



Department of Commerce

Energy Performance Standard for Existing Buildings

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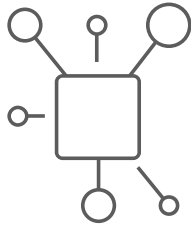




We strengthen communities



HOUSING / HOMELESSNESS



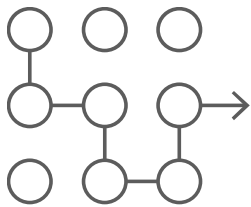
INFRASTRUCTURE



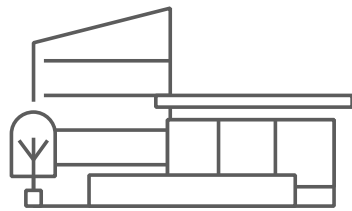
BUSINESS ASSISTANCE



ENERGY



PLANNING



COMMUNITY FACILITIES



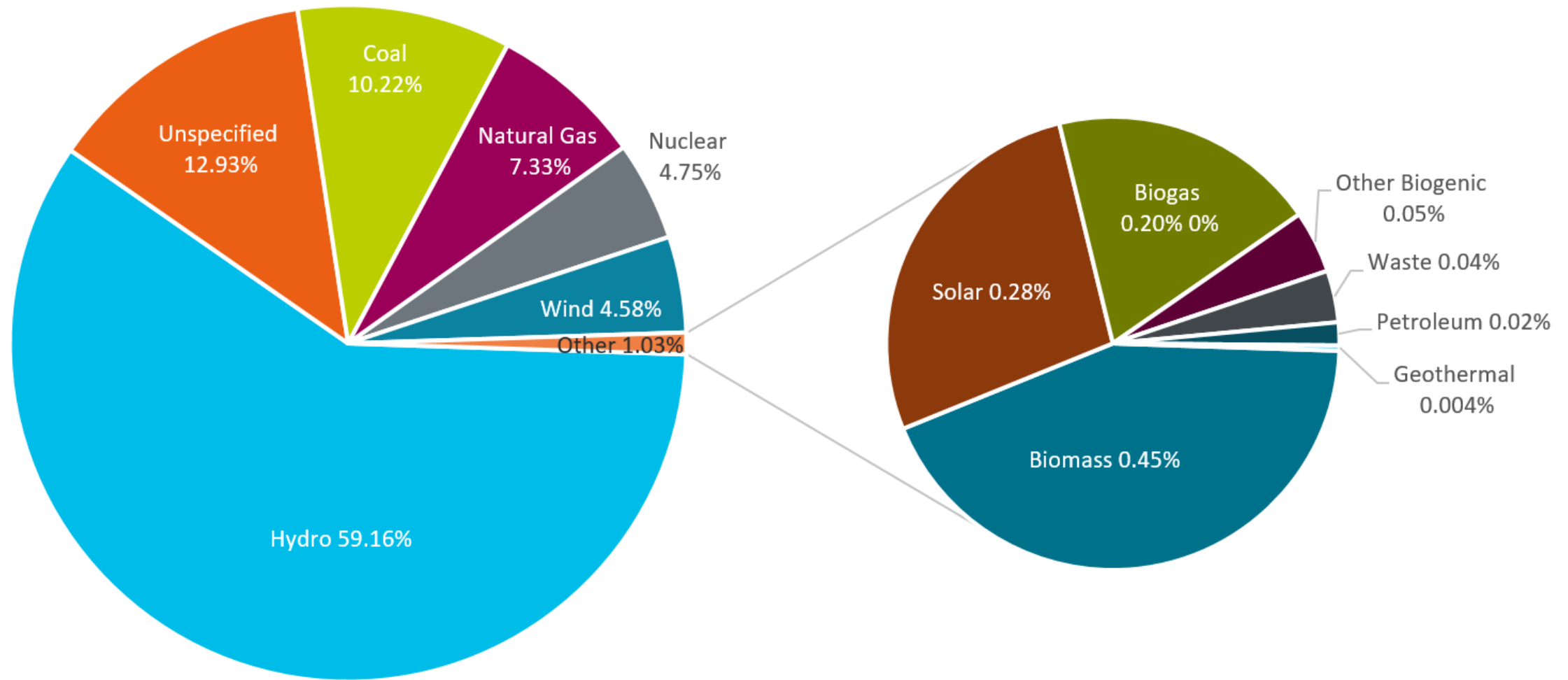
CRIME VICTIMS / SAFETY



COMMUNITY SERVICE

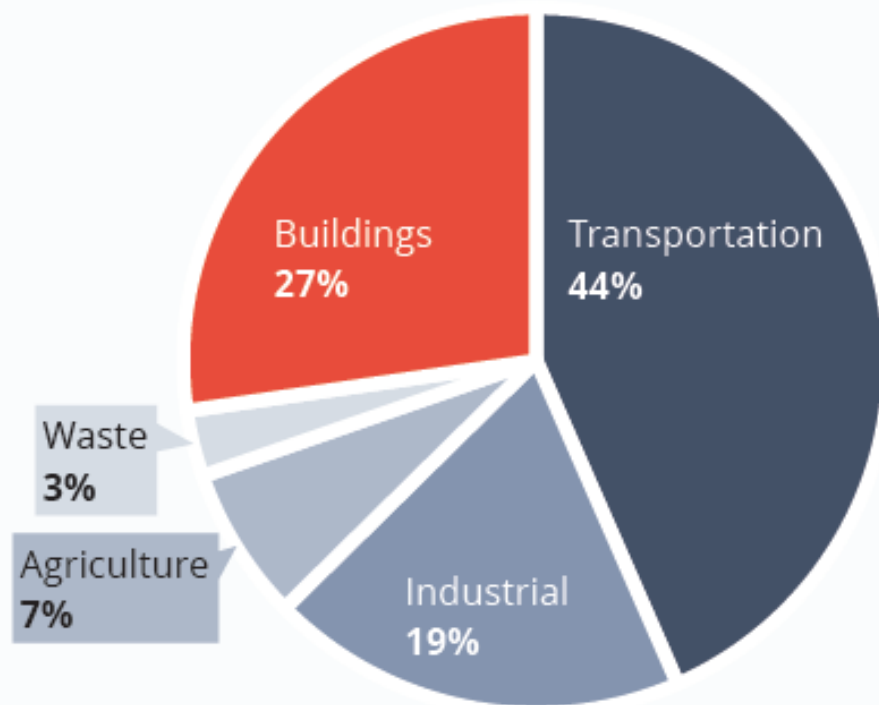


Figure 1: Washington State Electric Utilities Aggregate 2018 Fuel Mix (Percent)

