# Introduction

The first draft of Olympia's Commercial Reach Code included provisions that mandated all- and mostly-electric buildings in Olympia. However, recent legal developments have impacted the ability of local jurisdictions to require building electrification through building codes. The City of Berkeley was one of the vanguard jurisdictions in mandating electrification in new buildings. It's "gas ban" survived an initial court challenge, but that decision was reversed by the Ninth Circuit Court of Appeals in favor of the California Restaurant Association which had challenged the Berkeley restriction on grounds that it violated the federal Energy Policy and Conservation Act (EPCA). The Ninth Circuit recently denied a petition to re-hear the case, effectively prohibiting jurisdictions from using their building code to require building electrification.

An earlier version of the 2021 Washington State Energy Code (WSEC) included mandates for the use of heat pumps that did not comply with the Ninth Circuit's ruling. The final version has therefore been revised to remove those mandates and leverage an electric-preferred approach that incentivizes, but does not require, building electrification in a way that complies with EPCA and the Ninth Circuit Court's decision. Fossil fuel equipment is inherently less efficient than electric equipment, particularly heat pump equipment. Therefore, WSEC requires additional efficiency from buildings with fossil fuel equipment to achieve similar levels of whole-building performance as buildings with heat pumps.

This version of the Olympia Reach Code has been revised both to comply with the new standards for electrification in building codes established by the Ninth Circuit Court and to align with the new requirements and terminology in the revised version of the 2021-WSEC. This has three significant implications for this version of the reach code:

- This version has moved from using "combustion equipment" to "fossil fuel equipment" to refer to equipment that uses natural gas like in the 2021-WSEC.
- This version includes requirements to incentivize, but not require, buildings to electrify.
- This revised version of the code introduces electrification-ready requirements for new construction, additions, and alterations.
- There is no additional electrification requirement for equipment replacements beyond what is already in the 2021-WSEC. The 2021-WSEC includes requirements that natural gas equipment replacements achieve additional efficiency through the 2021-WSEC's "fossil fuel compliance path." The only way to strengthen that incentive would be to limit the prescriptive path to electric equipment and require fossil fuel equipment to go through the modeled performance path. However, WSEC's modeling path does not allow existing building conditions to be used in the baseline but rather requires existing building projects to use new construction building elements in the baseline building model. This means that a fossil fuel equipment replacement would trigger full code compliance in the modeling path, which seems too stringent for an equipment replacement.

# Olympia Electrification-Preferred Reach Code (Version 2)

This document describes concepts that have been proposed for inclusion in a reach code for Olympia that will encourage the electrification of buildings and building loads in Olympia. The 2021 WSEC includes new provisions that will expand the use of electric equipment and substantially decrease the use of combustion equipment in new buildings. This Reach Code is meant to build on the gains made in the 2021 WSEC, by further incentivizing the electrification of Olympia buildings, with a focus on conforming to recent legal decisions regarding building electrification codes.

The table below includes a high-level summary of the proposed code concepts. Each proposed code concept follows in the order that they would be located in the WSEC. Each code concept is presented as a proposed code language and a reason statement describing what the code language accomplishes. The code language is presented as a modification to the language found in the 2021 WSEC where the WSEC language that is being removed is formatted as ~~strikethrough~~ and the new language is formatted as underline.

