Legal & Regulatory Incentives
for Waste Heat-to-Power Development

What's available, and what's needed?

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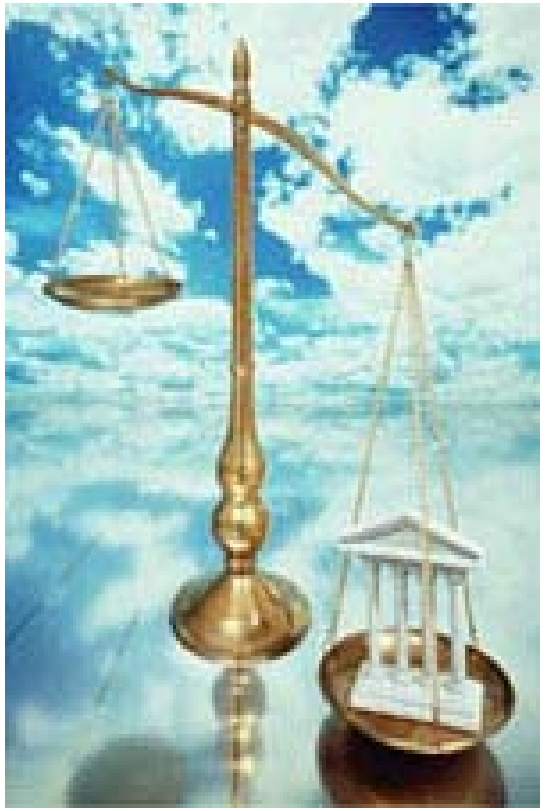
SUSTAINABLE ENERGY STRATEGIES

Topics

- **What's law got to do with it?**
- **What *is* waste heat-to-power?**
- **Selling the power**
- **Using the power**
- **Conclusions**
- **Next steps**

What's law got to do with it?

- **Energy remains pervasively regulated**
- **Policy, law & regulation tilt the scales toward resources that are -**
  - clean
  - efficient
  - renewable
  - diverse
- **Familiar resources have a head start, active constituents, & effective incentives**
  - building efficiency
  - established renewables (e.g., wind, solar, geothermal, & biomass)
  - typical cogeneration



- **Waste heat resources remain under most policymakers' radar**

What's law got to do with it?

"Federal, state and local governments have yet to recognize the vast thermal energy potential . . .

"Unfortunately, policy makers and energy developers are mostly unaware of waste heat. Its potential for development is poorly understood . . .

"Examining regulatory and legislative policies, there is little attention being paid to this recurring potential energy resource. *First and foremost, policy must be developed to value recycling this resource.*"

Source: *Thermally Activated Technology Roadmap*, USDOE/EERE, May 2003

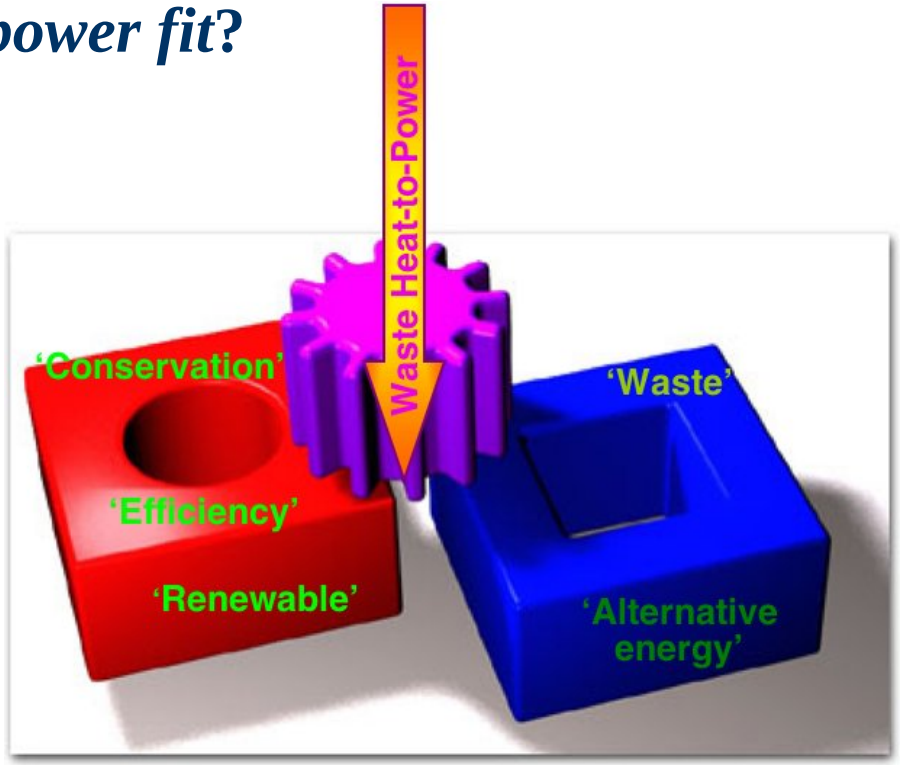
What's law got to do with it?

- **Sensible legal & regulatory policy can –**
  - ***expand markets*** for electricity from waste heat
  - ***raise awareness*** & promote consideration & adoption of waste heat options
  - ***improve economics*** of waste heat through grants, loans, rebates, tax benefits, etc.
  - ***reduce regulatory barriers*** to waste heat conversion & use
  - ***reduce transactional barriers & cost*** of waste heat projects
  - ***encourage efficient & sustainable resource use***

What *is* waste heat-to-power?

