PureSense®

California's AutoDR in Agriculture

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PMC Team

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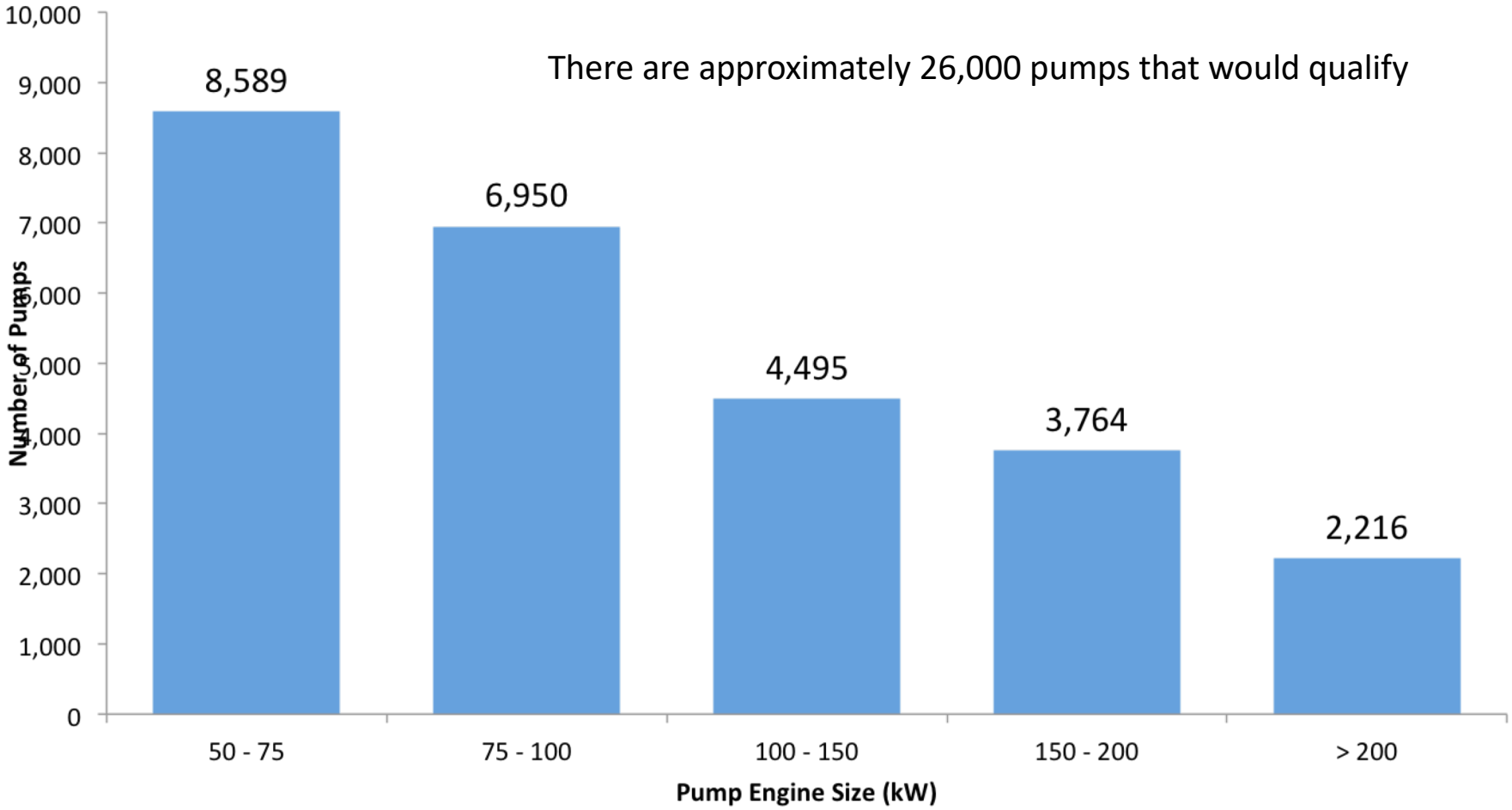
Technology Incentives, AutoDR

Utility	AutoDR TI Incentives	2012 to 2014 budget	Timing
PG&E	$200/kW	$26 MM	Proposals Now, applications Sep 2012
SCE	$300/kW	$35 MM	Accepting now
SDG&E	$300/kW	$9 MM	Accepting now

Example: 250 HP pump, max load 187kW, used 50% on peak equal 93.5 kW
Incentive for SCE would be 93.5 kW x $300/kW = $28,050.

Pumping Capacity of Well Pumps - California

There are approximately 26,000 pumps that would qualify



Source: USDA Census of Agriculture

TI Application Process

Step 1 –Fill Pipeline

WHO: Sales Representatives

WHAT: find Customers Interested in irrigation monitoring and/or pump control.

