Dining All-Electric

Inside the Kitchens of the Future

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Foreword: everybody eats

Food is part of all our lives. Now more than ever, the people who grow, prepare, and serve food — from professionals in the culinary industry to common consumers — are reckoning with how we can make the food system that sustains us more sustainable for our planet.

The real estate team at Microsoft has been working hard to champion sustainability in dining programs across the globe. We've debuted plant-based menuing options, sourced local ingredients, and zeroed in on reducing food waste. But the greatest food sustainability challenge in dining has long been the commercial facilities themselves.

From a corporate real estate perspective, the kitchens across our 15-million square-foot Puget Sound campus represent one of the last operational carbon emissions segments to eliminate in Microsoft headquarters' daily operations. Because flames and culinary excellence have always gone hand in hand, electric cooking at massive scale had never been done — and proof it could be achieved successfully didn't exist.

But where we lacked proof, we saw opportunity. Restaurants use roughly five to seven times the energy per square foot as other commercial buildings.[1] And our team of real estate and sustainability professionals understood that if we wanted to meet our commitment to become carbon negative by 2030, we had to make some tough decisions. Going 100% electric in these facilities was the only way to address our climate reality. The potential to create more sustainable and optimized kitchens was tremendous — if we faced the challenge.

Before looking at blueprints, we first had to harness a mindset of no half-ways — that is, going all-in on reducing carbon emissions while refusing to budge on food quality, cuisine variety, or operational efficiency. Success meant setting a precedent for an electric-fueled future of commercial cooking without sacrificing the integrity of our dining program.

Charged by a legacy of pioneering, our teams were eager to rise to the challenge of electric dining with calculated risk-taking and a growth mindset. From real estate leadership to our contractors in the kitchen, everyone involved became a champion of sustainability, excited to push the culinary and food service industries toward preserving the planet — and confident we would succeed.

Now, five years later, we have our first proof of concept in our recently completed One Esterra Food Hall — and our first opportunity to share what we've learned. We encourage everyone who reads this report to take our work and build on it. Creating avenues for maximum collective impact is the best bet to address climate change. Against a formidable threat that affects all of us, we only win when we all win. In this case, we need more cooks in the kitchen. We hope you join us.

Jodi Smith Westwater
Microsoft Dining Lead
Global Workplace Services

Katie Ross
Global Sustainability Lead
Global Workplace Services

Executive summary

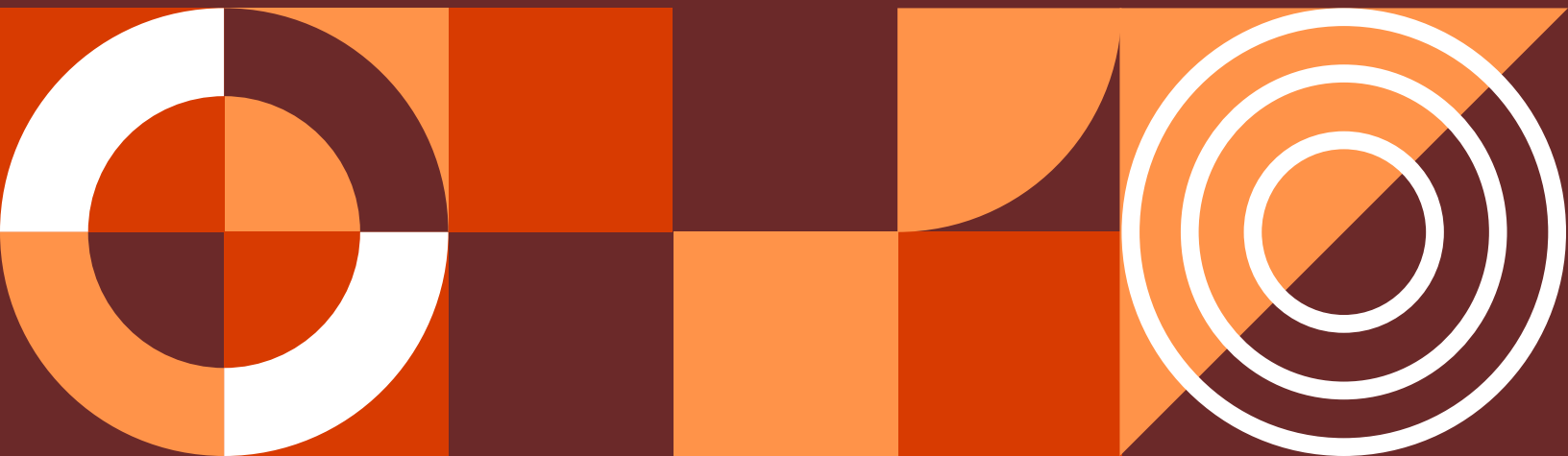
Microsoft has made bold sustainability commitments to be carbon negative, water positive, and zero waste by 2030. Beyond these big goals lies real work pioneering solutions to achieve them, not only internally, but at scale in organizations across the globe.

Commercial kitchens that conventionally use up to 80% gas equipment are one of the biggest carbon emissions hurdles in our real estate portfolio. This white paper outlines our team's progress implementing all-electric dining facilities throughout the East Campus modernization project at our headquarters in Puget Sound, and shares what we've learned so far in our first fully operating all-electric Food Hall at the One Esterra building.

All-electric dining at Microsoft began as an ambitious idea during the design phase of our East Campus modernization project in 2017. We identified an opportunity to omit the gas line, removing any temptation to rely on fossil fuels for powering daily operations. Kitchen facilities were the only part of campus daily operations we never tried to operate exclusively on electricity.

Trading gas-fired cooking for all-electric meant potentially putting Microsoft's world-class employee experience — including a variety of authentic dining options served without long waits — in jeopardy. It was up to our services lead, project delivery specialist, and chefs to commit to achieving top-class cuisine with all new processes and no model for success.

The real estate team at Microsoft publishes this white paper as a way of offering that model. We hope it is a proof of concept — and piece of inspiration — for other companies taking stock of their climate commitments, as well as those in the food service and culinary industries curious about the capabilities and promise of electric equipment. This paper also offers practical guidance for sustainability and real estate professionals looking to implement solutions at scale that are designed to combat climate change in a meaningful way.



Microsoft's first 100% electric dining facilities

One Esterra – completed

sq feet total

245,000

sq feet of cooking space

13,200

meals per day capacity

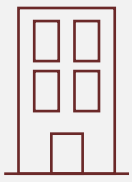
1,050

pieces of electric equipment

360

food hall

1



concepts

9

espresso location

1

East Campus – coming 2023

sq feet total

3,000,000

sq feet of cooking space

77,000

meals per day capacity

10,500

pieces of electric equipment

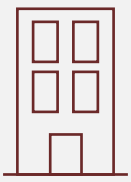
2,500+

sq feet catering kitchen

30,000

food halls

5



full-service restaurants

2

espresso locations

11

Section 1

Introduction: climate commitments, scalable solutions

Climate change is here and the time for response is now. Zero-carbon facilities mean solving for all-electric kitchens and leaving gas-fired appliances behind. It doesn't mean giving up a world-class dining program.

At Microsoft, carbon reduction and removal is one of our four environmental priorities alongside water reduction and replenishment, waste reduction, and ecosystem protection. In 2009, we made a series of commitments to reduce the company's carbon footprint and we have been carbon neutral across our Scope 1 and 2 emissions as well as employee travel since 2012.

In 2020, we concluded that "neutral" is not enough. Climate change is happening now, and while the world will need to reach net zero, those of us who can afford to move faster and go further should do so. Our goal is to drive down our Scope 1 and 2 emissions to near zero, reduce our Scope 3 emissions by more than half, and remove more carbon than we emit by 2030.[2]

Microsoft is committed to being carbon negative, water positive, and zero waste by 2030.

Buildings account for 40% of greenhouse gas emissions globally.[3] So to keep our commitments, we must decarbonize our buildings now — and our solutions must be comprehensive and forward-thinking enough to hold up far beyond the pledges we make today. They must, in short, be robust enough for the demands of the future. This is true especially in a field like real estate where today's decisions have implications long into tomorrow, the next decade, and beyond our lifetimes.

Carbon emissions by scope: 1, 2, and 3

Organizations measure their carbon emissions in three scopes, divided by degree of responsibility.

Scope 1

covers direct emissions from owned or controlled sources.

Scope 2

covers indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the company.

Scope 3

includes all other indirect emissions that occur in a company's value chain.

“We're no longer at a point of half measures. The urgency of the climate crisis demands bold steps, innovations at scale, and industry disruptions. We need to walk the walk and do the hard thing — because that’s our responsibility.”