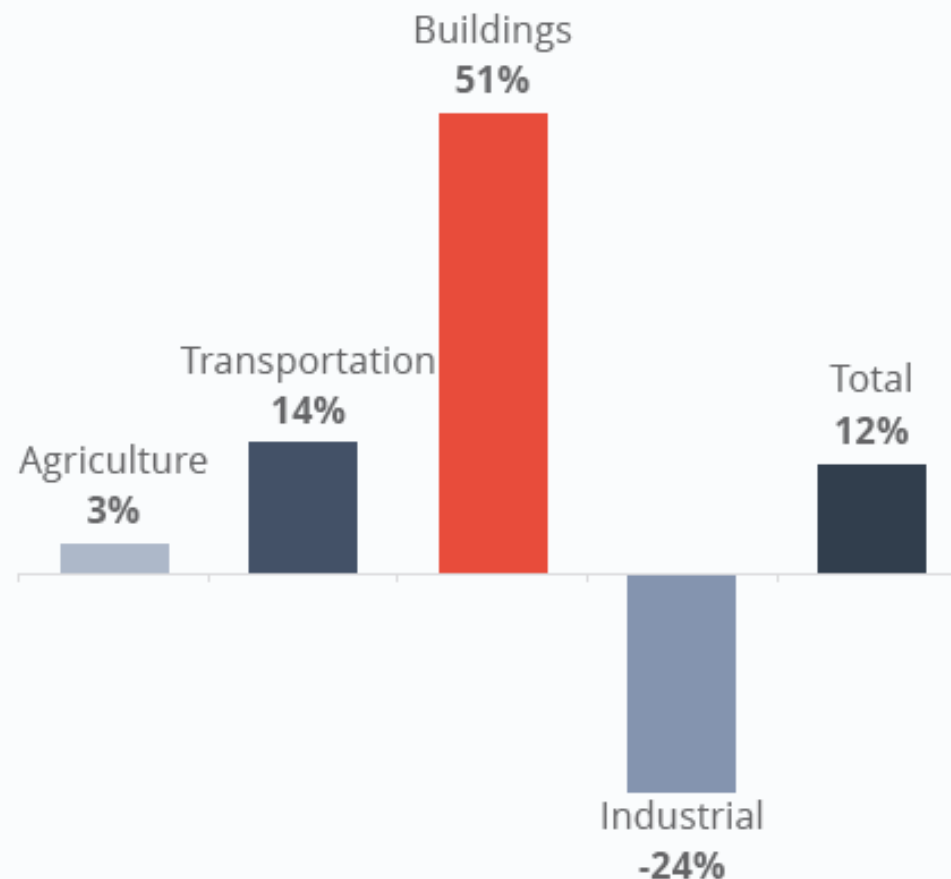


Why target buildings?

Source of Washington Greenhouse Gas Emissions, 2015



Change in Washington Greenhouse Gas Emissions, 1990–2015





Washington EE and Carbon Reduction

Policy Background

- Carbon Reduction Policy in Place but requires supporting initiatives
- Utility Energy Efficiency Programs are productive, particularly in the electric sector
- Strong Energy Code Statute in Place, making good progress in new construction
- Building CO2 emissions are significant and growing faster than other sectors
- 2019 the State Legislature passes HB 1257 - Clean Buildings



