Business & Technology Strategies

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C&I CASE STUDIES IN **BENEFICIAL ELECTRIFICATION**

Commercial Cooking

Great River Energy and Connexus Energy

BY **TOM TATE**, NOVEMBER 2017

SUBJECT MATTER EXPERT FOR QUESTIONS ON THIS TOPIC

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INTRODUCTION

The wise use of electricity, *Beneficial Electrification*, has sparked widespread re-thinking of policies that encourage or mandate less electricity use across the board. Advancements in electric technologies continue to create new opportunities to use electricity as a substitute for on-site fossil fuels like natural gas, propane, gasoline and fuel oil, with increased efficiency and control while also meeting environmental goals. It also offers local economic development opportunities and enhances the quality of the product used by the customer.

Electrifying industrial and commercial processes is a proven method to help local businesses stay competitive. Beneficial electrification strengthens the cooperative presence in the community and offers benefits to the electric system. Working with C&I customers is a good place to start since their usage, and thus interest in costs savings and efficiency, tends to be higher. To provide examples of various approaches to working with C&I customers on beneficial electrification initiatives, NRECA is developing a **series of case studies**.

NRECA America's Electric Cooperatives

MEMBER PROFILE

Great River Energy (GRE) of Maple Grove, Minn. is a not-for-profit cooperative that provides wholesale electric service to 28 distribution cooperatives in Minnesota and parts of Wisconsin. Those member cooperatives distribute electricity to approximately 685,000 member consumers. With $4 billion in assets, Great River Energy is the second largest electric power supplier in Minnesota and one of the largest generation and transmission cooperatives in the United States. Learn more at **www.greatriverenergy.com**.

Connexus Energy is the largest customer-owned electric distribution utility in Minnesota providing electricity and related products and services to approximately 130,000 homes and businesses in portions of Anoka, Chisago, Hennepin, Isanti, Ramsey, Sherburne, and Washington counties. Additional information about Connexus Energy is available online at **www.connexusenergy.com**.

DESCRIPTION OF PROBLEM/OPPORTUNITY

Background

Building load in an environment of mandated load reduction and an emphasis on increasing the percentage of renewable resources in the fuel mix may seem like a daunting, if not impossible, task. However, beneficial electrification allows cooperatives to build load while also delivering significant benefits to members — a win-win solution for every stakeholder. Implementation of beneficial electrification programs can have substantial beneficial impacts in:

- Reducing Greenhouse Gas (GhG) emissions
- Providing operational savings for members
- Improving the health and safety of members' employees
- Helping members achieve corporate green energy/efficiency goals

Facing just such a challenging environment, Great River Energy (GRE) decided to find ways of equipping their members with the programs and tools to pursue beneficial electrification to benefit the members, the co-op, and the environment.

Beneficial electrification is the process of replacing a fossil-fueled technology with a more efficient, electric alternative. The case can be made that the entire cooperative movement is built upon beneficial electrification of a different type, replacing manual, labor-intensive processes with electric powered alternatives. So, the concept is part of the co-op DNA.

For load growth, co-ops need to take over market share currently served by on-site fossil fuel technologies, especially those using propane, diesel, and gasoline. With the current abundant supply and low costs of natural gas, displacing that fuel is far more difficult to justify financially to a member.

The Commercial Cooking Market

The commercial cooking market can be loosely defined as any cooking operation outside a residence that is subject to regulation and routine inspections. This broad classification encompasses everything from a church kitchen to a five star restaurant to a school cafeteria.[1] (See **Figures 1** and **2** as examples.) Another key distinguishing feature is the size and scale of the equipment involved compared to residential

[1] See sidebar **"The Public School Cafeteria Opportunity"** for a more in-depth look at this important cooperative opportunity beginning on page 13.

kitchens. Most familiar will be the massive ranges, cook tops, and refrigeration, along with extensive venting capabilities.

FACTS AT A GLANCE

- **$799 billion:** Restaurant industry sales.
- **1 million+:** Restaurant locations in the United States.
- **14.7 million:** Restaurant industry employees.
- **1.6 million:** New restaurant jobs created by the year 2027.
- **10%:** Restaurant workforce as part of the overall U.S. workforce.
- **9 in 10:** Restaurant managers who started at entry level.
- **8 in 10:** Restaurant owners who started their industry careers in entry-level positions.
- **9 in 10:** Restaurants with fewer than 50 employees.
- **7 in 10:** Restaurants that are single-unit operations.