Katie Ross
Global Sustainability Lead, Global Workplace Services

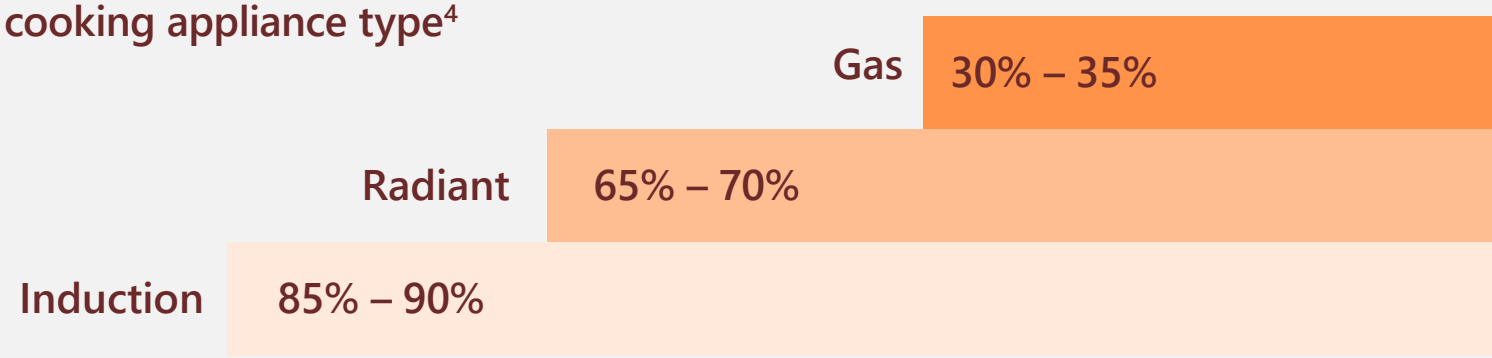
Solving for zero kitchen carbon emissions

Driving Scope 1 and 2 emissions to near zero in real estate begins with eliminating operational dependence on fossil fuels — and therefore gas lines — enabling all-electric facilities that source 100% renewable energy. Advances in mechanical systems have made all-electric building systems for heating, cooling, and hot water possible with reasonable cost trade-off. Commercial kitchens, however, have not been so straightforward.

Gas dining equipment is much more than just the industry standard for speed, technique, authenticity, and consistency. It’s also the basis for many long-established building codes that have dictated kitchen design since the 1950s. These codes add to the challenge of introducing novel technology to back of house. New pieces must satisfy yesterday’s architectural criteria and today’s culinary standards with the technology of tomorrow. And because most commercial kitchens have been content to use gas, there has been little demand on manufacturers to innovate electric equipment. Until now.

Our path to carbon negative dictates that we set a new standard. Solving for 0% gas appliances is the only responsible choice. Doing so while maintaining the integrity of our dining program means reimagining kitchen infrastructure from the ground up and working with manufacturers to face the challenge head-on.

Energy efficiency by cooking appliance type[4]



There are three types of appliances for cooking today: gas, radiant electric, and induction electric.

Gas

uses a supply of gas and a spark to create a flame for cooking.

Radiant

uses electricity to heat a metal element to cook on.

Induction

creates fast, direct heat on the cook surface through an electro-magnetic field.

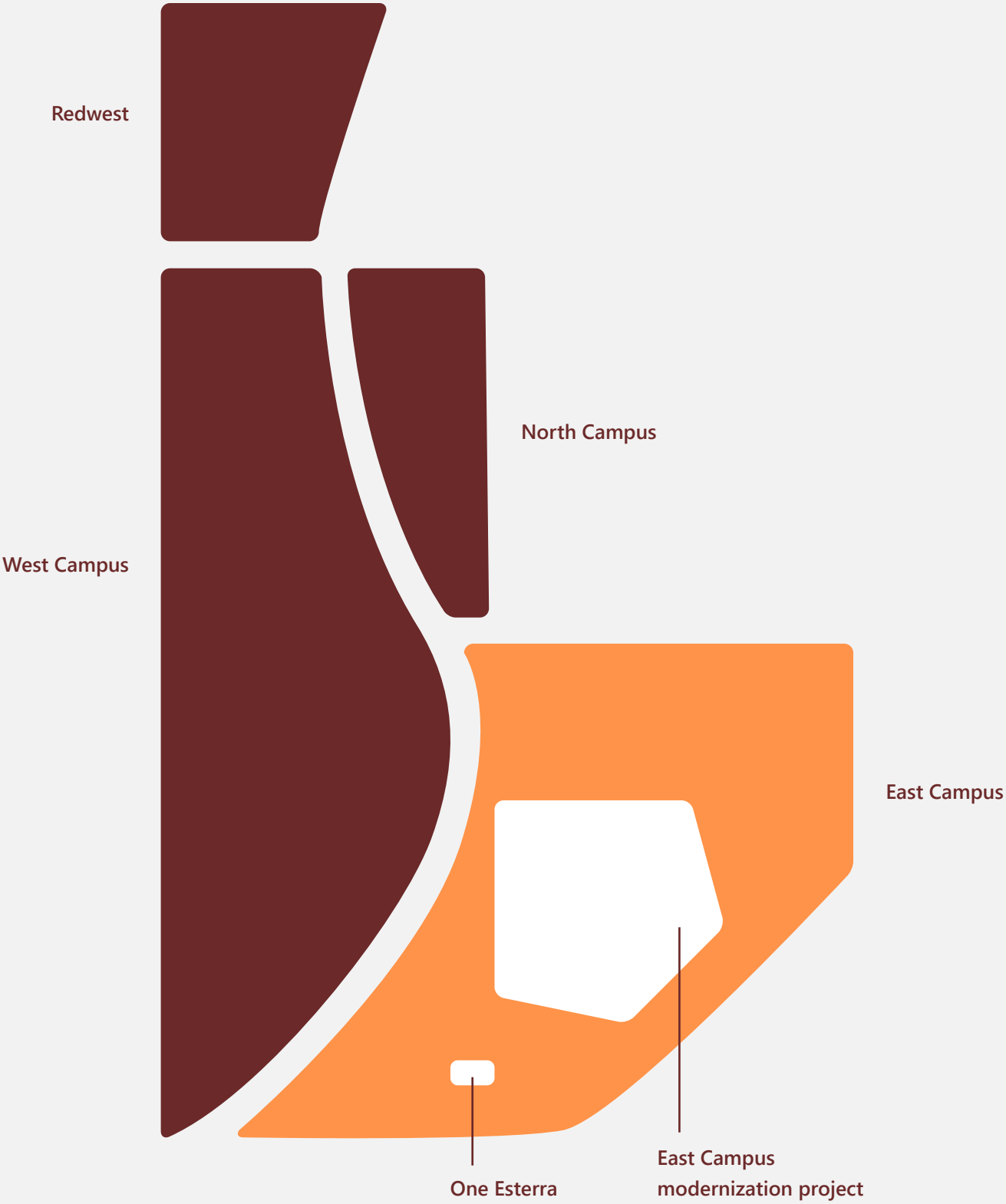
Gas or no gas: a critical opportunity in campus modernization

In 2017, Microsoft announced the East Campus modernization project covering three million square feet of real estate across 17 buildings in Puget Sound. Our real estate team designed the project to revitalize our corporate headquarters with an innovative East Campus renovation and built on our portfolio of accessible, sustainable, connected, and secure spaces.

As we announced plans for this campus modernization, the real estate team was simultaneously developing its sustainable design and construction strategy. Understanding how the built environment contributes to climate change, they set requirement standards for new construction that called for ultra-low, decarbonized energy use for daily operations. In other words, all-electric facilities — including kitchens.

The East Campus master plan includes 77,000 square feet of cooking space with five food halls and nine espresso locations, two restaurant/pubs, and a 30,000-square-foot catering kitchen. Demonstrating electric dining at this scale without sacrificing quality or experience not only advances Microsoft's sustainability commitments, but also makes an impact beyond the company. Through the development of new technology and the application of existing technology at scale, we believe we'll pave the way for more all-electric facilities to follow. But belief and reality are often at odds, so we're resolved to ensure the future we believe in by going step-by-step to create it.

Microsoft Redmond campus map



"This project represented an opportunity to diverge from traditional design in a way that enabled our sustainability goals and helped move the needle within the broader industry. I remember the team coming to me saying, 'If we commit to eliminating gas, there's no reason in the world we can't do this by 2022.' So, I told the team, we've got to go 100%. And the team set out to not only do it, but show that it can be better than gas overall."

Michael Ford
Corporate Vice President, Global Workplace Services

Section 2

Embracing change: learning to love electricity

The first step to implementing all-electric daily operations in corporate real-estate is championing innovative problem solving — and convincing stakeholders to rise to the challenge.