| **Measure** | **Description** |
|---|---|
| **New Construction Whole-Building Electrification-Preferred Requirements** | |
| This section includes requirements to incentivize – but not require – buildings to electrify. The final revisions to the WSEC included requirements for greater efficiency for buildings that use fossil fuels for space or water heating. | |
| Limit Buildings with Fossil Fuel Equipment to the Modeling Compliance Path | Limits buildings with fossil fuel equipment to the modeled performance compliance path. It includes exceptions for buildings that only use fossil fuel for process loads and buildings that are required to back up their heating systems (buildings like hospitals). |
| Electrification-Ready Space Heating and Service Water Heating | This proposal requires the installation of electrical-ready infrastructure when fossil fuel equipment is used for space heating or service hot water, with exceptions for when unplanned utility upgrades would be triggered. |
| **Existing Building Electrification-Preferred Requirements** | |
| This section includes provisions that incentivize or enable the electrification of specific gas end uses at certain building lifecycle events in existing buildings. They have been tailored to coordinate with the final adopted version of WSEC, particularly the allowances for like-for-like gas equipment replacements. | |
| Limit Substantial Improvements that utilize fossil fuel equipment to the Modeling Compliance Path | This proposal requires substantial improvements that include fossil fuel equipment to comply with the code via the modeled performance path. Since the baseline model in that compliance path is based on the new construction requirements, substantial improvements that do not electrify would need to effectively achieve new construction levels of performance. |
| Commercial Gas Pipe Testing | When replacement gas equipment is installed, the gas piping is required to be leakage tested. |

| | |
|---|---|
| Limit Additions that utilize fossil fuel equipment to the Modeling Compliance Path | This proposal limits additions that utilize fossil fuels to the modeled performance compliance path, incentivizing all-electric additions. |
| Electrification-Ready Additions | This proposal requires new fossil fuel space heating and water heating equipment installed as a part of additions to comply with electrification-ready requirements, It includes exceptions for when unplanned utility upgrades would be triggered. |
| Electrification-Ready Alterations | This proposal requires new fossil fuel space heating and water heating equipment installed as a part of alterations to comply with electrification-ready requirements. It includes exceptions for when unplanned utility upgrades would be triggered. |
| Heat Pumps for Split System AC Compressors | Require the installation of heat pumps for split-system AC compressor replacements and the configuration of existing combustion and resistance heating equipment as supplementary heat. |
| Service Upgrade | Require replacement service connections to be sized for full building electrification. |
| **Additional Existing Building Efficiency Requirements** | |
| This section includes additional high-value efficiency requirements for existing buildings. | |
| Commercial HVAC Control Upgrade | New HVAC equipment in alterations must have controls that comply with current code requirements. |

# Limit Fossil Fuel Buildings to the Modeling Compliance Path

## Code Language:

**SECTION C202**
**GENERAL DEFINITIONS**

*Add new definitions as follows:*

**APPLIANCE.** A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

**COMMERCIAL COOKING APPLIANCE.** Appliances used in a commercial food service establishment for heating or cooking food and which produce grease vapors, steam, fumes, smoke or odors that are required to be removed through a local exhaust ventilation system. Such appliances include deep fat fryers, upright broilers, griddles, broilers, steam-jacketed kettles, hot-top ranges, under-fired broilers (charbroilers), ovens, barbecues, rotisseries, and similar appliances. For the purpose of this definition, a food service establishment shall include any building or a portion thereof used for the preparation or serving of food.

**SECTION C401**
**GENERAL**

*Revise text as follows:*

**C401.3 Fossil fuel compliance path.** Buildings complying with the fossil fuel compliance path shall comply with the prescriptive compliance path of this code as defined in Item 1 of Section C401.2, and as modified by this Section C401.3. This compliance path shall only be permitted for new *buildings* where fossil fuel is used only for the following:

1. Industrial and manufacturing processes.
2. *Commercial Cooking Appliances*
3. Make-up air systems where energy recovery ventilation is prohibited by the *International Mechanical Code*.
4. Where it has been demonstrated to the *building official* that the *building* is required by an applicable law or regulation to provide space heating with an *emergency power system* or a *standby power system*.

## Reason Statement:

The latest Washington State Energy Code includes an electric-preferred option within its prescriptive path, which mandates higher efficiency for mixed-fuel buildings. This already presents a moderate incentive for design teams to electrify their buildings since buildings with gas equipment would need to achieve higher levels of efficiency elsewhere to make up the performance gap between fossil fuel equipment and heat pump equipment. Olympia has the opportunity to substantially increase that incentive by closing the prescriptive path to buildings with fossil fuel buildings. Buildings would still be allowed to include fossil fuel equipment, but those buildings would need to pursue compliance through the modeled performance path and would not be able to use the simpler and more straightforward prescriptive path.

