## STAFF REPORT

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| **Agenda Item:** | 6 | **Name:** | Jenny Ngo  Jake Tracy |
| **Proposed No**.: | 2021-0346 | **Date:** | January 25, 2022 |

**SUBJECT**

Proposed Ordinance (PO) 2021-0346 would make changes to the building, energy, and fire codes in King County Code (K.C.C.) Titles 16 and 17 for unincorporated areas.

**SUMMARY**

The County enacts and enforces regulations for buildings and construction-related activities in unincorporated King County through building, energy, and fire codes in K.C.C. Titles 16 and 17. These codes are model codes, which are published by the International Code Council (ICC) and modified through Washington state-specific amendments. King County adopts these model codes and makes further amendments to meet locally-specific needs.

The K.C.C. currently relies on the 2012 version of the model codes. PO 2021-0346 would reflects the most current adopted 2018 model codes, proposes substantive changes and technical clean-up from the last major update in 2012. It would also include energy code amendments for commercial and multifamily buildings beyond state mandates, including a prohibition on fossil fuel and electric resistance-based heating in most cases, and a requirement to install solar panels. The PO also would adopt an optional appendix in the state code that requires most new detached single-family and townhouses to provide an area for future installation of solar panels.

Analysis of the PO is ongoing.

**BACKGROUND**

Under state law,[[1]](#footnote-1) King County is responsible for enacting and enforcing regulations for all building and construction-related activities in unincorporated King County. Jurisdictions may choose to adopt their own building, energy, and fire codes, provided they are not in conflict with state law, or adopt by reference Washington state statutes known collectively as the Washington State Building Code.[[2]](#footnote-2) The most current Washington State Building Code is comprised of the following components:

* 2018 International Building Code (IBC)
* 2018 International Existing Building Code (IEBC)
* 2018 International Residential Code (IRC)
* 2018 International Fire Code (IFC)
* 2018 International Energy Conservation Code (IECC)[[3]](#footnote-3)
* 2018 International Mechanical Code (IMPC)
* 2018 Uniform Plumbing Code (UPC)

The Washington State Building Code includes model codes developed by the International Code Council (ICC) and amended by the State Building Code Council to address regionally specific priorities or circumstances. Local jurisdictions, including King County, further amend these codes to address locally specific priorities or circumstances. Local amendments that apply to single-family or multi-family residential buildings require approval by the State Building Code Council.

Updates to these model code occur on a regular basis, with adoption cycles occurring every three years. The most current updates are on the 2018 codes, many of which were adopted in 2019 but became effective in 2021 due to the COVID-19 pandemic.

The County's current building codes adopt the 2012 version of the Washington State Building Code and are located in Titles 16 and 17.

**ANALYSIS**

**Adoption of State Codes.** PO 2021-0346 would amend K.C.C. Titles 16 and 17 to adopt the 2018 International Property Maintenance Code (IPMC) and Washington State's adopted 2018 versions of the International Building Code (IBC), the International Residential Code (IRC), the International Energy Conservation Code (IECC), the International Mechanical Code (IMC), the International Existing Building Code (IEBC), the International Fire Code (IFC), and the Uniform Plumbing Code (UPC). The proposed ordinance also include amendments for clarity and technical corrections.

Attachment 4 prepared by the Permitting Division includes a table summarizing proposed revisions in the proposed ordinance.

**Changes to State-adopted International Building Code.**

*New exemptions from IBC (Section 8).* IBC 101.2 addresses when the IBC applies, including in all instances of construction, alteration, movement, use, enlargement, repair, maintenance and demolition of buildings and structures. The existing code provides an exception for detached one- and two-family dwellings and townhouses less than 3 stories, which are instead subject to the International Residential Code (IRC). The proposed ordinance would clarify terminology for dwellings and townhomes, and include new exemptions for live/work units in townhouses and owner-occupied lodging houses when certain provisions are met.

