



# CRA Insights: Energy

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Associates

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## Coal-retirement energy communities

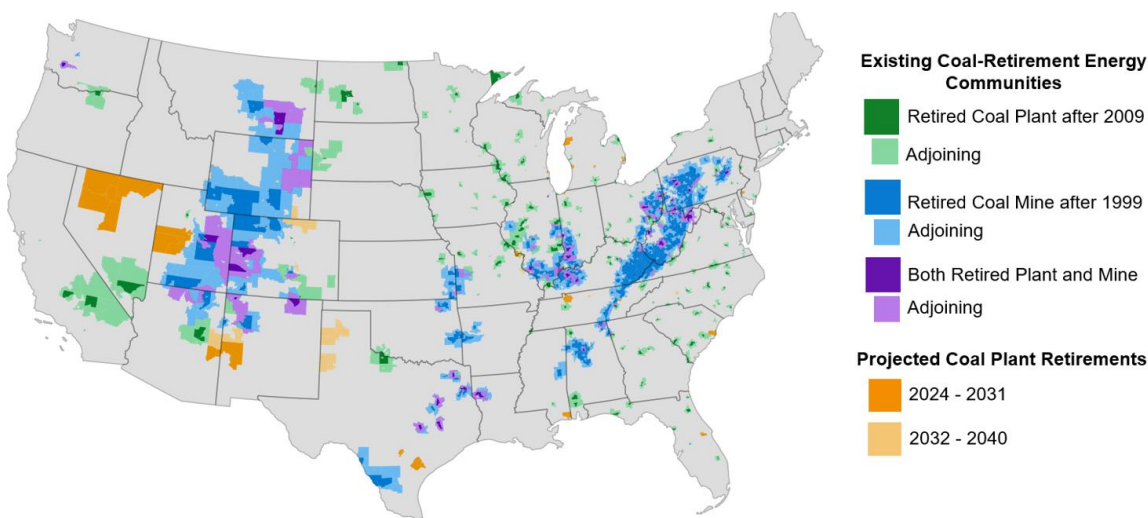
### Analysis of emerging tax credit opportunities from the Inflation Reduction Act

#### Introduction

The newly enacted Inflation Reduction Act (IRA) is set to extend and expand clean electricity tax credits and provide new opportunities for clean energy project development over the next decade. In addition to the extension of the investment and production tax credits at historical levels (provided certain prevailing wage requirements are met), the law also offers a new suite of “bonus credits” intended to encourage renewable and storage development in select geographic regions.

One such region, called an “energy community,” is newly defined and qualifies for a 10% “bonus” tax credit for clean electricity developed in certain areas affected by the retirement of manufacturing and energy infrastructure.<sup>1</sup> In this *Insights* piece, CRA explores the geographic extent of energy communities, with a particular focus on locations affected by coal infrastructure retirement. We estimate that coal-retirement energy communities comprise approximately 16% of total US land area and identify the strategic implications of this incentive for market participants over the next decade.

**Figure 1: Existing and potential coal-retirement energy communities**



<sup>1</sup> Definitions for energy communities can be found in Section 13101 of the Inflation Reduction Act.

## What is a coal-retirement energy community?

While there are multiple ways that a location can qualify as an energy community,<sup>2</sup> CRA has limited its assessment in this *Insights* to areas affected by the loss of coal infrastructure. Specifically, we look at coal-retirement energy communities, defined in the IRA as census tracts in which either:

- a. After December 31, 1999, a coal mine has closed;
- b. After December 31, 2009, a coal-fired electric generating unit has been retired; or
- c. Is directly adjoining to any census tract as defined in (a) or (b).<sup>3</sup>

## Incentives for energy communities

In general, clean energy and energy storage projects developed in areas qualifying as energy communities will receive an additional “bonus” credit as part of their overall eligibility for either the investment or production tax credit.<sup>4</sup> This will apply to all qualifying renewable electricity projects placed in service after 2022 and extend to all projects that commence construction by the end of 2032.