The requirement includes important exceptions that allow buildings with certain fossil fuel equipment to still use the prescriptive path:

- Industrial/manufacturing processes are not technically building loads and are industrial loads located within buildings. While there are feasible electric options for some industrial/manufacturing equipment, their feasibility is very situation-specific, and it would not be appropriate for the building code to regulate this kind of equipment.
- Commercial cooking appliances are provided an exception in alignment with what was present in the previously proposed electrification code. Commercial kitchens are effectively food manufacturing facilities in buildings. Many restaurants and food processors have production processes that have been developed around gas-fired equipment. While electric options exist for nearly all commercial kitchen equipment, the transition can be challenging for businesses and staff and therefore the equipment is exempted from the electrification-ready requirement.
- High volume makeup air systems for contaminated exhaust air streams. Some appliances within buildings (like commercial cooking and labs) have exhaust requirements that necessitate very high makeup air systems. The requirements for make up air tempering often cannot be met by heat pump equipment due to lower capacities. This can generally be solved by pairing heat pump equipment with energy recovery ventilation equipment. However, when the air stream is contaminated, energy recovery is generally not allowed by the mechanical code, eliminating this option. Therefore, these systems have been exempted from the electrification-ready requirements.
- Some occupancies, particularly emergency and healthcare occupancies, are required by law to have space heating that can run on backup power during a power outage. Running all-electric systems from backup power could substantially increase the need for onsite fuel storage. Therefore, buildings that only have these systems have been exempted.

# Electrification-Ready Commercial Space Heating & Service Water Heating

## Code Language:

*Add section as follows:*

**C103.2.2 Electrification system**. The construction documents shall provide details for additional electric infrastructure, including branch circuits, conduit, pre-wiring, panel capacity, and electrical service capacity, as well as interior and exterior spaces designated for future electric equipment, in compliance with the provisions of this code.

*Revise section as follows:*

**C105.2.5 Electrical system.** Inspections shall verify lighting system controls, components, meters, motors and installation of an electric meter for each dwelling unit, and additional electric infrastructure as required by the code, approved plans and specifications.

*Add section as follows:*

**C405.14 Electric infrastructure.** New *buildings* that use fossil fuels for space heating or *service water heating* shall install electric infrastructure in accordance with C405.14.1 through C405.14.2.

**C405.14.1 Fossil Fuel space heating.** Locations with piping for fossil fuel warm-air furnaces or fossil fuel boilers shall comply with Section C405.14.1.1 or C405.14.1.2, as applicable.

**Exceptions to C405.14.1:**

1. Where a branch circuit exists for space cooling equipment with the capacity to serve heat pump space heating equipment sized in accordance with the requirements of Section C403.1.2.
2. Where compliance with Section C405.14.1 would trigger an unplanned utility electrical service upgrade based on the NEC 220.87 method for determining existing loads.

**C405.14.1.1 Low-capacity space heating.** Locations of fossil fuel warm-air furnaces with capacity less than 225,000 Btu/hr (65.9kW) or boilers with a capacity less than 300,000 Btu/hr (88kW) shall be provided with an individual branch circuit in accordance with all of the following:

1. The branch circuit conductors shall terminate within 3 ft (1 m) of the location of the space heating equipment and shall be in a location with *ready access*.
2. The branch circuit conductors shall be sized to serve heat pump space heating equipment sized in accordance with the requirements of Section C403.1.2, and
3. The point of origin and the termination of the branch circuit shall be labeled "For future heat pump space heating equipment."

