Climate Mitigation vs. Asset Management – and Funding?

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SÄZÄN
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Learning Objectives

After the completion of the course, participants should be able to:

1. Participants will be able to better identify areas of organizational risk with regards compliance with Washington State climate mitigation regulations.

2. Participants will gain tools to help them identify opportunities to better align the seeming conflict between an effective asset management plan with condition-based capital asset renewal planning and mandates that seemingly require early replacement of energy systems.

3. Participants will be equipped with the latest information on available incentives and grant funding sources and Inflation Reduction Act Direct/Elective Pay opportunities that can help their organizations develop and strategize implementation of climate compliance mitigation plans.

Transportation – 44.7 million metric tons (MMT)

- Cars and trucks
- Shipping
- Aviation
- Marine transport

Residential, commercial and industrial heating – 23.3 MMT

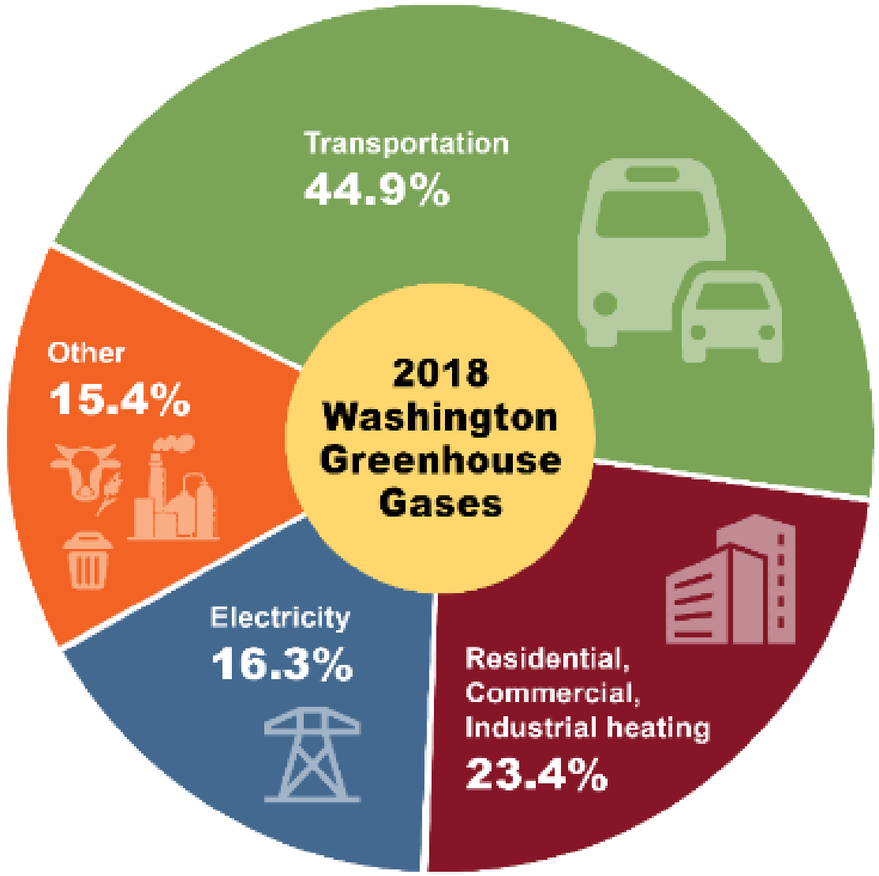
- Natural gas and oil used in residential and commercial space heating
- Natural gas, oil and coal used in industrial heating applications

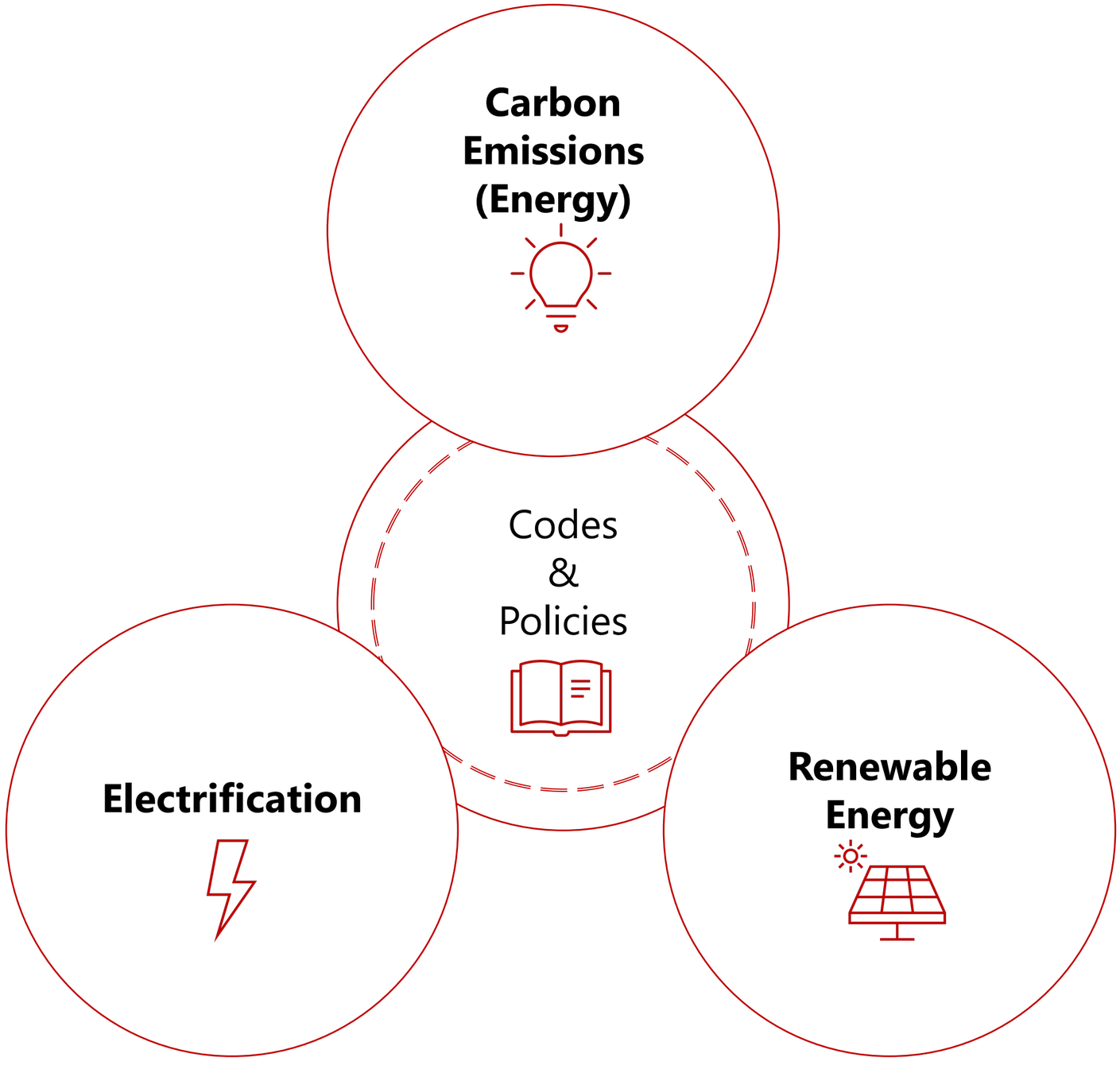
Electricity – 16.2 MMT

- Natural gas, coal and oil used for electricity generation

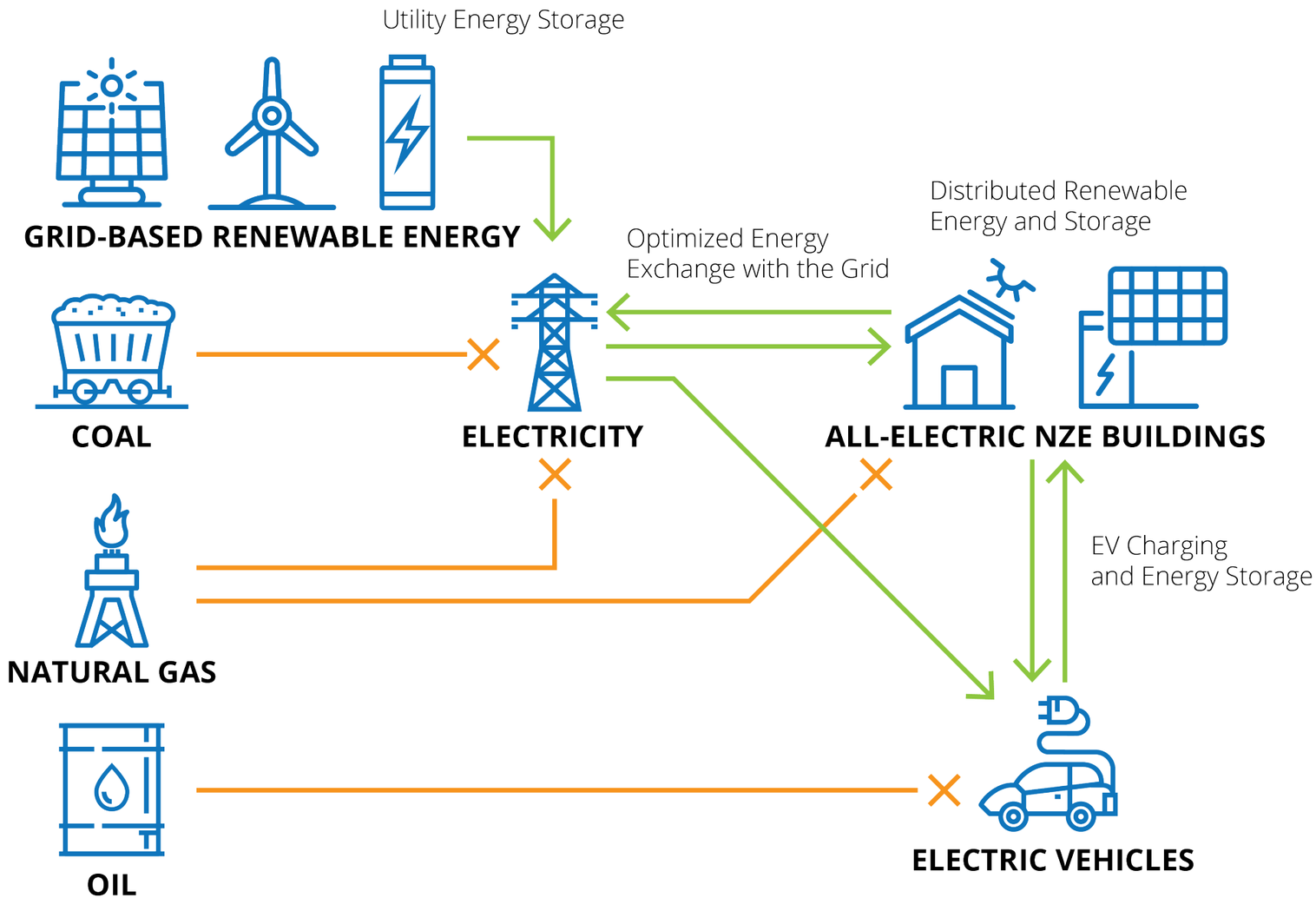
Other – 15.4 MMT

- Agriculture
- Industrial operations (cement, aluminum, HFCs)
- Waste management (landfills, wastewater)
- Natural gas distribution