*Building permit exemptions (Section 12).* IBC 105.2 identifies when work is exempt from permits. The PO modifies the exemption for detached residential accessory buildings (such as tool sheds, playhouses or treehouses, but excludes garages and buildings used for vehicle storage) and commercial agricultural and forestry accessory buildings (such animal shelter or equipment/material storage). Accessory residential buildings are required to be less than 200 square feet to be exempt from permit requirements, and under the PO would be required to be at least 5 feet from all other buildings and have a roof eave that does not project closer than 3 feet to an adjacent building.

Under the PO, agricultural and forestry accessory buildings would be limited to 400 square feet to be exempt from permit requirements, be at least 5 feet from all other buildings, have a roof eave that does not project closer than 3 feet to an adjacent building, not have installed heating, and not be connected to water, sewer or septic service.

The PO would exempt decks less than 30 inches above grade without a basement or story below would be exempt from permits. Photovoltaic solar panels with a dead load not exceeding four pounds, instead of three pounds, and no more than 18 inches above the roof or highest roof point on which they are mounted would be exempt.

*Extension of permit expiration (Section 14).* The proposed ordinance modifies the expiration period for issued permits from one year to two years. Mechanical permits and building permits to correct code violations remain limited to one year. The proposed ordinance also makes edits to clarify existing requirements.

*New definitions (Sections 25-28).* Adds new definitions for air admittance valve, boiler, and water heater, and corrects the definition of condominium.

*Removes fire requirements from IBC and references IFC (Sections 32-35).* These sections address the scope of the nd automatic fire sprinklers. The existing code duplicates language in the IBC and IFC, which has resulted in similar but not identical language in both codes. The proposed changes would remove the duplicative language in the IBC and instead make reference to the IFC.

*Moves plumbing fixture oversight from KCPH to Permitting (Section 59).* Public Health – Seattle & King County is responsible for enforcing plumbing-related requirements including the fuel gas requirements. The proposed ordinance makes technical corrections to titles, code citations and language, and removes a requirement that Public Health enforce plumbing fixture counts. Responsibility for plumbing fixture counts oversight would be transferred to permitting staff who oversee plan review for these fixtures.

**Adoption of Optional Appendix to State-adopted International Residential Code.** The State-adopted 2018 IRC includes an optional appendix relating to solar readiness for detached one- and two-family houses and for townhouses. Section 2 of the PO would adopt this optional appendix. This would require all new townhouses and detached single-family houses with 600 square feet or more of roof area oriented between 90 degrees and 270 degrees[[4]](#footnote-4) of true north to provide an area ready to install photovoltaic (PV) solar panels that:

* Is no less than 300 square feet, excluding any mandatory access or setback requirements;
* Is free from obstructions and shading;
* Contains a capped roof-penetration sleeve to accommodate a future PV system; and
* Is constructed with adequate load-bearing and electrical capacity for a future PV system.

Council staff has requested information on the cost of these new regulations for the average new single family home in King County and expects to have this information available at the next committee meeting.

**Changes to State-adopted International Energy Conservation Code.** In the past, the County has adopted the State's version of the IECC wholesale, without amendment. The PO would, for the first time, require more stringent energy conservation requirements than required by the State. These requirements would not apply to buildings subject to the IRC (i.e. residential buildings less than four stories in height).

According to executive staff, the proposed energy requirements were developed by working closely with King County staff that lead the Regional Code Collaboration (RCC).[[5]](#footnote-5) Both the RCC's model energy code ordinance, as well as the PO, were largely based on the Seattle energy code ordinance, which, according to executive staff, went through an "extensive stakeholder process." The RCC model ordinance was released prior to the finalization of the PO, and executive staff used RCC material to verify and improve the PO prior to transmittal.

Although at the time of transmittal the requirements of the PO applied more broadly than Seattle, Seattle adopted amendments to its energy code in December 2021 that align with the PO, and therefore adoption of the PO would make the King County energy code substantively the same as Seattle.

According to Executive staff, the City of Seattle has not undertaken detailed energy modeling, but Seattle staff estimate energy savings of roughly 15% resulting from its energy code. Council staff has not verified these estimates. Additionally, Executive staff notes that the Washington Clean Energy Transformation Act requires electricity providers to be greenhouse gas (GHG) neutral by 2030.[[6]](#footnote-6) At that time, GHG emissions from buildings will be almost entirely from on-site combustion. The PO would prohibit on-site combustion in some of unincorporated King County's largest buildings, and would prohibit some large on-site combustion systems.

