CRA Insights
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CRA Charles River Associates

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Federal Tax Credit implications and monetization strategies for power producers and utilities

Introduction

The energy tax credit provisions in the Inflation Reduction Act (IRA) are broad reaching as the legislation extends the lives of the popular Investment Tax Credit (ITC) and the Production Tax Credit (PTC), expands the list of technologies eligible for these credits, and provides opportunities for utilities and project developers to increase the credits' value by meeting certain criteria.

Renewable resource owners now have significant flexibility to pursue a variety of tax credit and monetization strategy combinations. But this flexibility introduces questions about which strategy combination maximizes value for resource owners. In this *CRA Insights*, we explore which factors influence the optimal ITC/PTC monetization strategy under various cost and operating conditions.

A choice of two tax credits

At the forefront of the IRA's provisions are extensions and modifications to the ITC and PTC. The applicability for currently covered technologies has been extended through the end of 2024, at which point both the ITC and PTC maintain the established credit value but become technology-neutral (i.e., applicable to all zero-emission technologies) through 2032. The ITC has also been expanded to apply to biogas projects, energy storage assets, and interconnection property for eligible resources less than 5 MW.[1]

The key differentiator between the ITC and PTC is the manner in which each credit is assessed, with the value of the ITC scaling with project capital costs and the value of the PTC scaling with a project's energy production.

[1] Interconnection property includes facilities required to connect the generating resource to the point of interconnection, such as a tap line.

Table 1: ITC and PTC values

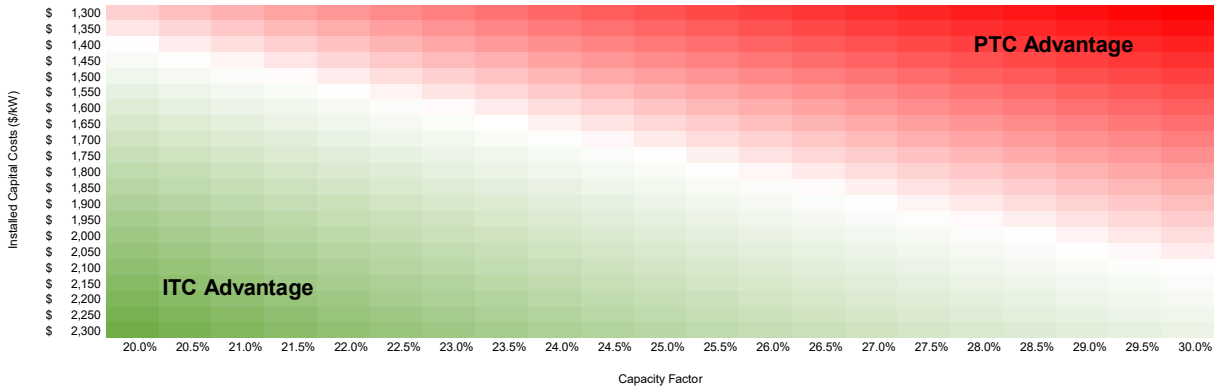
	2022 base credit value	2022 full credit value (5x base credit)[2]
ITC	6% of capital cost	30% of capital cost
PTC	$5.50/MWh, increasing annually with CPI	$27.50[3]/MWh, increasing annually with CPI

On top of the values outlined in Table 1, the IRA establishes bonus opportunities for projects sourcing materials domestically[4] or sited in "energy community" regions that historically have been home to the fossil fuel industry.[5] These bonuses, which can be stacked, offer substantial incentives for prospective renewable resource owners.

ITC vs. PTC under various cost and operating conditions

The IRA extended PTC eligibility to solar projects, which have only been eligible for the ITC in recent years. Therefore, solar developers now have the option to choose between the PTC or ITC for projects. To evaluate the thresholds at which each tax credit is optimal, CRA examined the credits under various scenarios by calculating the levelized cost of electricity (LCOE) for a hypothetical 100 MW solar project and assuming prevailing wage and apprenticeship requirements are met. The analysis calculates the LCOEs at different combinations of project capital costs (which have been volatile over the past year) and capacity factors (which measure energy production and vary based on project location and solar irradiance). The results show a clear line of demarcation between the two credits.

