



# Advantage Local

## Why Local Energy Ownership Matters

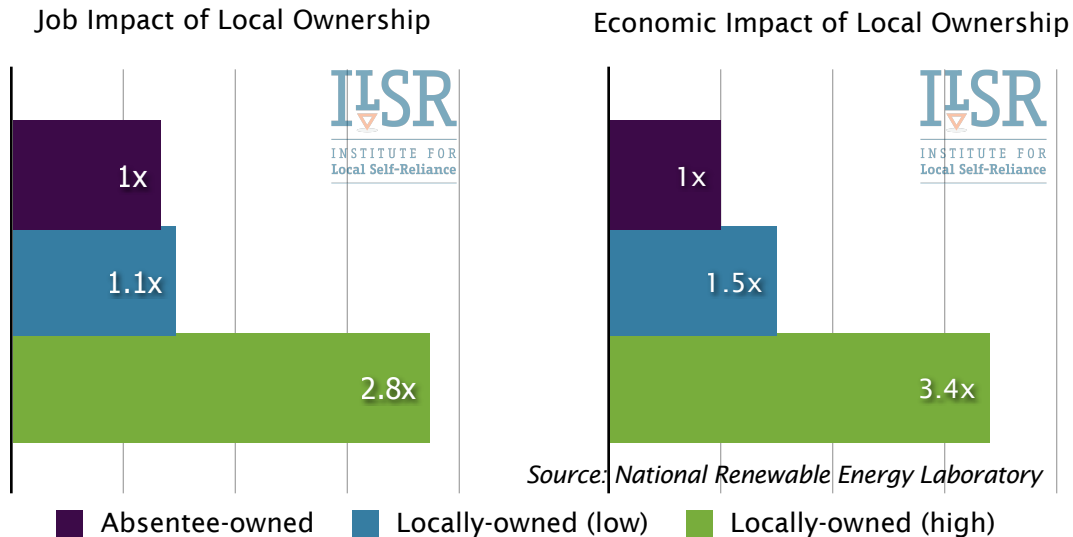
John Farrell  
September 2014

**ILSR** INSTITUTE FOR  
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# Executive Summary

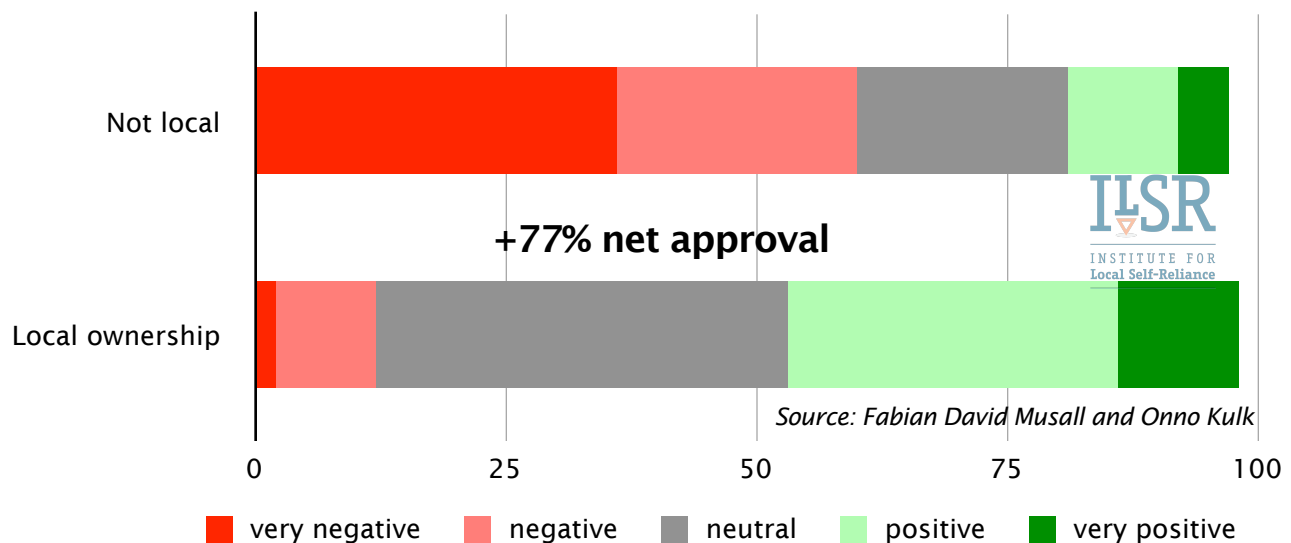
Why does ownership of renewable energy matter? Because the number of jobs and economic returns for communities are substantially higher when electricity generation from wind and sun can be captured by local hands.

## Local Ownership Means More Jobs & More Local Economic Impact



This economic self-interest motivates rapid expansion of renewable energy and builds political support for a low-carbon, more local and economically rewarding energy system. This report serves as a resource, especially for communities seeking independence from big out-of-state projects like high voltage transmission lines.

