

A Vision for Community-Focused Energy Systems

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Introduction:

This section was written by Matthew Siegel & Susan Shobeiri.

“Community-Focused Energy Systems” refers to systems that facilitate the transition to clean energy by not only reducing carbon emissions but also democratizing power. The term references a movement to begin empowering local residents, municipalities, and organizations to generate, manage, and benefit from the clean energy sources that they can own. With energy independence comes resilience to outages, disasters, and overloading. Thus, community energy may offer a safer, cleaner, and more reliable way to harness electricity everywhere. This idea is already coming to fruition in some localities, but it is far from widespread.

The catalyst for this movement is modern technology and modern policy. Community energy can start with the individual but expand to entire communities that have control over their source of electricity and a say in where it comes from. The components of community energy systems have been well studied, tirelessly fought for, and successfully implemented in many places across the world. Community leaders, policymakers, and experts in the field have been making progress on community energy systems for decades, but more work needs to be done to establish this as standard practice.

Community energy is about connecting people and moving forward with solutions that will help protect this planet. Burning fossil fuels for electricity has created demonstrative harm to the climate, environment, and communities, so it is time for a system-wide transformation with clean and renewable resources at its heart that puts the power directly in the hands of localities and people. Building sustainable energy systems within communities is a real, important, and possible way to protect the environment and people. Critical to this transformation is understanding how existing regulations may create barriers to implementing alternative energy systems. Electrical utilities might be made to work with the interests of the broader community by rewriting the default incentives from long-distance fossil fuels to local and sustainable alternatives.

The main focus of our research is outlining a vision for a clean energy transformation that enables communities to have more control, choice, and access than in the current corporate utility-dominated electricity system. The work references solutions such as Community Choice Aggregation programs and microgrids as a pathway toward grid modernization and decarbonization. The research addresses not just community and residential solar, but other distributed energy solutions and storage technologies as well. We spoke to experts to gather insight on how different geographical areas, organizations, and disciplines are approaching these challenges and finding solutions that are deeply entrenched in community needs and priorities. This report provides definitions of many such solutions before providing themes from and edited transcripts of our conversations with experts. Finally, we organized a panel discussion event with

three of these experts to share these visions with our peers and other experts, which can be found [at the course website](#).

Background:

This section was written by Matthew Siegel.

We begin with foundational definitions and key features of select core concepts:

Community Choice Aggregation (CCA):

Local governments procure electricity on behalf of their residents. These programs often insist on putting a greater focus on renewable energy and the voices of local people in choosing their energy supply.

- **Local control:** Municipalities choose where electricity comes from.
- **Consumer opt-out model:** Residents are automatically enrolled but can opt out, providing incentives for the adoption of safer and cleaner energy models.
- **Renewable emphasis:** Many CCAs meet and exceed state renewable portfolio standards.
- **Price competition:** CCAs can often offer lower or stable rates through bulk purchasing.
- **Democratic engagement:** Community voices influence procurement decisions and goals.

Microgrids:

Localized grids that can operate independently or in conjunction with the main grid, offering resilience and autonomy during outages.

- **Islandable operation:** Can disconnect from the main grid and operate independently during outages.
- **Localized energy:** Often powered by local renewables like solar and storage.
- **Improved resilience:** Critical services like schools, hospitals, and shelters stay powered during disasters.
- **Scalable:** Can serve anything from a single building to an entire neighborhood.
- **Energy independence:** Communities gain private control over their energy systems.

Distributed Energy Resources (DERs):

Decentralized energy sources refer to technologies like rooftop solar, home batteries, and smart appliances that reduce reliance on centralized power plants.

- **Decentralized generation:** Energy is produced precisely where it is consumed, reducing transmission losses and providing resilience through spreading out generation.
- **Energy savings:** Households can lower their electricity bills through self-consumption or net metering. Neighbors producing more than they consume can support the community.
- **Grid support:** DERs can also provide backup power or sell energy back to the grid.
- **Flexible and modular:** Systems can be sized to meet individual needs or expanded.
- **Emission reductions:** Reduce reliance on fossil-fuel-based electricity at all costs.

Grid Modernization:

A general term for improving electricity distribution, collection, and storage technology to account for modern energy needs and the transition from fossil fuels to clean energy. Modernization ensures that energy is sourced sustainably and reliably. The focus of many grid modernization efforts includes protecting from natural disasters, supporting areas experiencing outages, and ensuring equity for the distribution of electricity nationwide.

- **Smart infrastructure:** Sensors, meters, and automated controls improve efficiency and outage response.
- **Resilience upgrades:** Hardened power lines and underground cables withstand climate threats.
- **Two-way communication:** Enables integration of rooftop solar, EVs, and other DERs.
- **Equity-focused planning:** Designed to ensure vulnerable and underrepresented communities are prioritized.

Virtual Power Plants (VPPs):

A system that integrates and remotely manages a network of decentralized energy resources, such as solar panels, wind turbines, batteries, electric vehicles, and demand response devices. VPPs use advanced software and communication technologies to function like a single power plant.

- **Decentralized:** Made up of many small-scale energy producers and storage units.
- **Digital control:** Uses real-time data, forecasting, and AI to optimize performance.
- **Grid services:** Can provide energy, balance supply and demand, or reduce peak loads.

Themes:

These themes were summarized by Sarah Allam.