Figure 1: Heat map of ITC LCOEs vs. PTC LCOEs[6]



[2] Facilities must either have a maximum output of less than 1 MW or meet prevailing wage and apprenticeship requirements to receive the full credit value of five times the base credit value. See I.R.C. § 45(b)(7) for prevailing wage requirements and I.R.C. § 45(b)(8) for apprenticeship requirements.

[3] The IRS clarified that the full PTC value (i.e., five times the base credit value) will be $27.50/MWh due to rounding and order of operations considerations under the new IRA provisions in Announcement 2022-23. See https://www.irs.gov/pub/irs-drop/a-22-23.pdf.

[4] The domestic content bonus of 10% is available to both the ITC (for a total of 40% of capital costs) and PTC (for a total of $30.50/MWh) if (a) 100% of steel or iron is produced in the US and (b) 40% of manufactured products used in construction are produced in the US.

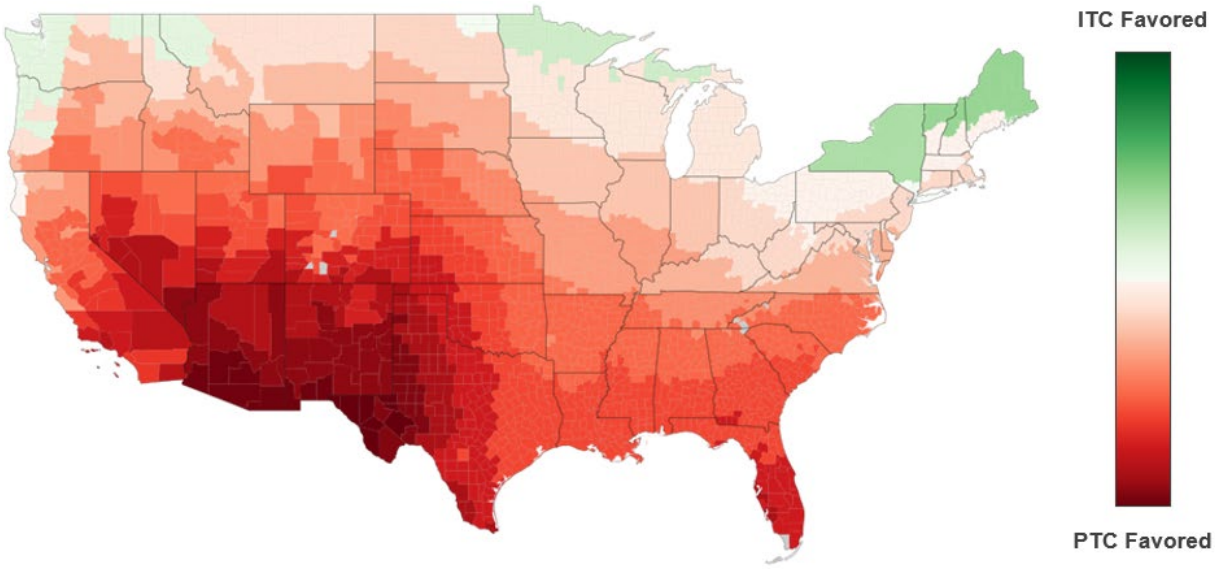
[5] The energy community bonus of 10% is available to both the ITC (for a total of 40% of capital costs) and PTC (for a total of $30.50/MWh) if project is located in (a) a brownfield site; (b) a community in which >=0.17% employment or >=25% of local tax revenues are related to coal, oil, or natural gas and has an unemployment rate at or above the national average; or (c) a community or adjacent community in which a coal mine has closed (after December 31, 1999) or generating unit retired (after December 31, 2009). See also Augustine, P. and Iyer, R. (2022, December). *Technical Report on Energy Communities*. https://www.crai.com/insights-events/publications/technical-report-on-energy-communities/

[6] CRA's modeling assumptions include: project in-service date of January 1, 2024; inflation of 2.1%; initial fixed O&M of $15.50/kW-year grown annually at inflation; five-year MACRS depreciation; 26% composite federal and state income tax rate; solar degradation of 0.5%/year; internal rate of return of 6.67%; resource owner is able to monetize 100% of tax credits.