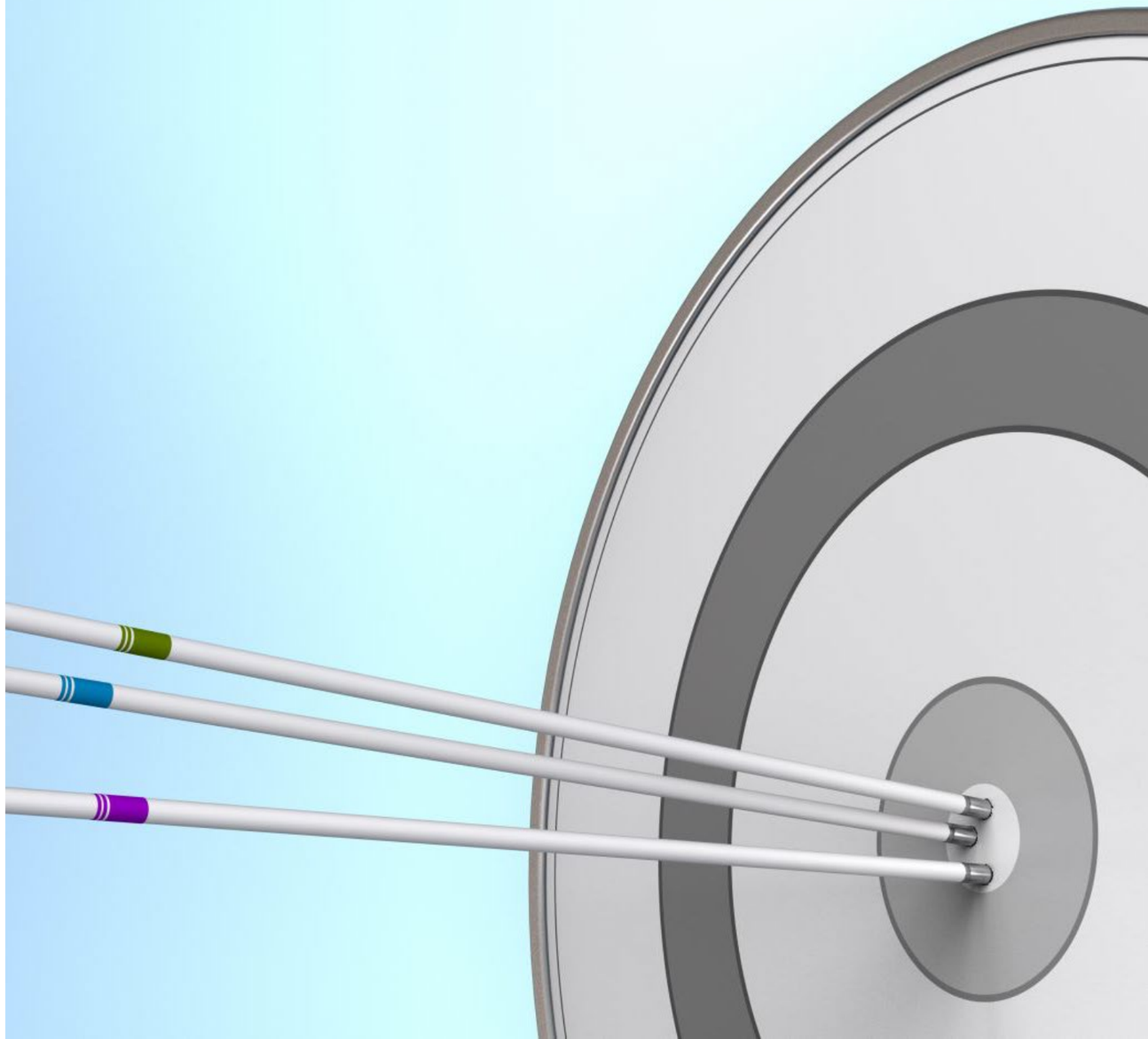

Carbon Emissions (Energy)
Codes & Policies
Electrification
Renewable Energy

POLICY OVERVIEW | ELECTRIFICATION AND DECARBONIZATION



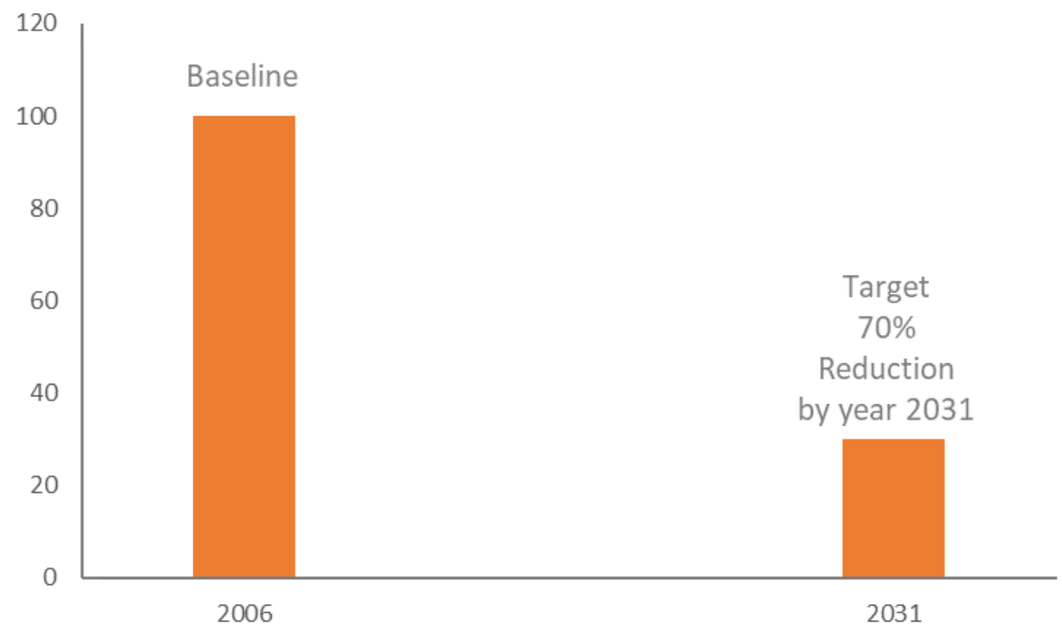
- **Carbon Emissions Reductions Goal by 2050 compared to 1990 levels**

100%



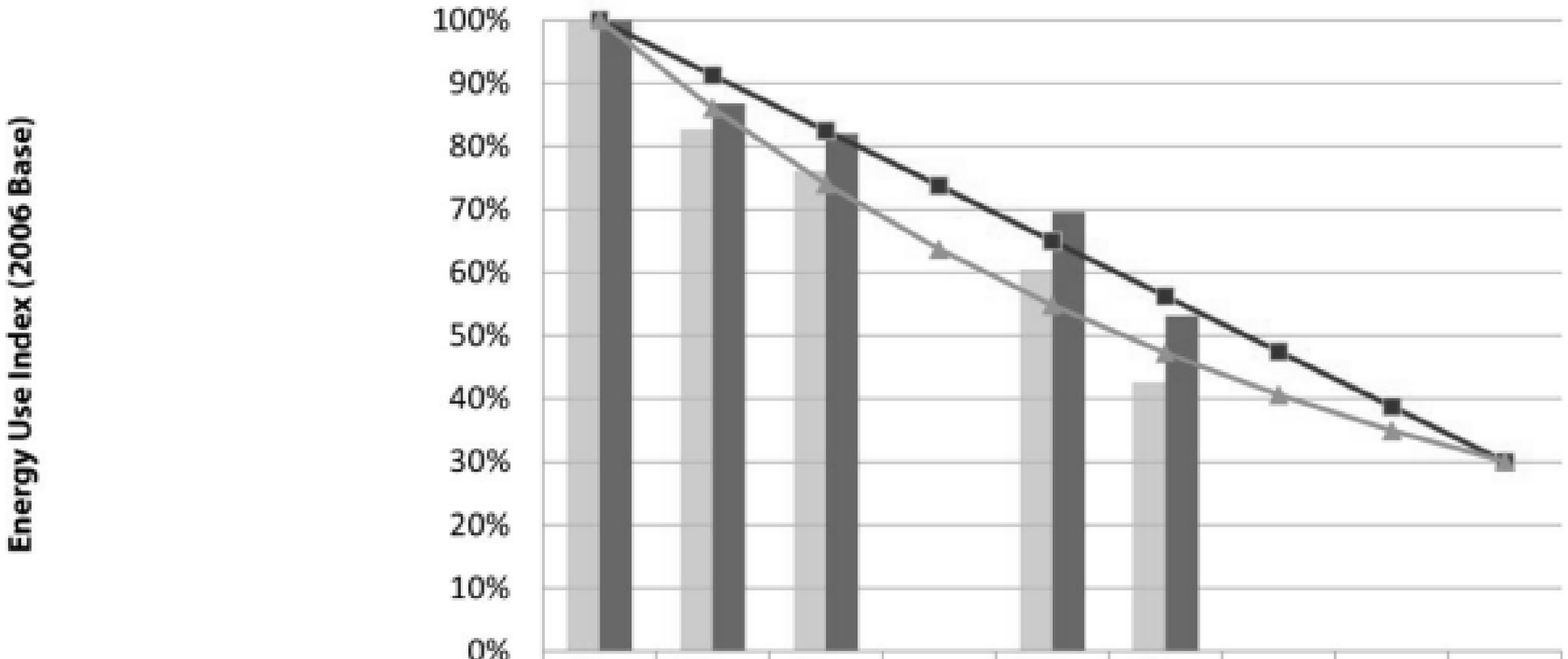
POLICY OVERVIEW | Net Zero Ready Goal

- **RCW 19.27a.160 (2009)**
  - Our state is the only state with energy code improvements requirements in statute.
  - Net Zero ready by year 2031!



Washington State Energy Code

Incremental Improvement Compared to Targets



	2006	2009	2012	2015	2018	2021	2024	2027	2030
Residential	100%	82.7%	76.1%		60.5%	42.4%			
Commercial	100%	86.8%	82.0%		69.6%	53.0%			
Target: 8.75 % savings compared to the 2006 WSEC	100%	91%	83%	74%	65%	56%	48%	39%	30%
Target: 14% savings compared to each previous code	100%	86%	74%	64%	55%	47%	41%	35%	30%

2021 Washington State Energy Code

POLICY OVERVIEW| WSEC – Heat Pumps, Heat Pumps, Heat Pumps!

