inflation Reduction Act, Pub. L. No. 117-169.

Understanding elective pay and transferability for local governments

The IRA introduced two new methods for organizations to receive benefits from climate and clean energy tax credits known as elective pay and transferability. These methods, particularly elective pay, stand to reshape the renewable energy landscape for local governments.

ELECTIVE PAY

Before the IRA, local governments and other tax-exempt entities could not directly access tax credit benefits. Since these entities do not have tax obligations to which any credit could apply, they would need to partner with private companies in order to indirectly gain the benefits provided

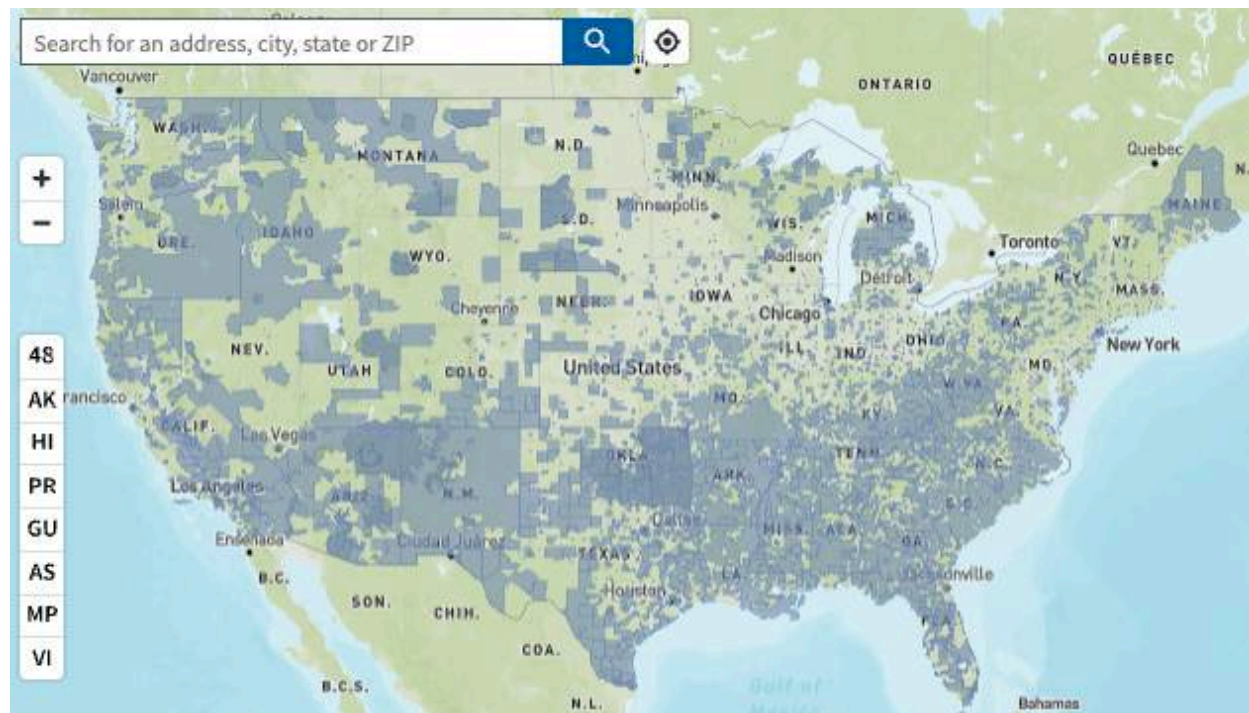
by credits. This effectively precluded many tax-exempt entities from directly owning any renewable energy infrastructure, requiring them to enter into third-party ownership and power purchase agreement (PPA) contracts to realize the value of the tax benefit.

However, the IRA introduced a new pathway for tax-exempt entities, including local governments, to directly receive the benefits of climate and clean energy tax credits. This method, known as elective pay or direct pay, allows for several different types of tax-exempt entities to claim the value of a tax credit and receive it in the form of a direct cash refund from the IRS (IRS 2023b).

BOX 4 • Justice40 and IRA tax credits

Justice40 is a federal directive to deliver 40 percent of the benefits of climate and clean energy funding to disadvantaged communities. It is not a stand-alone incentive program, but rather represents a commitment to distribute federal climate, clean energy, affordable and sustainable housing, clean water, and other investments more equitably. The Justice40 initiative was established by Executive Order 14008 and covers over 400 federal government programs, many of them established or funded through the IRA. For the purposes of Justice40, disadvantaged communities can be identified using the Council on Environmental Quality's Climate and Economic Justice Screening Tool (CEJST) and applicable state mapping tools (Lawyers for Good Government 2023). Justice40 disadvantaged community indicators span categories of climate vulnerability, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. In 2021 and 2022, over \$92 billion was made available to Justice40 covered programs. Many local governments are required to comply with Justice40 stipulations when using certain federal funding program (e.g., the National Electric Vehicle Infrastructure formula program). Certain IRA programs may prioritize Justice40 disadvantaged communities. For example, under proposed guidance the CEJST tool will be used to help identify disadvantaged and low-income communities for purposes of approving Low Income Communities Bonus Applications.

FIGURE 5 • Climate and Economic Justice Screening Tool



Source: CEQ 2023.

HOW DOES ELECTIVE PAY WORK?

Elective pay allows the following eligible tax-exempt entities (also known as applicable entities) to receive the value of certain clean energy tax credits as a cash refund from the IRS:

- State, local, tribal, and territorial governments
- Alaska Native corporations
- The Tennessee Valley Authority
- Rural electric cooperatives
- Any organization exempt from income tax under through § 501(a) of the Internal Revenue Code, including religious institutions, hospitals, social clubs, and all 501(c)(3) organizations
- All agencies and instrumentalities of state, local, tribal, and territorial governments (e.g., publicly owned utilities, fire departments, joint powers authorities, public universities, school districts, public libraries, etc.)

There are 12 climate and clean energy credits that the IRA authorized eligible tax-exempt entities to claim using elective pay. The full list of elective pay-eligible tax credits follows:

- Production Tax Credit (45), available through 2024
- Investment Tax Credit (48), available through 2024
- Clean Electricity Production Tax Credit (45Y), available beginning in 2025
- Clean Electricity Investment Tax Credit (48E), available beginning in 2025
- Nuclear Power Production Tax Credit (45U)
- Carbon Oxide Sequestration Tax Credit (45Q)
- Clean Hydrogen Production Tax Credit (45V)
- Clean Fuel Production Credit (45Z)
- Advanced Manufacturing Production Tax Credit (45X)
- Advanced Energy Project Credit (48C)
- Qualified Commercial Clean Vehicle Credit (45W)
- Alternative Fuel Vehicle Refueling Property Credit (30C)

Three of these credits—the section 45Q Carbon Oxide Sequestration Tax Credit, the section 45V Clean Hydrogen Production Tax Credit, and the 45X Advanced Manufacturing Production Tax Credit—can be claimed using elective pay by any tax-exempt or tax-paying entities, including for-profit companies, for five years (IRS 2023c).

For most elective pay tax credits (including the ITC, PTC, Clean Electricity Investment Tax Credit, Clean Electricity Production Tax Credit, Qualified Commercial Clean Vehicles Credit, and the Alternative Fuel Vehicle Refueling Property Credit), **an entity must own the property for which they are claiming a tax credit.** This can happen through direct ownership, ownership through a disregarded entity, being a co-owner of a property as part of a tenancy-in-common agreement, or being party to a joint operating agreement that has elected out of subchapter K under section 761. Under tenancy-in-common and joint operating agreements electing out of subchapter K, the elective pay credit refund will be determined separately with respect to each owner. **Property owned by a third party but leased or used by an applicable entity cannot claim elective pay.**

Additionally, under the proposed rules, partnerships and S corporations can only make claim an elective pay election under sections 45Q, 45V, and 45X. **This means that partnerships and S corporations are currently not allowed to claim elective pay for the ITC, PTC, Clean Electricity Investment Tax Credit, Clean Electricity Production Tax Credit, Qualified Commercial Clean Vehicles Credit, or the Alternative Fuel Vehicle Refueling Property Credit.** This is true even if one or all the members of a partnership or owners of an S corporation are tax-exempt applicable entities. As of September 2023, the U.S. Department of the Treasury has not finalized guidance for elective pay or for transferability. Information about these provisions is based on proposed guidance and is subject to change when final guidance is issued.

WHAT IS THE PROCESS FOR CLAIMING ELECTIVE PAY?

The IRS has outlined a five-step process that eligible entities, such as local governments, can use for claiming elective pay.

- 1 Identify and pursue the qualifying project or activity.** You will need to know what applicable credit you intend to earn and use elective pay for.
- 2 Determine the applicable tax year for the project or activity.** A “tax year” is an annual accounting period for keeping records and reporting income and expenses. This will determine the due date for a tax return and when an organization can file to claim a tax credit through elective pay. The due date for sending in a tax return filing and claiming elective pay is 4.5 months after the end of an entity’s tax year.

- For entities that do not normally file a tax return and so must submit a 990-T Exempt Organization Business Income Tax Return, the tax year based on the organization's established accounting period or fiscal year. For example:
 - If City X's fiscal year 2023 runs from January 1, 2023 to December 31, 2023, the due date for its form 990-T for 2023 is May 15, 2024.
 - If City Y's fiscal year 2023 runs from July 1, 2022, to June 30, 2023, the due date for its form 990-T for 2023 is November 15, 2023.
 - If City Z's fiscal year 2023 runs from October 1, 2022, to September 30, 2023, the due date for its form 990-T for 2023 is February 15, 2024.
- Tax-exempt entities may also file for an automatic six-month extension on their return. In this case, the due date for the tax return will be 10.5 months after the end of an entity's tax year.
- Tax-exempt entities may not file for an elective pay payment before the end of their tax year.

3 Complete pre-filing registration with the IRS. All elective pay claiming entities must complete a pre-filing registration process for each credit property for which they are seeking elective payment. This pre-filing registration will be performed through an online portal. Registrants will be required to provide information about their organization, the credits they are seeking, and individual information on each eligible credit property that they are claiming an elective payment for. The IRS will then provide a unique registration number for each applicable credit property, which will need to be provided on the tax return when making the elective pay election with the full tax return.

- According to the IRS, the pre-filing process "must be completed in sufficient time before planning to file a tax return." However, once the pre-filing registration website is launched, organizations seeking elective pay may complete the registration process for a credit property as soon as they have all the information required to do so.

4 Satisfy all eligibility requirements for any underlying tax credits being claimed, including any bonus credits, if applicable, for a given tax year. Plan to provide documentation showing that the project meets all eligibility criteria for any credits and bonus credits being claimed.

5 File a tax return along with the required forms for elective pay. To apply for elective pay, local governments and other entities submit a tax return along with all required documentation. Tax-exempt entities that already file a yearly return will submit any required forms along with their standard yearly tax return filing. Local governments and other entities that normally do not file a tax return must file Form 990-T, Exempt Organization Business Income Tax Return.

- Entities must also fill out Form 3800, General Business Credit and any source credit forms specific to the tax credits they are claiming, such as Form 3468 for the Investment Tax Credit or Form 8835 for the Renewable Electricity Production Credit. Entities will also need to provide all documentation necessary to substantiate these credits.
- The unique registration number for each credit property, assigned by the IRS during the pre-filing registration process, must be provided on all applicable forms to claim a tax credit under elective pay.

Please note that the IRS **does not require** a credit property to be placed in service before completing pre-filing registration. **However, it is likely best practice for tax-exempt entities to fulfill all eligibility requirements for a credit, including placing any credit property into service, before filling out the pre-filing registration form.** This will help to avoid confusion over the tax basis of a property if project parameters or costs change over time.

BOX 5 • Considerations for local governments: Elective pay

- **Elective pay makes direct ownership of energy infrastructure a much more important and affordable pathway for local governments and other tax-exempt entities than before.** Previously, local governments and other tax-exempt entities were required to purchase power from private entities in order to receive any benefit from tax credits. Conversely, direct ownership by local governments meant forgoing energy tax credits. This made direct ownership of clean energy generation infrastructure economically disadvantageous, limiting the scale and ambition of projects local governments could undertake. Elective pay, however, has opened the door for local governments and other tax-exempt entities to receive federal tax credits for energy projects they own, expanding the opportunities for them to own clean energy assets and advance clean energy in their community.
- **Elective pay tax credits are not grants.** Local governments are likely to be familiar with competitive grants and may expect similar processes and requirements between competitive grants and elective pay. However, elective pay tax credit claims are substantially different and require different considerations. Importantly, tax credits are uncapped, and local governments will not have to scope or justify projects according to specific program criteria or spending limits. Furthermore, once the correct documentation has been filed and the election has been received, there are very few reporting requirements for most elective pay-eligible credits.
- **Local governments should be aware of potential new opportunities to collaborate with the private sector using elective pay.** While some direct pay mechanisms existed previously [such as New Clean Renewable Energy Bonds and Renewable Energy Production Incentives (IRS 2018)], they saw limited use because of a variety of programmatic constraints. Instead, the vast majority of renewable energy project development has been undertaken by private developers relying on tax-equity partners to monetize resulting credits. Elective pay, however, could revolutionize project development, with developers coming up with innovative approaches to design and build, or even additionally operate and manage, facilities owned by local towns, counties, and utilities. Additionally, private developers may be attracted to projects where the owner has the certainty and liquidity of a full direct cash payment received through elective pay, rather than needing to seek out and secure tax equity investors or tax credit transfer deals.
- **Be aware of the domestic content rules (and exceptions) under the ITC and PTC.** To qualify for an elective pay claim for the ITC or PTC, entities are required to abide by domestic content requirements. Failing to meet these requirements will mean a 10 percent reduction in the elective pay refund received for projects that begin construction in 2024; a 15 percent reduction for projects that begin construction in 2025; and a 100 percent reduction for projects that begin construction after 2025. However, there are exceptions to these rules. Notably, these requirements do not apply to a project with less than 1 MW-AC of nameplate capacity. Furthermore, the IRA provides for waivers to these requirements in cases where meeting the requirements would increase project costs by 25 percent or more or where the materials needed to meet these requirements are not available in “sufficient quantity or quality.” Further guidance on these waivers is forthcoming.
- **Local governments can employ several strategies to make it easier to fulfill domestic content requirements.** These include:
 - keeping projects under 1 MW-AC in capacity;
 - seeking an exception if the project qualifies for one;
 - contracting with private developers or domestic manufacturers to ensure compliance; and
 - considering using a joint operating agreement or tenancy-in-common arrangement to enable working with a for-profit entity.

