



# Reducing Greenhouse Gas Emissions in Washington State Government

By

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For the

**Air Quality Program**

Washington State Department of Ecology

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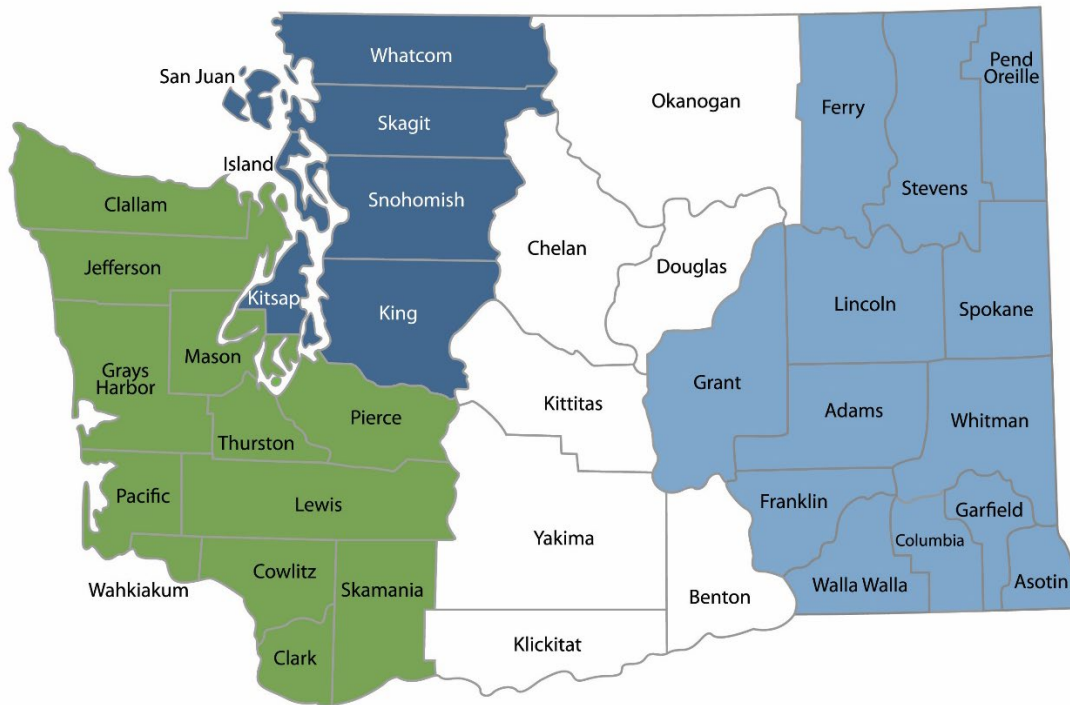
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## Map of Counties Served



|   |   |                                       |                                       |
|---|---|---------------------------------------|---------------------------------------|
| <b>Southwest Region</b><br>360-407-6300 | <b>Northwest Region</b><br>206-594-0000 | <b>Central Region</b><br>509-575-2490 | <b>Eastern Region</b><br>509-329-3400 |
|---|---|---------------------------------------|---------------------------------------|

| Region              | Counties served  | Mailing Address                        | Phone        |
|---------------------|--|--|--------------|
| <b>Southwest</b>    | Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum           | PO Box 47775<br>Olympia, WA 98504      | 360-407-6300 |
| <b>Northwest</b>    | Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom   | PO Box 330316<br>Shoreline, WA 98133   | 206-594-0000 |
| <b>Central</b>      | Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima   | 1250 W Alder St<br>Union Gap, WA 98903 | 509-575-2490 |
| <b>Eastern</b>      | Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman | 4601 N Monroe<br>Spokane, WA 99205     | 509-329-3400 |
| <b>Headquarters</b> | Across Washington  | PO Box 46700<br>Olympia, WA 98504      | 360-407-6000 |

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Washington State Department of Ecology  
Olympia, WA

**December 2022 | Publication 22-02-055**



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# Table of Contents

- List of Figures and Tables ..... 6**
  - Figures.....6
  - Tables.....7
- Acknowledgements ..... 8**
- Executive Summary ..... 10**
- Introduction..... 11**
  - Greenhouse Gas Limits .....13
  - Sources of greenhouse gas emissions.....14
  - Greenhouse gases included .....14
- Emissions from State Government Operations ..... 16**
  - Renewable energy systems .....18
  - Landscape, off-road, construction, and agricultural equipment .....18
  - Updates in reporting methodology .....18
- Greenhouse Gas Mitigation Summary ..... 20**
- Recommendations..... 25**
- Conclusion ..... 27**
- Appendix A - Agency Reports..... 28**
  - Agriculture, Department of.....29
  - Central Washington University .....31
  - Commerce, Department of .....36
  - Community Colleges of Spokane .....38
  - Corrections, Department of.....41
  - Eastern Washington University .....46
  - Ecology, Department of .....53
  - Enterprise Services, Department of.....57
  - Fish and Wildlife, Department of.....61
  - Health, Department of.....68
  - Labor and Industries, Department of .....71
  - Liquor and Cannabis Board .....75
  - Natural Resources, Department of .....80
  - Office of Financial Management.....93

|  |     |
|--|-----|
| Puget Sound Partnership .....                  | 95  |
| Seattle Community College.....                 | 96  |
| Social and Health Services, Department of..... | 102 |
| State Parks and Recreation Commission .....    | 107 |
| The Evergreen State College .....              | 115 |
| University of Washington .....                 | 119 |
| Veteran’s Affairs, Department of.....          | 127 |
| Washington Department of Transportation .....  | 130 |
| Washington State Patrol.....                   | 141 |
| Washington State University .....              | 144 |
| Western Washington University.....             | 147 |

# List of Figures and Tables

## Figures

|  |    |
|--|----|
| Figure 1. State agency emissions 2005–2021 and limits through 2050 .....                             | 17 |
| Figure 2. State agency emissions from buildings and transportation, 2018–2021 .....                  | 18 |
| Figure 3. Number of emission reduction strategies by category, 2020–2021.....                        | 21 |
| Figure 4. Number of emission reduction strategies by category, 2023–27.....                          | 22 |
| Figure 5. Number of emission reduction strategies by category to meet 2050 limit.....                | 22 |
| Figure 6. Department of Agriculture Historic Emissions and Future Limits.....                        | 29 |
| Figure 7. Department of Agriculture Emissions from Building and Fleets 2018–2021.....                | 30 |
| Figure 8. Central Washington University Historic Emissions and Future Limits .....                   | 31 |
| Figure 9. Central Washington University Emissions from Building and Fleets 2018-2021 .....           | 32 |
| Figure 10. Emissions from Building and Fleets 2020-2021 .....  | 36 |
| Figure 11. Spokane Community Colleges Historic Emissions and Future Limits.....                      | 38 |
| Figure 12. SCC Emissions from Building and Fleets 2018-2021 .....                                    | 39 |
| Figure 13. Dept. of Corrections Historic Emissions and Future Limits.....                            | 41 |
| Figure 14. Emissions from Building and Fleets 2018-2021 .....  | 42 |
| Figure 15. Eastern Washington University’s Historic Emissions and Future Limits .....                | 46 |
| Figure 16. Eastern Washington University’s Emissions from Building and Fleets 2018-2021 .....        | 47 |
| Figure 17. Dept of Ecology’s Historic Emissions and Future Limits .....                              | 53 |
| Figure 18. Dept. of Ecology’s Emissions from Building and Fleets 2018-2021 .....                     | 54 |
| Figure 19. Dept. of Enterprise Services’ Historic Emissions and Future Limits.....                   | 57 |
| Figure 20. Dept. of Enterprise Services’ Emissions from Building and Fleets 2018-2021.....           | 58 |
| Figure 21. Washington Dept. of Fish and Wildlife’s Historic Emissions and Future Limits.....         | 61 |
| Figure 22. Washington Dept. of Fish and Wildlife’s Emissions from Building and Fleets 2018-2021..... | 62 |
| Figure 23. Dept. of Health Historic Emissions and Future Limits.....                                 | 68 |
| Figure 24. Dept. of Health Emissions from Building and Fleets 2018-2021.....                         | 69 |
| Figure 25. Dept. of Labor and Industries Historic Emissions and Future Limits .....                  | 71 |
| Figure 26. Dept. of Labor and Industries Emissions from Building and Fleets 2018-2021 .....          | 72 |
| Figure 27. Liquor and Cannabis Board Historic Emissions and Future Limits .....                      | 75 |
| Figure 28. Liquor and Cannabis Board Emissions from Building and Fleets 2018-2021 .....              | 76 |
| Figure 29. Dept. of Natural Resources Historic Emissions and Future Limits.....                      | 80 |
| Figure 30. Dept. of Natural Resources Emissions from Building and Fleets 2018-2021.....              | 81 |
| Figure 31. Office of Financial Management Emissions from Building and Fleets 2020-2021.....          | 93 |

|   |     |
|---|-----|
| Figure 32. Seattle Community College Historic Emissions and Future Limits.....                      | 96  |
| Figure 33. Seattle Community Colleges Emissions from Building and Fleets 2018-2021 .....            | 97  |
| Figure 34. Dept. of Social and Health Services Historic Emissions and Future Limits .....           | 102 |
| Figure 35. Dept. of Social and Health Services Emissions from Building and Fleets 2018-2021 .....   | 103 |
| Figure 36. State Parks and Recreation Commission Historic Emissions and Future Limits .....         | 107 |
| Figure 37. State Parks and Recreation Commission Emissions from Building and Fleets 2018-2021 ..... | 108 |
| Figure 38. Proposed Clean Energy Transition Strategy and key supporting initiatives .....           | 112 |
| Figure 39. WSPRC greenhouse gas emission reduction targets for 2030, 2040 and 2050. ....            | 113 |
| Figure 40. The Evergreen State College Historic Emissions and Future Limits.....                    | 115 |
| Figure 41. The Evergreen State College Emissions from Building and Fleets 2018-2021 .....           | 116 |
| Figure 42. University of Washington Historic Emissions and Future Limits .....                      | 119 |
| Figure 43. University of Washington Emissions from Building and Fleets 2018-2021 .....              | 120 |
| Figure 44. UW Scope 1 Emissions for Seattle Campus .....  | 123 |
| Figure 45. Department of Veteran/s Affairs, 2021 MTCO2e from Buildings and Transportation .....     | 127 |
| Figure 46. Dept. of Transportation Historic Emissions and Future Limits .....                       | 130 |
| Figure 47. Dept. of Transportation Emissions from Building and Fleets 2018-2021 .....               | 131 |
| Figure 48. Washington State Patrol Historic Emissions and Future Limits.....                        | 141 |
| Figure 49. Washington State Patrol Emissions from Building and Fleets 2018-2021 .....               | 142 |
| Figure 50. Washington State University Historic Emissions and Future Limits .....                   | 144 |
| Figure 51. Washington State University Emissions from Building and Fleets 2018-2021 .....           | 145 |
| Figure 52. Western Washington University Historic Emissions and Future Limits.....                  | 147 |
| Figure 53. Western Washington University Emissions from Building and Fleets 2018-2021.....          | 148 |

**Tables**

|  |    |
|--|----|
| Table 1. Report contributors .....                           | 8  |
| Table 2. Global Warming Potentials .....                     | 15 |
| Table 3. DNR's transportation emissions by vehicle type..... | 81 |



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Table 1. Report contributors

| Agency   | Executive Lead                  | Emissions Reporter                         |
|--|---------------------------------|--|
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| <b>Eastern Washington University</b>                       | Mary Voves                      | Erik Budsberg                              |
| <b>Office of Financial Management*</b>                     | Nona Snell                      | Nadia Sarno                                |
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| <b>Spokane Community Colleges</b>                          | Andrew Lemberg                  | Reed Williams                              |
| <b>The Evergreen State College</b>                         | William Ward                    | Scott Morgan                               |
| <b>University of Washington</b>                            |                                 | Jecca Canet                                |
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| <b>Washington Department of Commerce*</b>                  | Nabila Gomes                    | Paul Burbage                               |
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| <b>Washington Department of Ecology</b>                    | James J. Pendowski              | Jacob Rain                                 |
| <b>Washington Department of Enterprise Services</b>        | Jason Marquis                   | Sharon Nyberg                              |
| <b>Washington Department of Fish and Wildlife</b>          | Jeff Davis                      | Hayley Edmonston                           |
| <b>Washington Department of Health</b>                     |                                 | Stephanie Miller                           |
| <b>Washington Department of Labor and Industries</b>       | Mark Young                      | Mark Young                                 |
| <b>Washington Department of Natural Resources</b>          | Annette Meyer                   | Amy Sikora                                 |
| <b>Washington Department of Social and Health Services</b> | Judy Fitzgerald                 | Ann Brunt                                  |
| <b>Washington Department of Transportation</b>             | Allison Camden                  | Lindsay Taylor                             |
| <b>Washington Department of Veterans Affairs</b>           | Alec Burkeimer                  | David Kinney                               |
| <b>Washington State Liquor and Cannabis Board</b>          | Jim Morgan/Matt Hanson          | Tia Livingood                              |
| <b>Washington State Parks and Recreation Commission</b>    | Ryan Karlson                    | Alexandra Sullivan                         |
| <b>Washington State Patrol</b>                             | Captain Chris Old               | Tanyah Williams                            |
| <b>Washington State University</b>                         | Joe Kline                       | Jason Sampson                              |
| <b>Western Washington University</b>                       | Joyce Lopes                     | Amanda Cambre                              |

\* Emissions from these agencies were not included when the 2005 baseline was established.

## Executive Summary

To address the threat of climate change to our state, the Washington Legislature established limits on greenhouse gas emissions in 2008 and updated these limits in 2020. As part of this response, the Legislature required state agencies to reduce their greenhouse emissions and report on their progress every two years.

State government is in a unique position to lead by example in reducing greenhouse gas emissions and combating climate change. This report provides information about reductions to greenhouse gas emissions by Washington state government through 2021.

The cumulative emissions of the largest 21 state agencies were 624,099 metric tons (MT) of carbon dioxide-equivalent in 2020 and 647,731 MT in 2021. In 2021, this is 13.3% below the 2020 state government emissions limit of 747,000 MT. Because the 2005 baseline consists of emissions from only these 21 largest-emitting agencies, only their emissions are counted toward achieving the emissions limits.

Collectively, Washington state government met its 2020 greenhouse gas emissions obligation on schedule and remained below the set limit in 2021. The COVID-19 pandemic likely contributed to the decline in emissions in both years. While emissions increased 4% from 2020 to 2021, overall emissions remained 17% lower in 2021 than prior to the pandemic. To meet the state's overall greenhouse gas emissions limits of 45% by 2030, 70% by 2040, and 95% by 2050, as required under RCW 70A.45.050, increased effort is required by all participants.

Most of the greenhouse gas emissions from state agencies come from buildings (i.e., electricity and natural gas used for power and heat) and transportation from state motor vehicles and the Washington ferry system. In 2021, buildings were responsible for 65% of agency emissions; the remaining 35% were from transportation.

This document includes emissions reports from 25 agencies in all, including the 21 agencies in the original baseline and 4 small agencies that have begun submitting greenhouse gas reports since the baseline was established. Reports for each agency are included in Appendix A. Only the original 21 largest agencies are counted toward the states progress in meeting its emissions limits. These 21 agencies were estimated to represent 93% of state agency emissions.

# Introduction

The Washington State Agency Greenhouse Gas (GHG) Emissions Reporting Program collects emissions data from state agencies, determines the total GHG emissions from state government, and compares this total to GHG emission limits established in statute. [RCW 70A.45.060\(3\)](#)<sup>2</sup> states that:

By December 31 of each even-numbered year beginning in 2010, the department shall report to the governor and to the appropriate committees of the senate and house of representatives the total state agencies' emissions of greenhouse gases for 2005 and the preceding two years and actions taken to meet the emissions reduction targets.

We are submitting this report in fulfillment of this requirement. The statute was updated in 2020 to include new requirements that agencies must also submit GHG mitigation reports to the Department of Ecology and the State Efficiency and Environmental Performance (SEEP) office at the Washington Department of Commerce starting June 1, 2022 and each even-numbered year after that ([RCW 70A.45.050](#)<sup>3</sup>). Information from these new mitigation reporting requirements is covered for the first time in this report.

## Background on Reporting Agencies and Establishing the Threshold

The original State Agency Climate Leadership Act passed in 2009 and was applied to 140 state agencies including all administrative, legislative, judicial, and elected offices, boards and commissions, community and technical colleges, and universities. 120 agencies submitted emissions reports that were published in 2010.

Early in 2016, Ecology initiated an interagency working group to reexamine the state agency greenhouse gas reporting requirements with the objective of improving reporting efficiency and data quality. The analysis of previously reported data suggested that the greenhouse gas emissions of only a small portion of agencies collectively accounted for most greenhouse gas emissions of all state agencies. To minimize the reporting burden to small agencies while still providing a realistic assessment of state agency emissions, the interagency working group established reporting thresholds based on the 2005 baseline data. Ecology determined that 27 agencies accounted for approximately 93% of state agency 2005 baseline emissions. The 2017 report focuses on these 27 agencies.

In 2019, the statute was updated, and a new threshold was established based on the emissions from 22 state agencies with the highest 2005 emissions. However, one of the 22 agencies has not reported since 2012 so in essence, 21 of the threshold agencies are actively reporting emissions data. Some agencies are committed to reporting emissions as participants of

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<sup>2</sup> <https://app.leg.wa.gov/rcw/default.aspx?cite=70A.45.060>

<sup>3</sup> <https://app.leg.wa.gov/rcw/default.aspx?cite=70A.45.050>

Executive Order 20-01.<sup>4</sup> The following list indicates agencies included in the current statutory threshold and an asterisk denotes those reporting as part of their SEEP commitment.

