

FDS & BAYREN PRESENT

FUTURE KITCHENS TODAY: A CHEF'S PERSPECTIVE ON KITCHEN ELECTRIFICATION

CHEF CHRIS GALARZA

FOUNDER – FORWARD DINING SOLUTIONS





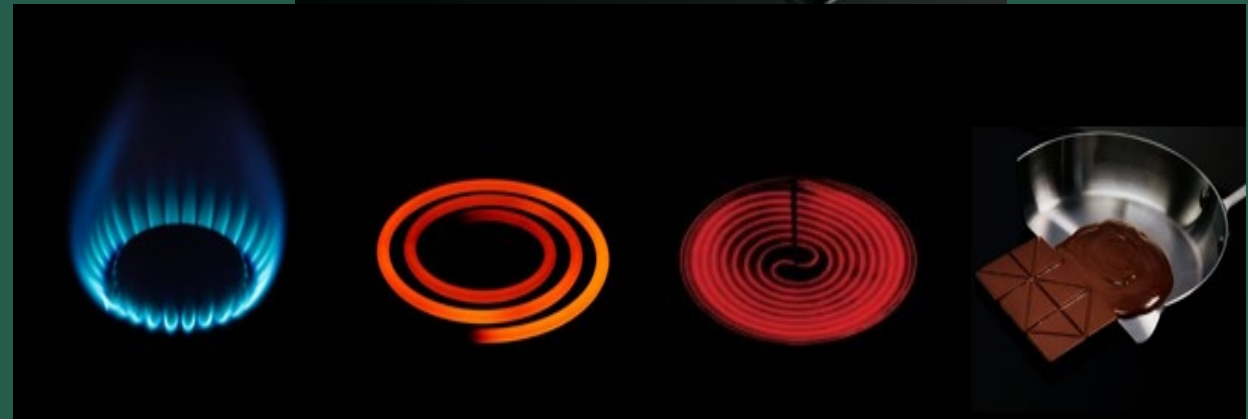
What is Induction?

What it's not...

- It's not Gas
- It's Not Coils
- It's not Radiant

What it is...

- A safer and quicker way of cooking
- A way of cooking using electro magnetic current to heat your cooking vessel
- An easy way to meet your sustainability goals as well as save \$\$\$

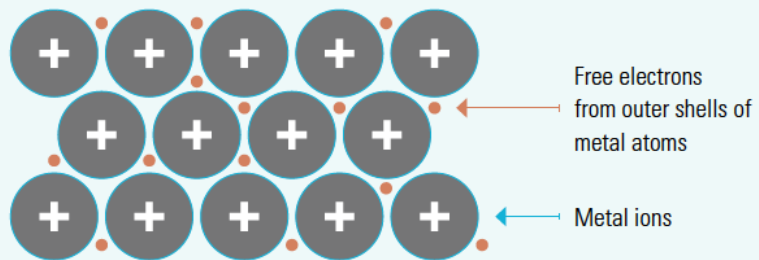




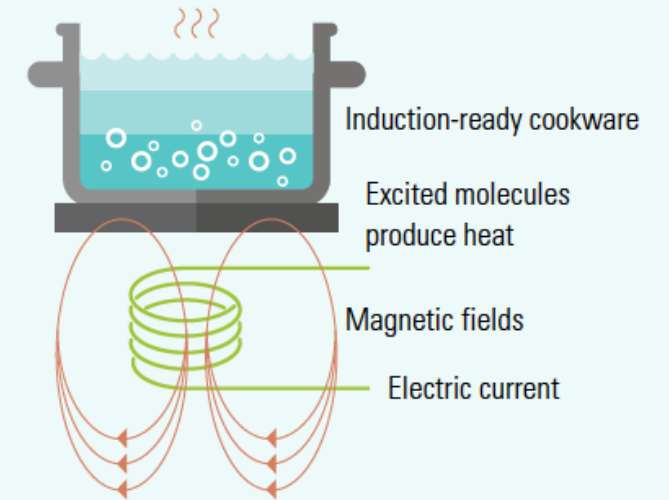
How does induction work?

