



Adopting AI to maximize DER integration and asset optimization



Agenda

- Kaiser Permanente sustainability program
- DERs integration challenges
- Use cases description
- Mitigation and solution
- Lesson learned and next steps

Kaiser Permanente at a Glance



***Recognized as one of
America's leading health care
providers and not-for-profit
health plans***

**Kaiser Foundation
Health Plan**

**Permanente
Medical
Groups**

**Kaiser
Foundation
Hospitals**

**> 12.2 million
members**

**> \$80 billion annual
operating revenue**

**78 million square feet of
occupied space**

**39 hospitals, > 650
medical
offices and other
facilities**

KP 2025 Environmental Stewardship Goals



Climate Action

Carbon neutral by 2020. ***Become “carbon net positive” by 2025***, buying enough clean energy and carbon offsets to remove more greenhouse gases from the atmosphere than we emit.



Sustainable Food

Buy all of our food locally or from farms and producers that use sustainable practices, including using antibiotics responsibly.



Waste Reduction

Recycle, reuse or compost 100% of our non-hazardous waste.



Water Conservation

Reduce the amount of water we use by 25% per square foot of buildings.



Safer Products

Increase our purchase of products and materials that meet environmental standards to 50%.



Sustaining Sustainability

Meet international standards for environmental management at all of our hospitals.



Collaboration

Pursue new collaborations to reduce environmental risks to foodsheds, watersheds and air basins supplying our communities.

Investing in Renewable Energy and Storage



- Utility-Scale Renewables
- On-Site Solar
- Energy Storage
- EV Charging Stations
-and more



Kaiser On-Site Renewable Portfolio



- Currently have more than 35 MW of on-site solar generation across KP
- A total of 57 additional projects -- totaling more than 46 MW and \$150 million in investment – are in development



More DER Brings Challenges



- Multiple vendors with different PPA rates
- Sometimes, multiple vendors on the *same site* (solar, fuel cell)
- Difficulty integrating into a microgrid
- Large-scale deployment of DER is hard to audit and check for billing errors – and there are always billing errors, even from utilities
- Battery storage brings demand charge savings – until it doesn't
- So in a nutshell, more DER brings more challenges, which can impact economic performance of these assets
- Need for closer monitoring and you can't always rely on the vendors

Challenge: Excessive Net Metering



- KP had a problem with excessive on-site generation from fuel cells
- Getting and analyzing data was too difficult/expensive from utilities or other vendors.
- Development of easy-to-use dashboard readily identified where, when and how much net metering took place
- Result is that some FC capacity downsized and moved to other sites, saving KP \$\$\$.
- Lessons learned – too much DER can be a problem; properly size DER and take into account potential for energy efficiency, which will lower DER needs.