Agreeing to all-electric daily operations in 77,000 square feet of commercial cooking space was a decision Microsoft did not take lightly. For our real estate team, creating spaces and experiences that empower employees is a top priority — and food represents an incredibly important aspect of that experience.

Convincing the culinary team

Chefs are artists. They come from long traditions that date back centuries. Today, with few exceptions, they're trained on gas. It's no surprise, then, that the culinary professionals at Compass Group — the integrated third-party food service partner that delivers and operates our Puget Sound kitchens day in and day out — pushed back when we asked them to execute new, exciting concepts with unproven, never-before-used all-electric equipment.

In Puget Sound, the dining program is vast, including 100+ locations, catering events and spaces, conference centers, and retail services, plus kitchenettes and hubs. Each of these destinations aims to provide employees with choice and diversity in meal options.

The program is built around four key pillars:

- **Authenticity:** Food at Microsoft must be appetizing and taste fantastic; every meal served to employees must be high quality.
- **Variety:** Dining options must be diverse, rotating, and numerous, from salad and deli bars to ethnically inspired concepts from all corners of the globe.
- **Speed:** Each Microsoft dining location must be designed for high-capacity throughput with the ability to serve thousands of meals a day without long wait times that could impede employee productivity.
- **Exhibition:** Spaces where food is prepared and served should offer immersive experiences and departures from work that create opportunities for connection and collaboration, and leave employees refueled, refreshed, and possibly even inspired.

"Across our dining program, we're committed to offering fantastic food with exceptional service in inspiring spaces. We're also focused on integrating our corporate responsibilities into our portfolio through diverse supplier spend and partnerships, technology which provides more accessible and sustainable experiences, as well as inclusive programs and hiring practices."

Jodi Smith Westwater
Microsoft Dining Lead
Global Workplace Services

The switch to all-electric could mean effectively re-building this dining program from the ground up. Unlike every kitchen we'd delivered in the past, throughput and capacity for an all-electric kitchen were unknown — and those operational metrics affect everything from labor and training to menuing and design. Our success hinged on the validation — or invention — of equipment that most professionals in the industry had never encountered, implemented at a scale the industry had never seen.

Compass Group quickly assembled a list of concerns that any restaurant professional may recognize:

- How will new equipment affect kitchen design, delivery, and daily operations?
- How often will electric equipment require maintenance or replacement?
- Do commercial service technicians exist for this state-of-the-art equipment?
- How will converting to electric impact overall operational costs?
- Will the new kitchens be able to meet employee expectations for a top quality, diverse selection of authentic foods?

Answers to these concerns did not exist. The opportunity to lean into them and be the team who discovered the solutions did. Our real estate team positioned electric dining as a pioneering effort and tapped into the culinary professionals' nature to meet a challenge. As stewards of hospitality, chefs are prone to say yes and solve problems — and they are proud when they deliver. Chefs often claim they can cook a delicious meal on anything. But the question remained: Does that include all-electric kitchen equipment?

In response to this question, Compass Group returned with a reasonable proposal to reduce gas equipment from 80% to 50%, or even 20%, a sustainability step in the right direction with less operational risk. However, the climate reality demands 100% solutions, and our real estate team knew that. They also knew the key to innovation is embracing challenges and learning from them — that is, adopting a growth mindset — so they "bet on yes," as the team likes to say. Removing East Campus's gas line was an all-or-nothing decision, and Microsoft was all in.

With full support from real estate leadership, the dining team got to the work of validating electric cooking methods, testing equipment, and disrupting an industry. The East Campus modernization project was still in the design phase, which gave Compass Group two years before the foundation was poured and equipment was purchased to develop a groundbreaking, carbon-free dining operation.

"I said to my team: we're at a critical crossroads. We can embark on this begrudgingly and find 'check the box' solutions, possibly diminishing our program in the process. Or, we can reframe our thinking, embrace growth mindset, and see this as an opportunity to reshape and disrupt an entire industry — to think differently and inspire future, sustainable change. Who do we want to be?"

Jodi Smith Westwater
Microsoft Dining Lead, Global Workplace Services

Life-cycle cost benefits of all-electric dining

Real estate leadership's first question about electric dining was: is it possible? The second was: is it affordable? Fortunately for the bottom line — and for the planet — sustainable decision-making in building design ultimately translates to money saved.

But making this case is not without its challenges, as our real estate team learned during initial conversations with the kitchen designers and operators. At first blush, the initial costs of electric equipment may seem unknown and potentially steep, but in the long term, the upfront investment in environmental choices for commercial kitchens can be justified with life-cycle cost benefits. Already, electric equipment in general boasts energy efficiency gains over gas. Selecting induction equipment promises further benefits over gas and radiant:

- **More efficient heat transfer** using less energy and cooks faster
- **Negligible energy use when idling** as no heat is produced
- **Reduced heat during operation** requiring less HVAC load
- **Improved conditions for staff** with less risk of injury and increased temperature comfort

In a recommendation for induction equipment prepared during decision-making, a model based on one building in the East Campus modernization project showed switching seven ranges and five griddles from radiant to induction provided a total annual energy savings of 115,800 kWh. Peak operational load dropped 50 kW, and food service EUI decreased 15.6% — a 3% reduction for the entire building.

The model was used to project annual energy savings for the entire modern East Campus, resulting in 832,300 kWh reduced, equivalent to the annual energy consumption of 69 U.S. households[5] — just by selecting a few pieces of induction equipment over radiant.

115,800 kWh

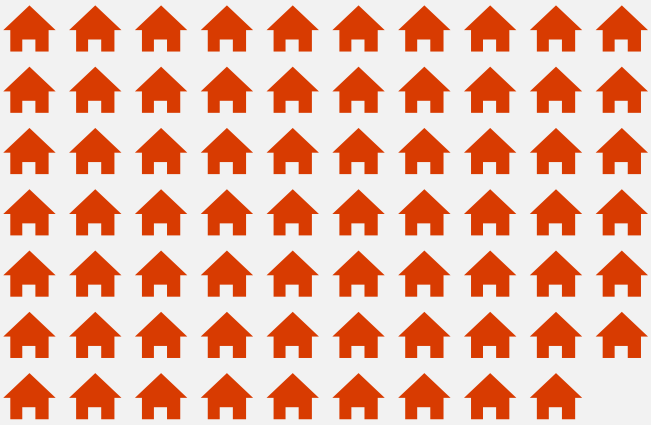
total annual energy saved by switching griddles and ranges from radiant to induction in a single building

Betting on yes

Microsoft's decision to go for all-electric dining was in many ways a gamble. We wagered the resourcefulness of our teams and the promise of new technology against valid concerns — because we understood our responsibility to the climate reality outweighed the risk. And not to mention the reward: a significant step forward in addressing an urgent crisis. In this way, **we bet on yes**. Despite all the unknowns, the problems could be worked through.

69

U.S. households could be powered every year with the energy saved by switching griddles and ranges from radiant to induction across East Campus



"As a chef, when you look around to what's going on in the world today, it's not so great, and if you can be a part of making positive change — assist in cutting down the carbon impact on the planet — then my question is, why wouldn't you?"

Chef Craig Tarrant
Culinary Director, Compass Group at Microsoft


EXIT
BEVERAGES

Section 3

Meeting concerns, solving problems: testing and results

The workplace of the future demands unique culinary concepts that modernize dining with globally inspired cuisines, innovation, and variety. A carbon negative future demands the commercial electric cooking equipment to deliver it.

Microsoft's East Campus modernization project represented a fresh opportunity for the dining team. Their first new build in Puget Sound in years, it was a holistic chance to rethink dining concepts in relation to the workplace of the future.

Even before the all-electric kitchen ask, the dining team had spent significant time identifying culinary concepts designed to revitalize dining on campus while satisfying employee preferences for cuisines from around the world. These culinary concepts guided the mission to deliver them on all-electric equipment.

Kitchen design and testing methodology

Demands of commercial kitchen equipment

Equipment is only valid for inclusion in a kitchen if it can prepare food that meets the following criteria:

Aesthetics

Ingredients must be visually appealing and appetizing when plated

Capacity

Meals cooked per hour directly affects service and operational costs

Speed

Food should cook fast without long wait times

Taste

Excellent, authentic flavor is a necessity

Temperature

Calibration is crucial so meals are never under- or over-cooked

"Any chef will tell you they can cook anywhere, and they'll cook on everything. So, the mindset that I had was like: You know what? Cool. This is a challenge. Let me take this on and I'll find a way to cook with electric without any issue."

