Improving Kaiser Permanente's sustainability footprint with enhanced energy efficiency, visibility, and optimization

Presented by: Seth Baruch, Alberto Colombo
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 million members
> $80 billion annual operating revenue
200,000+ employees
More than 70 million square feet of occupied space
40 hospitals
More than 700 medical offices and other facilities
Business Challenges for Kaiser Permanente

• Kaiser Permanente is a very large entity with more than 1,200 buildings nationally – hospitals, medical office buildings, data centers, administrative space, warehouses/distribution centers and even a manufacturing facility (eyeglasses).

• More than 1.5 million MWHs of consumption per year.

• We have exactly two people in the 200,000+ person organization to focus solely on energy issues.

• How to find the opportunities to save energy and identify the best places to deploy solar and other distributed energy resources?

• How will we know how those DERs are performing?

• This last point is key – you actually can have too much of a good thing.

• How do we know we’re on the right tariff? They keep changing all the time.

• How do we know how much money we’re saving from DERs?
Fuel Cell Net Metering

“…too much DER can be a problem; properly size DER and take into account potential for energy efficiency, which will lower DER needs…”

CHALLENGES
• Excessive on-site generation from fuel cells.
• Collecting and analyzing data was too difficult and expensive from utilities or other vendors.
• Some vendors required hardware installation, which can be disruptive.

SOLUTIONS
• DERNetSoft platform to monitor Net Energy Metering.
• Easy-to-use dashboard readily identified where, when and how much NEM took place.
• Scaled over multiple facilities in 4 different utilities territory.

RESULTS
• Some fuel cell capacity being downsized and moved to other sites, saving Kaiser Permanente M$.

© 2023 AVEVA Group plc and its subsidiaries. All rights reserved.
Auditing of Solar PPAs

Occasional billing errors

<table>
<thead>
<tr>
<th>Site</th>
<th>Actual Generation (KWH)</th>
<th>Expected Generation: Pre-Adj. (KWH)</th>
<th>Adj. Expected Generation: Locus (KWH)</th>
<th>% Expected Output Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA3941 - Harbor-MacArthur Medical Offices</td>
<td>41,858.9</td>
<td>434,753.3</td>
<td>57,544.0</td>
<td>72.74%</td>
</tr>
<tr>
<td>CN2203 - Napa Medical Offices</td>
<td>33,074.6</td>
<td>572,659.8</td>
<td>42,216.2</td>
<td>78.35%</td>
</tr>
<tr>
<td>CN1301 - Union City Medical Offices A</td>
<td>44,348.3</td>
<td>943,438.2</td>
<td>55,967.3</td>
<td>79.24%</td>
</tr>
<tr>
<td>CN2450 - Livermore Medical Offices</td>
<td>93,281.3</td>
<td>716,099.9</td>
<td>112,064.8</td>
<td>83.24%</td>
</tr>
<tr>
<td>CN3501 - S. San Francisco Hospital</td>
<td>27,302.8</td>
<td>502,016.3</td>
<td>32,993.6</td>
<td>82.75%</td>
</tr>
<tr>
<td>CA6051 - East Hills Medical Offices</td>
<td>479,755.2</td>
<td>563,971.7</td>
<td>578,375.0</td>
<td>82.95%</td>
</tr>
<tr>
<td>CN9201 - San Leandro Medical Center</td>
<td>72,710.3</td>
<td>1,271,174.9</td>
<td>92,834.7</td>
<td>78.32%</td>
</tr>
</tbody>
</table>

Sometimes there is under production
Savings from on-site solar projects can vary greatly depending on the selected utility rate, which can change.

- Option E would have saved $18,110
- Option R would have saved $31,125
## Night-time Set Back Opportunities

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Setback Percentage: 4 AM Divided by 2 PM Loads</th>
<th>By EUI Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max (%)</td>
<td>Min (%)</td>
</tr>
<tr>
<td>MOB (Medical Office Building – 9 am – 5 pm occupancy)</td>
<td>95.1%</td>
<td>39.7%</td>
</tr>
<tr>
<td>Hospital</td>
<td>100.8%</td>
<td>47.1%</td>
</tr>
<tr>
<td>Hospital</td>
<td>93.9%</td>
<td>43.9%</td>
</tr>
<tr>
<td>MOB</td>
<td>114.2%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Hospital</td>
<td>192.3%</td>
<td>60.6%</td>
</tr>
<tr>
<td>MOB</td>
<td>101.9%</td>
<td>23.8%</td>
</tr>
<tr>
<td>Hospital</td>
<td>90.0%</td>
<td>54.9%</td>
</tr>
<tr>
<td>Hospital</td>
<td>94.1%</td>
<td>56.6%</td>
</tr>
<tr>
<td>Hospital</td>
<td>91.3%</td>
<td>59.0%</td>
</tr>
<tr>
<td>Hospital</td>
<td>97.0%</td>
<td>65.9%</td>
</tr>
<tr>
<td>Central Utility Plant</td>
<td>80.5%</td>
<td>50.3%</td>
</tr>
<tr>
<td>MOB</td>
<td>100.0%</td>
<td>55.0%</td>
</tr>
<tr>
<td>Data Center</td>
<td>107.0%</td>
<td>82.0%</td>
</tr>
<tr>
<td>Admin Building</td>
<td>101.4%</td>
<td>19.6%</td>
</tr>
<tr>
<td>Admin Building</td>
<td>103.1%</td>
<td>34.9%</td>
</tr>
<tr>
<td>Call Center</td>
<td>113.5%</td>
<td>37.2%</td>
</tr>
<tr>
<td>MOB</td>
<td>62.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>MOB</td>
<td>683.5%</td>
<td>46.1%</td>
</tr>
<tr>
<td>MOB</td>
<td>130.9%</td>
<td>45.1%</td>
</tr>
<tr>
<td>MOB</td>
<td>78.6%</td>
<td>33.3%</td>
</tr>
<tr>
<td>MOB</td>
<td>58.6%</td>
<td>31.7%</td>
</tr>
<tr>
<td>MOB</td>
<td>125.9%</td>
<td>41.2%</td>
</tr>
<tr>
<td>MOB</td>
<td>1802.0%</td>
<td>35.6%</td>
</tr>
</tbody>
</table>