- **The bad news: unfamiliarity breeds confusion – *where does waste heat-to-power fit*?**

- **The good news:** ***everywhere!***
  - **'Conservation'** – CA*, OR, MT
  - **'Efficiency'** – OH, OR
  - **'Renewable'** – CA*,CO, FL, OR, VT, WA
  - **'Waste'**– PURPA, NV, OR, WA
  - **'Alternative energy'** – IL, MT



* California Pollution Control Financing Authority

Selling Power
Generated from Waste Heat

- **Facilities producing electricity from waste heat may qualify for PURPA benefits, including:**
  - interconnection with serving utility
  - selling wholesale power to serving utility at its 'avoided cost'
  - transmission through serving utility for purchase by another
  - non-discriminatory backup service from utility
- **2005 Energy Policy Act & new FERC regs –**
  - significantly change qualifying facility (QF) criteria
  - eliminate utility power purchase & sale obligations in some cases
  - narrow regulatory exemptions previously available to QFs
- **Will these changes impact waste heat-to-power?**

Selling Power
Generated by Qualifying Cogenerators

- **'Qualifying cogeneration facility'**
  - Operating & efficiency standards unchanged
    - Topping cycle: 5% useful thermal output; 42.5% (or 45%) efficiency
    - Bottoming cycle: no operating standard; 45% efficiency
      (if gas or oil used for supplemental firing; otherwise none)
  - Ownership restrictions eliminated: utilities can own
  - Stricter requirements for thermal use by new facilities

Selling Power
Generated by Qualifying Cogenerators

- **'Qualifying cogeneration facility'** – con't
  - Thermal use requirements for new facilities
    - these apply if a new QF plans PURPA sales to a utility
    - thermal must be used in a ***'productive & beneficial manner'***
      - *presumed so for existing thermal hosts*
    - electrical, thermal, chemical and mechanical output must be ***'fundamentally used for industrial, commercial, or institutional purposes, and not fundamentally for sale to an electric utility'***
      - *'safe harbor' for facilities using 50% of total energy output for these purposes*
      - *where less than 50% is used, FERC may still find requirement met*
      - *'most bottoming cycle facilities will readily satisfy requirement'*
      - *new cogen facilities 5 MW or less exempt*

Selling Power
Generated by Qualifying Small Power Producers

- **'Qualifying small power production facility'**
  - Eligible energy sources include solar, wind, geothermal, biomass, some hydro – and ***'waste'***
    - 'waste' includes 'residual heat' & 'heat from exothermic reactions'
    - ***so: waste heat can be a 'small power production' source***
  - Ownership restrictions eliminated: utilities can own
  - No operating or efficiency standards
  - 80 MW limit at a single site

Selling Power
Generated by Cogen or Small Power QFs

- **Utilities no longer required to purchase QF power or sell to QFs under some conditions**

  FERC is now proposing:

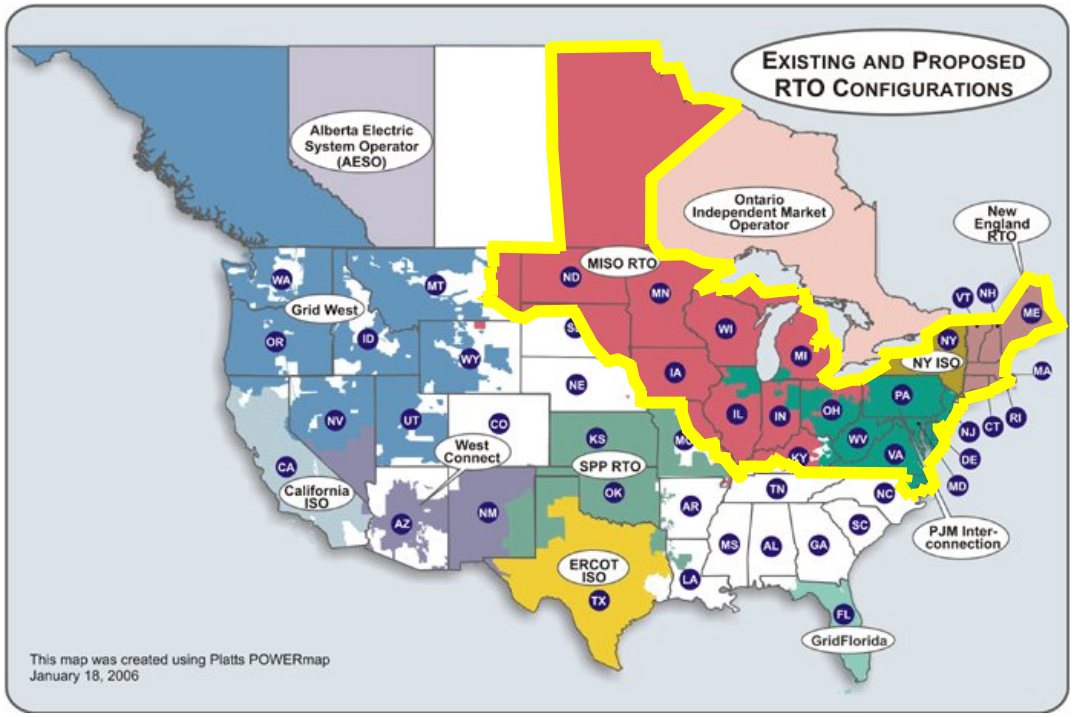
  - No *purchase* obligation if FERC finds a sufficiently competitive market for QF power, i.e. –
    - QF has 'non-discriminatory access' to –
      - independent, auction-based markets for short-term energy, & wholesale markets for short- & long-term energy & capacity
      - RTO/ISO interconnection & transmission services with FERC-approved 'open access' tariffs, in non-auction-based markets
      - other wholesale markets of 'comparable competitive quality'
  - No *sales* obligation if FERC finds –
    - others willing & able to sell & deliver electricity to QF
    - State law doesn't require utility to sell electricity in its territory