Chef Jevic Acain
Regional Executive Chef
Compass Group for Microsoft

Commercial kitchen design at Microsoft begins with determining performance metrics for dining locations based on transactions, or meals served, per day. For instance, if a food hall is meant to provide 1,000 transactions a day and includes seven stations featuring different cuisines, each of those stations contributes a portion of the 1,000 transactions. Once menu styles for culinary stations are determined, teams select equipment that can execute those concepts based on throughput metrics of equipment by meals per hour. By this logic, an Asian concept may call for a wok with the capacity to produce 150 meals per hour.

Typically, after determining throughput requirements by station, a project delivery specialist works with a kitchen designer to select equipment that matches a kitchen's demands and labor requirements. However, within the electric equipment selections available, many of the performance metrics were below the required capacity to execute Microsoft's concepts. While electric cooking was not necessarily new as a concept, equipment options supporting it were predominantly small-scale or intended for residential use — not the high-volume demand of commercial application. Solving these problems is where the chefs' and delivery specialist's rigorous work of evaluating electric cooking equipment began.

Over the course of 18 months, Compass Group tested the ability of different pieces of electric equipment to produce menu items from prospective culinary concepts based on the criteria of aesthetics, capacity, speed, taste, and temperature. First, the team sought commercially available pieces of electric equipment to replace those that would typically be powered by gas, such as ovens and fryers. Chefs identified and tested products that fulfilled the needs of many culinary concepts, rather than any one brand's specific product line. This provided validation of throughput while preserving flexibility in terms of equipment brands and menu items based on facility and supplier.

Specialty induction equipment required further cooperation between Compass Group and manufacturers to reach Microsoft's capacity requirements. Based on established criteria for food quality, chefs and equipment specialists partnered with manufacturers at Middleby Marshall and Jade Range over multiple rounds of testing to develop induction ranges and griddles to the point that performance was reliable for Microsoft's commercial demand. Teams also partnered on the development of specialty equipment such as the Jade Range induction wok, detailed later in this paper.

Longstanding relationships between Compass Group and kitchen equipment manufacturers made innovative product development partnerships possible. At Microsoft, we recognize that the capability of our contractors to lean on manufacturers is unique thanks to our position as an enterprise organization. While this may not be possible for all organizations, manufacturers have since made the equipment produced through our partnerships commercially available. And we hope that the work we've done lays the foundation for more accessible electric transitions in kitchens of all scales.

"Some equipment never existed before in our required capacity. So, over a long period of time we refined the equipment — test, failure; test, failure; test, failure — until we finally got to the point that we could rely on it."

Rick Nettle
Senior Director of Project Delivery
Compass Group at Microsoft

Key learnings on induction

In testing and validation, teams discovered some key learnings on induction equipment in terms of how it compares to gas and radiant technologies in commercial-grade kitchens. In general, induction requires unlearning techniques that are commonplace on gas, and requires training or green-skilling for cooks to execute the menu. Further learnings are detailed below.

Induction griddles

1. Pre-heat in ten minutes, faster than radiant and gas
2. Maintain heat consistency corner-to-corner
3. Have no issue with temperature recovery
4. Are easily cleaned with less harmful chemicals
5. Require level installation for best performance
6. Feature easy, yet sensitive, controls for temperature adjustment
7. Require a slightly longer cook time for products with higher density
8. Are available in fewer size options (as of 2022)
9. Provide smaller surface area heating (outermost surface edges conduct less heat)

Induction ranges

1. Rival gas in achieving temperature in one minute
2. Provide immediate heat upon contact, reducing cook time
3. Compare to gas with six adjustable cooking zones
4. Provide precise heat control with digital temperature readings
5. Are not impacted by loss of contact (and therefore heat) during a sauté "flip and swirl"
6. Have minimal temperature recovery time
7. Cook more evenly due to complete surface area energy transfer

> **"When we host tours, I say: tell me if you can tell the difference. And that's where we win because chefs are going to say: Well, I can't tell the difference. So why wouldn't I do this?"**
>
> **Chef Craig Tarrant**
> Culinary Director, Compass Group for Microsoft

Authentic electric dining

With all that we've learned, all-electric dining is still a frontier. As the East Campus modernization continues, so does our work identifying, evaluating, and developing specialty electric equipment. Some pieces, such as an electric charbroiler, have prototypes in development. Others such as an electric tandoor oven will be tested in the future.

To date, the dining team has identified a baseline of all-electric equipment to produce staple menu items as well as specialty equipment to execute unique culinary concepts. Nine concepts are currently validated and operational at the food hall in Microsoft's recently opened One Esterra building in Puget Sound.

Testing and implementation have shown that all-electric dining at scale is possible with only few adjustments. Contrary to the fears of the dining team, only minor differences are present in the final food product prepared on gas and electric. Throughput sacrifices due to equipment size are manageable through menu engineering techniques such as pre-velveting (or briefly boiling) proteins bound for the induction wok and adjusting how ingredients are cut to cook best on electric appliances. For instance, the bias (or diagonal) cut works best for vegetables. Chefs expect some of these techniques to gain traction as induction technology becomes more commonplace, while others may evolve as equipment improves to close throughput gaps.

As the dining team evaluates, develops, and integrates new equipment and procedures, we recognize that some questions will remain unanswered until chefs test them in the wild. For instance, long-term maintenance needs will only be fully understood after significant time and usage. And managers won't get a full picture of "performance under pressure" realities until they have plenty of lunch-hour rushes under their belt. While Microsoft recognizes the risks inherent in these unknowns, we also see bigger risks in letting these unknowns stall our steps forward.

The benefit of electric dining

Beyond operating on 100% renewable energy, all-electric dining facilities serve up a range of energy and health benefits, far out-performing gas kitchens.

Gas kitchens

- Gas cooking only transfers 30% of energy to food. The other 70% hangs in the air as harmful byproduct (a standard cookline producing 37.3 metric tons of CO_2 per year).[6]
- Open flames mean risk of fire. Gas leaks and fires have caused countless calls to the fire department at kitchens across the country, including Microsoft's.
- Powerful HVAC systems and hood ranges must run constantly to remove gas byproducts from kitchens, translating directly into more energy and a higher utility bill.
- Gas produces pollutants like carbon monoxide and formaldehyde. These fine particles are linked to cardiovascular diseases, seizures, stroke, cancer, and even death.[7]
- Grease prospers as another byproduct of gas equipment and cases of harmful chemicals are necessary for regular cleaning to keep kitchens up to code.
- Simply put, gas kitchens are hot and can be uncomfortable to work in.

All-electric kitchens

- Electric cooking is far more energy efficient than gas, eliminating up to 32.1 metric tons of CO_2 per year against a standard cookline.[8]
- With no open flame — or gas line at all — risk of gas leaks and gas fires disappears. With minimal buildup, risk of grease fires is also essentially eliminated.
- HVAC systems are utilized significantly less, meaning less energy cost. Some modern systems are demand-controlled to activate only when excess fumes are detected.
- Electric cooking reduces harmful pollutants to only the particulate matter produced from the food itself, compared to additional harmful pollutants produced from burning gas.[9]
- Electric equipment produces significantly less grease, some all-electric kitchens using only 5% compared to what they use in gas kitchens.
- More energy transferred to food means less heat in the kitchen, creating a more comfortable work environment for kitchen teams.