HB 1257– Instructions for Commerce


“In developing energy performance standards, the department shall seek to maximize reductions of greenhouse gas emissions from the building sector”.

This is accomplished through adoption of energy efficiency practices



Energy Performance Standard for Existing Buildings

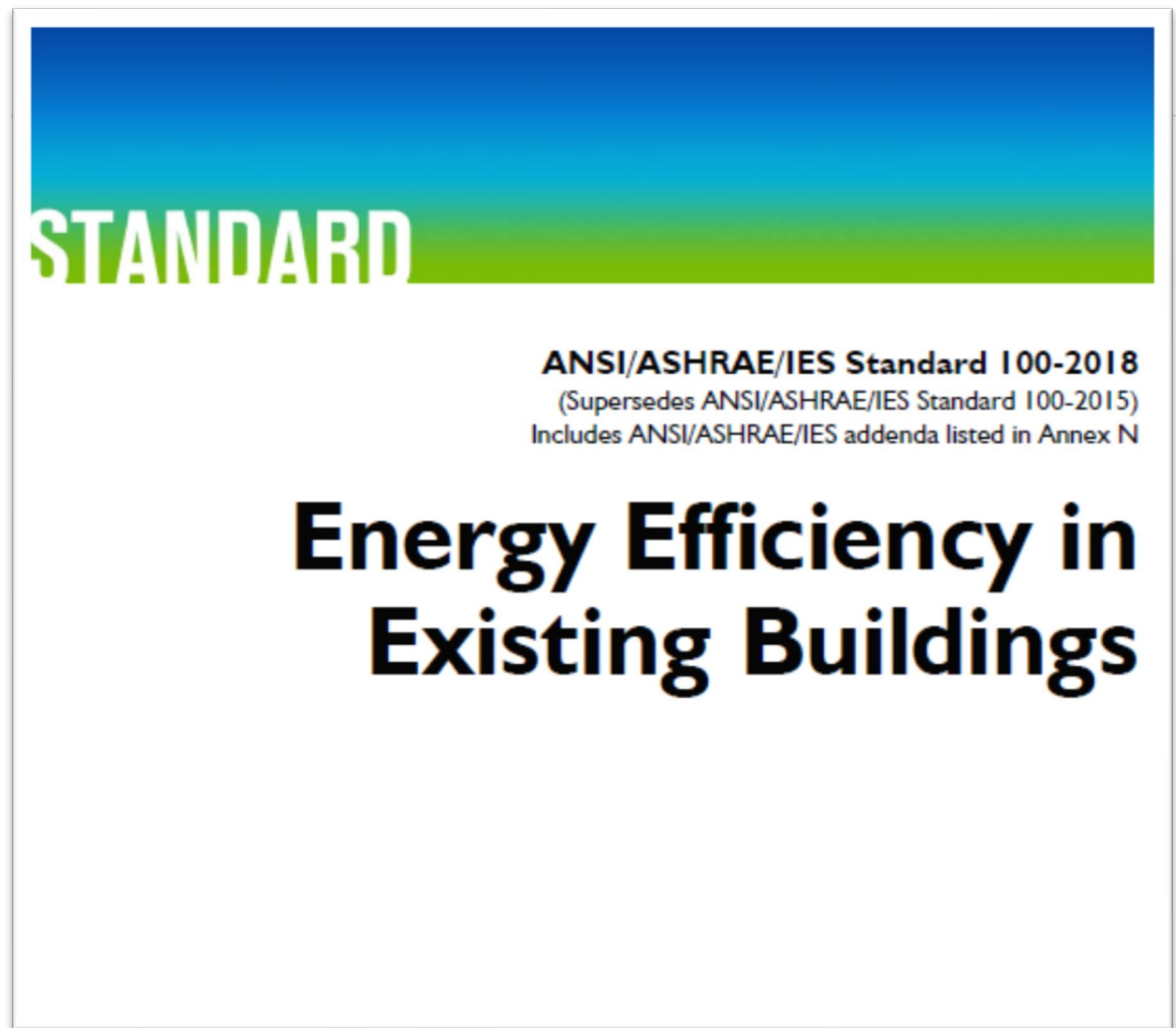
- Adopt a mandatory performance based efficiency requirement for large existing buildings
 - ASHRAE Standard 100-2018
- Develop WA specific energy performance targets
- Implement a voluntary early adopter incentive program to begin July 2021
- Mandatory compliance required by January 2026