2. Identify sites:
   . Pumps > 50HP
   . Customer wants monitoring/control
   . Willing to shut off duirng summer months

Step 2 – Utility Accounts

WHO: Sales and PMC team

WHAT: Get from Customer:

1. CISR , Authroization to review utility bills

2. All utility accounts with HP > 50 HP. This might be front page of bills, or a spreadsheet with:

. Service Account

. Meter #

. Service address

. Company name

Step 3 - Application

WHO: PMC team

1. Gather utility data on historical energy usage.

2.Technology Incentive Application, Customer signs, send to utility.

Time: Approval 1-2 months

Close Process

Step 4 – Customer Approval to Proceed

Who: Sales Rep and PMC Rep

1. Meet with Customer and discuss results of utility incentive application.

2.Decide on project and budget

3. Get approval from customer to proceed.

Time: 2-3 Weeks

Step 5: Field Survey Installation

Who: PMC Team

1. Field Survey
2. Confirm project aspects
3. Installation
4. Demand Response enrollment
5. AutoDR utility testing

Time: 1 month

Step 6: Invoice, & Support

Who: PMC team

1. Invoice
2. Training
3. Support

Merritt Farms, 94 sites

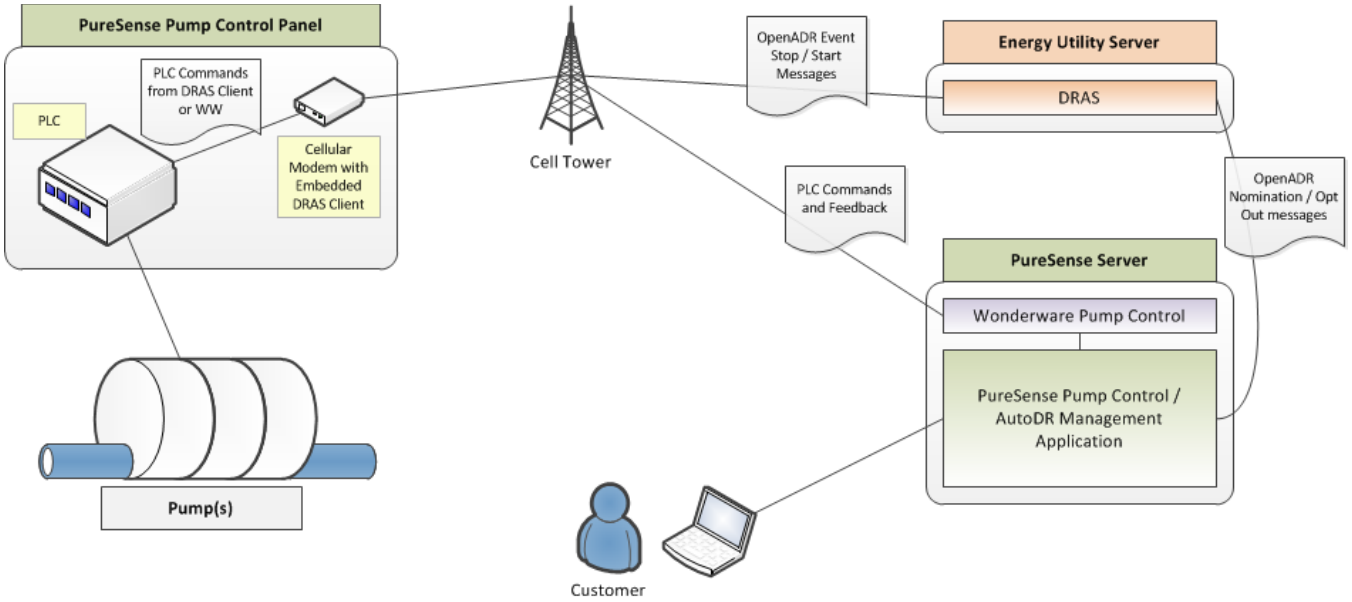
PureSense®

Merritt Farms

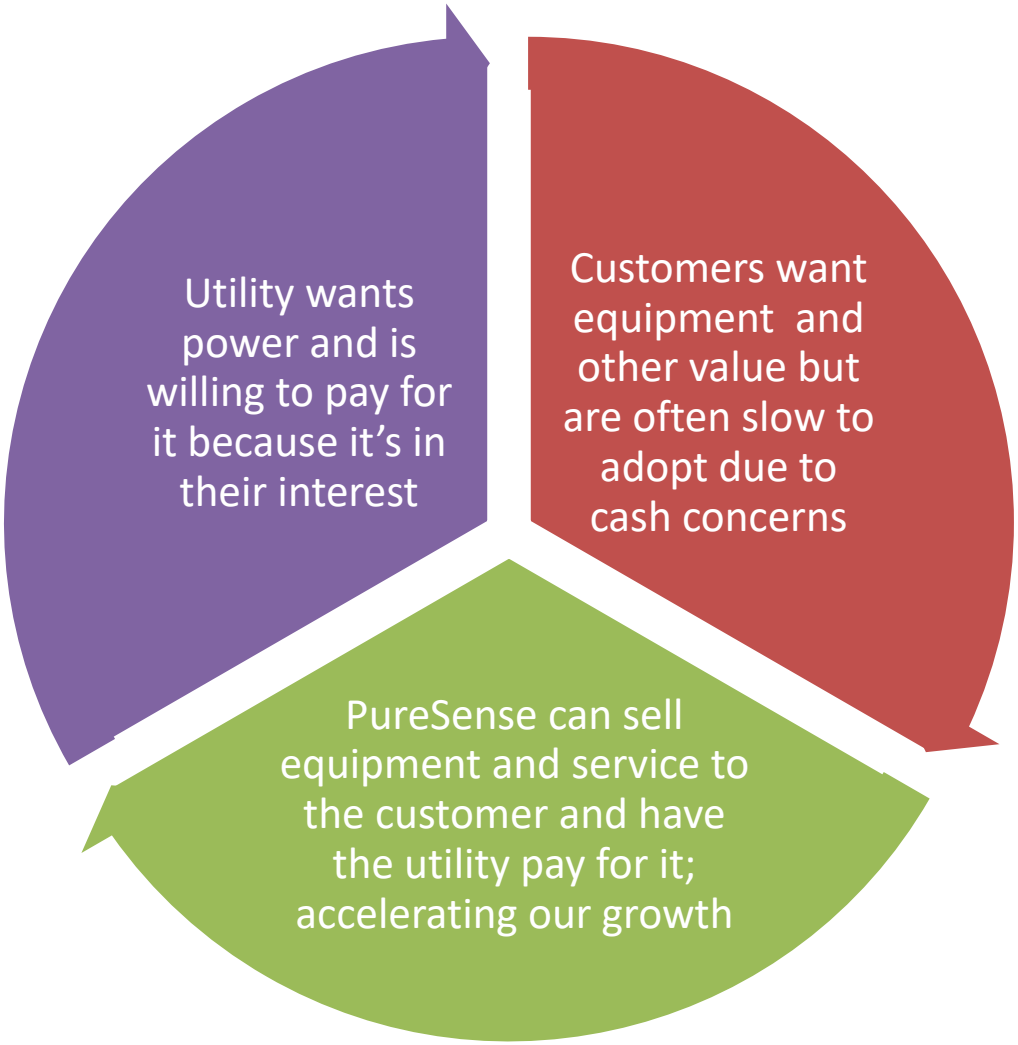
- 94 pumps total, SCE territory
- Estimated on peak load > 5,000 kW
- TI incentive > **$900K**