It is also important to note that an **elective-pay entity will receive the domestic content bonus incentive added to the ITC or PTC if it meets the requirements.** This means that, should a tax-exempt entity meet the domestic content and prevailing wage and apprenticeship requirements, it will receive a minimum 40 percent ITC or 3.05 cent/kWh PTC elective payment. Therefore, depending on the project, the extra costs associated with acquiring domestically manufactured products may be partially or fully offset by the bonus incentive.

- **Elective pay will require coordination and take time.** Local governments should ensure that all relevant departments (such as procurement, legal offices, finance and accounting, and others) are prepared to handle the processes needed to apply for and receive elective pay. Not following these procedures correctly could result in an entity not ultimately receiving the credit. Additionally, local governments should consider the time and staff capacity needed to claim a tax credit through elective pay and receive payment through the IRS. Because filing is based on a local government’s fiscal year, it is possible that an elective pay claim may be sent in and received months after a project is placed in service.
- **Third-party ownership is still an option, and private-sector involvement will be critical for many local government clean energy projects.** The addition of the elective pay pathway does not mean that local governments and other tax-exempt entities must use elective pay in their projects. Local governments can still pursue third-party ownership structures, such as leasing distributed energy resources or buying electricity through power purchase agreements. Depending on circumstances, third-party ownership may be preferable to or more economically viable than direct ownership using elective pay. Furthermore, even if a local government or other tax-exempt entity decides to pursue an elective pay project, it is very likely that it will need to contract with a private company to acquire materials, perform installations, and handle ongoing operations and maintenance. This would not prevent an applicable entity from receiving an elective pay tax credit, since the entity would still retain legal ownership of the project. As familiarity and experience with elective pay grows, private companies may begin to develop contracts and services designed for entities using elective pay.

TRANSFERABILITY

Transferability allows entities **not** eligible for elective pay (such as for-profit companies and businesses) to transfer some or all of certain climate or clean energy-related tax credits for which they qualify to a third-party eligible entity in exchange for a cash payment. This can be very beneficial for both buyers and sellers of tax credits, allowing buyers to reduce their federal income tax burdens and sellers to realize the value of their tax credit as a cash payment. For local governments, encouraging deals using transferability could stimulate further clean energy deployment among businesses in their community.

Before entering a transferability deal, buying and selling entities can negotiate on the terms and pricing of the credit and must individually confirm the tax credit transfer on their tax filings. The third-party eligible entity will then use the credit they receive to reduce their own tax liability. Tax credits cannot be resold once purchased and are generally bought for less than their nominal value.

All of the tax credits eligible for elective pay are also eligible for transferability with the exception of the Qualified Commercial Clean Vehicles credit (45W). **However, tax-exempt entities cannot sell tax credits to another party as per the IRA statute.** Additionally, proposed IRS guidance states that that local governments may not claim

elective pay on credits that they purchase in the credit transfer market. However, partnerships that include one or more applicable elective pay entities may be able to engage in transferability under limited circumstances (IRS 2023g). As of September 2023, final guidance on these provisions is still forthcoming and this may be changed.

Other tax credits for electrifying transportation and buildings

In addition to building carbon-free energy assets, the IRA contains provisions that can support local governments and communities as they electrify transportation and buildings.

QUALIFIED COMMERCIAL CLEAN VEHICLES CREDIT (SECTION 45W)

The Qualified Commercial Clean Vehicles Credit under section 45W provides a tax credit for clean vehicles placed into service by businesses and tax-exempt entities, including local governments. The tax credit is equal to the lesser of 30 percent of the value of the vehicle for fully electric or fuel cell-powered vehicles (15 percent for hybrid electric or fuel cell and internal combustion engine vehicles) or the incremental cost of the clean vehicle compared to a similar gasoline-powered vehicle. The value of the credits is capped at \$7,500 for vehicles that weigh less than 14,000 pounds, and \$40,000 for vehicles that weigh over 14,000 pounds.

BOX 6 • Considerations for local governments: Transferability

- **Transferable tax credits can be a boon for small businesses and other community stakeholders.** While local governments cannot directly engage in transferability, they can support community clean energy efforts by providing information to interested stakeholders. By selling a clean energy tax credit to another taxpayer as a cash payment, local businesses with renewable energy installations can take advantage of tax credit savings. This may be especially useful for businesses with lower federal or state tax liabilities; businesses that can claim significant amounts of depreciation; or businesses with significant existing tax deductions.
- **Local governments may be able to access the tax credit marketplace through public-private partnerships under certain circumstances.** Elective pay entities are explicitly disallowed, by statute, from selling any tax credits via transferability. Furthermore, proposed guidance prevents elective pay entities from being able to claim direct pay on purchased credits. However, partnerships between one or more elective pay eligible entities may be able to engage transferability in certain circumstances.
 - For example, partnerships with one or more applicable entities may be able to engage in transferability for the PTC. This is because entities claiming the PTC, unlike entities claiming the ITC, are not limited by the tax-exempt and governmental use rules under 26 U.S.C § 50(b)(3) and 50(b)(4).
- **Unless final regulations offer a different rule on partnership elective pay eligibility, local governments should avoid inadvertently entering partnerships when pursuing elective pay.** As previously discussed, the proposed guidance on elective pay states that partnerships are not applicable entities and thus are ineligible for elective pay for credits other than the 45V, 45Q, and 45X credits. However, even absent a formal agreement, it is possible that a partnership for tax purposes could unintentionally arise. Local governments should consult their attorneys to ensure that any projects for which they seek to utilize elective pay do not inadvertently constitute an ineligible form of partnership.



Photo by Mario Sessions/Unsplash.

ALTERNATIVE FUEL VEHICLE REFUELING PROPERTY CREDIT (SECTION 30C)

The Alternative Fuel Vehicle Refueling Property Credit under section 30C applies to alternative fuel vehicle fueling equipment installed after January 1, 2023. Alternative fuels include electricity, hydrogen, and natural gas. This tax credit applies to businesses, tax-exempt entities including local governments, and individual taxpayers. For individuals, the tax credit is worth 30 percent of the refueling equipment up to \$1,000. For businesses, the tax credit is equal to 30 percent of the cost of equipment up to \$100,000 if prevailing wage and apprenticeship requirements are met; if not, the credit is worth 6 percent. Both individuals and businesses can only claim the credit if the fueling property is in a census tract that is either a nonurban area or meets the qualifications of being a low-income community under section 45D(e).

ENERGY EFFICIENT HOME IMPROVEMENT CREDIT AND RESIDENTIAL CLEAN ENERGY CREDIT (SECTIONS 25C AND 25D)

The Energy Efficient Home Improvement Credit is available only to individual taxpayers and is equal to 30 percent of qualified expenses, which include energy efficiency improvements, residential energy property, and home energy audits. The credit has a \$1,200 yearly limit on most expenses and a \$2,000 limit on qualified heat pumps, biomass stoves, and biomass boilers. Taxpayers may only claim the credit on their primary residence.

The Residential Clean Energy Credit is also only available for individual taxpayers and is equal to 30 percent of the cost of new, qualified energy property for a taxpayer's main and secondary residences. Both renters and homeowners may apply for the credit. Qualified expenses include solar photovoltaics and water heating technology, wind turbines, geothermal heat pumps, fuel cells, battery storage technology, and labor costs associated with preparation, assembly, and installation of the property.

BOX 7 • Considerations for local governments: Tax credits for transportation and buildings

- **Local governments can take advantage of elective pay on certain tax credits to further fleet electrification.**

The 45W Commercial Clean Vehicles Credit and the 30C Alternative Fuel Vehicle Refueling Property Credit are both eligible for elective pay and can be used to purchase vehicles and build electric vehicle fleet charging stations. Furthermore, the processes of both vehicle procurement and electing for these credits may be more familiar to local governments and administratively less complex than energy projects. Local governments can consider using these opportunities as potential first projects using the elective pay process.

- **Local governments can support transportation electrification within their communities by installing publicly available electric vehicle chargers using the Alternative Fuel Vehicle Refueling Property Credit under Section 30C.**

These may be supplemented with direct grants and funding from federal sources, such as the Charging and Fueling Infrastructure Grant Program and the National Electric Vehicle Infrastructure Formula Program.

- **Although not eligible for elective payment, local governments can play a role supporting residential home energy efficiency and electrification for their community members.**

This can be achieved by promoting individual taxpayer-eligible tax credits, providing outreach and information, and potentially working with community-based organizations and others. Local governments may also look out for grant opportunities, including those introduced in the IRA, to support this work.

ENERGY-EFFICIENT COMMERCIAL BUILDINGS TAX DEDUCTION (SECTION 179D)

The Energy-Efficient Commercial Buildings Tax Deduction (179D) allows for building owners to claim a tax deduction for installing qualifying systems in order to reduce energy and power usage. Qualifying systems include interior lighting, HVAC, hot water, and building envelope systems. For property placed in service during 2023 and after, the deduction is equal to the lesser of the cost of the installed property or \$0.50 per square foot for a building with 25 percent energy savings, plus \$0.02 per square foot for each percentage point of energy savings above 25 percent up to a maximum of \$1.00 per square foot for a building with 50 percent energy savings.

Previously, federal, local, and state governments could take advantage of Section 179(d) by allocating the tax credit earned for a system or building they own to the designers of the qualifying energy efficient systems. The IRA extended this ability to tribal governments, Alaska Native corporations, and all other tax-exempt entities including religious organizations, charities, and other 501(c)(3) organizations. This allows governments and tax-exempt entities to negotiate better deals with architecture firms, engineering companies, contractors, energy service providers, and environmental consultants on energy saving upgrades to their buildings.

Bringing it all together: Funding, financing, and incentive stacking

While new tax credit bonus incentives and monetization methods represent the most dramatic changes for local governments, traditional grants and financing methods will still play an important role in enabling clean energy deployment. Applicable tax credits for projects will only be received well after they have been placed in service, so project owners—whether local governments or private-sector entities—will still need sufficient capital or financing to pay for the full cost of the project. In many cases, different layers of federal funding can be combined (often referred to as “stacking” or “braiding”) to enable larger projects.

According to proposed IRS guidance, using tax-exempt grants or forgivable loans to fund a project does not affect the amount of payment an entity receives through elective pay, unless the total amount of the grant plus the elective pay refund is greater than the tax basis of the project. **This means that grant funding, on its own, does not reduce the value of a tax credit that an elective pay entity receives.** Local governments and other tax-exempt entities can therefore look for ways to “stack” grants with elective pay to achieve significant cost reduction and create larger, more ambitious projects.

However, grant programs may have their own restrictions on allowable stacked funding sources. **Entities should consult the program rules of each funding source that they plan to use to ensure that stacking with tax credits is allowed.**

The following is a non-exhaustive list of potentially useful programs to stack with tax credits:

- **Greenhouse Gas Reduction Fund.** Introduced in the IRA, the Greenhouse Gas Reduction Fund (GGRF) will allocate \$27 billion to mobilize public and private investment in clean energy across three programs. Local governments should be aware of the National Clean Investment Fund, which is expected to start distributing financing products in mid-2024, and the Solar for All competitive grant programs. Additionally, the Clean Communities Investment Accelerator will fund nonprofits to provide funding and technical assistance to local community lenders within low-income communities.
 - Funding received directly from the GGRF or through GGRF-funded institutions may be able to provide upfront financing for projects, which can potentially be partially reimbursed through elective pay and other tax incentives.
- **Climate Pollution Reduction Planning and Implementation Grants.** Introduced in the IRA, the Climate Pollution Reduction Grants are a new \$5 billion EPA-administered program with \$250 million in planning grants and \$4.75 billion in implementation grants. The

implementation grants are available through September 2026 and are available to states, tribes, air pollution control agencies, and municipalities. Large metropolitan areas have dedicated funding as part of this program.

- **EPA Brownfields Program Grants.** The Environmental Protection Agency's Brownfields program is an existing program that received \$1.2 billion in additional funding in the Bipartisan Infrastructure Law. Funding from this program covers all aspects of brownfields remediation, including assessments, cleanup grants, and job training that may be relevant to local brownfields remediation efforts.
 - Brownfields Program Grants can work particularly well with the Energy Community bonus incentive, since brownfields are an eligible category of "energy community."
- **USDA Rural Development Electric Programs.** The U.S. Department of Agriculture administers many different loan and grant programs for utilities and energy project developers serving rural communities. These include programs that received increased funding from the IRA and the Bipartisan Infrastructure Law, including new Empowering Rural America funding.

Photo by Laura Beshilas/NREL.



- **EPA Clean School Bus Program.** Introduced in the Bipartisan Infrastructure Law, the Environmental Protection Agency's Clean School Bus Program offers a new \$5 billion grant competition for zero- and low-emission school buses and associated electric vehicle charging infrastructure.

- **DOT Charging and Fueling Infrastructure Grant Program.** Introduced in the IRA, the Department of Transportation's Charging and Fueling Infrastructure Grant Program offers a new \$2.5 billion competitive grant opportunity to local governments and other entities for publicly accessible electric vehicle charging infrastructure along both transportation corridors and in communities.