RAPIDLY IMPROVING TECHNOLOGY

VARIABLE SPEED COMPRESSORS

WORKS IN COLD AMBIENT TEMPERATURES

> 300% MORE EFFICIENT THAN FOSSIL FUELS

HEAT PUMPS

Celebrate PUBLIC WORKS! APWA WA

POLICY OVERVIEW| WSEC - Active Load Management

Measure Title	Occupancy Group					
	Group R-1	**Group R-2**	**Group B**	**Group E**	**Group M**	**All Other**
1. Lighting load management	12	15	27	15	NA	NA
2. HVAC load management	29	24	42	23	13	26
3. Automated shading	NA	7	12	16	NA	NA
4. Electric energy storage	41	50	126	72	37	65
5. Cooling energy storage	13	10	14	19	NA	14
6. Service hot water energy storage	31	248	59	8	5	70
7. Building thermal mass	NA	NA	50	95	96	80

Washington State Clean Building Performance Standard (AKA Clean Building Act)

POLICY OVERVIEW | WA CBPS

- Provides operational energy performance requirements for new and existing buildings

- Applies to buildings over 50,000 sf (aka Tier 1 buildings)

- Sets **Energy Use Intensity Targets** based on **Building Type**

- HB5722 expanded CBA to include buildings between 20,000 sf to 50,000 sf (aka Tier 2 buildings): reporting only, not required to meet energy targets for the first compliance cycle

POLICY OVERVIEW| WA CBPS – Tier 1 Compliance Timeline

You are here!

...And every 5 years thereafter

POLICY OVERVIEW | WA CBPS – Tier 1 Penalties for Non-Compliance

- $ 5,000 + $ 1/sf.yr up to 18 months of accrued penalty
- For a 50,000 sf building, max penalty $ 80,000
- For a 250,000 sf building, max penalty $380,000

$$$$

- Exemption
- Meet the EUI target
- Investment Criteria
  - With EUI
  - Without EUI

POLICY OVERVIEW| WA CBPS – Strategy for Existing Buildings that Exceed Target Today

- Benchmark performance now so you understand if there is a problem, and extent
- Perform informal audits and create a plan for interventions
- Factor in Owner Plans for facility – additions, major renovations, change of program
- Implement interventions now, ahead of performance period
- Achieve target EUI, streamlining future compliance hoop jumping
- Benefits: Lower soft costs (e.g. avoid formal Level II audits), more time to plan

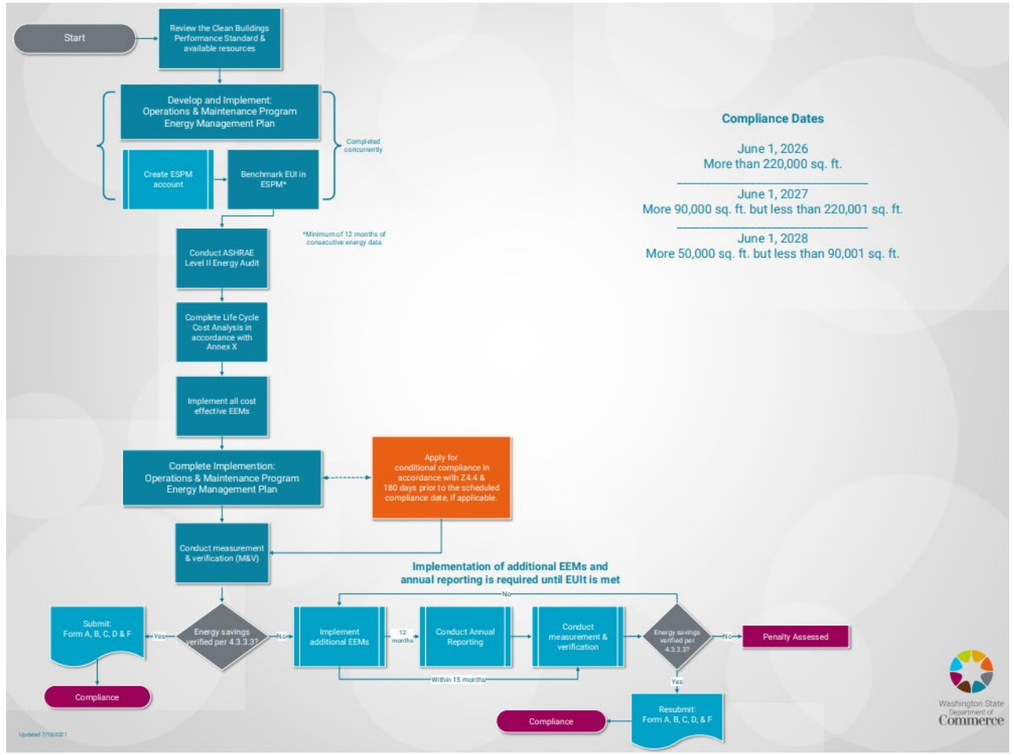
POLICY OVERVIEW| WA CBPS – Strategy for Existing Buildings that Exceed Target Today

EEM	EEM Brief Description	Annual Electricity Savings [kWh]	Annual Natural Gas Savings [Therms]	EUI Reduction [kBtu/sf.yr]	Annual Utility Savings [$]	Annual Electricity Savings [$]	Annual Gas Savings [$]	ROM COST [$]
EEM-01	Replace AHU-1 & AHU-2 DX Cooling Coils with Modern Equivalent	49,276		2.6	$ 3,745	$ 3,745	$ -	$ 1,700,000
EEM-02	RCx AHUs and Boiler Plant	29,408	684	2.6	$ 2,776	$ 2,235	$ 541	$ 5,000
EEM-03	Multizone AHU Controls and Sequencing Upgrade	58,150	8,716	9.0	$ 11,305	$ 4,419	$ 6,886	$ 50,000
EEM-04	Replace Chillers Add Heat Recovery	31,283	5,811	5.8	$ 6,968	$ 2,378	$ 4,591	$ 2,500,000
EEM-05	RCx CHW System and improve AHU-5 Cooling	16,169		0.5	$ 1,229	$ 1,229	$ -	$ 7,500
EEM-06	Optimize Kitchen HVAC	18,141		0.5	$ 1,379	$ 1,379	$ -	$ 50,000
EEM-07	RCx Heating System	519	1,453	1.2	$ 1,187	$ 39	$ 1,148	$ 60,000
EEM-08	Rooftop Photovoltaic	913,200		11.3	$ 69,403	$ 69,403	$ -	$ 1,950,000
EEM-09	Central Chilled Water System	473,380		5.9	$ 35,977	$ 35,977	$ -	$ 2,000,000
EEM-10	Heat pump conversion	(2,287,761)	138,599	22.0	$ (64,377)	$ (173,870)	$ 109,493	$ 8,000,000
EEM-11	Controls Modernization	539,311	20,790	14.2	$ 57,412	$ 40,988	$ 16,424	$ 2,700,000
EEM-12	Facility Wide Lighting Upgrades - Interior	422,705	(4,158)	3.7	$ 28,841	$ 32,126	$ (3,285)	$ 400,000
EEM-12	Facility Wide Lighting Upgrades - Exterior	31,703		0.4	$ 2,409	$ 2,409	$ -	$ 50,000
EEM-16	Existing Controls Optimization	359,541	13,860	9.5	38,274.4	27,325.1	10,949.3	$ 50,000
EEM-13	AHU-1 Modernization and Controls upgrade	112,703	3,519	8.1	$ 11,346	$ 8,565	$ 2,780	$ 1,958,589
EEM-14	AHU-2 Replacement	90,565	3,519	7.3	$ 9,663	$ 6,883	$ 2,780	$ 1,640,000
EEM-15	Replace Chillers	114,808		4.2	$ 8,725	$ 8,725	$ -	$ 750,000
		961,424	**201,575**	**115.8**	**$ 232,313**	**$ 73,068**	**$ 159,245**	**$ 24,871,089**

- Exemption
- Meet the EUI target
- Investment Criteria
  - With EUI
  - Without EUI

POLICY OVERVIEW | WA CBPS Investment Criteria with EUI

- Conduct Level II Energy Audit
- Identify EEMs
- Implement Cost Effective EEMs
- Benchmark after 12 months
- Conduct M&V (within 15 months)



- If 75% of projected savings in the audit not met, implement additional EEMs
- Benchmark after 12 months
- …….repeat until 75% project savings are met
- or assess penalty

POLICY OVERVIEW| WA CBPS Investment Criteria without EUI

- Conduct Level II Energy Audit
- Identify EEMs
- Implement Cost Effective EEMs
- Benchmark after 12 months
- Conduct M&V (within 15 months)

- If 75% of projected savings in the audit are met
- Conduct Commissioning
- Correct Performance issues, if identified
- Submit forms

Early Adopter Incentive Program

RCW 19.27A.220, State energy performance standard Early Adopter Incentive program began July 1, 2021 and applies to non-residential, hotel, motel and dormitory buildings greater than 50,000 sq. ft. An eligible building owner that demonstrates early compliance with the Clean Buildings Standard may receive a one-time base incentive payment of $.85 per gross square foot of floor area, excluding parking, unconditioned, or semi-conditioned spaces. Incentive funds are limited to $75 million.

HB 1976 – Increase Early Adopter Incentives

- Authorizes Commerce to provide greater incentive payments to building owners and include both Tier 1 and Tier 2 buildings
- If signed by Governor, goes into effect on June 6, 2024
- **BUT**, no fiscal appropriation is as yet tied to bill

Additional State and Local Policies

POLICY OVERVIEW| Other WA State Bills Tied to Clean Energy Transition

HB 1216 - Climate Commitment Act
Establishes a cap and invest program for greenhouse gas emissions.
Cap is set as an annual allowance budget that declines and limits emissions.
Emitters of 25,000 tons annually of carbon dioxide must comply by lowering emissions buying allowances or offset credits
The first auction raised > $1B
Directs revenues to CERA account (clean transportation projects/programs) & CIA Account (other low-carbon economy projects – grants!)

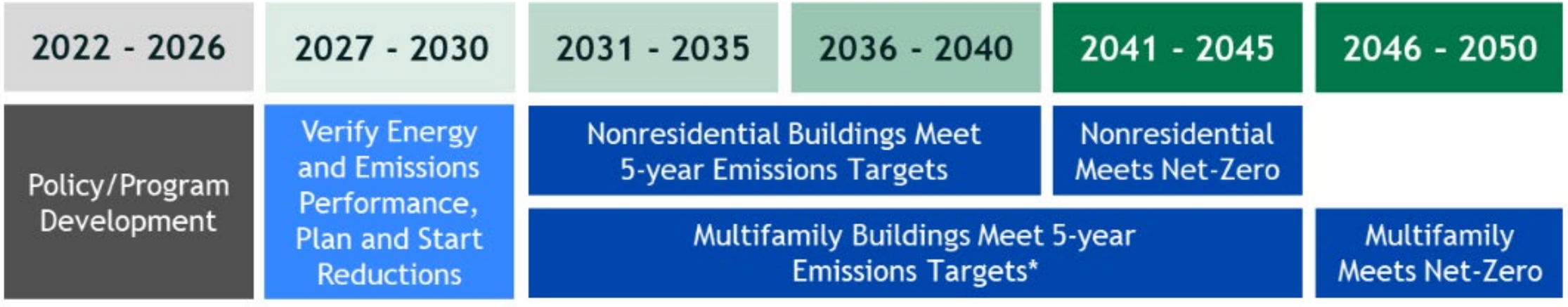
HB 2405 – C-PACER
Authorizes a capital provider (private entity) to provide financing (loans)for qualifying capital improvements such as energy efficiency and renewable energy, repaid as property assessments

HB 1390 – District Energy Systems
Provides CBPS compliance pathway for buildings served by district energy systems
Requires campus district energy system owners to develop a 15-year decarbonization plan

HB 1589 - 2023-24
Specifically requires PSE to speed shift toward clean (non fossil fuel) energy sources
80% by 2030
100% by 2045
or higher natural gas rates in near term

POLICY OVERVIEW| Seattle Building Emissions Performance Standard

Initial BEPS Deadlines (First Two Compliance Intervals)		
By October 1st of Year Listed	Verify & Report[1]	Meet Target
>220,001 SF	2027	2031
90,001 to 220,000 SF	2027	2032
50,001 to 90,000 SF[2]	2028	2033
30,001 to 50,000 SF	2029	2034
20,001 to 30,000 SF	2030	2035
1 - Verification & reporting also required 2031-35 and on-going for subsequent intervals.		
2 - Campus, portfolios and connected buildings due.		