- Sold PMC (94 units) and SMP (10 units)
- Customer earns over $20,000/yr in DR incentives.
- AutoDR solution

PureSense PMC

- Sophisticated communication and controls enabling on/off, monitoring flow/levels/pressure, data management and integrated software.



PureSense ESP



Terminology

- **kW**: Kilowatts (1hp = .76 kW)
- **Demand Response (DR):** reducing kW when Utility calls.
- **AutoDR:** when the utility can reduce the load directly.
- **Baseline:** Average amount of power used from the previous year's 3 highest consecutive months.
- **Technology Incentives (TI):** Incentives from Utilities to pay for initial equipment, installation, and controls.
- **Service Account (SA):** Billing site that has 1 or more meters.
- **Aggregator**: Independent third parties, authorized to work with a utility company to reduce the state's energy usage.
- **On-peak:** Afternoons M-F, May to Oct, e.g., PG&E noon-6pm

Customer Criteria for utility incentives

1. Pump size > 50HP
2. Must have on-peak usage and willing to shut off for 1 to 4 hours during summer months.
3. Communicating Smart or Interval meter

Demand Events

- Events can be called based for several reasons:
  - Heat
  - Price of energy
  - Utility need
- Events, May 1 to Oct 31, noon-6PM during the week (no weekends or holidays)
- 2012, PG&E 3 consecutive days, 4 hr each

