



Commercial Kitchen Electrification for Policy Makers

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Frontier Energy Food Service Technology Center



C/CAG RMCP Meeting
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**COUNTY OF
SAN MATEO**

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**The Food Service
Technology Center**

FrontierFSTC.com



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**We are a fuel agnostic,
mission-driven team**

**The mission is cutting carbon
and saving water**

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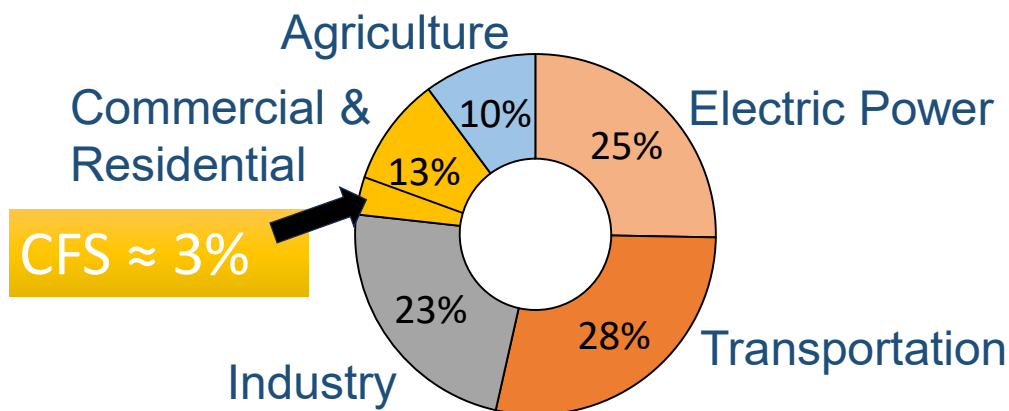
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Big Picture Perspective:
Commercial Food Service (CFS) is
the most energy intensive commercial end use

Commercial Kitchens can use 10 X more energy
per square foot than other commercial spaces

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Food Service is a relatively small, but important,
percentage of US Greenhouse Gas Emissions

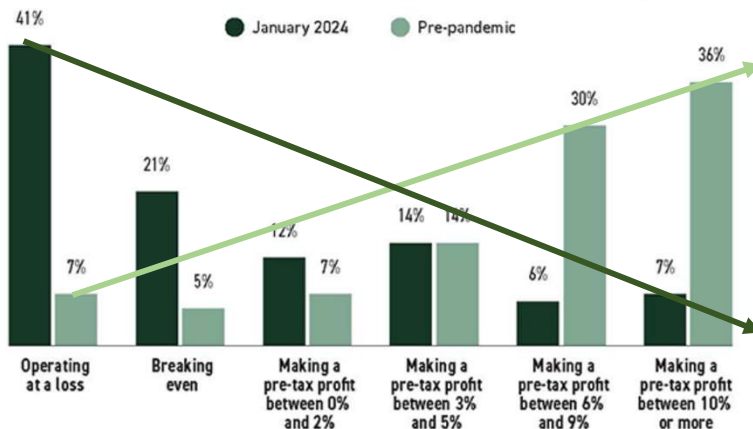


www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

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Restaurants are Suffering Economically

62% OF RESTAURANT COMPANIES ARE CURRENTLY OPERATING AT A LOSS OR JUST BREAKING EVEN (SHARE OF RESPONDENTS)



Q: Which best describes the current profitability of your overall operations?

Source & Chart: Restaurants Canada

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Kitchen Electrification - Technology Challenges

Performance
Availability
Reality

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Electrification means all-electric kitchens

The Challenges for Commercial Foodservice?

Requires some behavior change!



Electricity is a more expensive fuel than Gas



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Overcoming the Challenges

Many appliances require no behavior change to go all-electric...for example:



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Overcoming the Challenges

Much of the equipment is already electric and trends are moving more electric equipment into the kitchen.