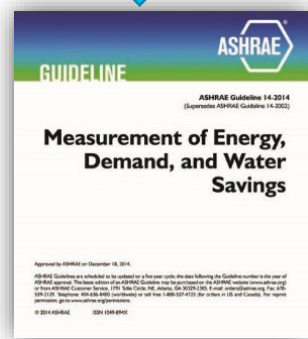
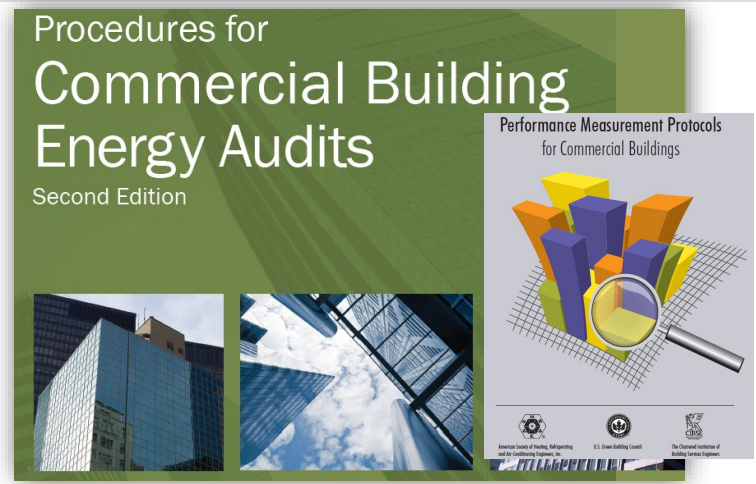
Energy Performance Standard for Existing Buildings

- Applies to nonresidential, hotel, motel, and dormitory buildings greater than 50,000 SF
 - Exceptions for industrial, utility buildings and economic hardship
- Compliance is a building owner obligation

ANSI/ASHRAE/IES Standard 100-2018



Direct
Reference



Procedures for Commercial Building Energy Audits, Second Edition

Sample EEM Summary Table

Measure Number	Measure Description	Annual Energy and Cost Savings			
		Peak Demand Savings (kW)	Electricity Savings (kWh)	Gas/Fuel Savings (therms)	Total Savings
EEM-1	Replace Inefficient Lamps with CFLs	7.8	15,245	-	\$
EEM-2	Reduce Pressure Setting on Pneumatic Compressor	-	2,312	-	\$
EEM-3	Install VFD on Yarnest Condenser Loop Pump to Reduce Flow	19.0	169,872	-	\$
EEM-4	Install VFD and Implement Demand-Controlled Ventilation for AHU-3	-	12,446	423	\$
EEM-5	Install CO2 Sensing and VFD to Control Garage Exhaust Fan	18.8	48,948	-	\$
EEM-6	Adjust Water Return Control and Install Condensing Boiler	-	44,838	17,203	\$
EEM-7	Replace Garage WPS Fixtures with LED Fixtures with Integrated Motion Sensor	6.8	29,854	-	\$
EEM-8	Repair Economizers on All Air Handlers	5.0	22,342	-	\$
EEM-9					
EEM-10					
EEM-11					
EEM-12					
TOTALS (Recommended Measures)		57.3	238,880	17,625	\$

*NPV assumes a discount rate of 4%.