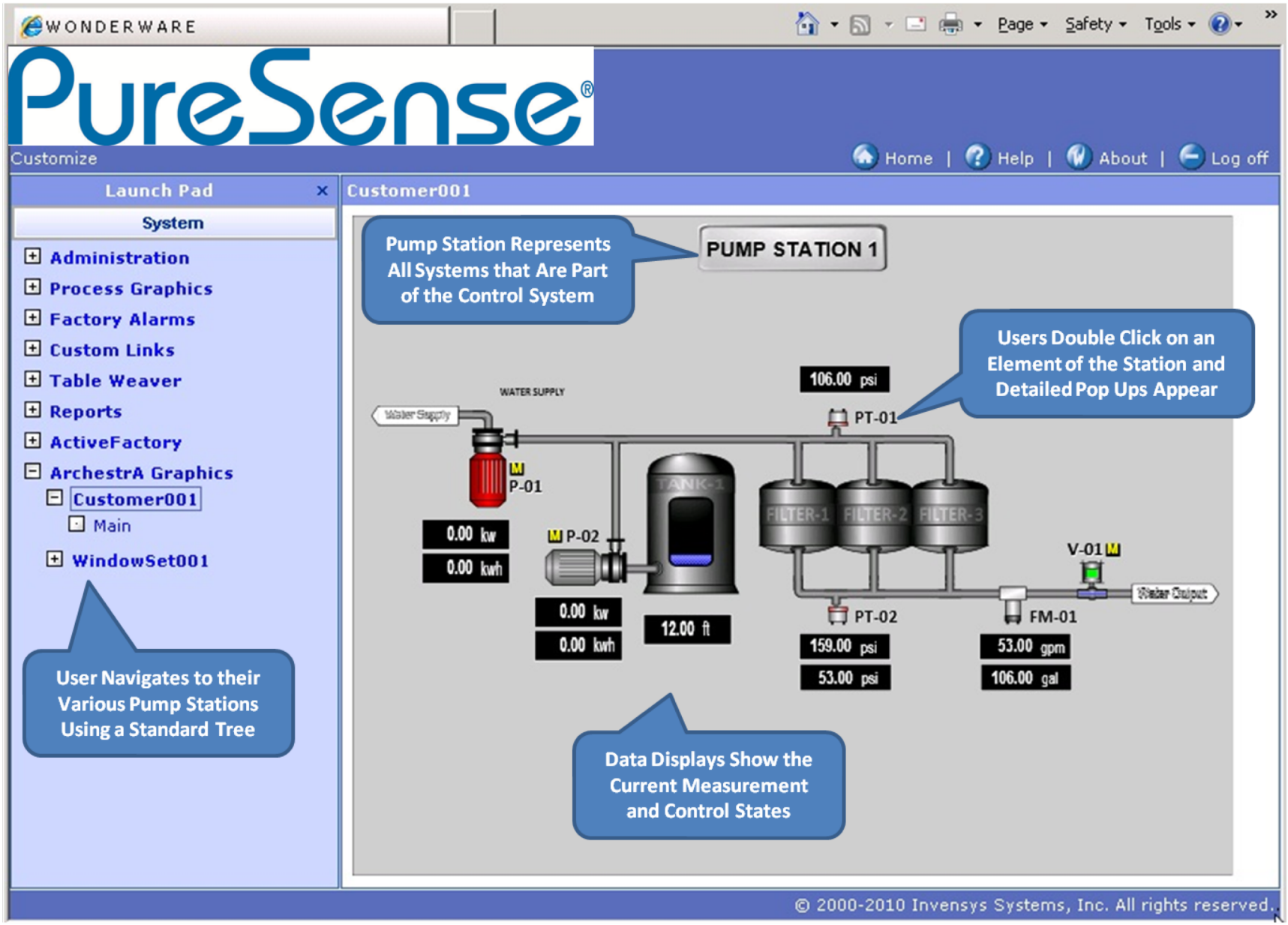
Application Steps

1. Customer Signs CISR (Customer Information Standardized Request) and provides all account and meter information
2. TI application submission
3. Utility or third party review and approval
4. Enroll in DR program (Constellation Energy)
5. Install PMC, train customer
6. Customer nominations 10 days prior to month start (e.g., May 20 for a June 1 start)