**Agencies & Higher Education with estimated 2005 baseline >10,000 MT**

Department of Transportation\*  
University of Washington+  
Washington State University+  
Department of Corrections\*  
Department of Social and Health Services\*  
Washington State Patrol\*  
Department of Enterprise Services\*  
Central Washington University  
Eastern Washington University  
Western Washington University  
Department of Fish and Wildlife  
Seattle Community Colleges  
State Parks and Recreation Commission+  
Spokane Community College  
The Evergreen State College  
Department of Natural Resources

**Agencies with estimated 2005 baseline > 5,000 MT**

Department of Health\*  
Liquor and Cannabis Board\*  
Labor and Industries\*  
Department of Veterans Affairs\*  
Department of Ecology\*

**Reporting agencies not captured by threshold**

Department of Agriculture\*  
Department of Commerce\*  
Department of Children Youth and Families\*  
Office of Financial Management\*

**Agency included in the threshold for which data is no longer reported**

Highline Community College

Each year, the Department of Ecology develops an emissions calculator to assist state agencies to aggregate their emissions, as required under RCW 70A.45.060(1). This calculator estimates

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<sup>4</sup> EO 20-01 Sate Efficiency and Environmental Performance  
[https://www.governor.wa.gov/sites/default/files/exe\\_order/20-01%20SEEP%20Executive%20Order%20%28tmp%29.pdf](https://www.governor.wa.gov/sites/default/files/exe_order/20-01%20SEEP%20Executive%20Order%20%28tmp%29.pdf)

emissions from major sources within state government operations, specifically energy sources from buildings and transportation fleets. Emission factors embedded in the calculator align with other greenhouse gas reporting programs in Ecology. These emissions factors are regularly updated in response to regulatory changes or updates in GHG accounting standards specified by the Intergovernmental Panel on Climate Change. Agencies must return a completed calculator to Ecology by June 30 of each year.

Ecology collaborates with Commerce's SEEP office to produce this report. The SEEP office produces a template for state agencies to report their emission reduction strategies. The summarized results of these reports are included in this report, alongside each agency's emissions profile. The emissions calculator and emissions reduction strategy template are available on Ecology's website.<sup>5</sup>

This year, state agencies were asked to provide voluntary information on renewable energy systems in their buildings. The Emissions for State Government Operations section includes a summary of this information and additional details can be found on individual agency pages.

Agencies were also asked to voluntarily report fuel consumed for landscape equipment, off-road vehicles, construction vehicles and equipment, agricultural equipment, and other uses not reported elsewhere. Because the 2005 baseline data for this program did not include these categories, they are not added to the agency totals in this report but are summarized in the Emissions for State Government Operations section.

## Greenhouse Gas Limits

The 2005 baseline reflects emissions from the 22 largest agencies. The 2005 emissions for these agencies were 879,036 MT, or about 93% of all state agency emissions. In recent years, four smaller agencies have begun reporting their emissions as well, though not all have established 2005 baselines.

In March 2020, the Washington Legislature updated both the greenhouse gas limits and the mitigation reporting requirements for state agencies with the passage of Engrossed Second Substitute House Bill 2311 (2020). These new limits for state agency emissions of greenhouse gases are found in [RCW 70A.45.050](#).<sup>6</sup>

- By 2020, reduce emissions to 15% below 2005 levels.
- By 2030, reduce emissions to 45% below 2005 levels.
- By 2040, reduce emissions to 70% below 2005 levels.
- By 2050, reduce emissions to 95% below 2005 levels and achieve net zero greenhouse gas emissions by state government as a whole.

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<sup>5</sup> <https://ecology.wa.gov/Air-Climate/Climate-change/Tracking-greenhouse-gases/Greenhouse-gas-reporting/State-agency-greenhouse-gas-reports>

<sup>6</sup> <https://app.leg.wa.gov/rcw/default.aspx?cite=70A.45.050>

This report is the first assessment of progress by state agencies to meet these new requirements.

HB 2311 implemented recommendations made by Ecology in its "[Washington State Greenhouse Gas Reduction Limits](#)" report that were based on a review of leading global and national assessments.<sup>7</sup> The new limits aim to avoid the worst consequences of climate change.

The 2020 limit is calculated as 15% of the 879,036 MT baseline emissions, which equals 747,181 MT. The 2030 limit is 45% below 2005, or 483,470 MT.

## Sources of greenhouse gas emissions

State agencies reported on their largest sources of direct and indirect emissions, including:

- Natural gas, electricity, and other fuels used in buildings and stationary equipment owned or operated by the state agency.
- Diesel, gasoline, and other fuels used in vehicles and equipment owned and operated by the state agency, including light and heavy duty, on-road vehicles, non-road or off-road vehicles, ferries, boats, and aircraft.

## Greenhouse gases included

State agencies reported on the three main greenhouse gases emitted from state agency activities:

1. Carbon dioxide (CO<sub>2</sub>)
2. Methane (CH<sub>4</sub>)
3. Nitrous oxide (N<sub>2</sub>O)

Greenhouse gas inventories use a common metric—carbon dioxide equivalent (CO<sub>2</sub>e)—to report greenhouse gas emissions. For any quantity and type of greenhouse gas, CO<sub>2</sub>e signifies the amount of carbon dioxide that would have the same global warming impact. National and global results are usually reported in millions of metric tons of carbon dioxide equivalent, or MMTCO<sub>2</sub>e. The Global Warming Potential (GWP) is the factor used to convert all greenhouse gases to this common unit.

Because Washington's state agencies produce less than 1 MMTCO<sub>2</sub>e, we instead report results in metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e, which we have shortened to MT to improve readability). Table 2 describes the global warming potential factors used in this report for each type of greenhouse gas.

In estimating greenhouse gas emissions for national or state inventories, both the U.S. Environmental Protection Agency (EPA) and Washington state comply with international greenhouse gas reporting standards under the United Nations Framework Convention on

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<sup>7</sup> <https://apps.ecology.wa.gov/publications/SummaryPages/1902031.html>

Climate Change (UNFCCC), and currently use the 100-year GWP values from the [Fourth Assessment Report of the Intergovernmental Panel on Climate Change \(IPCC\)](#)<sup>8</sup> and the EPA's [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016](#):<sup>9</sup>

Table 2. Global Warming Potentials

| Greenhouse Gas                    | GWP |
|-----------------------------------|-----|
| Carbon dioxide (CO <sub>2</sub> ) | 1   |
| Methane (CH <sub>4</sub> )        | 25  |
| Nitrous Oxide (N <sub>2</sub> O)  | 298 |

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<sup>8</sup> <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>

<sup>9</sup> [https://www.epa.gov/sites/default/files/2018-01/documents/2018\\_annex\\_6.pdf](https://www.epa.gov/sites/default/files/2018-01/documents/2018_annex_6.pdf)



## Emissions from State Government Operations

State government is in a unique position to lead by example in reducing greenhouse gas emissions and combating climate change.

In 2019, prior to the COVID-19 pandemic, emissions from state agencies totaled 778,414 MT. In 2020, emissions dropped 20% to 624,099 MT and in 2021 rose 4% to 647,731 MT. In 2021, state agencies collectively remained 13.3% below the 2020 limit.

State agencies must reduce an additional 164,261 MT (34%) to meet the 2030 limit of 483,470 MT (or 45%) below 2005 levels.

In 2021, buildings were responsible for 421,569 MT (65%) of state agency emissions and transportation fleets were responsible for 226,161 MT (35%). Emissions from Washington State Ferries totaled 144,603 MT, which was 64% of transportation emissions and 22% of total state agency emissions.

In 2020, 16 of the 21 agencies included in the original baseline had emissions below their individual 2020 limits. In 2021, 15 agencies remained below their 2020 limits. The COVID-19 pandemic caused a significant drop in agency emissions. However, it is notable that prior to the pandemic, 12 agencies had already met the 2020 limit in 2019. The combined state agency emissions in 2019 were just 4 % over the limit.

Figure 1 shows emissions from Washington state government operations from 2005 to 2021 and the future emission reduction limits.

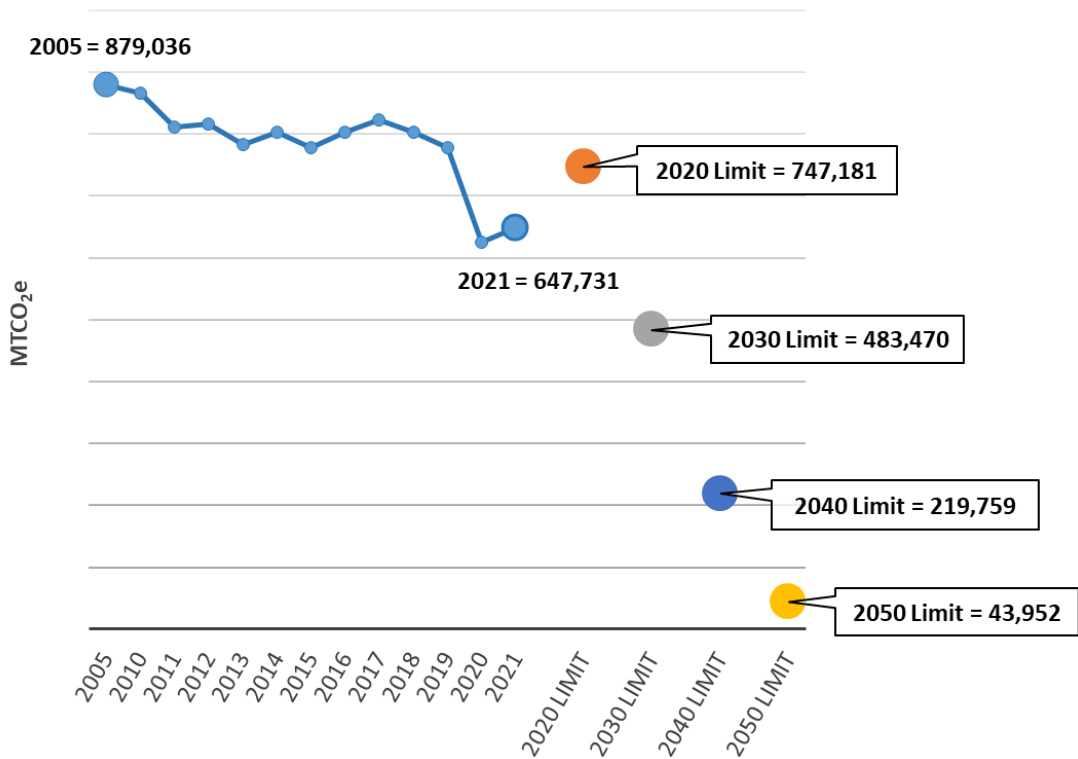


Figure 1. State agency emissions 2005–2021 and limits through 2050

Figure 2 shows total state agency emissions from buildings and transportation, with a separate view of ferries. Washington State Ferries represent 63 % of agency transportation emissions and 22 % of total state agency emissions.



Figure 2. State agency emissions from buildings and transportation, 2018–2021

## Renewable energy systems

This year, agencies were asked to voluntarily report renewable energy systems on their buildings. Nine agencies responded that they have solar photovoltaics on one or more buildings. Several agencies do not track energy production from these systems; however, those that do reported a total of 335,204 kWh of electricity generation in 2021. Two agencies reported using ground-source heat pumps (geothermal heat pumps), and one reported using an unspecified renewable thermal energy source.

## Landscape, off-road, construction, and agricultural equipment

Agencies were also asked this year to voluntarily report fuel purchases for landscape equipment, off-road vehicles, construction vehicles and equipment, agricultural or other equipment uses not reported elsewhere. Two agencies provided additional detail about fuel use by this equipment. The quantity they reported totaled about 40,000 gallons of gasoline, diesel, and propane, which equals approximately 380 MT.

## Updates in reporting methodology

There is significant variability in the GHG emissions associated with electricity between different electric utilities, depending on how they generate their power. In past reports, some agencies have used electricity emission factors specific to their local electric utility. However,

many state agencies operate across the entire state and are not able to report utility specific electricity emissions. This year and going forward, all agencies will use a single emission factor based on a three-year rolling statewide average. This may result in emissions reported in this document that differ from other reports agencies may produce. While electricity emissions are not determined by state agencies, some have opted to sign power purchase agreements to participate in utility green power programs like Puget Sound Energy's Green Direct or Avista's Solar Select. Weather and regional electricity demand cause these emissions to fluctuate significantly from year to year, often overshadowing agency direct emission reduction activities. However, these fluctuations will be reduced, and electricity sector emissions will decrease significantly in the future as the Clean Energy Transformation Act is implemented and electric utilities shift to lower carbon sources of electric power generation.

This report is no longer counting Renewable Energy Credits as an offset for electricity emissions. Electricity must be purchased through a green power contract to be reported as zero emissions.

State agencies have made progress toward streamlining their emissions reporting processes, maintaining records, aligning leadership and front-line staff, and showing a positive commitment to reporting and mitigation planning.

The purpose of emission reporting is to inform agency decision-makers and the Legislature where state agency emissions come from and to guide emission reduction efforts. Ecology and the reporting agencies continue to learn and evolve our processes for collecting emissions data and improve our accounting methodologies. Agencies occasionally identify new sources of emissions, such as when a meter is added to a newly identified building, or a new fuel purchasing account is uncovered. Ecology encourages and does not penalize the inclusion of new emissions data sources and methodology improvements, even if those sources were not included when the baselines were established and cause the appearance of emissions increases.

## Greenhouse Gas Mitigation Summary

In addition to annually reporting greenhouse gas emissions, state agencies must submit a report on mitigation activities. New reporting requirements were adopted in 2020 and took effect on June 1, 2022. In each even-numbered year, agencies must report to Ecology and the SEEP office the following information:

- Emission reduction actions implemented during the previous two years
- Activities planned for the next two biennia to meet emission limits
- The agency's long-term strategy to meet emission limits, updated as appropriate

Ecology and the SEEP office reviewed the mitigation information from each agency. This section reports aggregated findings, and Appendix A includes summaries of each agency's emissions and mitigation activities.

The state agencies and institutions included in this report provide a wide array of services to communities in Washington, from operating hospitals, laboratories, and dormitories to office buildings and classrooms.

The following figures show the number of times emission reduction strategies were mentioned within each of the major emission-source categories. From the graphics we can see agencies are developing more strategies for the built environment than other emission categories. These graphics do not estimate emission reductions, rather they reflect the focus and effort agencies are putting on these sources of emissions.

Figure 3 shows the relatively substantial number of strategies agencies implemented in the last biennium related to buildings. Environmentally Preferred Purchasing (EPP) is the purchasing of [Energy Star](https://www.energystar.gov/products)<sup>10</sup> appliances or more energy efficient equipment, including computers and monitors, to help limit energy consumption.

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<sup>10</sup> <https://www.energystar.gov/products>

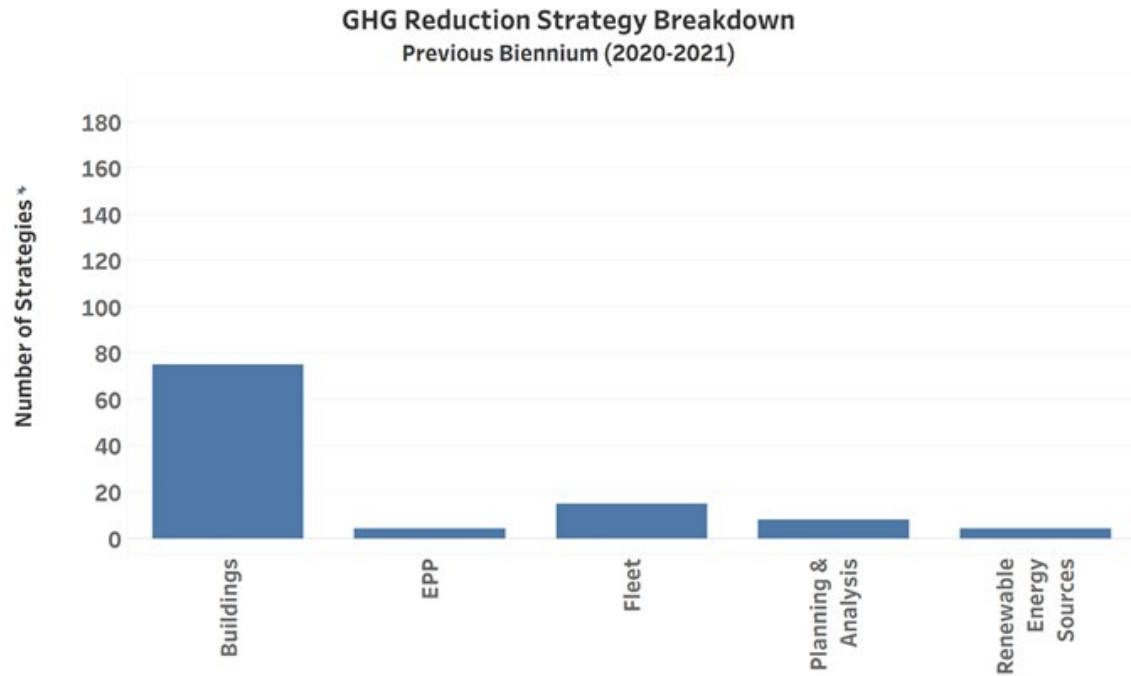


Figure 3. Number of emission reduction strategies by category, 2020–2021

Figure 4 shows the number of strategies agencies are planning for emission reductions over the next two biennia. Buildings remain a prominent focus of agency efforts.