**C405.14.1.2 Other space heating equipment.** Locations of fossil fuel space heating equipment not covered under C405.14.1.1 shall be provided with a raceway in accordance with all of the following:

1. The raceway shall be continuous from a branch circuit panel to a junction box located within the same space as the equipment or, where the equipment is located on the exterior of the building, within 3 ft (1m) of the equipment.
2. The junction box, raceway, bus bar in the electric panel and conductors serving the electrical panel shall be sized to serve electric space heating equipment sized to serve the same load as the fossil fuel space heating *appliance*.
3. The electrical panel shall have sufficient reserved physical space for branch circuit overprotection devices sized to serve electric equipment sized to serve the same load as the fossil fuel space heating *appliance*,
4. The point of origin and the termination of the raceway shall be labeled "For future heat pump space heating equipment."

**C405.14.2 Fossil Fuel water heating**. Locations with piping for fossil fuel water heaters shall comply with Section C405.14.2.1 or C405.14.2.2, as applicable.

**Exceptions to C405.14.2.**

1. Where compliance with Section C405.14.1 would trigger an unplanned utility electrical service upgrade based on the NEC 220.87 method for determining existing loads.

**C405.14.2.1 Low-capacity fossil fuel water heating**. Locations of fossil fuel water heaters that are not located in a dwelling unit and with an input rating of less than 300,000 Btu/hr (88kW) shall comply with all of the following:

1. An individual 30 ampere, 208/240-volt branch circuit shall be provided and terminate within 3 ft (1 m) of the water heater and shall be in a location with *ready access*.
2. The point of origin and the termination of the branch circuit shall be labeled "For future electric water heater".
3. The space containing the water heater shall have a height of not less than 7 ft (2 m), a width of not less than 3 ft (1 m), a depth of not less than 3ft (1 m) and a volume of not less than 700 ft3 (20 m3).

**Exception to C405.14.2.1:** Where the space containing the water heater is provided with air ducts or transfer openings to accommodate a heat pump water heater, the minimum volume shall not be required.

**C405.14.2.2 Other fossil fuel water heating.** Locations of fossil fuel water heating equipment not covered by Section C405.14.2.1 and not located in a dwelling unit shall be provided with a raceway in accordance with all of the following:

1. The raceway shall be continuous from an electric panel to a junction box located within the same space as the equipment or, where the equipment is located on the exterior of the building, within 3 ft (1m) of the equipment.
2. The junction box, raceway, and bus bar in the electric panel and conductors serving the electric panel shall be sized to accommodate electric water heating equipment sized to serve the same load as the fossil fuel water heating equipment.

## Reason Statement:

The above proposal for the addition of a new section C405.14 Electric Infrastructure focuses on electric-ready requirements for space heating and service water heating. Where fossil fuel-fired water heaters or space heaters are installed, they shall have a dedicated branch circuit and/or an electrical raceway, and planned space use for the future electrification of systems.

The updates in the WSEC 2021 after the Ninth Circuit's ruling prohibit the use of electric resistance equipment but will continue to allow fossil fuel combustion appliances for new construction buildings (Refer to Section C401.3 Fossil fuel compliance path, Chapter 4 Commercial Energy Efficiency). Electrification-ready measures for space heating and service water heating largely maintain the intent of the originally planned electric code while facilitating ease and cost-effectiveness of future electrification efforts. Incurring the incremental cost at time of construction or when additions take place to provide electric service capacity, electrical raceways, circuitry, and space allocation reduces future retrofit costs of fuel conversion.

# Limit Substantial Improvements with Fossil Fuel Equipment to the Modeling Compliance Path

## Code Language:

*Add new definition as follows:*

> **SUBSTANTIAL IMPROVEMENT.** Any *repair*, reconstruction, rehabilitation, *alteration*, *addition* or other improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained *substantial damage*, any repairs are considered substantial improvement regardless of the actual *repair* work performed. The term does not, however, include either:
>
> 1. Any project for improvement of a *building* required to correct existing health, sanitary or safety code violations identified by the *building official* and that are the minimum necessary to assure safe living conditions.
> 2. Any *alteration* of a *historic structure* provided that the *alteration* will not preclude the structure's continued designation as a historic structure.

