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Local Energy Collaboration

Additional submitted attachment is included below.

Comments on the Proposed 2019 IEPR Scoping Order

Subject: Local Energy Collaboration

February 28, 2019

The scoping order dated 2/14/2019 requested public comment. The following public comment is offered by Gerald Braun on behalf of IRESN, Inc.[1]

INTRODUCTION AND EXECUTIVE SUMMARY. The 2019 IEPR will: 1) "continue and expand on previous efforts to decarbonize California's energy system while ensuring that the benefits are equitably spread", and 2) "focus on actions needed to transform the transportation sector to dramatically reduce GHG emissions while making sure that low-income and disadvantaged communities share in the benefits." Transportation, energy equity, energy efficiency, electricity sector, electricity and natural gas demand forecast, natural gas assessment, Southern California energy reliability, and climate adaptation are "specific topics that will be addressed."

In 2018, IRESN sponsored, staffed and completed a preliminary analysis to identify state policies for local energy collaboration. While the project's analysis results are broadly applicable across the US and benefitted from experience and advisory inputs from California and other states, California is uniquely positioned to consider, refine, and implement the project's recommendations. The project advisory committee recommended that analysis results be brought to the attention of the CEC in the 2019 IEPR context. Because California is farther along the path to full decarbonization and local energy resilience than other states, its need to foster and support local energy collaboration is most urgent.

21st century energy service will evolve toward greater use of modular emerging zero carbon technologies in the transportation and buildings sectors. Collaboration between local governments and energy utilities will be the key to creating resilient low carbon energy systems serving local building and transportation energy needs. California should therefore identify barriers to such collaboration and seek to remove them. The 2019 IEPR process can initiate steps to remove barriers and create structures that facilitate collaboration. Specifically, the Commission can request and evaluate input from local governments and energy utilities on collaboration target areas and California-specific policy options. Some broadly applicable ideas and suggestions are identified in a recent draft report (Ref. 1). The Commission might also consider convening a workshop to determine which policy suggestions in the report or offered by workshop participants would be particularly well aligned with California's needs and priorities. The next section of this document summarizes preliminary research conclusions. It is followed by a section that provides a cross reference between IEPR topics and local energy collaboration steps for state, utility, and local government consideration. A concluding perspective addresses what is at stake for California and its communities and utilities.

PRELIMINARY RESEARCH CONCLUSIONS.

Local energy integration. California and other US states have energy policy eco-systems that rely on decisions and investments by local government and local energy service providers. Local governments, for example, invest in, maintain and upgrade transportation infrastructure, while energy service providers invest in infrastructure to fuel or charge zero emissions vehicles. State energy and transportation policy can be siloed or integrative. Integrative is better. Locally integrative is the future. Collaboration will be the key to local energy

[1] IRESN, Inc. is a registered non-profit business league focused on local energy integration and collaboration. Gerald Braun is an energy utility and solar industry veteran and founding director of Federal, state, utility and university-based renewable energy RD&D programs.

and transportation integration. In turn, local integration will be the key to future local energy resilience and economically beneficial energy decision-making.

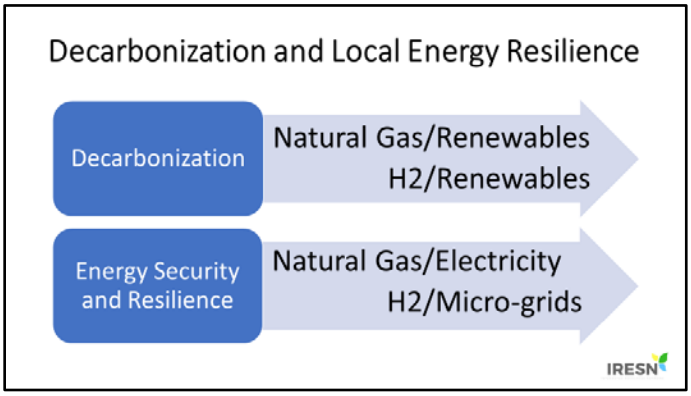
Need for state level attention. There are significant barriers to local energy collaboration that only state action can lower. Lowering barriers is necessary but not enough. Local capacities for energy collaboration must be expanded as well. Each state and local jurisdiction will have different opportunities and priorities. Nevertheless, a state's basic strategy must be to expect and support local energy collaboration, recognizing that it is not the current norm. Local energy collaboration targets are numerous. Because they catalyze one another, some or all must receive state policy attention over time.