- **Hospitals are in a tight range**: This indicates that the setback percentages for hospitals are relatively consistent.
- **This is what’s possible**: The Variations in Setback Potential across the range of back-up metrics is starkly lower than the potential to avoid.
- **This is what’s avoidable**: With further process and design optimization, this range of back-up potential can be reduced.
One MOB Example

If every KP building evaluated in this study got down to 1 w/sq foot from 10 pm to 4 am, the savings would be $1.7M/year.
This can be done for natural gas too

Again, a wide range of average day/night gas usage
SOLUTION

ENERGY COMMUNITY ECOSYSTEM

AVEVA Product Portfolio use case

Alberto Colombo
Energy Information System As A Service Provider

- **1800+** Total Customer Sites across the US
- **65M+** Total Square Foot
- **109MW** DER Capacity across all customer base
- **200** Total Distributed Energy Resources
- **30+** Utilities, CCAs, Municipalities & Cooperatives
- **490GWh** Annual DER Generation

© 2023 AVEVA Group plc and its subsidiaries. All rights reserved.
Distributed Energy Resources (DERs): Challenges

The fast growth of DERs such as PV Solar, Energy Storage System, Fuel Cell, Electric Vehicle is causing new challenges in the ‘behind the customer meter’ environment.

• Behind the meter environment is changing and has become much more complex.
• Challenging sustainability goals are driving large deployment of DERs.
• Lack of digitization, data availability and standardization across multiple utility territories.
• Multiple DERs managed by different vendors creates DER data silos behind the meter.
• Data sharing between internal and external teams.
Solution: Energy Community Ecosystem

A scalable and replicable solution to support large corporations in achieving their prosumer and sustainability goals.

- Scalable platform by design.
- Software As A Service model.
- Data collection automation, digitization and standardization.
- Behind the meter DERs data integration.
- Advanced energy analytics suite.
- Secure data sharing.
Energy Community Ecosystem: Architecture

The DERNetSoft SaaS platform is built on top of AVEVA Data Hub (PaaS) and enables the Energy Community Ecosystem.
Energy Community Ecosystem: Benefits

A replicable model to be adopted by other industries.

- The subscription model allows a company to access the service without large upfront cost (i.e., hardware installation).

- The platform approach guarantees scalability over large number of sites and across multiple utility territories.

- AVEVA Data Hub and DERNetSoft provide the energy domain expertise to collect, digitize and standardize meters and DERs data.

- The fully integrated solution breaks the existing behind the meter data silos and enables innovative energy services.

- AVEVA Data Hub community system feature enables data sharing and unlocks the network effect.
Building the Network Effect

Leveraging the AVEVA Data Hub community feature we can scale this approach to other industries and make an impact on the digital transformation.
Energy Community Ecosystem: Impact / Savings

Very quick Return on Investment (ROI)

• This initiative has saved Kaiser millions in energy savings and reimbursements for over production.

• If all of the identified measures were implemented, the savings would be into the tens of millions of dollars.

• KP is now talking about implementing policies/standards around nighttime setbacks in non-hospital buildings.

• This is a key tool to educate facility directors, chief engineers and regional executives about the benefits of our sustainability programs, such as being precise on the economic savings of solar power.

• When someone asks, “so how much are we really saving”, we have a firm answer.

• The next steps in the journey: integrating EV charging, expanding natural gas analytics to focus on Scope 1 emission reductions and substantially adding energy storage assets.
Conclusion

Doing more with less

• The platform enables Kaiser and other customers to hold vendors’ feet to the fire (solar, fuel cells, battery, etc.). Sometimes interests aren’t always aligned, and this tool provides assurance that the DER investments are the right size and scope.

• Energy management teams may be relatively small in large, decentralized organizations. No one has the ability to do everything – so we need to find those needles in the haystack (and there are a lot of needles).

• Having this intelligence greatly expands the reach and ability of small teams to augment their impact, to focus their time on the easier-to-implement opportunities. It increases our ability to have a much larger impact that a small team would normally have.

• What has enabled this low-cost/high-impact opportunity? A combination of much easier access to utility interval data and advanced analytics/machine learning. And this will only improve over time.

• Highly replicable in other sectors (network effect) to make a bigger impact on the decarbonization of the planet.
Seth Baruch
National Director Energy & Utilities
- Kaiser Permanente
- Seth.J.Baruch@kp.org

Alberto Colombo
Founder & President
- DERNetSoft
- alberto@dernetsoft.com
Questions?

Please wait for the microphone.
State your name and company.

Please remember to...

Navigate to this session in the mobile app to complete the survey.

Thank you!
Upcoming Sessions

Platform Developer Deep Dive: Getting the most out of AVEVA’s Industrial Platform
Thursday, October 26 @ 1:30-2:30pm
Room 2004

Platform Developer Roadmap: Leveraging new capabilities within AVEVA’s Industrial Platform
Thursday, October 26 @ 2:50-3:50pm
Room 2004
This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.
ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life’s essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world’s most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com