*Add section as follows:*

> **C501.2.1 Fossil fuel compliance path for substantial improvements.** *Substantial improvements* that utilize fossil fuel shall comply with Section C407.
>
> **Exception:** *Substantial improvements* that only utilize fossil fuel for the following:
> 1. Industrial and manufacturing processes.
> 2. *Commercial Cooking Appliances*
> 3. Make-up air systems where energy recovery ventilation is prohibited by the *International Mechanical Code*.
> 4. Where it has been demonstrated to the *building official* that the *building* is required by an applicable law or regulation to provide space heating with an emergency power system or a standby power system.
> 5. *Fossil fuel equipment* with a permitted installation date within the previous ten (10) years.

## Reason Statement:

This proposal mandates substantial improvements that include fossil-fuel equipment to comply with the code using the modeled performance path. Because the baseline model in this compliance path follows new construction standards, substantial upgrades that don't switch to electricity would need to match the performance levels of new construction. This gives additional incentive to design teams beyond just the requirement to utilize the modeling path to undertake electrification retrofits as part of the project.

The term 'substantial improvement' is defined by the IBC and IEBC and aligns with what most people mean when they use the term major renovation. It is used as a threshold for when certain flood protection requirements are triggered for existing building alterations. As substantial alterations are major construction projects with significant scope and (by definition) significant budget relative to building value, they provide a reasonable opportunity for an electrification retrofit of the building.

Similar to new construction requirements, there are exceptions in the code for specific gas loads in buildings that are difficult to electrify due to technological or market reasons. These exceptions include commercial manufacturing/industrial processes, commercial cooking appliances, high volume make-up air for contaminated exhaust streams, and where the heating system is legally required to operate on backup power, such as healthcare facilities. It also includes an exception for newer fossil fuel equipment that has not yet reached the end of its service life.

# Commercial Gas Pipe Testing for Equipment Replacement

## Code Language:

*Add new definition as follows:*

**FUEL GAS.** A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.

*Add sections as follows:*

**C501.8 Fuel gas pipe testing.** All *fuel gas* piping serving new *combustion equipment* shall be tested in accordance with Section 406 of the *International Fuel Gas Code*.

**Exceptions:**

1. For the purposes of demonstrating compliance with this section, unexposed pipe joints and welds shall not be required to be exposed for examination during the test.
2. Where it has been demonstrated to the code official that the *fuel gas* piping has met the requirements of this section within the previous five years.
3. Where compliance with this section would require interruption of *fuel gas* supply to *combustion equipment* that serves other tenant spaces or other *dwelling units*, provided all exposed pipe joints of the piping subject to the requirements of this section have been inspected for leaks by means of an *approved* gas detector, a noncorrosive leak detection fluid or other *approved* leak detection method once the equipment has been placed in operation.

## Reason Statement:

Gas piping degrades over time, creating the possibility of natural gas leakage. Even though the natural gas is treated with mercaptan to give it that rotten egg smell, small leaks may go undetected, particularly in buildings where pipes are not exposed and older buildings that are likely to have envelopes that are less tight than newer construction. According to the US DOE, building leakage accounts for nearly 27% of the natural gas leakage in the US natural gas distribution system. Leaking natural gas represents a loss in energy, and even small leaks can add up over long periods of time. Additionally, natural gas is also a potent greenhouse gas, with over 86 times the global warming potential of CO2 on a short-term basis.

The installation of new gas equipment provides an ideal time to test gas pipe leakage. Contractors are already on site and the gas will often be partially or fully turned off for the new equipment installation. Additionally, new equipment installation can disturb and inflict additional stresses on existing piping, creating opportunities for the formation of new leaks where existing natural gas piping has weakened but not previously failed.