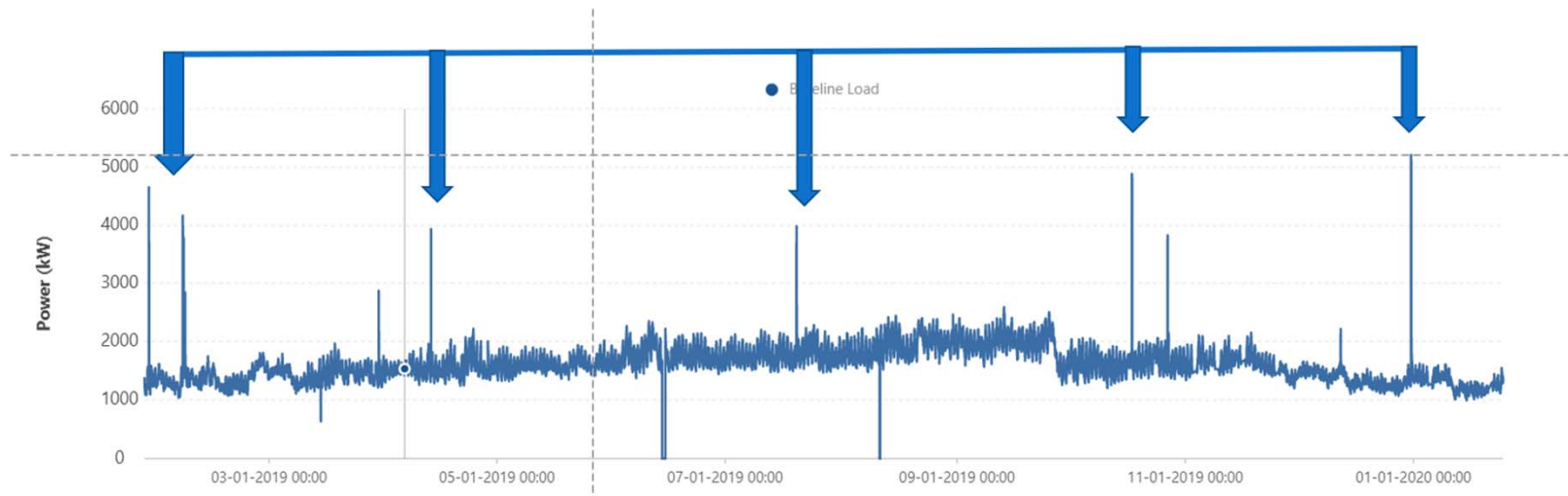


Too much net metering on weekends – solution is to potentially adjust demand profile, consider energy storage or downsize fuel cell

Challenge: Demand Charges



- Every one of these spikes costs the facility tens of thousands of dollars in demand charges.
- We need to identify why this is happening and the solution.
- With better/easier monitoring, we can easily see when the spike occurs and thus, what the cause may be.



Challenge: PPA Bill Audit



- KP has seen some solar PPA providers billing at the wrong rate and wrong number of kWhs.
- KP has a large portfolio of solar and fuel cell projects and can't audit every bill.
- Bill auditing solution connects to solar PV production, fuel cell production (as well as fuel cell gas consumption) to a system that knows PPA rates (including annual escalators) and predicted output of each DER project at every time of the year.
- System will send alarm when solar output, monthly bill cost or fuel cell efficiency is out of range. This will save KP hundreds of hours of staff time and identify excess costs that might not otherwise be spotted.



DERNetSoft Vision

A screenshot of the DERNetSoft website. The top navigation bar includes the DERNetSoft logo, a 'Log In' button, and a 'Sign Up' button. The main content area features a background image of the San Francisco skyline with the Transamerica Pyramid. Overlaid on this image is a large blue text box with the text: *we envision Advanced Energy Communities where energy is clean, resilient, affordable, and crowd-sourced*. To the right of this box, the text **Working to shape a sustainable energy future.** is displayed. Below this text are two buttons: 'Learn More' and 'Join Us →'. At the bottom of the screenshot, another blue text box contains the text: *DERNetSoft is an economic development tool to transform cities and communities from Energy Consumer into Energy Prosumer*.