Case Study

Inventing an induction wok

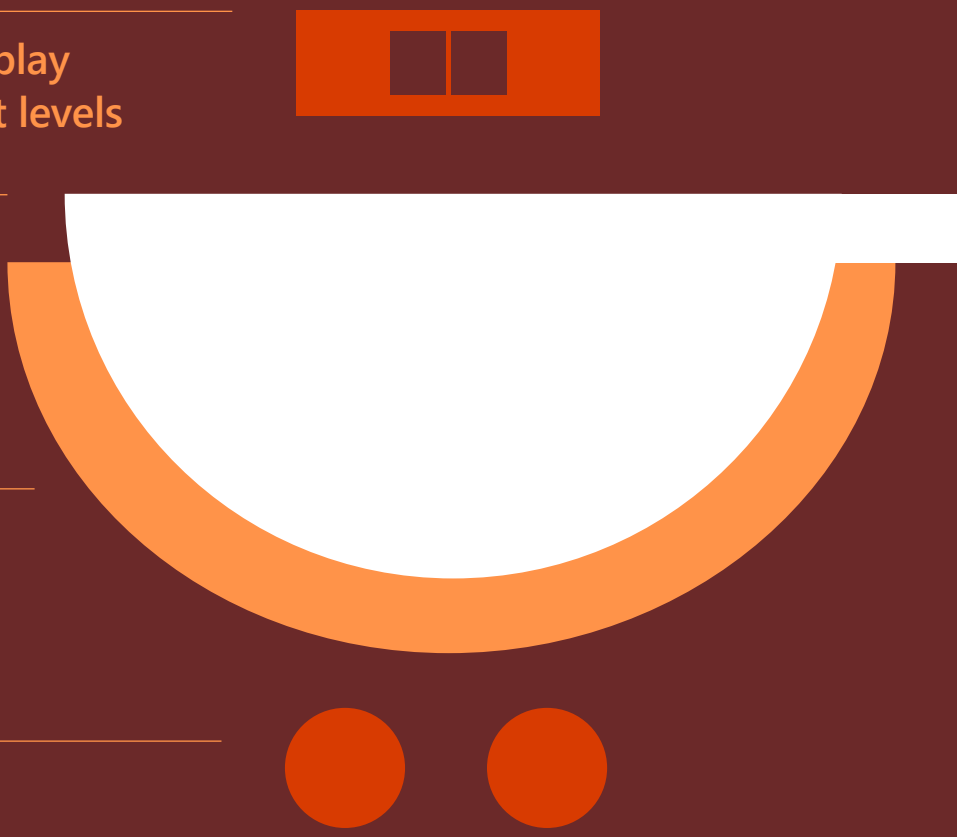
Microsoft considers its campuses living labs for innovation. When we committed to building all-electric kitchens, that meant pushing innovation to the dining industry. To meet our dining program's criteria for authenticity, variety, speed, and exhibition, our equipment specialists and chefs worked directly with equipment manufacturer Jade Range to develop a state-of-the-art induction wok. In many ways the centerpiece of the food hall at One Esterra, our induction wok can sear as many meals per hour as its gas-fired counterpart — with all the same flavor, only one quarter the energy, and no constantly running water.

A visual power indicator display allows chefs to monitor heat levels

The original shape of the wok is preserved, allowing the traditional motion of wok cooking

A concave induction burner provides contact, heat, and mobility

On/off switch and power dial make the induction wok simple and intuitive



Benefits of the induction wok

meals per hour capacity

150

efficiency of induction wok vs. gas wok

4:1

water use of induction wok vs. gas wok

no constant wash

1–3 gallons per minute

No flame = less heat
= no overheating chefs

Developed for
Microsoft, available to
commercial customers

Power, process, progress

Ensuring the induction wok could heat up quickly was the primary concern chefs communicated to manufacturing partners during development. Taking this into consideration, the electric power of Version 1 was correlated to be equivalent to its gas-fired counterpart. It debuted in spring 2020, pulled 16 kW, and was so heat intensive thanks to induction tech, it burnt everything as soon as it hit the pan. Over the course of two years, Compass Group chefs, principally Jevic Acain, tested, evaluated, and worked with Jade Range on redesigns for power, control, and operation. Version 4 pulls 12 kW and was confirmed, approved, and shipped to One Esterra in November 2021. And evaluation continues — as cooks work daily with the equipment, Compass Group supplies feedback to Jade Range for ongoing improvement.

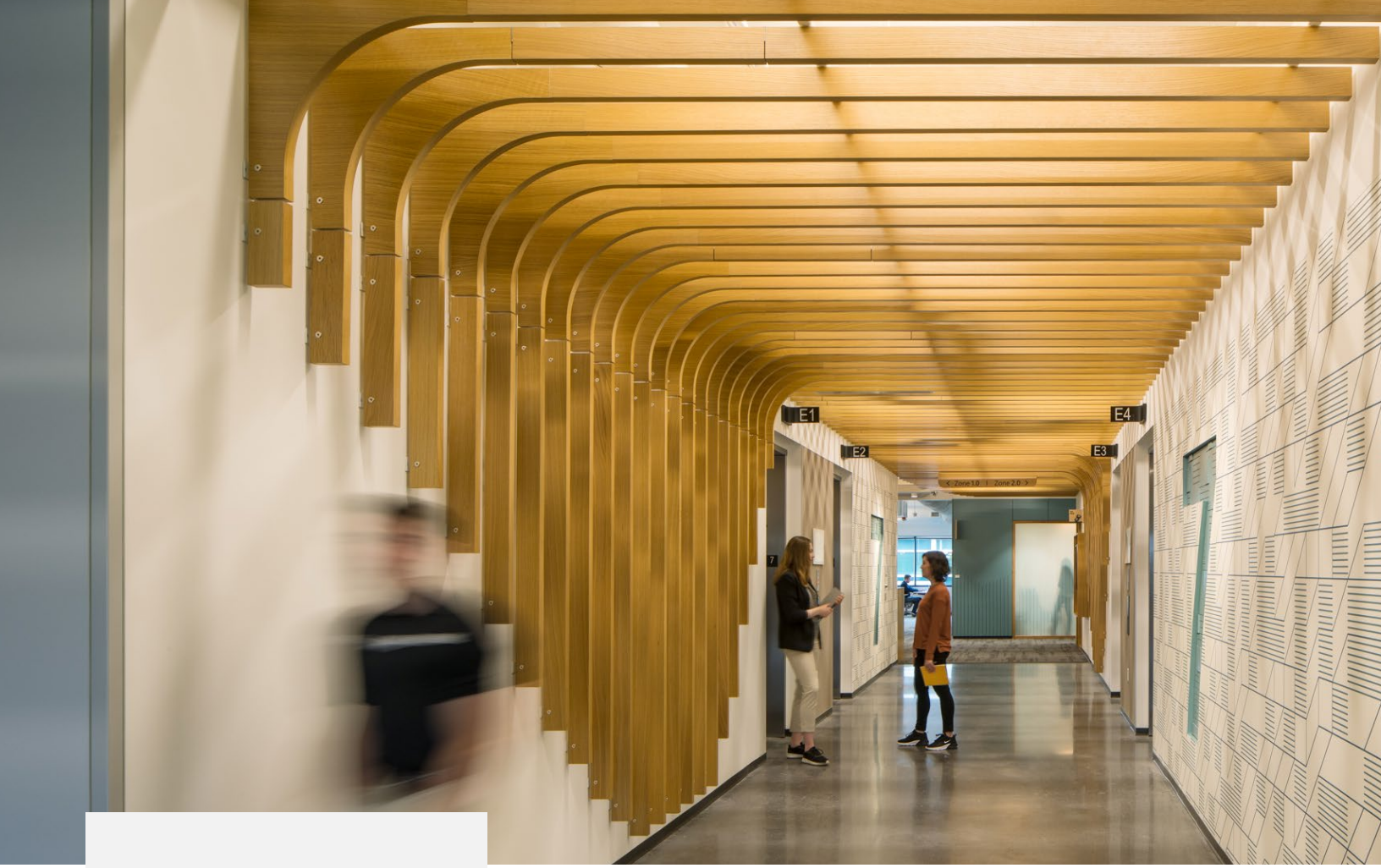
"The wok is really a shining example of product and equipment development where, initially, we said, 'Forget what we know, how do we make this operate 100% authentic in terms of taste and texture, and develop performance metrics identical, if not greater than, what we have on a gas fired wok?'"

Rick Nettle
Senior Director of Project Delivery
Compass Group at Microsoft

Section 4

Proof of electric dining at scale: One Esterra

Microsoft recently debuted its first all-electric dining facility at One Esterra. The state-of-the-art operation proves the viability and popularity of sustainable cooking technology.



Projected Energy Use Intensity (EUI) at the LEED Platinum One Esterra building[10]