Selling Power
Generated by Cogen or Small Power QFs

- FERC proposes to end mandatory purchase & sale for utilities in much of the East & Midwest

- Case-by-case determinations for utilities elsewhere

  (including California)



Using Power
Generated from Waste Heat

- Selling waste heat-generated power at wholesale under PURPA is still viable, but more complex & uncertain now
- Selling power under other wholesale regimes, such as renewable portfolio & green pricing programs, can benefit some projects
  - e.g., Nevada RPS 'qualified energy recovery' for –
    - exhaust heat from engines or manufacturing or industrial processes, or
    - pressure reduction in pipelines
    - but *not* from electricity generation
- Selling waste heat-generated power to others at retail still confronts daunting regulatory obstacles
- So – using the power onsite often makes sense, & may be able to benefit from other available incentives

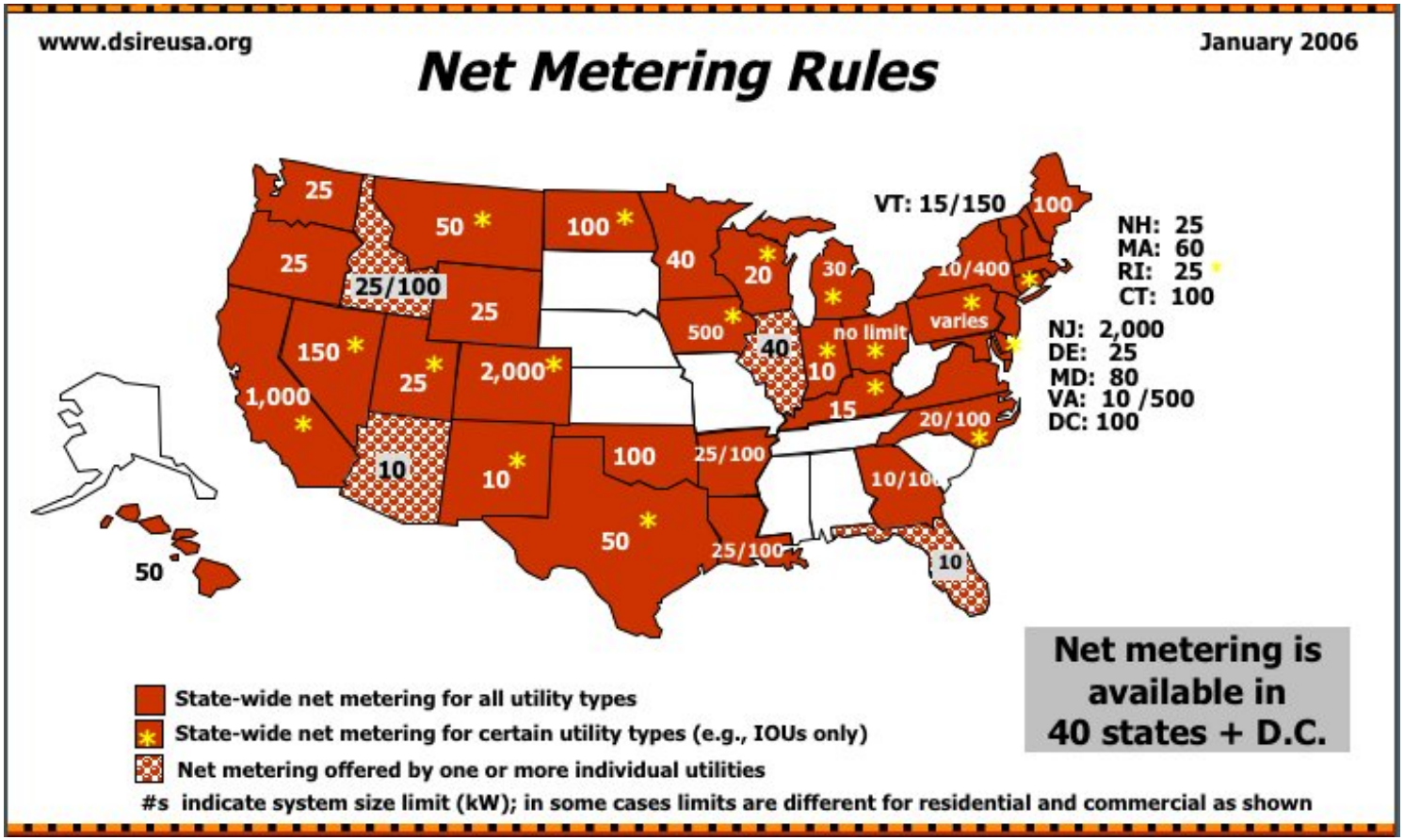
Using Power
Generated from Waste Heat

- Two promising incentives for onsite use are –
  - ***Net metering programs***
  - ***Demand response programs***
- Many state laws & PUC rules require these, & many utilities offer them
- Lots of variation– here's a quick summary ...