CUSTOMER EXAMPLE

PURESENSE PRODUCTS AND SERVICE


vwatt-demo.constellation.com
Admin
Contact Us
Help
VirtuWatt™
Constellation Energy
Welcome Joe Energy
ABC Industrial
Wednesday, February 1 2012, 11:28 (EST)
Account Settings
4 Notifications
Sign Out
CUSTOMIZE
Home
Marketplace
Energy Manager
Historical Usage
LMP Summary
Financial Summary
Weather
Manage Profiles
ISO : Results Update • Updated as of 2/1/2012 at 11:27am...
show more
Real Time Usage
Industrial Office
Wednesday February 01, 2012 11:28
MWh kWh
1 min 5 min 15 min 30 min 60 min
Industrial Offi... Baseline
3.24MW
MW
Show Meter Details
Weather
Industrial Office
Current
February 1, 2012
65.9 °F
Partly Cloudy
34%
3 W
30.01 kPa
Tonight
ISO Grid Load
PJM ISO
PJM ISO Grid Load
59 %
LMP
BGE
Day Ahead LMP Variance
$
MW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Administration
Process Graphics
Factory Alarms
Custom Links
Table Weaver
Reports
ActiveFactory
ArchestrA Graphics
Customer001
Main
WindowSet001
User Navigates to their Various Pump Stations Using a Standard Tree
Customer001
Pump Station Represents All Systems that Are Part of the Control System
PUMP STATION 1
Users Double Click on an Element of the Station and Detailed Pop Ups Appear
WATER SUPPLY
Water Supply
106.00 psi
PT-01
M
P-01
0.00 kw
0.00 kwh
M P-02
0.00 kw
0.00 kwh
TANK-1
12.00 ft
FILTER-1
FILTER-2
FILTER-3
V-01 M
Water Output
PT-02
159.00 psi
53.00 psi
FM-01
53.00 gpm
106.00 gal
Data Displays Show the Current Measurement and Control States
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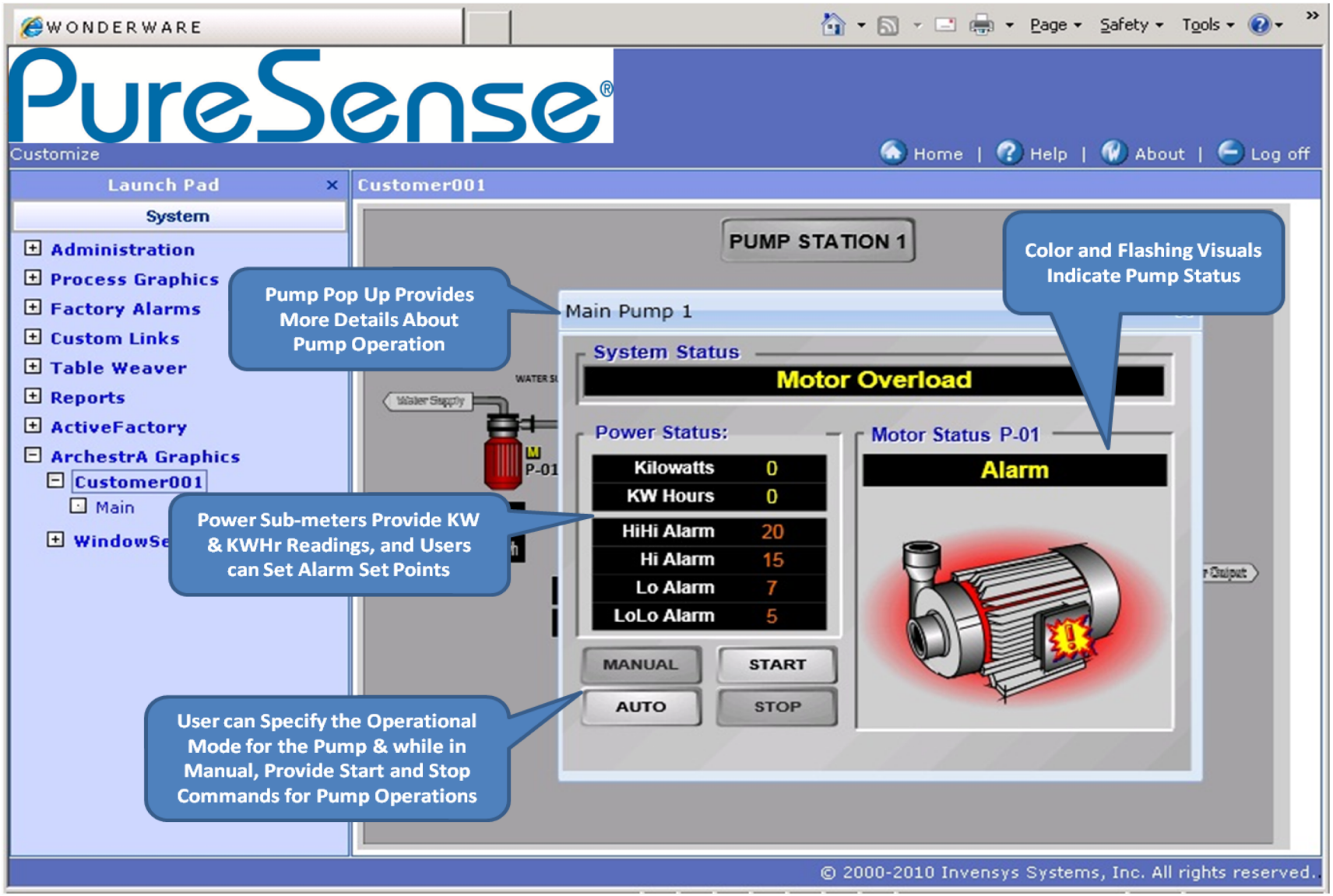
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Administration
Process Graphics
Factory Alarms
Custom Links
Table Weaver
Reports
ActiveFactory
ArchestrA Graphics
Customer001
Main
Customer001
PUMP STATION 1
Pump Pop Up Provides More Details About Pump Operation
Color and Flashing Visuals Indicate Pump Status
Main Pump 1
System Status
Motor Overload
Power Status:
Kilowatts 0
KW Hours 0
HiHi Alarm 20
Hi Alarm 15
Lo Alarm 7
LoLo Alarm 5
Motor Status P-01
Alarm
MANUAL
START
AUTO
STOP
Power Sub-meters Provide KW & KWHr Readings, and Users can Set Alarm Set Points
User can Specify the Operational Mode for the Pump & while in Manual, Provide Start and Stop Commands for Pump Operations
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California Smart Energy:
Carrots will turn to Sticks