Acceleration toward state goals. Energy and economic trends are linked at every governance level. Local energy trends and resources that decouple the linkage between energy use and greenhouse gas emissions can, with sustained local policy attention, outpace and complement relatively slow and incremental changes in existing US energy grids and supply chains (Ref. 2). US states have the necessary capacity and authority to accelerate these trends.

Empowering local energy collaboration. California and other states should consider establishing a point of coordination within state government to facilitate and monitor the progress of local energy collaboration. For example, an over-arching collaborative goal is for each county or major city to determine the most secure, resilient and cost-effective future balance between community-based and imported energy supply. Striking this balance locally is essential to secure and sustainable state energy supply.

DISCUSSION.

The current generally accepted vision for energy sector decarbonization is to alter the mix of supply sources while aggressively reducing usage.

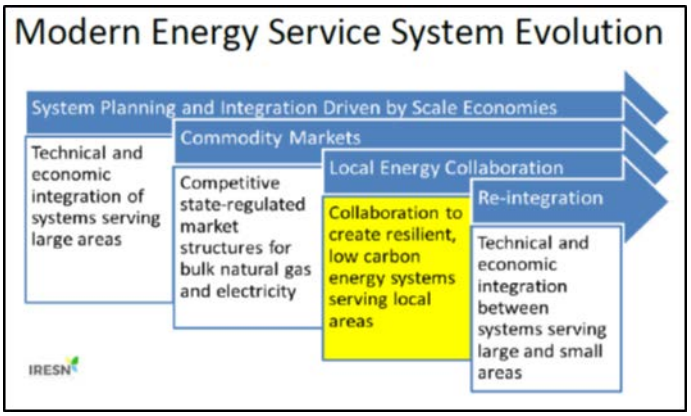


Vision for Energy Sector Decarbonization and Local Energy Resilience (Ref. 3). In California, decarbonization has involved altering the supply mix by substituting natural gas, solar and wind sources for coal in the electricity sector and more recently by expanding energy storage deployment to allow greater reliance on variable renewable sources. Longer term, hydrogen from solar and wind will contribute to energy storage capacity needed to accommodate seasonal variations in electricity usage. As building and transportation electrification proceeds, such seasonal variations may be more pronounced in some climate zones than in others. Natural gas and electricity are both beginning to displace petroleum in the transportation sector. Longer term, hydrogen from community solar and wind sources will store energy seasonally and displace petroleum. Locally produced hydrogen can enable fuel cell electric vehicles to compete with battery electric vehicles for a share of the transport vehicle market. It will also allow fuel cells and microgrids to provide more cost-effective local energy security and resilience.

Scale and Speed. Across the US, power plants that emit greenhouse gases are being retired and replaced by sources with lower CO2 emissions. The scale of this effort is appropriate. The inherent speed is not. Meanwhile, families and local businesses are demonstrating that local decarbonization can outpace the gradual

retooling of electric utility generation fleets. The draft report and previous integrated local energy analysis (Ref. 2) provide evidence that local decarbonization can be much faster than decarbonization of utility generation fleets. It can also be much slower. There are significant barriers to local clean energy resource deployment in the US. The best way to lower them will be to create structures and capacities that empower collaboration between monopoly energy service providers and local governments.