Source: National Restaurant Association 2017 Statistics:
http://www.restaurant.org/News-Research/Research/Facts-at-a-Glance

State specific statistics can be found here:
http://www.restaurant.org/News-Research/Research/State-Statistics

As reflected in the sidebar "Facts at a Glance," the commercial cooking market is very significant, accounting for nearly $800 billion in sales and employing 10 percent of the U.S. workforce.

According to the EPA, these facilities typically use 2.5 times more energy per square foot than other commercial operations. This consumption rate is due in large part to the extremely low efficiency of the equipment being used, often as low as 50 percent.

This poor efficiency level is driving the development of Energy Star[2] ratings for commercial cooking equipment and new control technologies that limit or turn off equipment to reduce energy use when cooking activities are not underway. A good example is a system that monitors cooking combustion products (e.g., smoke and grease) and throttles variable speed ventilation fans up, down, or off, depending upon the situation. Another is induction cooktops that only heat when a cooking pan is present.

Cooking equipment tends to have an extremely long life cycle and there is a large market for used equipment, so penetrating this market

FIGURE 1: Community Kitchen

FIGURE 2: Commercial-Scale Kitchen

[2] https://www.energystar.gov/products/commercial_food_service_equipment

segment takes diligence and a good sense of timing. There will be more on this later in this report.

Finally, where natural gas is readily available, natural gas cooking equipment dominates the market. In meeting with commercial cooking equipment dealers in the Twin Cities market, the author was told that 95 percent of what they sell is natural gas. During these meetings, there was also an obvious preference for gas because those appliances are frequently less expensive, which makes the selling process easier. These factors play heavily in the recommended approaches to the market.

DESCRIPTION OF THE TECHNOLOGY APPLICATION

The combination of technological advances and growing competitiveness of electricity with on-site fossil fuel sources is breathing new life into existing cooking solutions (e.g., induction cooktops, temperature holding cabinets, etc.), bringing overlooked solutions into the mainstream (e.g., sous-vide cooking), and introducing new solutions (e.g., variable speed exhaust, multi-units).

Below are the primary contributors to the growing benefits of electrifying commercial cooking operations with descriptions of each following:

- Commercial induction cook tops
- Multi-use equipment
- Finished food temperature maintenance
- Sous-vide cooking
- Variable speed exhaust

Throughout, these new technologies frequently have the additional benefits of reducing prepartion time, food waste, and time to table for customers.

Commercial Induction Cooktops

This technology has been around since 1933 when it was introduced at the Chicago World Fair.[3] Introduced again in 1950, serious developments did not begin until the 1970s. While it did not gain traction in the U.S., Europe and Asia continued development, as did NASA for their needs.

Today, microprocessor control has greatly improved the functionality and precision of this alternative to traditional fossil fuel and electric burner cooktops. The primary benefits of induction cooktops include:

- **Only on when cooking is underway.** This reduces the heat in the kitchen while improving energy efficiency and reducing exhaust ventilation requirements.
- **Rapidly reaches required temperature,** reducing preparation time.
- **Extremely precise temperature control.** Digital technology allows for setting and holding precise temperatures, whether simmer or boil, in a way that is just not possible with fossil fuel alternatives.
- **Only the surface under the cooking pan is hot.** The rest of the surface is cool improving safety and further reducing kitchen heat.
- **Readily adapts** to different size cooking pots and pans.
- **Comes in a wide range of sizes** from single "eye" countertop units to range size units.

Multi-Use Equipment

These appliances most frequently combine steam and convection cooking capabilities, and go by a variety of names including: combi-steamers, hot-air steamers, combination steam-convection ovens, or simply combi-ovens[4] (see **Figure 3**).

[3] http://www.nicecook.in/facts-about-induction-cookers/induction-cooker-history
https://en.wikipedia.org/wiki/Induction_cooking

[4] https://en.wikipedia.org/wiki/Combi_steamer

FIGURE 3: The Vulcan ABC7E Combi-oven

FIGURE 4: Vulcan ABC7E Controls

The genius of combi-ovens is that they can replace about half of traditional commercial cooking appliances.

These appliances allow the steaming of vegetables while simultaneously brazing or roasting meat and poultry. The genius of these appliances is that they can replace about half of traditional commercial cooking appliances, such as dedicated convection ovens, microwaves, cook tops, and even grills, depending upon the menu.