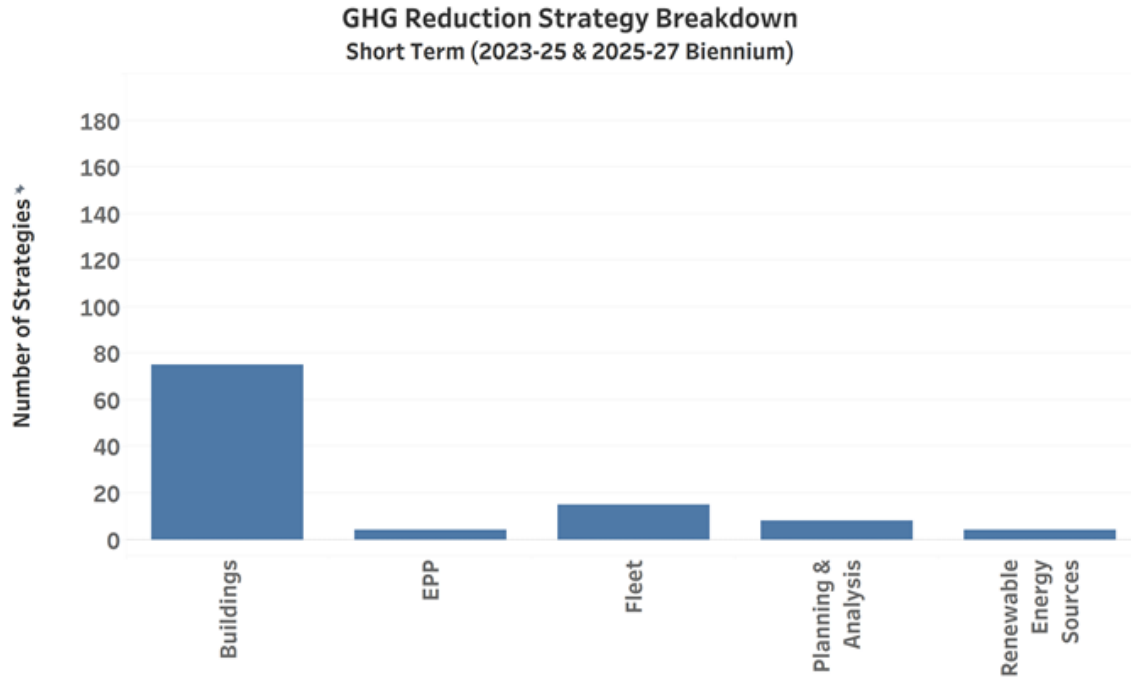


Figure 4. Number of emission reduction strategies by category, 2023–27

State agencies are continuing to focus their efforts on buildings to reach their 2050 emission limits, as shown in Figure 5.

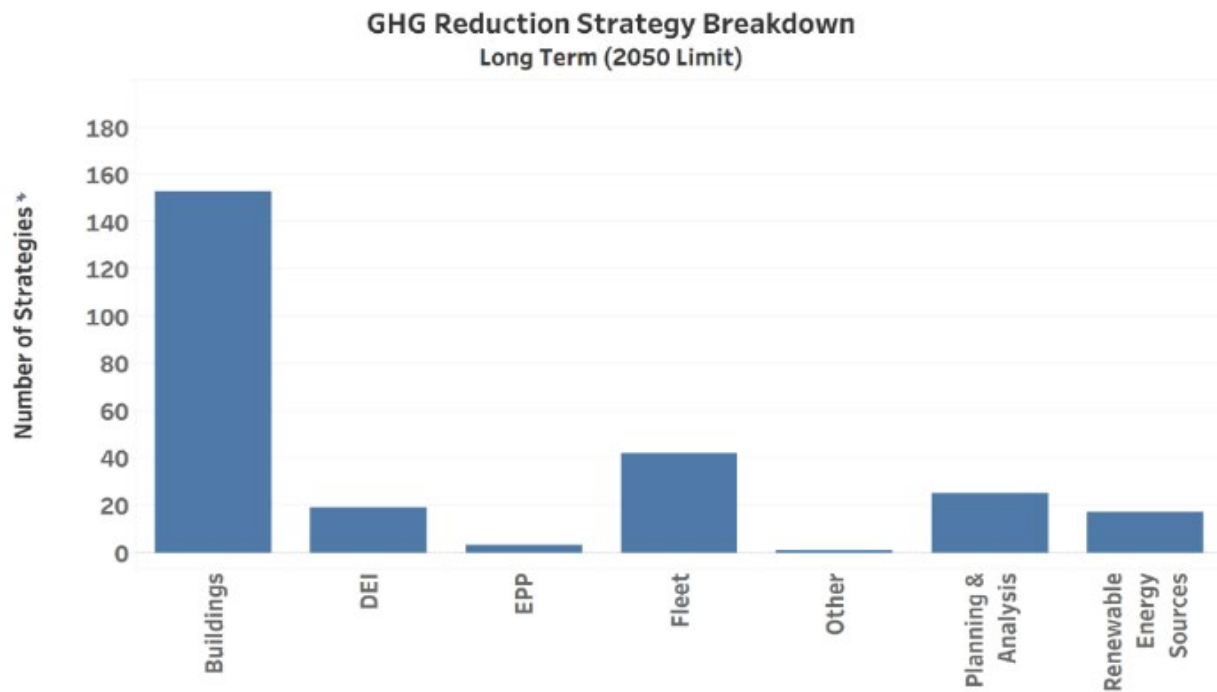


Figure 5. Number of emission reduction strategies by category to meet 2050 limit

State agencies are exploring how to integrate diversity, equity, inclusion, and respect (DEIR) with efforts to reduce GHG emissions (e.g., by implementing the Healthy Environment for All Act, or by incorporating the Washington Environmental Health Disparities Map<sup>11</sup> into decision-making). SEEP has created a tool to help agencies consider DEIR and environmental justice and will continue to support state agencies to ensure this work does not have adverse impacts or contribute to environmental and health disparities for overburdened communities and underserved populations.<sup>12</sup>

Some of the most commonly reported emission reduction strategies are listed below.

### **Facilities**

- Upgrade existing buildings with energy-efficient LED lighting, HVAC systems, and building controls.
- Take required steps to comply with Clean Building Performance Standards.
- Install metering/sub-metering equipment to track energy use.
- Complete energy audits.
- Work with the Department of Enterprise Services Energy Program and Energy Services Companies (ESCOs) to conduct Energy Services Performance Contracts (ESPC).
- Downsize occupied square footage.
- Incorporate energy efficiency with new leases and lease renewals.
- Resource conservation management.
- Pursue zero-energy or zero-energy capable performance for new building construction.
- Electrify central plants and district heating systems.

### **Transportation**

- Transition fleet vehicles to battery electric vehicles (BEV).
- Improve the utilization of fleet vehicles and eliminate underutilized vehicles from the agency fleet.
- Support remote meeting options to reduce vehicle travel.
- Install EV charging equipment.

### **Renewable Electricity**

- Add on-site solar photovoltaic arrays.
- Incorporate geothermal heating systems and ground-source heat pumps.
- Sign power purchase agreements (PPAs) to maximize the use of renewable electricity from utility providers.

### **Planning and Resource Allocation**

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<sup>11</sup> <https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map>

<sup>12</sup> See the Environmental Justice Consideration Tool at <https://www.commerce.wa.gov/growing-the-economy/energy/state-efficiency-and-environmental-performance-seep/>



- Dedicate staff resources for energy and sustainability work.
- Track and analyze energy use.
- Complete and implement campus master plans, energy management plans, climate action plans, and other strategic plans.

Many agencies reported challenges to implementing these strategies. The biggest barrier reported was access to funding to complete the work required to meet GHG emissions limits and comply with related laws and executive orders.

## Recommendations

When the Legislature updated RCW 70A.45.050 in 2020, it added that this legislative report “...must include recommendations for budgetary or other actions that will assist state agencies in achieving the greenhouse gas emissions reductions specified in this section.”

Implementing the recommendations below would support state agencies in achieving GHG limits.

- **Provide funding for state agencies and institutions to comply with Clean Buildings Performance Standards.** Buildings are the largest source of state agency GHG emissions. Investing in building energy efficiency is a cost-efficient way to significantly reduce GHG emissions. Meeting these standards is required by law (RCW 19.27A.210). In agency budget submittals for the 2023-25 biennium, agencies were asked to submit related requests with “CBPS” in the title. Funding CBPS decision packages will support agency compliance with the Clean Buildings law and reduce GHG emissions from state-owned buildings.
- **Install electric vehicle charging infrastructure at state facilities.** Supporting state agency fleet electrification efforts would lower GHG emissions related to transportation, but the lack of readily available EV charging at state facilities has been a barrier to the adoption of electric vehicles. SEEP is working with the Department of Enterprise Services (DES) to evaluate EV charging priorities for agencies covered by Executive Order 21-04 (Zero Emission Vehicles) and will continue to request funding to install Electric Vehicle Supply Equipment (EVSE) at state facilities.
- **Electrify district heating systems.** Several state agencies and institutions rely on district heating systems to provide energy to buildings, especially in campus environments. Some of these systems are inefficient and aging past their useful life. It is possible that some state agencies will not meet GHG limits without upgrading or electrifying these systems. It would be helpful to inventory district heating systems and prioritize upgrades with the biggest potential for reductions in energy consumption and GHG emissions.
- **Maintain zero-energy standards for new construction.** Executive Order 20-01 requires all newly constructed state-owned buildings be designed as zero-energy or zero-energy capable, and to “exceed the current state building code for energy efficiency to the greatest extent possible.” Since this executive order was implemented, state agencies have had mixed success with zero-energy building projects. Reinforcing or incentivizing this requirement for agencies covered by EO 20-01 would help ensure new buildings are high performance and climate friendly.
- **Explore innovative funding and financing mechanisms.** Other states and public jurisdictions rely on several innovative funding and financing mechanisms to support projects that reduce GHG emissions. These include, but are not limited to, public-private partnerships, energy efficiency as a service, revolving loan funds, green banks, and expanding access to the DES Energy Savings Performance Contracting program. Exploring alternative financing mechanisms could support cost-effective infrastructure projects and identify funding pathways that better align with the state’s climate goals.

The Governor's proposed budgets for 2023-25 include some funding that will help agencies make progress on reducing GHG emissions.<sup>13</sup> For example:

- State agency Clean Building Projects: \$93 million at multiple agencies
- Fleet electrification support and EV charging: \$23 million at multiple agencies
- WWU Heating Conversion Project: \$10 million
- Energy audit funding for public buildings: \$20 million for a new grant program at Commerce
- Building energy efficiency projects: >\$43 million at multiple agencies

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<sup>13</sup> <https://ofm.wa.gov/sites/default/files/public/budget/statebudget/highlights/budget23/09-Climate.pdf>

## Conclusion

The data presented in this report show that most state agencies are making progress in reducing greenhouse gas emissions. Collectively, Washington state government has met its 2020 greenhouse gas emissions limit and remained 13% below that limit through 2021. Emissions fell 20% from 2019 to 2020 and increased 4% from 2020 to 2021, but overall remained 17% lower in 2021 than prior to the pandemic.

Several state agencies have already met their 2030 limits. Most, however, must continue to prioritize further emissions reductions to meet the 2030 greenhouse gas limit of 45% below 2005 baseline levels. Collectively, state agencies must reduce emissions an additional 34% to meet the 2030 limits. Securing funding for emissions mitigation projects is the most significant challenge for agencies.

Most of the greenhouse gas emissions from state agencies come from buildings (i.e., electricity and natural gas used for power and heat), transportation from state vehicles, and the Washington State Ferries system. State agencies are successfully finding ways to innovate, collaborate and make progress on mitigation projects.

RCW 70A.45.050 emphasizes the importance of mitigation planning and documentation. State agencies and the SEEP Office continue to engage in this effort, identifying opportunities to reduce greenhouse gas emissions and design carbon neutral campuses.

## Appendix A—Agency Reports

This appendix provides the greenhouse gas profile for each of the 25 reporters, in addition to a summary of mitigation actions during the past two years and plans for meeting future emission limits. As of the drafting of this biennial report, every agency required to report, except one, has submitted its GHG inventory and mitigation narrative.

Each agency's greenhouse gas profile includes its 2020, 2030, 2040 and 2050 greenhouse gas limit. In developing strategies to meet these limits, the SEEP office at the Washington Department of Commerce is a critical asset to agencies.

# Agriculture, Department of

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 486                          |
| Fossil Fleet Energy Use Emissions | 1,221                        |
| Annual Fossil GHG Emissions       | 1,707                        |

In 2020, the Dept. of Agriculture dropped 4% below their 2020 limit. In 2021 their emissions increased to 12% above their 2020 limit and is currently 73% above their 2030 limit.

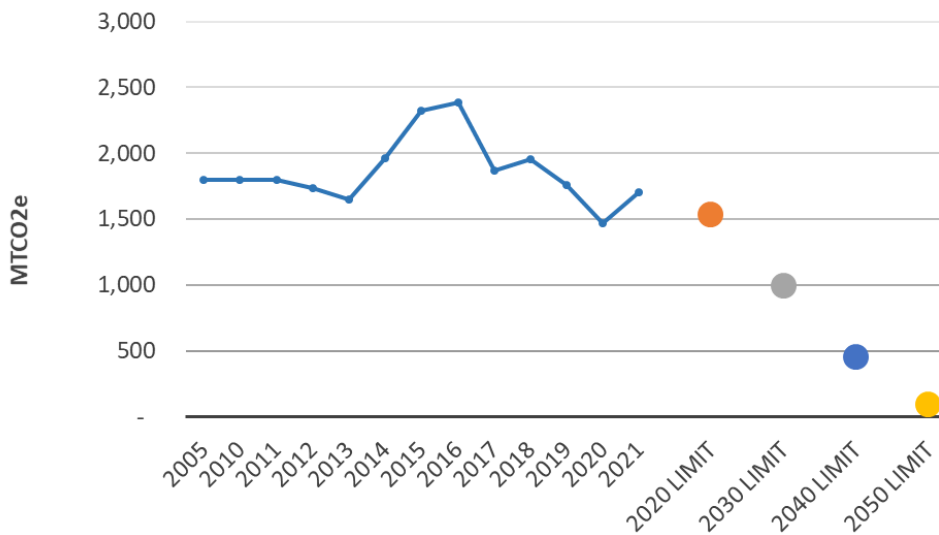


Figure 6. Department of Agriculture Historic Emissions and Future Limits

In 2021, 2% of Department of Agriculture’s emissions were from buildings they owned and 72% were from fleets. They reported a total of 161,229 square feet of building space. Natural gas combustion totaled 34% of building related emissions and indirect electricity emissions were the remaining 66%.

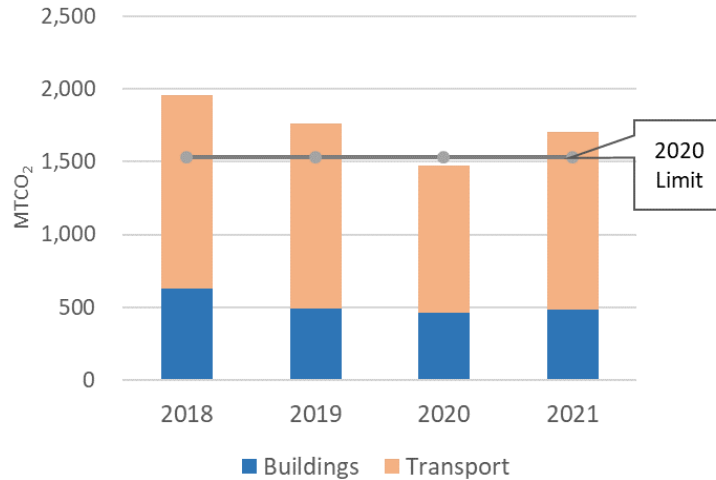


Figure 7. Department of Agriculture Emissions from Building and Fleets 2018–2021

### **Actions taken to reduce GHG emissions during 2020 and 2021**

During the 2020 and 2021 calendar years, the Washington Department of Agriculture (WSDA) worked with the Department of Enterprise Services (DES) to install electric charging stations at two facilities and began leasing five electric vehicles from Fleet Operations. WSDA also closed three facilities.

### **Priority actions planned for the 2023-25 and 2025-27 biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, WSDA plans to close one additional facility and downsize agency-occupied space in the Natural Resources Building in Olympia by 25%. WSDA will also consolidate two facilities into one location with the Dept of Labor and Industries at what is projected to be a LEED Silver facility. WSDA will be evaluating appropriate locations to install electric vehicle (EV) charging stations and plans to work with DES, SEEP, and landlords for electric vehicle supply equipment (EVSE) installations.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

WSDA actively seeks opportunities to reduce its greenhouse gas footprint. Many WSDA facilities are leased and not owned, which can make achieving reductions more challenging. Where possible, WSDA is focused on reducing occupied square footage in buildings such as the Natural Resources Building and partnering with other agencies on new spaces that are LEED certified), as well as adopting EV/hybrid vehicle usage where practical.

WSDA will continue to work with DES on efforts to reduce GHG emissions from its fleet and facilities to the extent practicable.

# Central Washington University

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 20,053                       |
| Fossil Fleet Energy Use Emissions | 1,029                        |
| Annual Fossil GHG Emissions       | 21,082                       |

In 2020, Central Washington University’s emissions were 7% above their 2020 limit. In 2021 their emissions increased to 16% above their 2020 limit and 80% above their 2030 limit.