## Local Ownership Dramatically Improves Attitudes Toward Wind Power



Unfortunately, there are at least **five substantial barriers** to local ownership in the U.S. energy system:

- **Tradition:** in its 100-year history, the U.S. electricity grid has primarily been controlled by centralized, vertically integrated utilities that are reluctant to lose market share.
- **Capital:** collectively raising capital for a locally owned renewable energy project tends to run afoul of Securities and Exchange Commission rules for investment that are unduly onerous for the size and scale of community-based projects.
- **Cash Flow:** revenue sources for renewable energy projects may come from four or more sources, complicating the challenge of making finance payments and recovering the initial investment.
- **Legal:** the most logical legal structures for local ownership, e.g. nonprofits or cooperatives, are often ineligible for federal tax incentives.
- **Utilities:** opposed to the erosion of their control of the technical and economic elements of the electricity system, utilities raise policy and technical barriers to the development of locally owned energy projects.

Fortunately, there are **policy solutions** to these barriers, including:

- Incentives for locally owned projects, rewarding their higher economic returns to state and community.
- Community renewable energy programs (like Colorado's Solar Gardens) that codify and simplify the organization of locally owned projects.
- Virtual net metering rules that allow the sharing of electricity output among many customers within a community.
- Crowd financing rules that remove financial and legal barriers to collective efforts to raise capital.
- Feed-in tariffs or CLEAN contracts that dramatically simplify a project's cash flow.
- Abandoning the tax code and switching renewable energy incentives to a cash basis.



## Acknowledgments

Thank you to Chris Mitchell for his help in setting up the Energy Self-Reliant States blog, from which much of this material originates. Also thanks to David Morris for his thoughtful comments and review, and Jake Rounds, for reviving this report.

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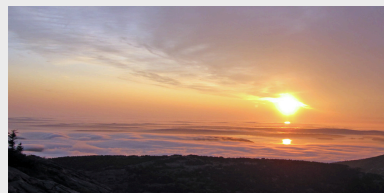
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## The Value of Local Ownership

Renewable energy is growing exponentially in the United States. Tens of thousands of megawatts (MW) of wind and solar are boosting rural and urban economies across the country.

But most clean energy projects fail to maximize the economic benefit to the communities and states where they are located by ignoring the value of local ownership.

### Local Economic Value

The rewards of maintaining local control and ownership are substantial. Locally-owned wind projects create an average of twice as many jobs as absentee-owned wind projects. And the total economic value to the community of locally-owned projects is 50 to 240% greater, as well.<sup>1</sup>

For example, a 20 megawatt wind energy project built in Minnesota but owned by Spanish firm Iberdrola would add \$20 million to the state's economy and create about 10 long-term jobs. But if that same project were owned by Minnesota farmers or Kandiyohi Power Cooperative, it would create 20 long-term jobs and as generate as much as \$68 million in economic activity for the state.

Fig. 1 Rapid Growth of Wind and Solar Power in the US

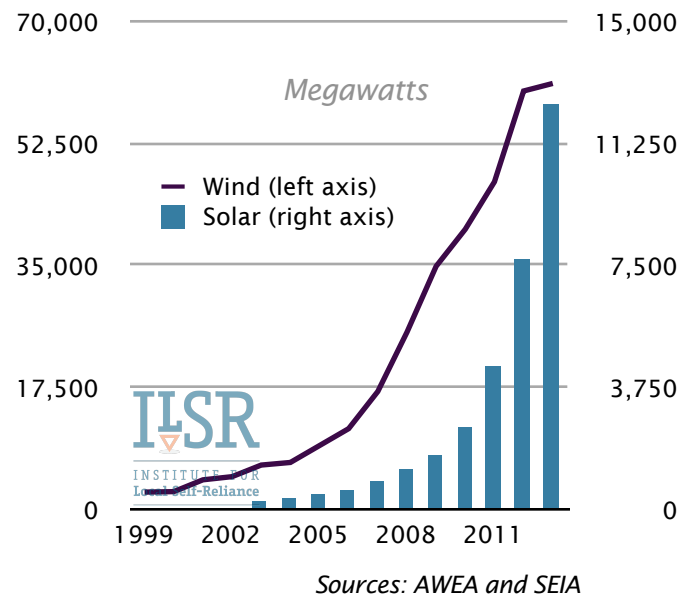
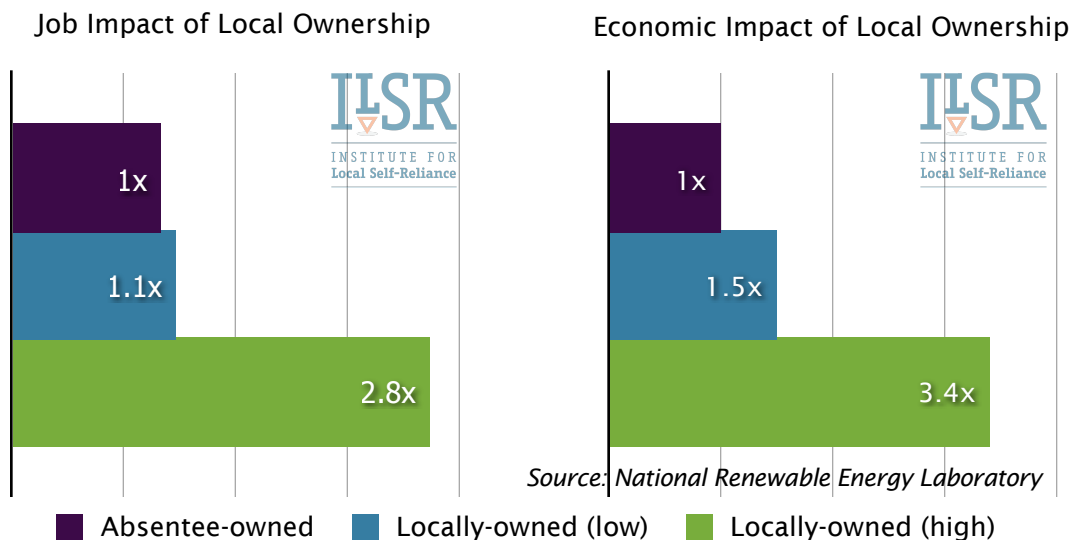