BOX 8 • Considerations for local governments: Stacking incentives

- **Tax-exempt grants and forgivable loans do not reduce the tax basis for investment tax credits under elective pay.** The Department of the Treasury's proposed guidance indicates that, for elective-pay entities, income received from grants and forgivable loans does not reduce the project basis for calculating the credit amount under sections 30C, 45W, 48, 48C, or 48E. This means that even if a local government or nonprofit receives a grant to cover part of the expenses for a qualifying project, the tax credit itself **is still calculated based on the full amount of eligible costs of the project.** However, if the total amount of the grant plus the tax credit is greater than the total cost of the project, the tax credit is reduced such that the total value of the tax-exempt grants and forgivable loans plus the elective pay refund is equal to 100 percent of the tax basis of project.
 - For example, City A receives a \$50,000 federal grant to install a \$100,000 ground-mounted solar installation. Using elective pay, City A claims a 40 percent ITC credit (30 percentage points for the base ITC plus 10 percentage points for meeting domestic content requirements). City A will then receive a \$40,000 credit from the IRS based on the \$100,000 solar project, leading to a total of grants and tax credits worth \$90,000. However, if City A receives a grant worth \$70,000 instead and elects for the same credit, it will receive only \$30,000 in through elective pay, so that the total of the grant plus the tax credit is equal to the cost of the installation.
- **Tax-exempt bonds reduce the basis for credits.** Any project funded by tax-exempt bonds that claims an ITC or PTC election will receive a reduction in the credit amount that is received. This reduction is equal to the percentage of total project costs covered by tax-exempt bonds up to 15 percent.
- **Streamlining administrative effort for claiming elective pay tax credit incentives is possible.** One of the most significant barriers to stacking different funding sources is the amount of paperwork and coordination required to manage each individual funding source. While grants and elective pay tax credits do require separate processes, local governments should keep in mind that some of the work required to apply for grants or financing will carry over to the elective pay tax credit application process. This includes project accounting and documentation of key project milestones (including the beginning and completion of construction). Local governments can also use the expertise of developers with whom they partner to make sure that expenses are being accounted for correctly and that both tax credit and grant requirements are being met.

Local government roles for effective and equitable implementation

KEY ROLES FOR LOCAL GOVERNMENTS TO CATALYZE IRA IMPLEMENTATION



Strategist: Develop a plan for IRA implementation



Project Host: Leverage public assets for community-wide benefit



Place-Based Expert: Engage communities and conduct data analysis



Deal Facilitator: Accelerate community deals and remove deployment barriers



Educator: Help community members understand and access IRA funding



Communicator: Track and share community benefits and positive impacts



Procurement Lead: Advance municipal clean energy, workforce and equity goals

Because there are so many factors involved in maximizing these new opportunities within the IRA, local governments can play myriad different roles. Most straightforwardly, local governments can lead on procuring clean energy assets to power municipal operations. Local governments can also serve as a connector, acting as the “glue” for complicated, multi-party projects, or targeting investments towards underserved communities most in need of cleaner air and lower energy bills. Finally, local governments can act as catalyst, supporting action from local nonprofits, community groups, universities, and other newly eligible entities.

Many of the roles below will be familiar to local governments, who can pick and choose which approaches will be most applicable for their community and their capacity and resources.

This section provides an overview of the key roles that local governments can consider; more detailed guidance and case studies on municipal operations can be found in the following sections and strategies for community-wide clean energy deployment can be found in Section 6.0. It is important to note that each of these strategies can be used to deliver benefits to historically disadvantaged communities and that local governments must work hand-in-hand with these communities throughout project and program planning and deployment.



Strategist: Develop a plan for IRA implementation

Planning and stakeholder engagement around clean energy projects and programs can help identify stakeholder needs (particularly those of disadvantaged communities), serve as an educational forum, build internal buy-in and community support, and prioritize potential projects and sites. Local governments can leverage their convening power to bring together an inclusive and representative community IRA working group to develop a data-driven, community-centered strategy.

If a local government has an existing climate or clean energy plan, staff should look to see how existing projects and programs might be impacted by or benefit from IRA incentives and what gaps remain for funding new projects and programs. For example, Chicago, Illinois released an addendum to their 2022 Climate Action Plan which shows the impacts of the IRA on the plan and identifies relevant funding provisions for plan actions (City of Chicago 2023). If a local government does not have a specific clean energy plan, staff might look at municipal clean energy operational strategies, climate plans, or other activities where planning and engagement around clean energy topics may have taken place.

FIGURE 6. FEDERAL FUNDING OPPORTUNITIES FOR LOCAL DECARBONIZATION TOOL

Source: ACCC 2023b.

Large cities and counties and those with aggressive near-term clean energy goals may benefit from developing a comprehensive analysis and strategy. For example, in March 2023, the Philadelphia Energy Authority (PEA) released an RFP for technical assistance to design and implement a strategic plan to maximize the City’s IRA funding potential, with a target of \$5 billion in total funding (PEA 2023). PEA requested that respondents review the authority’s portfolio of projects and programs and then identify an approach to best prioritize, sequence, and blend the different types of funding streams available through the IRA, including consumer rebates, tax credits and incentives, formula funding, and competitive grants.

Place-based expert: Engage communities and conduct data analysis

As part of the planning process, local governments can engage communities and align local qualitative and quantitative data on community demographics, needs, burdens, and opportunities with federal datasets to better understand IRA opportunities and prioritize project sites.

Local governments can start by identifying existing data sets, for example, information on disadvantaged community needs and barriers from previous planning efforts, local definitions and maps of underserved or environmental justice communities, and/or baseline data on energy burden

or electricity outages that could be used as justification for a project or to track progress of an initiative over time. Local governments must also engage communities directly and gather data and information from residents and businesses, particularly from communities that have been historically left out of planning processes. Bringing diverse community perspectives into planning will increase buy-in and project success and ensure that projects meet specific, identified community needs.

To maximize tax credit implementation, local governments can also screen for neighborhoods and communities that qualify for tax adders, for example, by using WRI’s IRA Bonus Mapper (WRI 2023). Similarly, local governments might use local permitting and housing data to understand which facilities might be eligible for the Low-Income Communities Bonus Credit Program. All of this data can be used to guide strategy development, prioritize project opportunities, and can be shared with partners to facilitate equitable project implementation. It can also support Bipartisan Infrastructure Law or IRA grant applications and related Community Benefits Plans.⁵



Photo by Karsten Würth/Unsplash.



Educator: Help community members understand and access IRA funding

Local governments can track relevant IRA opportunities for their communities and communicate across relevant stakeholders including individual consumers and families, nonprofits, and businesses. Many community partners, especially in disadvantaged communities, do not have the bandwidth to track the various federal funding programs and incentives available to them. It can be hard enough for local government staff to keep on top of all the opportunities. Local governments can sign up for federal grant email listservs, participate in local government membership networks, and use tools like WRI and RMI's Federal Funding Opportunities for Local Decarbonization tool to help stay apprised of opportunities to share with others (ACCC 2023b). Local governments can conduct outreach and education to alert community members of relevant IRA rebates, funding programs, and tax incentives for which they are eligible and host workshops and trainings to educate certain community segments on specific opportunities, for example, convening houses of worship on adding solar to their facilities.



Procurement lead: Advance municipal clean energy, workforce, and equity goals

Elective pay creates greater opportunity for municipal ownership of clean energy projects. Local governments can install a single solar array or a portfolio of clean energy projects on municipal facilities or underutilized land such as landfills, parking lots, or land adjacent to airports or wastewater treatment plants. When procuring on-site solar and other clean energy assets, local governments should consider opportunities to combine funding opportunities, including federal discretionary and competitive grants, state programs, and local financing from bonds or green banks. They should also consider ways to incorporate equity criteria into procurement processes and contracts, for example, via RFP bid criteria and project agreements.⁶

Local governments can also drive down costs and achieve efficiencies by leading an aggregated procurement of solar panels, electric vehicles, charging equipment and more across their own property portfolio, or in conjunction with other local entities like school districts or nearby

municipalities. Aggregated procurement with other stakeholders can help achieve municipal operations goals, access economies of scale, and also bring along partners with lower capacity or tighter financial constraints such as houses of worship or school districts in low-income neighborhoods. Participants in such projects could either purchase power from the project developer (for example, the city's electric power utility), or jointly own the project as tenants in common.



Project host: Leverage public assets for community-wide benefit

Local governments can locate projects on municipal buildings and land and share the benefits (for example, Renewable Energy Certificates (RECs) or discounted community solar subscriptions) with the community, particularly members of underserved communities. New incentives and favorable project economics may open up project sites that were previously too expensive to develop—for example, solar on closed landfills, which are often sited in historically marginalized communities and costlier due to site remediation needs—or too complex, such as solar plus storage systems serving community resilience hubs at municipally owned properties. Stacking IRA incentives could allow more local governments to pursue complex yet highly impactful projects such as community solar on brownfields in low-income, rural or communities of color.



Deal facilitator: Accelerate community deals and remove deployment barriers

Local governments can facilitate deals and projects with other partners without being a direct beneficiary or off-taker (a purchaser or user of the electricity). Local governments can also integrate equity and diverse community voices into clean energy project implementation and projects that aim to benefit specific community groups or members. Staff can make introductions, provide historical context on development and inequities across the community, and ensure that the right community voices are included in conversations about project siting and community benefits.

A fundamental step all local governments should take is to look for ways to reduce soft costs⁷ and bureaucratic red tape to accelerate clean energy deployment and increase governmental transparency. Local governments can help community members with grant applications by providing data, letters of support or grant writing assistance. Taking it a step further, they could bring together community nonprofit organizations and organize a joint request for proposals (RFP) for projects across multiple community sites (similar to a Solarize campaign⁸), helping to reduce the administrative burden and costs for the nonprofit participants. Finally, they can coordinate with local financing entities, like green banks and community development financial institutions (CDFIs), to provide project gap financing. All these efforts can be focused to help disadvantaged community members and organizations, which often face technological and institutional capacity barriers, to be able to access IRA incentives and grant programs.



Communicator: Track and share community benefits and positive impacts

As projects begin to roll out, local governments can play a key role in tracking and communicating the amount and impact of IRA-funded or -supported projects. This can include baselining and tracking community impacts, particularly in historically disadvantaged communities, and then communicating with community members and other stakeholders like state and federal agencies. This is especially important for projects that receive grant funding and that are required to demonstrate certain benefits for certain communities in compliance with Community Benefits Plans and the Justice40 initiative. On a broader level, local governments can share best practices and lessons learned with peer communities in their region and state or even nationally. This can help to scale and replicate innovative project types, partnership models, and contracting structures, while also establishing the local community as a leader in equitable clean energy implementation.

Strategies for maximizing the IRA for clean energy deployment for municipal operations

With the new IRA incentives, local governments have an opportunity to lead by example and procure clean energy to be used by municipal operations. Distributed energy resources like a rooftop solar installation or small-scale wind turbines can help minimize a local government's reliance on fossil fuels, save taxpayer dollars, and act as an educational resource for the rest of the community. With new incentives in mind, local governments can prepare to act as a procurement lead, soliciting projects to offset operational electricity consumption using upcoming on-site clean energy projects. For additional guidance on clean energy project development pathways, see EPA's On-Site Project Development Process (EPA n.d.). For additional guidance on clean energy procurement, see the American Cities Climate Challenge Renewable Accelerator's procurement guidance (ACCC 2023c).

Assess municipal energy consumption

Prior to any conversations about clean energy projects, local governments can collect energy consumption data for their municipal operations to create an energy baseline that tracks the energy consumption of municipal facilities categorized by facility type, use, or location. A baseline helps identify the municipal facilities with the largest energy loads, which in turn will help local governments develop a broader

clean energy strategy and prioritize facilities for energy efficiency improvements, clean energy deployment, and other actions to curtail fossil fuel usage. In many cases, local governments will be able to collect the load data from each of their facilities' electricity bills to develop a baseline on their own. The EPA's ENERGY STAR Portfolio Manager⁹ is an example of a useful tool which local governments already use in to help understand electricity data consumption patterns across their set of buildings and operations load (ENERGY STAR n.d.).

Identify and pre-screen opportunities for on-site clean energy at public facilities

Once a local government has a baseline understanding of its energy consumption, staff should identify where clean energy installations would provide the greatest benefit. Creating a list of priority facilities will support development of a broader clean energy project and procurement strategy. In prioritizing specific facilities, local governments also have an opportunity to consider project goals, such as decreased operating costs, reduced greenhouse gas emissions, maximizing community co-benefits, or demonstrating city leadership to residents. The list of priority sites can be broad and include any potential options that are of interest to local governments.

Local governments should pre-screen prioritized sites for clean energy production potential using tools such as Google's Project Sunroof (Google n.d.)¹⁰ or the National Renewable Energy Laboratory's calculator (National Renewable Energy Laboratory 2023).¹¹ For on-site projects, it is important to ensure that any selected sites are adjacent to a facility's electric meter. Beyond that, different types of land with the potential for development offer different benefits or challenges:

1. Municipal or public facility rooftops or adjacent properties ensure proximity to the benefiting facility, but a clean energy project might be limited in scale due to size of the roof, age of the roof, limited access to solar or wind resources, and other factors.

BOX 9 • Key strategies for local governments implementing IRA incentives

- Assess municipal energy consumption.
- Identify and pre-screen opportunities for on-site clean energy at public facilities.
- Evaluate project economics using IRA bonus credit opportunities.
- Identify project financing options.
- Zero in on viable projects.
- Update project solicitation processes.
- Determine project timelines to leverage IRA opportunities.