Microwave?

- Uses Electromagnetic current to oscillate the ferrous molecules in the pan creating molecular friction
- Works with Molecular Structure of Pan
- *Electric Resistive vs Induction*



HOW DOES ELECTRIC INDUCTION COOKING WORK?



- » An electrically charged copper coil underneath the hot top surface creates an electromagnetic field.
- » When ferrous metal cookware (magnetic) is placed in this field and electric current is induced, causing the cookware to heat.
- » The cookware becomes the heat generator, making the appliance very energy efficient!
- » Without cookware in the electromagnetic field, no energy is consumed and no heat produced.



Induction Cooking Pro's & Con's

Pro's

- Very High efficiency (80-93% vs 35%)
- Heats up quickly
- Precise temperature adjustments
- Reduction in Idling equipment
- No combustion (No CO!!)
- Dramatic improvement to thermal comfort
- Extended Life of Pots/Pans (No Warping!)

Con's

- Initial Cost
- Compatible cookware
- Electrical capacity (retrofit hurdle)





Equipment - What sort of solutions exist?

Electric Combi Oven



Induction Griddle

Electric Induction Range



Electric Water Heater



Electric Fryer



Electric Broiler



Electric Steamer



Induction – Refining Tradition





Gas Vs. Induction Cooking



Gas

- 50% Efficient (2.0 KW – 1.0 KBTU) *at best
- 38.6# of food per hour
- Needs time and elbow grease to clean
- Can cause burns and fires

Induction

- 90%+ Efficient (1.1KW – 1.0 KBTU)
- 70.9# of food per hour
- Easy to Clean
- Safe to use



Gas vs Induction Comparison

Range:

30kBtu/h burner at 35% = 10kBtu

5kW at 85% = 14kBtu/h

Wok:

100kBtu/h at 20% = 20kBtu

3.5kw at 91% = 11kBtu/h

5kW at 91% = 15kBtu/h

12kw at 87% = 35kBtu/h





Chatham Hood Ventilation

Hood Systems

- Advanced VAV control
- Remote monitoring and adjusting
- Heat Recovery
- Saves \$\$\$, Energy + CO2





Chatham Hood Ventilation

Hood Systems cont.

- Sensors Scan Cooktops
- Turns on/off when needed
- Works with Geothermal System





Chatham Hood Ventilation

Hood Systems cont.