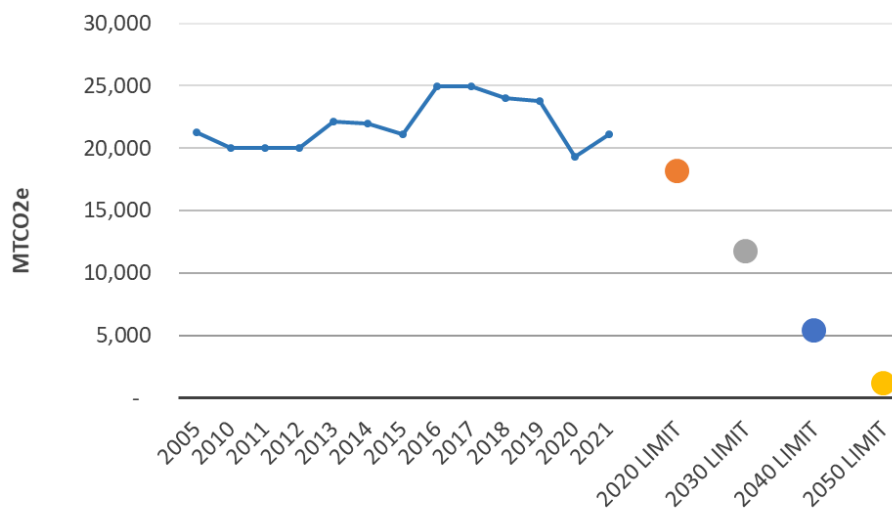


Figure 8. Central Washington University Historic Emissions and Future Limits

In 2021, the university reported that 95% of emissions were from buildings they owned and 5% were from transportation. The agency reported 3,533,354sf of space, 99% of which they owned. In 2021, 64% of the building sector emissions were from natural gas combustion while 36% were indirect electricity emissions. The university’s transportation emissions were 68% aviation gas, 26% motor vehicle gas, 6% diesel, and 0.2% propane.



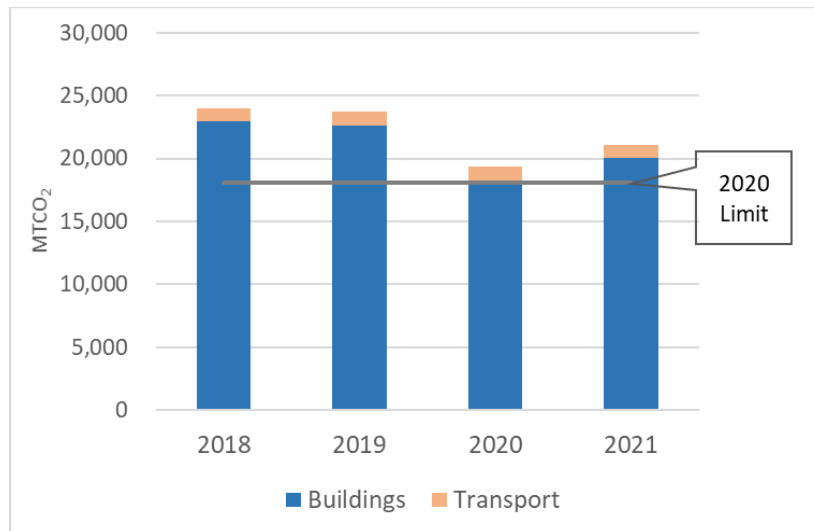


Figure 9. Central Washington University Emissions from Building and Fleets 2018-2021

The university recently commissioned an 83.30kW solar photovoltaic system on its Health Science building, which had produced 14.4kW as of Dec. 2021. Additionally, it has a 29.58kW system on Hogue Hall, which is not functioning at capacity. This system has produced 10,800kW since installation.

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, Central Washington University (CWU) took the following actions to reduce GHG emissions:

- **Randall/Michaelson heat exchanger replacement.** The result of this project was a more energy efficient heat exchanger for heating water.
- **Lind AC project.** Installation of multiple zone split system with a very high-efficiency rating. This project reduces the load on the central chilled water system in areas of this building where air was not properly distributed.
- **Replacement of three main air-handling units at the WA State Archives building.** This project increased the efficiency of the cooling units from 1995 standards and allows for much tighter control of building temperature and scheduling.
- **CWU campus electrical metering upgrades.** This phased project will allow CWU to easily track building level electricity usage. This is very beneficial considering upcoming legislative goals.
- **Boiler #3 front wall rebuild.** This project was completed on one of CWU's large central plant water tube steam boilers. The rebuilding of this front wall includes adding all new firebrick and insulation to the front of the boiler to increase the efficiency by allowing less heat to escape through the front shell.
- **Exterior lighting upgrades.** CWU completed work toward replacing all existing conventional outdoor lighting fixtures with low light-polluting LED fixtures.

- **Large, chilled water leak repair.** This leak on campus was costing a substantial amount of electricity to cool water and reduced water waste.
- **New heating water heat exchangers at Anderson and Moore.** Both heat exchangers were leaking thus wasting energy.

## Priority actions planned for the 2023-25 and 2025-27 biennia (short-term strategy)

During the 2021-23 biennium, CWU is taking the following actions to reduce GHG emissions:

- **SURC lighting fixtures and controls.** Upgrade lighting fixtures to LED and add lighting controls to take advantage of daylight harvesting and scheduling.
- **Black Hall and Science 1 variable speed heating and cooling pump control replacements.** Pumps are currently running at a consistent speed in manual mode due to failed controls. Replacement will allow for variable speed of energy intense pump packages.
- **Clean Building Energy Project.** This project helped achieve a baseline of energy usage in five CWU buildings over 50,000 square feet to check against parameters of HB1257.
- **Building automation server upgrade.** Allow for more reliable modification of HVAC schedules and energy monitoring. Provides more disk drive space to trend more points moving forward to monitor energy for upcoming legislative requirements.
- **Geothermal study.** The results of this study will give a feasibility analysis associated with adding geothermal energy to some CWU buildings. The intent would be to request funds from the Office of Financial Management to complete a recommended geothermal project.
- **Bouillon Hall HVAC upgrade.** Remove an old inefficient fan in the building's main air handling unit and replace with a fan wall that is fully controlled by variable frequency drives.
- **Correct heat recovery units on Samuelson Hall.** The units are currently configured with the thermal heat wheel in a position that does not recover energy on the outgoing exhaust as it was intended to do.
- **Installation of a new 1200-ton chiller at the central plant.** This chiller will be much more efficient than running old, existing chillers from the 1980s and 90s.
- **Science fume hood control upgrade.** This project will significantly decrease the amount of energy used by our building with the highest EUI on campus. The current exhaust control system is run by pneumatics and has leaks throughout the system, which leads to much more exhaust leaving the building than what the original design called for. This digital control upgrade will correct this issue while also allowing for much tighter control to conserve energy.
- **Hertz Hall building replacement.** Replace existing building with a much more energy efficient Health Science Building that is heated mostly by waste heat from the flue stacks of the heating plant main boilers.
- **Nicholson Pavilion renovation.** This project will result in new, more efficient HVAC equipment and control systems.

During the 2023-25 biennium, CWU is planning the following actions to reduce GHG emissions:

- **Demolition of two very old inefficient buildings** (Language and Literature/Farrell Hall) and replacing with one more efficient building (North Academic Complex). Pending Office of Financial Management funding.
- **Installation of all new LED Lighting Fixtures** at our State Archives Facility. Pending Office of Financial Management funding.
- **Metering Configuration.** Complete a project to install or configure all metering of heating and cooling to all buildings over 50,000 SF. This will allow for more accurate reporting to bring buildings into compliance with HB 1257.
- **Update Campus Master Plan to reflect de-carbonization strategy.**
- **Establish and fill Energy Manager/Engineer** to oversee the development of de-carbonization strategy.
- **Establish enterprise Energy Management Program.**
- **Launch Green Revolving Fund** to support campus energy efficiency projects with a defined payback period.
- **Develop CWU Climate Action Plan and Sustainability Plan** to direct and guide campus efforts.
- Continue to work with Department of Ecology to set utility-specific emissions factors to properly account for GHG emissions tied to purchased electricity.
- **Integrating sustainability into the new mission statement** of Central Washington University to help create an ethos of sustainability action that permeates decision making at the institution.
- Apply for construction funding for a **net-zero North Academic Complex Building.**
- Apply for design funding for a **net-zero Psychology building.**
- Seek out funding to **revamp Hogue Hall solar array** to increase production.

During the 2025-27 biennium CWU is planning the following actions to reduce GHG emissions:

- Integrate funding for a **geothermal system at the North Academic Complex and Psychology Building** into the capital request (assuming net-zero is not approved by OFM for construction of the original building).
- Apply for construction funding for a **net-zero Psychology replacement building.**
- Research suitability of existing campus buildings for PV arrays.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

CWU has worked hard to collaborate with individuals throughout CWU and OFM to look at building systems that are at end-of-life as a way to reduce GHG emissions by replacing the systems with new, more energy efficient systems. These projects can help our institution meet GHG reduction goals. CWU Operations plans to continue to push sustainability and energy savings to help advocate for funding, spread awareness, and ensure all stakeholders are headed in the same direction. Also, as of May 2022 our Sustainability Coordinator separated from the University. While working at CWU she was extremely influential to the campus community and

Capital Construction Team. CWU hopes to fill her position quickly to continue to improve plans toward reducing GHG Emissions.

CWU is currently undergoing a study associated with the Clean Buildings Performance Standard (HB 1257 was signed into law in 2019 and expanded in 2022). This project applies to 5 CWU buildings over 50,000 SF. Some of the deliverables of this project are an audit of existing sub-metering, energy efficiency measure options and modeling associated with some of those Energy Efficiency Measures (EEMs). CWU believes that these deliverables will play a vital role in ensuring we stay focused on the projects with the largest impact in reducing CWU's GHG Emissions.

Overarching strategies that CWU will use to meet emissions limits:

**45% below 2005 by 2030**

- Retro commissioning of buildings
- Investment in geothermal system for new construction in north neighborhood
- Building envelope and mechanical upgrades
- No new fossil fuel hook-ups in new or existing buildings

**75% below 2005 by 2040**

- Fully move district heating and cooling system to renewable energy source, reducing emissions by over 65%.
- Move to 100% electric fleet vehicles
- Purchase offsets for aviation fuel
- Creating capacity for energy storage

**95% below 2005 by 2050**

- Rely on carbon offsets to account for any lingering emissions

## Commerce, Department of

### Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO <sub>2</sub> e) |
|-----------------------------------|---|
| Building Energy Use Emissions     | 264                                       |
| Fossil Fleet Energy Use Emissions | 3   |
| Annual Fossil GHG Emissions       | 267                                       |

Dept. of Commerce began reporting in 2020 and does not have an established 2005 baseline. Commerce reported emissions on 27,267sf of privately leased office space. This excludes leased space in the Westin Building in Seattle for which data was unavailable. In both 2020 and 2021, over 99 % of reported emissions were from building energy use. In 2021, 55 % of these building emissions were from natural gas and 45 % were indirect electricity emissions. Commerce reported 3 MTCO<sub>2</sub> from fleets for both 2020 and 2021.

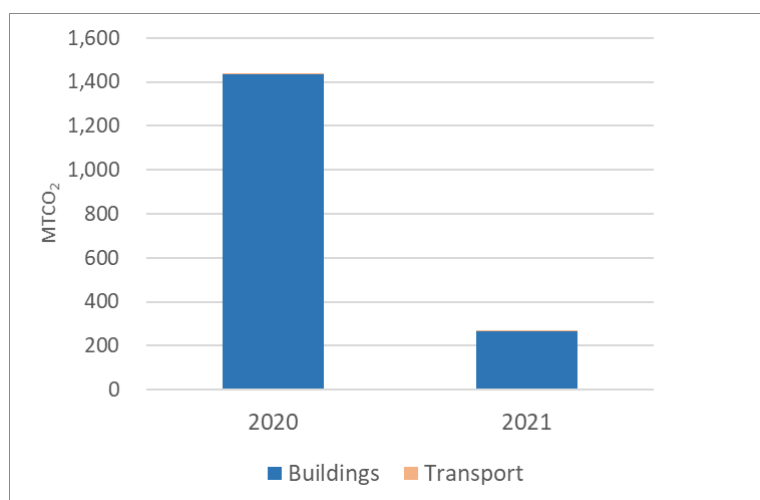


Figure 10. Emissions from Building and Fleets 2020-2021

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years the Department of Commerce (COM) took the following steps to reduce GHG emissions:

- Installed T5 LED light bulbs throughout Town Square Building 5
- Installed motion sensor lighting and occupancy sensors
- Replaced 3 single head EV charging stations with dual head chargers doubling the amount of EVs that can be charged at COM headquarters in Olympia

- Prioritized the purchase of energy efficient monitors, computers, and TVs as part of our lifecycle assessment

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

COM is planning to take the following actions during the 2023-25 and 2025-27 biennia to reduce GHG emissions:

- After assessing the agency footprint to determine facility usage, space needs, and community engagement, COM determined these steps:
  - Downsize current space in the Olympia headquarters office from two buildings to one. This will minimize COM's carbon footprint by reducing occupied square footage in Olympia (in progress).
  - The Spokane Office will be moving to a net-zero facility in December of 2022.
  - COM will be reassessing and revamping the CTR program to encourage additional program participation and assess future needs.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

COM's long-term emissions reduction strategy is to lead GHG reduction efforts through internal policy, education and understanding.

- Internal Policy: Our goals are to create policy that aligns with our goals of reducing waste, improving and restricting toxic use, creating inclusive policies, and recycling all recyclable items.
- Education: Our plans are to educate our staff and boards on alternative ways to reduce waste and limit emissions.
- Understanding: creating a place of understanding that allows for our staff to give feedback on things that can or cannot be done while conducting business (examples are community engagement in remote locations or working from home).

# Community Colleges of Spokane

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 7,876                        |
| Fossil Fleet Energy Use Emissions | 120                          |
| Annual Fossil GHG Emissions       | 7,997                        |

In 2020, the Community Colleges of Spokane (SCC) emissions were 3% below their 2020 limit. In 2021 their emissions increased very slightly but remained 2% below their 2020 limit. SCC must reduce emissions 51% to reach their 2030 limit.

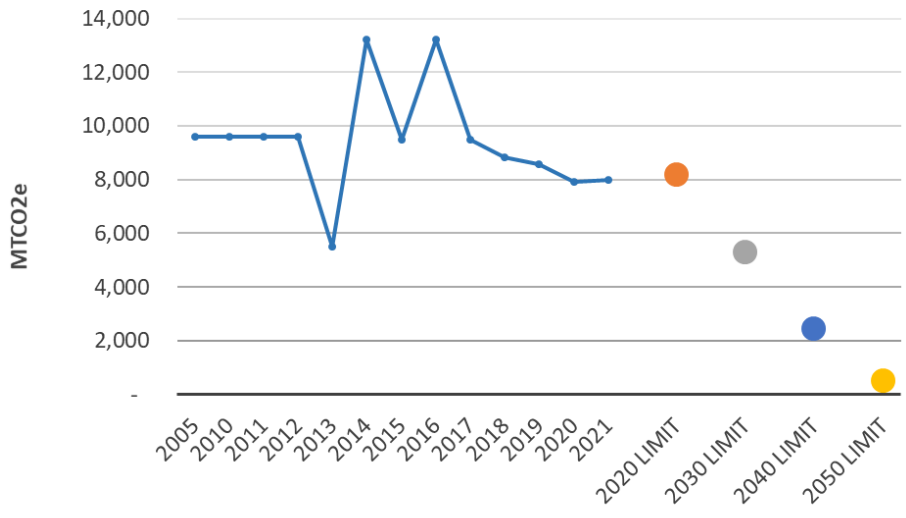


Figure 11. Spokane Community Colleges Historic Emissions and Future Limits

In 2021, SCC reported that 98% of reported emissions were from buildings and 2% were from transportation. The buildings emissions include 1,788,663sf of owned space and 222,280sf of privately leased space. In 2021, 69% of the building emissions were from natural gas combustion and 40% was from indirect electricity emissions.

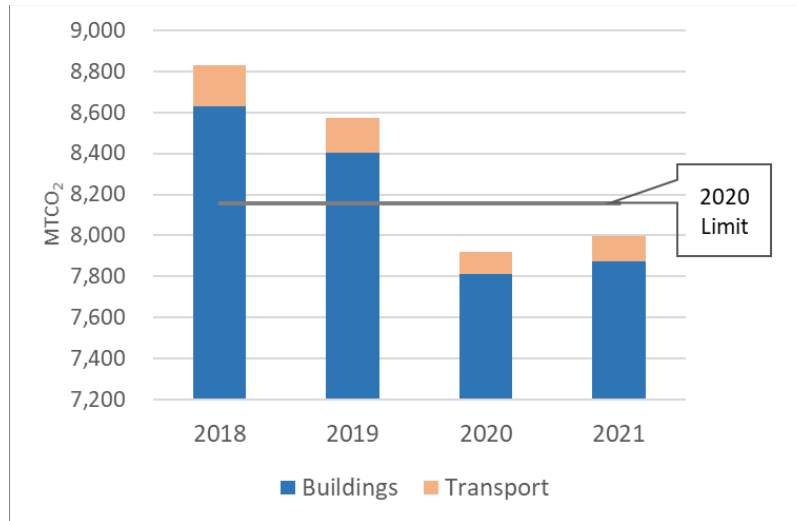


Figure 12. SCC Emissions from Building and Fleets 2018-2021

SCC has a solar photovoltaic system designed to produce 42 kWh of electricity and geothermal system designed to withdraw 800 gallons per minute. Actual production data is not available for these systems.

### **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the 2020 and 2021 calendar years, Community Colleges of Spokane (CCS) installed new HVAC units that utilize variable fan drives at Spokane Community Colleges (SCC) Buildings #6 and #19, as well as Building #17 at Spokane Falls Community College (SFCC). Additionally, a new chiller was replaced at the library on the SFCC campus, replacing a legacy chiller unit that was over 25 years old. The Facilities Department has made lighting retrofits a priority going forward. In 2021, thousands of light fixtures primarily on the Spokane Falls Campus were replaced with LED retrofits.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, CCS will continue to focus on LED lighting retrofits as the main strategy for reducing GHG emissions. CCS is also prioritizing the shutdown of buildings that are not being utilized in the summer months to reduce the electrical burden and need for conditioning unused space. The focus of minimizing HVAC run time in the mornings and evenings is a high priority, short-term goal.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**



CCS has engaged in a variety of short-term strategies to reduce GHG emissions (e.g., LED retrofits, HVAC scheduling, and ongoing energy usage analysis) in the 2021 calendar year. In the long-term, these same emissions reduction strategies will be paired with further implementation of summertime building shutdowns and the use of alternative fuel sources like ground source heat pump systems, solar photovoltaic (PV) systems, and renewable power purchasing agreements. Furthermore, CCS will continue long-term efforts towards making the shift from internal combustion engines to battery electric vehicles across the district fleet.