1. **Community energy aggregation allows for more efficient allocation of resources and the optimization of community utility.**
 - “There's a virtuous cycle here that we can take advantage of if we have the right kinds of programs. Whether through a community aggregation program or something else, the community administrator can bring these programs to the entire community. They can do community solar, for example, by buying from whatever local solar project exists to serve their area's needs. There's just so much that can happen if we give them a little regulatory wiggle room to do it.” — **Baird Brown, eco(n)law LLC: Principal**
2. **The legal and regulatory energy framework that exists is largely focused on utility convenience rather than community benefit. Utilities can be leveraged in a way that delivers these benefits.**
 - “If you could just get the utility to transfer their base grid mix from 25 to 75 percent renewables, it's probably going to be cheaper for everyone, and in some ways that might be the most equitable thing. These utilities know their job is to deliver affordable, reliable power. If you can just get some of the utilities and centers to line up in the right way, they might be able to deliver equitable clean energy to communities.” — **Lacey Shaver, World Resources Institute: Senior Manager of City Clean Energy within WRI's U.S. Energy Program**
3. **The implementation of community and solar microgrids can make the overall energy grid and communities more resilient to shocks.**
 - “Let's just say you live in an apartment building. If that apartment building has a solar microgrid, that site, that building has resilience. All the other buildings in the neighborhood might go down. But if you've got the solar microgrid, that building, or at least the critical loads of that building, can be maintained from that. From that solar microgrid in the neighborhood, you could do a community microgrid. A community microgrid covers a whole grid area. So now if the broader grid goes down, we island the community microgrid. If something happens to the community microgrid, then we have the solar microgrid at that one building, right? So we've got nested layers of resilience. That's how distributed energy resources can provide resilience to communities.” — **Craig Lewis, Clean Coalition: Founder and Executive Director**
4. **It is critical to realign the incentives of utilities to lead to more community-oriented energy outcomes.**
 - “A better approach is to change how the utility is regulated because it responds to regulatory incentives. If the utility is required by the regulator to maximize distributed energy resource adoption, it will do that. So, it's all about the laws and

the regulations on the electric utility. If all you're telling electric utilities is to provide electric power at least cost, if that's the only incentive they have, they're going to put in natural gas plants. These existing incentives will not result in outcomes that would bring power back into the hands of the people.” — **Beia Spiller, Resources for the Future: Director of the Transportation Program**

Interviews:

This section was written by Susan Shobeiri.

We conducted interviews with the following experts:

- Baird Brown, eco(n)law LLC: Principal
- Allie Detrio, Reimagine Power: Chief Strategist
- Jim Dodenhoff, Silent Running Clean Energy Advisory Services: Principal
- Beia Spiller, Resources for the Future: Director of the Transportation Program
- Lacey Shaver, World Resources Institute: Senior Manager of City Clean Energy within WRI's U.S. Energy Program
- Craig Lewis, Clean Coalition: Founder and Executive Director

We asked each expert the following questions:

1. Does local, state, and federal policy in its current form create regulatory barriers for community-based solutions? How can these be alleviated?
2. How can the optimization of distributed energy resources foster community resilience and sustainability?
3. What should we be doing to bring about a more community-focused energy system?

These core questions were followed by personalized questions based on the expert's work and depending on how the conversation went.

The remainder of this document includes edited transcripts of our conversations with the experts. They are not word-for-word transcripts but are intended to capture the expert's intent and perspective in a more streamlined manner. Each transcript was reviewed by the respective speaker. They are compiled in the order interviews were conducted. Some interviews include key quotations in bold print.

Baird Brown

Baird Brown is the principal of eco(n)law. His practice is devoted to taking effective action on climate change and on issues of energy and environmental justice. He assists in the development of innovative programs and strategies for widespread adoption of energy efficiency, renewable energy, and other sustainable technologies. He has helped develop pooled procurement and financing techniques for energy efficiency and renewable energy and has structured public-private partnerships for a broad array of infrastructure projects. Baird also advises on energy policy issues and represents clients before energy regulatory agencies. He helped form and serves as counsel to the Microgrid Resources Coalition. Baird has played key roles in organizations that advance energy and sustainability goals. He served as a co-chair of energy-related committees of the American Bar Association (ABA) and the International Bar Association, and he was a principal author of the form Renewable Energy Credit Purchase Agreement for the American Council on Renewable Energy (ACORE), the Energy Markets Association, and ABA. He serves on the boards of non-profit organizations that work for community revitalization and energy justice.

Interview transcribed by Susan Shobeiri.

Susan Shobeiri: What should we be doing to bring about a more community-based energy system?

Baird Brown: The big switches are that you have to change the utilities incentives and business model, which is a big job. Maybe half the states have adopted authorization for decoupling of rates and incentive rate-making. Pennsylvania has, but it's never been used. It was adopted in the late 1900s, so it's just sitting there. A bunch of states adopted retail sales, which is one kind of opening. I've been telling anybody who will listen that if you have retail choice, you can do community energy. You just have to form what in Pennsylvania is called an energy generation supplier, but in other states has different names. A retail energy supplier could, in principle, supply electricity to its neighbors or friends, or a community solar project, or whatever, but it has to supply the entire amount of energy, not just whatever they make from their power plant. Ten or eleven states now have community choice aggregation.

Susan Shobeiri: Does policy in its current form create regulatory barriers for community-based solutions? It sounds like it depends on where you are in the country; is that correct? Can you explain alternative regulatory solutions that you have proposed, such as a transactive energy tariff system?

Baird Brown: The answer is almost always yes. For example, you would think California, with its kind of own environmental laws, including the EPA exemption that at least it still has today and all its public fights with the administration, would be great. But the Public Utility

Commission in California enacted microgrid legislation back in 2017 and spent seven years doing nothing, and just recently closed the proceeding. I mean, they literally fought off every attempt at reform that would have made it easier for microgrids. It was just one of the more frustrating experiences of my career, and the Administrative Law judge who was assigned to the case kept issuing orders in which they completely misstated what all the opponents, all the people who were in favor of microgrids, had said. He just lied outright about what we said, and then said, therefore, you can't grant this. It was just frightening. **Even in a place like California, these regulatory barriers can be very persistent.**

California does have community choice aggregation. It's taken off, and it's almost a third of the state's load now. However, the state has failed several times to enact successful community solar legislation. It has legislation, but it's just so messed up that nobody uses it. And finally, unions are dead set against anything that allows anybody but a utility to build anything. So it's a hard combination to beat sometimes.