4.7 kBtu/SF
HVAC

5.0 kBtu/SF
Lighting

14.9 kBtu/SF
Plug loads

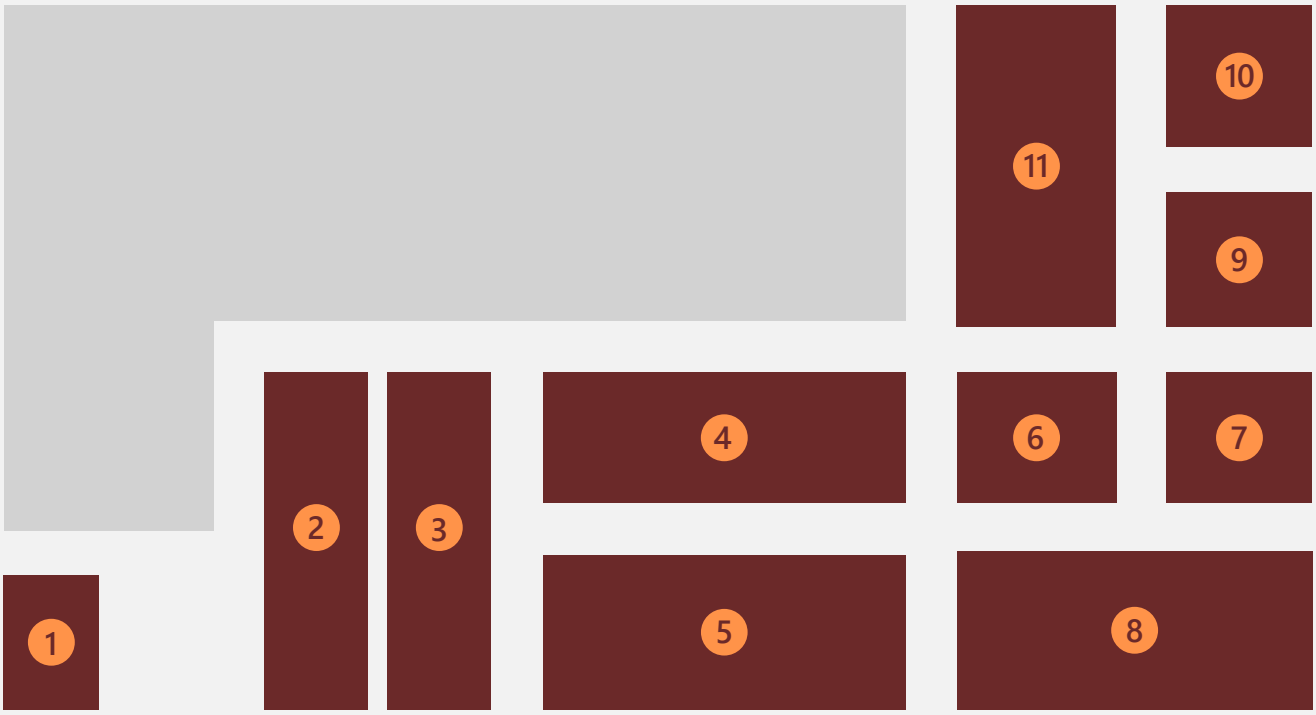
2.52 kBtu/SF
Process loads and exterior lighting

27.12 kBtu/SF
Building total

In October 2019, Microsoft began work on a building in Esterra Park, a mixed-use project under development on East Campus in Puget Sound. As a new construction build, the leased property was required to meet the real estate team's updated sustainability standards, including all-electric daily operations. When we determined the project would include a food hall, it became an opportunity to create a proving ground for all-electric dining.

Today, thanks to the detailed work of our real estate team, Compass Group, and operational partners, One Esterra, Microsoft's office at Esterra Park, is home the freshest example of the authenticity, variety, speed, and exhibition inherent to our dining program.

One Esterra Food Hall



1. **Espresso**: This lobby Espresso location features local, diverse-owned coffee roaster Boon Boona Coffee, as well as assorted pastries, bakery items, and sweets.
2. **Masa**: This custom concept boasts Latin cuisine featuring house-ground, heirloom corn and handmade tortillas. Rotating menus feature authentic Latin favorites including Mexican, Brazilian, Argentinian, Venezuelan, Peruvian, and more.
3. **VegTable**: This is a dedicated vegan and vegetarian concept, featuring rotating dishes highlighting plant-forward menuing and innovative protein alternatives.
4. **Diner**: This concept offers all-day breakfast and diner-inspired dishes and sides, including breakfast brioche sliders, avocado toast, fried chicken club sandwiches, burgers, fries, and more.
5. **Delicatessen**: The deli features a rotating selection of house-made wraps and grab-and-go sandwiches. The wraps and chapati are made fresh on in-station presses.
6. **Pacific Rim:** This concept features rotating Asian cuisine including house-made noodles and custom stir-fry rice dishes. All dishes are prepared utilizing the custom-developed induction wok.
7. **Internationalist**: This quick-serve concept offers different rotating global plates daily — including Indian cuisine, BBQ, Hawaiian plates, and more.
8. **Greens**: This is a self-serve salad bar featuring fresh and local produce, breads, and soups.
9. **Grilled**: This protein-forward concept features freshly grilled meats, veggies, and sides — featured equipment includes a radiant rotisserie.
10. **Eat Local:** This station represents Microsoft's commitment to connecting to the local community and offering increased variety — rotating local restaurant partners are showcased daily.
11. **Main Prep Kitchen:** This is where the dining team mixes dough, cuts vegetables, and prepares other ingredients ahead of service hours. In the culinary industry, it's often referred to as back of house

Inside the 245,000-square-foot One Esterra building is a modern dining facility that draws employees from across campus. The modern destination features nine globally inspired culinary concepts where chefs operate 203 pieces of all-electric kitchen equipment in full view of guests. The dynamic open kitchen layout is designed to inspire curiosity and deliver over 1,050 meals a day. Combined, the eateries cater to dietary needs ranging from vegetarian to gluten free and reflect cuisines from cultures near and far.

Each dining location and the prep kitchen utilizes a fully electric cookline of induction, radiant, and non-cooking equipment. A full breakdown of the One Esterra food hall's equipment list and power requirements by dining concept is available in Appendix C. In addition, the building includes a 24-hour frictionless grab-and-go location offering pre-made dishes and beverages, and kitchenettes on every floor for employees to make their own drinks and meals. Across all these locations, the building utilizes 360 pieces of electric dining equipment. Altogether, these appliances place One Esterra at the frontier of the culinary industry.

Operating One Esterra: the electric culture fit

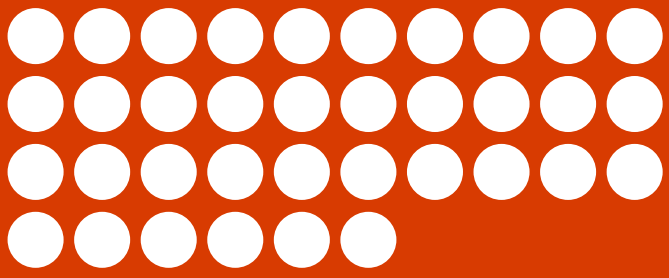
The best equipment in the world is only as effective as the team that operates it. With different cook times and preparation routines compared to a gas-fired kitchen, the challenges of electric dining stretched beyond equipment and facilities into staffing, as well. However, even with a significant learning curve and the challenge of new construction, One Esterra's stalwart and dedicated dining team adjusted to the unique flow of electric cooking quickly — thanks in large part to their open minds and enthusiasm to meet the future of commercial cooking.

The staff in electric kitchens have much to look forward to, which makes it easy for Compass Group to pitch the positives of One Esterra such as increased safety and easier cleaning. This helps dispel any concerns over the lesser-known equipment from new and existing culinary teams. In fact, associates new to the team — and to the culinary field altogether — are well suited for the new equipment. Without preconceptions, their beginner's mindset allows them to learn novel techniques on equipment like the induction wok and range with relative ease. Other equipment poses minimal learning gaps, like flat-tops and fryers, mirroring their gas counterparts. Overall, according to the staff behind the line, the transition proves easier than expected.

Thanks to its innovative food concepts, excellent dining staff, and sustainable power behind the counter, One Esterra has been easy to be excited about. The dining hall has earned a place on the must-eat lists of Microsoft employees and beyond, attracting the attention of well-known culinary leaders, politicians, students, city leaders, and journalists. And it's already collected one major award: **Best in Show at Food Management's 2022 Best Concepts Awards.**

Degreaser use by month for all-electric equipment

Degreaser use by month for gas equipment[11]




BREAD
ELICATESSEN

> **"The reputation One Esterra has built across campus isn't necessarily because they're using the electric equipment; it's because the food they're putting out is fantastic. Quality in, quality out."**
>
> **Beth Westmoreland**
> Executive Chef at One Esterra
> Compass Group at Microsoft

Benefits, costs, and yet to be seen

At the end of serving hours, One Esterra's all-electric kitchen — in particular, its induction equipment — provides a host of direct and indirect energy benefits in addition to reduced carbon emissions. Compared to gas-fired appliances, the electric alternatives selected for One Esterra are 48% more efficient.[12]

While the appetite to make these sorts of carbon-busting decisions is strong — at Microsoft and beyond — bottom-line concerns can often scare off would-be innovators. This should not be the case. In terms of upfront equipment costs, we found that some appliances, such as fryers and woks have relatively comparable costs between gas and electric equipment. For other equipment like griddles, charbroilers/planchas, and ranges, we noted a 2–3 times increase in equipment cost compared to a gas piece of equipment.

A closer look at the numbers reveals that cost savings are more prominent than expected and come in ways that may not seem obvious at first glance. For example, One Esterra's operational costs are reduced due to suppressed demand on the building's HVAC system. These savings have the electric kitchen's efficient heat transfer and reduced idle times to thank, along with demand control ventilation technology — which activates only as necessary, saving kilowatts by the hour.