The PO includes the following requirements that exceed or differ from the State-adopted IECC:

*Higher insulation standards* *(Sections 71-76).* The PO would codify higher insulation standards than contained in the State-adopted IECC, by requiring higher insulation values for certain building materials and features, including heating, ventilation and air conditioning (HVAC) equipment, concrete slabs, windows, skylights, and doors. Higher insulation values translate to better climate control and increased efficiency by reducing heating and cooling loss from the building.

*Prohibition of fossil fuel and electric resistance-based heating (Sections 79 & 86).* The PO would prohibit new HVAC systems and whole-HVAC-system replacements that use fossil fuel or electric resistance-based heating, with several exceptions described below.[[7]](#footnote-7) Electric resistance HVAC heating appliances would include, but not be limited to, electric baseboard, electric resistance fan coil, variable air volume electric resistance terminal reheat units, and electric resistance boilers. Fossil fuel combustion HVAC heating appliances would include, but not be limited to, appliances burning natural gas, heating oil, propane, or other fossil fuels. Electric heat pumps are the main alternative to electric resistance and fossil fuel-based heating. The PO would also prohibit fossil fuel and electric resistance-based heating for service hot water in buildings with central service water heating systems serving four or more Group R-1 or R-2 dwelling or sleeping units, and in any other building that has a heated water circulation system or a combined water heating capacity greater than 15 kW (51,195 Btu/h) under a single permit.[[8]](#footnote-8),[[9]](#footnote-9)

"Fossil fuel" is defined as follows:

*Petroleum and petroleum products, coal and natural gas, such as methane, propane and butane, derived from prehistoric organic matter and used to generate energy. Fossil fuels do not include:*

*A. Petrochemicals that are used primarily for non-fuel products, such as asphalt, plastics, lubricants, fertilizer, roofing and paints;*

*B. Fuel additives, such as denatured ethanol and similar fuel additives, or renewable fuels, such as biodiesel or renewable diesel with less than five percent fossil fuel content; or*

*C. Methane generated from the waste management process, such as wastewater treatment, anaerobic digesters, landfill waste management, livestock manure and composting processes.[[10]](#footnote-10)*

Electric resistance HVAC heating equipment would continue to be allowed:

* In most dwelling and sleeping units;
* In buildings with less than 2,500 square feet of conditioned space;
* In low-heating-capacity buildings, for auxiliary heating in certain heat pumps;
* For make-up air for commercial kitchen exhaust;
* In buildings where electric resistance provides less than 5% of total building HVAC heating capacity or heating for less than 5% of the conditioned floor area;
* In portions of buildings where the building official determines that the specific need cannot be practicably served with heat pumps or other space heating systems; and
* In temporary systems during construction.

Fossil fuel-based HVAC heating equipment would still be allowed:

* In buildings where fossil fuels provide less than 5% of total building HVAC heating capacity or heating for less than 5% of the conditioned floor area;
* In portions of buildings where the building official determines that the specific need cannot be practicably served with heat pumps or other space heating systems;
* For existing steam or hot water district energy systems that use fossil fuels as their primary source of heat; and
* For emergency generators.

Additionally, it should be noted that the proposal would not prohibit the use of fossil fuels for cooking, lighting, or decorative appliances such as fireplaces.

Council staff asked executive staff whether there are fossil-fuel or electric resistance-based cooling systems, as these are not covered by the ordinance. Executive staff state that they are not aware of these being used in any stand-alone cooling systems, and that heating is the predominant source of indoor climate conditioning in King County, though air conditioning is becoming more common in the area.

*HVAC and water heating efficiency standards (Sections 80-84; 87-93).* The PO contains several provisions that would increase HVAC and water heating efficiency beyond what is required in the State-adopted IECC. Changes include increased standards for demand control and energy recovery ventilation,[[11]](#footnote-11) minimum insulation standards around piping and tanks, and various technical requirements for heat pumps and heat pump water heaters. It would also prohibit demand recirculation water systems, which send cool water that has been sitting in the pipes back into the water heater rather than running the water directly to the outlet. Executive staff state that these systems require a significant amount of energy because they source hot water from the cold water supply rather than having a dedicated hot water return pipe, and therefore they are proposed for prohibition.