**Table 1: Credit amounts for energy communities<sup>5</sup>**

	Construction Start Date	Examples of Qualifying Technologies	Energy Community Bonus Credit Amount
Production Tax Credit (PTC)	Through 2024	Wind, Solar, Geothermal	<ul style="list-style-type: none"><li>• A 10% increase in the PTC rate, which would currently amount to \$2.6/MWh (PTC grows w/ inflation)</li><li>• Reduced to \$0.5/MWh if wage standards are not met</li></ul>
	2025-2032	Electricity-producing resources with net zero GHG emissions	
Investment Tax Credit (ITC)	Through 2024	Solar, Energy Storage, Clean Hydrogen	<ul style="list-style-type: none"><li>• An additional 10% of initial project investment is credited</li><li>• Reduced to 2% if wage standards are not met</li></ul>
	2025-2032	Any qualifying energy property with net zero GHG emissions	

Given the scope of these incentives, it will be important for project developers, utility resource planners, and other stakeholders to identify qualifying areas when assessing the economics of new generation resources. In addition to opportunities for renewable energy technologies like wind and solar, we expect many energy storage projects to be positioned for bonus credits, as there are generally fewer geographic limitations for storage project siting.

<sup>2</sup> Other areas which qualify as an energy community include “brownfield” sites and areas with high levels of direct employment in the fossil fuels or manufacturing industry. Official definitions for energy communities can be found in section 45(b)(11)(B) of the Internal Revenue Code of 1986. Clauses (i) and (ii) cover brownfields and unemployment, and clause (iii) covers coal infrastructure retirement.

<sup>3</sup> Section 45(b)(11)(B)(iii) of the Internal Revenue Code of 1986

<sup>4</sup> In addition to the investment and production tax credits, 40% of the \$10 billion clean energy manufacturing tax credit is reserved specifically for coal-retirement energy communities. The incentive will credit back 30% for each qualified investment, though projects must apply and be approved to receive this benefit. Refer to section 48C(e) for a full list of qualifying facilities and a complete view of the qualification standards and application process for manufacturing facilities.

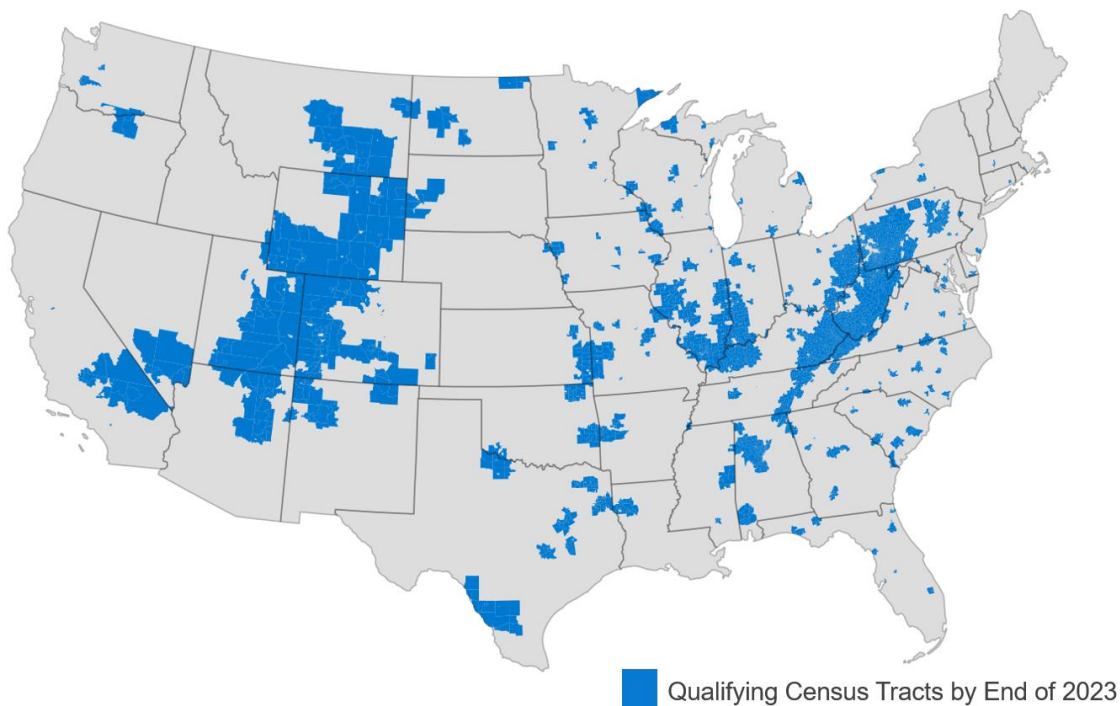
<sup>5</sup> Credits phase out after the later of 2032 and the time at which US power sector greenhouse gas emissions are at or below 25% of today's levels.