Susan Shobeiri: The final broad question we have is, how can the optimization of distributed energy resources foster community resilience and sustainability? Getting more to the heart of why these are solutions that can work better for everyone, and why there may be a different system that could be a better solution if it's implemented.

Baird Brown: So, one of the things I've been doing for the last 15-20 years is energy efficiency and solar. Back in 2011, I helped something called the Delaware Sustainable Energy Utility do its first pooled bond issue for energy efficiency projects for multiple state agencies and school districts. Now I represent the Philadelphia Energy Authority, which is particularly focused on programs to get energy efficiency and solar electrification for low- and moderate-income families in Philadelphia. We have a solarized program that I think is now the biggest in the country. We've done about 20 megawatts of solar, one rowhouse at a time. We're at 3,000 homes at this point. We also have programs to do combined energy efficiency and home repairs, utilizing all the federal programs, all the state programs, and all the local charitable programs, and combining them. So you get one-stop shopping for home repair, although I think we've only done several hundred homes, as it's a more expensive program. The solar pays for itself, once we get a lease program that doesn't require any down payments or other financing. Something like 45% of all the solar projects we've done are for low and moderate-income people without any subsidy at all.

One of the lessons is that programs work. People don't necessarily have enough knowledge to jump on and do things for themselves, and that's not just low and moderate-income people. It's communities. For example, the fact that we're doing this community choice aggregation for eight boroughs. They're all comparatively small jurisdictions. They don't have enough staff to do this for themselves. We're bringing in a framework where there's

an administrator, and they can actually combine their purchasing power across all eight boroughs. I'm aware of how other electric co-operatives and community-type organizations make efforts to do the same thing. I think that those kinds of programs make a huge difference.

The thing that you want to be able to do, and the reason why solar has worked here, is for people to get the benefit of what they install. For solar, that's easy, because you displace more expensive utility power. For energy efficiency, it's tougher because you save on your own energy bills, but roughly half the savings are on the utility side of the meter. Active energy efficiency can really be a demand response program as a real-time replacement for reserves and calling on other large generating resources. And these responses are local, which often means you can capture all the benefits of local power: saving line losses, improving efficiency. And if you do it in microgrids, you also get resilience for the local community. Many benefits can be combined with these programs.

But what you really get is not just the value of feeding into the wholesale market, but you also gain the ability to manage problems for utilities. That's what we proposed on behalf of the Microgrid Resources Coalition in California when they introduced the demand flexibility proposal and wanted to require all utilities to have a tariff. The utilities, and even the Commission staff, came back with these really complicated calculations. They were designed to pay people three, four, or five times the energy price at peak load—but only then. It wasn't relevant the rest of the time. So we proposed a system tied directly to the wholesale price, which worked 100% of the time. It depends on having a home controller that manages your energy use—and those now cost just \$100–\$200. A lot of people are building them, and they're getting better all the time.

We proposed a system that would carry wholesale pricing all the way into the distribution system, using pricing software agents at every substation. So as you go down the layers of the grid, you see the flows and send price signals to the residences and businesses in the area served by that substation, modifying the price based on demand and congestion at that particular substation.

It's actually fabulous. It's better than most virtual power plant designs because you only need one-way communication—not two. All you have to do is send a price signal, watch the flow, and adjust the price accordingly. There's no need for people to bid from individual homes or send signals back, which also makes it more secure. Nobody has access to your system, as it's just one-way to the residence. And it's got everybody helping out, all the time.

The point of all that—from the perspective of an agency like the Philadelphia Energy Authority—is to capture the value of those savings and let people get paid for them. That

helps pay for the installation of energy efficiency improvements in the first place. So there's a virtuous cycle here that we can take advantage of if we have the right kinds of programs.

Whether through a community aggregation program or something else, the community administrator can bring these programs to the entire community. They can do community solar, for example, by buying from whatever local solar project exists to serve their area's needs. There's just so much that can happen if we give them a little regulatory wiggle room to do it.

Jim Dodenhoff

Jim Dodenhoff is a principle at Silent Running that he founded in 2019 based in Culver City, California. Silent Running is focused on providing clean energy consulting and development services to both for-profit and non-profit firms, specializing in microgrid development, energy efficiency, clean energy finance, water-energy nexus projects, enterprise-wise sustainability initiatives, facility resiliency, and business model and business plan development. Dodenhoff has 25 years of experience within the energy and environmental services industry including past roles such as Director of Business Development at IPERC (Intelligent Power and Energy Research Corporation), where he was responsible for expanding the market and building partnerships for Microgrid control hardware and software solutions. As well as many other lead roles within other environmental companies in California. He has helped write grant applications for battery materials processing and battery manufacturing and advanced energy manufacturing and recycling. In addition to leading multiple consulting engagements for renewable energy development. Dodenhoff is also a part of organizations such as the Association of Energy Engineers and the Municipal and State Sustainable Energy Edge Forum where he advises and presents on issues such as Community Solar and Sustainability Workforce Development.

Interview transcribed by Lily Hall.

Lily Hall: What should we be doing to bring about a more community-based energy system?

Jim Dodenhoff: You have to understand what's happening in your community. For your research, Boston is a great laboratory. **You have to understand what that structure is, and then dive into it to understand whether it's working or not. “Working” has a definition in terms of what the objectives are. Is it reliable? Is it resilient? How about cost in Boston? Boston is another really good incubator, because, unlike, say, Kennebunkport, for example, you have a very diverse community there. So Boston is diverse, is it? Is it maybe affordable**

for some people and not for others? My encouragement to you would be to really focus on what you have locally.

Matthew Siegel: What is grid modernization, and how is it important for community resilience and sustainability?

Jim Dodenhoff: Grid modernization means a few things. **One is that we need to have a more resilient grid. We need to have a grid that is better capable of withstanding extreme weather events.** Extreme weather event risks are cold weather, hurricanes, northeasters, and things of that sort. The folks at National Grid, Eversource, or other utilities are focused on grid power, or grid modernization, which has a lot more to do with hardening for wildfires.