The red area in Figure 1 shows combinations of project capital costs and capacity factors at which the ITC leads to a greater LCOE than the PTC (i.e., it is more expensive and therefore the PTC provides greater value). The green values represent combinations at which the ITC provides greater value. As expected, greater project capital costs give an edge to the ITC and greater capacity factors (and therefore, greater energy production) give an edge to the PTC.

While a heat map is useful in determining the threshold for the relative advantage of one credit over the other, translating the results into real-world application requires identifying geographic locales that realistically support the varying levels of capacity factors and installed capital costs. CRA used regional capacity factor data from the National Renewable Energy Laboratory (NREL) and capital cost data from the US Energy Information Administration (EIA)[7] to estimate LCOEs on a geographic basis for the United States (See Figure 2):[8]

Figure 2: ITC LCOEs vs. PTC LCOEs at full credit values for select US geographies[9]



Overall, utilizing the PTC is likely to result in lower LCOEs throughout much of the country, with the ITC providing lower LCOEs in only the northernmost states. The PTC's favorable economics are especially strong in the Southwest, where high-capacity factors are coupled with low-capital costs relative to the national average. The Northeast and Northwest, on the other hand, show preference for the ITC due to a combination of higher installed capital costs and relatively low-capacity factors.

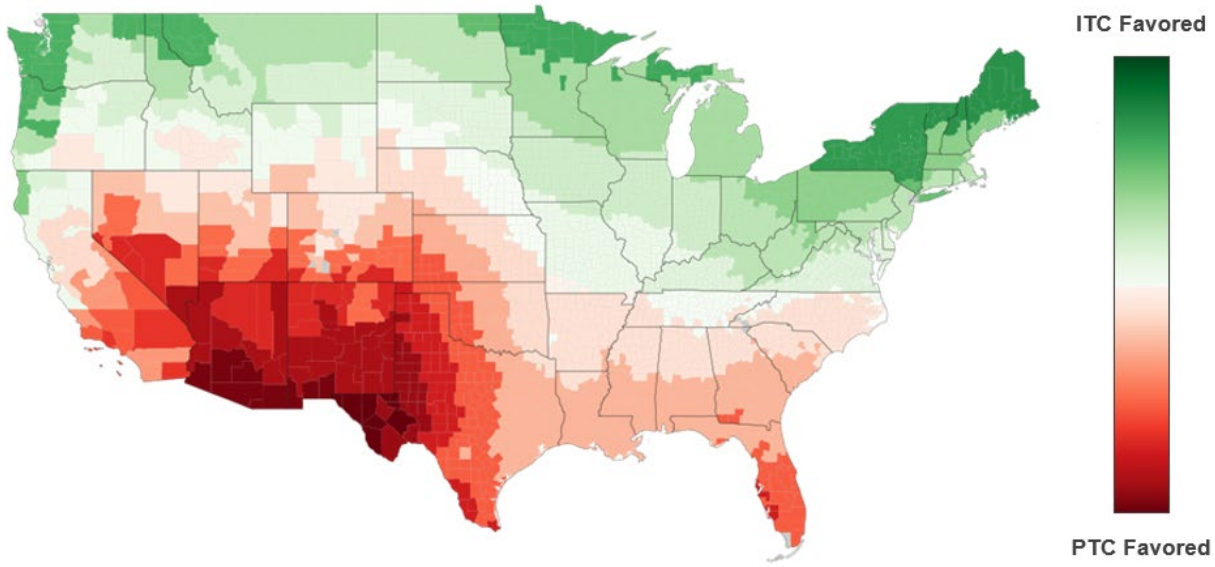
These economics change when the full tax credit values are adjusted for one of the IRA's bonus opportunities. Each bonus offers an adjustment of 10%, which is additive for the ITC (i.e., 30% base + 10% bonus = 40% total) and relative for the PTC (i.e., $27.50 base + [$27.50 * 10% bonus] = $30.50/MWh in 2022).