Using Power
Generated from Waste Heat

- **Net metering programs**
  - Utilities normally buy power at wholesale, & sell to customers at retail
  - Net metering allows self-generators to offset their excess production (otherwise valued at *wholesale*) against their *retail* purchases
  - Self-executing – minimizes transaction costs for customers & utilities
  - States limit eligible system size
    - *range:* ***10kW – 2 MW***
    - *typical:* ***25 kW – 100kW***
  - States define eligible resource types & customers

Using Power
Generated from Waste Heat



Using Power
Generated from Waste Heat

- **State net metering programs - eligible resources**

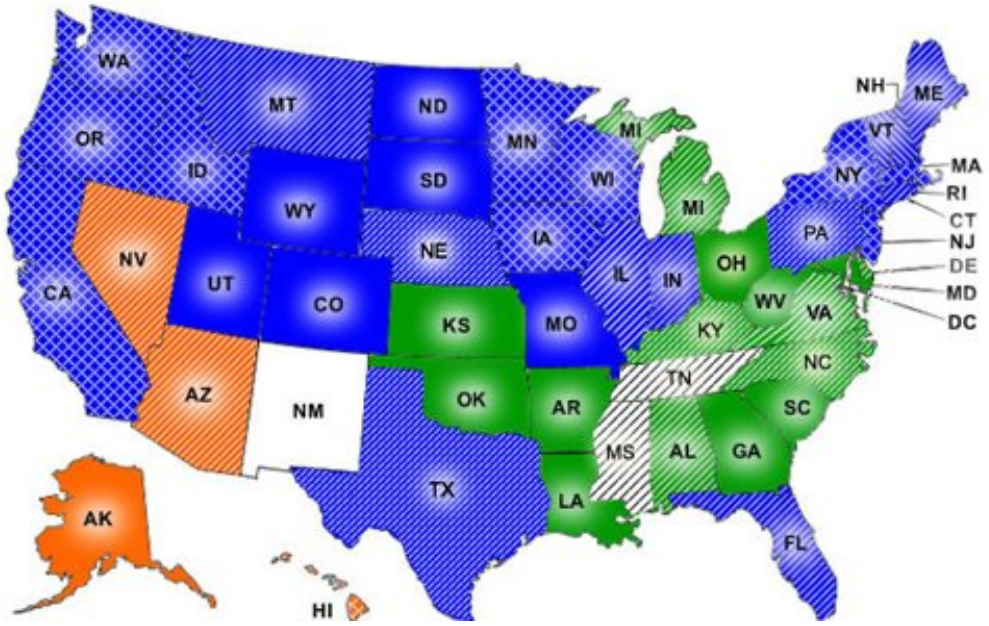
	Solar Thermal	Biomass	Geothermal	Landfill Gas	Digester Gas	MSW	Fuel Cells	Microturbines	Cogeneration
No. of States:	21	24	13	5	2	10	17	5	8

Using Power
Generated from Waste Heat

- **Demand Response Programs**
  - Encourage customers to reduce energy use during system peaks in exchange for lower electricity bills
  - 2 basic program types
    - ***Load response*** – for reliability; utility directly controls customer load or notifies customer to curtail or interrupt load; sometimes mandatory
    - ***Price response*** – customers respond to market signals; typically voluntary. Programs can include, e.g.:
      - day-ahead bidding
      - time-of-use rates
      - real-time pricing

Using Power
Generated from Waste Heat

- **State demand response programs**



Legend

- Demand response/load management as well as public purpose &/or utility energy efficiency programs
- Demand response/load management programs
- Public purpose &/or energy efficiency
- Distributed energy resource options
- Gas efficiency program
- No energy management programs