Now, Matthew, to your question, specifically, is grid hardening a thing, and what's important about it? So I think two things are going on. **We have to make what we have more resilient, then work towards a world where the grid becomes this thing that we can plug stuff into.** For example, I'm putting solar up on my house, and I'll probably have some power walls. I can do all of that. In an ideal world, I can plug this into the grid easily. So then when we have outages, and where I live, we have lots of outages. Our electricity is not that reliable. And by the way, electricity in the United States is not particularly reliable. In relation to most of the developed world, we're about average. So, I want to be able to plug without having to wait two years for the utility. I want to be able to do that without having to screw around with standards or complicated regulations.

When I say, take advantage during an outage, what does that mean? Take an example of wildfires about five miles from my house. I was not impacted by them, but I looked out my window and smoke was everywhere, and I lost grid electricity. I want to be able to use those assets, and in many cases, distributed energy, for many reasons that are really technical, will go down when the grid goes down. **So, this idea of being able to island my assets and being able to rely upon those at least for critical load during outages is key. When utilities go before the commissions and say they want to do some grid hardening, it's very important to understand what exactly they mean. Why is it superior to what we have? And how will it achieve? How will it achieve some of the key technical goals that a guy like a mechanical engineer would be looking towards? The other thing to get a little bit off script, but I suspect you're looking at this in your project, is, oh, by the way, how will hardening the grid in the city of Boston help create jobs and workforce development for people in the city of Boston? How will it benefit disadvantaged communities in the city of Boston?**

Beia Spiller

Beia Spiller is the Transportation Program Director and a Fellow at Resources for the Future. Spiller received her PhD from the Department of Economics at Duke University, continuing on to do postdoctoral research at Resources for the Future. Spiller worked at the Environmental Defense Fund as a Lead Senior Economist in the electricity regulation space before moving to work at Resources for the Future as the Director of the Transportation Program. Since then she has focused on building the transportation program and its focus on the electrification of vehicles with her primary field being Energy and Environmental Economics. Her work has included research on public and private transportation, vehicle electrification, electricity pricing and regulation, energy policies, taxes on gasoline, distributed energy resources, environmental justice, and health impacts of air pollution. Spiller was also a Board Member for the Association of Environmental and Resource Economists from 2022-2024.

Interview transcribed by Lily Hall.

Susan Shobeiri: Does local, state, and federal policy in its current form create regulatory barriers for community-based solutions? And how can these be alleviated?

Beia Spiller: I think that broadly, the way that policy is made does not provide many opportunities for community engagement. Policy is made through negotiations and closed backrooms. Even when we talk about really local policy, like utility policy, these issues emerge. Having been part of those negotiations, we would have to go up to Albany, spend four hours in a room having a conversation, and take the train back. I'm talking about a full day to participate in utility policymaking. Now, I was at a large green organization, so I could just go. But think about all those people in community groups who are completely at capacity already. You're telling them that to participate, to have a voice in these negotiations, they need to take the entire day off. Otherwise, they don't have a voice.

I decided to look at the cost of having these negotiations. I actually came up with a dollar value. This is what you're costing society by making us go up to Albany to participate. It's not just time, it's money. After that, they opened up a virtual attendance. It's little things like that. **If you're not able to be in the room and you don't have the time and the capacity to go and lobby, then you're not able to have the power in policymaking.**

It's even worse at the federal level, because at the federal level, policies are made by Congresspeople, and Congresspeople are influenced by how people come and talk to them, giving them input. You have to create a relationship with that Congressperson so that they trust you. You think that a community-based organization with five people is going to be able to fly out to Washington and create a relationship with multiple Congresspeople to be

able to argue their case? The way that policy is actually made is by the powerful. It is made by the people who have the capacity, and that generally excludes communities.

Now, there have been attempts made to set this policy in a way that involves community engagement. **I think that cities are going to have an easier time implementing local policies with community voices. It's a much smaller group; usually, a lot of community organizations already know their representatives locally.** They are probably talking a lot with the mayor's office. For example, I'm on a group called a transportation equity table. These are all community groups here in New York City, and they're always talking about how they went to the mayor's office. They have standing relationships with the local decisionmakers, so I think it's a lot easier for them to have influence at that level. But once you get to the state level, the connections are a lot weaker.

Then at the federal level, it's really hard. **Federal policy generally covers the entire nation, and community engagement is hard to do if it's not place-based. Each community is going to be so different and need different things. So, it's important for the federal policy level to have guardrails and fix broad market failures. When it comes to implementing policies that affect people locally, that's where it's even more important for community voices to be heard.**

Sarah Allam: So our next question is, how can the optimization of distributed energy resources foster community resilience and sustainability?

Beia Spiller: What we need to think about here is: what does optimization mean? Distributed energy resources are an interesting thing because, on the one hand, they provide power to the person who owns them. You don't have to purchase much electricity from the grid, so it provides your own resiliency. Let's say you have a backup generator, and that is a distributed energy resource. Power goes out, and you can continue to run. So that's a way that you can optimize the distributed energy resource to ensure resilience for things like power outages.

But at the same time, once you start putting more and more and more distributed energy resources on the system, you have this problem of cost shift. We do still really depend on the electric utility to expand the system, to allow us all to have that energy. So then the question is, what does optimization look like in that sense? Because if the energy flows back up, it will cause blackouts. In that situation, when solar goes out, maybe optimization means getting some batteries into people's homes. So that rather than just having to expand the system, you can give more control to the household, and reduce the impact on the system. Expanding the system might be an optimization solution, but there are social power questions that we have to think about when it comes to what we mean by optimal.

