



PureSense®

Pump Monitoring & Control

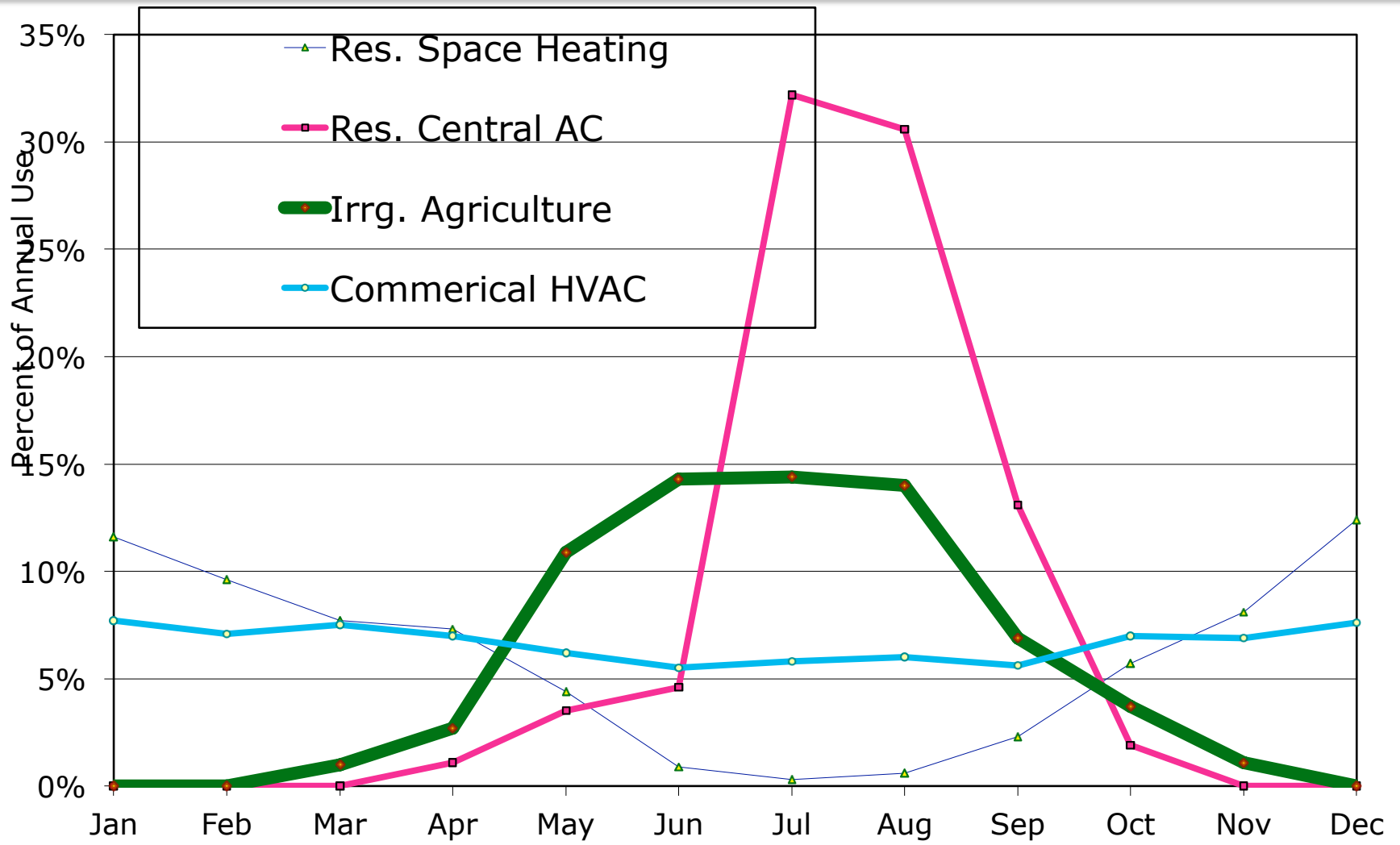
Bill Henry

Energy Analyst

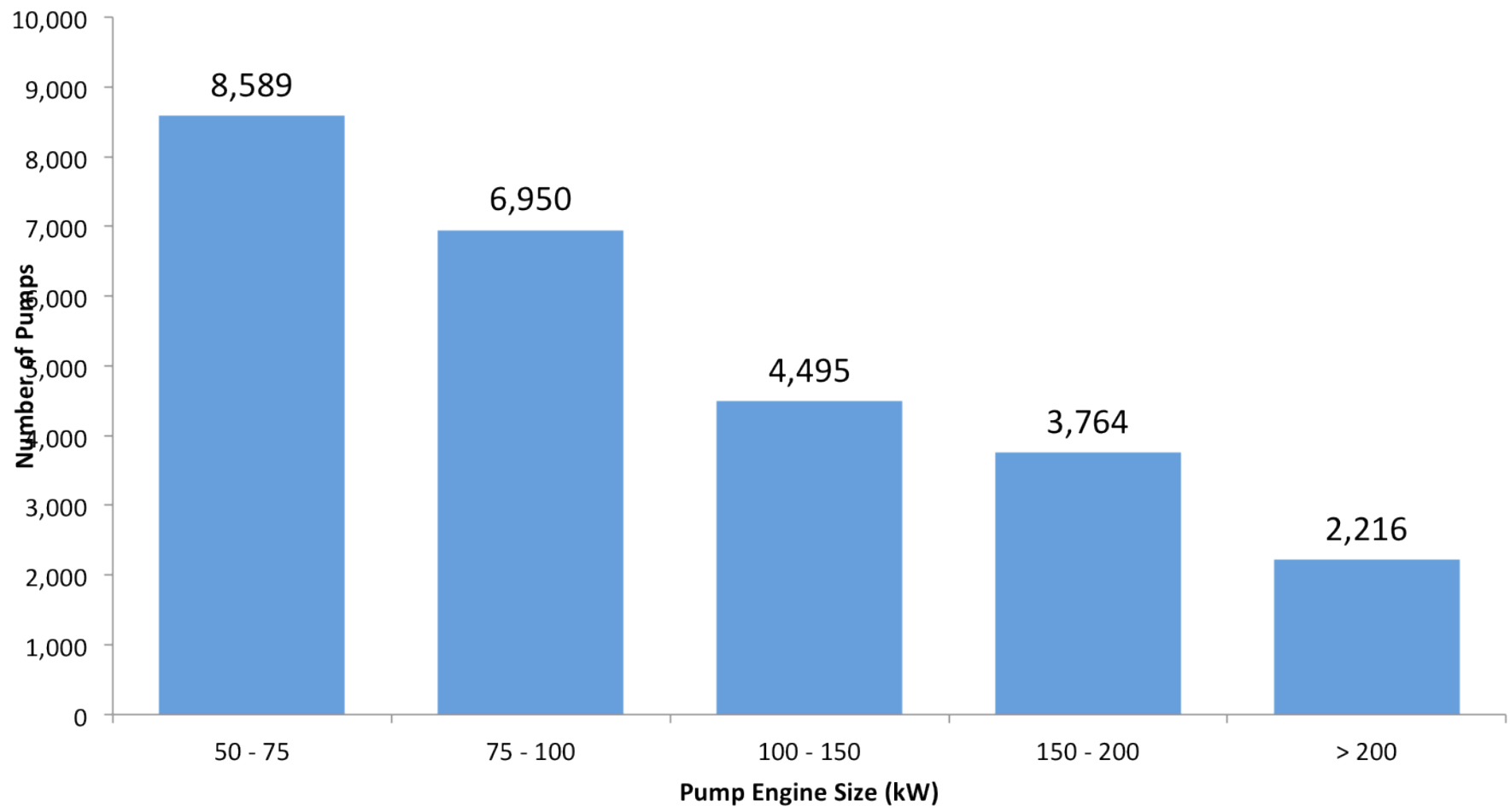