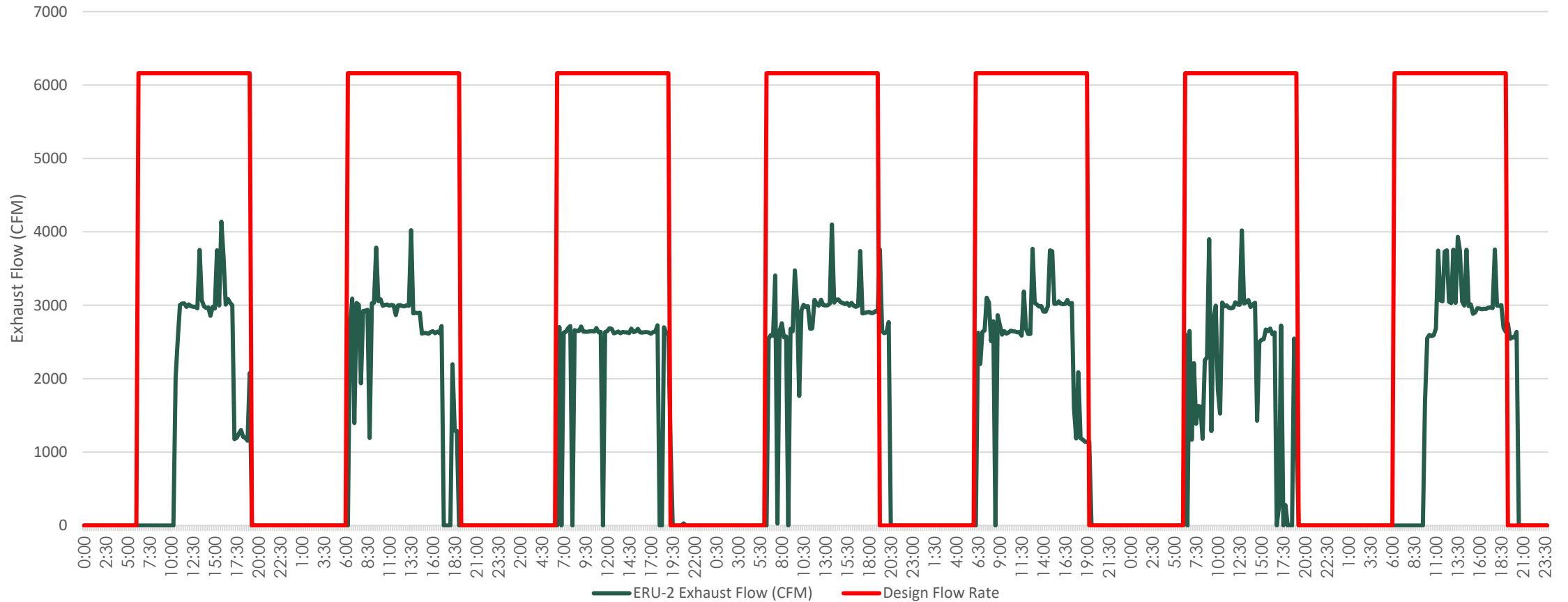
- Able to track efficiency in real time
- Able to identify errors
- Able to track usage by each individual hood





