

# Demand Control Ventilation for Commercial Kitchen Hoods

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CEE Winter meeting  
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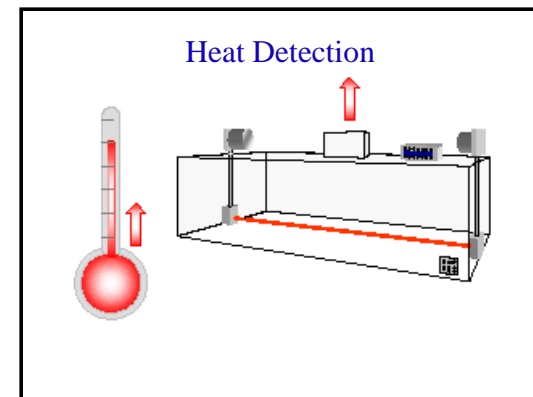
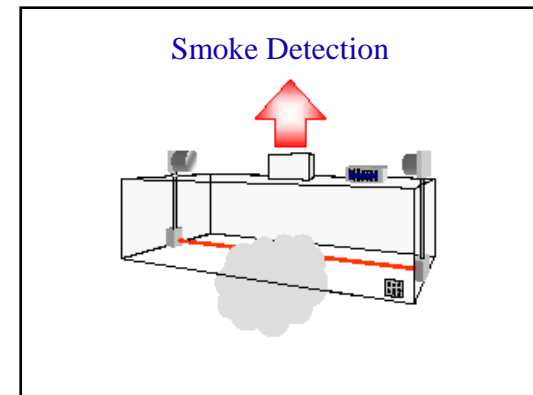
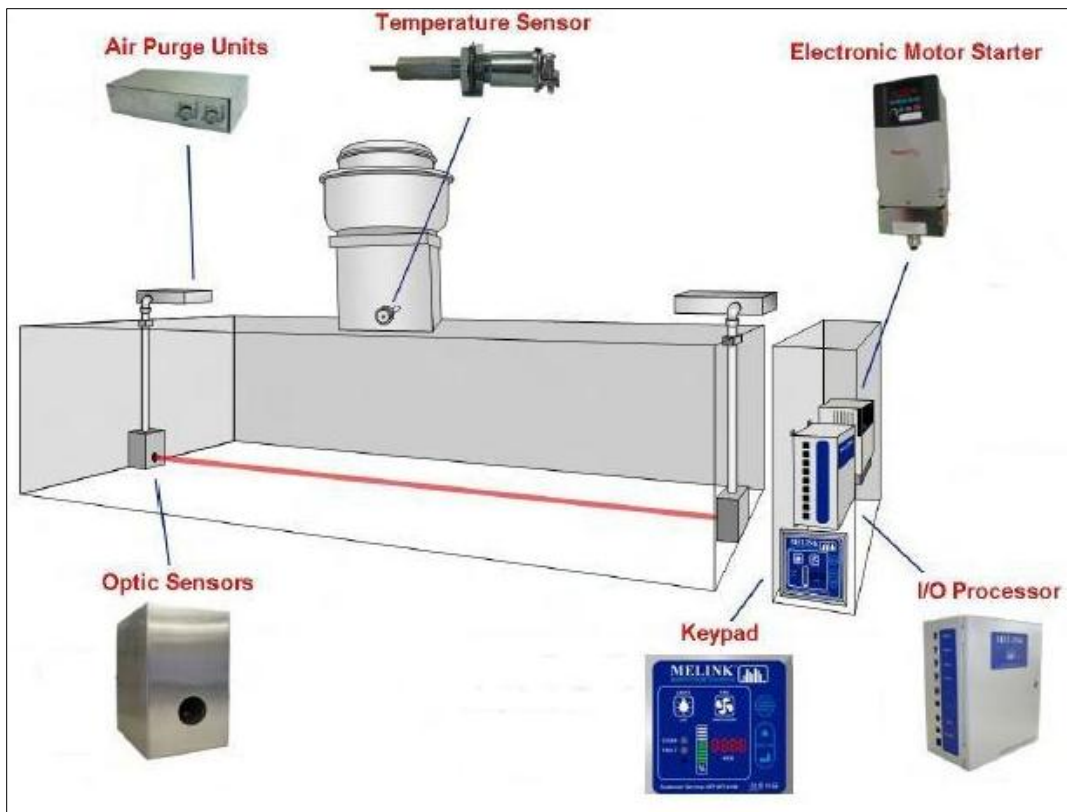