Technical and Economic Integration. Modern energy systems matured over their first 100 years by capturing scale economies and moving toward full technical and economic integration. Then, in the US, a new evolutionary stage was launched by creating commodity energy markets for bulk electricity and natural gas. Since then, new modular energy supply technologies have created technical and economic conditions for a new stage enabled by local energy collaboration and resulting in resilient, low carbon energy systems serving local areas. In the evolutionary metaphor, these systems are a new species that must be enabled to co-exist with incumbents and thrive. Technical and economic re-integration will be required to achieve balance and stability California's energy eco-systems. The figure illustrates the evolutionary progression.



Accelerating Clean Local Energy Deployment. If California's local governments and local electric system operators plan, exchange information and data, and coordinate their investments and programs, deployment of low carbon local sources can create economically direct, indirect and induced jobs while supporting state-wide goals. (Ref. 4) Fortunately, data and data analytics are outpacing climate change, enabling much more effective collaboration than possible in the past. State-wide acceleration will require removing impediments in both centralized and local deployment pathways, while keeping both pathways wide open.

Accelerating Energy Infrastructure Decarbonization and Resilience. California's energy policies can address the need for investment in local energy management capacity and integrated local energy planning and analysis (Rev. 2). Creating and rapidly replicating smart local grids will require crash courses in local energy collaboration. The early collaborative focus will differ for each community according to its energy profile, assets, and experience. There will be no substitute for learning by doing. Opportune "educational" venues may be microgrids powered by on-site solar and storage, supplemented by co-located community-scale renewables and storage.[2]

IEPR TOPICS AND COLLABORATION OPTIONS.

The IRESN Local Energy Collaboration Project developed a menu of local energy collaboration needs and opportunities and categorized them in ten generally applicable target areas. The full report suggests possible specific steps that states, utilities and local governments can take to meet local energy collaboration needs and capture opportunities. A summary of illustrative state interventions is provided on page 4. The following

[2] Economically optimized community microgrids may be rare in California until state interconnection and self-generation rules are updated.

Collaboration area:	States can:
On-site solar/storage	update solar electricity net energy metering legislation to allow system sizing based on expected future on-site electricity usage resulting from adoption of heat pump water heating and/or electric vehicle charging.
Community RE/storage	1. establish criteria for community eligibility to implement community renewables on a virtual net metering basis, or 2. allow communities to offer electricity from local renewable and solar-plus-storage projects up to a specified percentage of existing net metered solar capacity in the community
University engagement	develop roadmaps and provide funding for more effective university engagement in support of community/utility collaboration.
Underserved communities	Establish a goal 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 and/or local energy resilience plans that address clean energy training and consumer protection needs, including 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 a baseline integrated energy analysis to establish feasible climate action and resilience goals.
Energy user decisions	determine how secure, seamless sharing of energy usage data/information and GIS data between cities and utilities can inform energy user decisions and more data-driven and effective local climate action/resilience planning and tracking.
Transport fuels	require coordinated utility/local government planning and regulation of zero emissions vehicle fueling.
Building electrification	Provide guidance to local governments consistent with shared local/state interest in GHG emissions reductions, energy security and local energy resilience.

paragraphs provide a cross reference between IEPR topics and suggested local energy collaboration policies and initiatives.

Transportation. California can require submittal of joint local government/utility vehicle fueling infrastructure plans for areas where future vehicle fueling is expected to materially increase local demand for electricity or natural gas. Local governments can quantify local zero emissions vehicle (ZEV) adoption trends and evaluate locally appropriate fueling strategies. Utilities can: 1) evaluate grid upgrades, if any, that will be needed in counties and cities experiencing rapid adoption of ZEVs, and 2) determine the energy cost implications of fueling strategies under consideration by counties and cities.