In 2021, The CCS Board of Trustees approved a sustainability plan highlighting that the district “will identify, promote, and coordinate best practices that preserve and utilize the efficient use and conservation of energy, water and other resources.” With the plan outlining important efforts such as the significance of following and implementing Green Building Guidelines, the next obstacle to overcome is the challenge of attaining the necessary funding to execute resource conservation and GHG emissions reduction projects.

As CCS projects continue in the long-term, the primary focus for reducing GHG emissions will come in the form of eliminating natural gas units on new and remodeled spaces. As funding allows, CCS will continue to add solar PV arrays and ground source heat pump systems to buildings, helping reduce dependence on both electricity and natural gas.

## Corrections, Department of

### Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 48,075                       |
| Fossil Fleet Energy Use Emissions | 1,499                        |
| Annual Fossil GHG Emissions       | 49,574                       |

In 2020, the Dept. of Corrections emissions were 42 % below the agency’s 2020 limit. In 2021 their emissions increased but remained 35 % below their 2020 limit. Corrections’ 2021 emissions are slightly below their 2030 limit. The Department reports emissions from their owned prison facilities, which represents 99% of the Department’s total energy use.

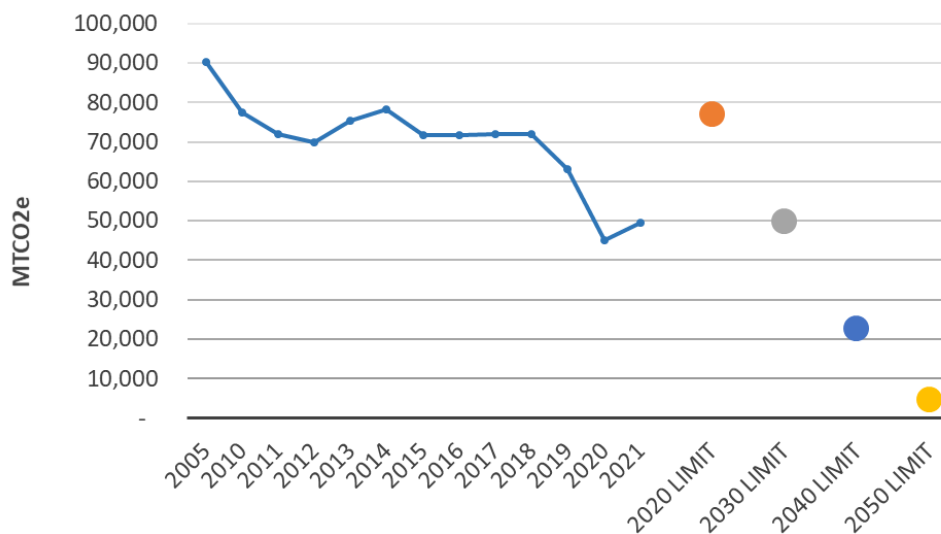


Figure 13. Dept. of Corrections Historic Emissions and Future Limits

In 2021, Corrections reported that 97 % of emissions were from buildings and 3 % were from transportation. The buildings’ emissions include 8,571,703 sf of space owned by the agency. In 2021, 56 % of the building emissions were from natural gas combustion and 37 % was from indirect electricity emissions.

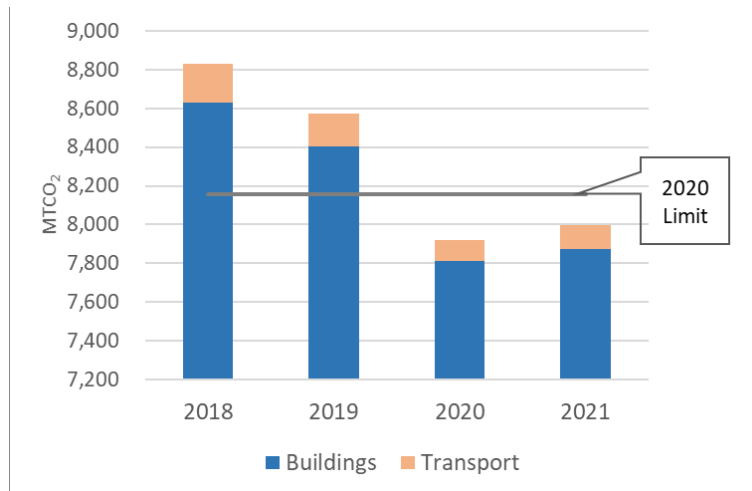


Figure 14. Emissions from Building and Fleets 2018-2021

SCC has a solar photovoltaic system designed to produce 42 kWh of electricity and geothermal system designed to withdraw 800 gallons per minute. Actual production data is not available for these systems.

### **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the 2020 and 2021 calendar years, the Department of Corrections (DOC) took the following actions to reduce GHG emissions:

**Energy Plan.** DOC organized a stakeholder group of agency leadership, budget directors, superintendents, and facility managers to develop an energy action plan. Work on the actions recommended in this plan began in calendar years 2020 and 2021 and will be ongoing as funding allows in the next two biennia. This is considered a living document and will be adjusted and updated periodically.

**Facility Condition Assessments.** Over the past two years DOC completed detailed facility condition assessments on all the department’s owned facilities. These assessments were conducted by a team of Capital Planning and Development staff, facility maintenance Staff and independent contractors. These assessments were uploaded into the new Asset Planner software and verified for accuracy and quality.

Implemented **Capital Planning and Facility Maintenance Software, Asset Planner.** This new tool replaces both the computerized maintenance management system and sustainable operations data management system. The new system will not only track recycling and waste generation activity, but also more nuanced data related to building energy systems, predictive capital planning tools, and facility maintenance management. These last two components will be critical for successfully reaching our goals of greenhouse gas emissions reductions, resource conservation, energy and water use reductions, better workplace environments for those supporting our mission, and better living environments for those in our care.

**Preservation and Energy Performance Contract Projects.** During the 2020 and 2021 calendar years DOC engaged in 42 capital projects with total project funding of \$79.4 million to directly reduce energy or water consumption and GHG emissions.

**Opportunities to Collaborate on Sustainable Operations and Energy Reductions in State government.** DOC is grateful to the support, assistance, guidance and fellowship of the State Efficiency and Environmental Performance (SEEP) Office. DOC participates actively in several of SEEP's work groups, as well as the Guidance Council and Governing Council. The results over the past year include collaborative processes, policy work, and funding requests with other state agencies to move the work of greenhouse gas emissions and toxics reductions forward. It has been a rewarding and productive fellowship owing its existence and success to the SEEP office and staff.

**Sustainable Corrections Infrastructure Partnership.** DOC committed to the federal Department of Energy's Better Buildings Sustainable Corrections Infrastructure Partnership (SCIP) Accelerator. SCIP is a voluntary initiative to partner with state governments interested in accelerating energy and water efficiency, renewable energy, storage technologies, and energy management in their public correctional facilities while maintaining the sectors priorities of security and resilience.

Over the next three years, DOC will strive for portfolio-wide energy savings of 20%, as well as operating and maintenance cost savings by identifying and demonstrating solutions leveraging energy and water efficiency, renewable energy, and storage technologies. DOC is working on three project areas and receiving technical assistance from the Department of Energy (DOE). Initial project areas focus on the utilization of renewable energy and storage technologies to reduce the operational and maintenance cost of our facility UPS systems while increasing the facilities' resiliency.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, DOC is planning to take the following actions to reduce GHG emissions:

- Sub-metering of all buildings over 50,000 SF (Tier 1 of Clean Buildings Performance Standard)
- Sub-metering of all buildings between 20,000 and 50,000 SF (Tier 2 of Clean Buildings Performance Standard)
- Create a new energy plan that meets requirements of Clean Buildings Performance Standards.
- Creation of new operations and maintenance plan that meets requirements of Clean Buildings Performance Standards.

- Perform gap analysis to identify DOC's current position in relation to newly implemented legislation, actions, and funding necessary to meet the GHG limits.
- Continue to invest funding and staff time into improving and learning the new asset planning software suite. This suite of integrated programs is promising to be of great assistance to DOC in the management of its built environment and compliance with new and existing energy, water, waste and GHG reduction goals and legislation.
- Facility preservation and Energy Performance Contracts as funded.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

DOC will conduct a gap analysis in 2022 to identify the current position in relation to new legislation, actions, and funding necessary to meet the GHG reduction limits established by RCW 70A.45.050 for years 2030, 2040, and 2050. DOC will leverage the results of this analysis to develop and implement a long-term emissions reduction strategy which is likely to include the following actions:

**Transportation.** DOC will continue to replace internal combustion engine (ICE) vehicles with EVs (including perimeter control, transport, and other vehicles). DOC will also reduce vehicle travel by replacing some in-person meetings with remote options. DOC plans to install EV charging infrastructure at all prison facilities to support an all-electric fleet and will continue to seek a variety of funding opportunities to make these upgrades at leased and owned facilities.

**Facilities.** Key strategies for reducing GHG emissions from DOC facilities include:

- Plan to electrify building space heating, hot water and cooking where feasible and when able
- Ensuring major renovations include fuel switch where feasible, and prioritize very low embodied carbon emissions
- Avoiding new construction in favor of lower embodied emissions alternatives, such as renovating existing space and using less building space.

Complimentary strategies for incrementally reducing GHG emissions from facilities:

- Improving building energy performance and energy efficiency using DES Energy Savings Performance Contracting or other proven building efficiency delivery methods
- Tracking building energy use by benchmarking each building over 10,000 square feet.
- Consider on-site renewable energy potential

Operational or organizational changes:

- Hiring a resource conservation manager (RCM), buy efficient IT equipment and appliances, consider organizational or service delivery changes that use less building space or energy, and encourage occupant behavior that reduces energy consumption
- Leveraging new leases and lease renewals to electrify heating and reduce energy use
- Changing space use allocations to reduce occupied square footage

Strategies to avoid adding more agency GHG emissions:

- Ensuring any new building is zero energy (ZE) or zero energy capable (ZEC), and very low embodied carbon emissions
- Ensure any new leased square footage is all-electric and energy efficient

DOC has long held the premise that comprehensive planning and a robust, proactive maintenance program is the most cost-effective energy conservation measure at our disposal. There is also a rule of thumb that the simple act of monitoring energy usage can result in a 5 % decrease in energy use. Ultimately, proactive facility maintenance and energy management results in energy conservation and cost avoidance. With this in mind, the new asset management system will assist in the development and maintenance of an energy management plan. In particular, the asset planning module of the software allows for tracking of facility equipment needs, which will aid in communicating those needs efficiently and proactively to build timely funding requests and budgets. This is worthwhile because deferred maintenance can result in higher energy consumption, major equipment failures, risk to safety and operations, and premature replacement of equipment.

DOC is also working to install a biomass heating system at Larch Corrections Center, install EV charging in all DOC facilities, and partner with DOE and others to identify and pursue energy saving projects at DOC facilities.

**Clean and Renewable Energy.** DOC has maintained a power purchase agreement (PPA) with the Avista Solar Select program for the purchase of solar generated power for the maximum allowable purchase by the program for the Airway Heights Corrections Center. DOC also instigated a small workgroup to explore the idea of public private partnerships and PPA's to expand opportunities to support the execution of large capital projects to convert facilities to electric heating, cooling, and domestic hot water demands. The department will continue to look for and engage in applicable power purchase agreements for clean and renewable electricity.

DOC is also interested in exploring access to alternative funding mechanisms.

# Eastern Washington University

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 18,969                       |
| Fossil Fleet Energy Use Emissions | 1,802                        |
| Annual Fossil GHG Emissions       | 20,772                       |

In 2020, Eastern Washington University’s (EWU) emissions were 7 % above their 2020 limit. In 2021, their emissions increased and were 17 % above their 2020 limit and 81 % above their 2030 limit.

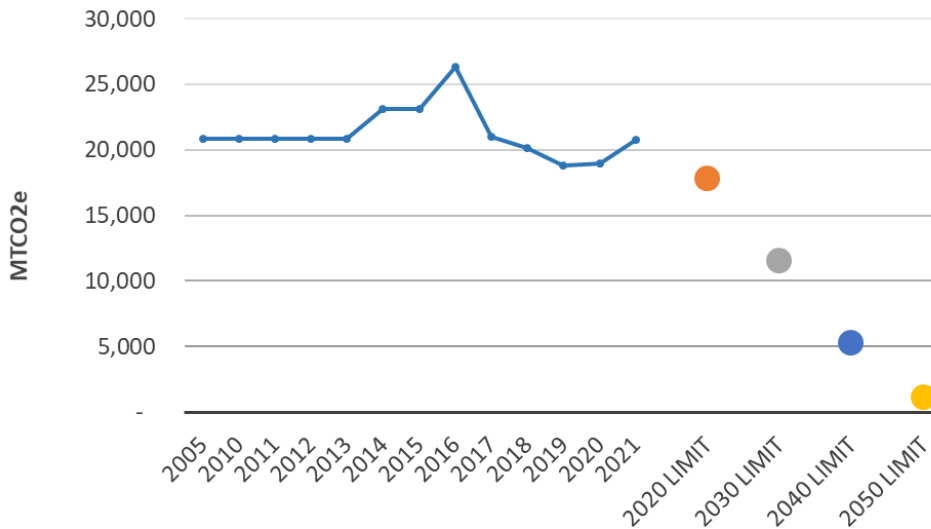


Figure 15. Eastern Washington University’s Historic Emissions and Future Limits

In 2021, EWU reported that 91 % of emissions were from buildings and 9 % were from transportation fleets. The university reported 3,192,617 sf of space, 94 % of which they owned, 3 % privately leased and 2 % leased from other state agencies. In 2021, 73 % of the building emissions were from natural gas combustion while 27 % was indirect electricity emissions.

EWU leases space in the privately owned Catalyst building in Spokane. The Catalyst is designed as a net-zero building, although they haven’t quite completed the transition to building sourced energy. They expect the energy use from this building to decline in the coming years. EWU also leases space in the WSU Health Sciences building at the Riverpoint campus in Spokane. WSU tracks the energy use for this space and includes it in their reporting metrics.

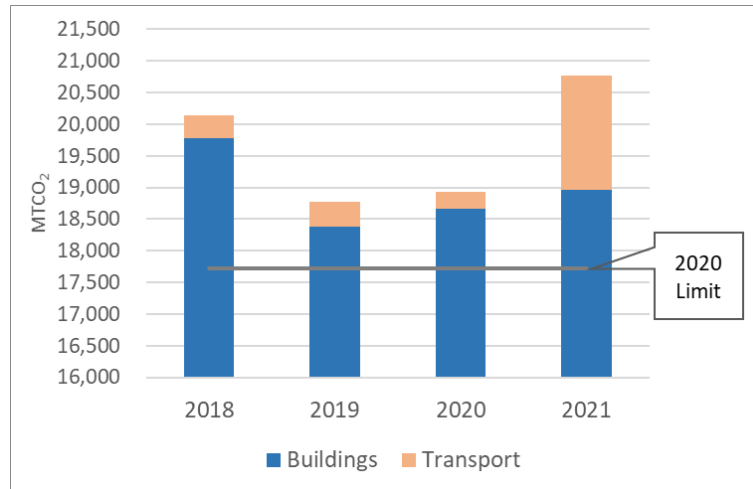


Figure 16. Eastern Washington University's Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, Eastern Washington University (EWU) completed construction on a new LEED Gold certified Interdisciplinary Science Center. This building does increase overall campus footprint and energy use, but by achieving LEED Gold status through energy efficient practices, it ensures that EWU can increase capacity for teaching in the STEM fields while being responsible with building space.

EWU is moving forward on minor works projects and expects to see improvements in energy efficiency, and GHG emissions reductions from the following items:

- Update/reroute steam supply to TAW building
- Repair/replace dehumidification system in AQT Building
- Conduct a Level 2 energy audit for PHASE complex
- Repair roof on JFK
- Repair roof on AQT building
- Repair roof on PEA
- New chilled water/steam pumps in PEA
- LED lighting upgrade in URC
- Repair campus utility meters
- Evaluate steam distribution system
- Vehicle charging station evaluation

At the end of 2021 EWU moved to lower building temperature set points from 71°F to 68°F. We started with 3 buildings in December 2021, and immediately saw reductions in energy use. For 2022 we are working to set the 68°F set point to all buildings on campus.

In 2021 EWU began work to repair and replace non-functioning building sub-meters on buildings across campus. Sub-meters tracking electrical, steam, chilled water, and domestic



water use, as well as wastewater generated from individual buildings on campus, will help us better understand and develop projects to reduce greenhouse gas emissions.

At the end of 2021 EWU started working on a Climate Action Plan for the university and identifying projects to work with industry partners to reduce energy use/greenhouse gas emissions. In 2022, we are now under contract with multiple consulting companies to better understand our options and will expand on this work in future greenhouse gas reports.

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

**EWU plans to take the following actions in the 2023 – 2025 biennium.**

### **Clean Building Performance Standard**

The PHASE complex is the largest building system on campus and falls under the 2026 compliance date for the Clean Building Performance Standard. We are currently conducting a level 2 energy audit of the complex and expect that report to be completed this coming summer. Based on the recommendations from that report we will move forward with energy retrofit projects.

**Minor works.** The following minor works projects are expected to improve energy efficiency and thereby decrease GHG emissions. Total energy savings will be calculated during project implementation.