Additional Funding Assistance for Energy Efficient and/or Clean Energy Retrofits

FUNDING OPPORTUNITIES| Inflation Reduction Act Elective Pay Eligible Tax Credits

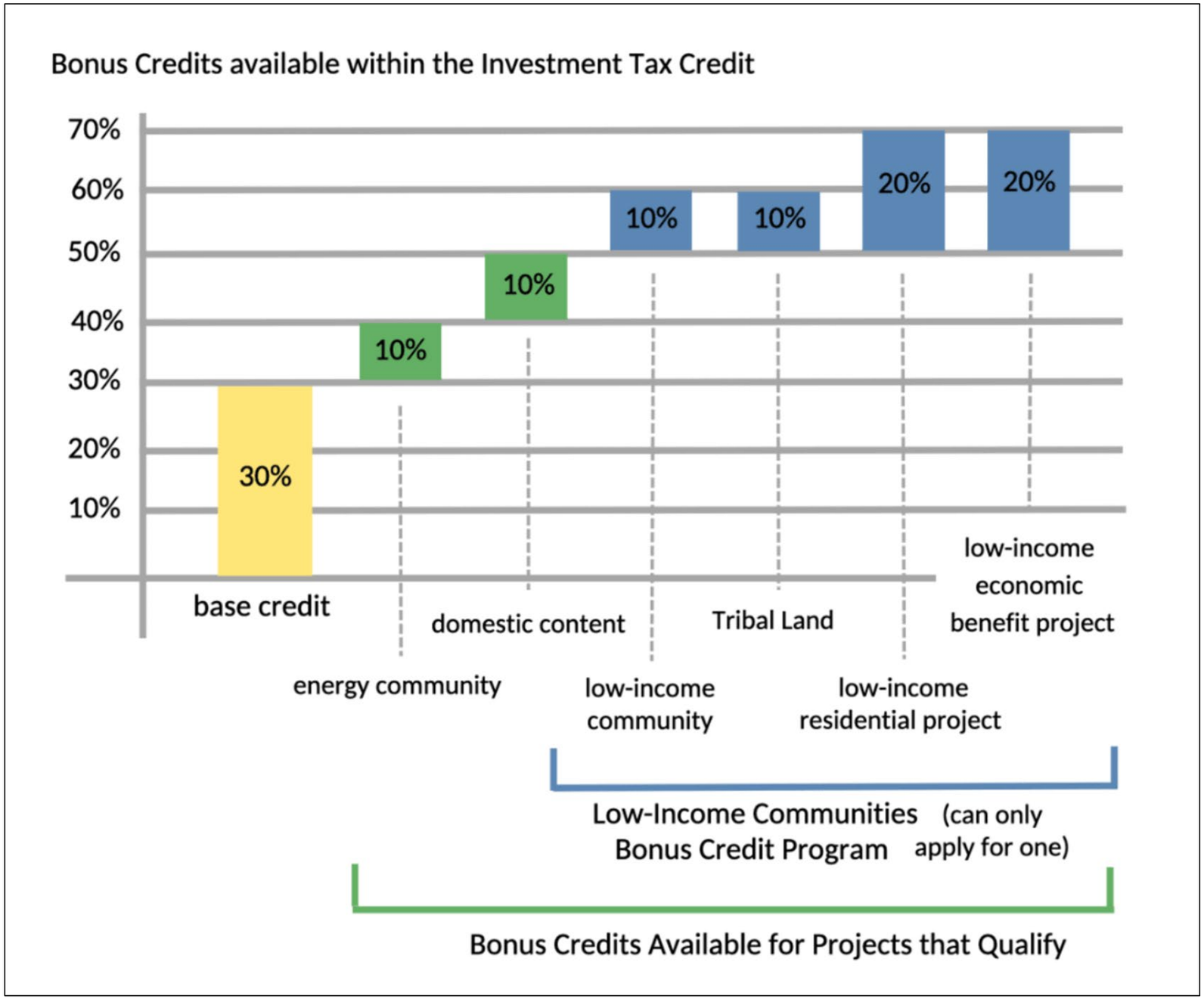
Clean Energy Tax Incentives: Elective Pay Eligible Tax Credits

The Inflation Reduction Act of 2022 ("IRA") makes several clean energy tax credits available to businesses; tax-exempt organizations; state, local, and tribal governments; other entities; and individuals. The IRA also enables entities to take advantage of certain clean energy tax credits through its elective pay provision (also colloquially known as direct pay). Elective pay allows several types of entities, such as tax-exempts and governments, to treat the amount of certain credits as a payment against tax on their tax returns and as a result receive direct payments for certain clean energy tax credits.

Energy Generation & Carbon Capture

Tax Provision	Description
Production Tax Credit for Electricity from Renewables (§ 45, pre-2025)	**For production of electricity from eligible renewable sources**, including wind, biomass, geothermal, solar, small irrigation, landfill and trash, hydropower, marine and hydrokinetic energy. **Credit Amount (for 2022):** 0.55 cents/kilowatt (kW); (1/2 rate for electricity produced from open loop biomass, landfill gas, and trash); 2.75 cents/kW if Prevailing Wage and Apprenticeship (PWA) rules are met [1,2,3,7]
Clean Electricity Production Tax Credit (§ 45Y, 2025 onwards)	**Technology-neutral tax credit for production of clean electricity**. Replaces § 45 for facilities that begin construction and are placed in service after 2024. **Credit Amount:** Starts in 2025, consistent with credit amounts under section 45 [1,2,3,6,7]
Investment Tax Credit for Energy Property (§ 48, pre-2025)	**For investment in renewable energy projects** including fuel cell, solar, geothermal, small wind, energy storage, biogas, microgrid controllers, and combined heat and power properties **Credit Amount:** 6% of qualified investment (basis); 30% if PWA requirements met [1,4,5,6,8]
Clean Electricity Investment Tax Credit (§ 48E, 2025 onwards)	**Technology-neutral tax credit for investment in facilities that generate clean electricity** and qualified energy storage technologies. Replaces § 48 for facilities that begin construction and are placed in service after 2024 **Credit Amount:** 6% of qualified investment (basis); 30% if PWA requirements met [1,4,5,6]
Low-Income Communities Bonus Credit (§ 48(e), 48E(h)) **Application required**	**Additional investment tax credit for small-scale solar and wind (§ 48(e)) or clean electricity (§48E(h)) facilities** (<5MW net output) on Indian land, federally subsidized housing, in low-income communities, and benefit low-income households. Allocated through an application process. **Credit Amount:** 10 or 20 percentage point increase on base investment tax credit [7]
Credit for Carbon Oxide Sequestration (§ 45Q)	**Credit for carbon dioxide sequestration** coupled with permitted end uses in the United States. **Credit Amount:** $12-36 per metric ton of qualified carbon oxide captured and sequestered, used as a tertiary injectant, or used, depending on the specified end use; $60-$180 per metric ton if PWA requirements met.[1,7]

FUNDING ASSISTANCE| Inflation Reduction Act – Investment Tax Credits



FUNDING ASSISTANCE| Energy Efficient Commercial Buildings Tax Deduction

What is it?
Building owners who place in service energy efficient commercial building property (EECBP) or energy efficient commercial building retrofit property (EEBRP) may be able to claim a tax deduction.

Who gets it?
The deduction is available to owners of qualified commercial buildings and designers of energy efficiency systems installed in buildings owned by certain tax-exempt and government entities.

How much savings are available?

- $0.50 per square foot for a building with 25% energy savings
- Additional $0.02 per square foot for each percentage point of energy savings above 25%
- Maximum of $1.00 per square foot for a building with 50% energy savings
- If local prevailing wages are paid and apprenticeship requirements are met, the deduction amount increases to 5 times the savings per square foot amount.

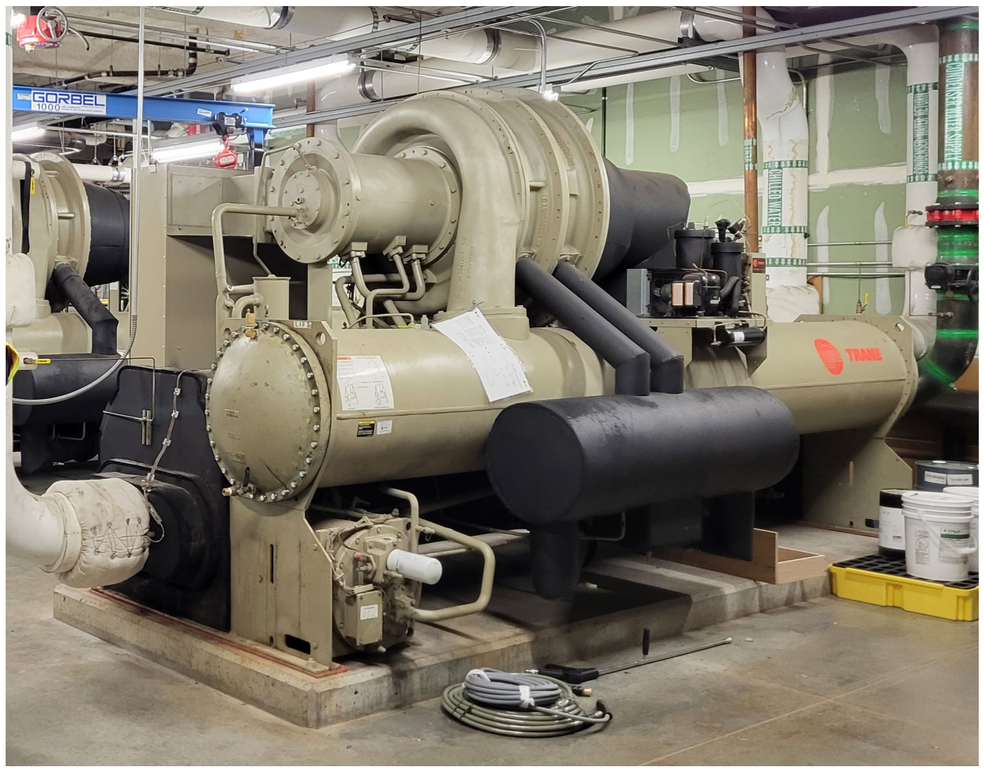
Savings compared to: ASHRAE Reference Standard 90.1-2019

Aligning Life Cycle Asset Management with Climate Mitigation Planning

Anyone have these systems in their buildings?