503.475.0391

bhenry@puresense.com

California Utility “On-Peak” Load Profiles



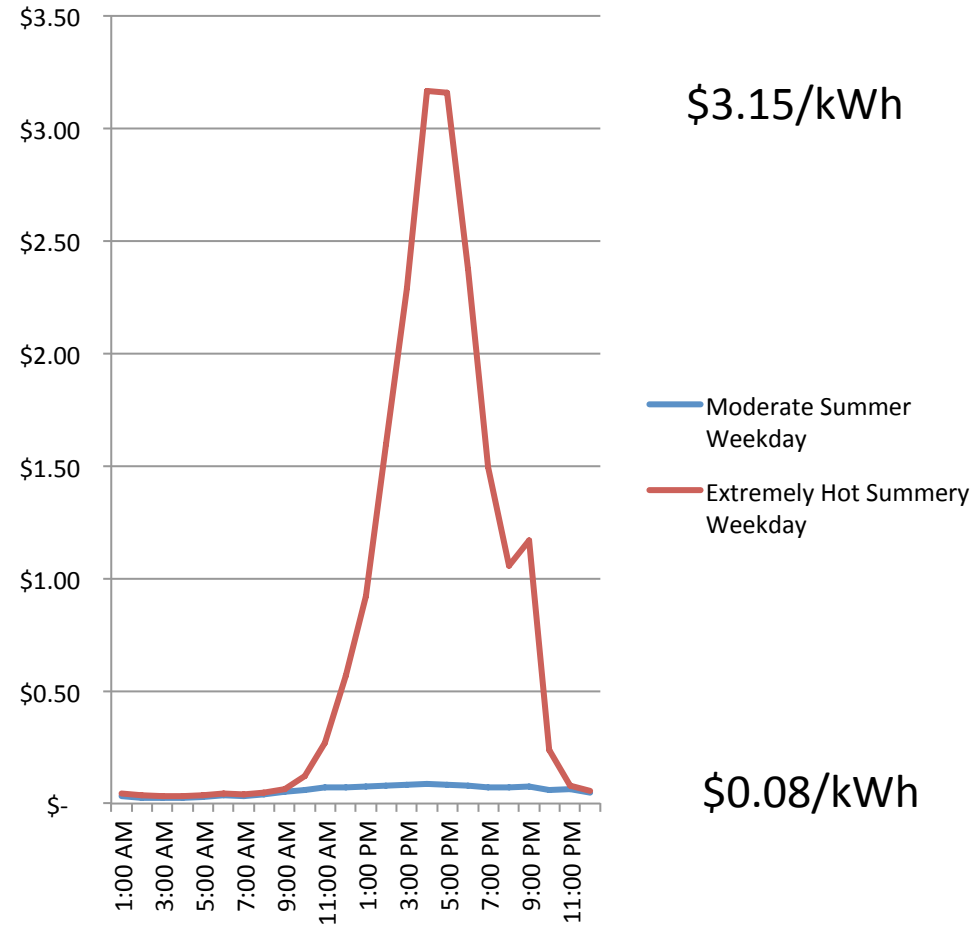