Real-World Data Chatham Kitchen

Variable vs Constant Volume Exhaust



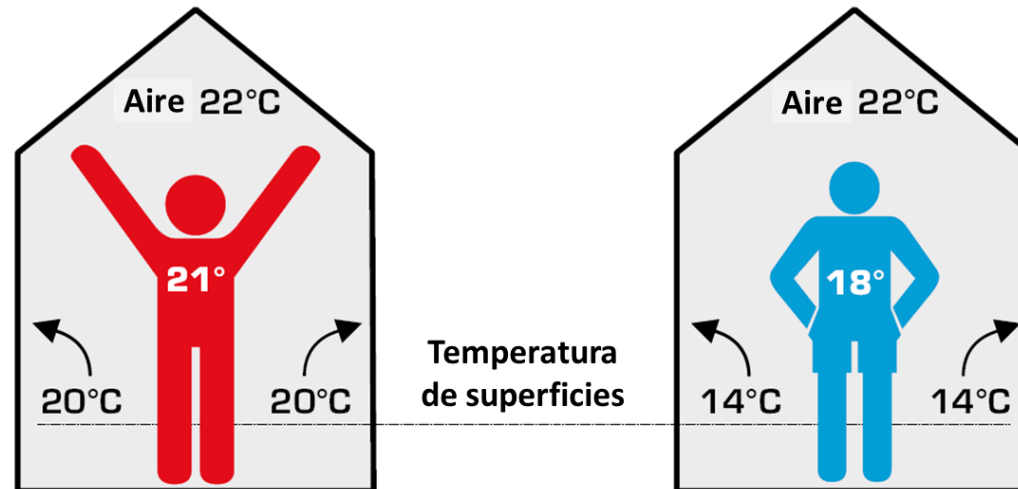
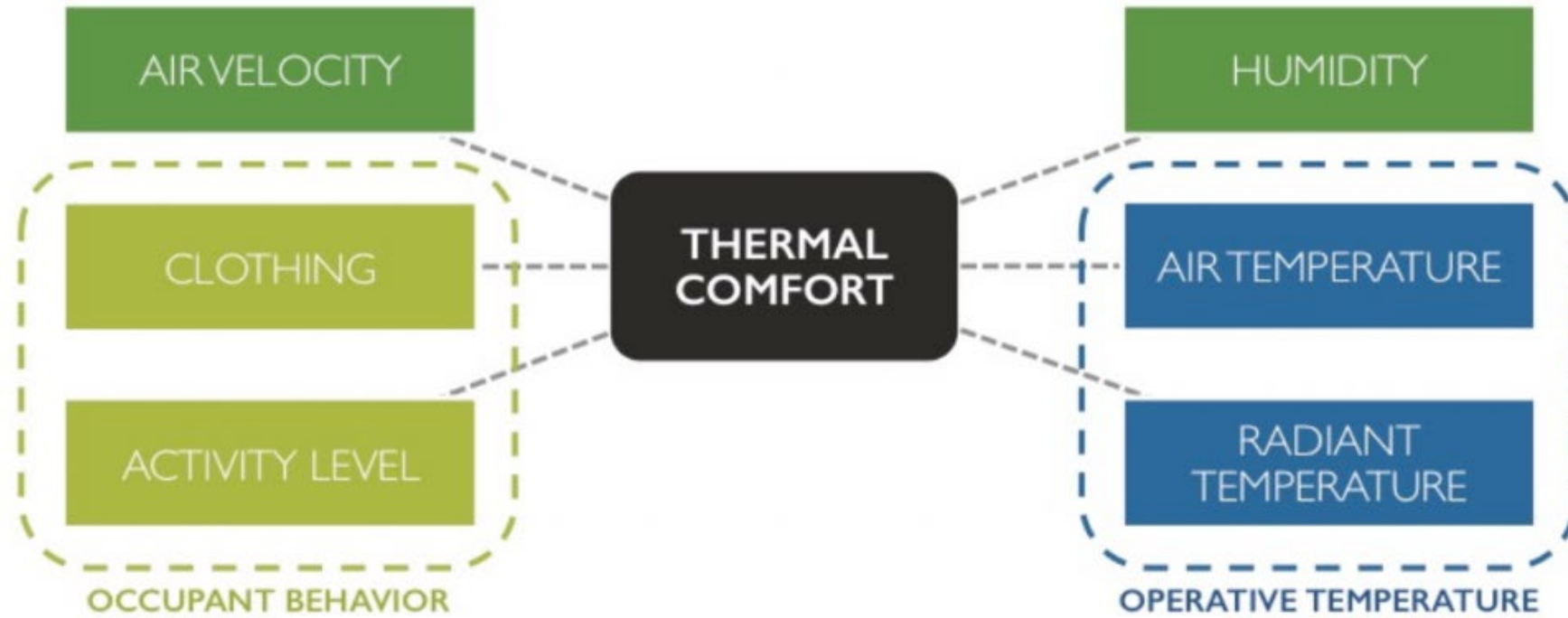