Fig. 2 Local Ownership Means More Jobs & More Local Economic Impact



Solar provides a similar long-term economic value. Installing a 1 megawatt solar project built near St. Louis, MO, would, regardless of ownership, create 28 jobs and \$3.1 million in economic impact throughout the supply chain.<sup>2</sup> But there's a huge local dollar flow advantage if the project is locally owned.

In a solar lease, for example, the benefits of the federal tax credit and accelerated depreciation would flow to the leasing company. Lease payments would also likely consume around a third of the energy savings from net metering. The result is that a locally owned 1 megawatt project would provide nearly twice the dollar flows to the local community; nearly \$5.7 million in net present value over the 25-year project life.<sup>3</sup>

## Local and National Political Value

Local ownership also helps build political support for renewable energy by reducing resistance and building a constituency to support expansion of renewable energy production.

Many wind power projects have come under fire from nearby residents in the United States, often claiming ill health effects from the turbine noise or shadow. It's not that people are made physically ill by new renewable energy projects. Rather, they are sick and tired of seeing the economic benefits of their local wind and sun leaving their community. Opposition to solar projects is less common since the physical presence is much smaller, but some large-scale solar projects planned for deserts of the Southwest have come under fire for the environmental impact of development on virgin desert land.

Such opposition is perfectly rational, since investments in renewable energy can be quite lucrative (private developers and their equity partners routinely seek 10 percent return on investment or higher). In most cases, renewable energy is absentee-owned and the lion's share of economic value leaves the community.

Of course, not-in-my-backyard (NIMBY) rarely manifests itself as an economic argument, and there's a good reason for that. In the typical project development process, there are precious few opportunities for public comment, and almost all of them represent up-or-down votes. None offer an opportunity to change the structure of the wind or solar development to allow for greater local ownership— And no project will be halted simply because it isn't locally owned. On the other hand, projects can and have been stopped on the basis of health and environmental impacts. Some people call it Wind Turbine Syndrome.



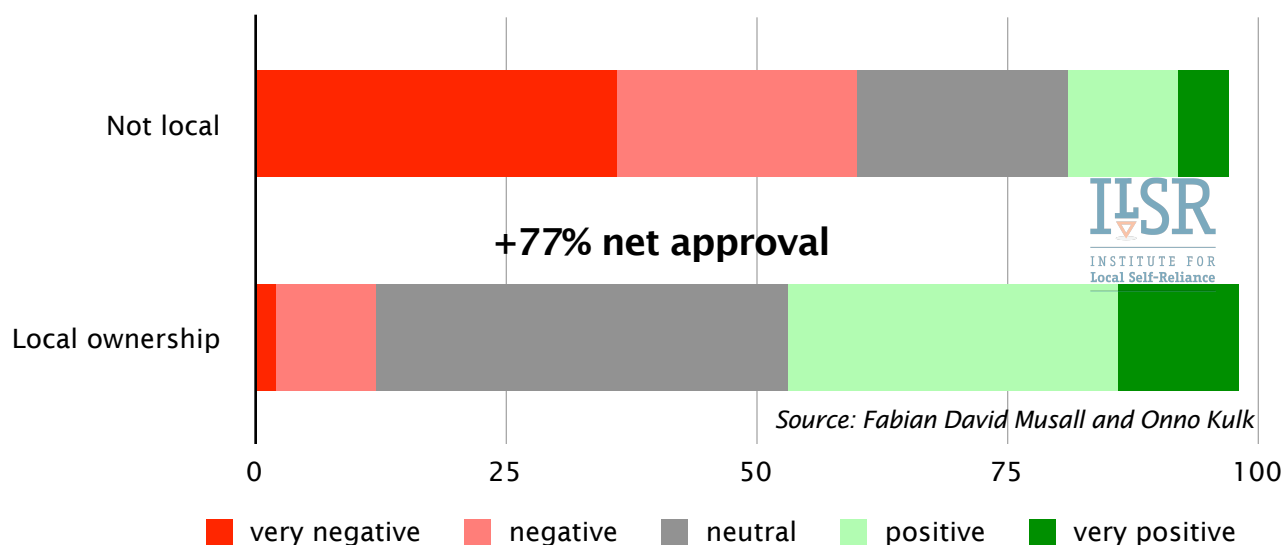
The result is long delays and higher costs – at best – for many wind power projects, as restrictive siting rules and resistance to new transmission infrastructure effectively kills many proposed wind farms.