Microgrids are something that you mentioned earlier, which I think is a really interesting solution. Microgrids can be islanded, so power goes out, but the microgrid continues to have power. But then the question is, what's driving that power? Is it a diesel generator, or is it solar? One of the things that we had gotten really concerned about is an increase in diesel generator purchases. New York was implementing a cap and trade program. What does that mean? It means that the electric sector has a cap on the amount of emissions it can produce. That cap decreases over time, so it's cleaning the grid. But it's also going to increase electricity prices. **What we're concerned about is that as electricity prices go up, people will turn to backup diesel generators in order to supplement during high-price times. This is because there's no tax on diesel in New York. We need to think about policies that affect the other parts of our lives that have nothing to do with power, like the gasoline taxes, for example. We have to be holistic.**

I think that part of optimizing is thinking about how all these things interact in a way that results in good outcomes. Resiliency is one thing, but if everyone shifts to burning diesel power, that is bad for health. We can't prioritize resiliency above health, that doesn't make any sense, so we need to be thinking about all these potential pitfalls that might come together.

Lily Hall: We just have one final general question. What should we be doing to bring about a community-based energy system?

Beia Spiller: Part of what I think is important is aligning the incentives of the utility with the benefits of the community, because it's very hard to imagine no electric utility. The cost of having everyone be completely off the grid is astronomical. There are benefits to economies of scale, and that's what the electric utilities leverage. I would encourage you to rethink your assumptions about what's so bad about having an electric utility.

Now, we need to address the key underlying factor. Why exactly do we have an issue with the utility? Perhaps we don't like utilities that are putting in natural gas plants. Maybe you want to say that. Okay, you want to replace natural gas plants with more distributed energy. **A better approach is to change how the utility is regulated because it responds to regulatory incentives. If the utility is required by the regulator to maximize distributed energy resource adoption, it will do that. So, it's all about the laws and the regulations on the electric utility. If all you're telling electric utilities is to provide electric power at least cost, if that's the only incentive they have, they're going to put in natural gas plants. These existing incentives will not result in outcomes that would bring power back into the hands of the people.**

We need to rethink how utilities are regulated. I don't believe utilities are inherently bad—they provide a vital service, and they can absolutely coexist with things like solar

energy on our systems. In fact, solar and battery storage create a slightly smaller, more distributed electric system that allows for better coexistence and optimizes energy use across neighborhoods.

One of the challenges we face now is the growing number of electric vehicles. As more EVs enter the market, they create new pressures, especially at the neighborhood level. When just one or two homes are charging EVs, the demand isn't too bad. But if everyone in a neighborhood starts charging their vehicles at the same time, that local transformer could easily become overloaded. The typical solution would be to upgrade the transformer, but there's a smarter alternative. We can use software to optimize charging across neighbors. For example, if your neighbor is already charging their vehicle, the system could delay yours until they're done, or alternate charging cycles between homes. Automation like this can coordinate energy use to avoid local demand spikes and ensure the system runs more efficiently without requiring major infrastructure upgrades.

Allie Detrio

Allie Detrio is the Chief Strategist and Founder of Reimagine Power. Detrio has a B.S. in Sustainability with a concentration in Economics from Arizona State University. This background led her to work at ENGIE a multinational electric utilities company, the largest IPP (Independent Power Producer) and provider of energy services in the world. At ENGIE Detrio served as the Manager of Policy & Strategy, developing crucial knowledge and experience with microgrid policy. From there Detrio started Reimagine Power, specializing in helping clients “navigate continuously evolving energy policies and regulations so they can focus on innovating the way to a more sustainable clean energy future.” Detrio is also a Senior Advisor for the Microgrid Resources Coalition in addition to serving as the Board Officer and Electricity Committee Chair for the Bioenergy Association of California.

**Due to technical difficulties the transcript for this interview is unavailable; therefore, this section will consist of notes from the interview as well as Microgrid Bills Detrio has spearheaded.*

Notes by Lily Hall.

Within our conversation, Allie Detrio outlined the most prominent barriers to adopting clean energy as well as the energy policy goals for the 21st century.

Detrio outlined widespread adoption barriers in response to our question on how policy in its current form creates barriers, with her answers summarized below:

- Self-interest from government-level regulators
- The current legacy of the centralized utility business model, as created by Sam Insull
 - Centralized system of power generation and distribution that concentrates power within a single entity, resulting in vulnerability
- The conflict of interest between utility, investors, and energy-capturing entities
- Political campaigns
- Cost-of-service regulation, which focuses on sales volume and capital investment

In response to these barriers, Detrio noted how a different approach to regulating utilities and the utility model could be an answer:

- Breaking apart utilities into smaller community-level operations
- Public-private partnerships between utilities and shareholders
 - Private owners deal with operation and maintenance
 - Helps to alleviate some of the risks of new utility operation
- New utility model
 - Regulation based on performance and safety
 - Incentivization to deploy infrastructure without operating infrastructure themselves
 - Cost-saving through risk reduction

As for the future of energy policy, Detrio outlined certain goals for obtaining a more community-based energy system:

- Fulfilling the requirements of clean, sustainable energy, as well as social justice requirements
- Building a grid that is more inclusive
- Quantifying resilience
 - Tracking the monetary values of lost energy loads to determine the impacts of a power outage
 - Using monetary information to justify investments in microgrids
- Resilience as a critical issue that should be in the charge of local consumers and communities

Bills that Detrio has played an influential role in:

- In Oregon:
 - House bill 2065 (2025): **“Allows the use of a third party to study or evaluate a request to connect a microgrid to a power grid.”**
 - <https://olis.oregonlegislature.gov/liz/2025R1/Downloads/MeasureDocument/HB2065>

- House bill 2066 (2025): **“Directs the Public Utility Commission to establish a regulatory framework to allow the ownership, deployment and use of microgrids and community microgrids within the service territories of electric companies.”**
 - <https://olis.oregonlegislature.gov/liz/2025R1/Downloads/MeasureDocument/HB2066>
 - In Colorado:
 - House bill 22 (2023): **“Concerning the creation of a grant program to build community resilience regarding electric grid disruptions through the development of microgrids, and, in connection therewith, making an appropriation.”**
 - <https://leg.colorado.gov/bills/hb22-1013>
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Lacey Shaver

Lacey Shaver is the Senior Manager of City Clean Energy within WRI's U.S. Energy Program. She designs and manages technical assistance and capacity-building programs for cities, counties, school districts, community-based organizations, and universities to help them make progress towards their climate and clean energy goals.

