Power Lane County Electric Grid Handbook Summary for Policymakers

Power Lane County is a partnership between Lane County government, Lane County utilities, the Center for Rural Livelihoods, and three U.S. Department of Energy national laboratories. The purpose of Power Lane County is to explore ways to make Lane County's electric grid more resilient and sustainable to support community resilience. It is funded through the U.S. Department of Energy's Energy to Communities: In-Depth Partnership program, which includes three years of technical assistance from the national laboratories.

KEY FINDINGS

The *Power Lane County Electric Grid Handbook* serves to help leaders, community decision makers, and the interested residents of Lane County establish a deeper understanding of their electric system. The *Handbook* reviews current and best practices in major planning areas, including affordability, meeting load growth, energy efficiency and conservation, hazards and resiliency, and local generation. It identifies existing gaps and opportunities for action to improve the affordability, reliability, and resilience of the county's grid and the communities it serves.

1. Lane County is served by a high density of mostly small publicly owned utilities, which creates a patchwork of service areas, utility policies, local oversight and programs. This creates challenges for coordination and planning.

2. For Oregon publicly owned utilities that rely on low-cost BPA hydropower, rising customer electricity rates have largely tracked inflation and are among the lowest in the nation. Customers of Oregon investor-owned utilities have seen larger rate increases. Pressure on rates is expected to rise.

3. Policy makers are increasingly concerned about the electricity cost and reliability impacts of projected demand growth from data centers and electrification of homes and vehicles. Small public utilities tend to rely on BPA to predict future demand, however BPA's models are based on historic demand data and do not always capture significant technology-driven changes. This leaves utilities and policy makers uncertain about future costs and risks. There is a need for more robust and data-driven methods of projecting future loads.

4. Extreme weather, increased wildfire risk, and other hazards stress the Pacific Northwest's aging electric infrastructure and require utility coordination and investment. These investments could increase customer rates but would promote resilience.

5. Some areas of Lane County's electric grid are more reliable than others. Metropolitan Eugene/Springfield customers are served by multiple transmission lines and a redundant distribution network. Some rural areas, however, are served by a single transmission line and a more vulnerable distribution network.

6. High temperatures and low regional snowpack can decrease the water available for power generation in the PNW's hydropower-based electricity system.

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7 Lane County could look to local solar or wind energy generation to improve future resilience, however the limited renewable energy potential of those natural resources within the county means that the cost of electricity from them will be high compared to the current low cost of BPA hydropower. This makes it difficult for utilities to invest in local generation for resilience while keeping rates low.

When new, large commercial or industrial users want to connect to the grid, sometimes both distribution utilities (Lane County's retail utilities that sell electricity to consumers like homes and businesses) and transmission utilities (BPA and Pacific Power, which both own transmission infrastructure in Lane County) need to conduct studies to make sure that the grid can serve those loads. If upgrades or new infrastructure are necessary, the utility determines whether the new large customer is financially responsible for the needed infrastructure. This can add a challenge to economic development, but it can also serve to ensure that existing customers do not bear the burdens of increased costs to serve new loads. 8

9 Powering some, but not all, loads in emergency or shortage situations can be difficult because utilities cannot control demand. The ability to isolate portions of the grid can improve resilience, for example, by providing continued service to critical facilities during shortages or by de-energizing a portion of the grid in a high wildfire risk area. Currently, there is room for improvement in knowledge of the electricity needs of critical facilities and the risks to the electric system, and the capacity of utilities to use this knowledge to isolate portions of the grid.

Currently, none of the generation resources in Lane County have blackstart capabilities. This means that, in the event of a regional grid outage, none of the generation resources in Lane County would be able to generate usable electricity and deliver that electricity to end users. Because so much of Lane County's electricity comes from outside the county, in the event of a regional outage, the generation sources within Lane County could not come close to meeting the demand within the county. 10

11 Demand response programs and distributed energy resources are ways that utilities can reduce peak loads. Reducing peak loads is important in circumstances when the costs of meeting peak loads are high or when individual grid components adjacent to peak loads are nearing their operational capacity limits. For Lane County utilities, the marginal cost of meeting peak demand is often manageable due to the terms of their contracts with BPA. Thus far the benefits of most types of demand response programs and distributed energy resources have not been seen by most of Lane County's utilities as outweighing the costs, however, interest may be emerging.

Enhanced grid resilience can be supported by a portfolio of technology solutions that strengthen physical assets, improve operational flexibility, and build the capacity to anticipate and respond to disruptions. Utilities across Lane County are at varying stages of modernization, depending on their size, resources, and regional risks. 12

GAPS AND OPPORTUNITIES

The *Power Lane County Electric Grid Handbook* identifies 25 opportunities for future planning by utilities and communities to address identified gaps and improve the resilience and reliability of Lane County's electric system. The opportunities fall into four categories: (1) utility studies and programs; (2) collaborative evaluation, planning, and framework development; (3) public accessibility, education, and outreach; and (4) countywide modeling. Opportunities are not prioritized or presented in order of importance.

