From: Nicolas Garcia
Subject: RE: Energy Code Proposal

All,

I only had a few minutes to look this over. Nevertheless, the economic analysis uses some very flawed data inputs. What I cannot say is whether using more accurate inputs would change the findings that the proposal is cost-effective.

Problematic data:

1. **A.6.1.1 Utility Rates.** For the purpose of calculating the TSPR the following simple utility rate determined by the Washington State Department of Commerce shall be used: $0.112/kWh of electricity
    a. This assumed electric rate is higher than current utility commercial rates and does not reflect the variability in rates among WA utilities.
        i. **PSE** Schedule 25: $0.070685/kWh over 20,000 kWhs
        ii. **PacifiCorp** Schedule 24: $0.06472/kWh over 9,000 kWhs
        iii. **Avista** Schedule 11: $0.08341/kWh over 3650 kWh
        iv. **SnoPUD** Schedule 20: $0.0698/kWh over 30,000 kWh
        v. **Cowlitz PUD** Schedule 8: $0.05490/kWh
        vi. **Chelan PUD** Schedule 3: $0.0361/kWh
        vii. **Clark PUD** Schedule 34: $0.077/kWh
        viii. **Inland P&L** Large Commercial: $0.057/kWh

2. **A.2 Compliance.** Compliance based on total system performance ratio requires that the provisions of Section 403.3 are met and the *total system performance ratio* of the *proposed design* is less than or equal to the *total system performance ratio* of the *standard reference design*. The TSPR is calculated according to the following formula:
    TSPR = annual heating and cooling load /annual carbon emissions from energy consumption of the building HVAC systems where:
        Annual carbon emissions from energy consumption of the building HVAC systems = sum of the annual carbon emissions in pounds for heating, cooling, fans, energy recovery, pumps, and heat rejection calculated by multiplying site energy consumption by the carbon emission factors from Table A1
    Annual heating and cooling load = the sum of the annual heating and cooling loads met by the building HVAC system in thousands of Btus.

    Carbon Emissions Factors

Type	CO2e (lb/unit)	Unit
Electricity	0.82	kWh
Natural Gas	11.70	Therm
Oil	22.50	Gallon
Propane	12.40	Gallon

    b. The assumed CO2e emissions rate of 0.82 lb/kWh is higher than the emissions from all but two WA utilities. Furthermore, it does not reflect the variability in emissions rates among WA utilities (emissions rates are my own calculation based on 2016 fuel mix disclosure report by WA state Department of Commerce).

i. **PSE**: 0.919 lb/kWh
ii. **PacifiCorp**: 1.110 lb/kWh
iii. **Avista**: 0.609 lb/kWh
iv. **SnoPUD**: 0.030 lb/kWh
v. **Cowlitz PUD**: 0.082 lb/kWh
vi. **Chelan PUD**: 0.021 lb/kWh
vii. **Clark PUD**: 0.317 lb/kWh
viii. **Inland P&L**: 0.029 lb/kWh

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