Informative background and tools



Standard 100 Energy Performance Targets

- Energy Utilization Index Target (EUI_t)
 - Btu/SF/year
- 54 building types
- Climate Specific
- STD 100 provides a number of different metrics to choose from
 - Site energy, Source energy
 - By fuel type, etc.

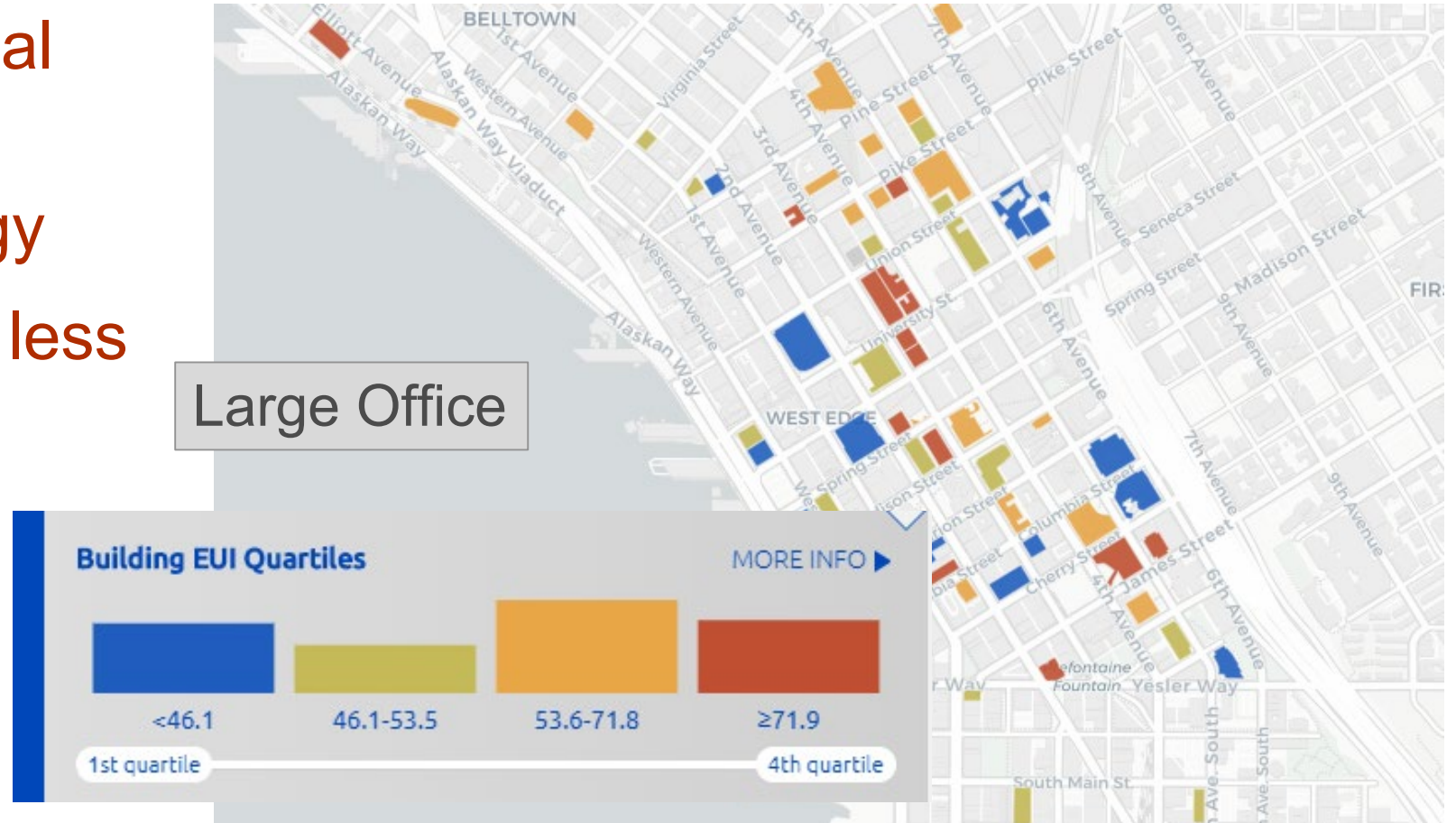
Table 7-2a Building Activity Site Energy Targets (EUI_t) (I-P Units)