By replacing the other appliances, combi-ovens free up valuable kitchen space. Further, with their smaller footprint, it is easier to fit them under existing ventilation hoods (if required) or even downsize the hoods. Many are being offered with simplified controls, which reduce employee training requirements and facilitates precise, repeatable control of the finished product (see Figure 4). Vulcan has introduced a combi-oven simulator in aim of demonstrating how easy they are to use.[5]

According to an article in the *Green Hotelier*,[6] these appliances can reduce energy use by as much as 50 percent through faster cooking times, use of sophisticated controls, and better insulation. The article also cites some models as using exhaust heat to preheat water used for steam.

Finished Food Temperature Maintenance

A common sight in convenience stores is the heated holding cabinet for cooked food. These are generally all glass to allow customers to see the selections clearly and are designed to maintain the proper serving temperature without letting the selections become unappealing to purchasers. Models with less glass are also used in the kitchen areas for a variety of other purposes, including (as defined by the EPA):[7]

- **Hot food holding cabinets** — maintain prepared food at a preset temperature.
- **Warming drawers** — maintain prepared food at a preset temperature.
- **Cook and hold** — an appliance that is used to cook the food and then hold it at a preset temperature.
- **Proofing Cabinet** — an enclosed mobile, portable, or stationary appliance designed to maintain the proper temperature and relative humidity for supporting fermentation of dough products by yeast.

Sous-Vide Cooking

A rising star in new electric kitchen technology is the hot water immersion cooker where food,

[5] http://www.vulcanequipment.com/products/combi/simulator

[6] http://www.greenhotelier.org/our-themes/energy-efficiency-in-the-kitchen

[7] https://www.energystar.gov/sites/default/files/specs/private/Commercial_HFHC_Program_Requirements_2.0.pdf

typically meat and fish, is placed in sealed plastic bags and cooked to a specific temperabelow that of the final serving temperature. Termed *sous-vide*, it offers commercial kitchens a great degree of control and repeatability over the temperature and quality of the food.

According to a webstaurantstore.com (an online commercial kitchen equipment seller) article and several other websites,[8] sous-vide offers the following benefits:

- Cooking sous-vide results in evenly-cooked meat and fish.
- Cooking sous-vide gives you specific control over the final temperature of the meat, avoiding overdone, dried-out food.
- You can hold foods cooked sous-vide at their specified temperature for long periods of time without damaging the texture or quality of the dish.
- Sous-vide cooking is by nature a repeatable process. Set the temperature, set the timer, and walk away. You will wind up with perfectly cooked food every time you do it.
- Sous-vide produces a more nutritious product, as vitamins and nutrients lost to steam and cooking liquids with normal methods are retained.
- Lower cooking temperatures retain delicate fats that are typically converted to cooking liquids, improving taste and texture.
- Improved food safety and health.

On the down side, this method takes a bit longer and requires finishing on a grill to impart the finished look, texture, and additional flavoring (such as charring on steaks) that customers expect. However, the longer preparation time works perfectly for commercial kitchens, as they can start meal preparation based on expected volume before opening for business.

FIGURE 5: Kitchen in a Poorly Designed Area

Variable Speed Exhaust

Commercial kitchens are under continuous scrutiny by a number of regulatory groups for indoor air quality and health/fire/safety issues. Properly engineered and constructed commercial kitchens today are likely to feature variable speed ventilation systems in hoods with controls to regulate their on and off state based on user-defined characteristics, including shutting down when no food is being prepared.

Unfortunately, commercial kitchens are quite often built in spaces not originally designed for that purpose. There may be an inadequate make-up air supply, hoods may be incorrectly sized, and efficiency controls are generally nonexistent (see Figure 5 as example).

[8] https://www.webstaurantstore.com/article/97/sous-vide-cooking.html
https://www.sousvidesupreme.com/en-uk/benefits.htm
http://sousvidereviews.com/2015/03/27/the-health-benefits-of-sous-vide-cooking
https://www.quora.com/What-are-the-advantages-of-sous-vide-cooking

Depending upon the jurisdiction having authority, there is likely pressure to have every preparation appliance under a hood. With the large footprint of traditional appliances, this is a challenge. Even where adequate space is available to meet this requirement, the energy consumption and maintenance of these hoods poses challenges and costs.