- Carrots = Incentives and performance pay

  What: TI Incentives and Demand Response Program

  When: through 2014

  Who: Ag with large On Peak usage, > 32kW

- Sticks = Time of Use (TOU) rates

  What: **Energy Costs will go up, unless control load**

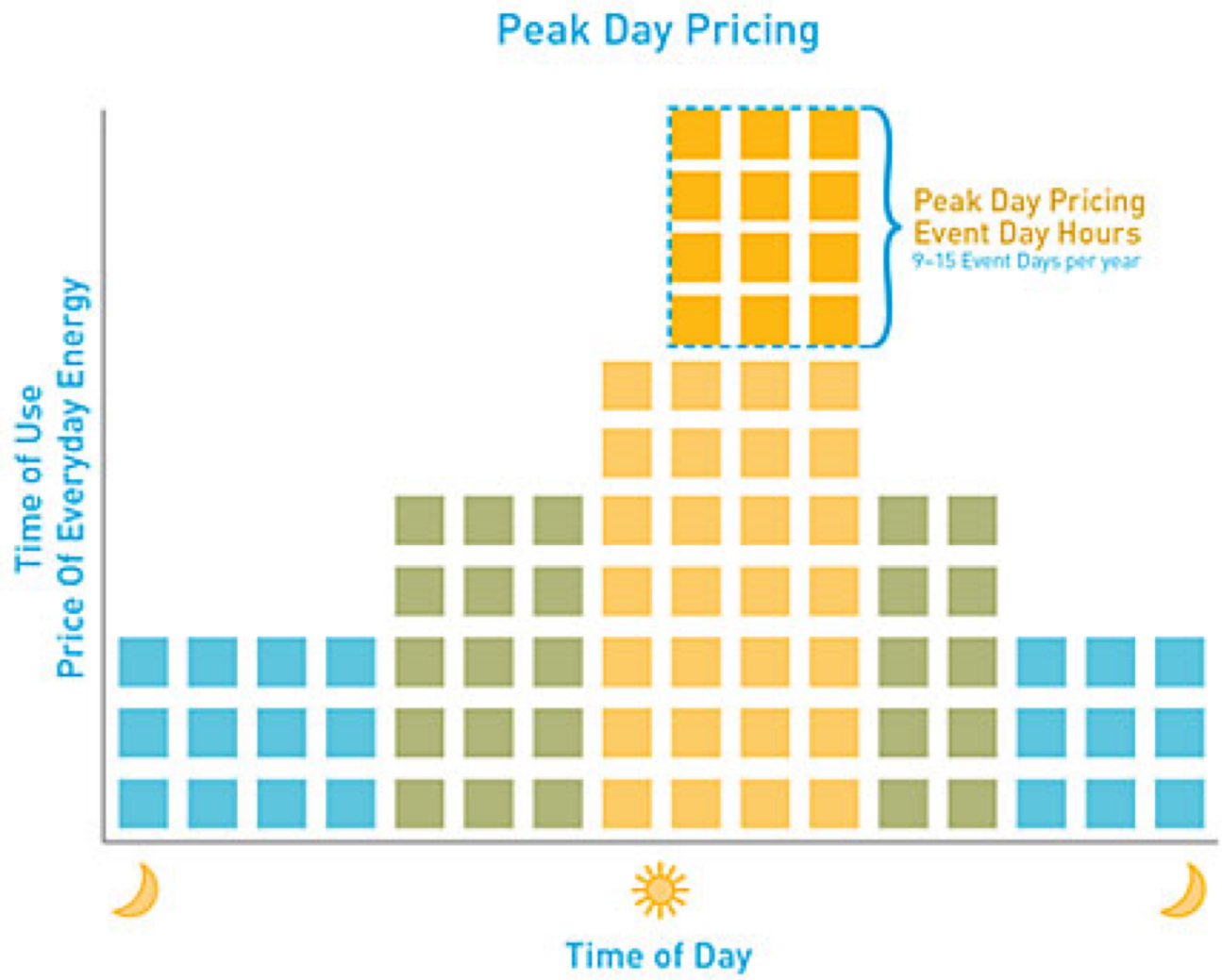
  Opportunity to reduce costs on TOU

  When:

  Feb 1, 2011 >200kW and 12 months of data

  Mar 1, 2013 <200kW and 12 months of data

Time of Use vs. Peak Day Pricing

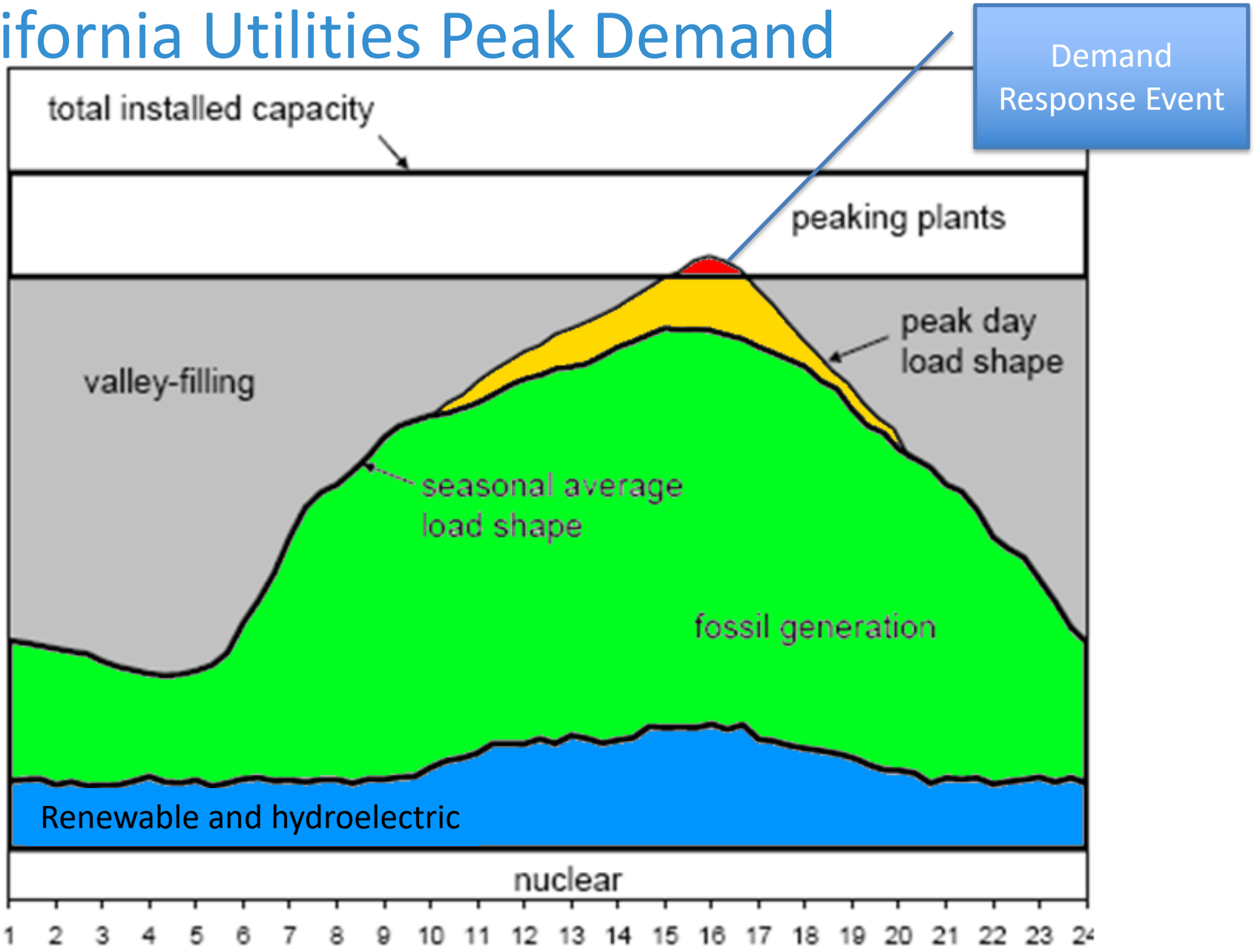


Why Utilities are doing this?