## Assessing the geographic extent of coal-retirement energy communities

CRA analyzed publicly available datasets provided by the Energy Information Administration (EIA) and the Mines Safety and Health Administration (MSHA) to evaluate and quantify the geographic extent of retired coal plant and mine census tracts that are expected to qualify as energy communities by the end of 2023. CRA also performed manual inspection of the datasets to correct certain errors, such as misrepresentation of the latitude-longitude coordinates of mines infrastructure.

We identify 4,323 census tracts containing retired coal infrastructure compliant with energy community definitions. Notably, we find that approximately **16.1, or almost one sixth**, of total US land area will qualify as a coal-retirement energy community at the time of the program start, as shown in **Error! Reference source not found.** By the end of 2032, CRA estimates that 18.1% of US land area will qualify due to projected coal retirements in census tracts that do not currently qualify.<sup>6</sup>

**Figure 2: Coal-retirement energy communities at end of 2023**



A key finding of this analysis is that coal infrastructure retirement in remote areas will allow for vast swathes of land to qualify for additional tax credits under the energy community definition. This is because census tracts are drawn to include populations of between 1,200 and 8,000 and increase in size in areas with low population density. As an example of this impact, coal mine shutdowns within a single tract in Southern Wyoming allow for more than 21,000 square miles of land to qualify as an energy community.<sup>7</sup>

## Specific regions of interest

To further assess the extent of energy communities, CRA identified three key regions that will be particularly impacted by this incentive: the Appalachian Belt and Illinois Basin, the Rocky Mountains, and historical “coal-consuming” states. While this paper’s scope is limited to areas that are expected

<sup>6</sup> Projected coal plant retirements were calculated by selecting all coal generators with announced retirement years in the EIA-860 inventory. The actual number will vary as plant retirement decisions are updated.

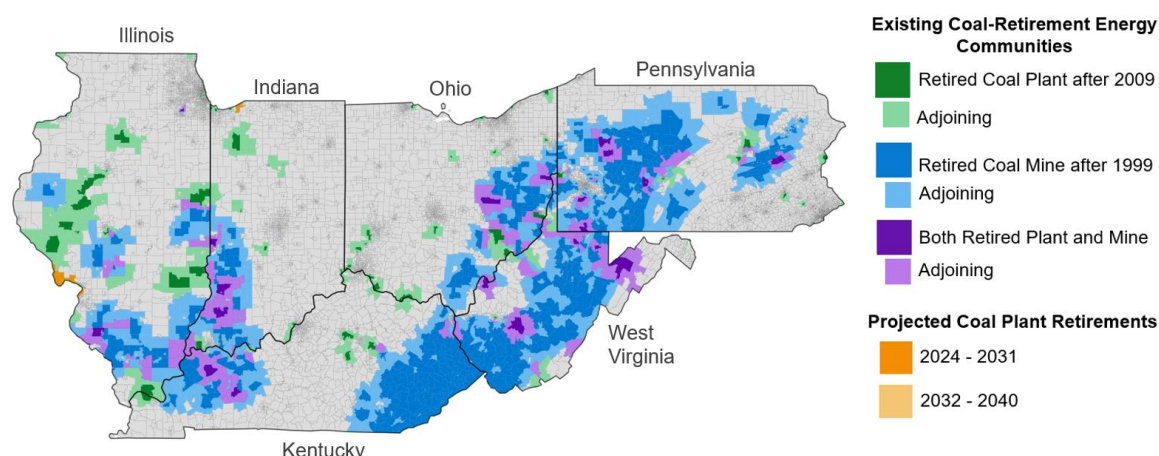
<sup>7</sup> Tract 56037971600 as defined in the 2020 US Census