A European study of strategies for developing renewable energy projects found that renewable energy developers would find more local support for their efforts if they focused on the ways they can benefit the community. The study authors categorized these mechanisms as addressing local environmental, opportunism, and NIMBY concerns:

*In a sentence: people want to avoid environmental and personal harm and share in the economic benefits of their local renewable energy resources and developers will increase their chances of success by addressing local desires.<sup>4</sup>*

In a study published in “Energy Policy” in 2011, authors found significantly higher support for expanding wind power production when an existing wind power plant was locally owned. Looking at two German towns, each with an adjacent wind park, the study found that local ownership increased the net support for additional wind power (support less opposition) from -44% to +33%: a shift of 77 percentage points!<sup>5</sup>

Fig. 3 Local Ownership Dramatically Improves Attitudes Toward Wind Power

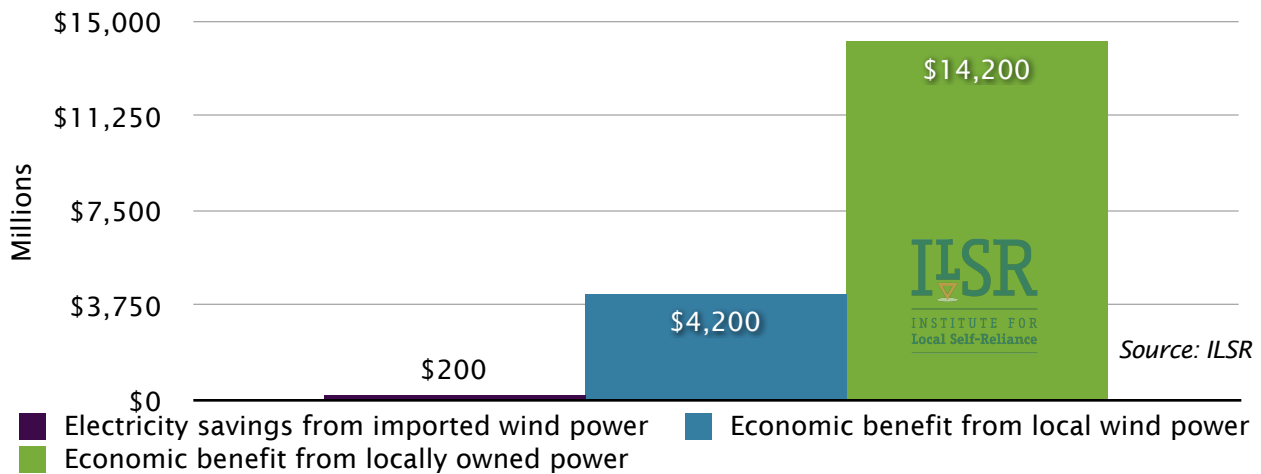


Thus, local ownership is not only good economic policy. It is good politics.

Expanding local ownership can build public support for policies favoring renewable energy, from state renewable energy mandates to federal tax incentives. Already, several state legislatures have debated bills to undermine state renewable energy policies and Congress has debated terminating incentives for wind and solar power in the name of fiscal conservatism. In an era of hostile state legislatures and deep federal deficits, strong public support for renewable energy will be essential to keep the market for wind and solar power alive.



Fig. 4 Missourians Get Much More from Local Wind Power



### State Economic and Policy Value

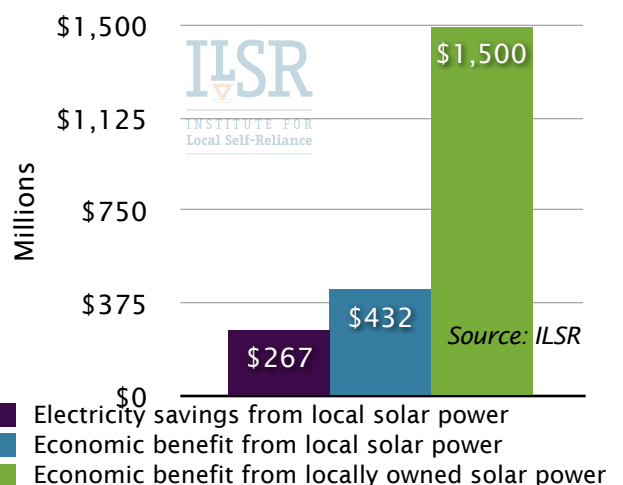
Consider what is happening in Missouri. Residents may lose out on their best opportunity for clean energy benefits. In 2008, voters approved a state renewable energy standard with a two-thirds majority, requiring utilities to get 15% of their power from renewable sources within the state or nearby. But in January of 2011, the Republican-controlled legislature fired the first salvo against Proposition C, stripping the “buy local” provision from the law and allowing Missouri utilities to acquire renewable energy via accounting rather than constructing wind and solar projects in the state.