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Overcoming the Challenges

Induction is a superior technology



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There is a slight misperception that creating
All-Electric Kitchens requires All-Induction Kitchens

Induction is just one way of transferring heat that happens to
work well for Range Tops

Examples of effective electric appliances
that are not induction include:

Broilers



Fryers



Pasta
Cookers



Ovens



Steamers



Kettles

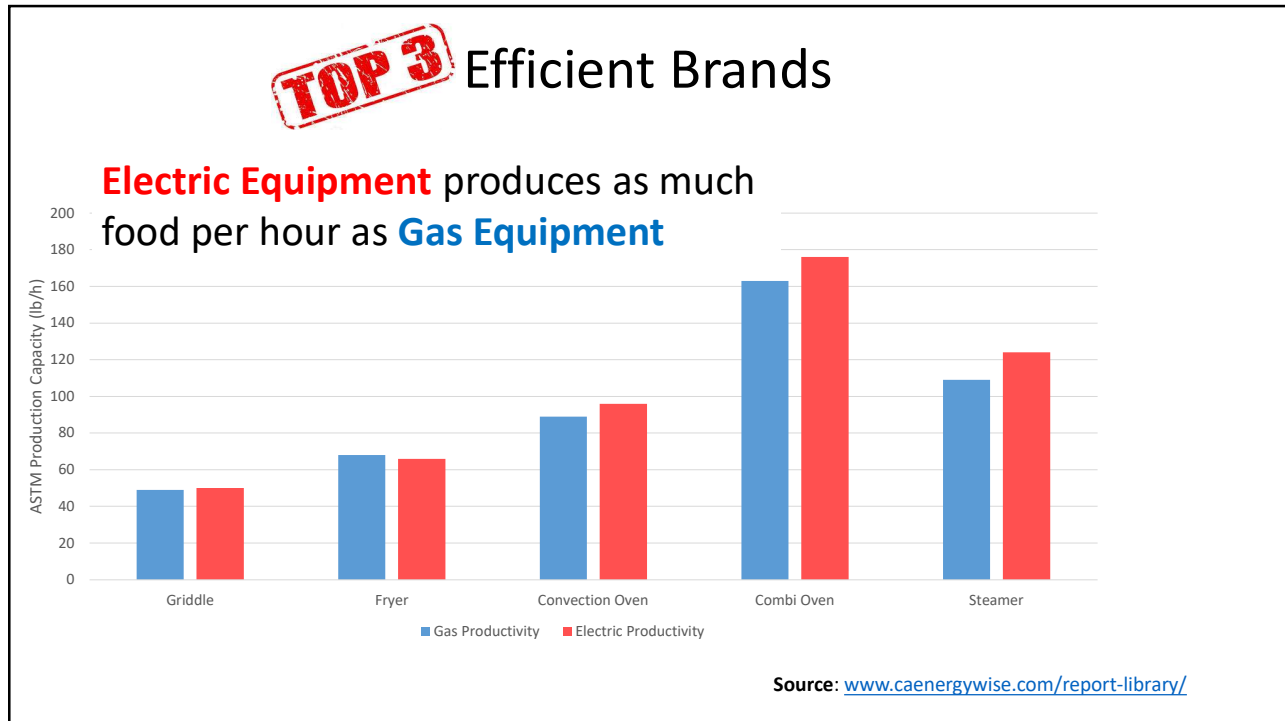


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Performance:
Can electric equipment keep up?

Yes

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Economics
Equipment Costs (CapEx)
Energy Costs (OpEx)
Other: Maintenance | Labor
Where to Start Cutting Carbon

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CapEx vs OpEx

For all equipment, except induction, CapEx for Gas \approx Electric
& OpEx for Electric is about 2 times greater than Gas



For induction, CapEx for Elec is 2X to 3X greater than Gas
& OpEx for Electric \approx Gas



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Base Efficiency Cookline

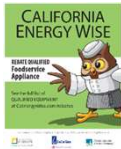


CO₂ = 35.2 metric tons/year


Fuel Cost = \$24,446/year

\$1.85/therm, \$0.34/kWh, 89 lb CO₂/MWh (PGE 2021)