2. Other land assets with the potential for development, such as water and wastewater treatment plants, brownfields like capped landfills, airports, and other municipal properties, may offer opportunities for larger on-site projects. These projects also benefit from potential flexibility with zoning restrictions, the ability to combine multiple technology types (wind with solar, or solar plus storage, for example), and the space to achieve greater economies of scale. As part of a broader portfolio, larger land assets can be used to expand the ambition of a local government's municipal procurement strategy. EPA's Solar Site Assessment and Utility Data Spreadsheet Tool (EPA n.d.)¹² and RMI's Municipal Solar Site Selection Tool (RMI 2023)¹³ are useful tools for identifying and screening publicly owned land assets.

Evaluate project economics using IRA bonus credit opportunities

Where projects are sited can improve economics by qualifying for IRA bonus credits

Local governments can prepare and account for bonus tax credits by mapping the list of prioritized sites alongside the geographic regions that qualify for IRA bonus credits. WRI has developed an IRA Bonus Mapper that can help

local governments check their eligibility for geographically-bound climate funding opportunities (WRI 2023). During the site prioritization process, local governments should consult with any community that would be affected by a new clean energy project to ensure that the project aligns with the goals of that community and provides meaningful benefits.¹⁴

Importantly, local governments should look through their list of identified public property and developable assets to determine if they geographically fall into the IRA bonus credit boundaries for the Energy Community Bonus Credit and the Low-Income Communities Bonus Credit Program. These bonuses will significantly impact the economic viability of clean energy projects and support local government prioritization. Furthermore, projects that receive bonus credits can help serve local environmental justice goals.

Project scale and size will affect the installed cost of electricity

Local government-led clean energy procurements seeking to offset electric consumption for municipal operations will vary widely in project scale, due to factors such as viable locations, specific electricity loads, and overall project

Photo by Nuno Marques/Unsplash.



structure (e.g., siting on-site, adjacent to an operation, or off-site). As local governments consider what size project to solicit to develop for municipal operations, it is important to note that typically the larger the project, the lower installed cost per unit of electricity. For example, the installation of a smaller bespoke system may inherently have a higher capital cost compared to a larger clean energy project (1MW or more). However, elective pay may lead to significantly better economics than before for smaller systems, and they may be eligible for bonus incentives and exempt from some requirements that apply to projects over the 1MW threshold. One purchasing option could be to combine multiple project sites into one project solicitation to achieve economies of scale, where desired.

Elective pay and public agency ownership may provide more favorable economics compared to third-party project ownership

Local governments can develop or reevaluate prior estimates of the economic and technical feasibility of projects under new models made possible by the IRA. This process assesses the generation potential of a clean energy project and estimated economic payback given both geographic and market expectations. Assessing project economics using elective pay can be a particularly valuable exercise now, since elective pay may make direct ownership models less expensive overall compared with third-party owned project models. In comparing ownership models, local governments will want to evaluate the projected costs of ongoing operations and maintenance related to owning a clean energy installation, as well as the potential benefit of providing excess electricity back to the grid through net metering or other compensation structures.

Identify project financing options

With new pathways and options for clean energy project financing enabled by the IRA, local governments need to decide between the many options at their disposal. Electric power projects implemented by state and local entities are often financed with long-term bonds issued at the start of the project and repaid over the life of the project. Meanwhile, power purchase agreements (PPA) and lease models generally require low or no upfront financing; instead, payments are made by local governments to developers over time. Elective pay projects, however, likely will require a different approach altogether to realize sound financial outcomes, and may differ substantially depending on whether an ITC or PTC is being sought:

- For an ITC project, bridge financing to cover initial project construction costs will be needed until the final amount of the credit is determined and the elective payment is received. Subsequently, longer-term financing of the remaining costs can be obtained, likely through long-term tax-exempt or taxable municipal bonds.
- For a PTC project, the tax incentive is paid over a 10-year period. Therefore, the entire project will have to be financed up front, but the bond issuance may be laddered with shorter term debt to be repaid with elective payment proceeds. Additionally, state revolving loan funds and federal loan and grant programs can serve as a source of capital for projects that local governments may be considering.

In the near term, local governments pursuing contracts for third-party-owned clean energy projects for municipal operations should consider if elective pay and direct ownership might offer more favorable economics. Local governments with clean energy projects in the works may want to pause to reassess project economics or obtain an additional set of pricing quotes. The passage of the IRA may exert downward pricing pressure even for traditional third-party-owned clean energy projects moving forward.

Looking ahead, emerging financing opportunities will become available for local governments, including access to low-cost capital from select lending institutions tasked with administering and originating loans for EPA's Greenhouse Gas Reduction Fund. This green bank network promises to offer local governments and others financing at below-market rates for developing green infrastructure projects, including clean energy deployment for municipal operations, starting in the second half of 2024. Additional financing sources local governments may wish to consider for supporting up-front project costs include state Green Banks, CDFIs, state energy offices; state revolving loan funds; Climate Pollution Reduction Grants; and other grant programs introduced in the IRA. Until then, local governments pursuing elective pay for projects will need to explore other capital sources to cover up-front project costs.

Attention should be paid to what projects and elements of a local government's project portfolio should move forward to make the best use of elective pay and low-cost capital sources. Elements of elective pay, like domestic content requirements, are slated to become more rigorous over time. That said, well-constructed public agency solicitations can include risk mitigation requirements of their own to address domestic content requirements and changes over time.

Zero in on viable projects

Three key factors will determine whether prioritized sites and projects should be deemed ready to advance to the RFP solicitation stage:

1. **An economically viable publicly owned clean energy project.** Local governments should advance projects that are technically and economically sound, with high confidence of future cost savings, with the goal that public funds utilized will be invested in trusted technologies that will serve government operations for years into the future.
2. **A viable site location for project construction.** If a project is slated for a specific location on municipal property or within the community, any potential barriers to interconnection or concerns about community impacts or permitting should be considered when prioritizing projects. Sites can be prioritized where concerns are limited or pre-work has already been done to address any concerns about siting, permitting, community impact or interconnection. In some cases, there is flexibility in project location and a solicitation can move forward to help identify preferred locations.
3. **Access to funding and/or financing to cover upfront project costs.** Local governments should assess their funding and financing options for project development. Potential project financing pathways include capital improvement budgets, municipal bonding, state revolving loan funds, and financing through other lending institutions, including those servicing EPA's Greenhouse Gas Reduction Funds.

Update project solicitation processes

With elective pay and other funding sources introduced in the IRA, local governments issuing solicitations for clean energy projects should update RFPs to reflect this new landscape. Particularly important is how to direct bid applicants to evaluate the potential to use elective pay. Local governments will need to be intentional and strategic in how the requirements for elective payment of tax credits are translated into the language used in solicitations and contracts to ensure that the developers' labor, apprenticeships, domestic content supply, and construction start date meet elective pay requirements without room for doubt.

Local governments may want to consider the following solicitation elements while developing an RFP seeking direct project ownership:

- **Comparative price quotes:** If a local government is evaluating a directly owned project versus third-party ownership, an RFP could request comparative pricing between both options (in states and markets where third-party project ownership is allowed).
- **Expected domestic content requirements:** For local governments pursuing elective pay after 2023 or seeking to take advantage of the 10 percent credit bonus for domestic content, an RFP could include specific language on domestic content requirements to which vendors must adhere.
 - For project investments in 2024 and after, seeking bids priced with and without domestic content will support a local government's understanding of projects anticipated credit and/or eligibility for elective pay credit writ large. Importantly, starting in 2024, projects that do not meet the domestic content requirement only receive 90% value of the elective pay credit, in 2025 if requirements are not met that value falls to 85%, and in 2026 and beyond, if the requirements are not met, an entity will receive 0% of the elective pay credit.
 - The final federal guidance related to domestic content and ability to access specific project waivers is still in development, and clarity is expected by the end of 2023. Until issued, it is uncertain if additional Treasury guidance will offer greater latitude related to the domestic content rules and exceptions and associated waiver process.
- **Contractual expectations surrounding project construction scheduling, including start date, period of construction, and project commissioning due date:** For fiscal planning purposes, local governments may want to embed project construction start dates and commissioning dates in their RFPs. The date that project construction commences and the date a project is placed into service can be important for taking elective pay. These dates may also inform local government finance officers when local government capital is spent and when payment can be expected to be received for accounting purposes.

BOX 10 • Key questions for municipal clean energy procurement using IRA incentives

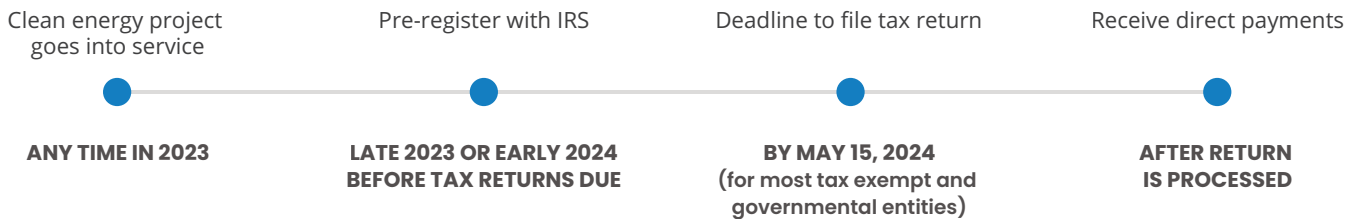
Columbus, Ohio, is an example of a city that has begun the process of integrating IRA opportunities into its clean energy procurement processes. In addition to the considerations listed earlier, the City of Columbus suggests the following queries for local governments to consider as they move forward:

- Can I begin construction of my project by the end of 2024 if my project is over 1 MW?
- Can I demonstrate continuous construction (or complete the project in four years)?
- Do I have the right team in place to meet—and do I understand—the pre-filing registration requirements and reporting documentation?
- How will I fund the remainder of the project cost not subject to elective pay?
- What portion of project costs will be eligible for elective pay?
- How do the economics of the project play out with and without the domestic content??
- How will I make sure that the most current IRA guidance is followed?.

Determine project timelines to leverage IRA opportunities

Elective pay is only available for projects that qualify for an underlying tax credit. The ITC is earned during the tax year that a clean energy project is placed into service. Many local governments, but not all, follow a fiscal year that aligns with the calendar year. Figure 7 gives a sample 2023 timeline for claiming elective pay for entities with a fiscal year that aligns with the calendar year.

FIGURE 7 • Sample timeline for claiming elective pay for most organizations with a calendar tax year



Source: White House 2023.

FIGURE 8 • Elective pay strategies can be organized across the development phases of a specific project

Concept phase	Energy Community and Low-Income Community Bonus Credit areas.
Funding options	Identify sources of funding (for example, capital investment funds, bonds, state financing, Greenhouse Gas Reduction Fund).
Informed procurement	<p>Enhance RFP to incorporate elective pay.</p> <ul style="list-style-type: none"> • Domestic content guarantee. • Placed in service date. • Prevailing wage and apprenticeship requirements. • IRS requirements as firm contract language. <p>Consider requesting two prices in the RFP: built-to own and PPA pricing.</p> <ul style="list-style-type: none"> • If pursuing a PPA, consider requiring pass-through of a share of the value of the PTC/ITC and applicable adders as part of PPA pricing. <p>File required IRS forms.</p>

Source: WRI authors.

In summary, local governments can take steps laid out in Figure 8 to incorporate elective pay and IRA incentives into their project development planning and procurement.

Municipal clean energy case studies

It can be difficult for local governments and other tax-exempt entities to imagine how IRA tax credits affect actual projects. The following hypothetical case studies are designed to meet this need, by directly demonstrating how the IRA changes the economics of various types of clean energy projects. Each case study outlines a realistic scenario in which a local government or tax-exempt entity is seeking to procure a clean energy system, and then uses real-world data and National Renewable Energy Laboratory’s System Advisor Model (National Renewable Energy Laboratory 2022)¹⁵ to model the system’s financial performance and the economic impact of IRA clean energy tax credit provisions. All the case studies are theoretical and are not based on any actual projects.

Each case study demonstrates different implications resulting from changes to clean energy tax credits introduced in the IRA. Case Study 1 shows how the introduction of elective pay can make direct ownership of energy systems an affordable and competitive option compared to third-party ownership structures (such as power purchase agreements). It also demonstrates how bonus credits and tax credit changes can increase the scope

of a clean energy project, for example, through the addition of an energy storage system, while remaining economically viable. Case Study 2 shows how elective pay for tax credits can be applied to larger projects and how domestic content bonuses and requirements play out in a real project. The case study shows that for projects that begin construction in 2024 or 2025 and are subject to the domestic content credit phase-out, meeting the requirements may be more economically advantageous than not even if there is a significant cost premium to procuring domestically manufactured products. Finally, Case Study 3 explores the difference between the ITC and PTC and shows how the addition of bonus credits can change the decision for larger projects about whether to choose the ITC or PTC.

CASE STUDY 1: COMPARING DIRECT VS. THIRD-PARTY OWNERSHIP IN WISCONSIN

In 2024, a nonprofit housing developer in Milwaukee, Wisconsin decides to add a 100 kW solar system for a four-floor, 33,000 square-foot apartment building it is constructing. The building is being developed using Section 8 project-based assistance funding. The developer is exploring whether to own the project directly and use elective pay or attempt to enter a third-party solar PPA. While third-party PPAs have not been expressly authorized in Wisconsin, two Public Service Commission rulings and a supporting bill in the Wisconsin state legislature have led to increased interest in third-party ownership options in the state (Lydersen 2023).

Since the system is under 1 MWAC in capacity, the system will automatically be exempt from domestic content requirements under elective pay. Additionally, since the building is a part of the covered housing program, the developer applies for and expects to receive a 20 percent bonus under the Low-Income Communities Bonus Credit Program. Because of this, the developer can only use the ITC for its system. The solar system is expected to run for 15 years before needing to be replaced.