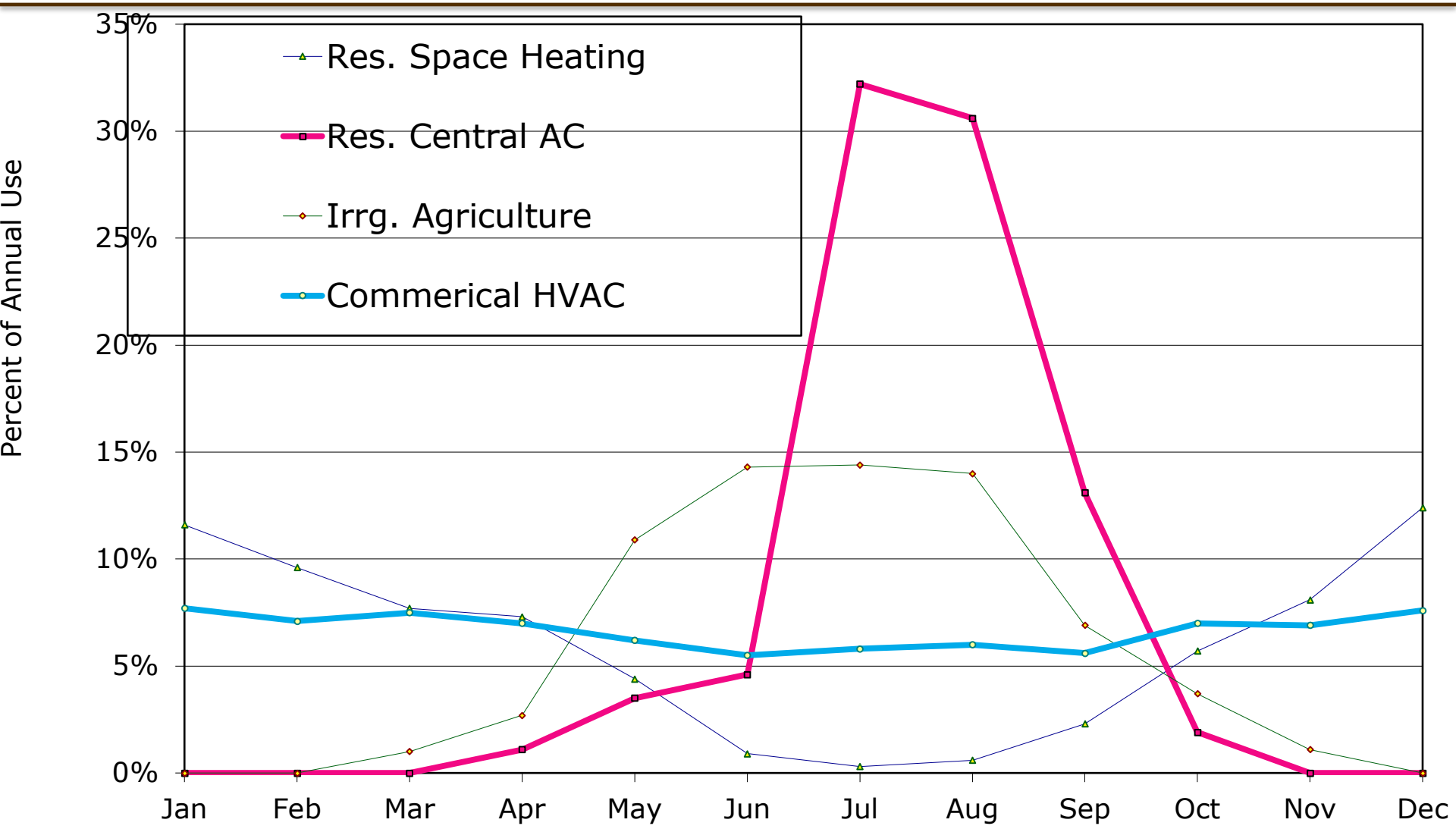
Utilities like PG&E and SoCalEdison:

- Need to reduce peak electrical demand as
  - Peak gas fire plants cost $1,200/kW, and run as little as 50 hrs/year
- Need a relatively small amount of power for a short period of time (6 hrs)
- Cost effective (and easier) to reduce power needs vs. increasing capacity

California Utilities Peak Demand



California Utility “On-Peak” Load Profiles



Aligning Grower Concerns with Utility

- Farmers are generally risk averse
- Crop loss due to under irrigation is a significant concern, can be catastrophic
- Want control over turn on and ability to opt-out if needed
- Without clear understanding of available water there is no comfort level