# Commercial Kitchen Hoods

- Used to remove cooking effluent
- Rated for peak cooking effluent removal
- Controlled by simple on or off
- Average hood operating hours
  - Full Service restaurant (dinner only); 15 hrs/day
  - Full service and quick service restaurants; 18 hrs/day
  - Hotels and any 24 hr full service and quick service restaurants; 24 hrs/day



# Demand Control Ventilation





# Savings

- Fan energy
  - Affinity law
  - Savings measure by power metering
- HVAC or heating
  - Less conditioned space exhausted
    - Less load
  - Can be measured by simulations



# Test Sites





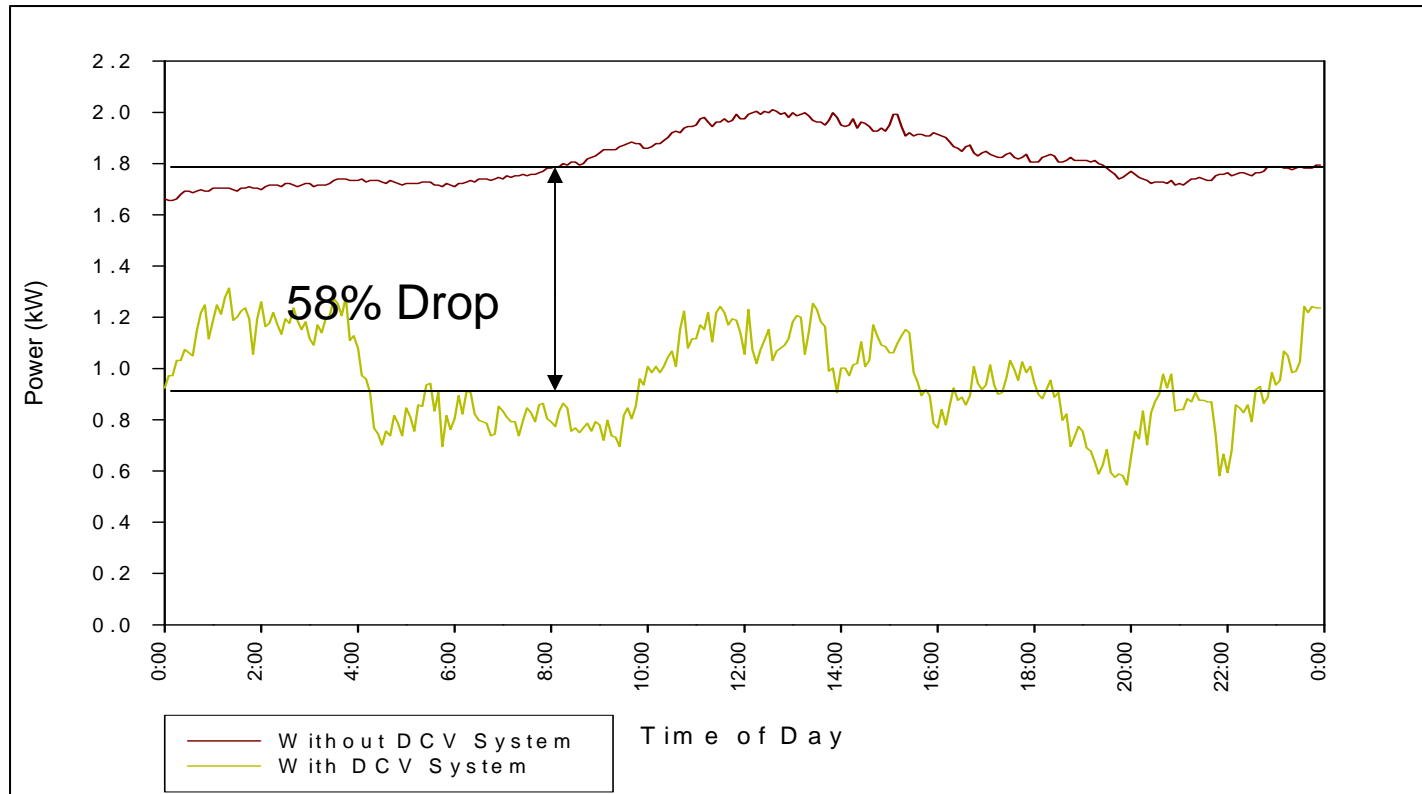
# Westin Mission Hills

- A hotel located in Rancho Mirage, CA
- Serves 472 guest rooms
- Single story kitchen
- 3 Hoods
- 24 hrs hood operation
  - (18 hrs kitchen operation)
- Melink system was installed on:
  - Combined 14 hp exhaust motors
  - Combined 8 hp Makeup air motors
  - Combined 37,000 Exhaust and MUA