How about these systems?

How about these systems?

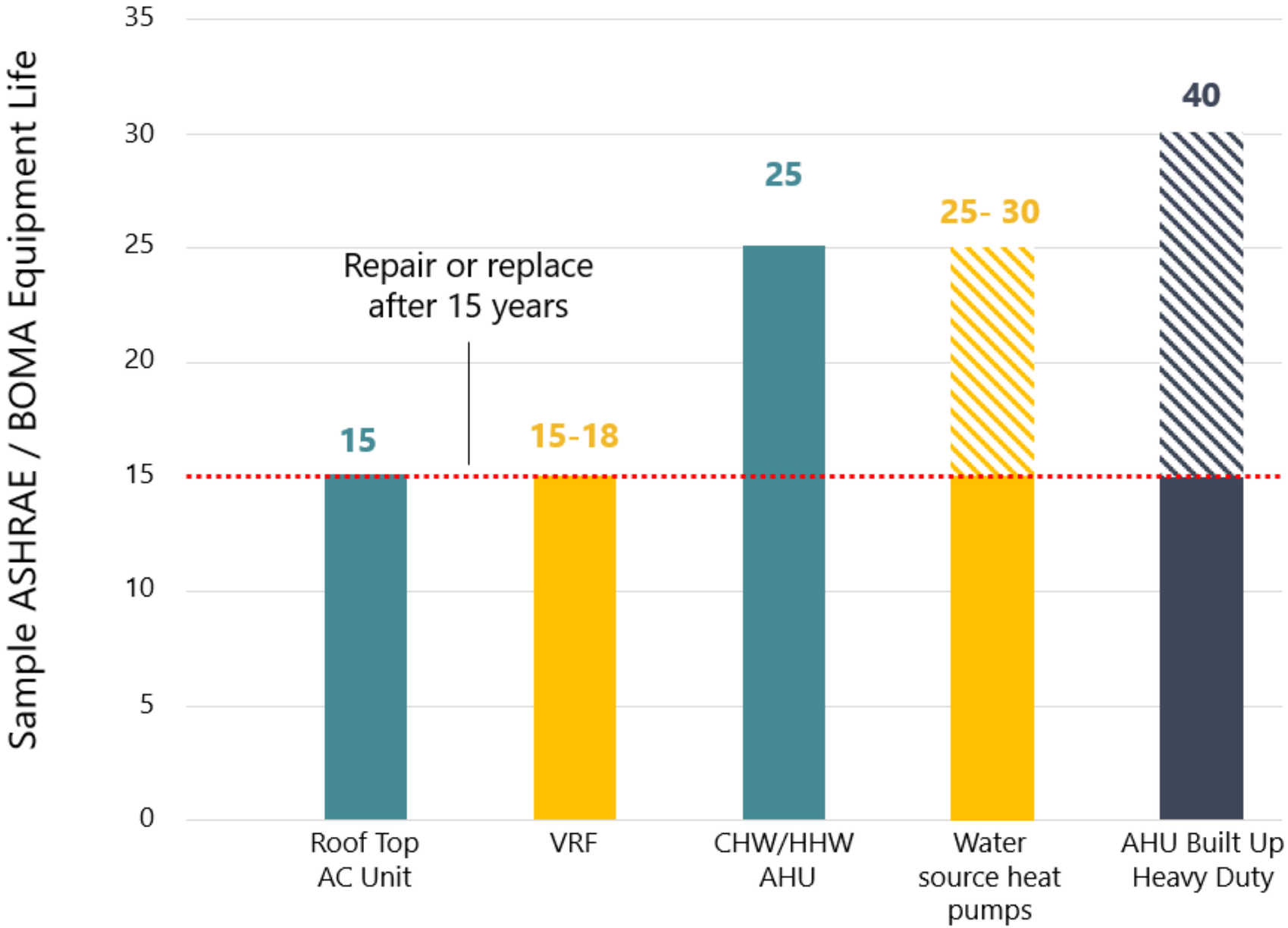


How about these….

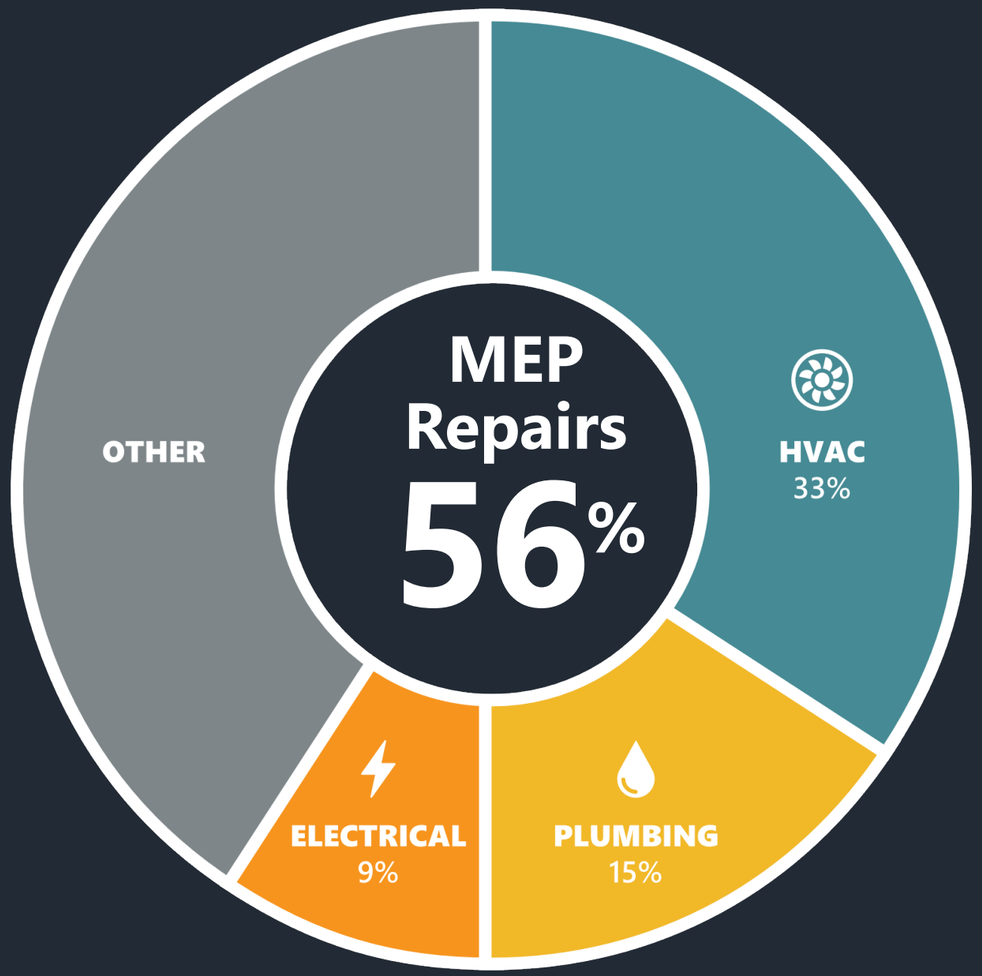
How about these….

Think Lifecycle!

- Longevity?
- How to replace?
- Can I rebuild it?
- What is the total life cycle cost?

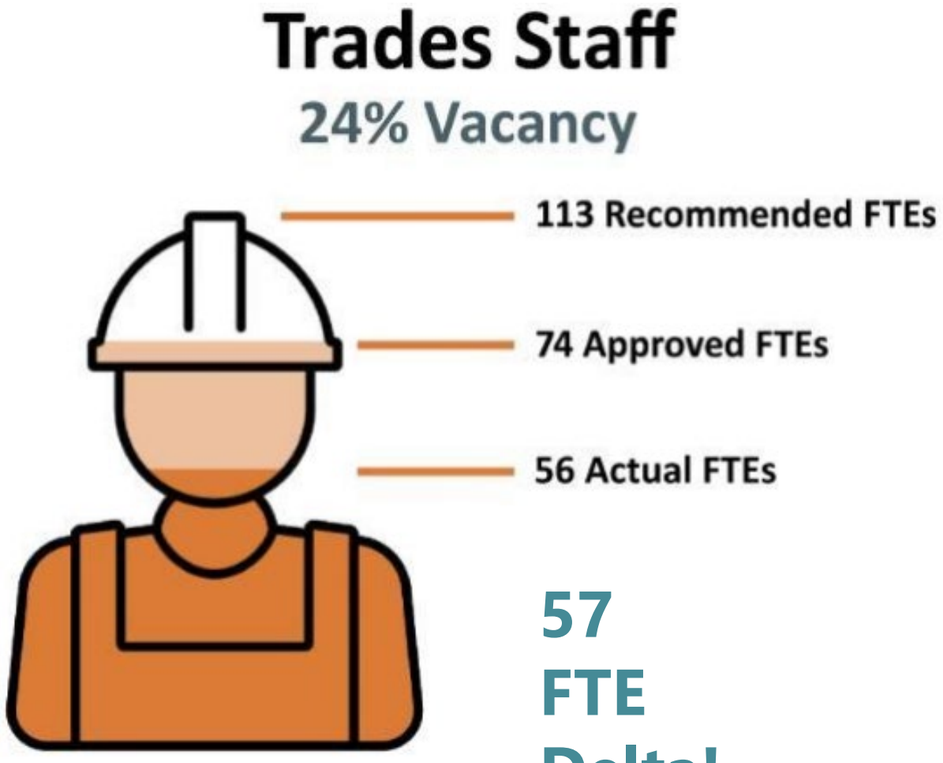


FCA Findings…MEP Deferred Maintenance



Deferred (Capital Renewal) is in the billions in Oregon alone…One University has a $650M backlog

Fewer trades, different skillsets, less money



57 FTE Delta!

3%
CRV Annually

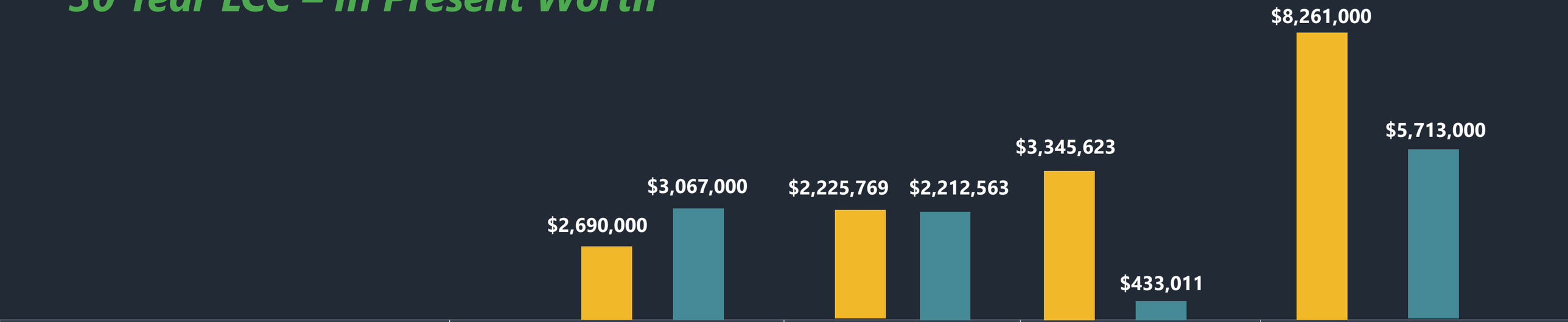
APPA Facility Maintenance Investment Benchmark

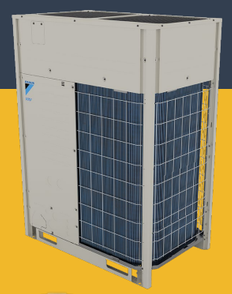
Doesn't everyone allocate 3% per year for capital renewal?