Using Power
Generated from Waste Heat

- **California demand response programs (partial)**

California Demand Response Programs for 2005

DRAFT - IN PROGRESS

PROVIDER	PROGRAM	ELIGIBILITY	INCENTIVES / PENALTIES	EQUIPMENT REQUIRED
Southern California Edison				
http://www.sce.com/Bla	**Base Interruptible Program (BIP)** Pays participants to reduce their load to a pre-determined level when the CAISO calls a load curtailment notice. Must commit to curtail at least 15% of average monthly load or a minimum of 100 kW, whichever is greater. Interruptions are limited to: - One event each day at four hours each. - 10 events per calendar month, and 120 hours per calendar year.	**Businesses** Customers served under rate schedule TOU-8 with a demands greater than 500 kW in any three months during the preceding 12 months.	**Incentives:** $7 per eligible kW per calendar month (monthly average peak kW minus FSL). **Penalties:** $8 per kWh for energy use over the pre-determined level during an interruption event.	Interval meter. If participants do not have an interval meter, the SCe can install one at no charge. Participants receiving a free meter will be required to remain in the program for one full year.
http://www.sce.com/RebatesIncentives/	**TOU** Provides lower energy and time-related demand charges for that portion of power usage a customer is willing to interrupt during specified hours. Interruption events are limited to one event per day, four events per calendar week (defined as Sunday through Saturday), and 20 events per year. An event will not exceed 4 hours, and the total period of interruption will not be more than 46 hours per month or 200 hours per year.	**Businesses** Eligible to new customers with monthly demands of more than 200 kW who are taking new load, or are new to SCE's service territory.	**Incentives:** Reduced kWh and kW rates year-round. **Penalties:** - 0 kW/1: $5.32 per kWh - 2-10kW/1: $5.32 per kWh - >10kW/1: $5.32 per kWh	Interval meter if participants do not have an interval meter, the SCe can install one at no charge. Participants receiving a free meter will be required to remain in the program for one full year. Two dedicated telephone.
http://www.sce.com/RebatesIncentives/	**Demand Bidding Program (DBP)** This bidding program offers a credit to qualifying SCE bundled service customers with a demand of 100 kW and above who voluntarily commit to reduce at least 15% of their average actual demand, but not less than 100 kW per hour, during a DBP event.	**Businesses** Full-service customers with an average monthly demand of at least 200 kW and not participating in the California Power Authority's Demand Reserves Partnership program.	**Incentives:** Day-Ahead Price Triggered event minimum $0.25 per kWh. Day-Of System Emergency and System Testing events $0.50 per kWh. Non-performance reduces up to $50 per kW of verified reduced on peak power. **No penalties.**	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers.
http://www.sce.com/RebatesIncentives/	**Critical Peak Pricing (CPP)** Allows participants to lower their business' electric bills by shifting or reducing electricity during critical peak summer afternoons (11 a.m. to 6 p.m.). Participants receive day-ahead notifications and program-linked rates a day prior to critical events during each summer season.	**Businesses** Must have bundled service customers with monthly demand of 200 kW or greater. Participants must also agree to take rates and services that accept program effectiveness.	**Incentives:** Transitional incentives. 100% bill protection. Non-performance rebates up to $50 per kW of verified reduced on peak power during CPP events. **Penalties:** No penalties, however, customer pays approx. 3 to 5 times their normal rate schedule for on peak usage.	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers.
http://www.sce.com/RebatesIncentives/CriticalPeakPricing.htm	**Optional Binding Mandatory Curtailment Plan** Allows participants avoid curtailments by implementing load reductions of 15% to 15% increments on their entire circuit or dedicated substation during rotating outages.	**Businesses** Available to any size customer. Must have ability to reduce up to 15% in annual load, in increments of 5%, during rotating outages.	**Incentives:** Exempted from rotating outages. **Penalties:** $0.30 per kWh on excess energy.	If the participant is the only customer on the circuit, standard interval metering may be sufficient to participate in the program. For multi-customer circuits, substation level metering will be required. Program participants pay the cost of required metering equipment.
http://www.sce.com/RebatesIncentives/CriticalPeakPricing.htm	**Scheduled Load Reduction Program (SLRP)** Participants usually use to three four-hour time periods during the week when they are willing to curtail their electric load. Participants must commit to curtail at least 15% of their average monthly load with a minimum of 100 kW per event. Must curtail electric load once each week for each period they choose during the summer season, June 1 through September 30. Loads cannot be shifted to an on-peak period of another day.	**Businesses** Must have bundled service customers with an average annual demand of 100 kW and not participating in the California Power Authority's Demand Reserves Partnership Program or Optional Binding Mandatory Curtailment Program.	**Incentives:** $0.10 per kWh. **No penalties.**	Telephone-accessible interval meter. Participants that do not have a meter, SCe will install one at no charge. Participants are responsible for the installation and monthly fees associated with telephone equipment and a dedicated phone line to the meter.
	Schedule 20/20 The 2005 "20/20 Program" rewards customers a twenty percent (20%) discount for achieving a twenty percent (20%) or more average reduction in energy usage during the summer season compared to the previous year.	**Businesses and Small and Commercial** Customers with demands less than 200 kW.	**Incentives:** Customers can earn a 20% rate reward if they are successful in achieving a 20% or more average reduction in energy usage during the summer season. **No penalties.**	None.
http://www.sce.com/RebatesIncentives/SummerDiscount.htm http://www.sce.com/RebatesIncentives/rightsolutions/SummerDiscount.htm	**Summer Discount Plan (Base & Enhanced)** SCE provides and installs a cycling device on participant's central air conditioner. Program operates only during the summer (first Sunday in June to first Sunday in October). The cycling device is activated by a remote radio signal, which in turn cycles the compressor, turn off, or "cycle," the air conditioner(s) when needed. Base Plan - up to a maximum of 15 cycling times per year for a maximum of 8 hours per day. Enhanced Plan - unlimited number of times per year for a maximum of 6 hours per day.	**Businesses** SCE customer with a central air conditioner in good working order; participate for a minimum of one year. **Residents** SCE customer with a central air conditioner in good working order; participate for a minimum of one year.	**Incentives:** Base Plan - Participants receive a credit on their summer season electric bills based on their current rate schedule, the cycling program and option selected, and the calculated tonnage of the air conditioner participating in the program. Enhanced Plan - Participants receive twice the credits of the base plan. **No penalties.**	SCE provides and installs a cycling device on customer's central air conditioner.
http://www.sce.com/RebatesIncentives/rightsolutions/EnergyEfficientThermostat.htm	**Energyshare® Thermostat DR Program** Provides residential customers with a program-ready new technology for controlling air temperature and reducing bills. SCE installs at the customer's facility a pre-programmed thermostat connected to SCE via the Internet. SCE will monitor and alter the thermostat based on real-needs during summer weekdays from May 1 through October 31.	**Limited to Small Commercial and Nonprofit Customers** Must have a working central air conditioner of at least 3 tons; be responsible for payment of your SCE and monthly energy usage of at least 1,000 kWh, but not exceed an average monthly billing electrical demand of 200 kW.	**Incentives:** Cash incentive (up to $150). Free digital programmable thermostat (installed and programmed at no charge worth up to $100). **Penalties:** Forfeit $25 per event fee.	At least one functional, working central air conditioning system. Customers must have a working central air conditioner. Customer three tiers and 20 tons nominal cooling rating, with a single thermostat controlling each unit. Units controlled by the customer. More than one system, with its thermostats, may be included in the program at SCE's discretion, but no more than five.
http://www.sce.com/RebatesIncentives/rightsolutions/AgriculturalPumping.htm	**Agricultural and Pumping Interruptible Service (AP-I) Option A, B, C, D** Provides lower energy and/or time-related demand charges to customers who are willing to interrupt power usage of SCE's request. Interruption events are limited to one event per day, four events per calendar week (defined as Sunday through Saturday), and 20 events per year. An event will not exceed six hours per day, 46 hours per month, or 120 hours per year.	**Agricultural and Pumping Customers** Must have a monthly demand of 50 kW or greater of maximum demand or have 50 horsepower or greater of connected load and may not participate in CAISO's Demand Response Program. Must be on TOU-PA-5CR, PA-L, and customers serviced under experimental rate structures.	**Incentives:** - 0 kW/1: $0.00027 per kWh. **Penalties:** - 0 kW/1: $0.34per kWh - 2-10kW/1: $5.32 per kWh - >10kW/1: $5.32 per kWh	Must have a load control device installed by SCE at the customer's expense. Any customer's account in the interruption notification system. Participants are responsible for the installation fees associated with SCE's control device.