The developer is also exploring pairing the 100 kW solar installation with lithium-ion battery storage to provide demand charge savings and resilience benefits. It estimates that the building will need to last through a 24-hour outage serving 15 percent of its regular load, enough to power a common room with an associated fridge. Using these parameters, the developer uses NREL’s ReOPT lite tool to find an optimized battery storage system for its needs and finds that the optimal configuration is a 113 kWh/20 kW system.

To evaluate the economic potential of both solar and solar plus storage options, the developer calculates the total costs and tax credit values for each option. The developer also calculates the net present value of each system, which is a common measure of economic potential for renewable energy systems and represents how much an investment is worth over its lifetime at the current moment.

While considering the resilience benefits of the storage system, the developer decides to evaluate the economic potential for the solar-only option due to the higher net present value. To determine whether to go with an elective pay option or try entering into a third-party PPA, the developer compares the net present value of the system by itself with the net present value of third-party PPAs across range of PPA prices and escalators (the rate at which the price of the energy increases each year). The developer is most interested in finding out its indifference point, or the first year PPA price at which the lifetime economic value of entering a PPA and owning the system itself is the same.

TABLE 4 • Project economics figures for 100 kW non-profit housing solar and solar + storage systems

DESCRIPTION	TAX CREDIT ADJUSTMENTS	RECEIVED?	100 KW SOLAR	100 KW SOLAR + 113 KWH/ 20 KW LI-ION BATTERY STORAGE
Initial project costs			\$214,000^a	\$246,895^b
Bonus credits and tax credit adjustments	Prevailing wage and apprenticeship requirements	Yes	\$64,200	\$74,060
	Domestic content bonus credit	Exempt	\$0	\$0
	Energy community bonus credit	No	\$0	\$0
	Low-income community bonus credit	Yes	\$42,800	\$49,373
Total value of credit			\$107,000	\$123,448
Net cost of project including credit			\$107,000	\$123,448
Net present value for modeled midrise apartment building^c			\$75,463	\$31,814

Notes:

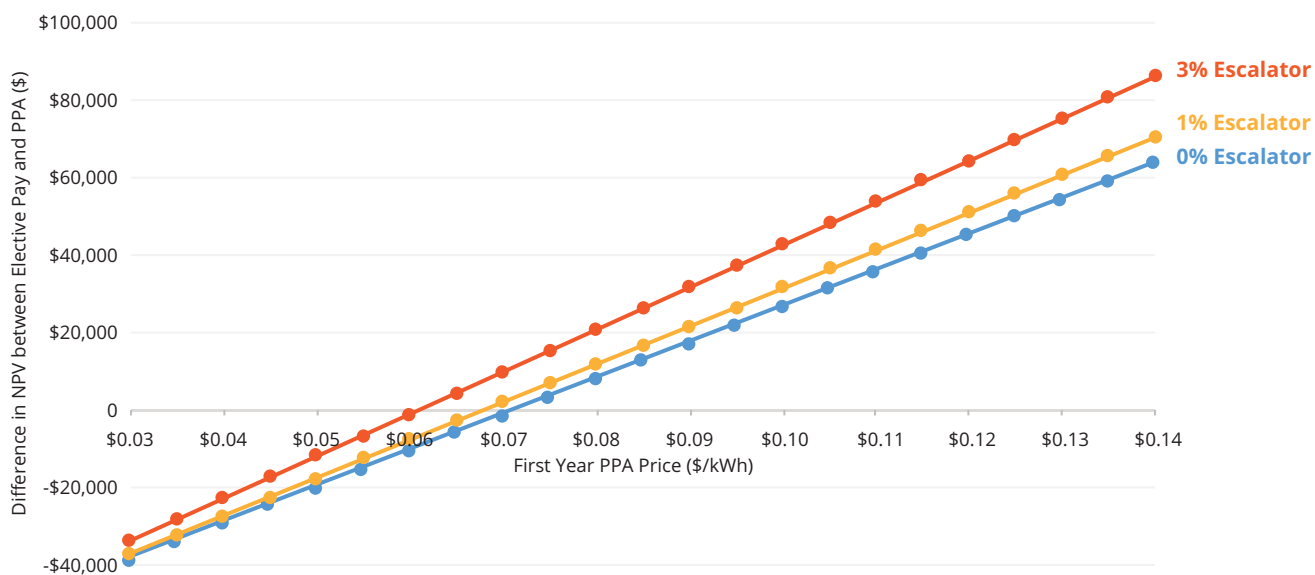
^aEstimates developed using NREL System Advisor Model, with cost assumptions from the LBNL Tracking the Sun Report.

^bCost of battery system based on NREL Annual Technology Baseline 2023 for a 4-hour battery storage system.

^cNet present value based on a 15-year expected service life.

Source: WRI authors.

FIGURE 9 • Difference in net present value (NPV) between elective pay and third-party PPA options at different first-year PPA prices



Source: WRI authors.

TABLE 5 • PPA indifference points for different price escalators

PPA ESCALATOR RATE	FIRST YEAR PPA INDIFFERENCE POINT (\$/KWH)
0%	\$0.07179
1%	\$0.06813
3%	\$0.06117

Source: WRI authors.

The developer receives an offer from a local solar company for a third-party PPA price of \$0.074/kWh with a 1 percent year-over-year escalation rate. Based on its calculated indifference point of \$0.068/kWh, the housing developer decides to reject the PPA offer and pursue direct ownership of the system using elective pay.

The housing developer contracts with a separate local solar company to build the project and files for elective pay according to IRS guidelines. The project is ultimately installed in August 2024. The developer has a calendar year accounting period, meaning that its tax year 2024 ends on December 31, 2024. It pre-registers the project using the IRS portal in January 2025, and files its tax return, elective pay forms, and Low-Income Bonus Credit Program application on the due date of May 15, 2025. The IRS processes the forms and awards the project the 20 percent bonus under the Low-Income Bonus Credit Program. After processing the

forms and the application, the IRS sends the elective pay refund amount to the housing developer. As modeled, the refund will be \$107,000.

CASE STUDY 2: LARGE SOLAR PROJECT USING DIRECT PAY AND DOMESTIC CONTENT IN ARIZONA

A large southwestern city near Phoenix, Arizona, is looking to meet its municipal renewable energy goals. It owns and operates a large convention center with 1 million square feet of roof area. Taking advantage of the rooftop space on the building and the potentially large energy cost savings, it decides to build a large solar array on the rooftop of the convention center. It issues an RFP in June 2023 to find a qualified local solar developer and requires the developer to evaluate the economics of the project using elective pay.

Based on analysis of the budget and load profile of the building, the developer ultimately decides to build a 2 MW-DC solar installation. The developer plans to begin construction in 2024 and place the installation into service in late 2025. The city plans to issue 20-year municipal bonds to fund the project entirely, reducing the value of the tax credit further by 15 percent. However, the city and developer want to evaluate whether fulfilling the domestic content requirements is economically viable. The developer estimates that the solar array will have a 25-year lifespan.

To evaluate the economic potential of both options, the developer calculates the total costs and tax credit values in both scenarios. The developer also calculates the net present value of each system, which is a common measure of economic potential for renewable energy systems and represents how much an investment is worth over its lifetime at the current moment.

TABLE 6 • Project economics figures for 2 MW convention center rooftop solar project

DESCRIPTION	CREDIT IMPACTS	RECEIVED?	VALUE WITHOUT DOMESTIC CONTENT BONUS	VALUE WITH DOMESTIC CONTENT BONUS
Initial Project Cost			\$5,380,000^a	\$6,460,000^b
Bonus credits and tax credit adjustments	Prevailing wage and apprenticeship requirements	Yes	\$1,614,000	\$1,938,000
	Domestic content bonus credit	No	\$ (137,190) ^c	\$646,000
	Energy community bonus credit	No	\$0	\$0
	Low-income community bonus credit	No	\$0	\$0
	Municipal bond use reduction	Yes	\$ (242,100)	\$ (387,600)
Effective ITC Tax Credit Rate			22.95%	34%
Total value of credit			\$1,234,710	\$2,196,400
Net cost of project including credit			\$4,145,290	\$4,263,600
Net present value for modeled convention center^d			\$165,031	\$399,849

Notes:

^aEstimates developed using NREL System Advisor Model, with cost assumptions from the LBNL Tracking the Sun Report for Arizona.

^bSince the project begins construction in tax year 2024, it is subject to a 10 percent reduction in the value of the tax credit it receives if it does not meet domestic content requirements.

^cAssumes a 20 percent cost premium for meeting domestic content requirement over business as usual.

^dConvention center energy usage approximated by representing it as twice the load of a large, approximately 500,000 square foot office in Phoenix, Arizona.

Source: WRI authors.

The solar developer finds that, under elective pay, meeting domestic content requirements results in slightly higher net costs and a significantly larger net present value for the project overall, even if it assumes a 20 percent cost premium per watt. The city therefore decides to move forward with procuring domestically produced steel, iron, and manufactured components to meet the requirements.

Assuming the city uses elective pay for the project, the project begins construction in May 2024. The city's tax year 2024 ends on June 30, 2024. The project is placed in service in November 2024, during the city's tax year 2025. In early July 2025, the city pre-registers the project using the IRS portal along with all other elective pay-eligible projects that it places in service in its tax year 2025. On November 15, 2025, the city files its 990-T tax return, the investment credit tax form, and general business credit form to get the credit. The IRS processes the election and sends the elective pay refund by the end of 2025.

CASE STUDY 3: BONUS INCENTIVES CHANGING THE EQUATION IN NORTH CAROLINA

In 2021, a municipal utility for a 5,000-person town in the Charlotte, North Carolina, metropolitan area issues an RFP for a 15 MW single axis solar farm within its service territory. The utility has identified a new solar installation as a way to reduce its energy costs, particularly during summer peak hours. The utility realizes that part of its service territory is within a census tract adjacent to a coal plant that closed in 2006, meaning that it can potentially access the energy community bonus for the project. It finds a large piece of land for sale close to a local highway that is ideal for installing a large solar array and purchases the land from its original owner.

While the utility originally was planning to enter a traditional public-private partnership structure to take advantage of tax credits, the introduction of the IRA in 2022 allows the utility to use elective pay and own the project directly. Construction begins in late 2023, and the installation is placed into service in 2025. Since the project begins

TABLE 7 • Project economics figures for 15 MW North Carolina 1-axis tracker solar array

DESCRIPTION	TAX CREDIT ADJUSTMENTS	RECEIVED?	ITC SCENARIO	PTC SCENARIO
Initial project cost			\$23,100,000^a	\$23,100,000^a
Bonus credits and tax credit adjustments	Prevailing wage and apprenticeship requirements	Yes	\$6,930,000	\$7,512,580 ^b
	Domestic content bonus credit	No	\$0	\$0
	Energy community bonus credit	Yes	\$2,310,000	\$784,262
	Low-income community bonus credit	No	\$0	\$0
	Municipal bond use reduction	Yes	\$ (1,143,450)	\$ (1,244,526)
Total value of credit			\$8,096,550	\$7,052,316
Net cost of project including credit			\$15,003,450	\$16,047,684

Notes:

^aEstimates developed using cost assumptions from the 2022 LBNL Utility-Scale Solar Report.

^bThis figure assumes a 10-year production tax credit starting in 2023 at 0.0275 cents/kWh with a 3 percent annual escalator to keep pace with inflation. Generation was modeled using the National Renewable Energy Laboratory's System Advisor Model.

Source: WRI authors.

construction in 2023, it is not affected by domestic content requirements, and the utility does not attempt to procure domestically manufactured components to meet the domestic content bonus. However, it has raised municipal bonds to fund the cost of the project, meaning that it is subject to a reduction in the tax credit that it will receive under elective pay.

The IRA allows solar projects to receive the PTC instead of the ITC. Therefore, the utility must decide whether it makes more sense to elect for the PTC or ITC for the project.

The utility finds that, although the PTC alone would be worth more than the ITC, the addition of the energy community bonus credit makes the ITC more valuable and leads to lower overall costs.

Assuming that the utility uses elective pay for the project, the project begins construction in late 2023 and is placed in service in September 2025. The utility uses an October 1 to September 30 fiscal year, meaning that its fiscal year 2025 ends on September 30, 2025. In October, the utility pre-registers the project using the IIRS pre-registration portal. Then, on the due date of February 15, 2026, the utility files its 990-T tax return, the investment credit tax form, and general business credit form. The IRS processes the forms and sends the elective pay refund during the 2026 calendar year.

Strategies for maximizing the IRA for community-wide clean energy deployment

While the IRA creates many opportunities for local governments looking to decarbonize their own operations, its potential to accelerate community-wide clean energy deployment for the benefit of all residents is even greater. Local governments can leverage their knowledge, infrastructure, resources, and convening power to design and implement ways for their residents to gain maximum benefit from the IRA's clean energy provisions. This section covers various strategies that local governments can undertake to advance clean energy broadly within their communities.

Provide real estate for clean energy development

Local governments can leverage access to public assets, such as land or buildings, for deployment of innovative and equitable clean energy projects like micro grids, resiliency hubs, and community solar or wind. While a local government might not be directly buying or using energy from the project, providing access to under-utilized land can accelerate the deployment of clean energy in a community. This can be used to target benefits to underserved communities. For example, in Denver, Colorado, community

solar projects sited across schools and recreation centers provide savings for low-income and energy-burdened city residents (McKinstry 2022).

IRA incentives might open up project sites that were previously not cost effective to develop (for example, solar on closed landfills that often have expensive site remediation needs but are often sited in environmental justice communities). Stacking IRA incentives could allow more local governments to pursue complex yet highly impactful projects such as Houston's Sunnyside community solar landfill project, which include 50 MW of utility-scale solar, 2 MW of community solar, 150 MW of battery storage, and an agricultural hub and training center, all within a historically disinvested neighborhood (ACCC 2022).