*Energy star requirements for commercial food service (Section 85).* The PO would require that fryers, hot food holding cabinets, steam cookers, and dishwashers in commercial kitchens meet energy and water efficiency criteria under the U.S. Environmental Protection Agency's (EPA) Energy Star program. Through the Energy Star program, the EPA ensures that each product that earns the label is independently certified to deliver the efficiency performance and money savings.[[12]](#footnote-12) Council staff asked executive staff how the items above were chosen, rather than stoves, ovens, refrigerators, freezers, etc. Executive staff stated that "[we] asked this of the Seattle energy code staff, as these codes are largely modeled on Seattle energy code efforts. They noted that this list was used because these appliances were not covered by federal equipment efficiency regulations, and thus there are no concerns with violating federal preemption laws." Executive staff also stated that the vast majority of the energy savings would be derived from using Energy Star-certified commercial fryers, which would be covered by the PO.

*Changes to lighting power density requirements (Sections 95-97).* Lighting power density (LPD) is a measure of the watts of energy used for lighting per square foot of floor area. The State-adopted IECC lists the maximum allowed LPD for a variety of commercial uses, and the PO would reduce the maximum LPD for most of these uses by roughly ten percent. Executive staff notes that reduced LPD does not necessarily mean decreased illumination, but rather that less power is used to achieve a level of illumination.

*Electric receptacles at gas appliances (Section 98).* The PO would require that, where a dwelling unit subject to the IECC uses appliances served by natural gas, an electrical receptacle and circuit are provided within 12 inches of the appliance, so that an electric version of the appliance can be more easily installed at that location at a future date.[[13]](#footnote-13) An electric receptacle would not be required at a gas fireplace.

*Energy efficiency credits (Sections 99-110).* In addition to the other requirements of the energy code, certain development activities are required to achieve additional energy efficiency credits. The code provides a list of actions and associates credits awarded for each action, and applicants for certain development activities must choose from among the list to achieve a certain number of credits. Actions include more efficient HVAC performance, reduced lighting power, high performance water heating, and on-site renewable energy. The following development activities are subject to the energy credits requirement:

* New building construction;
* Changes in space conditioning (i.e. converting a low-energy space to a heated or semi-heated space);
* Change of occupancy;
* Building additions; and
* Initial tenant Improvements.

The PO would amend this section of the State-adopted IECC in several ways:

* Raise the required number of credits from six to eight;
* Raise the required number of credits for building additions under 1,000 square feet from three to four;
* Disallow or modify use of credits that would become standard requirements if the PO is adopted. For instance, because high-efficiency service water heating would be required, it could not be used to receive credits. Likewise, commercial kitchen equipment could not receive credits for being Energy Star-certified, since this would be a requirement for all commercial kitchen equipment under the provisions of the PO.
* Removes potential incentives to install fossil fuel-based heating systems by stating that such systems are not eligible to receive credits.

*Solar readiness for multifamily construction (Sections 114-116).* The State-adopted IECC requires all commercial buildings with 20 or fewer stories to provide a solar-ready zone equal to 40% of the roof area or 20% of the electric service size, whichever results in the smaller area. The PO would extend this requirement to multifamily residential buildings, would provide an exception when certain solar exposure conditions are not met, would allow area for mechanical equipment to be subtracted from the solar-ready zone calculations, and would provide standards for solar PV roof penetrations.

*Solar PV Installation Requirement (Sections 69 & 117).* In addition to the above requirements, the PO would require each new building, and each addition larger than 5,000 square feet of gross conditioned floor area, to include a renewable energy generation system consisting of 0.25 watts rated peak photovoltaic energy production per square foot of conditioned space. For a two story building with 5,000 square feet of conditioned floor space, such a system would cover roughly 4% of total roof space. Council staff has requested information on the estimated cost for such a system and potential operating savings that would be achieved over time.