to be most impacted by the law, qualifying tracts exist across much of the country, and opportunities will be present in a diverse set of market areas.

### Appalachian Belt and Illinois Basin

States in the Appalachian Belt and Illinois Basin are likely to contain many qualifying energy community areas as a result of the large number of coal mines that have retired over the past two decades. Eastern coal mines tend to be smaller in size, but more numerous than in the West,<sup>8</sup> leading to a well-distributed availability of energy communities throughout the region. Despite their comparatively smaller-sized census tracts, over 41% of land area is estimated to qualify in the states shown in Figure 3.

**Figure 3: Appalachian Belt and Illinois Basin coal-retirement energy communities**



On the Appalachian side, large portions of qualifying land in Western Pennsylvania, Eastern Ohio, West Virginia, and Kentucky will have access to the PJM market, with opportunities for both merchant project developers and regulated utilities depending on the state and zone. In areas where wind and solar potential are not strong, the bonus investment tax credit (ITC) credit for stand-alone storage can still be widely applied.

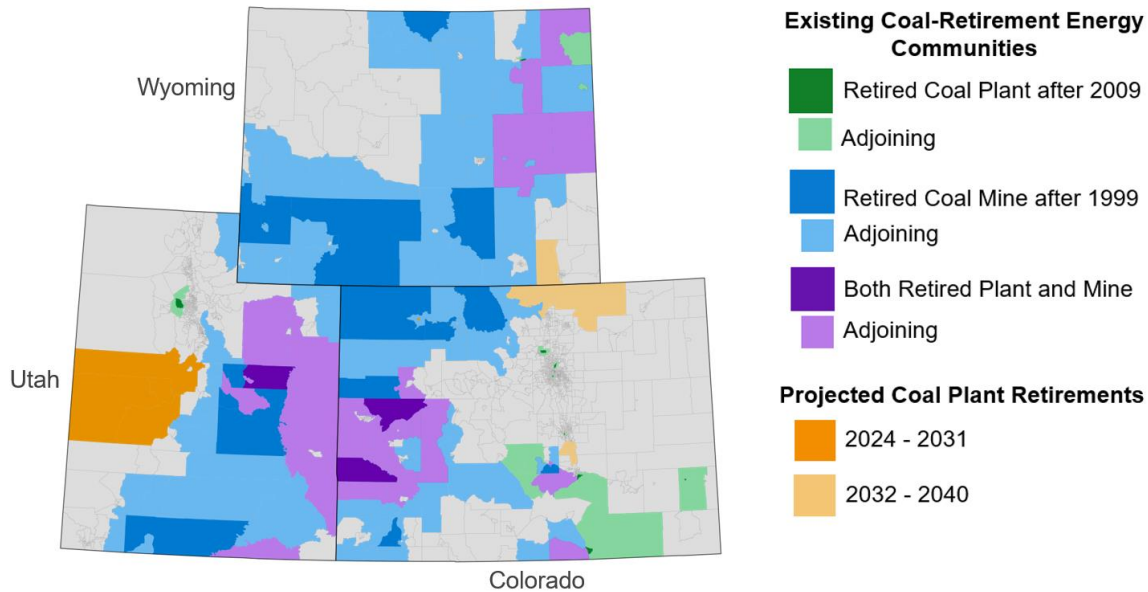
Illinois, Indiana, and Western Kentucky benefit not only from abandoned Illinois Basin coal mines, but also well-distributed retired coal generation plant infrastructure. New clean energy developments in these areas will have access to the MISO market and can be positioned to replace the large amounts of fossil fired generation that has or will retire as a result of electric utility transition plans in Indiana and Kentucky and the recently passed Climate and Equitable Jobs Act in Illinois.