We Focus on People



*Shifting focus from delivering
Business Value
to delivering
Values for People*

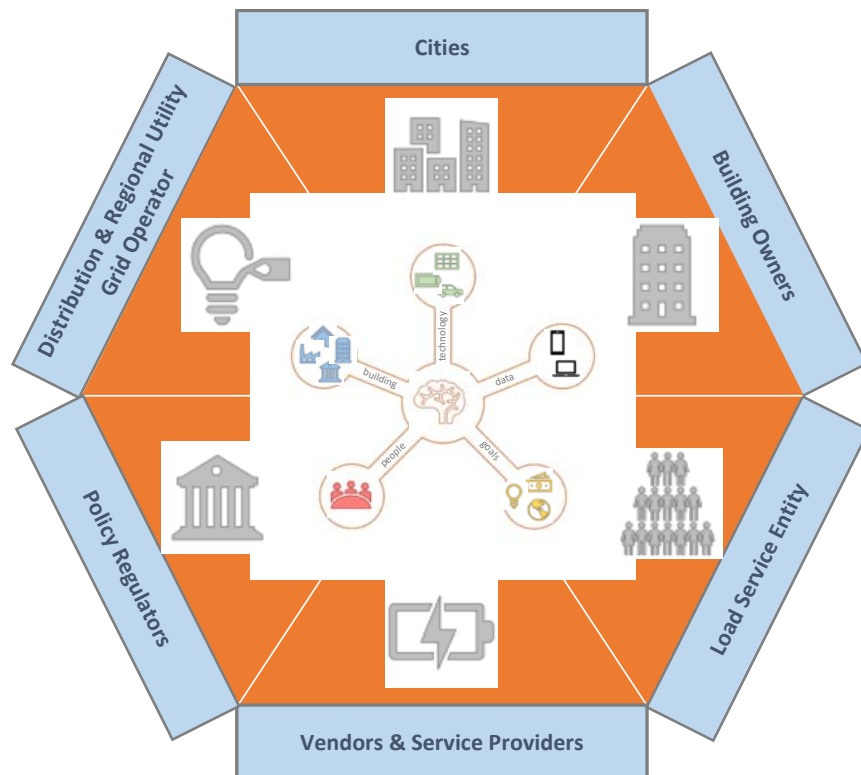
We, the Post-Digital People



**Tech-clash—a clash
between business and
technology models that
are incongruous with
people's expectations and
needs**

Technology Vision 2020 | [accenture.com/technologyvision](https://www.accenture.com/technologyvision)

DERNetSoft Marketplace

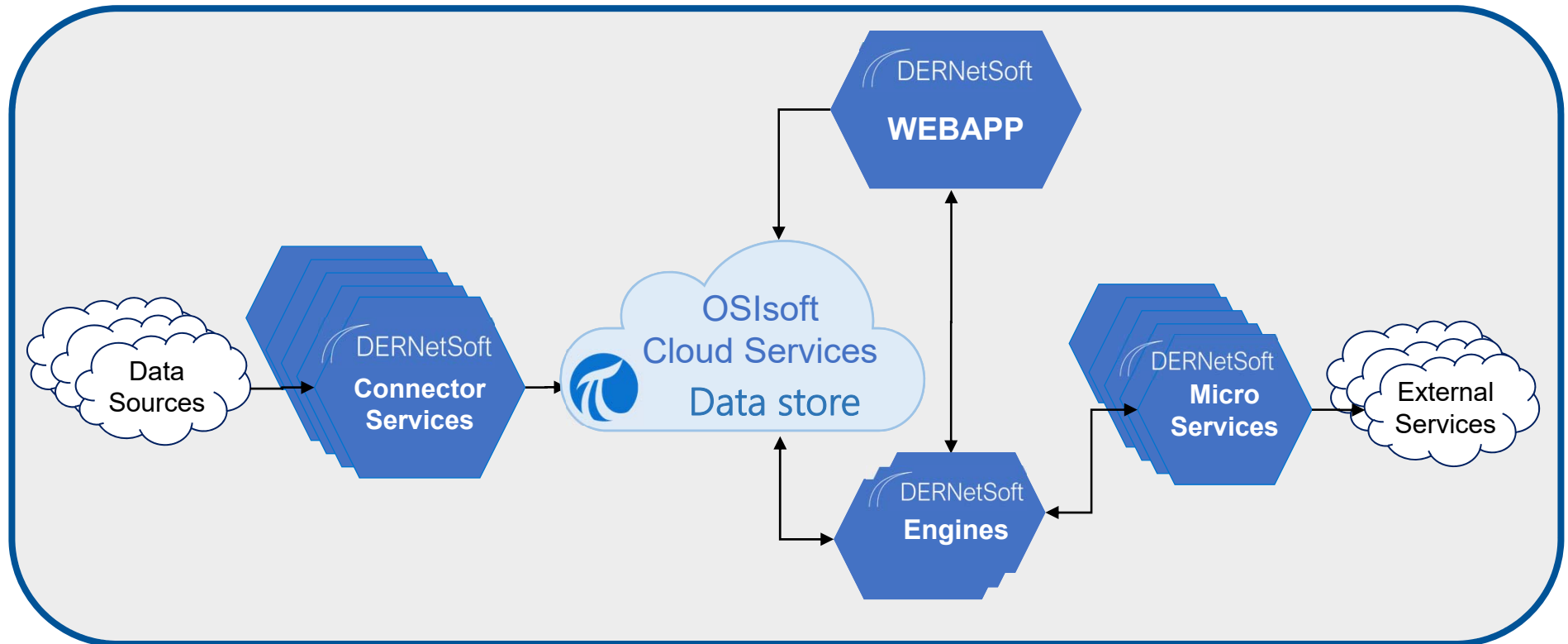


- *Holistic, replicable and data driven approach*
- *Multi-sided energy marketplace to connect all energy stakeholders*
- *AI based cloud platform*
- *Scale DER adoption and market participation*
- *First deployment in San Leandro, CA*
- *Kaiser Permanente engagement*