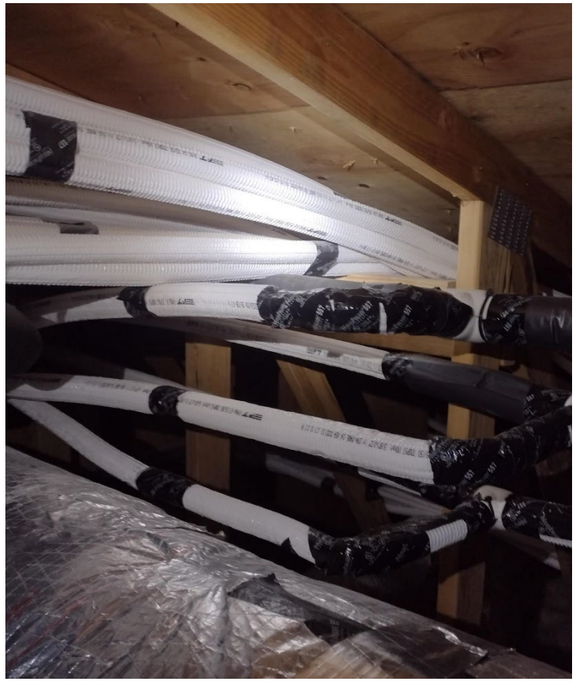
- **What are the maintenance requirements**
- **What is the system longevity ?**

Sample Life Cycle Cost Analysis

30 Year LCC – In Present Worth

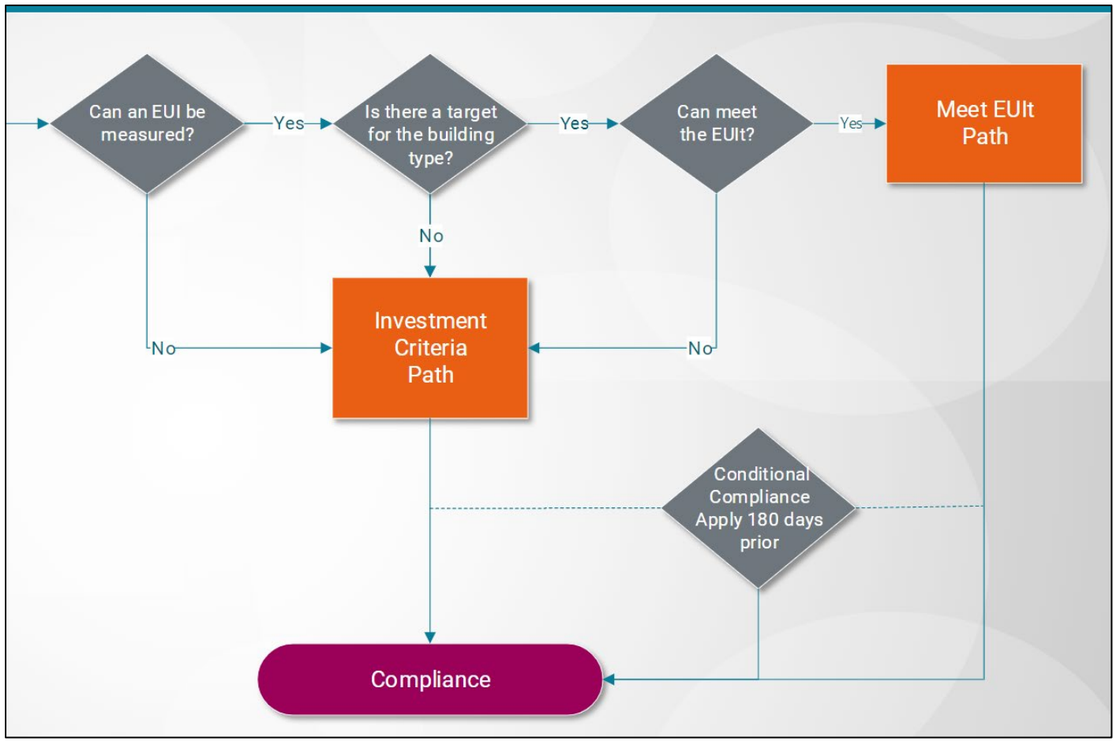


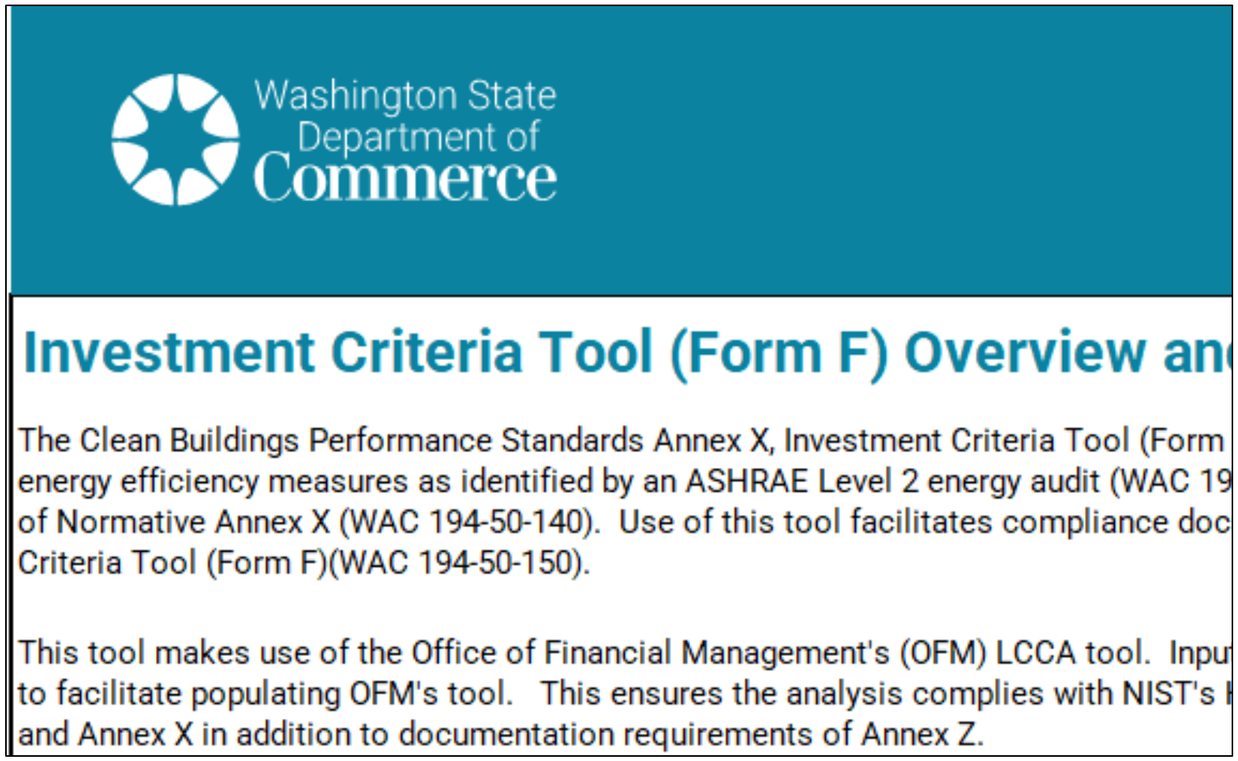
System Type	Estimated Initial Cost	Energy & Maintenance,	Renewal Cost	Total Cost of Ownership
 **VRF** Proposed Alternate	$2,690,000 **(-$377k Cost Reduction)**	$2,225,769 **($13,206 Added cost)**	$3,345,623 **(+2,912,612 Added Cost)**	$8,261,000 **($2,548,000 Cost Add)**
 **VAV AHU W/ Reheat & CHW** Baseline Design assumption	$3,067,000	$2,212,563	$433,011	$5,713,000



X2.3.2.1 Life cycle cost assessment on individual measures

How does CBA evaluate life cycle…




Washington State Department of Commerce

Investment Criteria Tool (Form F) Overview an

The Clean Buildings Performance Standards Annex X, Investment Criteria Tool (Form energy efficiency measures as identified by an ASHRAE Level 2 energy audit (WAC 19 of Normative Annex X (WAC 194-50-140). Use of this tool facilitates compliance doc Criteria Tool (Form F)(WAC 194-50-150).

This tool makes use of the Office of Financial Management's (OFM) LCCA tool. Inpu to facilitate populating OFM's tool. This ensures the analysis complies with NIST's and Annex X in addition to documentation requirements of Annex Z.

X2.3.2.1 Life cycle cost assessment

Select Life Cycle Variables:

- Remaining useful life of existing systems
- Maintenance costs

Values Entered in Constant Dollar Values Based on Year 2024

Baseline - Code Minimum or Like for Like Replacement Schedule of Existing Components Upgraded in the Alternative Scenario

Project Description

Initial Cost(s) of Baseline (Including soft-costs of each individual measure)		Implementation Cost	Life (yrs.)	Remaining Life (yrs.)
Rebuild boilers	$	4,000,000	10	4
Subtotal	**$**	**4,000,000**		

Baseline Annual Maintenance & Other Annual Non-Utility Costs		$ 15,000	
			Period (yrs.)
Baseline Periodic Major Maintenance Expenses (Not Applied to initial construction year)	10000		25

X2.3.2.1 Life cycle cost assessment

Select Life Cycle Variables:

- Installation costs

Estimate the total expected cost of implementation for each practical measure. Cost es

1. Material costs;
2. Labor costs, contracted or executed by employees;
3. Design fees;
4. Construction management, contracted or executed by employees;
5. Site-specific installation factors;
6. Permits;
7. Temporary services;
8. Testing, adjusting, and balancing;
9. Utility service upgrades;
10. Verification, as required in Section 9.2.2 only;
11. Commissioning;
12. Taxes;
13. Profit;
14. Any additional adjustments that significantly impact the cost estimate of the *EEM*.