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Efficient Cookline



CO₂ = 24.5 metric tons/year
Fuel Cost = \$16,283/year
Savings vs Base = 10.7 tons and \$8,163

\$1.85/therm, \$0.34/kWh, 89 lb CO₂/MWh (PGE 2021)

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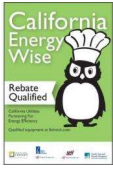


**Fast, Small, Flexible, and Energy Efficient:
Kitchen of the Future**




\$1.85/therm, \$0.34/kWh, 89 lb CO₂/MWh (PGE 2021)

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Hybrid "Kitchen of the Future" Cookline

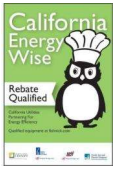


Gas Electric


$\text{CO}_2 = 12.5 \text{ metric tons/year}$
 $\text{Fuel Cost} = \$7,816/\text{year}$
 $\text{Savings vs Base} = 22.7 \text{ tons and } \$16,929$

\$1.85/therm, \$0.34/kWh, 89 lb CO₂/MWh (PGE 2021)

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All-Electric "Kitchen of the Future" Cookline



Electric

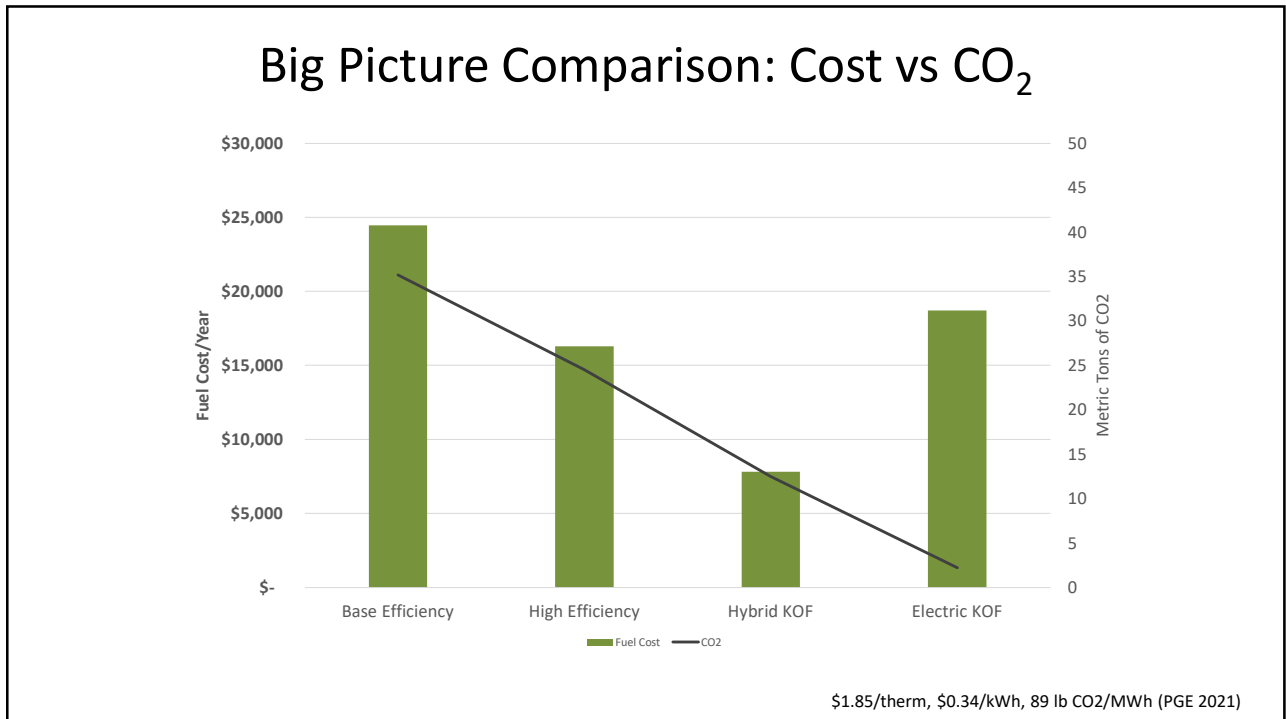
$\text{CO}_2 = 2.2 \text{ metric tons/year}$
 $\text{Fuel Cost} = \$18,710/\text{year}$
 $\text{Savings vs Base} = 33.0 \text{ tons and } \$5,710$

