Permanent Load Shifting
Technology, Economics, and Impact
PLS Topics

- What is PLS
- What technologies are available
- How do current electric rates treat PLS
- What incentives are available for PLS
- What is the environmental impact
What is PLS?

- Permanent Load Shifting moves power consumption from peak to off peak
- Is NOT energy efficiency (although applications may be energy efficient as well)
- Purpose is to reduce peak power consumption
Available PLS Technologies

HVAC
- Thermal Energy Storage–Stratified Chill Water
- Thermal Energy Storage–Ice on Coil
- Ice Storage Air Conditioning

Batteries
- Vanadium Redox Flow Batteries

Flywheel

NOTE: For some utility incentive programs, only those technologies that can meet a “round trip energy neutral or better” criteria are allowed.
How do current rates treat PLS

- Demand Charge Billing
- Peak vs. Off-Peak Energy Charges
- Real Time Pricing
- Critical Peak pricing

- All have elevated charges for Peak
- Savings varies wildly
Incentives

- Trane/PG&E “Shift and Save” program: $2,000 per peak kW reduced (retrofit)
- PG&E “Savings by Design” program for new construction– case by case basis
- Cypress/PG&E “Shift and Save” program: $1,400/kW for new construction
- Other programs elsewhere in state and nation
Environmental impacts

- Shifts marginal power consumption from dirty “Peaker” plants operating at the worst time to much cleaner base load facilities operating at the best time
- Night power has a higher proportion of renewable generation (wind, hydro), nuclear, and high efficiency natural gas
Conclusions

- Peak power consumption costs more than off-peak power consumption
- Reducing Peak Power consumption has disproportionate economic and environmental impacts
- Permanent Load Shifting technology is one potential option to consider
If you want to know more ...

- **PG&E/Cypress Shift and Save**
  - Cypress Customer Service Center
  - 877.811.8700
  - support@cyp-res.com

- **Trane “Shift and Save”**
  - John J. Burdette III,
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- **PG&E Savings by Design**
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