Form-F Capital Expenditures, Non-Utility Operating Expenses, and Incentives

Energy Efficient Alternative - Bundle of Energy Efficiency Measures Hard and Soft Costs

Project Description	Boiler replacement with heat pump
Useful life of equipment for measure with longest life (years)	25
Study Period (years)	25

Cost of Implementing Bundle of Measures

	Description	**Amount ($)**	**Life**	**Years of Delay**
Material costs:				
Longest Life Measure	15	$ 1,500,000	25	
Labor costs (contracted or executed by employees), one-time cost				
		$ 3,900,000		
Site-specific installation factors, one-time costs				

X2.3.2.1 Life cycle cost assessment

Select Life Cycle Variables:

- Periodic Major Maintenance Requests

Periodic Major Maintenance Expenses

Description		Amount ($)	Life
Replace heat pump	$	3,000,000	15
Sub-totals	$	3,000,000	

ASHRAE Equipment Life Expectancy chart

ASHRAE is the industry organization that sets the standards and guidelines for most all HVAC-R equipment.
For additional info about ASHRAE the website is www.ashrae.org .

Equipment Item	Median Years
Air conditioners	
Window unit	10
Residential single or Split	
Package	15
Commercial through-the wall	15
Water-cooled package	15
Heat Pumps	
Residential air-to-air	15
Commercial air-to-air	15
Commercial water-to-air	19
Roof-top air conditioners	
Single-zone	15

Equipment Item	Median Years
Air terminals	
Diffusers, grilles, and registers	27
Induction and fan coil units	20
VAV and double-duct boxes	20
Air washers	17
Ductwork	30
Dampers	20
Fans	
Centrifugal	25
Axial	20

Equipment Item	Median Years
Air-cooled condensers	20
Evaporative condensers	20
Insulation	
Molded	20
Blanket	24
Pumps	
Base-mounted	20
Pipe-mounted	10
Sump and well	10
Condensate	15

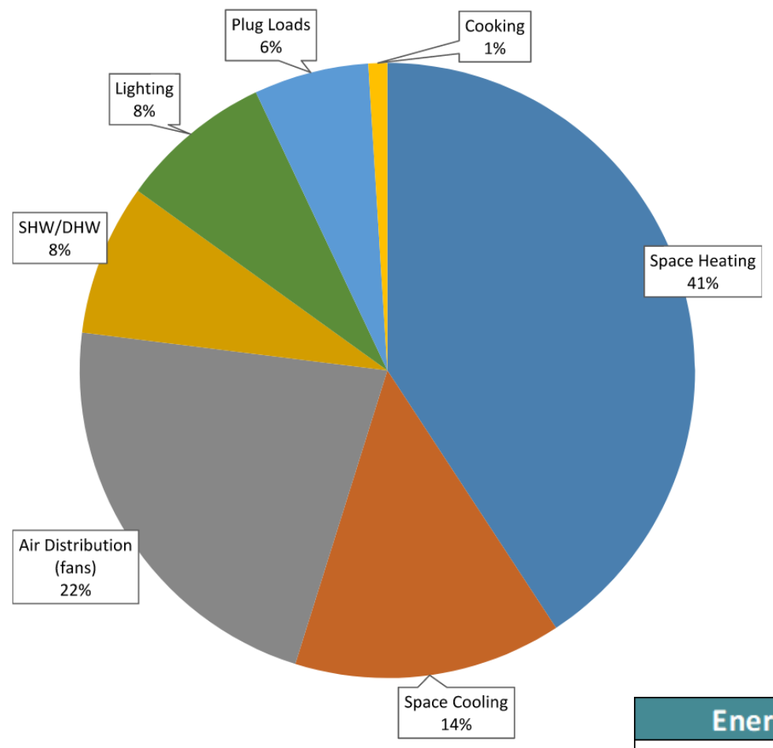
X2.3.2.2 Phased implementation. *building owner* is not required to replace a system or equipment before the end of the system's or equipment's *useful life*.

Life Cycle Cost Analysis		**BEST**
Alternative	Baseline	Alt. 1
1st Construction Costs	$ -	$ 8,000,000
PV of Capital Costs	$ 8,021,980	$ 8,000,000
PV of Maintenance Costs	$ 415,247	$ 830,495
PV of Utility Costs	$ -	$ -
Total Life Cycle Cost (LCC)	**$ 8,437,227**	**$ 8,830,495**
Net Present Savings (NPS)	**N/A**	**$ (393,267)**

Life Cycle Cost Analysis		**BEST**
Alternative	Baseline	Alt. 1
1st Construction Costs	$ -	$ 8,000,000
PV of Capital Costs	$ 8,431,089	$ 8,000,000
PV of Maintenance Costs	$ 415,247	$ 830,495
PV of Utility Costs	$ -	$ -
Total Life Cycle Cost (LCC)	**$ 8,846,336**	**$ 8,830,495**
Net Present Savings (NPS)	**N/A**	**$ 15,841**

Example 270k SFT Building

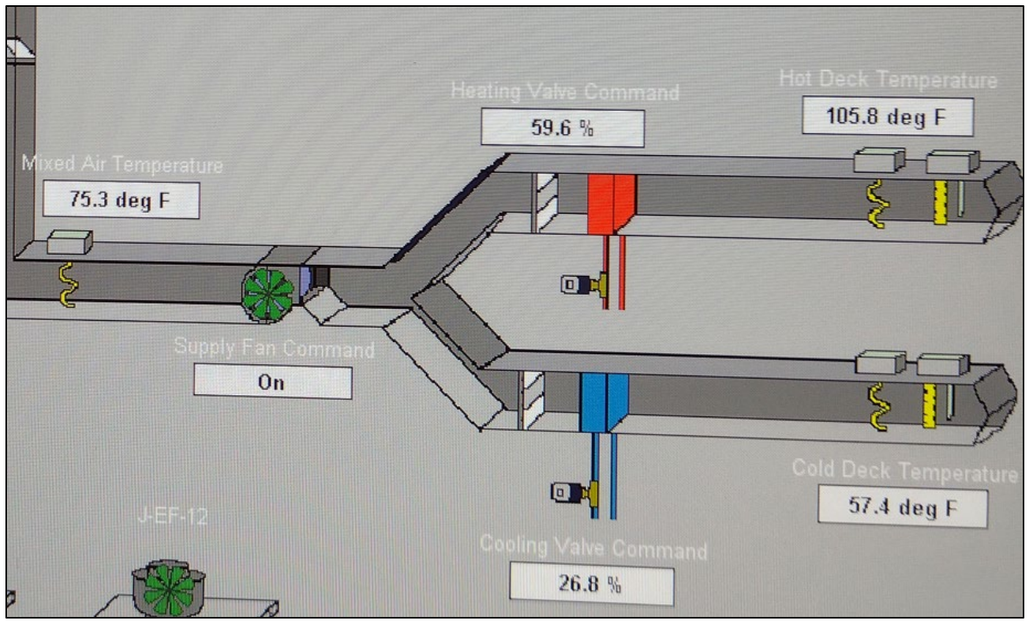
Total Energy Consumption

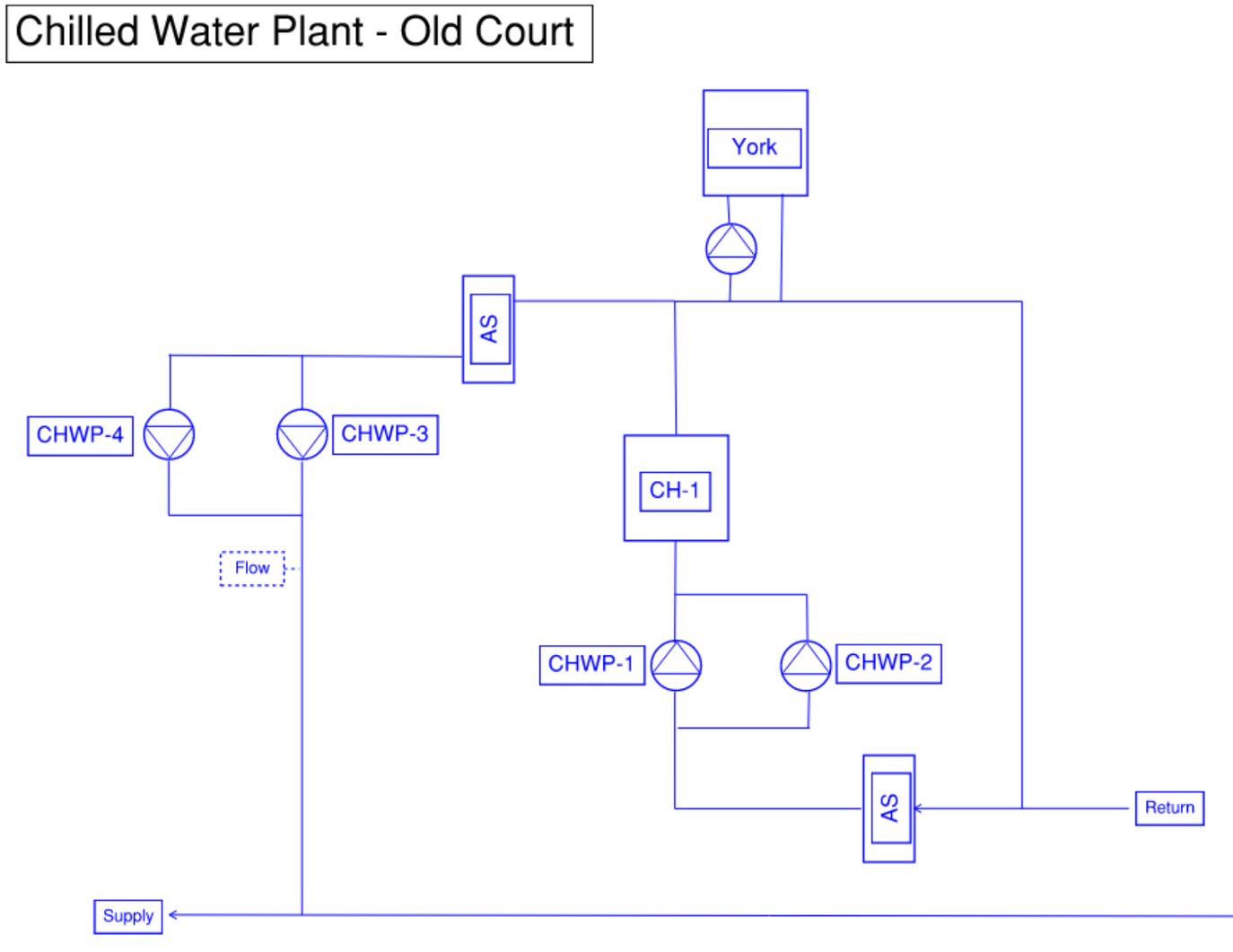


Energy Usage	EUI
Current EUI	122.9
Target EUI	95.2
Target Reduction	**27.7**

Energy Audit – Review Building Equipment

Energy Audit – Review Systems Review Controls





Scenario Based Capital Planning

Identified ASHRAE EEMS				Ca	
EEM	Building	EEM Brief Description	EUI Reduction [kBtu/sf.yr]	Scenario 1 - Low Cost/Medium Cost	Scenario 2 - Minimum Compliance
~~EEM-01~~	~~New Courts~~	~~Replace AHU-1 & AHU-2 DX Cooling Coils with Modern Equivalent~~	~~2.60~~		
EEM-02	New Courts	RCx AHUs and Boiler Plant	2.61	Yes	Yes
EEM-03	New Jail	Multizone AHU Controls and Sequencing Upgrade	8.96	Yes	Yes
EEM-04	New Jail	Replace New Jail Chillers Add Heat Recovery	5.78		
EEM-05	New Jail	RCx CHW System and improve AHU-5 Cooling	0.46	Yes	Yes
EEM-06	New Jail	Optimize Kitchen HVAC	0.52	Yes	
EEM-07	New Jail	RCx Heating System	1.23	Yes	
EEM-08	All Buildings	Rooftop Photovoltaic	11.33		Yes
EEM-09	All Buildings	Central Chilled Water System	5.90		
~~EEM-10~~	~~All Buildings~~	~~Heat pump conversion~~	~~22.01~~		
EEM-11	All Buildings	Controls Modernization	14.25		
EEM-12	All Buildings	Facility Wide Lighting Upgrades - Interior	3.73		
EEM-12	All Buildings	Facility Wide Lighting Upgrades - Exterior	0.39	Yes	
EEM-13	Old Courts/Jail	AHU-1 Modernization and Controls upgrade	8.10		
EEM-14	Old Courts/Jail	AHU-2 Replacement	7.27		
EEM-15	Old Courts/Jail	Replace Chillers	4.15		
EEM-16	All Buildings	Existing Controls Optimization	9.50	Yes	Yes