Opponents to the original renewable energy law have cited high costs, but their actions are heavy with irony: the economic benefits of keeping the “buy local” provision are at least 20 times higher than the savings from importing renewable energy from elsewhere.

Assuming a generous savings of 1.5 cents per kilowatt-hour from remote wind power, Missouri ratepayers could save – at best – about \$200 million by importing electricity from the windiest Midwestern states. But these savings are dwarfed by the economic value of in-state renewable energy. The economic benefit of a single 2-megawatt wind turbine is \$2 million, according to the American Wind Energy Association. If the state met its renewable standard with in-state wind instead of imports, the economy would gain at least \$4.2 billion and over 3,000 jobs. If that wind power were locally owned, the economic value could rise as high as \$14 billion, supporting nearly 9,000 jobs.<sup>6</sup>

A similar and significant benefit is possible for Washington, DC, where getting nearly 20 percent of its electricity from rooftop solar PV could provide the District with nearly 15,000 jobs and \$1.5 billion in economic activity. Once again, local ownership provides the impetus for the largest economic gains from more energy self-reliance.

Fig. 5 Benefits of Solar “Home Rule” (20% Solar) for D.C.



## Barriers to Ownership

Unfortunately, local ownership is restrained by federal and state policies. The biggest barrier is the system of federal tax incentives that leaves only the wealthy and large corporations able to participate in renewable energy projects.

For solar, a 30% federal tax credit and accelerated depreciation favor commercially-owned projects that can use depreciation. The tax credit also means that investors in solar need substantial tax liability to make full use the tax credit. Half of American families pay too little in taxes to use the Investment Tax Credit for a rooftop solar array.<sup>7</sup>

The situation is even worse with wind power, where federal tax rules limit the Production Tax Credit to passive income (essentially, business income). Thus, most Americans are unable to effectively use the federal incentives to become renewable energy producers.

The result is that the few successful community-owned projects have to do executive financing acrobatics, executing deals like the “Minnesota flip,” “sale/leaseback,” and “inverted lease” to find an arrangement that preserves some of the value of the federal incentives while allowing local participation.<sup>8</sup> In each of these situations, the local owners have to take on an “equity partner” who provides some of the upfront cash for project development in exchange for the federal tax incentives. Of course, this equity partner takes its cut, so much of the tax incentives are diverted to the equity partner’s bottom line rather than buying down the cost of wind or solar power. And all of that revenue leaves the local economy.



Credit: Chris Gaw

Local Ownership Requires Financing Acrobatics

Federal incentive	Ownership Barrier
Accelerated depreciation	Only available to commercial renewable energy projects, not residential.
30% Investment Tax Credit (solar)	Requires substantial tax liability that half of Americans lack, also precludes cities, non-profits and cooperatives.
Production Tax Credit (wind)	Can only be used against business income, also precludes cities, non-profits and cooperatives.

The recession that started with the 2008 financial crisis provided an opportunity to quantify the costs of the tax credit scheme and to understand its impact on project ownership. In

2009, Congress converted the tax credits into cash grants. Thus, a wind or solar project wouldn't need a lot of tax liability to use the incentive (though they still had to be a taxable entity).

The rationale behind the cash grant was revealing. Using equity partners to finance wind and solar projects requires equity partners have a steady income (and tax bill). When the recession destroyed the balance sheets of most financial firms, the tax equity market also dried up (see graphic). No tax equity meant no wind or solar projects could be financed. Renewable energy projects were only narrowly saved by a temporary transition of the federal tax credits to cash grants.

While the cash grant program was developed to save the industry from poor policy design, it had two unintended benefits.

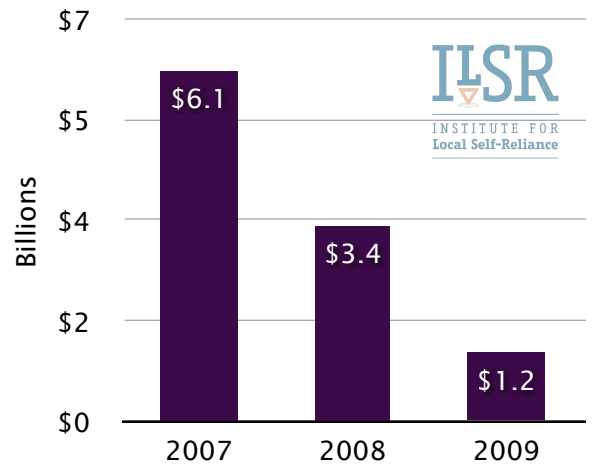
On the one hand, it saved money. A study of the cash grant program released in 2011 revealed that because local developers sold their tax credits to equity partners for as little as 50 cents on the dollar, cash grants were twice as effective as tax credits for renewable energy development.<sup>9</sup> In fact, using tax credits instead of cash grants for wind and solar projects increased the cost per kilowatt-hour produced by 18 and 27 percent, respectively.<sup>10</sup>