#### Facility Preservation

- Clean Building Performance Standard Projects
- Exterior Building Envelop Improvements
- HVAC Improvements
- Roof Replacements

#### Infrastructure Preservation

- Medium Voltage Switch Replacement
- Building Automation Systems Improvements

#### Program

- PHASE Energy Saving Improvements

**LED lighting projects.** LED lighting retrofits are an ongoing process with projects being completed on a revolving basis. Energy rebates from Bonneville Power Authority help to offset the cost of this work. Through 2023 – 2025 we will continue to switch out lighting across campus to efficient LED lighting. Energy savings are calculated for respective projects.

### **Science remodel**

Starting in 2022, we are beginning a major remodel of the EWU Science Building (SCI). This is a multi-phased, multi-year project that is estimated to be completed in 2026. Energy life cycle cost analysis for the building is estimating the remodel will reduce the SCI's EUI and GHG emissions by more than 50 %.

### **Martinson and Williamson Predesign**

Martin (MAR) and Williamson (WLM) are two interconnected academic buildings located on campus that are in need of a significant remodel. These buildings must comply with the Clean Buildings Performance Standard. We have submitted for predesign funding for the 2023 – 2025 biennium and intend to remodel these buildings. A major remodel of these buildings will help to reduce energy use and GHG emissions.

### **Electric vehicles and infrastructure**

We are currently under contract with an electrical engineer consultant to evaluate EWU's electrical grid and assess the feasibility/cost to install electric vehicle charging stations across campus for both public and facilities use. This assessment will inform the next steps in our vehicle electrification infrastructure process.

As vehicles and equipment need replacing, we will look to electrical options to replace those with internal combustion engines. During the 2023 – 2025 time period we will be developing a more robust plan for vehicle electrification. A list of all campus vehicles is attached in the supplementary materials.

### **Energy Management**

We are in the process of evaluating building temperature set points to better assess what levels to heat/cool buildings. In 2022 we are reducing the building heating temperature from 71°F to 68°F. We will assess occupancy comfort and building management at this temperature to see if this is manageable/sustainable for the long term. This evaluation will continue through 2023 as we identify how we can keep buildings occupants comfortable while reducing steam loads. We will also be assessing building temperatures from a cooling side and seek to determine the ideal temperature settings during the warmer months.

### **Prairie Restoration Project**

The EWU Restoration project seeks to restore more than one third of campus land back to native habitat, and through this process, support research, educational, and recreational opportunities (<https://www.ewu.edu/give/funds/prairie-restoration/>).

Restoration of the land has the potential to sequester carbon, helping to offset GHG emissions elsewhere. In addition to natural carbon sequestration through plant photosynthesis, we are conducting research on the use of biochar as soil amendment to boost plant growth and carbon storage. As this project develops, it has the potential to sequester carbon on an annual basis and plays an important role in EWU's commitment to sustainability planning.

### **Landscape Climate Resiliency Masterplan**

A landscape architect has recently been selected to develop a landscape masterplan for EWU that is focused on sustainability. The masterplan will inform numerous projects and programs that will help reduce carbon emissions from landscape maintenance, as well as make the campus more resilient to a changing climate through the implementation of drought tolerant, native plants and other sustainable management practices.

The plan is expected to be completed in 2022, and projects will begin in 2023. Implementation of the Landscape Climate Resiliency Masterplan will be a multi-year project as funding allows.

### **EWU plans to take the following actions in the 2025 – 2027 biennium.**

#### **Completion of Science Building remodel**

The Science Building is currently estimated to be completed 2026.

#### **Renovation of Martin and Williamson building complex**

If successful in acquiring predesign funding in 2023 – 2025, we will submit a funding request to move forward with design in 2025 – 2027.

#### **Minor works**

Specific projects are not identified at this time. However continuous maintenance and improvement projects are expected. Many of these projects will address energy system updates and improvements to building envelopes. These projects will be done with attention and consideration to improving energy efficiency and reducing greenhouse gas emissions.

#### **Clean building performance standard**

Between 2022-2025, EWU will be conducting energy audits and assessing building performance through a number of metrics. Data collected through these processes will inform the necessary steps for 2025 – 2027 in bringing buildings into compliance with the Clean Building Performance Standard.

#### **Lighting retrofits**

LED lighting retrofits are an ongoing process with projects being completed on a revolving basis. Energy rebates from Bonneville Power Authority help to offset the cost of this work. Through 2023 – 2025 we will continue to switch out lighting across campus to efficient LED lighting.

#### **Electric vehicles and infrastructure**

Electric vehicle related projects for 2025 – 2027 will be informed by the assessment currently under way and strategic planning conducted during 2023 – 2025 time period.

#### **Prairie Restoration Project**

Ongoing implementation, support, and monitoring of this project will continue.

#### **Landscape Climate Resiliency Masterplan implementation**

Continued implementation of landscape masterplan

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

Eastern Washington University is committed to achieving carbon neutrality as quickly as possible. We have decreased our peak greenhouse gas emissions by 12 % since ~ 2014. To limit our impact on climate change we need to accelerate our GHG reduction rate. We are conducting studies with consulting firms to develop plans to improve energy efficiency, install electric vehicle infrastructure, and create a Climate Resiliency Landscape Masterplan. Information collected from these studies, along with internally developed planning will be used to update long term planning strategies in our Climate Action Plan. Currently we are working on projects to improve energy efficiency including LED lighting, repairing/replacing damaged equipment, and evaluating building envelopes. During 2023 – 2025 we will be assessing building energy use and updating infrastructure to meet requirements for the Clean Building Performance Standard, continuing renovation of the Science building, requesting predesign funds to update Martin and Williamson, conducting minor works projects that improve energy efficiency, and investigating opportunities for carbon sequestration. EWU has significant potential to quickly reduce greenhouse gas emissions and move towards carbon neutrality. Funding resources are the immediate barrier to implementing major GHG reductions at EWU and overcoming this barrier will be critical to achieving our goals.

EWU is currently evaluating and developing strategies to move towards carbon neutrality for the nearer term (2030) and longer-term (2040 and 2050). Currently EWU's Scope 1 and 2 emissions are ~8 % above 2005 levels, however this is down from a high of ~20 % above 2005 levels in 2012-2014, indicating a downward trend in GHG emissions. The downward trend in GHG emissions is likely related to a repair/replacement of building equipment, and upgrades to our energy distribution systems. To achieve the targets set in 70A.45.050 we must accelerate increases in energy efficiency and GHG reductions. During 2022 we are prioritizing the development of emission reduction strategies through internal research as well as working with consulting/engineering firms to set pathways towards energy efficiency and GHG reductions.

Approximately 95 % of Scope 1 emissions at EWU are tied to heating campus with natural gas through the central steam plant. The remaining 5 % are from the use of gasoline and diesel in campus maintenance vehicles. Scope 2 emissions are from the use of electricity in chillers at the central plant, HVAC, lighting, and plug load. When Scope 1 and 2 emissions are combined, Scope 1 emissions make up ~ 70 % of the GHGs, indicating significant opportunities for reduced GHGs from campus heating. However, transitioning off of natural gas to other alternative fuels (i.e. RNG, boiler electrification, geothermal, etc.) will have high associated costs. In the near term we are looking for improvements within the current steam delivery system while continuing to use natural gas. For the long-term we are starting to review options and look at all opportunities to transition off of natural gas.

In general, our current thinking is that 2030 reduction target is achievable through available technologies and practices. The main barrier to achieving the reduction target is not limited by technology, but by financial resources. If funds are properly allocated to support the purchasing and installation of appropriate equipment, and adequate staffing levels are supported to

maintain/repair facilities, we will achieve the 2030 GHG reduction target. As we look to 2040 and 2050, the reduction targets become more challenging to plan for strategically. To achieve a 70 % reduction in GHG, and ultimately carbon neutrality, we may need to utilize technologies that are not yet available at appropriate scales. These technologies may be those that are currently cost prohibitive, unproven at scale, or still in the very early stages of development. We can begin to anticipate potential solutions and review opportunities, but we have not set a specific pathway. Therefore, our current strategic planning for 2040 and 2050 is to assess and evaluate all carbon reduction options and find sustainable solutions.

### **2030 strategies**

- Invest in infrastructure improvements to reduce energy use and GHG emissions
- Support facilities personnel in management/maintenance of campus
- Use existing space efficiently
- Avoid increasing total campus square footage
- Carbon sequestration through the Prairie Restoration Project and management of the campus landscape.
- Launching a new University Sustainability Committee to build stakeholder engagement and help guide EWU towards sustainable practices

### **2040 and 2050 strategies**

- This section is still evolving for EWU, and will remain dynamic process for the near future, but will include the following efforts:
- Work with EWU staff, faculty and students to propose, research, and evaluate GHG reduction strategies
- Collaborate with industry experts to identify opportunities to transition EWU off of natural gas
- Investigate the role of carbon capture/sequestration from point source GHG emissions
- Electrify where possible
- Track and review emerging technologies/practices to reduce GHG emissions.

## Ecology, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 1,180                        |
| Fossil Fleet Energy Use Emissions | 1,208                        |
| Annual Fossil GHG Emissions       | 2,388                        |

In 2020, Dept. of Ecology's emissions were 53 % below their 2020 limit. In 2021, their emissions increased but remained 40 % below their 2020 limit and 7 % below their 2030 limit.

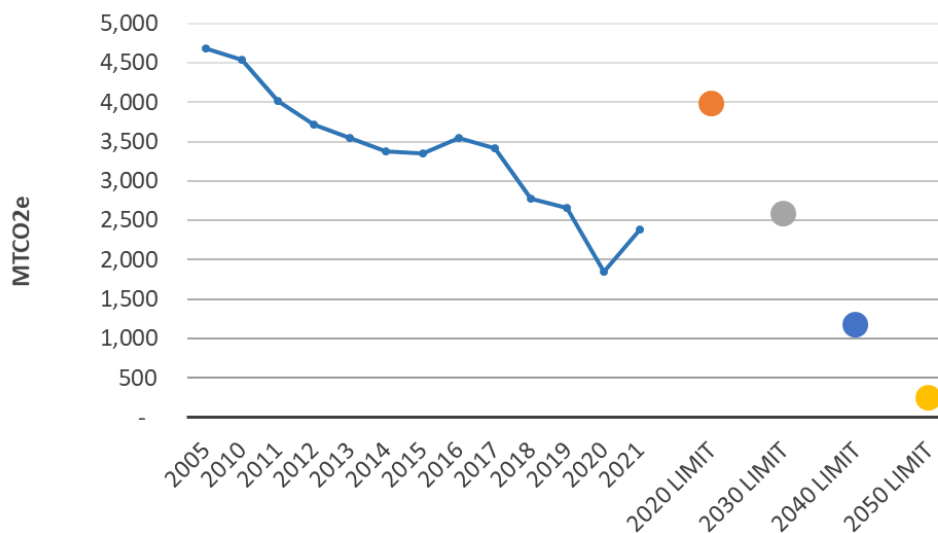


Figure 17. Dept of Ecology's Historic Emissions and Future Limits

In 2021, Ecology reported that 49 % of emissions were from buildings and 51 % were from transportation. The agency reported 558,254 sf of space, 72 % of which they owned and 28 % privately leased. In 2021, 11 % of the building sector emissions were from natural gas combustion while 88 % was indirect electricity emissions. Diesel used to power generators contributed .6 % of Ecology's building-related emissions.

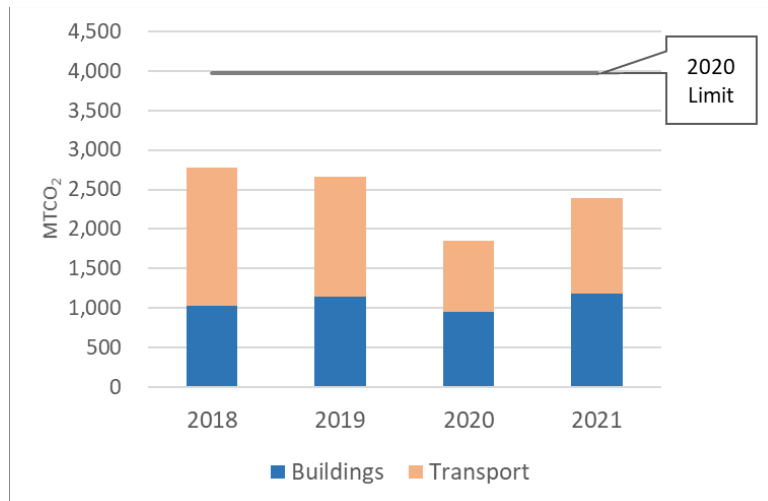


Figure 18. Dept. of Ecology’s Emissions from Building and Fleets 2018-2021

Ecology generated 103,051 kWh of electricity from solar photovoltaic systems in Spokane, Union Gap and Padilla Bay. The Lacey headquarters buildings has a ground-source heat pump designed to produce 200 tons of cooling capacity (about 2.4 million BTUs) which saves the equivalent of approximately 77,000 kWh of electricity annually. Ecology purchased an electric riding lawnmower in 2021.

### **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the 2020 and 2021 calendar years, the Department of Ecology (ECY) took the following actions to reduce GHG emissions:

- **Zero Energy Buildings**
  - Designed and constructed one of the state’s first zero energy buildings. This project was completed in June 2021 in Spokane.
  - The ECY headquarters building in Lacey replaced about 3,360 light fixtures and 262 air system components to reduce energy use.
- **New Roof for Lacey Headquarters Building**
  - Installed an Energy Star Rated Roof on the Lacey HQ building.
- **Zero Emission Vehicles and Infrastructure**
  - By the end of 2020, Ecology added 8 battery electric vehicles to the agency fleet and 11 electric vehicle charging stations.
- **Electric Lawn Mower**
  - Procured a battery-operated lawn mower with solar roof for the agency’s Lacey headquarters property.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, ECY is planning the following actions to reduce GHG emissions:

**Fleet Electrification.** According to the DES vehicle replacement schedule between 2022 and 2025, over 200+ Ecology fleet vehicles are identified for replacement due to age. Of those 200+ vehicles, about 100+ are feasible to transition to ZEVs, pending discussions with operators to determine if business needs can still be met. This ultimately means roughly 55% of Ecology's fleet will be replaced by 2025, and pending the approval of any needed exemptions, Ecology's fleet would reach roughly 45% electric, which is in compliance with the Governor's Executive Order 21-04 target of 40% electrification by 2025.

**Boiler Replacement—Eastern Regional Office, Spokane.** This project is the replacement of a boiler system to a smaller and more energy efficient model.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

### **Ecology's GHG Emissions**

The Department of Ecology is 40% below the established 2030 emissions limit in 2021.

The Department of Ecology's (ECY) existing greenhouse gas (GHG) emissions reduction strategies have already helped us surpass our 2030 goal and include the primary areas of workforce, vehicles, and facilities. For ECY's long-term emissions reduction strategy, workforce strategies include a focus on the reduction of the number of commute days by expanding and encouraging telecommuting and compressed work schedules as flexible options for employees. The agency seeks to incentivize and enable low-emissions commute modes by continuing the incentive for employees commuting via carpool, public transit, bicycle, walking, and vanpool, captured via our Automated Commute Trip Reduction (ACTR) system.

ECY seeks to increase Zero Emission Vehicles (ZEV) and electric vehicle support equipment by tracking technology development for ZEV trucks and acquire and test against business needs when a viable option becomes available on the market. We intend to increase electric vehicle chargers at agency facilities and replace vehicles with ZEVs wherever possible. We want to increase the use of alternative electric transportation options, as well as acquire and test zero emission alternatives to other motorized vehicles and equipment. These efforts are meant to reduce the vehicle miles driven metrics by continuing the promotion of the Commute Trip Reduction (CTR) program and minimizing driving to meetings and/or trainings through the utilization of hybrid meeting technology and efficient scheduling. ECY encourages the use of ZEVs as the agency continues to develop an internal education and outreach campaign that increases knowledge, familiarization, and comfort with the use of ZEVs while we transition our fleet to ZEVs.

ECY's facilities strategies continue to maximize energy efficiency in new and existing buildings. We are implementing any and all energy efficiency upgrades as they become known and available. The agency focuses on reducing solid waste generated by ECY operations by implementing office waste reduction measures and practices which improve recycling and minimize single-use disposables and plastics.



## Vehicle Fleet, Equipment, and Business Travel

### **Increase electric and alternative fuel vehicles and equipment.**

- Purchase long-range electric vehicles at time of replacement, in accordance with Governor Inslee's Executive Order 21-04.
- Switch to renewable diesel.
- Retrofit emergency generators (if necessary- dependent on the fuel source).
- Acquire and test new electric equipment as technology develops.

**Increase vehicle fuel economy.** Downsize heavy-duty trucks at time of replacement, after determining the true need.

**Increase use of alternative electric transportation options.** Acquire and test electric bikes, all-terrain vehicles, boats, etc. as technology develops.

### **Reduce miles driven and traveled.**

- Stage electric transportation and equipment throughout the state.
- Evaluate fieldwork routes to identify mileage reduction opportunities.
- Minimize driving to meetings and training through the implementation of teleconferencing technology and efficient scheduling.

## Facilities

**Move towards 100% renewable electricity for all Ecology facilities.** Purchase 100% renewable electricity.

### **Maximize energy efficiency in new and existing buildings.**

- Emphasize smart building technology use.
- Expand energy-saving solutions at owned facilities, and advocate for it at leased facilities.
- Geothermal possibilities.
- Continue Participation in the Green Power program.
- Pursue the reduction/elimination of natural gas infrastructure/usage in Ecology-owned facilities.
- Assess the feasibility of a regularly occurring office closure to save on energy usage.
- Expand electric vehicle charging infrastructure at all locations, for both public and private use.
- Conduct a systemic inventory of carbon inputs to develop strategies for reduction.