Thermal Comfort in Commercial Kitchens





Thermal Comfort in Typical Kitchens

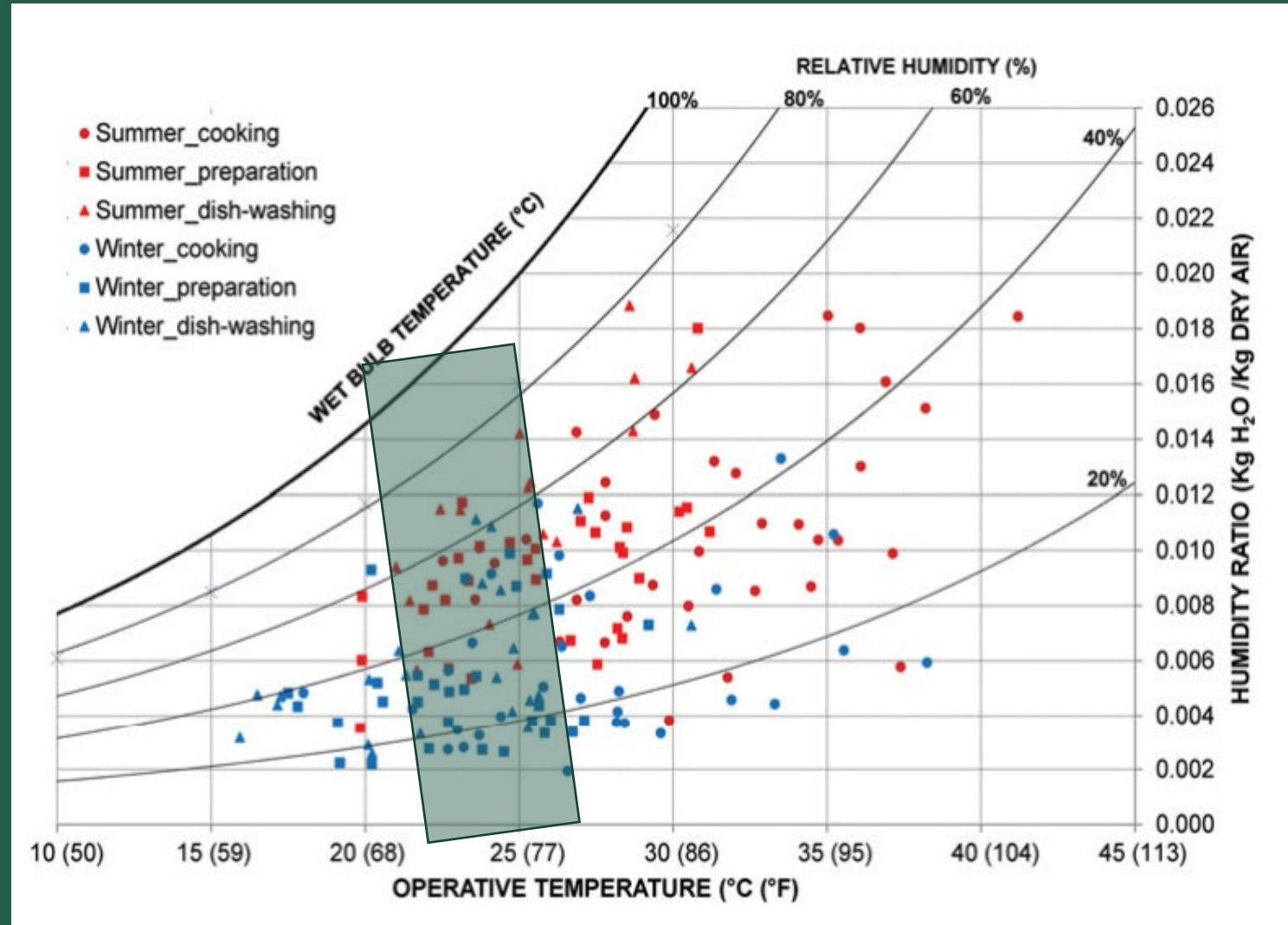




Thermal Comfort in Typical Kitchens

ASHRAE RP-1469 Thermal Comfort in Commercial Kitchens

- >100 Kitchens in U.S., one week test
- All climate zones represented
- Comparison of Summer and Winter





Summary of Benefits of Electrifying:

- No more idling equipment
- Reduces building emissions = reduced environmental impact
- Operates efficiently = saving energy & utility costs
- Precision cooking controls
- Dramatic improvement to thermal comfort
- Extended life of pots & pans
- Easier to clean = saving on chemical costs
- Faster throughput = increased productivity
 - Dollar per labor hour improved
- Improved indoor air quality





Commercial Kitchens Wanted!

PSE scientists want to measure air quality in commercial kitchen settings. We are interested in measuring both gas-fired and electric appliances.

Sampling can be performed during on or off hours with very minimal equipment. We provide compensation and an air quality report to participants.



Bringing science
to energy policy



FORWARD DINING SOLUTIONS LLC
PUSHING SUSTAINABLE KITCHEN DESIGN FORWARD

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Thank You.

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