Energy Equity. California can drive change toward an end state where there is no net out-flow of dollars from under-served communities for imported commodity energy purchases, i.e. natural gas or electricity that is not produced locally. In the interim, states can: 1) Require that the difference between projected electricity usage and on-site zero carbon supply in new housing be off-set by local renewables, 2) require or incent community renewables projects serving low income communities (Ref. 5) to include energy storage and/or back-up power capacity, and 3) require grid owners to collaborate in planning and operating renewable-based microgrids. In parallel, utilities can: 1) deliver renewable electricity from community-owned projects to low and moderate income renters and homeowners at the price they charge for imported electricity, 2) offer on-bill financing for energy efficiency retrofits, and 3) help create community microgrids that enable more integrative deployment of local supply and storage resources. Local governments can arrange for sites to be donated for community energy projects serving disadvantaged neighborhoods and co-sponsor community microgrid development.

Energy Efficiency. California can: 1) require cities and utilities to jointly determine which state subsidized energy efficiency programs would be most effectively administered by the utility, the city, or the city and utility jointly, 2) provide guidelines for joint management where it best serves energy users and supports achievement of state and community goals, and 3) determine the best role for Community Choice agencies in energy efficiency program implementation. Utilities can: 1) consider creating energy efficiency, demand response and flexible load programs for administration directly by local governments or third parties selected by local governments. Local governments can: 1) assess the response to current programs by local families and businesses and the extent to which the programs align with local goals, 2) determine energy efficiency and demand side opportunities (e.g. flexible demand, demand response and beneficial electrification) that must be captured if the city's climate action and resilience goals are to be achieved, and 3) partner with utilities to capture them.

Electricity Sector. As California's energy market transformation progresses, electricity system needs will change. Some resource categories will become more valuable. For example, flexible resources become more valuable as variable energy resources comprise a larger share of the portfolio. California can respond by establishing greater transparency of system needs and fair compensation for local as well as central station resources that provide flexibility. Meanwhile, there is much that can be accomplished outside the economic regulatory arena through effective engagement between local jurisdictions and local energy grid owners. For example, effective engagement could result in more economically sensible local rules for on-site solar electricity system sizing and/or and its integration with electric vehicle batteries for purposes of solar assisted demand response and local energy resilience.

Effective engagement could result in much improved asset utilization. At present, because net metered solar electricity generation off-sets usage and does not typically generate renewable energy credits, it does not "count" against an energy service provider's renewable portfolio obligation. It is therefore valued minimally by California electric utilities as if it were a source of non-dispatchable and non-renewable bulk electricity. It is

"neither fish nor fowl", i.e. it reduces net electricity usage but there are no programs to incentivize reductions in net usage; it produces zero carbon electricity but is not recognized as a supply resource; properly integrated in local energy infrastructure it is a local energy resilience resource but responsibilities for local energy resilience are not clearly assigned. Unintegrated and unaggregated it is primarily a building energy resilience resource rather than a community energy resilience resource. System sizing is typically economically sub-optimal, but the system owner is not allowed to produce more zero carbon electricity than is consumed on site.

Electricity and Natural Gas Demand Forecast. Local government and Community Choice provider engagement in local energy resource development, decarbonization and energy resilience will create disparities in local energy profiles. These disparities will have consequences for local transportation and energy infrastructure planning. Not only will state and regional planning need greater visibility to local trends, but local facility managers, local energy managers and local energy service providers will need greater visibility to more granular and local forecasts. Thanks to California's prior efforts to encourage local climate action and adaptation planning[3] and to the more recent local initiatives to accelerate decarbonization locally, there will be a need for what might be termed "collaborative forecasting". Collaborative forecasting will allow local governments and energy utilities to account for decisions outside their control that may impact their decarbonization and energy resilience goals and plans.

Natural Gas Assessment. Natural gas infrastructure contributes to overall energy resilience (Ref. 6). Depending on annual space heating requirements, natural gas usage in buildings either accounts for a relatively small share of local GHG emissions, or it accounts for a greater share that cannot quickly be eliminated without impacting electricity service and costs. While inefficient natural gas usage has avoidable climate impacts, highly efficient natural gas usage may in some cases be a more economically and environmentally productive strategy than electrification. The trade-offs are complex at the state level, and local government should take care to consider the stability and possible changes in state policy. The best approach in all cases is to consider multiple long-term scenarios in order to understand what policy levers to pull at what point.