According to the Uniform Mechanical Code:

> *Hoods shall be installed at or above all commercial-type deep fat fryers, broilers, fry grills, steam-jacketed kettles, hot-top ranges, ovens, barbecues, rotisseries, dishwashing machines and similar equipment which produce comparable amounts of steam, smoke, grease or heat in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include any building or portion thereof used for the processing of food but shall not include a dwelling unit.*
>
> *This section shall not apply to cooking equipment when such equipment has been submitted to the department for evaluation, and it has found that the equipment does not produce toxic gases, smoke, grease, vapors, or heat when operated under conditions recommended by the manufacturer. The department may recognize a testing organization to perform any necessary evaluations.*

Another advancement in the ventilation arena is the introduction of demand control ventilation (DCV) to commercial cooking applications, now dubbed *demand control kitchen ventilation* (DCKV) by the EPA.[9] DCKV is an energy efficiency measure that uses sensors and variable speed fans to match the exhaust operation to the amount of cooking underway. According to an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)[10] article:

> *The current NFPA-96 Standard and International Mechanical Code require that a hood operate at full design airflows whenever full-load cooking activity occurs underneath an exhaust hood.*

Existing systems may only provide for two stages of exhaust operation or simply offer an always on option. This is a real energy hog and also significantly increases the noise levels in commercial kitchens. DCKV systems recognize when the amount of cooking drops and throttle the exhaust system back to match the exhaust operation with the effluent and temperatures at the cooking station. An excellent report by Southern California Edison[11] provides a detailed look into this aspect of commercial cooking operation featuring the results of tests at five sites.

Additional design guidance is available in an earlier ASHRAE document[12] made available by a vendor of air cleaning equipment. ASHRAE members can access additional information by logging in to the ASHRAE website.

The exact combination of benefits from electric commercial cooking equipment will vary with the specific needs and situation of each member-consumer.

HOW DOES THE COMMERCIAL/INDUSTRIAL CUSTOMER BENEFIT?

As with the application of any technology, the exact combination of benefits will vary with the specific needs and situation of each member-consumer. Saying that, when a member invests in electric alternatives for commercial cooking,

[9] https://www.energystar.gov/about/2015-emerging-technology-award-demand-control-kitchen-ventilation

[10] https://www.ashrae.org/resources--publications/periodicals/ashrae-journal/features/demand-controlled-ventilation-for-commercial-kitchens

[11] http://www.etcc-ca.com/sites/default/files/OLD/images/stories/et_07_10_dcv_com_kitch_hoods_final_report.pdf

[12] http://www.berriman-usa.com/pdf_brochures/commercial_kitchen_hood_design_guide_1_031504.pdf

Beneficial Electrification of commercial cooking equipment supports member satisfaction through energy savings and increasing quality and consistency of product served, while also ensuring long-term load for the cooperative.

the benefits can be classified into the following areas:

- Precise and repeatable temperature control, which helps provide a consistent, acceptable quality product for the customer and reduces food waste.
- Multipurpose appliances reduce space requirements in the food preparation area and free more space for customer service, resulting in increased revenue.
- Maintain serving temperatures and food quality on made-ahead items, which again gives the customer a better quality product, reduces waste, and encourages repeat visits.
- Shorter cooking/preparation times, which allow the restaurant to turn their tables faster, increasing revenue.
- Hot water baths do the bulk of the cooking and then staff finish the preparation on traditional appliances. As with other benefits, quality is increased, food waste reduced, and customer satisfaction is increased.
- Depending upon the appliance, reduced smoke and air borne particulates, resulting in lower ventilation requirements.
- Reduced contributions to poor indoor air quality, an especially important benefit in offices, schools, and other community-oriented facilities.
- Reductions in smoke and grease, and a corresponding reduction in the danger of kitchen fires and a reduction in maintenance on hoods and filters.
- Reduced energy consumption, which lowers operating costs and increases operating revenue.

HOW DOES THE COOPERATIVE BENEFIT?

Cooperatives that engage their members in this segment will benefit from increased, persistent loads where electric alternatives replace fossil fuel commercial cooking equipment. As noted earlier, commercial cooking equipment has a very long life span, on average 10 but as high as 25 years in many situations.[13,14] So, while the individual appliance may not offer a large increase in load, it is a load that will continue for many years.

The second key benefit comes from increasing member satisfaction. By engaging the member in efforts to reduce the energy costs of running their commercial cooking operation, while increasing quality and consistency of the product served, the cooperative helps the member increase the satisfaction of their customers.

Here is an equation the cooperative and member alike can appreciate:

Higher product quality + energy savings + operating savings = prosperous commercial cooking member that will be on the lines for years.

WHAT ARE THE EXPECTED REDUCTIONS IN FOSSIL FUEL USE AND COST AND SUBSEQUENT GHG REDUCTIONS?

Outside of major cities and towns, natural gas is often not available. In these areas, propane is going to be the fossil fuel displaced. Because of the widely varying types of commercial equipment, it is difficult to calculate a broad estimate of GhG reduction.