## Enterprise Services, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 5,823                        |
| Fossil Fleet Energy Use Emissions | 465                          |
| Annual Fossil GHG Emissions       | 6,288                        |

In 2020, Dept. of Enterprise Services' (DES) emissions were 31 %below their 2020 limit. In 2021, their emissions decreased further and were 68 %below their 2020 limit and 50 % below their 2030 limit, nearly approaching their 2040 limit.

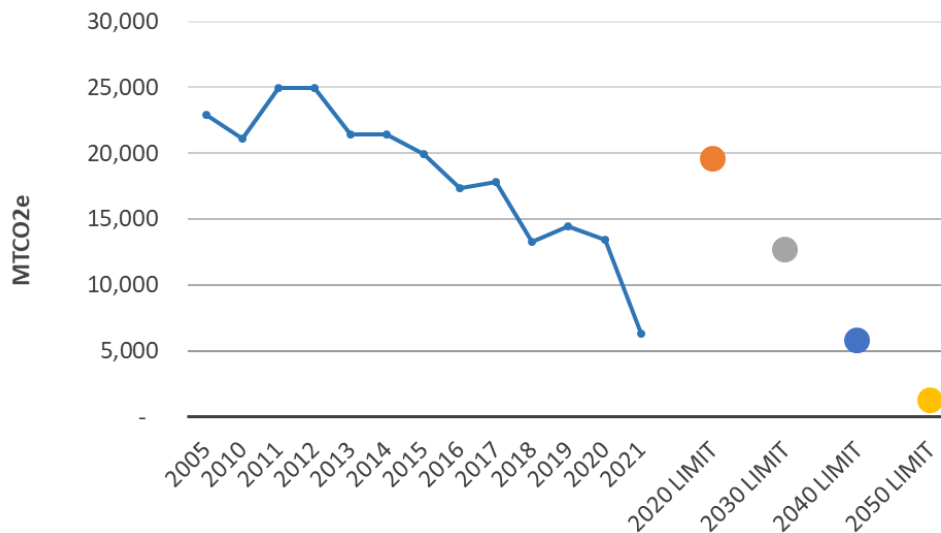


Figure 19. Dept. of Enterprise Services' Historic Emissions and Future Limits

In 2021, the Department reported that 93 % of emissions were from buildings and 7 % were from transportation. The agency reported 9,685,090 sf of space, 69 % of which they owned, 22 % privately leased, and the remainder leased from other state agencies. In 2021, 91 % of the building sector emissions were from natural gas combustion while 9 % was indirect electricity emissions. DES purchased over 42 million kWh of electricity through a zero-carbon green power contract, therefore reducing their electricity emissions significantly.

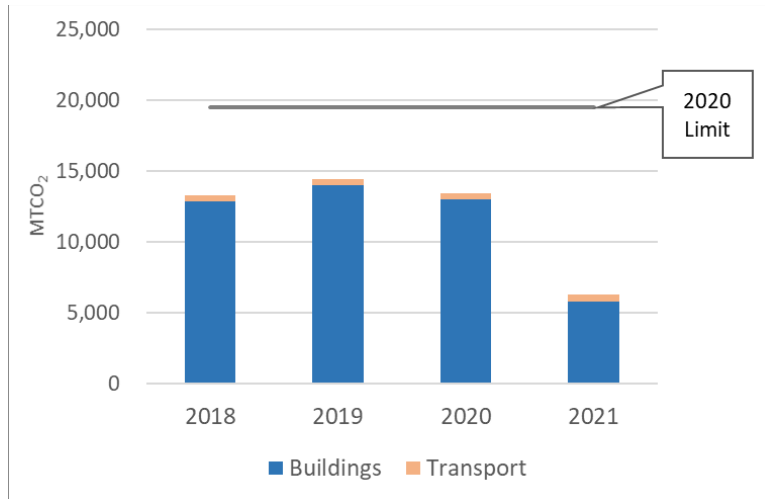


Figure 20. Dept. of Enterprise Services' Emissions from Building and Fleets 2018-2021

## **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the 2020 and 2021 calendar years, the Department of Enterprise Services (DES) took the following actions to reduce GHG emissions:

- Installed EV charging stations:
  - Installed 1 at 1312 Fones Road in Olympia
  - Installed 2 dual head chargers on Capitol Campus in the visitor lot
  - Installed 1 dual head charger on the Capitol Campus in the ProArts lot
  - Installed 12 chargers on level A in the Plaza Garage
  - Installed 24 chargers on level B in the Plaza Garage
  - Installed 2 chargers at the NRB visitor lot.
  - Install 1 charger in the mansion lot/garage
  - Install 1 dual charger at Capitol Court Building
- The DES Energy Program has worked through technical issues and gained access to electric metering data that allows for building electricity consumption on the Capitol Campus to be monitored, and the data to be used for data-based decision making along with the non-campus buildings. This is a step forward to being able to comply with the Clean Buildings Act.
- The Capitol Court Building roof maintenance project was turned into an energy saving roof replacement project.

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

DES is planning to take the following actions during the 2023-25 and 2025-27 biennia to reduce GHG emissions:

- DES Fleet Operations has been awarded \$2.9M in the supplemental budget to put towards EVSE chargers at state owned office locations and is currently working with agencies to identify/prioritize locations for these EV Charger installs.
- The DES Energy Program is working to gain access meter data for steam/natural gas, and chilled water to complete our ability to measure all utilities, calculate EUIs, and to comply with the Clean Buildings Program.
- DES plans to submit a capital budget request for the 2023-25 biennium to continue to move forward with the Next Century Capitol Campus (NC3) project which upgrades campus buildings (including the Legislative Campus Modernization (LCM) project that is currently funded); and replaces the old power plant that is past its useful life with a Centralized Combined Heat and Power Plant (CHP) that is much more efficient and sustainable. The new plant will make it possible for DES to meet 2050 emission goals and comply with Executive Order 20-01 by “promoting innovative clean, home-grown energy technologies over the burning of imported fossil fuels,” “reducing atmospheric levels of GHGs,” and by “improving job growth and competitiveness in green energy businesses and technologies.”

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

DES is focused on meeting the 2050 GHG targets established by RCW 70A.45.050. DES has already reached the 2030 targets and has a plan that, with hard work, will be successful in meeting the 2050 target. Each DES division is tasked with making changes. Fleet Operations is replacing gas fueled cars with EVs and installing charging stations, Planning & Project Delivery (PPD) in conjunction with Buildings and Grounds (B&G) is focusing on new energy efficient building upgrades, and energy upgrades when making building repairs. The Energy Program is working to make sure buildings energy use can be measured and is working to provide data for data-based decision making. Each division is working collaboratively so success is achieved.

- Since 2006 DES has reduced energy consumption in its facilities by over 40%. In 2018 DES had met its 2050 GHG targets. The new targets established under HB 2311 raised the bar. Even with these more aggressive emission targets, DES has still managed to meet the 2030 GHG targets.
- The biggest opportunity for DES is to replace the existing Capitol Campus steam heating system. The CHP project will replace the existing end of life steam system with a hot water distribution system. Providing a pathway to net zero. Without this project the campus will not be able to meet its GHG emission reduction goals in RCW 70.235. 50. Additionally, the CHP project improves resiliency to climate change impacts, provides life-cycle cost savings, and supports Continuity of Operations for State Government.
- Many buildings on the Capitol Campus need maintenance and upgrades. The DES 10-year plan focuses on working toward energy saving projects that will help move campus buildings toward Net-Zero goals.

**Transportation.** DES has an aggressive plan to promote the use of EVs and encourages remote work to reduce miles driven and help downsize occupied office space.

**Facilities.** DES will pursue new buildings with high performance standards and on-site solar arrays. DES will leverage recommendations from its resource conservation manager (RCM) to review energy data and identify opportunities and will collaborate actively with internal departments to make improvements.

**Renewable Electricity.** DES has a power purchase agreement through PSE's Green Direct program that applies to approximately 27 buildings. This represents more than 90% of the electricity that is consumed on the Capitol Campus.

## Fish and Wildlife, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 5,932                        |
| Fossil Fleet Energy Use Emissions | 6,906                        |
| Annual Fossil GHG Emissions       | 12,838                       |

In 2020, Department of Fish and Wildlife (WDFW) emissions were 36 % below their 2020 limit. In 2021, WDFD's emissions increased to 1 % above their 2020 limit and 56 % above their 2030 limit. WDFW conducted an extensive review of emissions data and identified new sources of emissions not previously reported. This does not mean they are emitting more than in that past, rather, that their emissions reporting is more accurate than they may have been in the past.

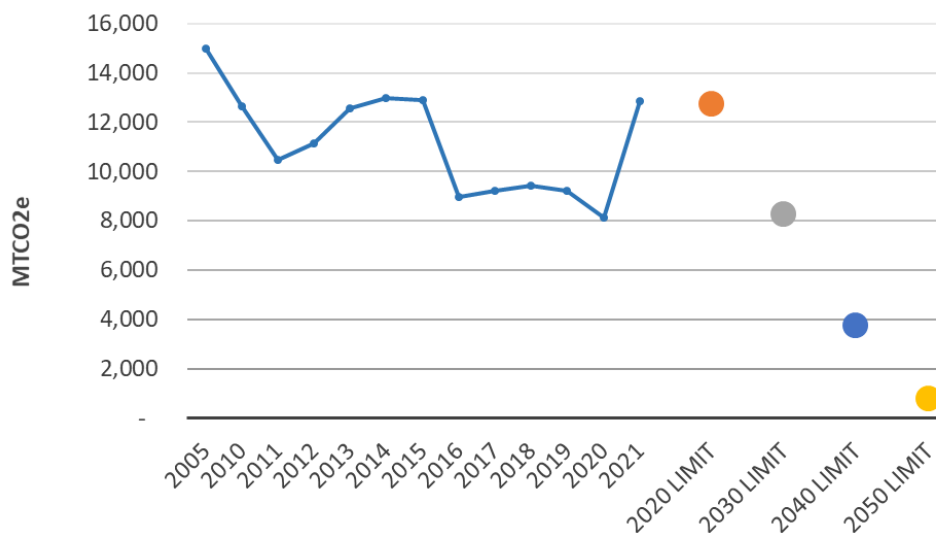


Figure 21. Washington Dept. of Fish and Wildlife's Historic Emissions and Future Limits

In 2021, WDFW reported that 46 % of emissions were from buildings and 54 % were from transportation. The department reported 1,763,397 sf of building space, 82 % of which they owned, 10 % privately leased and the remaining 8 % leased from DES or other state agencies. In 2021, 10 % of the building sector emissions were from natural gas combustion while 90 % was indirect electricity emissions. The department also began including fuel used in DES leased vehicles for the first time in 2021. This increased their fleet emissions by 61 % over the prior three-year average.

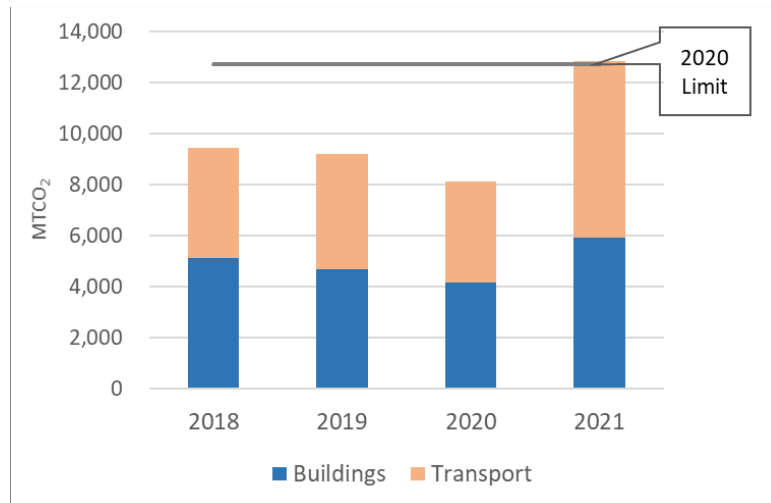


Figure 22. Washington Dept. of Fish and Wildlife’s Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

In 2020 and 2021, WDFW took the following actions to reduce GHG emissions:

- Hired an Environmental Sustainability Coordinator to lead work on GHG reduction and carbon sequestration.
- Contracted with Cascadia Consulting Group to 1) develop an improved GHG inventory and 2) model the effectiveness and cost of GHG reduction strategies. This work goes beyond fleet and buildings to also address voluntary sources: employee commuting, business flights, hatchery fish digestion, solid waste, water, and purchased materials.
- Developed a draft Sustainability Plan to reduce emissions from fleet and buildings plus the voluntary sources described above. The draft Sustainability Plan will be considered by WDFW’s Executive Management Team in June 2022 and by WDFW’s Commission in August 2022. The information presented in this GHG emissions reduction strategy report is drawn from WDFW’s draft Sustainability Plan and should be viewed as **preliminary and subject to change** based on review by WDFW’s leadership.
- Developed a decision package for the 23-25 biennium to fund implementation of the Sustainability Plan, along with two capital project proposals to install electric vehicle charging infrastructure and implement energy efficiency improvements.
- Created a central fleet coordinator position and implemented energy efficiency improvements.

## Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)

During the 2023-25 and 2025-27 biennia, WDFW is planning to take the following actions to reduce GHG emissions.

**Priority actions to reduce fleet emissions**

- Develop an electric fleet transition plan that addresses which vehicles can be converted when given operational demands, charging infrastructure needs, costs, maintenance, and policy questions like pricing and public access (*requested in 2022 supplemental budget*).
- Install electric vehicle charging infrastructure at approximately 30 agency-owned facilities and 20 leased facilities, which would enable converting about half of the fleet to electric at the time of replacement by 2034 (*requested in 2023-25 capital budget*).
- Develop staff training and resources on electric vehicle charging, driving, and troubleshooting.
- Research the availability and usability of alternative fuels like renewable diesel for larger trucks for which electric is not an option (*requested in 2023-25 decision package*).

**Priority actions to reduce buildings emissions**

- Implement energy efficiency improvements through ESPC contracts (*requested in 2023-25 capital budget*).
- Increase staff capacity to implement energy efficiency and renewable energy projects and improve data and tracking of energy use (*requested in 2023-25 decision package*).
- Assess feasibility and siting for solar energy systems on buildings and fish hatchery ponds; assess feasibility and siting for micro-hydro systems in fish hatchery pipes (*requested in 2023-25 decision package*).

**Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

WDFW will use a combination of strategies to meet GHG emissions limits in the future.

**Transportation.** Long-term strategies to reduce fleet GHG emissions include the transition to electric vehicles, vessels, and equipment. Where all-electric is not possible, we will transition to alternative fuels, increase fuel efficiency, reduce miles traveled and improve fleet management.

| FLEET STRATEGIES AND ACTIONS |  | LEAD PROGRAM           | TIMEFRAME |
|------------------------------|--|------------------------|-----------|
| TRANSITION TO ELECTRIC       |  |                        |           |
| F1                           | Develop an electric fleet transition plan that addresses which vehicles can be converted when given operational demands, charging infrastructure needs, costs, maintenance, and policy questions like pricing and public access. | BSP-Conservation; CAMP | Short     |
| F2                           | Install electric vehicle chargers at agency-owned offices, hatcheries, and wildlife areas. Seek grant funding.   | CAMP; Fish; Wildlife   | Short     |



|  |  |                             |        |
|--|--|-----------------------------|--------|
| F3   | Update lease terms to require installation of electric vehicle chargers at leased offices, hatcheries, and wildlife areas.                                       | CAMP; Fish; Wildlife        | Medium |
| F4   | Institute a policy to select electric or plug-in hybrid vehicles as vehicles are replaced or added unless there is a significant operational demand issue.       | BSP-Conservation; CAMP; all | Short  |
| F5   | Collaborate with DES to train staff on electric vehicle charging, driving, and troubleshooting in the field. Communicate resources to address common concerns.   | BSP-Conservation; CAMP      | Short  |
| F6   | Track technology advances for electric and hybrid vessel motors; acquire and test motors as they come on market.   | Fish; Wildlife; ENF         | Medium |
| F7   | Track technology advances for electric UTVs, snowmobiles, motorcycles, etc.; acquire and test as they come on market.  | Wildlife; ENF               | Medium |
| F8   | As small equipment is replaced or added, order electric chainsaws, weed whips, mowers, forklifts, etc. whenever possible. Purchase extra batteries and chargers. | Wildlife; Fish              | Medium |
| <b>TRANSITION TO ALTERNATIVE FUELS WHERE ELECTRIC IS NOT AN OPTION</b> |  |                             |        |
| F9   | Research the availability, usability, and emissions of alternative fuels like renewable diesel, biodiesel, ethanol, hydrogen, and sustainable aviation fuel.     | BSP-Conservation; CAMP      | Short  |
| F10  | Implement transition to alternative fuels through purchasing for bulk fuel sites and staff guidance on buying alternative fuels at commercial sites.             | CAMP; Wildlife; Fish        | Medium |
| F11  | Train staff on using alternative fuels. Communicate resources to address common concerns.  | BSP-Conservation; CAMP      | Medium |
| <b>INCREASE FUEL EFFICIENCY (MPG) WHERE ELECTRIC IS NOT AN OPTION</b>  |  |                             |        |

|                                 |  |                             |        |
|---------------------------------|--|-----------------------------|--------|
| F12                             | Institute a policy to select the smallest vehicle size that meets operational demands as vehicles are replaced or added.   | BSP-Conservation; CAMP; all | Short  |
| F13                             | Improve vessel fuel efficiency through hull design, engine upgrades, maintenance, removing weight, and reducing speeds and idling.   | Fish; Wildlife; ENF         | Medium |
| <b>REDUCE MILES TRAVELED</b>    |  |                             |        |
| F14                             | Assess the potential of shifting more vehicles into a shared/pool approach rather than being assigned to individuals to encourage carpooling between work sites.   | CAMP; all                   | Long   |
| F15                             | Encourage virtual meetings and trainings through infrastructure, policies, and culture.  | BSP-IT; all                 | Short  |
| F16                             | Identify tasks that could be done via walking, biking, UTV, or drone rather than vehicle/vessel. Acquire the necessary equipment and develop policies and communications to encourage work outside vehicles. | Wildlife; Fish; ENF         | Long   |
| F17                             | Work with DES to modify vehicle utilization requirements that create incentives to drive more.   | CAMP; all                   | Medium |
| <b>IMPROVE FLEET MANAGEMENT</b> |  |                             |        |
| F18                             | Improve data on fleet inventory, fuel use, utilization, and MPG to enable better understanding of trends and opportunities to reduce emissions.  | CAMP; BSP-Conservation      | Short  |
| F19                             | Utilize new central fleet coordinator role to assist in implementing fleet actions.  | CAMP                        | Short  |

