The first widescale end-use load research project in the United States was also the last. Conducted between 1986 and 1989 by the Bonneville Power Administration, the End-Use Load and Consumer Assessment Project, known as ‘ELCAP,’ documented energy use at hourly intervals from both residential and commercial end uses. Even though consumer behaviors and circumstances of 30 years ago are very different than those of today, ELCAP data is still used across the country for energy modeling and forecasting.

In addition to seismic shifts in technology — including the advent of personal computing, LEDs, video games, and smart thermostats, to name a few — the way Northwest residents work and live has undergone a major transformation in the decades since the ELCAP study. Recognizing the need for up-to-date energy use data, the alliance brought together a working group of utilities and energy efficiency organizations in 2016 to form the Northwest End-Use Load Research (EULR) project. Data gathering began in 2018 with the residential Home Energy Metering Study (HEMS), which will ultimately monitor 400 homes across the region over a five-year period. The Commercial Energy Metering Study (CEMS) kicked off in 2019 and will sample approximately 100 buildings over a similar timeframe. Both studies will collect end use load data in one-minute intervals providing unparalleled insight into how Northwest residents and businesses use energy today.

The Northwest Power and Conservation Council (the Council), the entity responsible for developing the region’s 20-year power plan, is a member of the EULR working group. “The diversity of how people interact with their appliances, thermostats, and lighting systems, or how businesses operate facilities, is impossible to predict,” said Charlie Grist, Manager of Conservation Resources at the Council. “This research will allow us to see how buildings operate in the real world relative to our engineering models of the perfect building.”

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NEEA and its partners anticipate that EULR data will support many areas of utility planning, including energy efficiency, load forecasting, resource planning and demand-response efforts. “Capacity is a growing concern for many Northwest utilities,” said Phillip Kelsven, Energy Efficiency Planner, Bonneville Power Administration (BPA). “Since the region isn’t adding generation resources, we need to increase resources on the demand side. That means really understanding how energy is being used, which EULR data helps us do.”

Additionally, the benefits of accurate load shape data extend to areas of the utility business that aren’t typically associated with energy efficiency. These include ratemaking, transmission planning and distribution planning. According to Kelsven, “knowing precisely where energy is being used will have a suite of benefits for BPA and its utility customers, including supporting transmission projects and helping utilities properly price residential, commercial and industrial customer rates.”

The EULR working group expects that more timely and granular energy use load data will translate into millions of dollars in savings for the region. To put it in perspective, Northwest utilities spend over $350 million each year on energy efficiency alone. If better data, analysis, and information allowed program managers to save just one percent of these costs, that could mean as much as $17.5 million in savings over five years.

“There’s a long list of known and valuable uses for this data,” said the Council’s Charlie Grist. “But I’m most excited by the number of uses we haven’t even considered yet. Take the COVID-19 pandemic, for example. With the EULR project, we’ll be able to immediately know the impact for homes and businesses of the stay-at-home order. Along with so many other applications, this data will help us track these changes in real time.”

To learn more about the EULR project, visit neea.org/EULR

“Having load shapes that are current, rather than 30 years old, will help convince more organizations that energy efficiency is real, and highlight the benefit of efficiency and demand response to the utility bottom lines.”

—Philip Kelsven, Energy Efficiency Planner, Bonneville Power Administration

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