Utility Studies and Programs		
Rate Design Studies	Explore ways for utilities to pursue their goals (e.g. energy conservation, reduced peak energy use, fairness to customers, increased revenue for capital projects) through best-practice rate-setting.	Chapter 1; Chapter 4
Sectionalizing, Islanding, & Blackstart Studies	Identify areas of the grid to isolate from the broader grid to strategically de-energize (sectionalizing), keep a portion of the grid energized in a larger outage to maintain service to critical infrastructure (islanding), or use existing local generation to restart an isolated portion of the grid if the grid goes down (blackstart).	Sections 4.4, 5.2, and 8.3; Chapter 6
Collaborative peak management programs	Enable utilities to establish programs while sharing the costs of staff training, customer outreach, and other expenses associated with initiating and running the programs.	Section 4.3
Demand response operational training	Minimize the costs to utilities of implementing demand response or other energy efficiency or conservation programs and teach customers how to effectively participate in programs and adopt associated technologies.	Section 4.3
Enhanced situational awareness prioritization and investment	Improve real-time weather monitoring, wildfire risk, fuels, and system conditions to improve their ability to monitor and respond to changes.	Section 5.2

Collaborative Evaluation, Planning, and Framework Development		
Improvement plans for distribution planning & risk management	Facilitate improvements to utility plans and practices by evaluating adoption of best practices for distribution planning and/or risk management.	Section 4.2; Chapter 5
Consequence analysis framework	Analyze potential harms of a utility-caused wildfire ignition to help utilities justify and prioritize investments.	Section 5.2

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Critical customer tracking and load shedding planning	Update critical customer tracking and load shedding plans annually and share them between utilities and the county to keep all parties informed about how vulnerable populations will be served during an emergency.	Sections 3.2, 8.3
Collaborative wildfire mitigation plan (WMP) innovation	Improve and streamline the WMP process. Steps to such a process could include: WMP evaluation, WMP template development, WMP integration plans, supply chain management database development and benchmarking, weather monitoring, after-action reporting standardization, training and tabletop exercises, customer engagement	Section 5.2
Cost sharing arrangements for wildfire risk mitigation	Explore cost sharing arrangements or other collaborative actions for employee training, utility benchmarking, hazard modeling, supply chain management, and customer engagement.	Section 5.2
Collaborative grid planning process development	Foster collaboration among utilities, city planners, the county, developers, and other stakeholders to stay informed of potential developments or other step changes to load. Support utilities and electric boards in adopting planning metrics that are important to their customers and stakeholders, such as hosting capacity, cost of service and avoided costs, resiliency, equity, energy efficiency, and/or environmental impacts.	Section 4.2
Local energy and resilience planning	More directed and sustained planning efforts by cities and Lane County government could clarify local goals, priorities, and feasible actions related to energy and electricity.	Chapter 9
Electric vehicle infrastructure planning	Help prepare Lane County for increases in electric vehicle adoption in collaboration with utilities to help minimize the number of grid upgrades needed to serve electric vehicles and allow the utilities to integrate electric vehicle infrastructure as a distributed energy resource for demand management.	Chapter 2

Public Accessibility, Education, and Outreach

Energy workforce development	Strengthening the skilled energy workforce in Lane County could expand access to well-paying local jobs. Oregon's Clean Energy Workforce Coalition, launched in 2022, aims to help build the local energy workforce and could be a key partner.	Chapter 2
Increased access to utility planning documents	Cities, the county, utility boards, and customers can encourage utilities to make their planning documents more accessible to the public so customers and other stakeholders can stay informed and have meaningful opportunities to participate.	Section 4.1
Public demand response interest surveys	Survey interest in demand response among residential, commercial, and industrial customers to help utilities estimate likely participation and plan accordingly. Surveys can also educate the public of the potential benefits and limitations of such programs.	Section 4.3

Assessment of customer willingness to pay for resilience	Survey customers' willingness to pay for resilience investments to help utilities understand how their customers weigh risks relative to future benefits. Responses can be used to help utilities predict what kind of rate increases might be acceptable to customers in exchange for a more resilient system.	Section 4.4
Specific renewable energy guidelines/ goals	While many cities in Lane County have general goals to boost renewable energy, few have tangible guidelines or actionable plans. If renewable energy remains a priority for cities, they might consider taking more specific action.	Chapter 9

Countywide Modeling

Countywide load forecasting	Forecast future electric loads to help utilities prepare for changes in electrification to support community development goals.	Section 4.2
Peak load scenarios investigations	Estimate future peak loads (where and under what circumstances demand will be highest) to help utilities prepare to serve those loads. Future peak load scenarios can provide similar insights to load forecasts, but with simpler models.	Section 4.2
Model countywide energy efficiency and conservation scenarios	Conduct a study investigating energy efficiency and conservation scenarios to help cities, the county, and utilities understand the capacity for offsetting increased loads from electrification, and development. Studies could also inform infrastructure investments.	Section 4.3
Valuing resilience	Develop a method to value the benefits of resilience measures to help local governments and utilities evaluate options systematically and communicate the tradeoffs of resilience measures clearly.	Section 4.4
Wildfire risk assessment	Improve estimates of wildfire probability and intensity across the landscape and translate those results to utility infrastructure so utilities can base their wildfire mitigation plans on more accurate, asset-specific risk assessments.	Section 5.2
Wildfire spread models	Create models that utilities can use in real-time during a fire to predict how the fire will spread to inform their decisions to send out crews, de-energize lines, or take other mitigative measures.	Section 5.2
Geospatial data tracking to support project prioritization	Collect geospatial data that can inform future decisions about where to dedicate electricity system improvement efforts and develop prioritization methods to further support decision making.	Chapter 8