Explore new approaches for purchasing clean energy for the community

The IRA's tax credit provisions provide significant opportunities for local governments to use their procurement power to bring about community-wide clean energy benefits and savings, especially to those residents who need them the most. For example, local governments can leverage elective pay to create publicly owned energy infrastructure for the community. Under the ITC and PTC and proposed elective pay guidance, there are no restrictions on where local government-owned infrastructure can be located or how the energy produced by the infrastructure can be distributed. This opens opportunities to work with private businesses, housing providers, and even individual households while still taking advantage of the savings and benefits provided by elective pay. Working with these entities could include some of the following ideas:

BOX 11 • Key strategies for local governments leveraging IRA incentives for community-wide clean energy deployment

- Provide real estate for clean energy development.
- Explore new approaches for purchasing clean energy for the community.
- Accelerate community deals.
- Remove deployment barriers.
- Identify opportunities to target projects within the community.
- Help community members understand and access IRA funding.
- Communicate benefits and potential savings to the community and peers.

- A low-income solar program in which a local government owns solar panels on single-family residential rooftops while selling the electricity generated by the panels to the participating households through a PPA
- A large rooftop solar portfolio on multi-family affordable housing using a leasing structure



Photo by BQ Energy.

- Supplying community gathering spaces and businesses with battery storage to enable them to support communities during and after natural disaster

As discussed in previous sections, governmental entities cannot make use of partnership structures and claim elective payment for the ITC or PTC. However, local governments can be partners in a partnership with a private entity, and so may be able to access the tax credit marketplace through partnerships. Further guidance on this is forthcoming from the IRS, and local governments interested in pursuing transferability through a partnership should consult with their legal department before making any decisions.

Accelerate community deals

Local governments can help local nonprofit organizations take advantage of elective pay. The IRA allows for any nonprofit organization as well as any “agency or instrumentality” of a state or local government to use elective pay. This means that a host of important community institutions can use elective pay for their own procurements, including but not limited to schools, parks and recreation facilities, transportation authorities, houses

of worship, hospitals, human services providers, nonprofit housing developers, and more. Local governments can use their connections and expertise to help elective-pay entities in their communities understand the opportunity available to them and navigate the process. Ways local governments could do this include

- providing technical assistance to nonprofits and community institutions during the elective pay pre-filing and filing process;
- setting aside grants for certain categories of nonprofits and community institutions looking to build elective pay clean energy projects; and
- organizing aggregated or bulk purchasing efforts, such as a solarize campaign made up of tax-exempt entities to take advantage of equipment pricing economies of scale.

The new transferability rules mean that any for-profit entity, no matter how large or small, can sell its energy tax credits to any other for-profit entity. While local governments cannot transfer tax credits that they originate, they can support tax-credit transfer deals for local businesses. Supporting transferability deals could help local businesses looking to install solar, energy storage, charging

infrastructure, or other eligible property more easily obtain the financial benefits of an applicable tax credit. This could be especially useful for smaller local businesses with lower federal tax liabilities and more short-term cash needs. Ways of doing this include

- partnering with local tax experts to provide technical assistance on the tax credit transfer process;
- connecting local tax credit buyers and sellers through regularly updated online listings or face-to-face meetings; and
- distributing economic or community development financing for projects looking to use transferable tax credits.

Remove barriers to community deployment

Harnessing the IRA to advance clean energy projects is easier in a policy environment that is conducive overall to clean energy development. Local permitting processes and zoning codes can present significant barriers to building new energy infrastructure in a community. Unclear, slow, or overly burdensome permitting and inspection procedures can add significant time and costs to the deployment of solar panels, energy storage, EV chargers, and energy-efficiency technologies, even though such technologies are well understood and come in cookie-cutter forms. Furthermore, intentionally or unintentionally restrictive zoning codes can block energy infrastructure projects or result in suboptimal outcomes that fail to achieve their full benefit potential.

By removing any of these permitting or zoning barriers and simplifying the energy deployment process, local governments can make it easier and cheaper for community members to adopt clean energy technologies. DOE's SolSmart program provides best practices and technical assistance for communities across the United States looking to reduce soft costs related to solar, and some state energy offices provide similar services for local governments looking for additional state- or technology-specific guidance.

Identify opportunities to target projects within the community

Local governments have access to a wealth of both quantitative and qualitative information about their communities. This place-based expertise can be leveraged to help municipal utilities, businesses, nonprofits, and community members understand what opportunities exist

for maximizing IRA tax credit benefits and ensure that the benefits are received by those who need them the most. Local governments can conduct mapping exercises that combine the use of federal datasets for IRA incentives with local datasets and make them publicly available for broad community use.

Local governments can also incorporate local quantitative and qualitative data analysis tools to identify areas that may not be eligible for bonus incentives but are still valuable for advancing renewable energy, community benefit, and/or energy justice goals.

As place-based experts, local governments should work to bring community partners to the table as they and others plan to take advantage of IRA tax credits and funding. One area of note for local governments is the use of ITC and PTC bonus incentives, which incentivize development in "energy communities," which often correspond with economically depressed or disinvested areas. Additionally, the ITC has additional bonus incentives explicitly for low-income communities and projects attached to buildings in covered housing programs. While these provisions were put in place to provide economic benefits to the areas they incentivize, they open vulnerable communities to potentially exploitative development project siting from developers looking to maximize savings. Therefore, local governments should be proactive in understanding what communities in these incentivized areas need and want with regard to renewable energy development and use community engagement forums to ensure that any development that does occur is equitable and in line with community interests.

Help community members understand and access IRA funding

As a trusted source of information for residents, local governments are well-poised to educate community members on the funding opportunities created by the IRA. They can create and share inclusive and accessible educational materials about IRA funding opportunities to help eliminate community confusion and highlight relevant opportunities. Information on IRA incentives should be combined with information on programs, state, local, or utility incentives; permitting requirements; and trusted local contractors to create a one-stop shop for information. These materials can be tailored for specific audiences:

- **Individual households:** Discuss the Residential Clean Energy Credit, Energy Efficient Home Improvement Credit, and the Home Energy Rebate Program.
- **Businesses:** Discuss the new investment tax credit for energy property, the Clean Vehicle Tax Credit, and opportunities for transferring tax credits on online marketplaces.
- **Nonprofits:** Discuss similar tax credits to businesses but emphasize the new direct pay mechanism.

Local governments can also hold meetings for residents, businesses, and nonprofits to raise awareness of IRA opportunities. These meetings can cover various topics, such as elective pay, new residential tax credits, and bonus incentives. Local governments can leverage existing networks and connections with community leaders and organization to plan, host, and promote these meetings to reach wider audiences.

These types of outreach and education efforts require local government staffing and capacity to be effective, which can be a constraint. Local governments can consider how to integrate IRA education into existing and ongoing outreach and engagement efforts with targeted communities, such as municipal programs that help human services providers and multi-family housing owners green their properties. Local governments can also seek additional funding from state and federal government programs and grants or philanthropy to assist with education and engagement efforts.

Communicate the benefits and potential savings to the community and peers

Actively communicating the savings and benefits gained from IRA-incentive driven projects is key to encouraging incentive use in the community. Local governments can run print, radio, television, or social media campaigns to direct local community members to city informational resources or clean energy programs. Local governments can also gather and share testimonials, case studies, or success stories about how IRA and other incentives have enabled clean energy deployment and, by extension, savings or benefits for community members. Local governments can tailor their outreach and messaging to the audience and even highlight different aspects of IRA funding depending on the audience. For example, outreach at job fairs could emphasize high-quality employment opportunities brought about by prevailing wage and apprenticeship requirements, while individual household outreach could emphasize cost savings and reducing carbon emissions.

Additionally, local governments can track, analyze, and identify which incentives and programs are most beneficial and where improvements could be made and communicate this knowledge to the IRS and other federal decision-makers. Local governments should also connect and share lessons learned with peers to help scale effective program designs, deal structures, and communication strategies for maximizing IRA benefits.

Summary and conclusions: Seizing the opportunity

The IRA presents an unprecedented opportunity to help all U.S. communities benefit in the transition to clean energy by revitalizing marginalized and disadvantaged areas, reducing air pollution, and creating new jobs. If communities effectively seize the opportunity before them, millions of new jobs could be created in a diverse set of communities across the United States (Foster 2023).

Local governments can especially benefit from the ability to take federal tax credits directly through elective pay, helping them recoup costs up front and take advantage of bonus incentives specifically designed for low-income communities, brownfields, and areas facing closure of fossil fuel facilities. Together, these tax incentives make clean energy projects even more cost-effective than they have been, which can help cities and their residents save money on energy costs. By taking advantage of all bonus incentives, small projects (under 5 MW) can save up to 70 percent, and larger projects can save 50 percent. Households can save over \$1,000 per year by taking advantage of clean energy and electric vehicle tax credits (White House 2022).

Local governments play crucial roles in enabling the build-out of clean energy projects and transportation and building electrification for municipal facilities and within the broader community, including as project hosts, facilitators, planners, and educators. Supported by policies like the Justice40 initiative, which requires 40 percent of the benefits of

government climate and clean energy funds to flow to low-income communities, local government-driven planning and implementation of the IRA can help increase clean energy uptake and deployment and achieve more equitable community outcomes.

In coming years, new types of partnerships, deal structures, and business models for developing projects are likely to continue to emerge, due to the new flexibility introduced through elective pay and transferability of tax credits. Local governments can play a role in helping to shape, design, and implement these new approaches and models, particularly those designed to serve low-income communities.

The IRA provides a plethora of incentives and funding, but the implementation details are complex. As guidance and rules continue to come out, there will be ongoing adjustments and learning. This guidebook identifies details for local governments to consider when developing a plan for implementing clean energy projects equitably, based on the guidance issued by the Department of the Treasury and federal agencies to date, but the journey of implementation will be ongoing.

Photo by Blackbox/Unsplash.



APPENDIX A. GLOSSARY

TERM	DEFINITION
Community Benefits Plan	An agreement between developers and community groups that outlines benefits the community will receive as part of a development project, ensuring that local residents share in the project's benefits. These benefits may include job opportunities, infrastructure improvements, and community programming, among others.
Community Development Financial Institution (CDFI)	A specialized financial institution that serves low-income individuals or communities lacking access to mainstream banking services. CDFIs focus on fostering economic growth and development in underserved areas through financial products, services, and support.
Community solar	A type of solar project where financial benefits flow to multiple customers within a specific area. The way customers participate in community solar often takes the form of a subscription. Customers voluntarily subscribe to a project and, in turn, receive electricity bill credits based on their subscription. Community solar projects can be led by private businesses, by utilities, and in some cases, by communities that band together to develop projects themselves.
Disadvantaged community	A federal designation under the Justice40 Initiative, which directs 40 percent of the benefits from certain federal investments flow to "disadvantaged communities." The Climate and Economic Justice Screening Tool (CEJST) identifies over 27,000 census tracts in the United States as disadvantaged using a variety of indicators. In general terms, a disadvantaged community refers to a group or area that faces social, economic, or environmental vulnerabilities.
Elective pay	A mechanism introduced in the IRA through which certain tax-exempt entities, including state, local, and tribal governments, associated government agencies and instrumentalities, rural electric cooperatives, and nonprofit organizations, can realize the value of 12 climate and clean energy-related tax credits as a cash refund.
Energy justice	The goal of achieving equity as it relates to social and economic participation in the energy system.
Gigawatt (GW)	A measure of power which is equal to 1 billion watts or 1,000 megawatts.
Green bank	A green bank is a financial institution or facility that focuses on leveraging private investment to support renewable energy, energy efficiency, and other sustainable projects. Its primary aim is to reduce greenhouse gas emissions by providing favorable financing mechanisms for clean energy technologies.
Greenhouse Gas Reduction Fund (GGRF)	A funding stream in the IRA that contains \$27 billion to mobilize public and private investment in clean energy across three programs.
Kilowatt (kW)	A measure of power which is equal to 1,000 watts.
Kilowatt-hour (kWh)	A measure of energy which is equal to 1,000 watts being used or generated for one hour.
Megawatt (MW)	A measure of power which is equal to 1 million watts or 1,000 kilowatts.
Megawatt-hour (MWh)	A measure of energy which is equal to 1 million watts or 1,000 kilowatts being used or generated for one hour.
Nameplate capacity	The maximum rated power output that an electricity generation asset can produce under certain conditions, measured in watts. Nameplate capacity figures are used to measure and compare the size of power generation facilities. Nameplate capacity for different technologies can be measured in either watts-AC (alternating current) or watts-DC (direct current) units, reflecting potential differences in power production and consumption needs. Generally, solar PV is rated in watt-DC units, while other technologies (such as wind turbines, hydroelectric plants, and biomass generators) are rated in watt-AC units.
Net present value (NPV)	Net present value (NPV) is the value of future cash flows over the entire lifetime of a project adjusted to reflect their value today. It is used to evaluate the overall profitability of an investment or project, accounting for discounts in the value of money received at later dates. It represents the difference between the present value of cash inflows and outflows over a period of time.
Power purchase agreement (PPA)	A contract with an energy project through which a customer agrees to purchase the electricity produced by a generator over a specified period at a predetermined price per unit of energy.