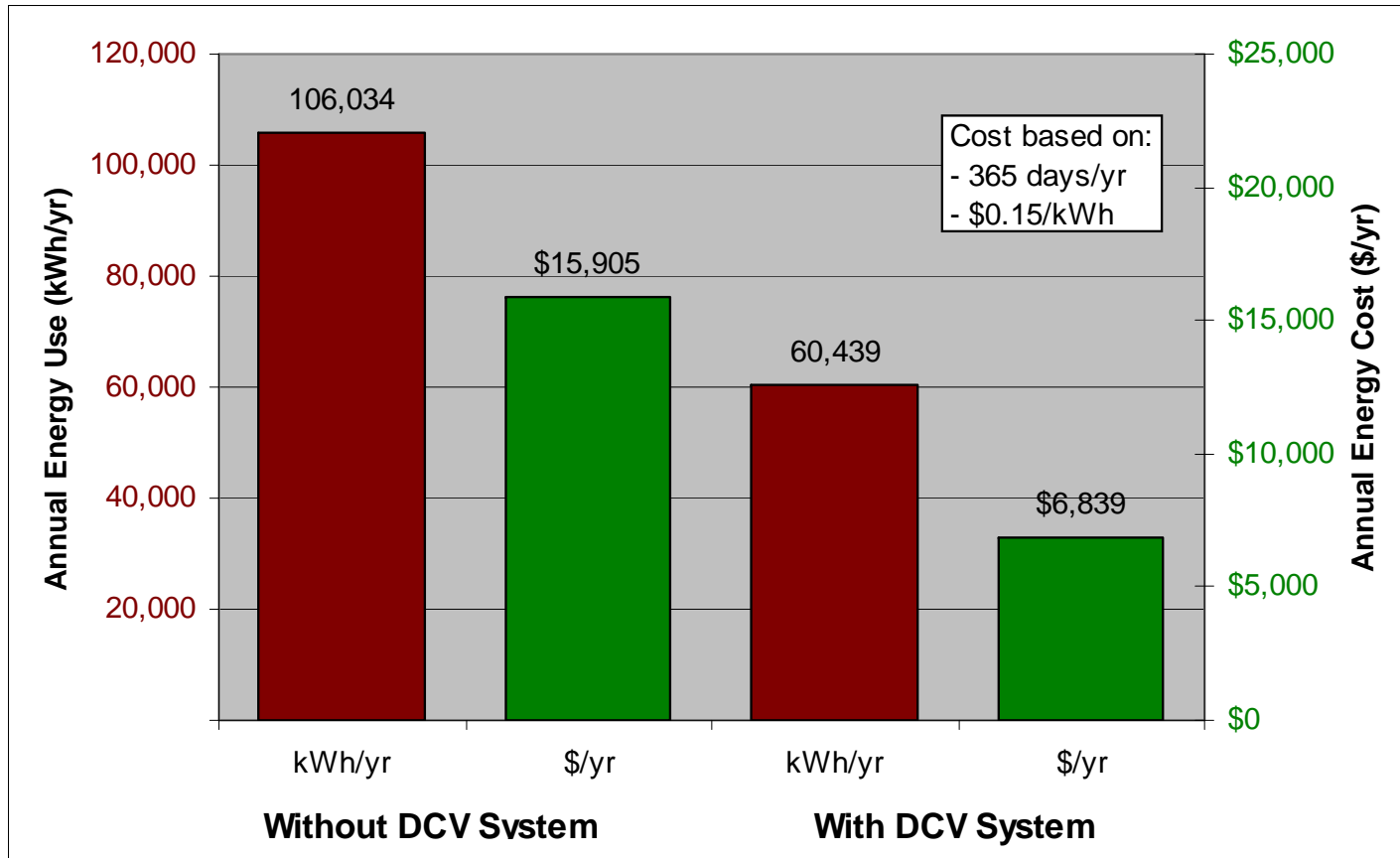


# Typical Demand Profile for the Center Cookline





# Result





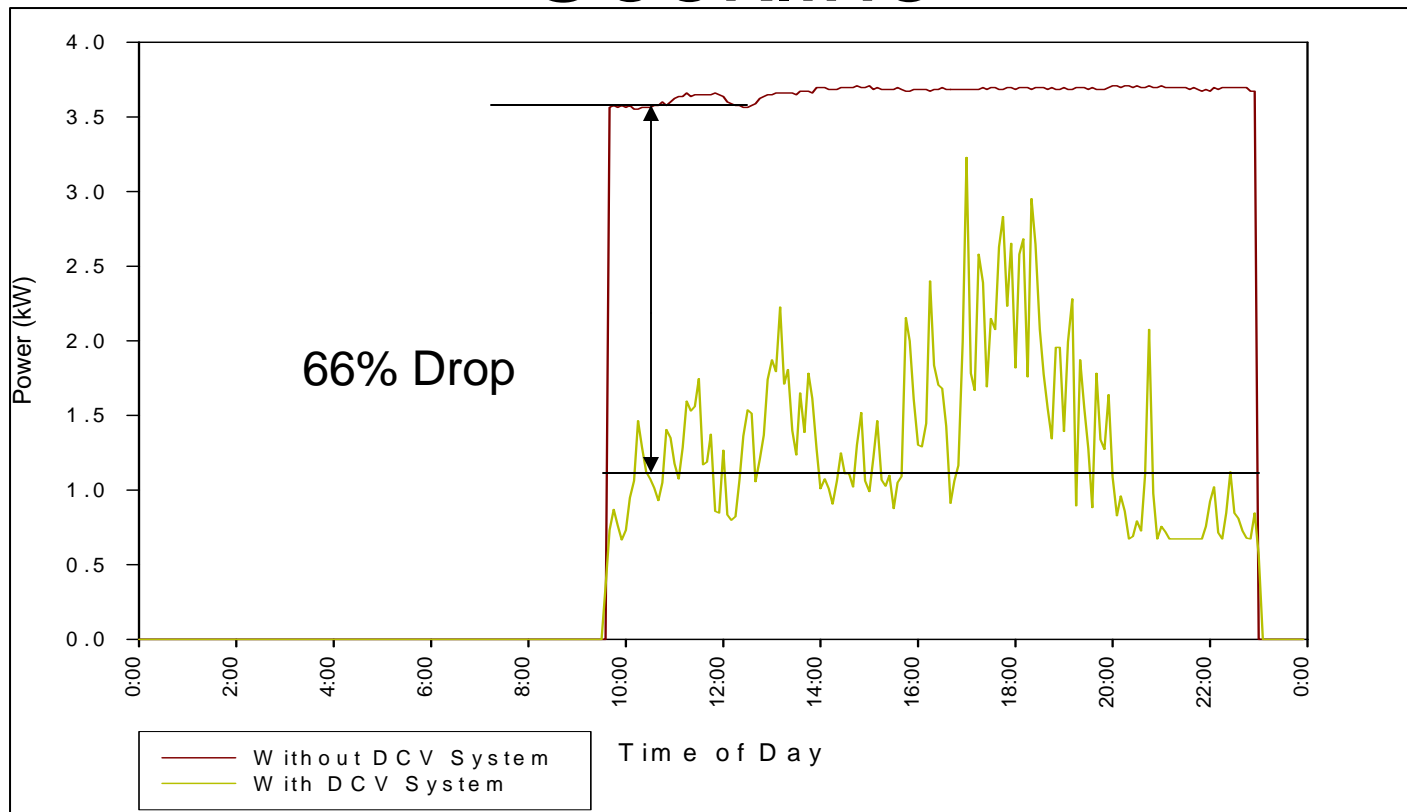
# Panda Express

- Quick Service chinese food restaurant located in Quartz Hill
- Store hours from 10 a.m. to 9:00 p.m.
- About 13.5 hours kitchen hood operation
- Two 12ft Hoods
- Melink system was installed on:
  - Combined 4 hp exhaust motors
  - Combined 3 hp makeup air motors
  - Combined 11,000 cfm Exhaust and MUA