Pumping Capacity of Well Pumps - California



Source: USDA Census of Agriculture

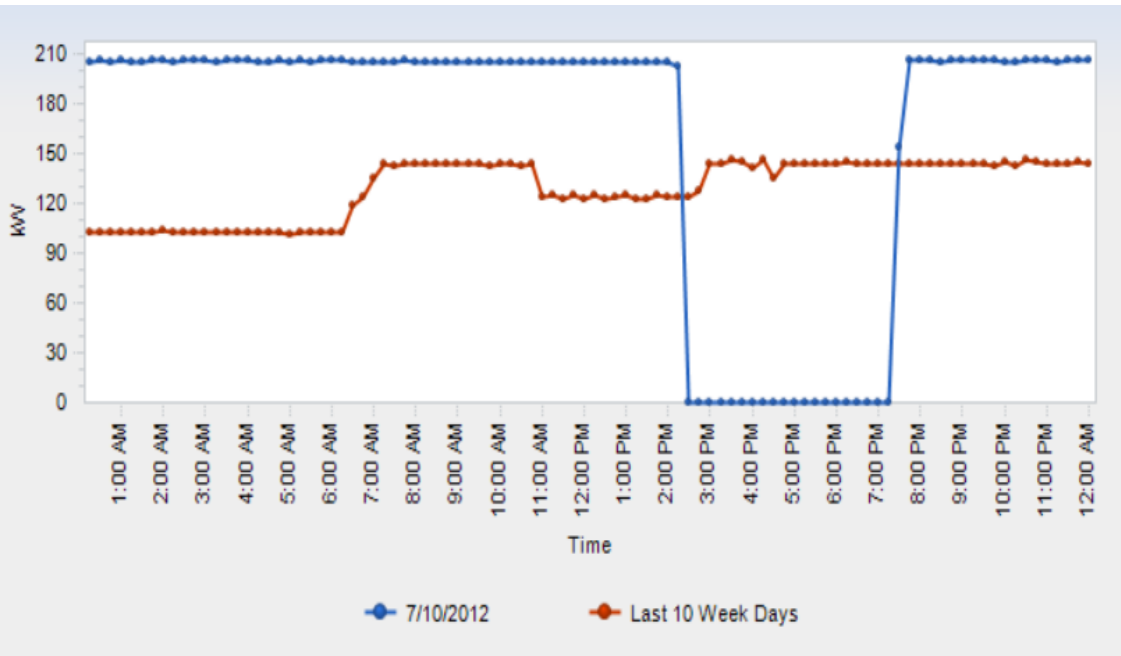
Real Time Price, Time of Use, Demand Response

