State Policies for Local Energy Collaboration

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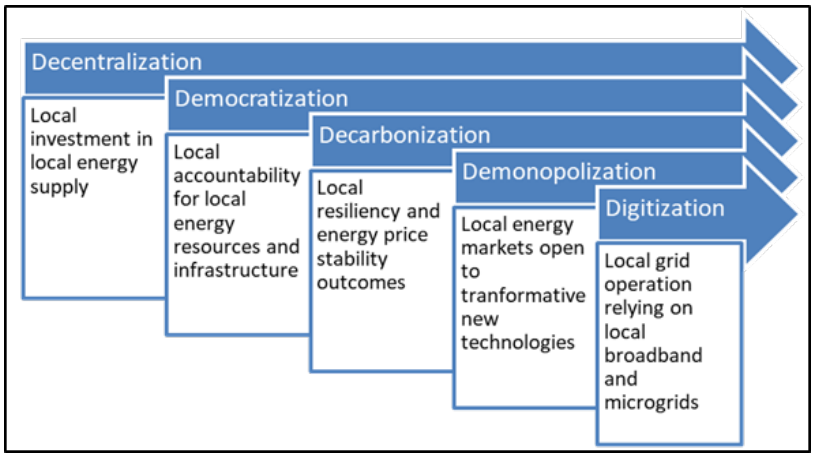

Introduction

City and county governments in the US rarely concern themselves with energy costs or energy systems. Why should they? Conventional energy service depends on the operation of global fuel delivery systems and continent-spanning electricity production and delivery machines. Utility operating costs change relatively slowly and are closely monitored by both state and Federal agencies.

But what if getting involved could strengthen the local economy, creating good paying local jobs and insulating the community the worst effects of disastrous events, such as hurricanes, wildfires, terrorist attacks and cyber-attacks? Local public officials would be remiss if they didn't at least pay attention. They must also act.

The figure summarizes an energy sector change scenario. New energy technologies are modular, leading to an opportunity for decentralization. Decentralization leads in turn to an opportunity for democratization through local decisions. Local decisions can greatly accelerate GHG emissions reduction, aka "decarbonization". As counties and cities decarbonize, the future of building and vehicle transportation energy may converge. As this happens, each local jurisdiction will have unique local resource and integration opportunities.[1]

Why can't these changes be managed by energy utilities that have adopted new technologies in the past? The old technologies aren't going away, are they? Existing energy infrastructure will continue to be vitally important. But missing modernization opportunities can be costly. Won't state and Federal governments make sure modernization proceeds apace? They can't. Not without local attention. Because each city and county differs from all the others in attributes that affect how and when the new technologies come on stream. Taking transformative new technologies and their rapid growth and changing costs into account will make local energy system integration challenging and rewarding and a vital complement to existing infrastructure upgrades.

Costs that should concern local governments are opportunity costs. What is the cost to the local economy of not using locally produced renewable electricity, fuels and heat? Of not creating the local jobs that come with it? Of paying the community's share of the costs of its continued reliance on fossil fuels? What is the cost of local projects that do not get the most out of available resources for the dollar spent on them, or are developed without regard to future energy usage and future local infrastructure?

IRESN's Local Energy Collaboration Project was an investigation to determine:

- How 21st century local governments and energy utilities can collaborate; and
- How states can create a collaborative expectation and policy environment for their work together.

[1] Building decarbonization enablers will include building retrofits that drive carbon footprints of existing buildings toward zero. For example, retrofitting a home with a solar array sized to serve all major electricity uses will be the most cost- and carbon-effective strategy. In some climates, hybrid natural gas furnace and heat pump systems may be both carbon-effective and cost-effective. In the transportation sector, enablers will include zero carbon vehicles relying on batteries and hydrogen fuel cells, plus reductions in vehicle miles traveled resulting from proliferation of autonomous vehicles and shared mobility.

State policies for local energy collaboration should account for aggregated state, and even multistate, energy production and usage profiles. They will vary widely, though not as widely as local profiles. IRESN's investigation produced a menu of local energy collaboration needs and opportunities (for states, local governments and energy utilities) and categorized them in ten generally applicable target areas. A summary of illustrative state interventions is provided in the table below.