Climate Adaptation. Local resource development is foundational to increased resiliency. To be timely and successful, it requires collaborative efforts between energy utilities and local project permitting and code enforcement functions. Anticipating future collaboration needs, California should foster the development of information and dataset sharing protocols between local governments and utilities with appropriate safeguards for sensitive information and privacy interests of consumers. Energy management capacity building is also important. Local governments typically lack staff capacity for sustained, meaningful, and productive engagement with energy utilities. They may have no visibility to energy sector technology and economic trends, nor opportunities to influence specific assumptions and investments. Grant funded planning and analysis are mostly wasted unless there is follow up. Follow up requires action, organization and capacity. California can take steps to upgrade all three. It can: 1) offer phased matching grants to local jurisdictions to build staff capacity to co-manage (with energy utilities) local energy market transformation consistent with state goals and priorities, 2) co-fund and require completion of a baseline integrated energy analyses (Ref. 2) to establish feasible climate action and resilience goals, and 3) Require that cities and utilities jointly track local energy resource development progress and jointly complete and sign off on annual forecast and plan updates.

[3] 10 years ago, California local governments were required to develop climate and action and adaptation plans. The plans featured aspirational goals. Over the following decade, citizens and business owners took effective action in some cases, but in many cases, there was no progress tracking by local governments nor any plan updates. On the plus side, partial community level information needed to track progress is now available from at least one incumbent energy utility.

CONCLUDING PERSPECTIVE.

Both local governments and energy utilities encounter obstacles to local decarbonization and energy resilience that can only be removed or mitigated by the other. Energy Commission programs have mined grant funded project experience to highlight some of these obstacles (Ref. 7). The resulting "opportunity costs" are a drag on local economies, especially those least able to afford them. State policies must recognize that each county, city or neighborhood differs from others in terms of energy usage patterns and local energy supply opportunities.

New California neighborhoods, especially new neighborhoods, some existing neighborhoods, plus a few cities, and perhaps some counties, can move toward producing 100% of their electricity locally. Fewer still can hope to produce 100% their transportation fuel in the near term. Some may choose to continue to import 100% of locally used electricity and fuel, at least until the economic advantages of doing otherwise are clearly demonstrated.

At a minimum, all local jurisdictions should be empowered and encouraged to strike an economically advantageous balance between energy imports and local energy resources consistent with local usage patterns and supply opportunities.

Until now, state energy policies, appropriately, have tended to focus on incremental change within the framework of legacy business models and regulatory paradigms. Historically, this focus has reinforced an increasingly questionable premise that communities should simply import energy and export dollars to pay for it. From a county and city perspective, it leaves large amounts of avoided GHG emissions and avoided energy service costs on the table.

From a state perspective, the path to achieving California's decarbonization goals will be smoother and more economically efficient if energy utilities and local governments engage collaboratively. There are significant barriers to local technical and economic integration. Via local energy collaboration, they can be navigated and overcome even if they cannot quickly or easily be eliminated.

Local energy collaboration is a means, not an end. It must therefore have an over-arching strategic purpose while accounting for extreme diversity from community to community. The over-arching purpose must be to strike the best local and state-wide balance clean energy imports and clean energy production.

References.

1. State Policies for Local Energy Collaboration, February 2019
2. Integrated Energy Analysis for Davis, California
3. Collaborative Vision for Clean Local Energy
4. Local Energy Collaboration: An Emerging Priority
5. Community Solar in the US
6. Resiliency of US Natural Gas System
7. California Energy Commission Staff Workshop on Energizing California's Communities with Renewables: Recent Successes and Future Opportunities, July 29, 2015