### Rocky Mountains

The Rocky Mountain states are likely to benefit from a combination of coal mine retirements and disproportionately large census tracts, which permit the region to have approximately 150,000 square miles of qualifying energy community areas in Colorado, Utah, and Wyoming alone. This is equivalent to over 54% of total land area, as shown in Figure 4.

<sup>8</sup> The Bureau of Land Management estimates that 60% of all abandoned coal mines exist in Kentucky, West Virginia, and Pennsylvania alone.

**Figure 4: Coal-retirement energy communities in Rocky Mountain States**



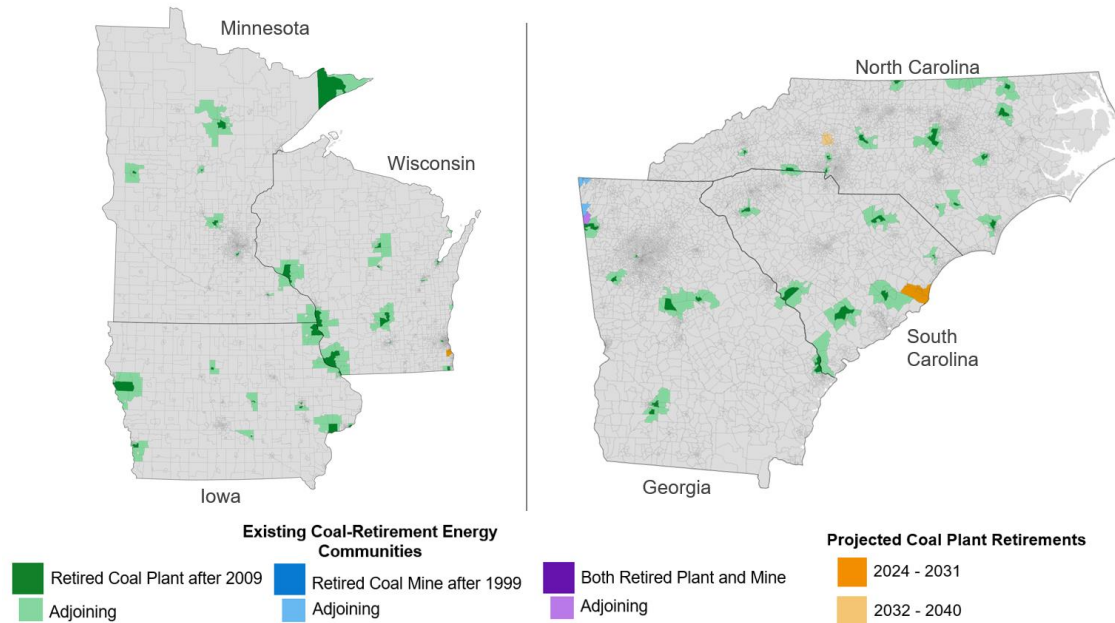
Although many energy communities will be located far from load centers, there are likely clean energy development opportunities for geothermal, wind (particularly in eastern Wyoming), and solar (particularly in Southern Utah and Colorado) across this region. Additionally, much of this land is federally owned and may be subject to a right-of-way approval process.