The cash grant not only saved the renewable industry from the failing tax equity market, but meant that fewer projects had to use equity partners at all. The ratio of solar projects owned by third-party investors fell during the recession as developers able to use the cash grant no longer needed tax equity partners.<sup>11</sup> One 7-turbine wind project in South Dakota, for example, was able to pass the cash grant through to 600 local investors.<sup>12</sup> Unfortunately, the cash grant program expired at the end of 2011, shuttering the brief window of opportunity for more local ownership.

There are four other barriers to local ownership of renewable energy projects.<sup>13</sup>

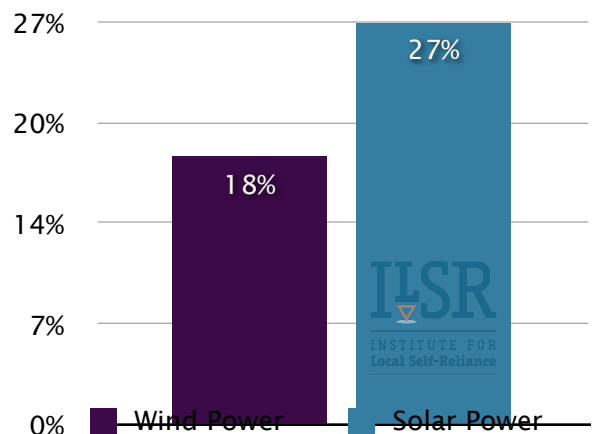
One is the tradition of centralized ownership and control of the electricity system in vertically integrated utilities, uninterested in losing market share.

Fig. 6 The Shrinking Tax Equity Market



Source: ILSR

Fig. 7 Increased Cost of Renewable Energy Projects When Using Tax Credits Instead of Cash Incentives



Source: ILSR

Another barrier is the expense and legal complication of organizing multiple investors. The most likely strategy – forming a cooperative – is often precluded because most cooperatives don't pay taxes and therefore have no tax liability to assuage with federal tax credits. The second-best strategy of a public investment offering is often hindered by and Exchange Commission registration rules that make such a program very expensive for small projects.<sup>14</sup> Thus, the few successful community-owned projects tend to rely on complex partnerships with tax equity firms that let much of the project's revenue slip out of the local economy in exchange for access to federal tax incentives. The 2012 federal JOBS Act has promised to allow more crowd financing opportunities, but the rules haven't been finalized by mid-2014,<sup>15</sup> and the only guidance thus far is that these crowd solicitations should not use social media to advertise.

A third additional barrier is managing complicated cash flows. A U.S. commercial solar project may have revenue from as many as four sources: energy savings from the utility, a state or utility rebate, federal tax credit, and federal accelerated depreciation.

A final barrier is the electric utility, which raises supposed technical limitations to installing more local solar or wind power. Regulators tend to defer to utilities over technical issues, causing hardship for local projects attempting to get online.<sup>16</sup>

## Models for Ownership

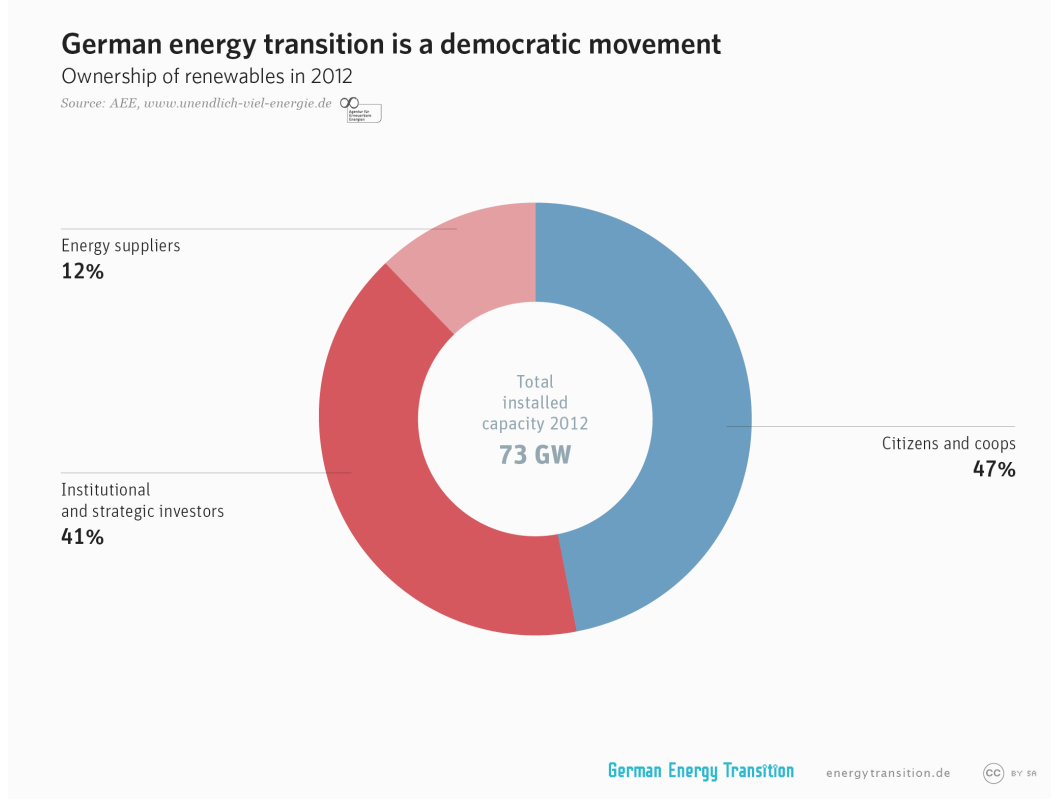
Despite the challenges of realizing local ownership of renewable energy, a few models have emerged to make it easier to achieve and more replicable.