She has a particular interest in creative program design and facilitation to drive impact and a commitment to integrating equity in local sustainability efforts. She organizes cohorts of local leaders working on similar clean energy and electrification strategies, develops tools and resources, and runs training and peer learning events to help cities decarbonize their electricity supply, electrify their transportation systems, and bring the benefits of clean energy to all.

Prior to WRI, Lacey managed education and outreach for the LEED for Cities and Communities program at the U.S. Green Building Council and launched the STAR Community Rating System, the first U.S. framework and certification program for local governments to benchmark community-wide sustainability performance. Lacey has also conducted analyses of local climate and hazard mitigation planning at The Nature Conservancy; developed data management strategies for community organizing, fundraising, and marketing at Greenpeace; and performed spatial analysis of land use and energy reliance for the Foundation for Environmental Security and Sustainability.

Interview transcribed by Susan Shobeiri.

Susan Shobeiri: Does policy in its current form, at any scale, local, state, or federal, create regulatory barriers for community-based solutions? How are these alleviated? How do you work with different municipalities to find a solution that fits within existing policy frameworks?

Lacey Shaver: There are barriers at all kinds of levels. Starting at the local level, one thing we see all the time is that local laws and bureaucratic processes can slow down the timeline for deploying clean energy resources and add additional costs. **There's a whole body of research around local policy hurdles and ways that local governments can streamline their zoning, their permitting processes, their inspection processes, and just make it a lot easier.** For example, sometimes you have to have people come out and do onsite inspections. You have to mail in your forms, but by just digitizing everything or having an automatic permit system, you can make this process more straightforward. There are a lot of things you can do to remove all of those barriers. And there's a lot of research out there that shows that those barriers do meaningfully contribute to both the total cost of installation and the timelines. If you're a community trying to install these kinds of things, you don't want to hear that it's going to be an extra six months or you're going to have \$500 worth of permitting cost. That might be a make it or break it for you, depending on your budget.

There's a host of regulatory barriers at the state-level. For example, the distribution grid is antiquated in many places. When you're looking at communities, especially low-income communities, a lot of times the distribution grid is outdated and needs a lot more upgrades, which are more costly. It can be really hard to find out any information about the distribution grid. And so, if you do have a utility commission that has mandated that some of those grids need to be public, it can help to understand some of those costs better. Issues with antiquated grids can hinder feasibility. You could have the best laid plans, and do all this work in a neighborhood, but you get there and can't install anything else. So there's foundational work. Even if you had the money, the buy-in for the project, all the scope design, the grid isn't there.

Further, things like community solar and CCA are not enabled in every state. There are plenty of states that do not allow third-party ownership at all. If you don't have that kind of state-level enabling legislation, it can really limit your choices. And sometimes it's just not even clear. I was doing a workshop for some cities in Virginia, and they were asking, what are our options? I was going through the state energy code, and I saw that they have aggregation, they have community solar programs. But once you get into the details, you see that there's only been one community solar pilot. It was a pilot. It was capped at 10 megawatts. It was way over-subscribed, and it ended 5 years ago. So even when it seems like there could be options, they may be crafted in a way that makes it too complicated to access.

Incentives are a shifting place. There are a lot of incentives that are needed, and depending on where you are, those incentives may need to be realigned. For example, California is

having some real big challenges around net metering and integrating storage. I don't know exactly where it stands. But it seems that the state believed in incentivizing solar energy, but incentivized it so much that they've created another host of challenges for themselves. And so, incentives are not the be-all end-all, and they're not a permanent long-term solution. They're certainly a tool in the toolkit, but they need to evolve. That can be challenging in itself, and explaining to the policymakers when and how to make those changes and ensure they're done at the right time and equitably is a whole process in itself.

Susan Shobeiri: How can optimizing distributed energy resources foster community resilience and sustainability?

Lacey Shaver: I think integration of DERs is a huge solution going forward. Things like virtual power plants and load and shift usage are a huge piece of the puzzle. For the first time in a couple of decades, we're in a rising electricity and load growth situation due to data center demand, and that is going to put pressure and competition. There's a need for more resources. But if there are a couple of solar farms that are coming off the interconnection queue in the state, what is the competition for them? And who's getting them? Is it the large companies? Is it cities? Is it communities? What are the costs?

There are a lot of live conversations about the cost share of the infrastructure and grid updates that are needed for a lot of these new loads and bringing them on. Who pays for these updates? Is it the large customer? Is it the data center, the manufacturing facility, or the school depot that is electrifying in Boston, or the transit agency? These large loads are coming on and do require a fair amount of upgrade. So, who is paying for it? Does the cost become shared amongst all residents? What does that look like?

I think Hawaii is a place where grid defection is starting to come up more, as rich folks have got to put solar on their roofs early, and they have pretty low costs, and then you might have some folks who didn't have the money. And then, somehow, if you're accounting by percentage of how much you're using, if you can't access clean energy because you didn't have the money because you don't have the income... do you end up paying a larger share of those infrastructure costs?

So there's this whole discussion around cost share. The biggest thing we can do is figure out how we use electricity as efficiently as possible. There's a lot we need to figure out: how to do EV battery heat pumps, solar plus solar storage. I'm really hoping to see a lot more in that virtual power plant, storage, and connected DER landscape.

Susan Shobeiri: Definitely. You touched on many different things that we're trying to consider. With the way our regulatory framework is established, you do have to focus on local solutions, or at least things that are feasible right now seem to be largely local. But then you're looking at a

modernization that isn't necessarily local. So that's a huge challenge that is easy to see from someone who is only just now starting to look into these issues. A big part of our research is just understanding how different organizations are approaching these challenges that we're facing.