#### **Historical coal-consuming states**

In states with high historical coal use for electricity production over the past decade, such as the upper Midwest (specifically much of Zones 1, 2, and 3 in MISO) and the Southeast, only 6.21% and 6.23% of land area, respectively, is expected to qualify as an energy community (Figure 5). However, despite the low general percentage of qualifying land area, the relatively large number of retired coal plant tracts, often located in areas with strong existing transmission infrastructure, will provide opportunities for clean energy and storage project development. Existing interconnection rights are already becoming a highly valuable attribute of retiring plant sites, and the energy community bonus tax credit provisions are likely to contribute additional value to redevelopment projects.



**Figure 5: Coal-retirement energy communities in the Upper Midwest and Southeast**



### Implications of bonus credits for resource planning and market analysis

The 10% energy community bonus has the potential to meaningfully impact clean energy project economics, and utility resource planners and project developers will need to be mindful of the potential implications when evaluating long-term generation plans and near-term project development opportunities. Market participants should consider improving their data management and tracking of this key new variable, and resource planners and market analysts will likely need to incorporate assumptions on bonus tax credit opportunities in their project and portfolio assessments.

### Data management

Given the multiple ways a location can qualify as an energy community, a foundation of strong data will be critical to project screening and evaluation. Therefore, utilities, project developers, and other stakeholders should consider developing a strategy to track energy communities over time. Importantly, as shown in the figures above, this not only includes coal generation facilities, but also incorporates coal mine infrastructure. Key considerations for data management include:

- Data sources are fragmented, so structured collection and management of data may be necessary, particularly for entities that operate across multiple jurisdictions or across the country. Even if there are no sites directly within a utility's service territory, opportunities may exist just outside, which is particularly relevant for utilities operating within an Independent System Operator (ISO) market area.
- New tracts will become available every year due to new retirements, while old tracts do not expire. Utilities and project developers should monitor infrastructure that may shutter in the near future, since new clean energy developments could be sited on or near retiring facility sites to take advantage of existing transmission infrastructure and the new bonus credits at the same time. Importantly, a plant owner would not need to retire an entire plant to receive the bonus credit. So long as a single generating unit has retired, the tract can qualify, allowing for optionality at multi-unit sites.
- Some tracts will be determined as an energy community on a case-by-case basis. Thus, diligence on determinations will be needed in certain cases.

## Modeling inputs and assumptions

Electric resource planners and power market analysts regularly make assumptions about a range of market and policy drivers, and bonus tax credit eligibility is now a new variable to be added to the list. When performing integrated resource planning analyses or project assessments, bonus credit opportunities may be considered in the following ways:

- Resource planners may wish to evaluate how much new wind, solar, and storage capacity, if any, may be eligible for the bonus credit when performing portfolio analysis. While precise estimates on the magnitude of potential qualifying projects may be impossible to make, scenario analysis can likely assess the impact of various assumptions on potential portfolio outcomes.
- When evaluating future coal plant retirements, utility resource planners and other market analysts should assess whether replacement capacity could take advantage of the bonus credit if the retirement establishes a new energy community tract.
- When performing Requests for Proposals (RFP) for new clean electricity generation and storage resources, RFP administrators and bid evaluators should consider specifically requesting information on energy community eligibility, and various tax credit levels may need to be explicitly assessed in project evaluation.

## Conclusions and future work

Ultimately, coal-retirement energy communities offer a measurable expansion of federal tax credits for clean energy and storage and will become a relevant consideration for new generation resource developments. Given the large extent of these qualifying communities, projects across the country will need to be cognizant of the potential impact of these new incentives, particularly since eligible projects entering service as soon as January 2023 can take advantage of them.

For areas with few or no coal-retirement energy communities, it is worth noting that the IRA contains other location-based provisions ranging from rural and low-income areas to brownfield sites. Similar studies can be performed for these other classifications, as they may uncover similar opportunities unique to the specific geographic characteristics of a given region.

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