In Germany, a renewable energy policy called a feed-in tariff (also known as CLEAN Contracts in the U.S.) provides any prospective renewable energy producer with a guaranteed, long-term contract and grid connection at a financially attractive price. The simplicity has helped induce over 73,000 megawatts of renewable energy by the end of 2012, with over half that owned by individuals.<sup>17</sup>

This CLEAN Contract policy has also been enacted in North America, including Ontario, Vermont, Hawaii, and by municipal utilities in Gainesville, FL, and San Antonio, TX.<sup>18</sup> However, through mid-2012 only 132 megawatts of renewable energy had been installed under U.S. CLEAN programs out of program capacity of over 1200 megawatts. Additionally, most U.S. programs set their prices on the presumption that developers will use federal tax incentives, undercutting much of the potential to support local ownership.

Few local ownership policies have been adopted in the United States and, to date, their impact has been modest. There are two policies in Minnesota supporting local ownership. One is the Community-Based Energy Development statute in Minnesota, which requires utilities to offer a separate tariff to community-based projects that meet certain thresholds for local ownership and local benefit.<sup>19</sup> The policy has helped to develop over 100 MW of locally-owned wind power since 2005. Minnesota's early use of a production incentive for

Fig. 8 Germany's Massive Renewable Energy Market is Dominated by Local Ownership





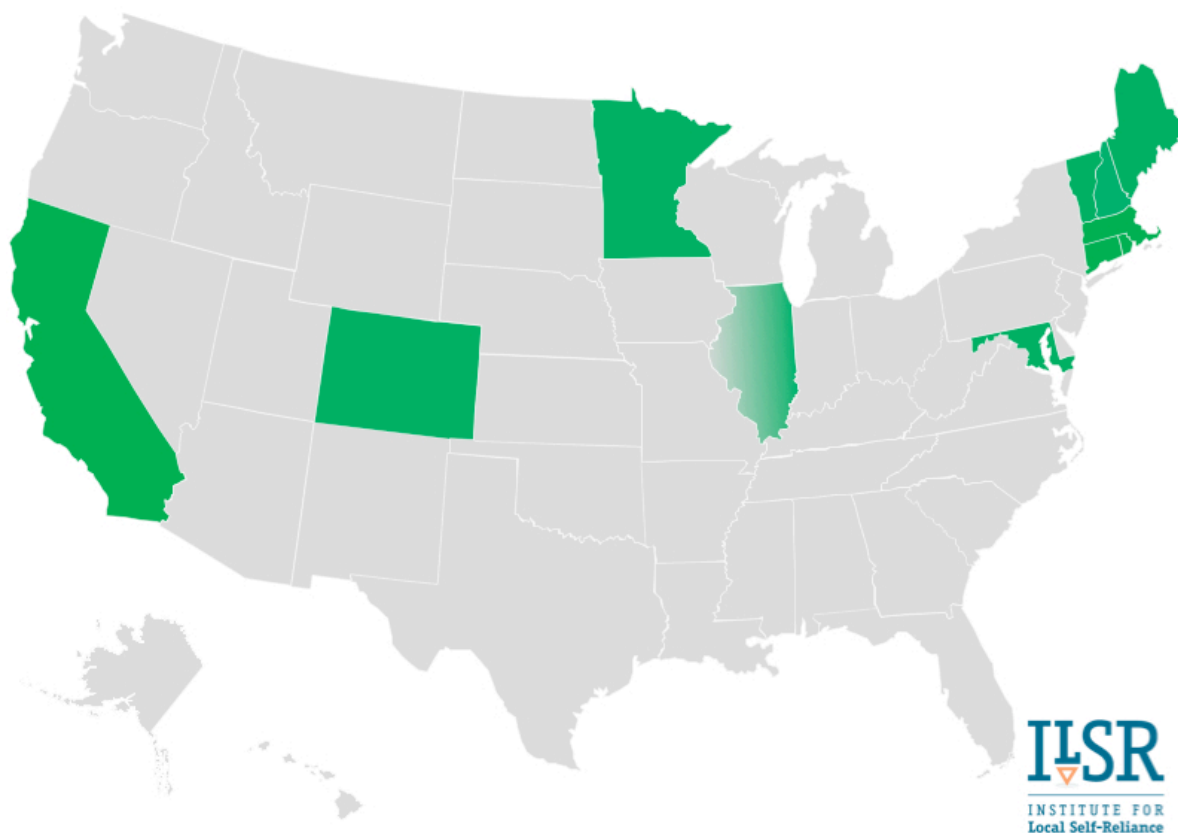
small wind projects (2 MW and smaller) that helped birth the community-wind industry in the state.<sup>20</sup>