Collaborative target:	States can:
On-site solar/storage	update state solar legislation to account for costs and benefits of energy storage, solar augmented heating, and expanded electricity usage for electric vehicle charging and heat pump space and water heating.
Community RE/storage	1. establish criteria for community eligibility to implement community renewables on a virtual net metering basis, or 2. Loosen restrictions on sizing of solar arrays powering buildings and campuses. E.g., allow communities to purchase and virtually redistribute electricity from local renewable and solar-plus-storage projects up to a specified percentage of net metered solar capacity in the community.
University engagement	provide funding for more effective university engagement in support of local energy collaboration.
Underserved communities	set goals that there be no net out-flow of dollars from under-served communities for imported commodity energy purchases, i.e. natural gas or electricity not produced locally.
Local energy training	require up-to-date local climate action/energy resilience plans that address consumer protection and staff training, e.g. community microgrid specification/design training for local government and utility employees.
Energy efficiency	require local governments and utilities to jointly determine which state subsidized energy efficiency programs would be most effectively administered by the utility, local government or collaboratively through a co-managed effort.
Local energy planning and analysis	1. offer phased matching grants funding local technical capacity to co-manage (with energy utilities) local energy market transformation, and 2. co-fund and require completion of a baseline integrated energy analysis to establish feasible climate action and energy resilience goals.
Data and data analytics	determine how secure, seamless sharing of energy and GIS data and information can inform energy user decisions and more data-driven and effective local climate action/resilience planning and tracking while ensuring privacy and data security.
Transport fuels	require joint utility/community planning and regulation of clean vehicle fueling.
Local energy resilience	Provide guidance to local governments consistent with shared local/state interest in GHG emissions reductions and local energy security/resilience trade-offs.

The project report suggests an even more robust menu of specific steps that states, utilities, system operators and local governments can take to meet local energy collaboration needs and capture opportunities. Local menu choices will vary from state to state and especially from community to community. Making choices and doing the collaborative work will pay economic dividends and create capacity and experience for more ambitious collaboration in the longer term.

The Energy Policy Eco-system

US energy utilities have standardized business models that rely on long term corporate finance. Wall Street calls the tune, which tends to produce a relatively uniform response. State governments differ relatively little from one another in terms of governance models and responsibilities. In this case, to some extent, the Federal government calls the tune. Local governments have greater flexibility than energy utilities and states. They serve widely varying populations organized around diverse employment opportunities. They may be economically advantaged or disadvantaged. Their per capita energy expenditures and energy usage profiles differ greatly even within the same climate zones, as do quantities and qualities of local clean energy resources. Depending on their size and location, they may have mature and strong, or weak and embryonic, local energy business eco-systems. They will increasingly need to exercise their authorities and flexibility to pro-actively develop and secure the maximum benefit from clean local energy resources.

While the US Federal government concerns itself with policies governing inter-state energy commerce, it leaves regulation of local energy services to states or local jurisdictions that choose to set up local energy service. Therefore, states will need to provide policy leadership to smooth the transition to greater reliance on clean local energy resources.

Instead, state policies are getting in the way of clean local energy resource deployment. They are typically organized around an energy system model that does not anticipate or account for on-site energy production and or the possibility of decentralized resources providing supply and grid services. There are non-policy roadblocks as well. Energy utilities may not engage with local governments to remove roadblocks to cost-effective clean local energy resource development unless their business model offers rewards for doing so. Typically, it doesn't. Both states and local jurisdictions also may not recognize the need to integrate plans for local energy services with plans for the other services counties and cities provide.

Local government rarely engage with energy utilities on technical and economic issues. The resulting collaborative deficit has significant and increasingly negative consequences. For example, net energy metering of on-site solar electricity production is gaining traction across the US, despite historical energy utility resistance. It is materially accelerating reductions in grid electricity usage in states where grid electricity prices are high and annual sunny hours are also high. Even so, costs of net metered solar electricity in the US are higher, by as much as factors of two or three, than in some other industrialized countries, e.g. Australia, where scale-up of on-site solar electricity deployment is delivering significant cost savings.

Collaborative attention is needed, not only to fix this problem, but also to open additional pathways to clean local energy resource deployment, e.g. community renewables and storage. The current collaborative deficit has a latent downside as well. It will result in unnecessarily costly infrastructure investments for electric vehicle charging, grid back-up, renewable natural gas, and local zero carbon fuel production and delivery infrastructure.

Even where the need for collaborative engagement is recognized, local governments cannot collaborate effectively with energy utilities if they lack the requisite experience and capacity to do so. Collaborative local energy resource planning is a necessary first step. A combination of state R&D grant programs and local government out-sourcing can support this step, but the resulting goals may not be actionable by either the energy utility or the local government without effective follow-up, adjustments on both sides, progress updates and sustained collaboration. Sustained collaboration requires steadily increasing local government capacity to facilitate local projects, engage with local energy retailers, and ensure safe, resilient public and building energy infrastructure.