In the spirit of continued investigation, a comprehensive cost benefit analysis detailing our sustainability investments and savings is currently underway. As demand for electric equipment increases, we anticipate their initial costs will fall, enabling more kitchens to save on energy and reduce their carbon emissions — providing the best chance to preserve the planet for many meals to come.

Percentages in this section are based on an internal sample of selected equipment and connected kW and BTU loads with no diversity calculated.

Section 5

Moving ahead, together

From our first all-electric kitchen at One Esterra to the facilities under construction on the East Campus to our food halls across the globe, Microsoft is committed to championing zero-carbon kitchens on our campuses and beyond.

Microsoft's commitment to sustainable solutions at scale continues in the ongoing East Campus modernization project. Our work in Puget Sound is only at the start. And with all-electric designs being the ultimate goal for every Microsoft kitchen, all-electric dining has a bright future ahead.

Pursuing carbon reduction at scale is part of Microsoft's aim to make sustainable decision-making easier for everyone. From the viewpoint of the chefs and project delivery specialists charged with electrifying our kitchens, a shift in the culinary market can already be seen. Since the East Campus modernization project began in 2017, manufacturers have increasingly dedicated time and resources to developing more affordable and better designed electric commercial cooking equipment.

All-electric kitchens, all over the planet

While all-electric dining will play a huge role in the future of real estate and facilities at Microsoft, to preserve the planet, organizations of all sizes and scales must also take on this challenge. The climate crisis demands cooperation across companies and sectors where competition is the norm. This means keeping detailed records of solutions and sharing them publicly to inspire innovation and adoption. This white paper provides information in hopes of encouraging exactly this sort of collective action.

We share what we've learned because sustainable solutions cannot wait. The urgency of the climate crisis compelled Microsoft's choice to make large-scale sustainability commitments, including electrification. In testing and implementation, the need to create a scalable roadmap for electric kitchens was our North Star. Now, thanks to our team's detailed work, we have a path to follow — and a premier example of the destination: One Esterra.

Our hope as an organization is that every dish served onsite at Microsoft may be a proof point for the validity of all-electric kitchens — and that the tools, strategies, and information provided through this paper help make low-carbon kitchens as common as the desire for a fresh-cooked meal.

Cooking is constantly evolving. Microsoft is evolving, too.

Will you join us?

Endnotes

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10 "Microsoft One Esterra Project Design Concept and Sustainability Strategies." Brightworks Sustainability, Brightworks Sustainability, 19 Jul. 2022.

11 Internal calculations based on standard Greasestrip case size.

12 Percentage based on an internal sample of selected equipment and connected kW and BTU loads with no diversity calculated.

Acknowledgements

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All photos provided courtesy of Microsoft.

Appendix A:

Recipe for success on induction equipment

The best way to learn how to use induction equipment is to cook on it. Throughout testing and training, Regional Chef Jevic Acain discovered invaluable techniques for cooking with induction equipment. Here he serves up a few tips for commercial cooks and home chefs as they introduce sustainable technology into their kitchens.

1. **Enter with an open mind.** Learning anything takes time. An induction stovetop is different from the gas ranges that many chefs are trained on, and therefore cooks differently. Embracing the challenge of mastering a new method of cooking is the fastest path to success.

2. **Establish your heat settings.** Induction equipment features a range of power controls, some with precise temperature reading, others with dials between low and high or values one to ten. Choose a favorite, simple dish to cook on repeat to get familiar with the heat settings and adjust to the pacing of induction cooking.

3. **Leave preheating behind.** On induction, pans heat up immediately, eliminating the need to preheat them with oil. Water boils faster, too, creating a unique rhythm of cooking. While chefs tend to prep their ingredients ahead of time, this is more important than ever with induction equipment.

4. **Use all five senses.** Induction cooking offers unique cues for chefs. Smelling smoke, tasting char, listening for a sizzle, feeling for tenderness, and looking for a sear can help inform when food is fully cooked. Keep track of clues like these to make every meal better than the last.

"People may be hesitant and scared at first, but it's just like anything, right? Induction is new, it's challenging — but once people accept it, it's easy."

Chef Jevic Acain
Regional Executive Chef
Compass Group for Microsoft

Appendix B:

Chef Acain's Chicken Thai Fried Rice

A hallmark of any Asian cuisine, fried rice dishes top the menu at Thai restaurants all over the world. At One Esterra's Asian concept, Pacific Rim, Chef Jevic Acain has executed a unique variation on this classic recipe.

Forgoing the overly complex, he allows fresh, essential ingredients to speak for themselves, leaning on a straightforward combination of chicken, rice, egg, and house-made stir fry sauce. Prepared on the state-of-the-art induction wok, Chef Acain's chicken Thai fried rice is a delicious example of the chef's personal culinary philosophy: simple, thoughtful, flavor-forward cooking.

Vegetarian stir fry sauce (serves 4)

2 minced garlic cloves

½ tsp. extra virgin olive oil

⅓ cup soy sauce

3 tbsp. granulated sugar

⅓ cup cold water

½ tsp. sesame oil

1½ tbsp. rice vinegar

2 tsp. cornstarch

1 tbsp. cold water

Silken chicken breast (serves 4)

1 lb. boneless, skinless chicken breast

1 tsp. sesame oil

2 tbsp. canola oil

¼ cup cornstarch

1 tsp. salt

½ tsp. baking soda

1 qt. canola oil for deep frying

Steamed jasmine rice (serves 4)

1⅔ cups jasmine rice

2½ cups water

Chicken Thai fried rice (serves 1)

3 oz. vegetarian stir fry sauce

8 oz. steamed jasmine rice

4 oz. silken chicken breast

1 tsp. minced garlic

2 tbsp. yellow onions

1 egg

1 tbsp. green onions

2 lime wedges

fresh cilantro

canola oil

Prepare rice

Bring the water to a boil in a medium pot. Stir in the rice, cover the pan, and reduce the heat to low. Simmer for 15 minutes until all the water has been absorbed. Taste the rice to test for doneness — it should be perfectly cooked. If it's still too firm, add a few tablespoons of water, cover the pan, and let the rice absorb the water off the heat for a few more minutes.

Prepare sauce

In a small pot, heat olive oil on medium and add garlic. Cook until golden brown. Add soy sauce, sugar, water, sesame oil, and rice vinegar. Bring sauce to a boil. Mix cornstarch with remaining water to make a slurry and add it to the sauce. Stir to thicken. Remove from heat and refrigerate until ready to use.

Prepare chicken

Trim chicken breast and slice into ⅜ by 1½ inch pieces. In a large bowl, add chicken, sesame, and canola oil and toss to coat evenly. Add salt and baking soda to chicken and oil. Mix well and refrigerate for 5 minutes. Add cornstarch and mix well until evenly coated. Refrigerate again for 20 minutes. To deep fry, heat a large pot of canola oil to 350° F. For best results, carefully check temperature of oil with a cooking thermometer. Place coated chicken pieces into oil in small batches, using a slotted spoon to keep pieces from sticking together. Once done, remove chicken pieces and place onto paper towels on a heat safe surface. Allow oil to reach 350° F again before adding more chicken for best results. Use immediately or cool completely and store in the refrigerator for later use.

Prepare dish

Gather prepared rice, sauce, and chicken. Mince garlic, then slice yellow onion, lime, and green onion. Season wok by pouring 1 tbsp. canola oil and a sprinkle of salt into the pan and use a paper towel to rub in. Remove any excess oil and salt. Heat wok to medium-high and ensure water sizzles when sprinkled on surface. Reduce heat to medium. Add 2 tbsp. canola oil to wok and swirl to coat pan. Add garlic and onion to wok and cook until lightly browned, about 30 seconds. Add chicken and toss. Season with salt and stir. Make a small well in the garlic and onion, crack egg into the well, and scramble until fully cooked, about 1 minute. Add green onion and toss for 30 seconds. Add rice and sauce. Stir fry and toss for 3 minutes — do not allow rice to become golden brown. The finished product should be dry with less sauce. Add slight char by turning heat to high for 10–20 seconds. Remove from heat immediately, plate, and garnish with cilantro and lime wedge.

Chef Jevic Acain

Regional Executive Chef
Microsoft Puget Sound

Born: Philippines
Resides: Washington State
Joined Compass Group: 2015
Formerly: Morimoto Waikiki
Lael's Restaurant, Grand Hyatt San Diego
Market Café, Lowes Coronado Bay

"When I was younger, if a dish was too plain, I would think: I don't want to be basic. But in reality, basic is the best. It brings you back to focusing on the ingredients.

Appendix C:

Equipment lists by station

The following table features the final equipment lists from the prep kitchen and each culinary concept station at One Esterra. The dining team selected these pieces in 2021 based on the options that were available at the time. In the year since, we've been encouraged by the movement of the commercial cooking equipment market.