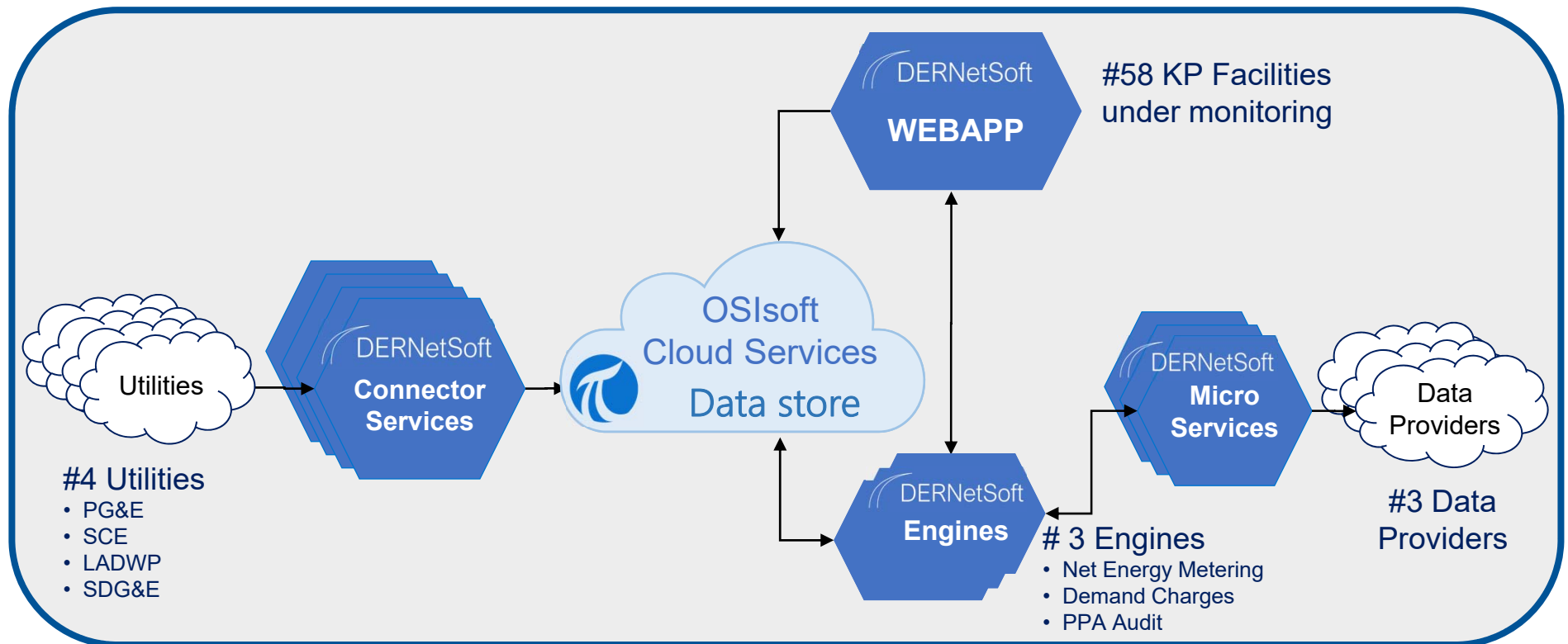
How it works



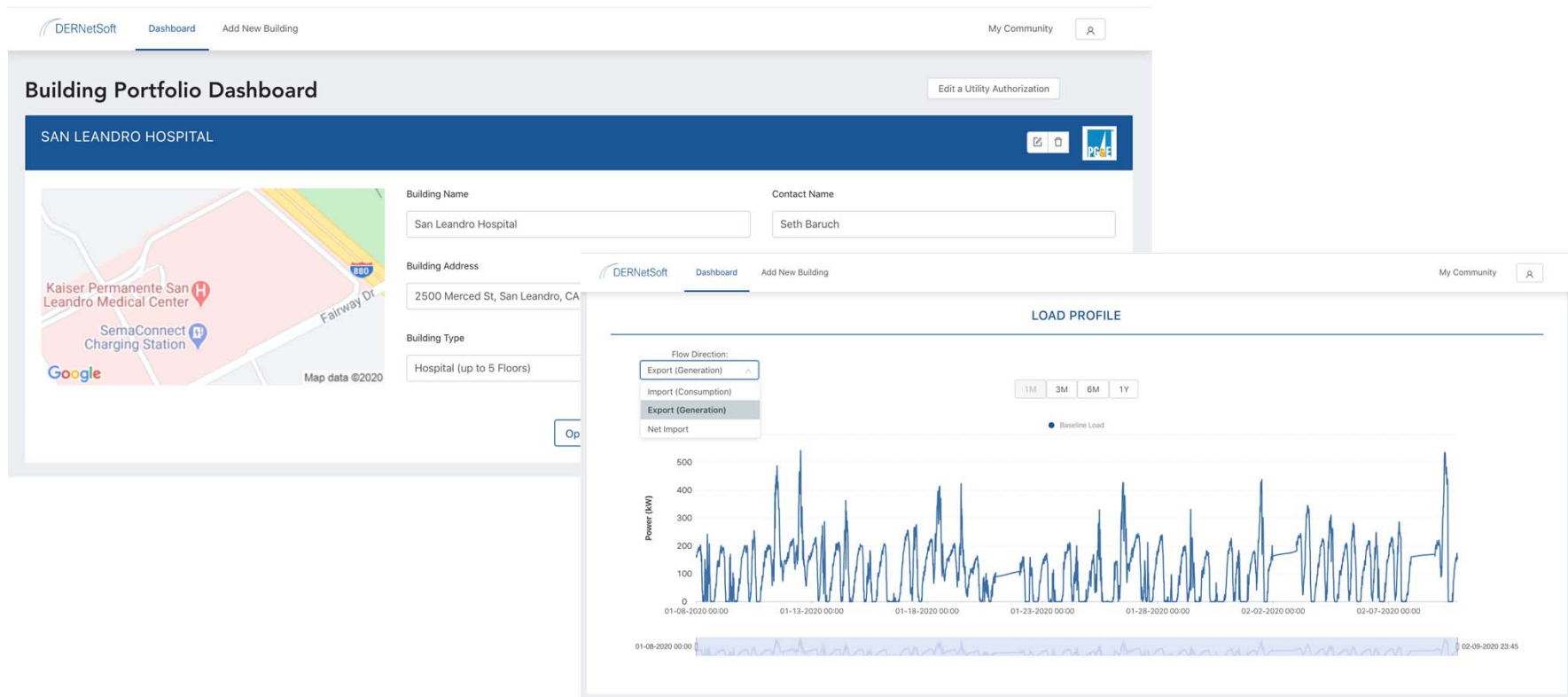
Solution – General overview



Solution - Kaiser Permanente



Solution - Kaiser Permanente



Solution - Kaiser Permanente



The screenshot displays the DERNetSoft dashboard interface. On the left is a sidebar with navigation options: 'My Energy', 'Kaiser P...', 'Community B...', 'Description: A...', 'Community Me...', 'Metrics: Energy', 'Started: Tue J...', 'Import Meter Data F...', and 'Import Hosting Cap...'. The main content area is titled 'My Energy Communities' and features a 'Kaiser Permanente Community' card. This card includes a 'Community Details' section with the following information: Description: A community of all KP buildings; Community Members: 32; Metrics: Energy Consumed, Energy Usage Intensity, Greenhouse Gas Emissions; and Started: Tue Jan 22 2019. To the right of the details are three metric cards: 'Instantaneous Demand' at 19,023.1 kW, 'Instantaneous Generation' at 23,257 kW, and 'Total GHG Emissions' at 63,632 Metric Tons CO2. An 'Open' button is located at the bottom right of the community card. The top of the dashboard shows the 'DERNetSoft' logo, 'Dashboard' title, and a user profile icon.