The PO would allow for reduced system size or exemption from the solar PV installation requirement in several instances, described below.

* Affordable housing projects would not be required to install solar PV. Affordable housing would be defined as follows:

*Buildings that:*

*1. Are owned by a public housing authority for the purpose of providing affordable housing;*

*2. Are owned by a government agency or nonprofit organization and operated as a shelter, including temporary and emergency shelter facilities providing day and warming centers that do not provide overnight accommodation, for people receiving support services from county- recognized government assistance programs for homelessness; or*

*3. Are subject to a regulatory agreement, covenant or other legal instrument recorded on the property title for a minimum of 40 years that:*

*a. Restricts at least 51 percent of the units to be occupied by and affordable to households earning no more than 60 percent of area median income; or*

*b. Restricts initial and subsequent sales of at least 51 percent of the residential units to households with incomes no more than 80 percent of area median income.*

The definition above references emergency warming shelters but not cooling shelters. Executive staff state that the intent is that cooling shelters would also be included in this definition.

* The Permitting Division could allow all or part of the on-site solar PV system requirement to be waived if the applicant builds a solar PV system that is 50% of the required system size on an existing affordable housing project within unincorporated King County, or 75% of the required system size on a new construction affordable housing project within King County.[[14]](#footnote-14) The latter part of the previous sentence references King County as a whole, not unincorporated King County specifically. Executive staff states that the intent was that this latter requirement apply only within unincorporated King County.

Additionally, as written, the size of the system being placed on an affordable housing site is not tied directly to the size of the system being removed from the development site, only to the size of the system that would otherwise be required. It would be at the discretion of the Permitting Division to determine how much of "all or part" of the system was allowed to be waived and replaced by a 50% or 75%-sized system on an affordable housing project. This may present issues if there is not a consistent formula for determining the ratio between the amount waived on the development site and the amount placed on the affordable housing site. Council staff has asked executive staff about the intent of this requirement.

If an applicant were to use this option, they would have to submit documentation demonstrating that the renewable energy generation system has been installed on the affordable housing project site, that the system is fully operational, and that ownership has been transferred to the owner of the affordable housing project, before issuance of the certificate of occupancy.

* The Permitting Division could approve a financial contribution to a Washington State agency solar energy fund in lieu of constructing all or part of the required solar PV system on-site. The payment would equal $2.50 per watt of installed capacity, which Executive staff says is the estimated cost of installing commercial solar PV. No solar energy fund exists currently, and the PO would acknowledge that there is no assurance such a program will be available. Executive staff states that the Washington State Housing Finance Commission is in the process of setting up a solar energy fund that would serve this purpose.
* If the project receives three additional energy credits beyond what is required, solar PV is not required. Two additional credits would reduce the required system size by 2/3 and one additional credit would reduce the required system size by 1/3.
* For projects using the total building performance compliance path allowed by the IECC, if a three percent reduction in the building performance factor is achieved, a solar PV system would not be required.[[15]](#footnote-15) A reduction of two percent would reduce the required system size by 2/3 and a reduction of one percent would reduce the required system size by 1/3.
* Lastly, the building official would be able to approve an alternative method to meet the solar PV system requirement if the owner's engineer or architect can demonstrate, to the satisfaction of the building official, that the alternative method would provide equal or greater solar performance than required.

**Other Substantive Changes.**

*Plumbing fees (Sections 133, 134, 143).* The PO adds language requiring a plan review fee for plumbing permits that is equal to the cost of performing the review, consolidates the gas piping fee schedule and clarifies that fees apply to medical gas installation, and adds language regarding permit renewals for plumbing permits, including a 50% permit cost or $50 for renewals, an 18-month time period, and limiting the number of renewals to one.

*Fire access road requirements (Section 167*). The PO modifies the standards for fire access roads to increase the weight load (25 tons to 37.5 tons), specify driving surfaces include asphalt or concrete, and require new buildings or additions to be accessible by an approved fire access road.