This provision requires that existing fuel gas piping be tested like a new installation according to the International Fuel Gas Code (IFGC). It includes targeted exceptions for elements of the IFGC testing methodology that is not appropriate for existing buildings. It also includes an exception for piping that has been tested in the last five years to prevent repeated testing. Finally, it includes an exception to ensure that testing requirements don't necessitate other tenants losing service, which could be a

considerable impact in larger buildings with multiple tenant spaces. In those cases, it only requires visual inspection of the exposed joints with a testing fluid.

Savings will vary based on the level of degradation of the natural gas piping and whether any leaks were detected which will subsequently be eliminated.

# Limit Commercial Additions with Fossil Fuel Equipment to the Modeling Compliance Path

## Code Language:

*Add section as follows:*

> **C502.2 Prescriptive compliance.** Additions shall comply with Sections C502.3 through C502.8. This compliance path shall only be permitted where the *addition* only utilizes fossil fuel for the following:
>
> 1. Industrial and manufacturing processes.
> 2. *Commercial Cooking Appliances*
> 3. Make-up air systems where energy recovery ventilation is prohibited by the *International Mechanical Code*.
> 4. Where it has been demonstrated to the *building official* that the *building* is required by an applicable law or regulation to provide space heating with an emergency power system or a standby power system.

## Reason Statement:

Chapter 5 includes prescriptive requirements for existing building projects like additions and also allows those projects to use the modeled performance path in Section C407. This proposal prohibits additions that are served by fossil fuel equipment from utilizing the prescriptive compliance path. By using "utilizes" instead of "includes," the proposal also covers additions that would extend existing fossil fuel systems to serve the addition.

Like the new construction requirement, the code section includes important exceptions for certain gas loads in buildings that are especially challenging to electrify for technological or market reasons. These exceptions include commercial manufacturing/industrial processes, commercial cooking appliances, high volume make-up air for contaminated exhaust streams, and buildings where the heating system is required by law to be able to run on backup power (primarily healthcare facilities).

# Electrification-Ready Commercial Additions

## Code Language:

*Modify text as follows:*

**C502.2.3 Building mechanical systems**. New mechanical systems and equipment serving the building heating, cooling or ventilation needs, that are installed as a part of the *addition*, shall comply with Sections C403, C408.2, C409.5, ~~and~~ C501.6~~.~~, and C405.14.

*Modify text as follows:*

**C502.2.4 Service water heating systems.** New service water-heating systems and equipment that are installed as a part of the addition shall comply with Section C404, C408.3, C409.5, ~~and~~ C501.6~~.~~, and C405.14.

## Reason Statement:

This proposal extends the electrification-ready requirements to equipment installed as part of additions, incentivizing electrification at the time of equipment installation, and facilitating cost-effective future fuel switching. This references the C405.14 section which includes exceptions for when unplanned utility service upgrades would be triggered.

# Electrification-Ready Commercial Alterations

## Code Language:

*Add text as follows:*

**C503.4.6.1 Fossil fuel space heating equipment.** All new fossil fuel space heating equipment shall comply with Section C405.14.

*Add text as follows:*

**C503.5.2 Fossil fuel water heating equipment.** All new fossil fuel service water heating systems shall comply with Section C405.14.

## Reason Statement:

This proposal extends the electrification-ready requirements to alterations, including equipment replacements and substantial improvements, incentivizing electrification at the time of equipment replacement, and facilitating cost-effective future fuel switching. This references the C405.14 section which includes exceptions for when unplanned utility service upgrades would be triggered.