Washington state has a community solar policy supporting 75 kW and smaller solar projects owned by public entities or utilities (but voluntarily ratepayer funded). The significant incentive (\$0.30 per kilowatt-hour) has so far only been claimed by two solar projects.

Other models have tried to adapt to the existing, if flawed, renewable energy policy framework. For example, a law in Colorado establishes a type of community solar called Community Solar Gardens. Colorado utilities are obligated to buy at least 6 MW of power from these small-scale solar projects (up to 2 MW), with each project having at least 10 “subscribers.”<sup>21</sup> Projects can be built and financed by organizations that can use federal tax incentives, but then individuals can subscribe to get a proportional share of the electricity output from these solar gardens. The solar gardens should broaden participation in solar electricity generation while skirting some of the barriers to ownership.

While the Colorado program is relatively small, it has given birth to other community solar and “virtual net metering” policies that allow multiple electric customers of a utility to share the energy output from a shared solar array. The following chart shows the 11 states with virtual net metering policies enacted through February 2014.<sup>22</sup>

Fig. 9 Virtual Net Metering Offered in 11 States by 2014



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Source: ILSR

With and without the community solar laws, a number of interesting community ownership models have arisen to accommodate a difficult policy environment.

A community wind project in South Dakota also succeeded in attracting over 600 local owners in a clever strategy. Four local agricultural trade organizations bought seven turbines out of a larger, adjacent wind project being built by the local electric cooperative and solicited their members to buy shares. The project was able to pass the federal cash grant through to individual investors, and used an “intra-state” offering to avoid the costs of a full Securities and Exchange Commission registration. Unfortunately, the model may be of limited value since the cash grant in lieu of tax credits has expired.<sup>23</sup>

One strategy that allows individuals to become shareholders in solar power without buying into a specific project is the SolarShare bonds being sold by a non-profit in Ontario. The bonds provide a 5% annual return on investment and will be used to finance solar power projects in Ontario (made into a lower-risk investment by Ontario’s feed-in tariff program).<sup>24</sup> This allows any Ontario resident to see a return on investment and a small slice of ownership in the solar energy economy.

A California company, Mosaic, is pioneering a similar strategy in the U.S. Investors in California and New York (and soon other states) can be financiers of local solar projects, providing low-cost financing and earning a modest return on investment.<sup>25</sup>

With fewer than 1 percent of U.S. renewable energy capacity in locally-owned projects, the unfortunate truth is that successful local ownership is the exception rather than the rule. The successful projects tend to combine one-time funding or ingenuity in a fashion that satisfies complex federal and state requirements without easy replicability.

## Policy Makes a Difference

- Feed-in tariffs or CLEAN Contracts that offer a comprehensive price for power (exclusive of tax incentives) could open the door for a variety of local ownership structures and dramatically simplify financing.
- Changing federal tax incentives into refundable tax credits or converting them permanently to cash grants could also reduce the burden on cities, non-profits or cooperatives in financing renewable energy projects, broadening opportunities for ownership and the pool of capital for renewable energy investments.
- Even small changes, such as statewide virtual net metering rules that allow many people to share the electricity from a single, centrally-located community-scale power plant could make it easier for locally-owned energy projects to capture economies of scale and simplify financing.

The economic benefits of local ownership justify changes – some small, some large – to American energy policy.

## Further Reading

- [Energy Self-Reliant States](#) – an ongoing web resource on distributed renewable energy
- [Community Solar Power: Obstacles and Opportunities](#) – profiling nine successful community solar projects and the policy changes needed to make community solar easier
- [Energy Self-Reliant States, 2nd edition](#) – a groundbreaking atlas of state-by-state renewable energy potential
- [Democratizing the Electricity System](#) – a guide to the transition from a centralized, 20th century grid system to a 21st century, decentralized electricity system
- A [Rooftop Revolution](#) – a series of two reports and other resources about the transformational opportunity of rooftop solar energy.
- The [Future of Solar Economics and Policy](#) – an extensive analysis of how solar will work for utilities and solar customers over the next decade.

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