Renewable energy certificate (REC)	A tradable commodity that represents the non-power attributes associated with renewable electricity generation.
Request for proposals (RFP)	A competitive solicitation process to obtain supplier proposals with the intent to contract for procurement.
Solar lease	An agreement where a third party owns and maintains solar panels on a host property with the host paying a monthly fee for the electricity generated by the panels.
Solarize campaign	A community-based solar bulk-purchasing program that aims to reduce the cost of solar for customers and increase its adoption. It typically includes three elements: 1) a competitive installer selection designed to meet community needs, 2) community outreach and solar education often through joint public-private partnership collaboration, and 3) a time-limited offer for customer sign-ups.
Tax basis	A tax basis is the original value of an asset for tax purposes, typically the purchase price, adjusted for certain events. It is used to determine the capital gain or loss when the asset is sold.
Tax-exempt bond	A debt security issued by a government entity, the interest on which is exempt from federal income taxes.
Tax-exempt entity	A tax-exempt entity is an organization that is not obligated to pay federal income taxes. Such entities typically include local governments, nonprofits, religious institutions, and certain educational institutions.
Third-party ownership	An arrangement where a third-party developer owns and operates an energy asset, like solar panels, on a host property. The host typically pays the third party either a monthly lease fee or for pays for the electricity generated by the asset through a PPA.
Transferability	A mechanism introduced in the IRA that allows entities not eligible for elective pay, such as for-profit companies and businesses, to transfer tax credits for which they qualify to a third party in exchange for cash payment.

APPENDIX B. TABLE OF TAX CREDITS RELEVANT FOR LOCAL GOVERNMENTS

The IRA outlined 12 new and updated climate and clean energy tax credits eligible for elective pay (IRS 2023b). These credits can accelerate local government deployment of clean energy and climate technologies, including renewable energy assets, electric vehicle infrastructure, and public fleet vehicles. Those with particularly high relevance for local government entities are outlined in Table B-1 below.

TABLE B-1 • Select IRA tax credit provisions relevant for local governments

TAX CREDIT	DESCRIPTION	ELECTIVE PAY ELIGIBLE
Energy Investment Tax Credit (§48)	Extension and modification of existing ITC through 2024. Modifications include expansion to wind and energy storage technologies.	Yes. Subject to domestic content requirements.
Clean Electricity Investment Tax Credit (§48E)	New technology-neutral ITC beginning in 2025 for any generating sources that emit net-zero CO ₂ -equivalent emissions.	Yes. Subject to domestic content requirements.
Renewable Electricity Production Tax Credit (§45)	Extension and modification of existing PTC through 2024. Modifications include expansion to solar technologies.	Yes. Subject to domestic content requirements.
Clean Electricity Production Tax Credit (§45Y)	New technology-neutral PTC beginning in 2025 for any generating sources that emit net-zero CO ₂ -equivalent emissions.	Yes. Subject to domestic content requirements.
Commercial Clean Vehicle Credit (§45W)	New up to \$40,000 credit (up to \$7,500 for vehicles <14,000 lbs.) for commercial clean vehicles (e.g., school and transit buses, heavy-duty municipal vehicles, light-duty fleet vehicles).	Yes.
Alternative Fuel Vehicle Refueling Property (§30C)	Extension and modification of existing §30C tax credit through 2032. Includes electric vehicle charging and alternative fuel refueling equipment. Limited to low-income or non-urban census tracts.	Yes.

Source: WRI authors.

APPENDIX C. MODELING ASSUMPTIONS FOR CASE STUDIES

This appendix contains relevant assumptions used to model system costs, expected generation, eligible tax credit values, and overall financial performance of the generation systems outlined in the case studies within this paper. For all case studies, the National Renewable Energy Laboratory's System Advisor Model (SAM) is the modeling software.

As each entity discussed during the case studies is tax-exempt, federal income tax, state tax income, and property tax rates are assumed to be 0 percent. Additionally, insurance and sales tax figures were not included in the estimates of costs. Installed cost is assumed to represent 100 percent of basis for the ITC tax credit.

Case Study 1: Comparing direct vs. third-party ownership in Wisconsin

DESCRIPTION	VALUE	NOTES AND SOURCE
System parameters		
Installed total cost per watt	\$2.14/W-DC	LBNL Tracking the Sun, median small nonresidential installed cost per watt for Wisconsin (Barbose et al. 2022)
Tilt angle	42 degrees	Latitude of Milwaukee, Wisconsin, rounded to nearest degree
Azimuth	180 degrees (due south)	
Total system losses	19.40%	NREL SAM default system losses (14.08%) plus 6.2% expected loss from snow (Ryberg and Freeman 2017)
O&M fixed cost by capacity	\$18/kW-yr. for solar alone \$30/kW-yr. for solar + storage	NREL SAM default O&M value for respective models
Analysis period	15 years	
Financial parameters		
Debt fraction	100%	
Loan term	15 years	
Interest rate	4%	Default SAM interest rate
Inflation rate	3%	Assumed inflation rate based on recent patterns of inflation
Discount rate	7%	Office of Management and Budget recommended discount rate for cost-benefit analysis (OMB 1992) https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a94/a094.pdf
Energy usage parameters		
Electric rate	Wisconsin Energies General Secondary Demand Time-of-Use Rates (Cg2) with Customer Generating Systems – Net Metering (CGS NM) Less than 300 kW attachment	Cg2 general secondary demand time-of-use rate with CGS-NM rate (Wisconsin Electric Power Company 2023) https://www.we-energies.com/pdfs/etariffs/wisconsin/cgs-nm.pdf
Electricity bill escalation rate	3.30%	Average Wisconsin electricity bill escalation rate, 1997-2022 (Zientara 2023) https://www.solarreviews.com/blog/average-electricity-cost-increase-per-year
Annual load	227,353 kWh	Commercial and residential hourly load profiles for all TMY3 Locations in the United States, midrise apartment, Milwaukee, Wisconsin (Ong and Clark 2022) https://data.openei.org/submissions/153

Annual peak demand	69 kW	Commercial and residential hourly load profiles for all TMY3 locations in the United States, midrise apartment, Milwaukee, Wisconsin (Ong and Clark 2022) https://data.openei.org/submissions/153
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Annual electric load growth rate	0%	
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Case Study 2: Large solar project using direct pay and domestic content in Arizona

DESCRIPTION	VALUE	NOTES AND SOURCE
System parameters		
Installed total cost per watt	\$2.69/W-DC	LBNL Tracking the Sun, median large nonresidential installed cost per watt for Arizona (Barbose et al. 2022)
Tilt angle	33 degrees	Latitude of Phoenix, Arizona rounded to nearest degree
Azimuth	180 degrees (due south)	
O&M fixed cost by capacity	\$18/kW-yr.	NREL SAM default O&M value for solar alone
Total system losses	14.08%	NREL SAM default system losses https://www.nrel.gov/docs/fy17osti/68705.pdf
Analysis period	25 years	
Financial parameters		
Debt fraction	100%	Note: Debt and debt parameters were used to model municipal bond issuance. This reflects 100% of the costs being paid for through municipal bonds
Loan term	20 years	Reflects a 20-year bond issuance
Interest rate	3.5%	Bloomberg Municipal Bond Yield Index, week of 7/5/2023. Used as representative of bond coupon rates (Howard 2023) https://www.schwab.com/learn/story/2023-mid-year-outlook-municipal-bonds
Inflation rate	3%	
Discount rate	7%	Office of Management and Budget recommended discount rate for cost-benefit analysis (OMB 1992) https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a94/a094.pdf
Energy usage parameters		
Electric rate	Arizona Public Service Extra-Large General Service time-of-use rate (E-35) with E-56R Rider	Arizona Public Service rate schedule updated December 1, 2021 (APS 2021a, 2021b) https://www.aps.com/-/media/APS/APSCOM-PDFs/Utility/Regulatory-and-Legal/Regulatory-Plan-Details-Tariffs/Business/TOU-Business-NonRes-Plans/e35_TimeOfUseExtraLarge.ashx?la=en https://www.aps.com/-/media/APS/APSCOM-PDFs/Utility/Regulatory-and-Legal/Regulatory-Plan-Details-Tariffs/Business/Rate-Riders/e56r_ClassifiedServicePartialRequirements.ashx?la=en
Electricity bill escalation rate	2.36%	National average of state electricity bill escalation rates, 1997–2022 (Zientara 2023) https://www.solarreviews.com/blog/average-electricity-cost-increase-per-year

Annual load	7,646,295 kWh	Commercial and residential hourly load profiles for all TMY3 locations in the United States, large office, Phoenix, Arizona (Ong and Clark 2022) https://data.openei.org/submissions/153 Note: Load for convention center is estimated by multiplying this load profile by 2.
Peak demand	1,688 kW	Commercial and residential hourly load profiles for all TMY3 locations in the United States, large office, Phoenix, Arizona. (Ong and Clark 2022) https://data.openei.org/submissions/153 Note: Load for convention center is estimated by multiplying this load profile by 2.
Annual electric load growth rate	0%	

Case Study 3: Bonuses changing the equation in North Carolina

DESCRIPTION	VALUE	NOTES AND SOURCE
System parameters		
Installed total cost per watt	\$1.54/W-DC	LBNL Utility-Scale Solar Report, median installed cost per watt for North Carolina (Bolinger et al. 2022)
Tilt angle	0 degrees	Reflective of standard 1-axis tracking technology
Azimuth	180 degrees (due south)	
Total system losses	14.08%	NREL SAM default system losses
O&M fixed cost by capacity	\$18/kW-yr.	NREL SAM default O&M value

ENDNOTES

1. The Section 45 Production Tax Credit and Section 48 Investment Tax Credit are substantially similar in structure to the Section 45Y Clean Electricity Production Tax Credit and Section 48E Clean Electricity Investment Tax Credit respectively. To avoid confusion, this roadmap uses the term ITC to refer to both the Section 48 and Section 48E credits and the term PTC to refer to both the Section 45 and Section 45Y credits unless otherwise specified.
2. This includes all land located within an Indian reservation, pueblo, or rancharia; all land located outside an Indian reservation, pueblo, or rancharia owned by an Indian tribe, individual Indian, a dependent Indian community, or that is held in trust by the United States for the benefit of an Indian tribe or individual Indian; land owned by an Indian tribe conveyed to an Alaska Native corporation; and any land within a census tract in which the majority of residents are Alaska Natives or are enrolled members of a federally recognized tribe or village (25 U.S. Code § 3501(2)).
3. These programs include “a covered housing program (as defined in section 41411(a) of the Violence against Women Act of 1994 (34 U.S.C. 12491(a)(3)). https://www.law.cornell.edu/topn/violence_against_women_act_of_1994; <https://www.law.cornell.edu/uscode/text/34/12491>, a housing assistance program administered by the Department of Agriculture under title V of the Housing Act of 1949, https://www.law.cornell.edu/topn/housing_act_of_1949, a housing program administered by a tribally designated housing entity (as defined in section 4(22) of the Native American Housing Assistance and Self-Determination Act of 1996 (25 U.S.C. 4103 (<https://www.law.cornell.edu/uscode/text/25/4103>)) or such other affordable housing programs as the Secretary may provide.” (Inflation Reduction Act, 26 U.S.C. §48E(h)(B)(i), 2022).
4. WRI’s IRA Bonus Mapper is available at <https://wri.github.io/ira-eligibility-enhancements/#map=3.63/38.07/-95.87>.
5. The U.S. federal government is increasingly requiring that potential grant and loan applicants submit Community Benefits Plans with specific measurable goals as part of their request for funding. These plans are designed to invest in America’s workforce; engage communities and labor; advance diversity, equity, inclusion, and accessibility; and implement Justice 40 (Said 2023). For more information about how a particular agency is implementing this requirement, local governments can view the U.S. DOE’s webpage on Community Benefits Plans (DOE 2023b).
6. There are many ways that local governments can integrate equity into municipal clean energy projects and programs. See, for example, the American Cities Climate Challenge Renewables Accelerator publication entitled *Integrating Equity into City Clean Energy Initiatives Considerations and Resources for U.S. Local Governments* for more information (Foster 2022). The City of Chicago, Illinois is an example of a recent city clean energy procurement with strong equity components (City of Chicago 2022).
7. Soft costs are the non-hardware costs associated with a solar or other clean energy technology. They can include permitting, financing, and installation costs, as well as costs incurred by companies to acquire customers and pay suppliers. In terms of solar, the National Renewable Energy Laboratory has calculated that these costs can be up to 65 percent of the total cost of a solar installation (DOE 2023a). Local governments can play a significant role in reducing these costs. For more information on how to reduce soft costs, see the DOE SolSmart website.
8. “Solarize” campaigns, also known as solar bulk purchasing campaigns or solar co-ops, are an effective and efficient way to bring down costs and expand access to solar for residents. These campaigns can help to overcome common financial and logistical hurdles to installing solar. Local governments can play various roles in Solarize efforts; more information can be found in the City Renewables Accelerator’s Solarize procurement guidance (ACCC 2023d).
9. EPA’s Energy Star Portfolio Manager and additional information related to benchmarking can be found at <https://www.energystar.gov/buildings/benchmark>.
10. More information on Google’s Project Sunroof can be found here: <https://sunroof.withgoogle.com/>.
11. More information on NREL’s PVWatts can be found here: <https://pvwatts.nrel.gov/>. The webpage offers guidance on how to utilize the tool as well.
12. The EPA’s Solar Site Assessment and Utility Data Spreadsheet Tool can be found within the “On-Site Project Development Process” page at <https://www.epa.gov/green-power-markets/site-project-development-process>.
13. RMI’s Municipal Solar Site Selection Tool and related tutorial video can be found at <https://cityrenewables.org/resources/municipal-solar-site-selection-tool-mssst/>.
14. For specific examples of community engagement in action, see California Strategic Growth Council’s “SGC Catalyst Models (California Strategic Growth Council 2023).” These models were developed to help decision makers advance climate equity in direct investment programs and policies: <https://www.sgc.ca.gov/programs/catalyst-models/>.
15. The NREL System Advisor Model is available at <https://sam.nrel.gov/>.