No.	Commercial Building Type	EUIs by Building Type by Climate Zone (kBtu/ft ² -yr)																
		ASHRAE Climate Zone																
		1A	2A	2B	3A	3B Coast	3B Other	3C	4A	4B	4C	5A	5B	5C ^a	6A	6B	7	8
1	Admin/professional office	39	40	39	42	33	39	33	46	40	40	48	42	39	54	47	58	81
2	Bank/other financial	55	57	56	59	46	55	47	65	56	57	68	59	56	76	67	82	115
3	Government office	49	50	49	52	41	48	42	57	49	50	60	52	49	67	59	72	101
4	Medical office (nondiagnostic)	33	34	33	35	28	33	28	39	34	34	41	36	33	46	40	49	69
5	Mixed-use office	45	46	45	48	38	45	39	53	46	47	56	48	45	62	55	67	94
6	Other office	38	39	38	40	32	37	32	44	38	39	47	40	38	52	46	56	78
7	Laboratory	178	176	171	175	147	165	159	194	173	179	209	187	181	232	211	249	331
8	Distribution/shipping center	12	16	16	20	11	18	14	27	23	22	36	30	24	49	40	60	113
9	Nonrefrigerated warehouse	6	8	8	10	5	9	7	13	11	11	17	14	12	24	19	29	54
10	Convenience store	135	146	135	152	127	139	141	166	150	157	178	162	167	193	179	208	263
11	Convenience store with gas	108	118	109	122	102	112	114	133	121	126	144	130	135	156	144	168	212
12	Grocery/food market	112	122	113	127	106	116	118	138	125	131	149	135	139	161	149	174	219
13	Other food sales	34	37	34	38	32	35	36	42	38	40	45	41	42	49	45	53	66
14	Fire/police station	66	65	63	64	54	61	59	71	64	66	77	69	67	85	78	92	122
15	Other public order and safety	60	59	57	59	49	55	53	65	58	60	70	63	61	78	71	84	111
16	Medical office (diagnostic)	33	32	32	32	30	32	27	32	30	28	30	30	28	31	30	31	35
17	Clinic/other outpatient health	50	48	49	48	45	48	40	48	46	42	46	45	42	47	45	46	52
18	Refrigerated warehouse	69	68	66	68	57	64	62	75	67	69	81	72	70	90	82	96	128



Washington Energy Utilization Targets

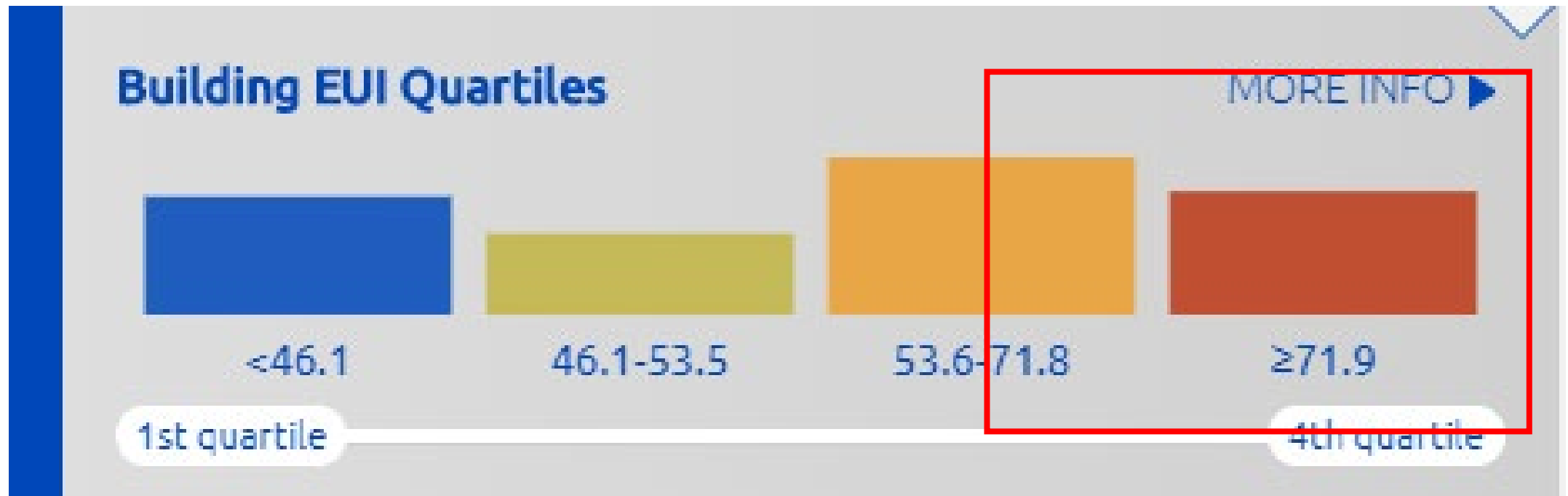
- Based on regional energy use data
- Site based energy
- Targets shall be less than average by building type