DERNetSoft Dashboard

My Energy Communities

Add A Community

Kaiser Permanente Community

Community Details

Description: A community of all KP buildings

Community Members: 32

Metrics: Energy Consumed, Energy Usage Intensity, Greenhouse Gas Emissions

Started: Tue Jan 22 2019

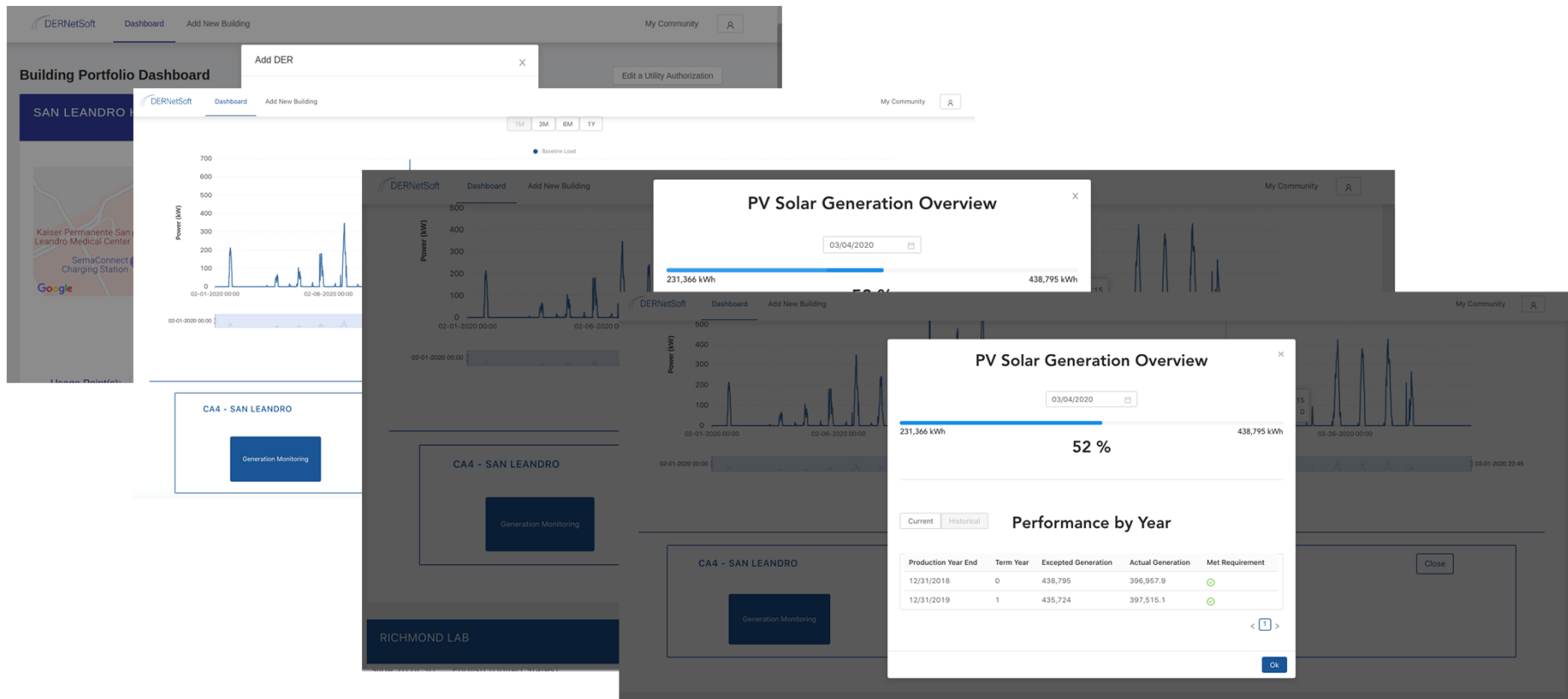
Instantaneous Demand
19,023.1 kW

Instantaneous Generation
23,257 kW

Total GHG Emissions
63,632 Metric Tons CO2

Open

Solution - Kaiser Permanente



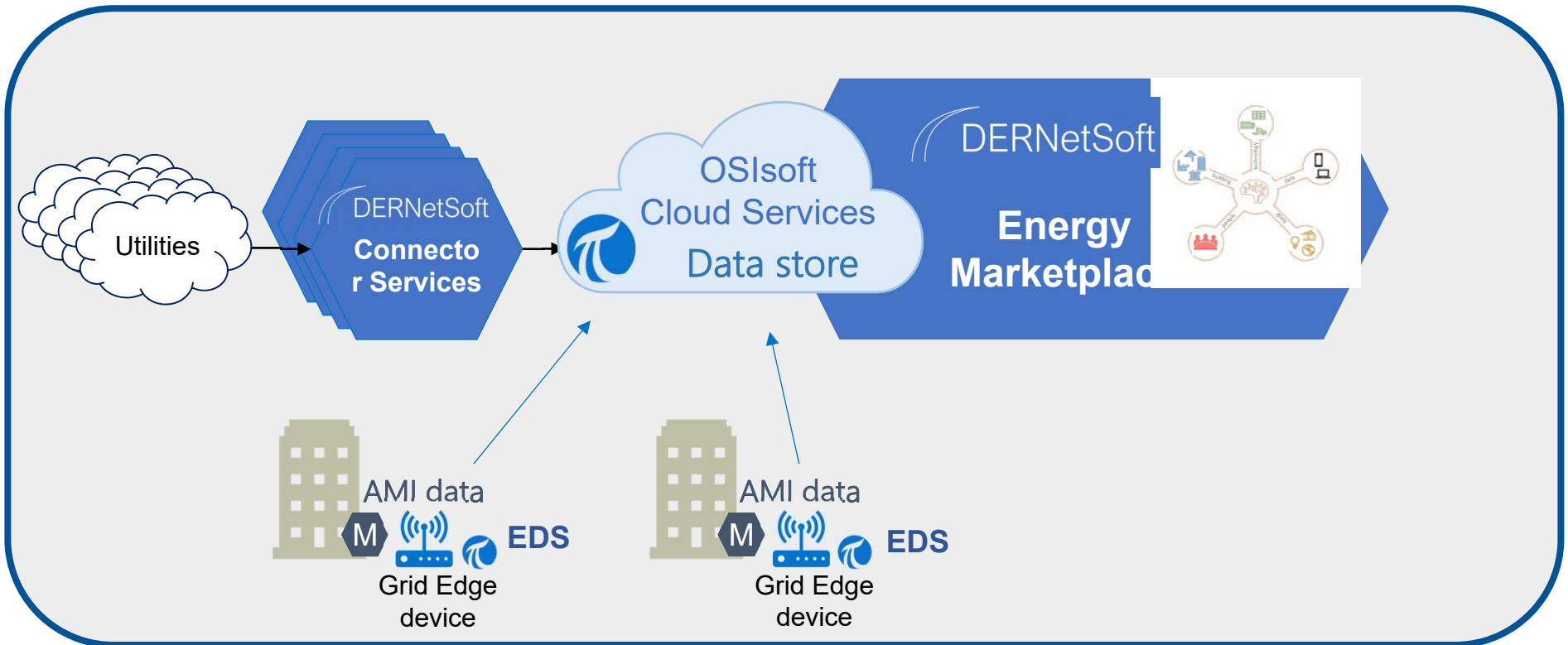
What is up next?



- Increase data granularity visibility from the smart meter
- Piloting an autonomous demand charge management agent
- Increase behind the meter DER data integration and visibility for outage management and DER operational optimization



What is up next?



DER MONITORING AND OPTIMIZATION



CHALLENGES

- Excessive Net Metering from PV Solar and Fuel Cell generation
- Power Demand Charges
- Power purchase agreement bill auditing

SOLUTION

- Monitor Net Energy Metering, PPA compliance and power demand enable by OCS/EDS technology.
- Data integration from solar PV and fuel cell generation.
- Easy-to-use dashboard and notifications for operation optimization

BENEFITS

- Some fuel cell capacity being downsized and moved to other sites, saving KP \$\$\$.
- Platform approach to scale up to 58 KP facilities in 4 utilities territories



Too much DER can become a problem; with such monitoring, we can easily see when the spike occurs and thus, what the cause may be. It saved KP hundreds of hours of staff time and identified excess costs and local over generation



Speakers



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