[7] CRA adjusted regional capital costs for inflation.

[8] CRA determined average capital costs for ten total US regions, including seven ISO regions and three non-ISO regions. National average of $1,567/kW excluding Hawaii. National average increases to $1,669/kW if including Hawaii.

[9] See assumptions in footnote 6.

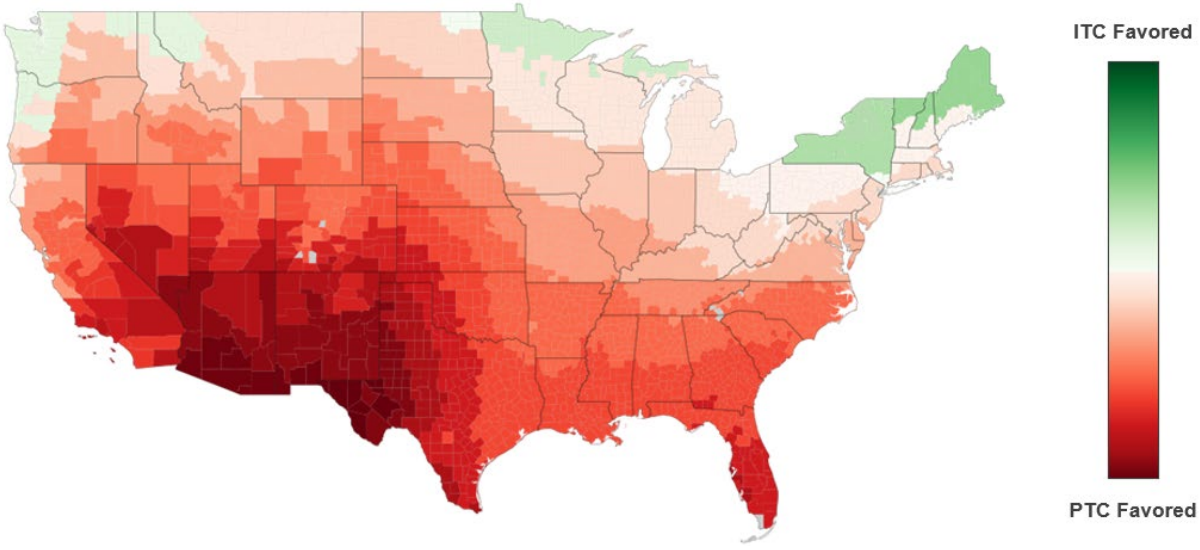
Figure 3: ITC LCOEs vs. PTC LCOEs at full credit values plus 10% bonus for select US geographies[10]



The nature of the ITC has the potential to shift the regional economics of the tax credits. The 10% ITC adder reduces a solar project's LCOE by approximately 10%, while the 10% PTC adder may reduce a solar project's LCOE by only 3-8%, depending on the project's operating characteristics. As seen in Figure 3 above, many regions previously well within PTC-favorable areas shift to either well within ITC-favorable areas or into much more ambiguous territory once the 10% bonus is earned.

However, the ITC's advantage with a 10% bonus is dependent on the underlying capital costs. If, for example, capital costs are lowered by 20% (Figure 4), the PTC's likely advantages incorporate a geography very similar to what was identified prior to the consideration of any bonus credit.

Figure 4: ITC LCOEs vs. PTC LCOEs at full credit values plus 10% bonus for select US geographies, with 20% discount to average capital costs[11]



[10] See assumptions in footnote 6.
[11] See assumptions in footnote 6.

The bottom line: solar developers seeking to amplify the value of tax credits by meeting one of the IRA's bonus conditions will need to pay particularly close attention to each project's characteristics and evaluate projects on a case-by-case basis.

Hybrid solar plus storage resources

An increasing amount of renewable energy resources are being paired with storage each year, adding a layer of complexity to the selection of tax credits. Because storage dispatch is not energy production, the PTC can only benefit the generating capacity of the hybrid resource.