BIBLIOGRAPHY

- ACCC (American Cities Climate Challenge Renewables Accelerator). 2022. "Houston, TX." <https://cityrenewables.org/story/houston-tx-2/>. Accessed September 15, 2023.
- ACCC. 2023a. "Local Government Renewables Action Tracker." <https://cityrenewables.org/transaction-tracker/>. Accessed August 30, 2023.
- ACCC. 2023b. "Federal Funding Opportunities for Local Decarbonization." <https://cityrenewables.org/ffold/>. Accessed August 11, 2023.
- ACCC. 2023c. "Procurement Guidance." <https://cityrenewables.org/overview/>. Accessed August 11, 2023.
- ACCC. 2023d. "Solarize Procurement Guidance." <https://cityrenewables.org/solarize/>. Accessed August 11, 2023.
- APS (Arizona Public Service). 2021a. *Rate Schedule E-35: Extra Large General Service Time of Use*. Phoenix, AZ: APS. https://www.aps.com/-/media/APS/APSCOM-PDFs/Utility/Regulatory-and-Legal/Regulatory-Plan-Details-Tariffs/Business/TOU-Business-NonRes-Plans/e35_TimeOfUseExtraLarge.ashx?la=en.
- APS. 2021b. "Rate Rider Schedule E56-R: Classified Service Partial Requirements—Renewable." Phoenix, AZ: APS. https://www.aps.com/-/media/APS/APSCOM-PDFs/Utility/Regulatory-and-Legal/Regulatory-Plan-Details-Tariffs/Business/Rate-Riders/e56r_ClassifiedServicePartialRequirements.ashx?la=en.
- Barbose, G., N. Darghouth, E. O'Shaughnessy, and S. Forrester. 2022. *Tracking the Sun: Pricing and Design Trends for Distributed Photovoltaic Systems in the United States, 2022 Edition*. Berkeley, CA: Lawrence Berkeley National Laboratory. https://emp.lbl.gov/sites/default/files/2_tracking_the_sun_2022_report.pdf.
- Bolinger, M., J. Seel, C. Warner, and D. Robson, D. 2022. *Utility-Scale Solar, 2022 Edition: Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States*. Berkeley, CA: Lawrence Berkeley National Laboratory. https://emp.lbl.gov/sites/default/files/utility_scale_solar_2022_edition_slides.pdf.
- California Strategic Growth Council. 2023. "SGC Model Hub." <https://www.sgc.ca.gov/programs/catalyst-models/>. Accessed September 8, 2023.
- City of Chicago. 2022. "Mayor Lightfoot Announces Agreement to Purchase 100% Clean, Renewable Energy Starting in 2025." August 8, 2022. https://www.chicago.gov/city/en/depts/mayor/press_room/press_releases/2022/august/Purchase100PercentCleanRenewableEnergy2025.html#:~:text=Construction%20of%20the%20solar%20project,medium%2D-sized%20buildings%20and%20streetlights. Accessed September 15, 2023.
- City of Chicago. 2023. "Addendum: Impacts of the Inflation Reduction Act on Chicago's 2022 Climate Action Plan." May 8, 2023. https://www.chicago.gov/content/dam/city/sites/climate-action-plan/documents/BA_Chicago-CAP-Addendum_20230508_Reduced.pdf. Accessed September 7, 2023.
- Congressional Budget Office. 2022. *Summary Estimated Budgetary Effects of H.R. 5376, the Inflation Reduction Act of 2022*. August 5, 2022. https://www.cbo.gov/system/files/2022-08/hr5376_IR_Act_8-3-22.pdf.
- DOE (U.S. Department of Energy). 2023a. "Solar Soft Costs Basics." <https://www.energy.gov/eere/solar/solar-soft-costs-basics>. Accessed August 11, 2023.
- DOE. 2023b. "About Community Benefit Plans." <https://www.energy.gov/infrastructure/about-community-benefits-plans>. Accessed August 11, 2023.
- DOE. 2023c. "Energy Community Tax Credit Bonus." <https://arcgis.netl.doe.gov/portal/apps/experiencebuilder/experience?id=a2ce47d4721a477a8701bd0e08495e1d>. Accessed August 11, 2023.
- EIA (Energy Information Administration). 2023. "Frequently Asked Questions: What is U.S. electricity generation by energy source?" March 2, 2023. <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>. Accessed September 15, 2023.
- ENERGY STAR. n.d. "Benchmark Your Building Using ENERGY STAR Portfolio Manager." <https://www.energystar.gov/buildings/benchmark>. Accessed August 11, 2023.
- EPA (Environmental Protection Agency). n.d. "On-Site Project Development Process." <https://www.epa.gov/green-power-markets/site-project-development-process>. Accessed August 11, 2023.
- EPA. 2023. "Summary of Inflation Reduction Act Provisions Related to Renewable Energy." June 1. <https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy>. Accessed September 15, 2023.
- Foster, B., L. Shaver, Z. Greene. 2022. *Integrating Equity into City Clean Energy Initiatives Considerations and Resources for U.S. Local Governments*. Washington, DC: ACCC Renewables Accelerator. <https://cityrenewables.org/wp-content/uploads/2022/01/Integrating-Equity-into-City-Clean-Energy-Initiatives.pdf>.
- Foster, D. 2023. "Inflation Reduction Act Analysis: Key Findings on Workforce Demand." Paper presented at the Energy Future Initiatives, July 26, 2023. <https://www.energy.gov/sites/default/files/2023-07/Dave%20Foster%20presentation.pdf>.
- Gearino, D. 2023. "The Most-Cited Number About the Inflation Reduction Act Is Probably Wrong, and That Could Be a Good Thing." *Inside Climate News*, April 20, 2023. <https://insideclimatenews.org/news/20042023/inside-clean-energy-inflation-reduction-act-spending/>. Accessed September 15, 2023.
- Google. n.d. "Project Sunroof." <https://sunroof.withgoogle.com/>. Accessed September 18, 2023.
- Goldman Sachs. 2023. "The US Is Poised for an Energy Revolution," April 17, 2023. <https://www.goldmansachs.com/intelligence/pages/the-us-is-poised-for-an-energy-revolution.html>. Accessed September 15, 2023.

- Gonçalves, T., Y. Liu, J. Tang, and J. Rosas. 2022. *3 Ways US Cities Broke Clean Energy Records in 2021*. Washington, DC: World Resources Institute. May 18, 2022. <https://www.wri.org/insights/us-clean-energy-trends>. Accessed September 15, 2023.
- Howard, C. 2023. "2023 Mid-Year Outlook: Municipal Bonds," July 7, 2023. <https://www.schwab.com/learn/story/2023-mid-year-outlook-municipal-bonds>. Accessed September 15, 2023.
- Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization. 2023. "Energy Community Tax Credit Bonus." <https://energycommunities.gov/energy-community-tax-credit-bonus/>. Accessed September 15, 2023.
- IRS (Internal Revenue Service). 2018. "New Clean Renewable Energy Bonds Notice 2018-15." January 31, 2018. <https://www.irs.gov/pub/irs-drop/n-18-15.pdf>. Accessed September 18, 2023.
- IRS. 2022. "Treasury and IRS Announce Guidance on Wage and Apprenticeship Requirements for Enhanced Credits/Deductions." November 29, 2022. <https://www.irs.gov/newsroom/treasury-and-irs-announce-guidance-on-wage-and-apprenticeship-requirements-for-enhanced-credits-deductions>. Accessed September 15, 2023.
- IRS. 2023a. "IRS Provides Initial Guidance for the Domestic Content Bonus Credit." May 12, 2023. <https://www.irs.gov/newsroom/irs-provides-initial-guidance-for-the-domestic-content-bonus-credit>. Accessed September 15, 2023.
- IRS. 2023b. "IRS Releases Guidance on Elective Payments and Transfers of Certain Credits." June 14, 2023. <https://www.irs.gov/newsroom/irs-releases-guidance-on-elective-payments-and-transfers-of-certain-credits-under-the-inflation-reduction-act>. Accessed September 15, 2023.
- IRS. 2023c. "Elective Pay and Transferability Frequently Asked Questions." June 14, 2023. <https://www.irs.gov/credits-deductions/elective-pay-and-transferability-frequently-asked-questions>. Accessed September 15, 2023.
- IRS. 2023d. "IRS, Treasury Update Notice 2023-29 Related to Energy Community Bonus Credit Amounts under the Inflation Reduction Act." June 15, 2023. <https://www.irs.gov/newsroom/irs-treasury-update-notice-2023-29-related-to-energy-community-bonus-credit-amounts-under-the-inflation-reduction-act>. Accessed September 15, 2023.
- IRS. 2023e. "Frequently Asked Questions about the Prevailing Wage and Apprenticeship under the Inflation Reduction Act." August 29, 2023. <https://www.irs.gov/credits-deductions/frequently-asked-questions-about-the-prevailing-wage-and-apprenticeship-under-the-inflation-reduction-act>. Accessed September 15, 2023.
- IRS. 2023f. "Additional Guidance on Low-Income Communities Bonus Credit Program." *Federal Register* 88: 35793, August 15, 2023.
- IRS. 2023g. "Section 6417. Elective Payment of Applicable Credits." *Federal Register* 88: 40534, June 21, 2023.
- Jay, L., K. Johnson, I. Sitcov, K. Wright, M. Armstrong, and K. Gajewski. 2022. *Climate Action and the Inflation Reduction Act: A Guide for Local Government Leaders*. C40 Cities and Climate Mayors. October 2022. <https://www.c40knowledgehub.org/s/article/Climate-action-and-the-inflation-reduction-act-a-guide-for-local-government-leaders>. Accessed September 15, 2023.
- Lawyers for Good Government. 2023. *A 50-State Survey of State Policies and Decision Makers to Help Ensure Federal Investments Go to 'Disadvantaged Communities' Under Biden's J40 Initiative*. <https://www.lawyersforgoodgovernment.org/dac-report>. Accessed September 15, 2023.
- Lydersen, Kari. 2023. "Advocates Say Conditions May Be Improving for Rooftop Solar in Wisconsin." PBS Wisconsin, April 17, 2023. <https://pbswisconsin.org/news-item/advocates-say-conditions-may-be-improving-for-rooftop-solar-in-wisconsin/>. Accessed September 15, 2023.
- National Renewable Energy Laboratory. 2022. "System Advisor Model." <https://sam.nrel.gov/>. Accessed September 18, 2023.
- National Renewable Energy Laboratory. 2023. "PVWatts Calculator." <https://pvwatts.nrel.gov/>. Accessed August 11, 2023.
- Mckinstry. 2022. "City & County of Denver Solar Gardens." <https://www.mckinstry.com/city-county-of-denver-solar-gardens/>. Accessed September 15, 2023.
- OMB (Office of Management and Budget). 1992. *Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*. Washington, DC: OMB. <https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a94/a094.pdf>.
- Ong, S., and N. Clark. 2022. (Database.) *Commercial and Residential Hourly Load Profiles for all TMY3 Locations in the United States*. National Renewable Energy Laboratory. <https://data.openei.org/submissions/153>. Accessed September 5, 2023.
- PEA (Philadelphia Energy Authority). 2023. "Philadelphia Energy Authority RFP: Technical Assistance for Federal Funding Opportunities in the Inflation Reduction Act." https://philaenergy.org/public_bids/pea-rfp-inflation-reduction-act-technical-assistance/. Accessed August 11, 2023.
- RMI (Rocky Mountain Institute). 2023. "Municipal Solar Site Selection Tool (MSSST)." <https://cityrenewables.org/resources/municipal-solar-site-selection-tool-mssst/>. Accessed August 11, 2023.
- Ryberg, D.S., and J. Freeman. 2017. *Integration, Validation, and Application of a PV Snow Coverage Model in SAM*. Golden, CO: National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy17osti/68705.pdf>.
- Said E., D. Saha, G. Adcox, and C. Scott-Buechler. 2023. *US Clean Energy Projects Need Public Buy-in. Community Benefits Agreements Can Help*. Washington, DC: World Resources Institute. August 31, 2023. <https://www.wri.org/insights/community-benefits-agreements-us-clean-energy>. Accessed September 15, 2023.

Shrestha, R., R. Rajpurohit, and D. Saha. 2023. "Redefining America's 'Energy Communities' Can Boost Clean Energy Investment Where It's Needed Most." July 31, 2023. <https://www.wri.org/insights/redefining-americas-energy-communities>. Accessed September 15, 2023.

Weaver, J. 2022. "To PTC or ITC, That Is the Financial Question." *PV Magazine*, August 25, 2022. <https://pv-magazine-usa.com/2022/08/25/to-ptc-or-itc-that-is-the-financial-question/>.

White House. 2022. "BY THE NUMBERS: The Inflation Reduction Act," August 15, 2022. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/15/by-the-numbers-the-inflation-reduction-act/>.

White House. 2023. "What Is Direct Pay (Elective Pay)?" <https://www.whitehouse.gov/cleanenergy/directpay/>. Accessed September 15, 2023.

Wimberger, E., C. Best, H. Newberry, H. Argento-McCurdy, L. Jay, K. Johnson, G. Lewenstein, et al. 2023. "Maximizing the Impact of Federal Climate Investments: The Unique Role of Cities." September 2023. https://www.c40knowledgehub.org/s/article/Maximising-the-impact-of-US-federal-climate-investments-The-unique-role-of-cities?language=en_US. Accessed September 14, 2023.

Wisconsin Electric Power Company. 2023. *Electric Service Rates in the State of Wisconsin*. Vol. 19. Milwaukee, WI: Wisconsin Electric Power Company. <https://www.we-energies.com/pdfs/etariffs/wisconsin/elecraateswi.pdf#pagemode=bookmarks>.

WRI (World Resources Institute). 2023. "IRA Bonus Mapper." <https://wri.github.io/ira-eligibility-enhancements/#map=3.4/37.24/-97.83>. Accessed August 11, 2023.

Zientara, B. 2023. "How Much Electricity Prices Increase per Year in the U.S." Blog. March 3, 2023. <https://www.solarreviews.com/blog/average-electricity-cost-increase-per-year#:~:text=Key%20takeaways,around%20that%20amount%20each%20year>.