Energy Usage	EUI
Current EUI	122.9
Target EUI	95.2
Target Reduction	**27.7**

Capital Plan	Cost	Annual Utility Savings	EUI Reduction	Payback (Years)	CBA Compliance
Scenario 1 - Low Cost/Medium Cost	$ 272,500	$ 58,560	23.68	4.65	No
Scenario 2 - Minimum Compliance	**$ 2,062,500**	**$ 122,988**	**32.86**	**16.77**	**Yes**
Scenario 3 - AHU Replacement Focus	$ 7,500	$ 1,229	0.46	6.10	No
Scenario 4 - Distributed Cooling	$ 3,250,000	$ 15,693	9.93	207.09	No
Scenario 5 - Central Chilled Water	$ 1,950,000	$ 69,403	11.33	28.10	No

Refine Phase

Project Criteria

2.3 Goals

The overarching goal of the central chilled water plant is to centralize the chilled water plant, reduce life cycle costs, reduce maintenance, reduce energy, and free up space in the old court sally port and parking lot. Metrics of success include:

- Reduce site wide EUI by a minimum of 5.9 KBTU/SF.YR
- Provide infrastructure for a phased central chilled water plant starting with the Old Court/Old Jail.
- Return parking space to County currently utilized by mechanical equipment.
- Minimize or eliminate chilled water outages and construction impact.
- Provide a plant that can be expanded upon in future phases.

3.2.4 Recommended Vendors

The following vendors are recommended for equipment procurement. The equipment described was used in developing the Basis of Design (BOD). Manufacturer cutsheets are provided in the Appendices for the recommended equipment for this project.

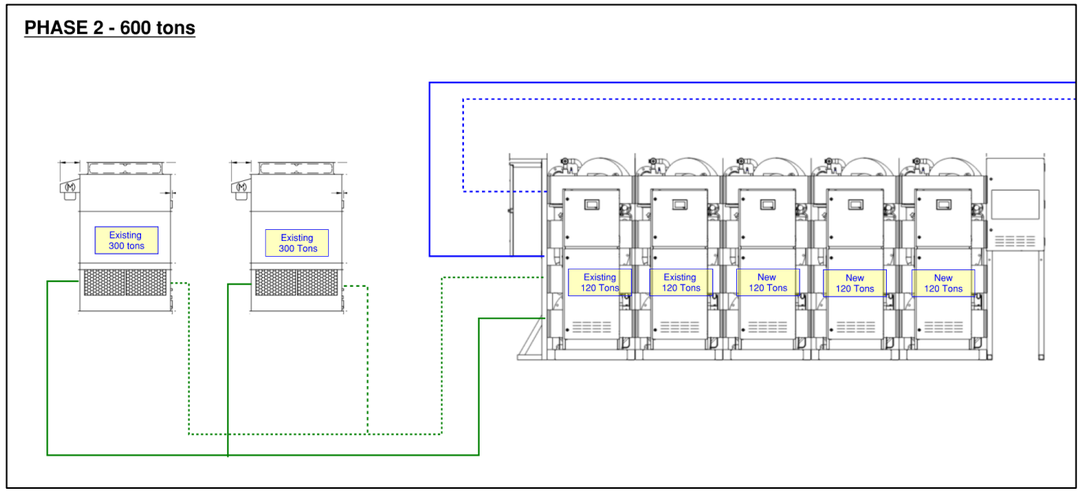
1. Trane Sinstesis Air Cooled Chillers RTAF
2. Trane Ascend Air Cooled Chillers
3. York YCAL Air Cooled Scroll Chiller.
4. York YVAA Air Cooled Variable Speed Screw Chiller
5. Multistack MSS-M Water cooled MagLev Modular chiller
6. Multistack ACF_M Air-Cooled MagLev Chiller

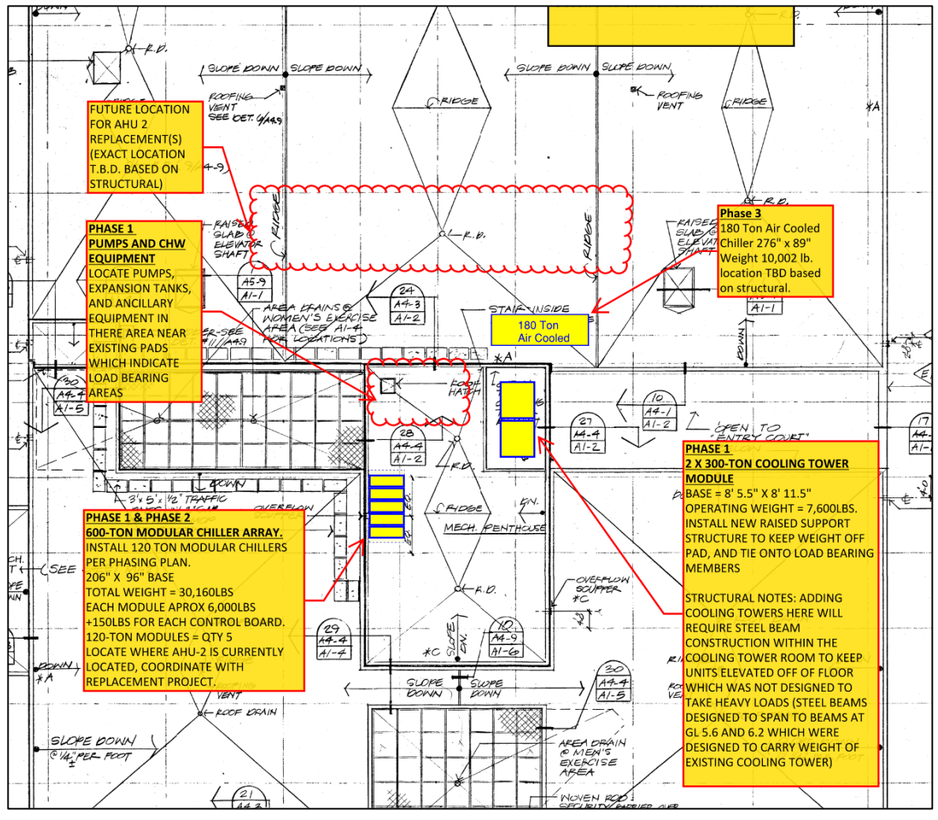
4 Execution Strategy

4.1.1 Procurement Strategy

The recommended procurement strategy for this project is either a Design-Bid-Build (DBB) or a General Contractor/Construction Manager (GC/CM) delivery method. Of paramount importance is the ability of the county to obtain a high quality design that will work across all phases.

Concept Design





Energy Audit

Energy Capital Planning

Refine Phase

C-100

DB RFP

Get the work done!

Compliance deadlines

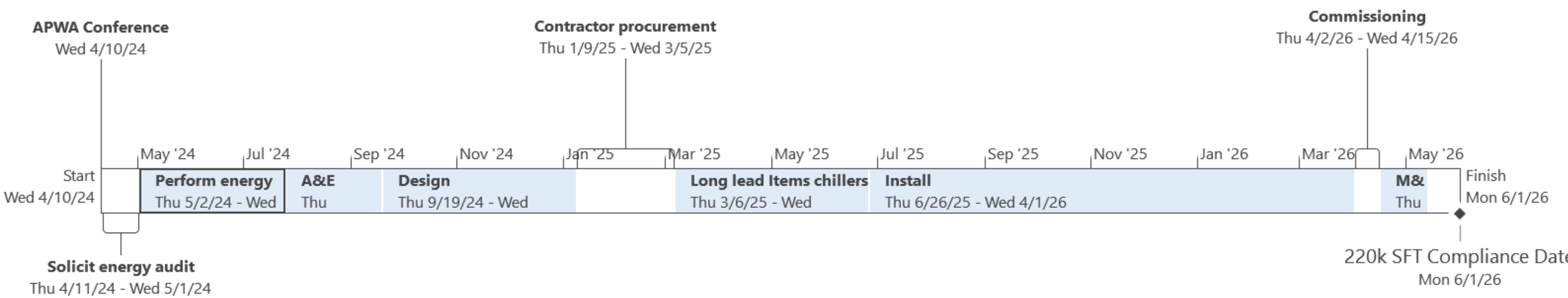
Tier 1 covered buildings reporting schedule:

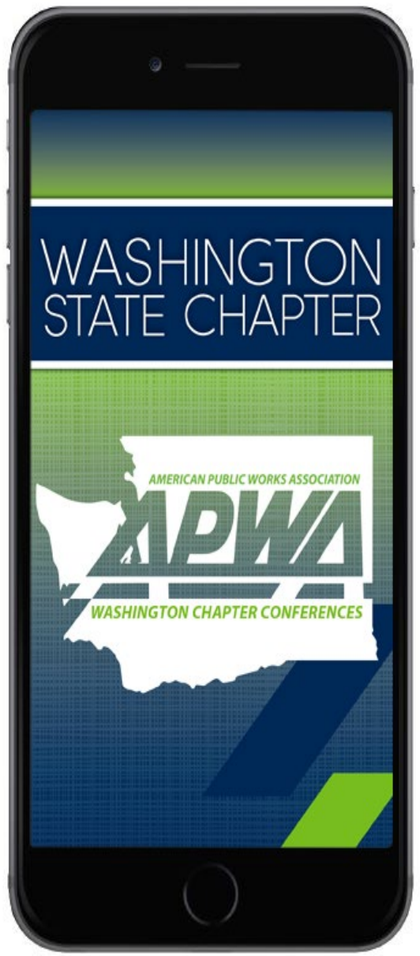
- **June 1, 2026** - More than 220,000 sq. ft.
- **June 1, 2027** - More than 90,000 sq. ft. but less than 220,001 sq. ft
- **June 1, 2028** - More than 50,000 sq. ft. but less than 90,001 sq. ft

Tier 2 covered buildings reporting schedule:

- **July 1, 2027** - More than 20,000 sq. ft. but less than 50,001 sq. ft. and All Multifamily residential buildings more than 20,000 sq. ft.

Meeting Compliance Workflow





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