Fortunately, there are methods to calculate the reductions in specific situations. The first comes in the form of conversion calculators that a number of commercial cooking appliance manufacturers offer on their websites. An example can be found on the Vulcan website.[15]

[13] https://chdexpert.wordpress.com/tag/foodservice-equipment

[14] http://www.theclimatetech.com/commercial-kitchen-equipment-average-lifespan

[15] http://www.vulcanequipment.com/products/combi click on Resources then select a calculator

The second is to use the EPA's baseline calculation of the amount of GhG in an 18 pound propane cylinder. If the amount of propane consumed by the appliance is known or can be determined, the reduction in GhG can be calculated. Here is the formula from the EPA website:[16]

18 pounds propane/1 cylinder ×
0.817 pounds C/pound propane ×
0.4536 kilograms/pound × 44 kg CO2/12 kg C ×
1 metric ton/1,000 kg
*= **0.024 metric tons CO2/cylinder***

PROGRAM PERFORMANCE FOR GRE AND ITS MEMBER COOPERATIVES

Close cooperation with members is key to collect the necessary data to make accurate estimates of the benefits of the conversion.

GRE included the commercial cooking segment in their beneficial electrification program development primarily because these products were recognized in the Minnesota Technical Reference Manual[17] (MTRM), the products had calculable energy savings associated with them, and they were included in the ENERGY STAR Program. The ENERGY STAR certification was especially important because it is well recognized by commercial (and residential) consumers.

Products selected to be included in the program are basically those that are found in the MTRM and those that could be shown to have calculatable energy and other beneficial savings. Audits of the facility implementing upgrades are not required aside from demonstrating proof of purchase.

In the first two years of the program, GRE cooperatives have had two members take advantage of the program and its rebates. The equipment involved included: an electric range with convection oven, hot food holding cabinets, and an electric fryer.

GRE feels the rather slow uptake on the program is due to its newness and the effect of the pre-owned equipment marketplace on purchase decisions. They are currently working to develop an understanding of how the pre-owned option affects the decision making process and investigating ways to incorporate pre-owned equipment into the program. This is a strategy that has not been used in other programs.

WHAT CHALLENGES DID THE CONVERSION POSE?

Assessing challenges and performance requires close cooperation with the member to collect the necessary data to make an accurate estimate of the benefits to the conversion. When it comes to associated costs, there are a number of factors that need to be addressed and emphasized with the member to avoid unpleasant "surprises" either during or following the conversion.

Characteristic of all beneficial electrification efforts is the fact that the member's electric bill will increase. While the total impact of the conversion should yield substantial offsetting benefits to the member, the electric bill is singularly visible and the increase needs to be communicated before, during, and after the conversion to reinforce the benefits gained.

Second, care must be taken to determine how the member operates. For example, if a cooperative has time-of-use rates, is there a potential for major food preparation activities to coincide with times of peak electric demand and lead to a massive bill for the member? Understanding how the member operates the new equipment provides an opportunity to get creative with rate design, developing one that maximizes the benefit to both the co-op and the member.

Third, is the existing electric infrastructure serving the member capable of handling the increased load represented by the new equipment? For instance, some equipment may require or benefit from three phase service.

[16] https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

[17] https://mn.gov/commerce/industries/energy/utilities/cip/technical-reference-manual

Because commercial cooking equipment is typically replaced incrementally unless the project is a total renovation or new construction, the contribution from the new load must be matched against the costs incurred by the co-op to improve facilities. This allows management to make the best decision for the co-op as a whole.

Fourth, the life of commercial cooking equipment varies widely, from 5 to 25 years depending upon usage and maintenance. A working average is 10 years. As a result, once purchased, it will be a long time before equipment is replaced. It is important for the cooperative to develop the necessary relationships with members, so it can be part of future replacement decisions.

Aside from these more tangible potential issues are the less tangible:

- Preconceived notions regarding electric versus fossil fuel performance
- Decision makers being entrenched in old methods of cooking
- Existing relationships with equipment suppliers who prefer fossil fuel
- Lack of budget to move the project forward
- No local decision-making authority (e.g. chain restaurants)

Fortunately, most of these less tangible issues can be overcome during the sales cycle and with the use of accurate and compelling data documenting the benefits to the member.

HOW DID THE CO-OP MAKE THE SALE?

Connexus attributes their successes implementing the program to having a robust key account management program with the commercial members in their territories. This program has allowed the account managers to develop strong relationships of trust with their assigned members.