Washington Energy Utilization Targets

- Targets shall be less than average by building type





Standard 100 Actions

All buildings

- Section 5 Energy management plan
- Section 6 Operations and Maintenance Protocol
- Section 7 Building energy use tracking compared to targets
- **Buildings that exceed EUI Targets or do not have EUI Targets**
 - Section 8 Conduct ASHRAE level 2 audit
 - Section 9 Implement efficiency measures
 - Bring the building below the EUI target
 - OR
 - All measures that are cost effective to the building owner or occupant



Standard 100 Actions

This is a continuous process

- Energy benchmarking is ongoing
- Energy management programs require continuous maintenance. They are approved by ownership on an annual basis
- O&M is an ongoing activity
- Energy audits and measure implementation is renewed every 5 years
- Reporting to Commerce is required beginning in 2026 and every 5 years after



Early Adopter Incentive Program

- To qualify, the building must be 15 EUI or more above the EUI
- To receive the incentive, the building owner must bring the building in full compliance with the standard, and meet the EUI
- This is a performance incentive
 - It will take 18-25 months to implement the standard and verify performance
- This is state incentive



Considerations in developing a program

- No one likes rules. Optimize the benefits. Mimic existing processes
- Implement with a long time horizon. It takes time to implement and verify project outcomes
- Adopt EUIt with required implementation in mind. Not so low that audits don't result in good efficiency projects
- Create cost effectiveness criteria that are robust, but not unreasonable

Extra Slides





Washington State Energy Code Development Statute

- **RCW 19.27a.020**

- 2) The council shall follow the legislature's standards set forth in this section to adopt
- (a) Construct increasingly energy efficient homes and buildings that help achieve the broader **goal of building zero fossil-fuel** greenhouse gas emission homes and **buildings by the year 2031**;

- **RCW 19.27a.150**

- residential and nonresidential construction permitted under the 2031 state energy code must achieve a **seventy percent reduction in** annual net **energy consumption**, using the adopted 2006 Washington state energy code as a baseline



2019 WA Legislation of Interest

- **HB 1257 – Clean Buildings**
 - www.commerce.wa.gov/buildings
- **HB 1444 Appliance Efficiency**
 - www.commerce.wa.gov/appliances
- **SB 5116 Clean Energy Transformation**
 - www.commerce.wa.gov/ceta
- **HB 1112 transition away from hydrofluorocarbons**
 - <https://ecology.wa.gov/Air-Climate/Climate-change/Greenhouse-gases/Reducing-greenhouse-gases/Hydrofluorocarbons>

Winners Are:

1112 Hydrofluorocarbon
1126 Distributed Energy
1257 Energy Efficiency
1428 Fuel Mix /Electricity Attributes
1444 Appliance Efficiency
1512 Electrification of Transportation
5116 Clean Energy Economy
5223 Net Metering
5588 Hydrogen
1102 > Budgets
1109 >
2042 Green Transportation

SB 5116 Clean Energy (electricity)

- 2025: Eliminate coal from retail portfolios
- 2030: Greenhouse gas neutral standard
 - At least 80 percent of electricity delivered to load must be from renewable or non-emitting
 - Alternative compliance options for up to 20 percent
- 2045: 100 percent renewable or non-emitting retail electricity supply
- Safeguards for rates, vulnerable populations, and reliability
- Social cost of carbon included in utility planning efforts





HB 1444 Appliance Efficiency

- Adds 17 new products to state standards
 - Based on standards developed by the Appliance Standards Awareness Project, and the CEC
 - Consumer net present savings \$2 billion (2035)
- First in nation, Grid Enabled Water Heater
 - Facilitates demand control
 - Based on PGE and BPA demonstration projects