- Pumping during low-price hours
Ability to shift pumping off-peak
- Demand Response
Shut off for shorter periods
Utility & 3rd party aggregator programs



SCE Real Time Price Tariff

Demand Response



SCE Capacity Bidding
Example: August Day-Of
150 kW Baseline * \$24/kW =
\$3,600 DR Payment

PureSense Customer Example

Five 400 HP Pumps

Est 2012 DR revenue: June \$1,800, July \$7,000, Aug \$4,700, Sept \$1600

Demand Response Technology incentive \$94,000

Irrigation Controls

Control with Confidence

- Remote or local pump control
- Real time status
- Permissives ensure safe startup
- Manage multiple sites

Monitor with Ease

- Flow rate, totalizer
- Well and reservoir level sensors
- Pressure
- Soil Moisture



Soil Moisture leads to Energy Efficiency

10% energy reduction primary pumping energy reduction

- Irrigation Water Management
- Scientific Irrigation Scheduling
- BPA - \$5.20 incentive per acre

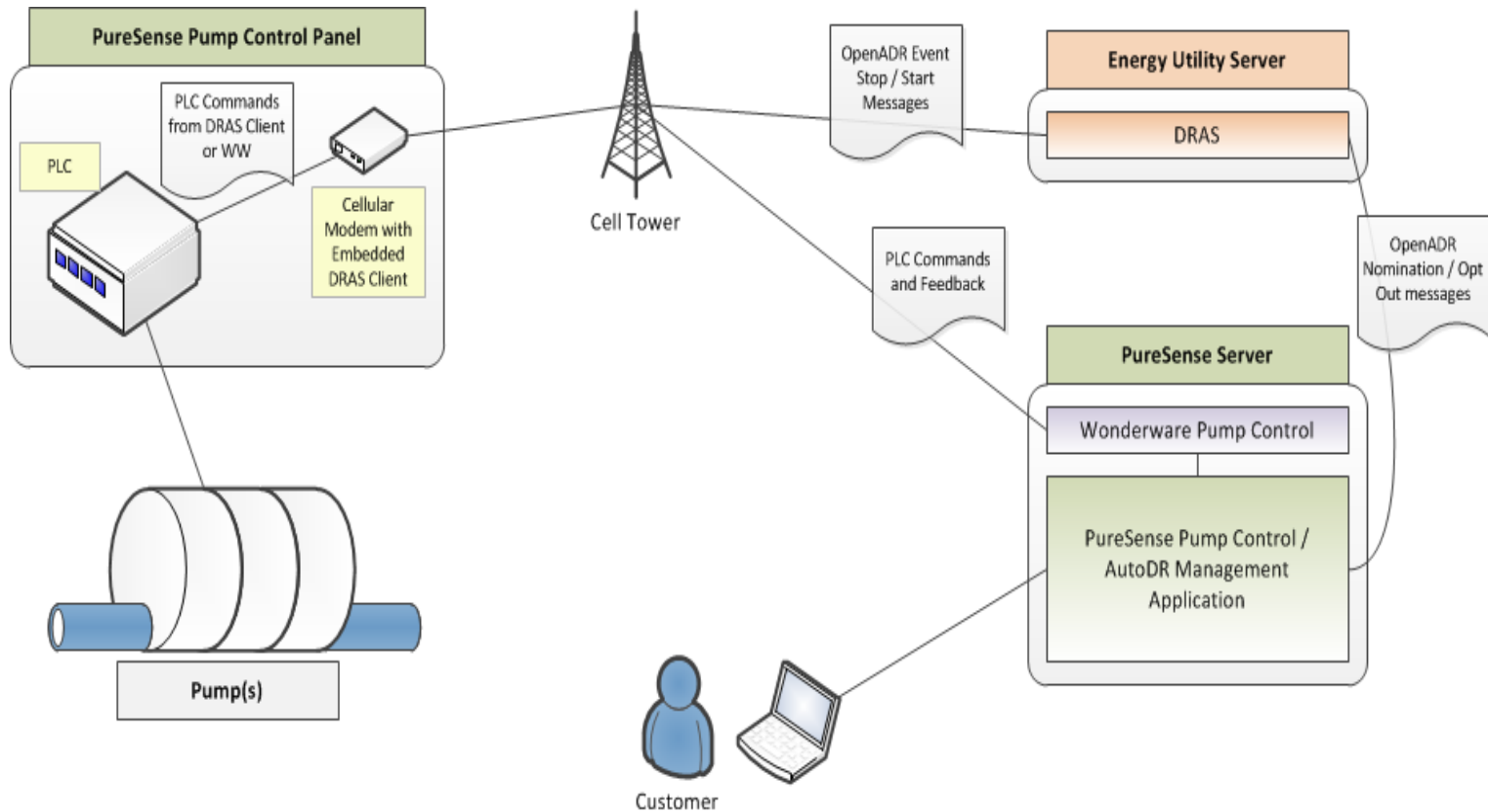


Source: Interim Evaluation of GWMA Irrigation Scheduling Pilot Project

<http://www.nwcouncil.org/energy/rtf/meetings/2006/01/RTF2GWMApilot.pdf>

PureSense PMC w/ADR

Automated Demand Response – OpenADR



PureSense Irrigation Management System

The screenshot displays the PureSense Irrigation Management System interface. At the top left is the logo "PureSense Irrigation Management System". On the top right, it shows "John Smith Demo Farm" and "0 Alarms". A navigation bar includes "DASHBOARD", "SETTINGS", "WONDERWARE", and "TOOLS". A sidebar on the left lists "Demo Farm", "Almonds", "Ryan's Pump 1", "Tomatoes", and "Pump 1". The main content area shows "Showing all items in Demo Farm" and "Last Updated 04:20:51 PM".

The primary focus is on "Ryan's Pump 1" (Emulator 01 Pump Station). Its status is "RUNNING" (indicated by a green light icon) and "HOA Status Auto". It has "Run Hours since START 1.33 hr". A "Control" button is visible. Below this, a "TOTAL RUN HOURS BY DAY" bar chart shows run hours for dates 5/31, 6/01, 6/02, 6/03, 6/04, 6/05, and 6/06. The y-axis is labeled "undefined (hr)" with values 0, 6, 12, 18, 24. The chart shows approximately 4 hours on 6/05 and 16 hours on 6/06. A blue arrow points from the chart to the "LINE 1 FLOW" section.

The "LINE 1 FLOW" section (Emulator 01 Pump Station) includes a "Flow Meter 1" gauge showing "0.00 gpm". A red box highlights the text "Water Pumped TODAY 1.02 ac-in" with a red arrow pointing to it. To the right are two pressure gauges: "Inlet Pressure 1" at "75.00 psi" and "Outlet Pressure" at "45.00 psi".

Below this is the "Pump 1" (Emulator 02 Pump Station) section, which is currently "NOT RUNNING" (indicated by a grey light icon) and has "HOA Status Auto". A "Control" button is also present.

Merritt Farms, 94 sites

PureSense®



AutoDR Example

- SCE AutoDR Technology Incentive
- \$300/kW

300 HP Pump, 225 kW, 40% on-peak

$225 \text{ kW} * 0.4 * \$300 = \$67,500$ incentive