San Diego Gas & Electric	PROGRAM	ELIGIBILITY	INCENTIVES / PENALTIES	EQUIPMENT REQUIRED
http://sdge.com/business/dry.shtml	**Base Interruptible Program (BIP)** Offers a monthly bill credit to participants for reducing their load to a pre-determined level when the CAISO calls a load curtailment event. Option A – Interruptions are limited to: - One four-hour event each day - 10 events per month - Maximum of 120 hours per year PG&E and SCG&E offers a second level of participation. Option B – Interruptions are limited to: - One three hour event each day - 3 hour notice - 10 events per month - Maximum of 90 hours per year	**Businesses** All three-phase metered customers who can reduce electric load by at least 15% of their monthly average peak demand or a minimum of 100 kW, whichever is greater.	**Incentives:** Option A - $7 per kW per month for the amount of load reduction, paid year-round. Option B - $1 per kW. **Penalties:** Option A - $8 per kWh for energy use over the pre-determined level during an interruption event. Option B - $2.50 per kWh.	Interval meter. If participants do not have an interval meter, the SCe can install one at no charge. Participants receiving a free meter will be required to remain in the program for one full year.
http://sdge.com/business/dry.shtml	**Demand Bidding Program (DBP)** Allows participants to submit bids for a proposed level of load reduction at an offered price for each curtailment event. Participants must commit to reduce a minimum of at least 15% of their average monthly demand. Bids may be requested on a "day-ahead" basis when a CAISO's Alert notice is issued for the next day or when the CAISO's forecasts a day-ahead peak demand of 45,000 MW or greater.	**Businesses** Full-service customers with an average monthly demand of at least 20 kW and not participating in the California Power Authority's Demand Reserves Partnership program.	**Incentives:** Day-Ahead Tolerant Price = $0.10 per kWh of Actual Demand Reduction. **No penalties.**	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers. Participants receiving a free meter will be required to remain in the program for one full year.
http://sdge.com/business/dry.shtml	**Critical Peak Pricing (CPP)** Allows customers to lower their electric bills by shifting or reducing electricity during critical peak summer afternoons (11 a.m. to 6 p.m.). Participants receive day-ahead notification and program rates prior only 12 days during each summer season.	**Businesses** Bundled customers with monthly demand of 200 kW or greater.	**Incentives:** Customers receive a commodity discount all year with the exception of CPP event days on peak hours. **Penalties:** Higher on peak energy charges on Critical Peak Pricing days.	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers.
http://sdge.com/business/dry.shtml	**Optional Binding Mandatory Curtailment Plan** Participants avoid curtailments by implementing load reductions of 0% to 15% increments on their entire circuit or dedicated substation during rotating outages.	**Businesses** Must file load reduction plan with utility for approval. Bundled service and direct access service customers are eligible.	**Incentives:** Participants are exempted from rotating outages. There are penalties associated with non-compliance by SDRG plan curtailments. **Penalties:** Penalties and penalty for energy consumed above the power reduction commitment.	If the participant is the only customer on the circuit, standard interval metering may be sufficient to participate in the program. For multi-customer circuits, substation level metering will be required. Program participants pay the cost of required metering equipment.
http://sdge.com/business/dry.shtml	**Scheduled Load Reduction Program (June 1 - September 30)** Participants identify one to three four-hour time period(s) during the week when they are willing to curtail their electric load. Participants must commit to curtail at least 15% of their average annual demand or a minimum of 100 kW, whichever is greater. Must curtail electric load once each week for each period they choose during the summer season, June 1 through September 30. Loads cannot be shifted to an on-peak period of another day.	**Businesses** Full-service customers with an average annual demand of 100 kW and not participating in the CAISO's Reliability Services Load Program or Optional Binding Mandatory Curtailment Program.	**Incentives:** $0.10 per kWh. **Penalties:** $0.30 per kWh on excess energy.	Telephone-accessible interval meter. Participants that do not have a meter, SCe will install one at no charge. Participants are responsible for the installation and monthly fees associated with telephone equipment and a dedicated phone line to the meter.
http://sdge.com	**Schedule 20/20** The 2005 Residential/Small Business "20/20 Program" rewards customers a twenty percent (20%) discount for achieving a twenty percent (20%) or more average reduction in energy usage during the summer season compared to the previous year. Medium and Large Business customers can participate in the PG&E "Base 20/20" program and earn 20% off their months on-peak charges by reducing average of 20% on on-peak days.	**Residential and Small Business** Customers with demands less than 20 kW. Medium and Large Business customers greater than 20 kW.	**Incentives:** 20% rate reward. **No penalties.**	For the Commercial Peak Day 20/20, if participants do not have an interval meter, the SCe can install one at no charge.
http://sdge.com/business/dry.shtml	**Ruling Backed Reduction Program** Provides utility customers with a method to reduce the cost of electricity consumption during Stage 3 Emergency (blackout) when a Rule Load Curtailment Event is called. Program does not provide participants with an exemption from rotating outages.	**Businesses** Must have back-up generation capable of serving at least 15% of annual maximum demand or a minimum of 50 kW, whichever is greater.	**Incentives:** Participants receive a $0.35/kWh bill credit for reducing their load by at least 15% (minimum 50 kW required). **No penalties.**	Internal meter. If participants do not have an internal meter, the SCe can install one at no charge.
http://sdge.com/business/dry.shtml	**A1-TOU CP** Program is based on an electric load reduction rate equivalent to help mitigate the impact of supply shortages. Participants shall load when requested by the CAISO, when SDG&E reaches specific peak levels, or for local utility emergencies. Enhanced Plan - Participants receive twice the credits of the base plan. **No penalties.**	**Customers** Customers with distributed generation and who are receiving bundled service from SDG&E. Businesses without distributed generation who have the ability to reduce load when called upon may sign a waiver contract to participate.	**Incentives:** Participants save up to 5% on the electric commodity portion of its SDG&E bill. **Penalties:** Higher energy prices during critical events.	None
http://sdge.com/business/dry.shtml	**Smart Thermostat Program** Interactive demand response pilot program tests new technology for controlling air temperature and reducing bills. SDG&E installs at the customer's facility a pre-programmed thermostat connected to SDG&E via the Internet. SDG&E will monitor and alter the thermostat based on real-needs during summer weekdays from May 1 through October 31.	**Limited program for Residential Customers** Must have a working central air conditioner.	**Incentives:** Participants may save money on electric bills, earn up to $100 incentive from SDG&E for reducing energy use, and receive a new digital programmable thermostat (installed and programmed at no charge worth up to $100) will be released, by a small fee, every time the customer overrides their thermostat setting during program events. **Penalties:** Penalty payment per events.	At least one functional, working central air conditioning system with a single zone thermostat for each unit, controlled by the customer. More than one system, with its thermostats, may be included in the program at the SCG's discretion.
http://sdge.com/business/dry.shtml	**Bill Protection** Bill Protection is available to customers during the first 11 months the customer is receiving Critical Peak Pricing service, but no later than December 31, 2005.	**Customers** Customers electing SDG&E commodity service on Schedule EECC-CPP (Critical Peak Pricing).	**Incentives:** Bill Protection provides that participating customers will pay no more for energy commodity service than they would have had they remained on Schedule EECC. **No penalties.**	None