In summary, slow deployment of clean local energy resources is costly to local US economies, especially to those of underserved US communities. It is therefore costly to states as well. Removing current roadblocks will make the benefits of clean local energy resources more accessible and beneficial at the community vs. the individual energy user level. Removing roadblocks will be a collaborative process.

Recommendations

1. Local government engagement. Local governments with no prior experience providing energy service or working with energy utilities should prepare to engage in collaborative local energy planning and infrastructure development, keeping the following questions in mind:
   - How much can the local economy be strengthened through local energy investments?
   - How much is local energy resilience worth?
   - How can local government help the utility to move more quickly toward smarter and more resilient local infrastructure?

2. Long term local energy infrastructure planning. Energy utilities should have a detailed and publicly visible long term plan to deliver smart local infrastructure and achieve its best and most economically efficient use. Few in the US do. Plans will need to identify changes in rules pertaining to self-generation, interconnection, grid access and grid access pricing. More locally focused utility planning and more flexible utility policies must be accompanied by much closer engagement with local government in clearing a path for local projects and more economically productive use of local energy resources.

Conclusions

1. Local energy system integration is best done collaboratively. New building and community scale technologies are transforming the US energy sector. Unprecedented opportunities lie ahead for local energy development. Local energy system integration is therefore an emerging economic imperative in communities experiencing rapid uptake of solar PV and electric vehicles. Technical and economic integration will require policy alignment and collaboration among cities, counties, energy utilities (both gas and electric), and state government.
2. Regulatory reform may be needed. States win when local jurisdictions win economically and environmentally. States hold the key to local energy collaboration, because they set standards and control public resources available for grants and incentives. States lose when their regulation of energy service monopolies impedes local energy collaboration. Thus, state regulation can be a double edged sword. States should ask: Is effective collaboration possible under current rules? If not, step one would be regulatory reform to make it possible.

3. States can guide and reward local energy collaboration. Some level of collaboration is immediately possible because many important collaborative outcomes do not require either utility or local government business models to change. States should guide and reward purposeful local energy collaboration. If this is their intent, they should consider establishing a point of coordination within state government with funding and authority to facilitate local energy collaboration.
4. Universities can fill local energy planning and analysis gaps. There is also a potentially invaluable role for higher education in support of collaborative local energy planning and integration. Renewable energy collaboratives, supported by university faculty and student teams, have demonstrated their value and effectiveness in early stages of state-wide renewable energy expansion.
5. The best energy supply portfolio includes locally produced energy. One long term collaborative goal is to establish the most secure, resilient and cost-effective balance between locally produced and imported energy supply. Striking this balance locally enables secure, resilient state-wide energy supply.
6. Data and data analytics are key to goal setting and tracking. Utilities can support clean local energy deployment planning by sharing data needed for local trend analysis and integrated energy analysis. Counties and cities can use analysis results to set goals and create plans, e.g. climate action and resilience plans. They can then track progress using their own GIS datasets, plus energy usage updates provided by local energy service providers.
7. Build on what is already working. Where local energy collaboration occurs, it will empower participants to expand their vision beyond monopolistic rules and behaviors that impede change, innovation and competition. The initial collaborative focus should be to find out what is already working and how it could work better (faster and more cost-effectively) in each jurisdiction.

Resources

2019

Report– Policies for Local Energy Collaboration

a. Report Supplement - Local Energy Collaboration – Energy Sector Transformation Context
b. Report Appendix – Collaborative Vision for Clean Local Energy
c. Report Appendix – Resiliency of the US Natural Gas System (by Ron Edelstein)
d. Report Appendix – Community Solar in the US (by Tony Haske)
e. Perspective – Residential Solar in the US

2. Op-Ed – Local Gas and Electric Collaboration
3. Op-Ed – Doom and Hope
4. Webinar - Local Energy Collaboration

2018

5. Op-Ed – The Gathering Storm
6. Newsletter – City/Utility Collaboration for Energy Resilience and Sustainability
7. Op-Ed – City/Utility Collaboration: An Emerging Priority
8. Op-Ed – Removing Obstacles to Local Energy Collaboration

2017

9. Report – Clean Local Energy Trends

2016

10. Newsletter – Cities, Microgrids and the Climate Emergency

2015

11. Op-Ed - Community Choice – Shaping Local Energy Eco-systems?
12. Report – Integrated Energy Analysis for Davis, California
13. Policy Paper – Energy Infrastructure Finance: Local Dollars for Local Energy