The IRS may soon address this issue by clarifying rules around the simultaneous election of the PTC on the generation portion and the ITC on the storage portion of hybrid resources. Separation of these components would allow owners to maximize credit value in situations where electing the PTC is optimal for generation capacity without sacrificing the ability to take the ITC on the project's storage capacity.

Utilities, independent power producers, and monetization strategies

In addition to the choice of ITC or PTC, resource owners should consider how to monetize the tax credit of their choosing. The IRA has expanded the monetization options available to utilities and independent power producers (IPPs) to include a credit transfer, so that both now have three options (though tax-exempt entities will have four):

- Self-monetization: The resource owner retains the value of the tax credits and offsets incurred income tax.
- Tax Equity Partnership: The resource owner enters a partnership with a tax equity investor with federal tax liability, sharing the value of the tax credits in exchange for an upfront capital contribution.
- Transfer: The resource owner sells the tax credits to another organization which uses the credits to offset its income tax. The price received in exchange for the tax credits will likely be at a discount to face value, allowing the two parties to share in the credit's value and to account for recapture and credit qualification risks.
- Direct pay – Available only to tax-exempt entities such as municipal utilities, cooperatives, and tribal nations, the resource owner receives a check for the full value of the credits from the IRS.

Taxable utility monetization strategies

US utilities differ significantly in size and tax strategy. Some regularly incur large tax liabilities while others (often major investor-owned utilities with significant capital expenditure programs) have net-operating loss (NOL) carryforwards or bonus depreciation benefits that leave small or zero tax liabilities. Utilities in the former category will be able to fully monetize credits without the transaction costs associated with other monetization options, while those in the latter category will find little-to-no opportunity to self-monetize credits.

Tax equity partnerships offer monetization via an upfront capital contribution that can be valuable to utilities with capital constraints, particularly those that are vertically integrated or provide services beyond electric. Utilities often face competing demands for capital, whether it be from electric transmission or distribution investment needs or from gas, water, or telecom investments. However, tax equity partnerships involve a reduction in ownership percentage, thereby lowering how much of a project is rate based and therefore the utility's return on equity.

Newly available tax credit transfers could become a popular option for utilities. Such structures are conducive for both ITC and PTC monetization. In the case of PTCs, annual transfers may appeal to utilities that prefer annual cash flows and place a higher value on incremental returns on equity versus extracting

100% of the tax credit value. Utilities opting for the ITC may also find transfers preferable due to increased returns on equity, although potentially at the expense of other tax benefits such as accelerated depreciation.

IPP monetization strategies

Many IPPs may find monetization via tax equity partnerships or transfers to be preferred over self-monetization, particularly if those IPPs have low tax liabilities and limited project pipelines. IPPs with less-established balance sheets may find tax equity partnerships to be optimal given the increased purchaser discount that comes with greater risks and corresponding indemnity considerations. These same IPPs may also derive value from the tax equity partnership's upfront capital contribution if less-established balance sheets translate to higher borrowing costs from other capital sources.

Key takeaways

The IRA's tax credit provisions provide strong incentives to further renewable resource penetration. A wide range of resource owners stand to benefit from the extension of the ITC and PTC, and increased investment is likely among the expanded list of technologies. Alongside the credits, expanded monetization methods allow for a broader group of energy providers to leverage benefits and increase investment in renewable resources.

Though the circumstances surrounding every project are unique, there are several broad, key takeaways for resource developers and owners:

- As has been widely discussed, the ITC becomes more favorable with greater installed capital costs and the PTC becomes more favorable with greater capacity factors (and the resulting energy production).
- At full credit value, the PTC is likely to be the most advantageous option for much of the US from an LCOE perspective. Note that resource owner returns on investment and equity will vary with project characteristics as well as with the chosen monetization strategy.
- The IRA's bonus adders disproportionately improve the value of the ITC relative to the PTC.
- Optimal monetization strategies will vary significantly depending upon organizational structures and tax liabilities. While some generalizations can be made for utilities versus IPPs, the optimal strategy will vary between owners.

About CRA's Energy Practice

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