Pacific Gas & Electric	PROGRAM	ELIGIBILITY	INCENTIVES / PENALTIES	EQUIPMENT REQUIRED
http://www.pge.com/biz/demand_response/base_interruptible_program.shtml	**Base Interruptible Program (E-BIP)** Pays participants to reduce their load to a pre-determined level when the CAISO calls a load curtailment notice. Must commit to curtail at least 15% of average monthly load or a minimum of 100 kW, whichever is greater. Option A – Interruptions are limited to: - One four-hour event each day - 10 events per month - Maximum of 120 hours per year PG&E offers a second level of participation. Option B – Interruptions are limited to: - One three hour event each day - 3 hour notice - 10 events per month - Maximum of 90 hours per year	**Businesses** All three-phase customers served under rate schedules A-10, A-10 TOU, E-19 and E-19 TOU with loads of 500 kW and over participating in another mandatory load curtailment program or an Optional Binding Mandatory Curtailment Plan.	**Incentives:** Option A - $7 per kW per month for the amount of load reduction, paid year-round. Option B - $1.25 per kW. **Penalties:** Option A - Penalty is $8 per kWh for energy use over the pre-determined level during a curtailment event. Option B - $1.50 per kWh.	Interval meter. If participants do not have an interval meter, the SCe can install one at no charge. Participants receiving a free meter will be required to remain in the program for one full year.
http://www.pge.com/biz/demand_response/demand_bidding_program.shtml	**Demand Bidding Program (E-DBP)** Allows participants to submit bids for a proposed level of load reduction at an offered price for each customized event. Participants must commit to reduce a minimum of at least 15% of their average monthly demand. Bids may be requested on a "day-ahead" basis when a CAISO's Alert notice is issued for the next day or when the CAISO's forecasts a day-ahead peak demand of 45,000 MW or greater.	**Businesses** Full-service customers with an average monthly demand of at least 20 kW and not participating in the California Power Authority's Demand Reserves Partnership program.	**Incentives:** Day-Ahead Tolerant Price = $0.10 per kWh of Actual Demand Reduction. **No penalties.**	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers. Participants receiving a free meter will be required to remain in the program for one full year.
http://www.pge.com/biz/demand_response/critical_peak_pricing.shtml	**Critical Peak Pricing (E-CPP)** Allows participants to lower their business' electric bills by shifting or reducing electricity during critical peak summer afternoons (noon to 6 p.m.). Participants receive day-ahead notification and program rates prior only 12 days during each summer season.	**Businesses** Bundled service customers with a total maximum demand of 200 kW or greater during any one of the past 12 billing months.	**Incentives:** Participants receive a discount on all part and on-peak usage on all other days of the summer period (from starts May 1 and ends October 31. Usage during summer peak hours is discounted on days when no CPP events are called. **Penalties:** Higher on peak energy charges on Critical Peak Pricing days.	Interval meter. If necessary, the SCe will provide and install the metering equipment at no cost for qualifying customers.
http://www.pge.com/biz/demand_response/optional_binding_plans.shtml	**Optional Binding Mandatory Curtailment Plan (OBMC)** Lets participants avoid curtailments by implementing load reductions of 0% to 15% increments on their entire circuit or dedicated substation during rotating outages.	**Businesses** Must file load reduction plan with utility for approval. Bundled service and direct access service customers are eligible.	**Incentives:** Participants are exempted from rotating outages. **Penalties:** $0.30 per kWh measured on the 1/2 hour Termination from program.	If the participant is the only customer on the circuit, standard interval metering may be sufficient to participate in the program. For multi-customer circuits, substation level metering will be required. Program participants pay the cost of required metering equipment.
http://www.pge.com/biz/demand_response/scheduled_load_reduction.shtml	**Scheduled Load Reduction Program (S-SLRP)** Participants usually use to three four-hour time periods during the week when they are willing to curtail their electric load. Must commit to curtail at least 15% of their average monthly load or a minimum of 100 kW per event. Must curtail electric load once each week for each period they choose during the summer season, June 1 through September 30. Loads cannot be shifted to an on-peak period of another day.	**Businesses** Must have bundled service customers with an average annual demand of 100 kW and not participating in the CAISO's Reliability Services Load Program or Optional Binding Mandatory Curtailment Program.	**Incentives:** $0.10 per kWh measured on the 1/2 hour Termination from program. **Penalties:** $0.30 per kWh on excess energy.	Telephone-accessible interval meter. Participants that do not have a meter, SCe will install one at no charge. Participants are responsible for the installation and monthly fees associated with telephone equipment and a dedicated phone line to the meter.
http://www.pge.com	**Schedule 20/20 (M-2020)** The 2005 "20/20 Program" rewards customers a twenty percent (20%) discount for achieving a twenty percent (20%) or more average reduction in energy usage during the summer season compared to the previous year. Customers on TOU rate schedules only have to demonstrate a 20% or more average reduction during the on-peak times to be eligible for the 20% discount. **No penalties.**	**Residential and Small Commercial** Customers with demands less than 20 kW.	**Incentives:** Customers can earn a 20% rate reward if they successfully achieve a twenty percent (20%) or more average reduction in energy usage during the summer season. **No penalties.**	None
http://www.pge.com/biz/demand_response/critical_peak_pricing.shtml	**Pilot Optional Binding Mandatory Curtailment Plan (POBMC)** Same as OBMC program but rewards customers in Santa Clara, San Mateo and Alameda counties.	**Businesses** Must customer must file load reduction plan with utility for approval. Bundled service and direct access service customers are eligible.	**Incentives:** Customers on TOU rate schedules only have to demonstrate a 20% or more average reduction during the on-peak times to be eligible for the 20% discount. **Penalties:** $0.30 per kWh measured on the 1/2 hour Termination from program.	If the participant is the only customer on the circuit, standard interval metering may be sufficient to participate in the program. For multi-customer circuits, substation level metering will be required. Program participants will pay the cost of required metering equipment.