The heart of our research is trying to find out what experts think we should be doing to actually bring about this transformation. So, what should we be doing to bring about a more community-based energy system? What are the most critical steps to be taking right now that can help move us towards this kind of system?

Lacey Shaver: My first gut reaction is, we need to be doing all of it as fast as possible on all levels. One thing that I'm wrestling with a lot, I work with a lot of cities, and everyone's like, yes, we want as much distributed resources in our community as possible, solar panels on every house, batteries in every oven. **And my response is that this is the most expensive, complicated way that we could do this transition. Even if we do all that, we will still need offsite power somewhere. And so I think a lot of folks are trying to kick the can down the road and don't want to deal with utilities, thinking that they're gonna do whatever they're gonna do, or that communities can't influence the stakeholder group.** I think, especially on the community-based solutions side, everyone wants to see the most local solution.

For example, there are so many use cases where we need to do resilient microgrids, but I feel like people sometimes forget that having every single building basically be an island and microgrid with solar on top is the absolute most expensive, hardest to deploy, and needs the most installers route to go. Instead, if you could get the utility to transfer their base grid mix from 25 to 75 percent renewables, it's probably going to be cheaper for everyone, and in some ways that might be the most equitable thing. These utilities know their job is to deliver affordable, reliable power. If you can just get some of the utilities and centers to line up in the right way, they might be able to deliver equitable clean energy to communities.

So it's a balance, right? I think you need all of it. You need to move the utilities and the entire grid mix. And I think you need to figure out every place it makes sense to put DERs to do solar, to integrate storage where it makes sense.

Especially on the storage front. We need a lot more of it. But batteries take minerals, and where are the minerals coming from? I think sometimes folks get really happy-go-lucky on that. But you want to optimize right? We don't want to be doing mining that is not needed – and that has its own detrimental impacts – for the sake of everyone having a battery in their oven, so that they don't have to upgrade their electrical panel. So sometimes we oversolve with technology for some problems that could be simpler.

It's gonna depend on the exact community and what their needs are. I think of hurricane-prone areas. Arguments for the need for distributed systems just resonate in a different way in Puerto Rico and in Florida than it does in Ohio. So the focus should be on figuring out what are the community's needs? And what are the pathways that you have available? And then what are the trade offs? Because I do think there are trade-offs of cost. There are trade-offs of speed, there are trade-offs of democracy and governance, if people really feel strongly about owning their system. I think there's a huge opportunity to do more community-owned projects, and I think we should enable a lot more of that. But with each of these paths you take, there are some different trade-offs. It's critical for each community to assess what aligns with their particular goals and the market availability vision for the future.

Susan Shobeiri: Definitely. I like that answer a lot. I think it's a little different from what we've been hearing. You want to think about these solutions, and obviously, there's an ideal world, but you're also trying to get as many people on board as fast as possible. There are more efficient ways for a certain area to do something. That could mean changing how the utilities are operating themselves instead of trying to change that structure completely. So I like that acknowledgement, but then, also knowing that it really should be tailored to a community. Tailored to what their needs are, and to what their priorities are as well.

I'd like to hear more of your thoughts on common initiatives that you've seen local governments enacting. Do you think any of those models, or even any of those specific case studies from your report, stand out to you as a promising model that could be feasibly pursued by other localities or other communities?

Lacey Shaver: The impetus of the report is to push folks to think that you can do equity in everything that you do. And it's just gonna look different. It's gonna have different kinds of impacts. **A lot of times, a city comes to me and asks, what's the biggest bang for my buck? If I only do one thing, what should I do? And I almost always turn it back to them and ask, what are your goals? What are you driving towards? Because if you're saying, what's the biggest thing in terms of GHG emissions, I'm going to give you one answer. If you say that your biggest concern is increasing access in general to low-income populations, I'm going to give you another answer. If you're like, what is the biggest way we can reduce energy burden? Those are three different things you could solve for. And they are three different programs where the bang for buck is going to be a little bit different. There's just not a silver bullet with community-wide, clean energy.**

Universities have done a lot of great work in this space. At the end of last year, a huge 408 megawatt deal was signed. MIT, Harvard, and Mass. General Brigham were the anchors, and then they brought along a whole bunch of other Boston-area entities, so Cambridge was able to

participate and get a much better deal. These deals at scale can bring a lot more folks along. But the projects are cited in Texas and North Dakota. So it's not really a local solution. Cambridge spent a long time looking and doing community engagement, and they were like, if we were to cite a similar project in Massachusetts, the GHG emissions reductions would be lower impact and the cost would be higher. By citing a project not in the Massachusetts grid, we can clean a dirtier grid. We can have a much larger GHG impact, and we can do it at lower cost.

Almost no city I work with takes that approach. Most want the generation resource as close as possible for that community impact. But I think it's justifiable. It's interesting that they took that approach. They're like, these are our taxpayer dollars. We want to stretch it. We want the biggest GHG impact we could have for our bank.

People come to different ends with how they structure this. **I think that community solar is clearly still very underutilized. It's grown a lot, but the potential is great. It's one of the only solutions you can use for low-income, for renters, for folks who cannot put solar on their house for whatever reason. It could be because they live in a condo in a big, multifamily building. They have no control. It could be because they would need a new roof, and they just can't afford it. So I think community solar programs are huge for community access. CCAs can be great. But in my opinion, they can vary quite a bit, and they're not always the end-all-be-all solution.**

Another great and interesting example is the city of Ann Arbor. They have enabled what they're calling a sustainable energy utility, and their goal is basically to create a giant microgrid under downtown. They're gonna run an entire wire system adjacent to the DTE Energy wires, and it's not really a utility because it's what they call a sustainable energy utility. But it's basically just a giant microgrid and allows them to feed local DERs into a larger grid than you would normally think.