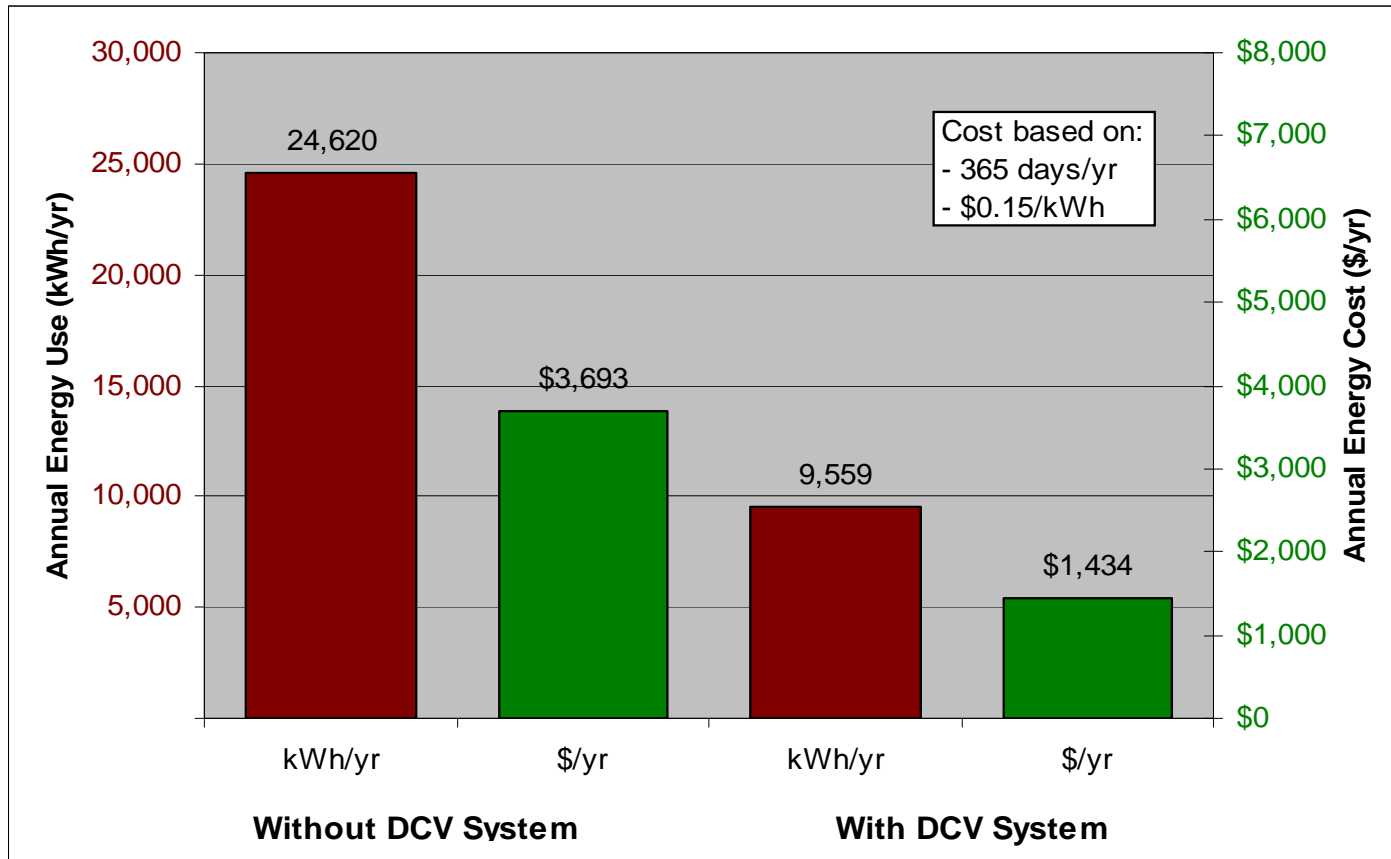


# Typical Demand Profile for Main Cookline





# Results





# Overall Results

	Westin Mission Hills	Desert Springs Marriott	Panda Express	El Pollo Loco	Farmer Boys
Hood Exhaust (cfm)	37,000	38,000	11,000	13,000	6,500
Exhaust + MUA Fan (kW)	12.1	27.9	5.2	4.7	2.9
Energy Savings (%)	57	62	66	38	52
Annual Energy Savings (kWh/yr)	60,439	150,819	15,061	9,871	7,884
Annual Cost Savings (\$/yr)	\$9,066	\$22,623	\$1,481	\$2,259	\$1,183





# Energy Savings Potential

- DCV savings impacted by:
  - Hood configuration
  - Equipment duty rating
  - Hours of operation
  - System Horse Power rating
- Best application of the technology



# Current CA incentive

- \$350 per exhaust HP for retrofit
- \$300 per exhaust HP new construction



# Challenges for the technology

- Specialized installation
- Lack of maintenance service expertise
- Looking into quantifying air conditioning savings due heat load reduction
- Looking into different manufacturers



# CEE specifications

- Give more recognition to the technology
- National specification
- Other utilities could adopt an incentive program around this technology



# Questions?

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