Using this base of trust, the account managers are positioned to collect the data necessary to provide an accurate assessment of the bottom line benefits the member can expect. That data includes having an understanding of the member's:

- Operational goals
- Financial goals
- Issues with current commercial cooking equipment and the output including:
  - Inconsistent product,
  - Food waste,
  - Unacceptable preparation times, and
  - Customer dissatisfaction with product.
- Corporate goals concerning reduction of GhG and increasing energy efficiency
- Other intangible factors noted in the preceding section

In addition to direct efforts with commercial kitchen members, cooperatives should build relationships with the local restaurant equipment vendors. The account managers can take advantage of the resources of these organizations to support the determination and validation of the benefits the member can expect from converting to electric alternatives.

Having these relationships is important, as it extends the capabilities of the co-op, bringing in the people with the detailed understanding of the performance benefits delivered by the electric cooking options. And, since nearly all manufacturers offer both electric and fossil fueled equipment, these trade allies are likely to be objective in their support. They get a sale regardless of which fuel source is used.

Some of these trade allies also offer kitchen design services, which can be very important when identifying how new electric equipment

Timing is an essential element of a commercial cooking program.

might free space and reduce a range of operating and environmental issues.

Many chain operations will have equipment decisions made at a central location. For regional or franchise operations, the office could be nearby. For national chains, the decision makers might be several states away. (See **Appendix A** for a Decision Maker Location Matrix). When it is possible to interact directly with the decision makers who specify the cooking equipment, the opportunities to integrate electric alternatives into standard designs grow and simplify local sales.

Working with trade allies is a proven method of extending the capabilities and effectiveness of the co-op's own promotional efforts, but a word of caution is warranted. These trade allies are in business to make the sale. If it is a bid situation, if there are fossil fuel alternatives in specifications, or if the ally feels the sale will be lost if they promote electric options, they are likely to go with the fossil fuel alternative.

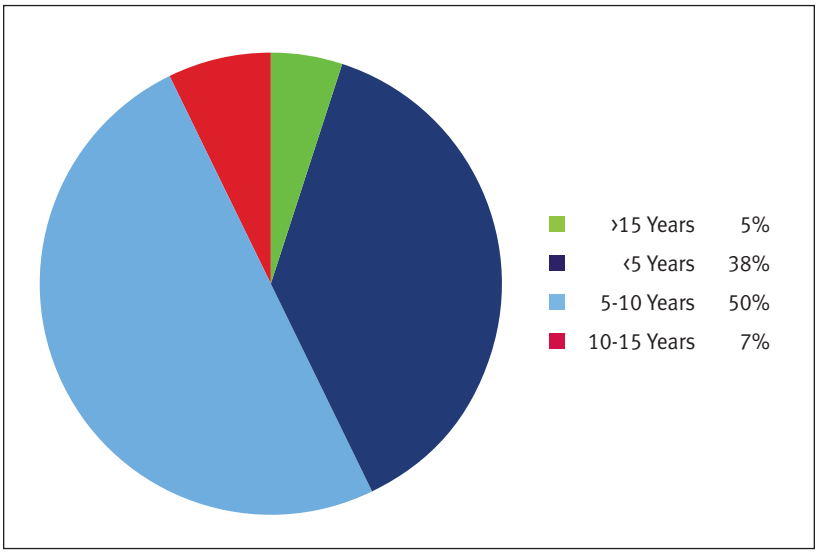

FIGURE 6: Duration of Restaurants in Business (CHD-Expert Opportunity Data)

The co-op's incentive is also an important part of the sale. While incentives represent a fairly small percentage of the total cost of the electric alternative, it demonstrates the commitment of the co-op to the member beyond the direct impact the financial returns of the conversion.

WERE THERE LESSONS LEARNED AND HAVE THERE BEEN ANY NEW DEVELOPMENTS SINCE THE DEPLOYMENT?

The lessons learned are simple:

- It is not enough to just make the sale. The co-op needs to communicate regularly once the conversion has occurred, so that the member does not encounter pushback from others in the organization over the increase in the electric bill — particularly if those pushing back were not part of the conversion effort.
- Remain engaged with the member over the long term, so at the end of life for the equipment the member buys electric again.
- Be flexible in providing rebates for situations where a member replaces existing electric cooking equipment. While it might be considered a free rider, retention of the load is important.
- Get ahead of the specification and replacement process by developing appropriate trade-ally relationships.

WHAT DO COOPERATIVES NEED TO KNOW ABOUT IT?

Timing is an essential element of a commercial cooking program. According to **CHD-Expert,** the source of the 10-year average life data point, 88 percent of restaurants have been in business for less than 10 years and 38 percent for less than 5 (see Figure 6). Neither of these two categories is likely to be interested in equipment changes.