The variety of electric appliances available today has already expanded — and we anticipate this will continue. As such, we encourage restaurants pursuing electrification to use the lists below in combination with additional, independent market research. Those utilizing these lists should also note that the kW load metrics provided for pieces of equipment are based on total connected load with no diversity or duty cycles calculated. Asterisks (*) next to kW load metrics denote two connections.

Station	Equipment	Manufacturer	kW load	Quantity
Prep kitchen	Walk-in cooler/freezer assembly	American Panel	1.92*	1
	Unit cooler (cooler)	Omni	0.37	1
	Unit cooler (freezer)	Omni	0.22	1
	Blast chiller/shock freezer (roll-in remote refrigeration)	American Panel	1.66	1
	Bun slicer	Oliver	0.82	1
	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Tilting kettle (40 gal.)	Market Forge	18.04	1
	Tilting kettle (30 gal.)	Market Forge	11.97	1
	Mobile range with oven	Jade Range	24.79	1
	Convection steamer	Market Forge	20.04	1
	Mobile combi oven (double stacked)	Blodgett	43.23*	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Mobile reach-in refrigerator	Traulsen	0.89	1
	Mixer (80 qt.)	Hobart	4.32	1

Continued on the next page

Station	Equipment	Manufacturer	kW load	Quantity
Prep kitchen	Mixer (20 qt.)	Hobart	0.96	1
	Slicer	Globe	0.3	2
	Food processor	Robot Coupe	1.44	2
	Fire suppression system	Ansul	0.24	1
	Ice maker (1,590 lbs.) (Water cooled)	Manitowoc Ice	2.5	1
	Ice machine (flake 740 lbs.) (Water cooled)	Manitowoc Ice	1.85	1
	Air dryer	Stero/Mars	4.16	1
	Food collector/scrapper	Salvajor	1.32	1
	Dishwasher with booster heater	Stero	53.37*	1
	Mobile reach-in refrigerator	Traulsen	0.59	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Fire suppression system	Ansul	0.24	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Fire suppression system	Ansul	0.24	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Water wash control cabinet	Gaylord	2.4	1
	Demand control ventilation system cabinet	Gaylord	2.4	1
	Prep kitchen total		**229.97**	**40**
Masa	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	1
	Mobile undercounter refrigerator	Traulsen	0.9	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	3
	Heated display cases	RPI	0.46	1
	Refrigerated cold pan (drop-in)	Wells Bloomfield	0.34	1
	Mobile refrigerated worktable	Larosa	1	1
	Vertical cutter mixer (45 qt.)	Hobart	10.81	1
	Corn tortilla machine	Tortilla Masters	0.24	1
	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Utility distribution system	Gaylord	144.1	1
	Mobile fryer assembly with filter	Pitco	10.57	1
	Mobile range with refrigerated base	Jade Range	11.5	1
	Mobile refrigerated equipment stand	Jade	1.51	1
	Multizone plancha	EVO	21.62	1
	Super shot countertop food steamer	Nemco	1.8	1
	Fire suppression system	Ansul	0.24	1
	Masa total		**214.44**	**18**

Station	Equipment	Manufacturer	kW load	Quantity
Pacific Rim	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Fire suppression system	Ansul	0.24	2
	Wok range	Jage Range	29.93	1
	Pasta cooker	Pitco	12.48	1
	Mobile range with refrigerated base - base and induction top	Jade Range	11.5	1
	Mobile fryer assembly with filter	Pitco	23.29	1
	Fry dump station	Carter-Hoffmann	1.81	1
	Rice cooker	Town	3.12	3
	Mobile undercounter blast chiller	American Panel	1.2	1
	Mobile refrigerated worktable	Larosa	1	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	2
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Pacific Rim total		**93.93**	**18**
Grilled	Mobile undercounter blast chiller	American Panel	1.2	1
	Mobile reach-in refrigerator	Traulsen	0.84	1
	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Rotisserie	Rotisol	23.9	1
	Mobile range with refrigerated base	Jade Range	11.5	1
	Multizone plancha	EVO	21.62	1
	Mobile refrigerated equipment stand	Jade	1.51	1
	Fry dump station	Carter-Hoffmann	1.81	1
	Mobile fryer assembly with filter	Pitco	45.73*	1
	Mobile reach-in freezer	Traulsen	1.16	1
	Heat lamp	Alto-Shaam	0.48	2
	Mobile refrigerated worktable	Larosa	1	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	3
	Grilled total		**120.21**	**18**

Station	Equipment	Manufacturer	kW load	Quantity
Diner	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Induction griddle	Cooktek	14.05	1
	Mobile refrigerated equipment stand	Jade	1.51	1
	Mobile refrigerated equipment stand	Jade	1.51	2
	Cheesemelter (wall mounted)	Lang Manufacturing	3.6	1
	Induction griddle	Cooktek	14.05	1
	Mobile range with refrigerated base	Jade Range	11.5	1
	Mobile fryer assembly with filter	Pitco	23.29	1
	Fry dump station	Carter-Hoffmann	1.81	1
	Waffle maker	Krampouz	2.6	1
	Toaster	Antunes	3.29	1
	Egg machine	Antunes	3.12	1
	Mobile undercounter refrigerator	Traulsen	0.9	1
	Soup warmer (drop-in)	Cooktek	0.84	2
	Mobile refrigerated worktable	Larosa	1	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	4.53	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Mobile undercounter freezer	Traulsen	0.96	1
	Diner total		**94.25**	**22**
Deli	Mobile undercounter refrigerator	Traulsen	0.74	1
	Heated merchandiser	RPI	5.97	1
	Mobile reach-in refrigerator	True	0.26	1
	Hot and cold display cases	RPI	4.53	1
	Electromechanical dual heat dough press	Doughxpress	3.12	1
	Convection/microwave oven	Turbochef	6.2	1
	Super shot countertop food steamer	Nemco	1.8	1
	Mobile undercounter refrigerator	Traulsen	0.9	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	4.53	1
	Hot carving station	Alto-Shaam	0.76	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	1
	Mobile hot holding cabinet	Alto-Shaam	1.08	1
	Deli total		**31.99**	**19**
Internationalist	Mobile undercounter blast chiller	American Panel	1.2	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Mobile hot food holding cabinet	Traulsen	3.22	1
	Mobile reach-in refrigerator	Traulsen	0.98	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	2
	Mobile hot holding cabinet	Alto-Shaam	1.08	1
	Hot carving station	Alto-Shaam	0.76	1
	Internationalist total		**13.01**	**9**

Station	Equipment	Manufacturer	kW load	Quantity
VegTable	Mobile refrigerated equipment stand	Jade	1.51	1
	Induction griddle	Cooktek	16.21	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	1
	Mobile refrigerated worktable	Larosa	1	1
	Mobile undercounter refrigerator	Traulsen	0.9	2
	Mobile undercounter freezer	Traulsen	0.96	1
	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Fry dump station	Carter-Hoffmann	1.81	1
	Mobile fryer assembly with filter	Pitco	23.29	1
	Mobile range with refrigerated base	Jade Range	11.5	1
	Fire suppression system	Ansul	0.24	1
	Vegtable total		**66.78**	**15**
Greens	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Soup warmer (drop-in)	Cooktek	0.84	2
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	4.53	2
	Refrigerated cold pan (drop-in)	Hussmann Refrigerated Service	0.37	2
	Mobile undercounter refrigerator	Traulsen	0.9	2
	Greens total		**8.74**	**10**
Eat Local	Mobile combi oven (double stacked)	Blodgett	43.2*	1
	Mobile range with refrigerated base	Jade Range	11.5	1
	Exhaust hood with make-up air (type i)	Gaylord	3.6*	1
	Mobile refrigerated equipment stand	Jade	1.51	1
	Induction griddle	Cooktek	14.05	1
	Mobile undercounter freezer	Traulsen	0.96	1
	Fry dump station	Carter-Hoffmann	1.81	1
	Mobile fryer assembly with filter	Pitco	23.29	1
	Mobile hot holding cabinet	Carter Hoffmann	2.1	2
	Mobile refrigerated worktable	Larosa	1	1
	Refrigerated hot/cold pan (drop-in) operation	Wells Bloomfield	3.67	1
	Mobile undercounter refrigerator	Traulsen	0.96	1
	Mobile reach-in refrigerator	Traulsen	0.89	1
	Mobile undercounter blast chiller	American Panel	1.2	1
	Mobile reach-in freezer	Traulsen	1.34	1
	Undercounter dishmachine	Hobart	8.61	1
	Eat Local total		**119.71**	**18**