They're still in the process of standing it up. And there were a whole bunch of legal questions on if it was legal and if it challenged DTE's authority as their monopoly investor-owned utility. But they're trying to come up with this creative solution around the idea that they don't really want to own the whole grid. But they're not seeing the local uptake that we want, which would give them some more power and authority. So I think if they're successful, a lot more people will be interested in this kind of model. **The questions again are, just how expensive is it? And does it actually hit the goals that you want? I think, especially for a city where you're dealing with taxpayer dollars and a limited amount of money, these are the key questions. As I mentioned, a lot of really cool technology solutions are awesome, but really expensive.**

Lacey Shaver: I had a thought when it was your call to action. **My call to action is really about being clear about your goals and then measuring your progress towards that. I think when**

you're looking at equitable community-wide clean energy you need to understand, where are you? Who doesn't have access to clean energy? What are the barriers? Then track that progress.

I think that's one thing that I'm trying to advocate for a lot more folks to do and doing a lot more residential low-income solar, with the Solar for All Grant program. I think we really want to get a lot more solar out in low-income and disadvantaged communities. And there's that moment there. But let's be really strategic and make sure we're getting it where it's really needed, and make sure that we're meeting people's needs and not just overburdening them with being like: Here's some free solar. Just fill out these 15 different forms. Show us your proof of SNAP and this, and then let some strangers trample all over your house. **We have a great product. But you need to think about it from the user experience and make sure that you're really providing value to communities. And so understanding that working with them, and then delivering on that value, is my call to action.**

Craig Lewis

Craig Lewis is the founder and CEO of the Clean Coalition, a nonprofit organization which designs and implements clean energy solutions across the US. Craig holds a Bachelor's Degree in electrical engineering and computer science from UC Berkeley, as well as a Master's degree in Electrical Engineering, and a Master's of Business Administration, both from the University of Southern California. He has experience in both the private and public sectors, and has worked extensively with the government on issues such as energy policy.

Interview transcribed by Sarah Allam.

Sarah Allam: Our first question is, does local, state, and federal policy in its current form create regulatory barriers for community-based solutions, and how can these be alleviated?

Craig Lewis: I mean, that's the big question, right? The answer is yes, you know, policy creates the rules that you have to play by. So if those rules are not set in the way that is going to allow enabling technologies for what's generally referred to as "distributed energy resources," then the policy, by default, creates barriers. Right now, the policies are not written anywhere that I'm aware of in a really friendly way to distribute energy resources. So, yes, massive barriers. How would we alleviate that? It's coming up with policy proposals and then fighting to get those proposals implemented. At the end of the day, this is just a battle. It's kind of good versus evil. I'll put it that way.

First of all, it's designing policy proposals. You have to actually design policy proposals to make sure that it's going to accomplish what you want it to. Designing policy proposals is not all that different from designing a car. From a process standpoint, you have to design a solution that's going to accomplish what your design criteria are. Your design criteria is to get a lot more distributed energy resources in place. That's kind of like what your end game needs to look like, and your proposal needs to deliver on that. If you're designing a car, you know you need wheels. You know you need a steering wheel. You know there are things you need, because the car needs to get people from point A to point B in a really enjoyable fashion, right? So those are your design criteria that you have to design by. The design criteria in this case is that we want to unleash distributed energy resources, so policy proposals have to be designed to accomplish that.

We've got this terminology we use called A.P.E. This stands for Aim, Plan, Execute, and if you don't aim correctly, then there's no use in planning or executing, because if you don't know what you're aiming for, you will definitely not hit your mark. You have to know what you're aiming for, otherwise you're spinning your wheels and you're wasting your time and everybody else's that you're interfacing with. Your policy proposal needs to be clean, and you need to be able to see that it's going to achieve what you're aiming for. But you've got to start with the aim, and then once you have your aim, then you consider where the market is at and where we want to be. So how do we get from there to there? From a policy standpoint, you're gonna have a staircase. It's hardly ever that you're going to go directly from there to there, right?

Today, we have this big remote energy that dominates the energy landscape in the United States. Almost all of the energy in the United States is from these big, remote power plants—whether it's big coal plants, natural gas plants, solar plants, wind plants—that require long transmission lines to get from where the energy is generated, where nobody lives and works, to where people live and work. Long transmission lines. So that's where we're at. Clean Coalition's aiming to get to a point where we have an energy system that is largely distributed, as opposed to a distribution grid that requires long transmission lines. We're not going to get from there to there in one step vision. That's not going to happen. So, how do we design policy proposals that staircase us to get from point A to point B? Every step is a huge battle. There might be 10 big steps, and each one of those big steps could take a year or two or three or five or ten. Some of them may never succeed. You'll have to design a different way across each of those steps, because you don't know what you're going to be facing when you get to that point.

Matthew Seigel: All right, our next question is, how can the optimization of distributed energy resources foster community resilience and sustainability?

Craig Lewis: There are two definitions I think are really useful to think about. One is reliability, which is a term that's used a lot in the electricity industry, and the other is resilience. A lot of

people don't know the difference between those two words. Reliability is all about maintaining the current circumstances. Resilience is about adapting to change circumstances. If everyone's power is on in one area, reliability is about maintaining this and keeping the grid on. The grid does go down sometimes. So the resilience is all about adapting to those new circumstances, which is when the grid is down. **When you're reliant on all remote resources, and the grid goes down, there's a long process to get that grid back up. But if you have distributed energy resources, you have multiple layers of resilience that you can design into your solution.**

And this is when the Clean Coalition talks about solar microgrids. That's at an individual site. **Let's just say you live in an apartment building. If that apartment building has a solar microgrid, that site, that building has resilience. All the other buildings in the neighborhood might go down. But if you've got the solar microgrid, that building, or at least the critical loads of that building, can be maintained from that. From that solar microgrid in the neighborhood, you could do a community microgrid. A community microgrid covers a whole grid area. So now if the broader grid goes down, we island the community microgrid. If something happens to the community microgrid, then we have the solar microgrid at that one building, right? So we've got nested layers of resilience. That's how distributed energy resources can provide resilience to communities.**

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