\$1.85/therm, \$0.34/kWh, 89 lb CO₂/MWh (PGE 2021)

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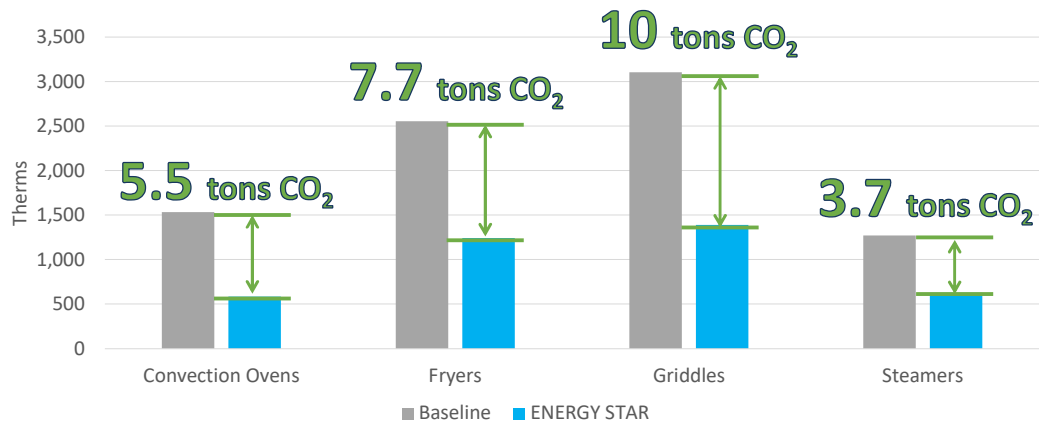


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Gas Energy Efficiency = Carbon Reduction



*Based on an average of 30 days monitoring

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Labor and Maintenance Savings

- Potential labor savings from advanced equipment
 - Programmable | Self-cleaning
- Labor savings for cleaning of induction range tops
- Anecdotal savings for maintenance of electric equipment
- Reduced heat to kitchen for induction equipment
- HPWHs can reduce kitchen temperatures

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Building the Decarbonized Kitchen of the Future Requires Wholistic Design

- Smart, high-tech equipment - combination & rapid-cook ovens
- High-efficiency cooking, holding, refrigeration, and sanitation
- Safer, faster, equipment – induction cooking and holding
- Off-peak production – automation, cook/chill, sous vide
- Demand controlled ventilation
- Advanced plumbing design with HPWH
- Optimized HVAC with HP space heating

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Reality:

Energy Efficiency is the most crucial component
of decarbonization and electrification

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PG&E Resources

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 <p>ENERGY SURVEYS Do-It-Yourself Energy Surveys</p>	 <p>DESIGN GUIDES Performance & Efficiency Guides</p>	 <p>SEMINARS See What's New</p>	 <p>TRY BEFORE YOU BUY Love It Before Buying</p>
 <p>CALIFORNIA ENERGY WISE CAEnergyWise.com</p>	 <p>CALCULATORS Calculate Energy Cost</p>	 <p>REBATES Foodservice Equipment Rebates</p>	

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California Foodservice Instant Rebates Program



CALIFORNIA ENERGY WISE

CAEnergyWise.com



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Induction Cooktop Rebates

63 models spread across 10 different manufacturers
\$250 Instant Rebate per hob



= \$1,000

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PG&E Induction Cooktop Loaner Program (ICLP)

PG&E Customers: Try induction cooking at home!

Benefits of induction include:

- Faster Heat Up Times
- Precise Temperature Control
- Increased Safety & Kitchen Comfort
- Easy to Clean



Borrow a unit for two-weeks at no cost. We cover shipping!

Visit pge.com/inductionloaner or scan the QR code to reserve your cooktop! → → → →



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Thanks!

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