That leaves a 12 percent share most likely to be in the market for replacement commercial cooking equipment.

When it comes to impacting new construction, **restaurantdata.com** reports that a new facility opens every nine minutes. With that pace of new openings, it is doubly important to develop the trade ally and centralized decision-maker relationship, so proper consideration is given to electric options.

The first thing the co-op needs to do is to determine the extent of any opportunity and to create the underpinnings of an effective program offering. In the case of GRE's program, GRE managed the concept with Minnesota State Regulators and also the development of program implementation materials used by participating member co-ops like Connexus Energy.

The distribution co-op needs to make its own assessment of the opportunity:

1) List the restaurants that have been members for at least 10 years.
2) Work with trade allies to determine the local trends in equipment replacements; take the electric equivalent and estimate the size of the potential load available for conversion or retention.
3) Is the cooperative willing/able to offer a rebate? An example of the rebates offered by Connexus Energy in Minnesota is provided in **Appendix B.** This is provided for informational purposes only. Each co-op will develop rebates in accordance with any regulatory guidelines and the financial value of the program.
4) Are there any regulatory hurdles and if so, how likely are they to be resolved? How long will it take to resolve them?

The next two items are not necessarily deal breakers for program participation, but should be considered as beneficial in terms of creating the maximum value for both program participants and the co-op:

5) Does your co-op have attractive off-peak or other rates that would be especially useful for this new load? Can these types of rates be developed?
6) If environmental benefits are a major driver, can you tie the new load to the renewable component of your fuel mix?

After confirming an opportunity and clearing any regulatory and rate hurdles, it is time to design the program specifics. What kind of equipment qualifies, how are rebates applied for, and what rebate amounts are going to be offered? Rebate forms and internal processes to manage the verification of compliance and subsequent payment of earned rebates are also needed, along with a plan to communicate the program with appropriate members. ■

THE PUBLIC SCHOOL CAFETERIA OPPORTUNITY

The Issues Confronting Our Public Schools and the Opportunity for Beneficial Electrification

The news is full of stories of the numerous challenges public school systems in the United States are facing. According to an article by the **Public School Review**, updated on June 22, 2017, the top 10 challenges include funding, technology, bullying, and student health.

Within those challenges lies an opportunity for beneficial electrification when it comes to commercial cooking equipment: student health and the focus on reduction of childhood obesity. As you might expect, this focus includes an emphasis on healthy meals.

A report by the **Pew Charitable Trust** published in 2015 goes deeper into the nutritional issues facing schools. This report lists five areas requiring attention:

1. Reauthorization of the Child Nutrition Act
2. Local wellness policies
3. Nutrition standards for child care centers
4. Additional support for schools
5. Standards for school food service professionals

It is issue number 4 that reflects the opportunity for beneficial electrification within public school kitchens. The article goes into a bit more detail.

> *'Schools need resources such as **updated kitchen equipment**, staff training, and technical assistance to serve healthy meals and snacks. Last year, the federal government took steps to help address schools' needs, which will continue into 2015. Among these efforts:*
>
> - *Congress passed a budget for fiscal year 2015 that includes $25 million for schools to purchase kitchen equipment. This funding builds on the $35 million appropriated and distributed to states for school food service grants in the past two years.*
> - *USDA launched the Team Up for Success pilot training initiative to identify challenges and to provide resources to promote a healthier school day. Through the initiative, schools addressed unique obstacles by participating in a training workshop followed by peer-to-peer mentoring; they will continue receiving assistance this year. The results of the pilot will help to inform future efforts to potentially expand the initiative.'*

Clicking on the link "updated kitchen equipment" takes you to another Pew landing page with a variety of supporting articles. At the bottom of this page is a link to an article specifically focused on rural public schools, **Rural School Districts Need Kitchen Upgrades**. While the focus is largely on manual tools of the cooking trade, the need for greater efficiency, better ventilation, less waste, and better food safety can be seen. All of these can be resolved to the benefit of the schools, their pupils, and taxpayers alike by using the electric alternatives noted in the full report.

Cooperatives should take advantage of these challenges facing the public school systems in

Continued

THE PUBLIC SCHOOL CAFETERIA OPPORTUNITY (CONT.)

their service areas by working collaboratively to introduce the benefits of electric alternatives and support efforts of school systems to access Federal funding where it is available.

The Pricing Challenge

As Table 1 illustrates, the challenge to public school food service operations is huge when the prices they are allowed to charge are as low as those shown. Factor in free and reduced price students and the challenge grows. It is clear that issues of reducing waste and cost of production can go a long way to helping all school districts address this challenge.