Statewide	PROGRAM	ELIGIBILITY	INCENTIVES / PENALTIES	EQUIPMENT REQUIRED
California Independent System Operator (ISO) 916-608-5812	**Voluntary Load Reduction Program** Relies upon participants to reduce their energy consumption by an amount of their choosing when the CAISO declares a power emergency.	**Businesses, cities and water agencies** Not already participating in the CAISO's Demand Response Program or an ISO's Optional Binding Mandatory Curtailment Program.	Potentially lower energy costs. CAISO acknowledges and promotes these "good citizen" conservation efforts through media events, news releases and a "thank you" to companies via its website.	None
California Energy Commission, Nancy Tronaas 916-654-4774 http://www.consumerenergycenter.org/home/businesses/energy_audits.html	**Enhanced Automation** Provides a free preliminary evaluation to identify demand response potentials.	**Businesses** Medium- to large-sized business with demand of 200 kilowatts (kW) or more	Lower energy costs and improve building operations	None
California Energy Commission, Nancy Tronaas 916-654-4774 http://www.consumerenergycenter.org/home/businesses/energy_audits.html	**Technical Assistance** Provides professional audit, reimbursable up to $50 per kW of load reduction, provided the business agrees to participate in one of the eligible Demand Response initiatives.	**Businesses** Currently, Critical Peak Pricing, Demand Bidding Program and Hourly Pricing option participants are eligible.	Participants receive up to $50/kW of load reduction	None
California Demand Response Partnership Program http://www.calmhtp.com/Documents/Partnership%20Program%20Overview.pdf	**California Demand Response Partnership Program** A business or organization makes adjustments to lower energy consumption during periods when the cost of the supplies and/or price spikes. Business or organization signs up to participate via a Demand Response Provider. Participants will be notified by e-mail, pager or phone that a reduction will be needed. Industrial businesses may elect to reschedule certain operations to non-peak power usage time.	**Businesses, cities and water agencies**	**Incentives:** Two types of payments from Demand Response Provider: a fee for the committed capability to reduce demand and a performance payment that is tied to the actual amount of demand that is reduced. Payment amount may vary depending on the package of services provided. **Penalties:** Failing short of 85% compliance incurs charges. Repeat non-compliance leads to program suspension.	Participants must have an interval meter, which records electricity usage in 15-minute intervals.

Conclusions

- **Law & regulation haven't yet focused closely on waste heat-to-power policy or incentives.**
- **Waste heat-to-power doesn't fit exclusively into a single favored resource category – but actually fits in many.**
- **Incentives designed for other purposes can benefit waste heat projects, whether they sell the power or use it onsite.**
- **Developing coherent, consistent & defensible regulatory policy, tailored to waste heat attributes, is essential to level the playing field & encourage development.**

Useful Next Steps

- **Develop a coherent policy rationale for treatment of waste heat-to-power**
- **Develop model legislation & regulatory approach to enhance certainty for providers & customers**