# Commercial HVAC Control Upgrade

## Code Language:

*Add section as follows:*

> **C503.4.1.2 Controls.** New heating and cooling equipment that are part of the *alteration* shall be provided with controls that comply with Section C403.4.
>
> > **Exception:** Systems with direct digital control of individual zones reporting to a central control panel

## Reason Statement:

In many cases, WSEC only requires that new portions of HVAC systems comply with the requirements for new construction. This leaves many unaltered portions of the HVAC system unaffected, including controls (other than DOAS controls). Controls are a vital component of effective and efficient operation of heating and cooling systems and older controls that do not meet current code requirements significantly hamper efficiency in buildings. Obsolete controls also increase the operational costs for building owners and tenants. Codes like WSEC have relied on HVAC controls as a cost-effective means of delivering energy efficiency in buildings, so this is a significant missed opportunity. Equipment replacement is an ideal time to also upgrade controls. Contractors are onsite, operation of the HVAC system is already disrupted, and the cost of controls would generally be a small line-item cost in the project.

This missed opportunity is particularly significant given the adoption of Building Performance Standards (BPS) in the state of Washington. BPS policies set performance levels for existing buildings. This creates a need for the Olympia Energy Code to be much more proactive in tailoring requirements specifically for existing buildings. Building energy retrofits that are implemented as part of alterations, additions, and changes in occupancy are far more cost-effective than stand-alone retrofit projects implemented only to meet a BPS. By incorporating reasonable and cost-effective retrofits into typical existing building projects, the Olympia Energy Code will provide additional energy, carbon, and cost savings to building owners and tenants and help ensure that more building retrofits are undertaken at opportune and cost-effective times.

This proposal requires that thermostatic controls be brought into compliance with current control requirements when equipment is replaced. It includes an exception for systems with complex central control systems where control upgrades would be far more involved. The proposal does not require the installation of new controls, so existing controls that already meet current code requirements would already be in compliance with this new section.

# Heat Pumps for Split System AC Compressors

## Code Language:

*Add the following section:*

**C503.4.3.1 Cooling equipment replacements.** Where existing unitary air conditioners and condensing units are replaced, they shall be replaced with heat pumps configured to provide space heating. If existing fossil fuel space heating equipment that serves the same cooling zone is retained, it shall be configured as supplementary heat in accordance with Section C403.4.1.1.

## Reason Statement:

Unitary air conditioners are essentially cooling-only heat pumps. AC replacement therefore provides a valuable opportunity to electrify or partially electrify space heating. This section requires that when AC equipment is replaced that it gets replaced with a heat pump that is configured to also provide heating.

It also requires that any existing heating system be reconfigured as supplementary heating. This allows existing heating equipment to remain as a backup heating system, which is particularly important in buildings that are required to have emergency backup power for space heating.

# Commercial Service Upgrade

## Code Language:

*Add section as follows:*

**C503.7.8 Electrical Service replacement.** Where a *building* electrical service is replaced, the new electrical service shall include additional electrical capacity for the following as applicable:

1. Replacement of c*ombustion equipment* used for cooking with electric cooking equipment
2. Replacement of c*ombustion equipment* used for space heating with electric heat pump equipment or reverse-cycle chiller sized for the heating load of the *building* in accordance with C403.3.1 based on the existing *building* features
3. Replacement of c*ombustion equipment* used for water heating with electric heat pump equipment sized for the service hot water load of the *building*
4. Addition of electric vehicle charging infrastructure that complies with OMC 16.100.000 ELECTRIC VEHICLE PARKING.

The required capacity of space and water heating equipment shall be reduced by any energy recovery systems serving the heat or space heating equipment in the *building.*

**Exception:**

1) Where it has been demonstrated to the *code official* that compliance with this section would increase the total cost of the electrical service replacement to the *building* owner by more than 25 percent.
2) Where compliance with Section C403.1.4 would trigger an unplanned utility electrical service upgrade based on the NEC 220.87 method for determining existing loads.

## Reason Statement:

One substantial obstacle to electrification retrofits in buildings is the need to upgrade the capacity of the building's electrical service. These unplanned service upgrades can add substantial costs to an electrification retrofit project. This proposal reduces those obstacles by ensuring that all planned service replacements are sized for full building electrification. In this way, the building will be ready for a more effective electrification retrofit in the future.