TABLE 1: Average Meal Prices FY 2015-2016

School Type	Lunch	Breakfast
Elementary	$2.34	$1.39
Middle	$2.54	$1.47
High	$2.60	$1.51

Additional Meal Prices and Reimbursement Information

- School Meal Trends and Stats
- Pearl, MS 2017-2018 Handbook, prices on page 30
- Gwinnet County, GA meal prices

APPENDIX A: DECISION MAKER LOCATION MATRIX

Given the nature of restaurant and commercial cooking facility ownership, the decision makers can be located outside the cooperative's service area. The following table illustrates this situation with a partial listing of commercial cooking opportunities.

TABLE: Location of decision makers by business type

Business Type	Decision Maker
Church/Community facility (VFW, municipality owned, etc.)	Local
Standalone restaurant	Local
Chain fast food — franchised	Local/Regional
Chain fast food — corporate ownership	National
Chain restaurant — franchised	Local/Regional
Chain restaurant — corporate ownership	National
Standalone resort (including golf courses)	Local
Chain resort (including golf courses)	National
Convenience store — franchised	Local/Regional
Convenience store — corporate ownership	National
Hospitals	All
Senior housing	All
Sports facilities – college, pro, minor league	Local
Education – all levels	Local
Commercial/Industrial operations	All

APPENDIX B: EXAMPLE OF CONNEXUS ENERGY REBATE APPLICATION

Commercial Kitchen 2017 Rebate Application

CONNEXUS ENERGY
Your Community Energy Partner

Business name _____

Commercial Kitchen – ENERGY STAR Ovens & Cooktops

Efficient Equipment – Energy Star	Manufacturer	Model #	Operating Days/Year	Qty	Rebate/Unit	Rebate
Efficient Range w/Convection Oven (full size)					$1,500.00	$
Flashbake Oven					$225.00	$
Convection / Microwave Oven					$200.00	$
Electric Griddle					$400.00	
Induction Cooktop					$1,000.00	$
					**Project Cost	$
					Total Rebate	$

Commercial Kitchen – ENERGY STAR Hot Food Holding Cabinets

Hot Food Holding Cabinets Eligible Equipment		Manufacturer	Model #	Operating Days/Year	Qty	Rebate/Unit	Rebate
Size	Volume (ft^3)						
Full-Size	20					$290.00	
3/4-Size	12					$250.00	$
1/2-Size	8					$150.00	$
						**Project Cost	$
						Total Rebate	$

Commercial Kitchen – ENERGY STAR Hot Food Electric Fryers

Electric Fryers - Standard & Large Vat	Manufacturer	Model #	Operating Days/Year	Qty	Rebate/Unit	Rebate
Standard Open Deep					$300.00	$
Large Vat Open Deep					$300.00	$
					**Project Cost	$
					Total Rebate	$

Commercial Kitchen – ENERGY STAR Electric Steamers

Electric Steamers - Type	Manufacturer	Model #	Operating Days/Year	Unit Qty	Pan Qty	Rebate/ Pan	Rebate
3 & 4 Pan Steamers						$100.00	$
5 & 6 Pan Steamers						$100.00	$
						**Project Cost	$
						Total Rebate	$

**Required Information. Must enter total project cost to determine rebate.
Rebate must comply with all program specific rules and qualifications.

**Total Equipment Cost	$
Total Rebate	$

_____ Connexus Energy Representative

_____ Date

About the Author

Tom Tate has been in the electric utility world for 25 years, working in various capacities for both IOU and cooperative operations and is well versed in the municipal business model. With experience in every member service, marketing, and sales management role, Tom discovered a passion and talent for writing about technology in a manner that makes complex concepts easily understandable for members and customers. Today, he runs his own freelance writing company and provides content for a number of cooperative and industry operations from his adopted home of Minneapolis, MN.

Questions or Comments

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- Business and Technology Strategies **feedback line**.
- To find more *TechSurveillance* articles on business and technology issues for cooperatives, please visit our **website archive**.

BUSINESS AND TECHNOLOGY STRATEGIES
DISTRIBUTED ENERGY RESOURCES WORK GROUP

The Distributed Energy Resources (DER) Work Group, part of NRECA's **Business and Technology Strategies** department, dentifying the opportunities and challenges presented by the continued evolution of distributed generation, energy storage, energy efficiency and demand response resources. For more information, please visit **www.cooperative.com**, and for the current work by the Business and Technology Strategies department of NRECA, please see our **Portfolio**.