*Emergency radio changes (Sections 174-187).* The PO adds four new sections to K.C.C. Chapter 17.04 for emergency responder radio coverage, prescribing which buildings require systems, removing exceptions from the state code, establishing a 99% floor area radio coverage requirement, signal strength, and system activation requirements. These changes were developed in coordination with other agencies entering into the Puget Sound Emergency Radio Network (PSERN) to support implementation.

**Technical Changes.** In addition to substantive changes discussed above, the PO includes a number of technical and clarifying changes throughout K.C.C. Titles 16 and 17 to align the Washington State Building Code with the K.C.C. and to remove incorrect, outdated, and duplicative language.

**Public Outreach and Engagement.** Executive staff provided a summary of the outreach and engagement that occurred during the development of the PO. This summary is Attachment 5 to this staff report.

**Process and Timeline.** Staff anticipates that a striker will be necessary to make technical and clarifying changes to the PO. Per Council rules, the striker would be distributed no later than the third business day prior to the committee meeting. Line amendment concepts would need to be transmitted to staff by the end of the second business day prior to the meeting. If this were to occur in February, the dates would be February 17th and 18th, respectively.

The PO is subject to the State Environmental Policy Act (SEPA) and requires environmental review and public noticing. If the PO is voted out of committee, SEPA review and noticing would occur prior to the ordinance being taken up by the full Council. Councilmembers would need to inform council staff of any amendment concepts no later than one week following committee action, so that these concepts can be included and considered during the SEPA review. Amendment concepts that are not initially included in the scope of the SEPA review may result in additional environmental review that may delay Council action. The ordinance may be taken up by full Council when the SEPA public comment period is concluded and a threshold determination is issued.

**INVITED**

* Jim Chan, Division Director, Permitting Division, Department of Local Services

**ATTACHMENTS**

1. Proposed Ordinance 2021-0346
2. Transmittal Letter
3. Fiscal Note
4. Summary of Proposed Ordinance relating to King County Building and Fire Code Updates
5. Public Engagement Summary

1. RCW 36.32.120 [↑](#footnote-ref-1)
2. The Washington State Building Code can be found in Title 51 WAC. [↑](#footnote-ref-2)
3. Also known as the Washington State Energy Code [↑](#footnote-ref-3)
4. 90 degrees to 270 degrees of true north covers half of the total possibilities of compass direction, and therefore any sloping roof with two opposite-facing sides would have at least one side oriented in such a way as to trigger this requirement, assuming that it meets the size threshold above. If the roof slopes in only one direction, an applicant could avoid this requirement by angling the slope of the roof outside of the 90-to-270 range. [↑](#footnote-ref-4)
5. The RCC is made up of representatives from King County, Seattle, and other King County cities [↑](#footnote-ref-5)
6. WA SB 5116 [↑](#footnote-ref-6)
7. Electric resistance heating generates heat by converting incoming electricity to heat in an internal heating element. [↑](#footnote-ref-7)
8. R-1 includes transient boarding houses, congregate living facilities, hotels, and motels. R-2 includes apartments houses, convents, dormitories, fraternities and sororities, live work units, timeshares, and nontransient boarding houses, congregate living facilities, hotels, and motels. [↑](#footnote-ref-8)
9. Executive staff states that most "small-footprint businesses" would be below the 15kW requirement, further stating that a "small restaurant or the showers for a yoga studio [could be served] with a 12 kW water heater. [↑](#footnote-ref-9)
10. K.C.C. 21A.06.532.C. [↑](#footnote-ref-10)
11. Demand control ventilation uses sensors to optimize air circulation based on the number of people occupying the space. Energy recovery ventilation uses exhaust air to precondition incoming air. [↑](#footnote-ref-11)
12. https://www.energystar.gov/about?s=mega [↑](#footnote-ref-12)
13. The IECC applies to multifamily residential buildings with four or more stories. [↑](#footnote-ref-13)
14. Affordable housing defined as above. [↑](#footnote-ref-14)
15. The total building performance compliance path allows a building to bypass the specific prescriptive requirements of the energy code by instead showing, through building energy modeling, that the building will achieve equal or superior energy efficiency (building performance factor) through other means. [↑](#footnote-ref-15)