**Facilities.** Long-term strategies to reduce building GHG emissions include reducing energy use through energy efficiency projects and converting gas systems to electric, transitioning to renewable energy and improving facilities management.

| <b>BUILDINGS STRATEGIES AND ACTIONS</b> | <b>LEAD PROGRAM</b> | <b>TIMEFRAME</b> |
|---|---------------------|------------------|
| <b>REDUCE ENERGY USE</b>                |                     |                  |

|  |   |                        |        |
|--|---|------------------------|--------|
| B1   | Utilize Energy Saving Performance Contracting to identify, prioritize, and implement energy efficiency improvements, such as pumps, insulation, lighting, windows, and weatherproofing. | CAMP                   | Short  |
| B2   | Institute a policy to require electric heating systems rather than gas in renovations and new construction. Develop and implement a plan to replace existing gas heating systems.       | CAMP                   | Medium |
| B3   | Work with DES to develop and implement green lease language that requires energy efficiency standards and replacement of gas heating.   | CAMP                   | Medium |
| B4   | Develop design specifications that integrate energy efficiency, renewable electricity, low-impact materials, etc. into design of capital projects.                                      | CAMP; all              | Medium |
| B5   | As post-COVID work patterns emerge, assess occupancy by in-person workers and potential to downsize office space.   | CAMP                   | Medium |
| <b>TRANSITION TO RENEWABLE ELECTRICITY</b> |   |                        |        |
| B6   | Assess feasibility and siting for solar energy systems on offices, wildlife area buildings, and hatchery buildings and ponds. Implement installations.                                  | CAMP                   | Medium |
| B7   | Assess feasibility and siting for micro-hydropower systems in hatchery pipes. Implement installations.  | CAMP; Fish             | Medium |
| B8   | Investigate options to purchase renewable electricity through utility company opt-up programs, power purchasing agreements, and renewable energy certificates.                          | BSP-Conservation       | Long   |
| <b>IMPROVE FACILITIES MANAGEMENT</b>       |   |                        |        |
| B9   | Increase staff capacity to assist in implementing buildings actions and improve energy management.  | CAMP                   | Short  |
| B10  | Pursue funding for energy efficiency and renewable electricity projects including grants and utility incentives.  | BSP-Conservation; CAMP | Short  |

|     |   |                        |        |
|-----|---|------------------------|--------|
| B11 | Improve data on energy use, facilities inventory, and utilities inventory through systems like Energy Star Portfolio Manager and meters/sub-meters to enable better understanding of trends and opportunities to reduce energy use. Implement recommendations in Washington State University Energy Program report. | BSP-FSP; CAMP          | Short  |
| B12 | Assess and communicate the return on investment, payback period, and long-term cost savings of energy efficiency and renewable electricity projects.  | BSP-Conservation; CAMP | Medium |

WDFW has developed a draft **Sustainability Plan** to reduce emissions from fleet and buildings plus reduce emissions or address other environmental impacts from voluntary sources: employee commuting, business flights, hatchery fish digestion, solid waste, water, purchased materials, and toxic chemicals.

# Health, Department of

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 5,070                        |
| Fossil Fleet Energy Use Emissions | 331                          |
| Annual Fossil GHG Emissions       | 5,401                        |

In 2020, Department of Health (DOH) emissions were 21 % below their 2020 limit. In 2021, DOH’s emissions decreased slightly to 22 % below their 2020 limit. They remain 21 % above their 2030 limit.

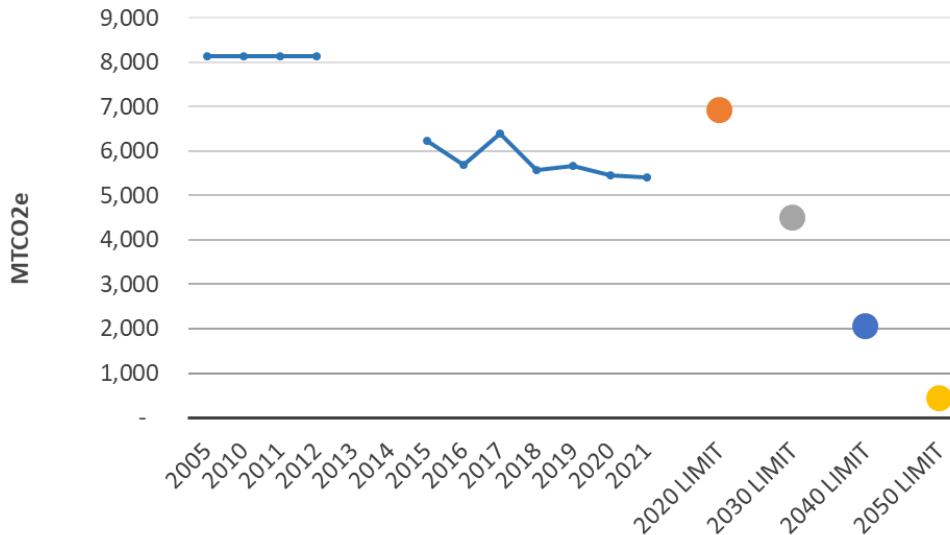


Figure 23. Dept. of Health Historic Emissions and Future Limits

In 2021, the DOH reported that 94 % of emissions were from buildings and 6 % were from transportation. The department reported 691,042 sf of building space, 12 % of which they owned, 87 % privately leased and the remaining 1 % leased from other state agencies. In 2021, 95 % of building emissions were indirect emissions from steam purchased through a district heating system. An additional .6 % of building emissions were from natural gas combustion and 5 % was indirect electricity emissions. More than half of DOH’s electricity was purchased using a zero-carbon green power contract, reducing their electricity emissions by 277 MTCO<sub>2</sub>. 75 % of DOH’s transportation emissions are from motor vehicles and the remaining 25 % are from boats.

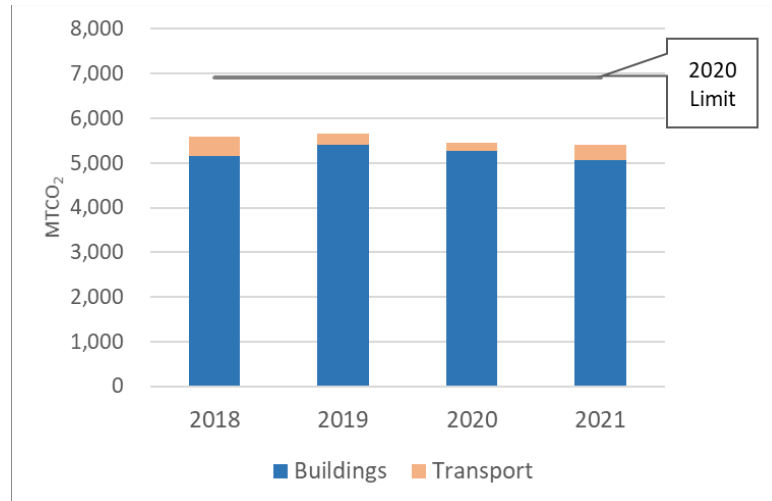


Figure 24. Dept. of Health Emissions from Building and Fleets 2018-2021

### **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

In 2020 and 2021, the Department of Health (DOH) took actions to reduce GHG emissions that included changing warehouse lighting to LED (the upgrades included occupancy sensors and photocells). DOH also added light occupancy sensors to restrooms to conserve energy when not occupied and installed LED wall packs on the Israel side of the TC1 building. Central Boiler plant improvements were also completed to reduce steam usage for the facility. Energy efficient improvements at DOH’s South Lab created a more energy efficient building, installed solar panels, and upgraded to a high efficiency HVAC system. During this time period, DOH also added two EVs to the agency fleet, removed canned air from DOH facilities, and reduced the brick-and-mortar space needs by consolidating areas.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, DOH plans include:

- Recruit for Sustainability Coordinator and vehicle management role. This position is instrumental in implementing change in strategies to make the work environment and practices sustainable and eco-friendly by reducing DOH emissions. Incumbent will implement legislative directives, develop policies and procedures, develop and implement systems, implement long-range strategic plans, formulate goals and objectives, and meet customer needs.
- DOH will continue to work with DES and electrify the agency fleet, as well as seek funding for more EV charging stations.
- DOH has reinstated the Parking/CTR committee that will strive to support greener modes of transportation and help make these modes more accessible to all DOH employees.

- The DOH SEEP team participates in many state-wide workgroups convened by the SEEP Office. The DOH SEEP team meets regularly to bring together the work of each committee in order to set goals and determine how to reach them.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

To meet long-term emissions limits, DOH and DES have a schedule in place to electrify our fleet, making sure to meet goals established in Executive Order 21-04.

DOH considers the environmental impact of our entire agency in many ways. DOH is always on the lookout for ways to reduce the physical space we occupy by encouraging telework, maximizing our space use through workplace modernization, and relinquishing leases where necessary to eliminate underutilized space. When DOH selects furnishings and finishes we give preference to items with either a high recycled content or other positive environmental impact. DOH strives to use our fleet efficiently which helps to increase the longevity of each vehicle and we give preference to hybrid or electrical vehicles. Our used office supply program allows employees the option of choosing previously used items instead of ordering new. Preference is given to recycled/reduce/reuse office supplies.

DOH is hiring a sustainability coordinator to further our knowledge and reduce emissions—this position will be key to developing and implementing long-term plans to reduce GHG emissions.

**Transportation.** DOH has developed a schedule to replace internal combustion engine (ICE) vehicles with battery electric vehicles (BEV). DOH will also work to improve the utilization of fleet vehicles, support remote options for meetings, install additional EV chargers, and switch permanently assigned vehicles to EVs.

**Facilities.** Where applicable, DOH will include information related to performance standards in the [Clean Buildings](#) law and address strategies related to other existing requirements, including facility [benchmarking](#) and Zero Energy building standards (for agencies named in EO 20-01). Key strategies include efficient LED lighting and HVAC systems, efficient appliances, building envelope improvements, and reducing occupied square footage. DOH is also prioritizing upgrades to the Public Health Lab including an on-site solar array, EV charging, a central boiler plant with a ground-source heat pump, and other energy efficient features.

## Labor and Industries, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 1,845                        |
| Fossil Fleet Energy Use Emissions | 2,281                        |
| Annual Fossil GHG Emissions       | 4,126                        |

In 2020, the Department of Labor and Industries (L&I) emissions were 21 % below their 2020 limit. In 2021, L&I's emissions increased but remained 10 % below their 2020 limit. They remain 39 % above their 2030 limit.

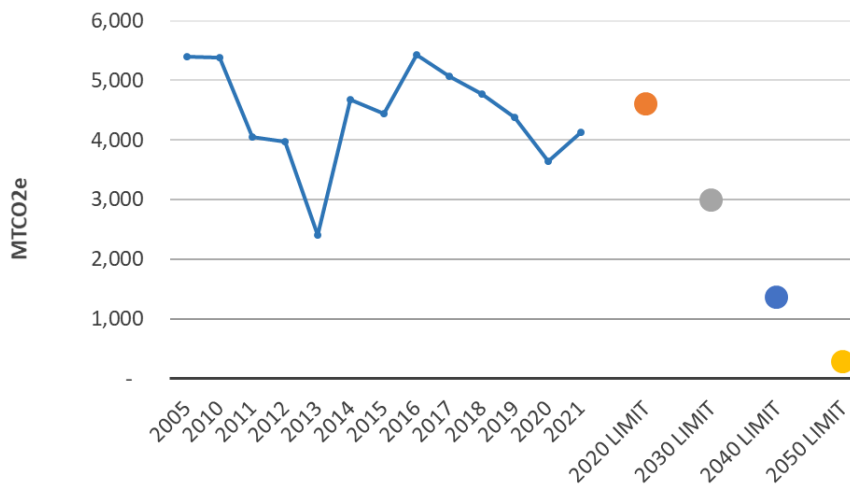


Figure 25. Dept. of Labor and Industries Historic Emissions and Future Limits

In 2021, L&I reported that 45 % of emissions were from buildings and 55 % were from transportation. The department reported 825,777 sf of building space, 56 % of which they owned, 39 % privately leased and the remaining 5 % leased from DES. In 2021, 6 % of building emissions were from natural gas combustion and 94% were indirect electricity emissions. 99 % of L&I's transportation emissions were from gasoline used in motor vehicles and the remaining 1% were from diesel used in vehicles.



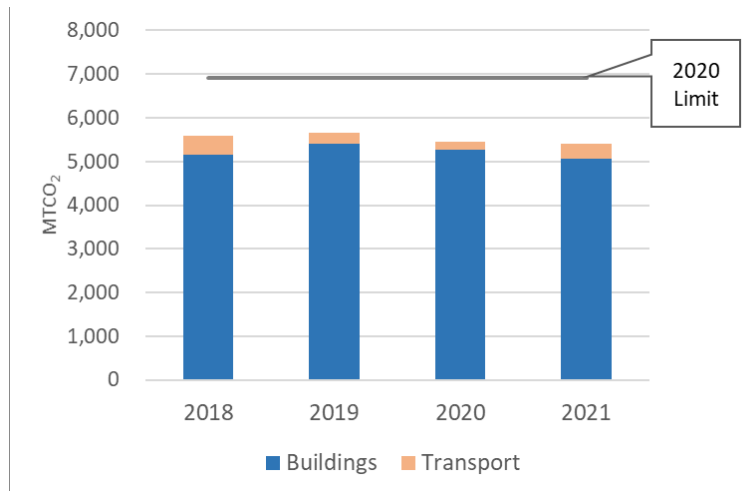


Figure 26. Dept. of Labor and Industries Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

In 2020 and 2021, Labor and Industries (L&I) took actions to reduce GHG emissions that included upgrades to the headquarters building in Tumwater. This building was designed and built in 1992 with energy efficiency in mind. It won First Place in the Energy User News Efficient Building Award which was a national competition presented by Johnson controls in 1994. L&I is also registered with the Olympic Region Clean Air Agency, and since March 2017 L&I have been working with the Department of Enterprise Services (DES) Energy Program and an Energy Services Company (ESCO) University Mechanical Corporation (UMC) on an Investment Grade Audit (IGA) to create a multi-phase project to replace many of the infrastructure components at the headquarters building with energy efficient equipment.

Phase 1 of this project was completed in 2020-2021 and replaced the following:

- Natural gas fired boilers were replaced with heat pumps
- Building chillers were replaced with modern computer-controlled equipment
- Domestic water pumps were replaced with modern equipment and variable frequency drives to control energy flow with demand
- LED lighting pilot replaced 32-watt fluorescent fixtures to LED in target areas to include 1<sup>st</sup> floor and elevator lobbies

L&I has a guaranteed expected savings of approximately 51,000 KW/y as well as over 20,000 therms with this project.

Other conservation measures implemented in 2020-21 included ensuring setback temperatures are followed and replacing building NAE controllers which allow for better efficiency and control.

L&I is currently in the permitting stage of phase 2 of this energy project and expects to see additional improvements in future years.

In a past Capital budget request L&I proposed replacing all lighting at the headquarters building with LED. This request was not approved, but L&I will try to complete as much possible with current operating budget and grant funding and resubmit remaining elements in our next budget request.

The Department of Labor & Industries (L&I) and Department of Agriculture (Agriculture) are constructing a shared laboratory complex that would bring five separate laboratories to one location. The new complex would enable the agencies to resolve a variety of concerns with their existing facilities, employee safety, lab functionality, space limitations, etc. The shared facility will ensure lab infrastructure meets current codes and functional requirements, provide much needed meeting and training space, incorporate modern employee workspaces, and improve services provided to the public. The building is designed to be LEED Silver project, with High Efficiency Components and Zero Energy Capable. It includes radiant floor heating and geothermal heat pump system with approximately 250 geothermal wells on site. The building will have premium efficiency HVAC equipment, and glazing. It would be Zero Energy Capable via the use of load shedding equipment installed as part of the project and provision for future solar panels. This building is expected to be complete in the first quarter of 2023.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, L&I is planning a geothermal heating system for the headquarters building and solar panel carports for the SW parking lot. L&I is also planning building cladding repairs and solar panel installation in the SW lot and will continue to lease electric and hybrid fleet vehicles as much as possible and as range and capabilities increase.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

To meet established GHG limits, Labor and Industries will continue to invest in building infrastructure and implement energy conservation methods to further reduce our energy demand.

**Headquarters Building.** Complete Phase 2 of energy project, including air handlers, cooling tower, HVAC equipment upgrades, LED fixtures, solar panels, building envelope improvements, geothermal heating, and high energy performance.

**Leased Facilities.** Reduce agency leased footprint statewide working with DES Real Estate Services and OFM to comply with current and future leasing requirements.

**Construction.** L&I and the Department of Agriculture are constructing a shared laboratory that includes the following:

- Combines five labs to one
- LEED Silver
- High Efficiency HVAC equipment and glazing
- Zero Energy Capable with load shedding equipment and future solar panels provision.
- Geothermal heat pump with ~ 250 wells.
- Radiant heating
- Completion ~ April 2023.

**Transportation.** L&I leases electric vehicles where possible. Most meetings and trainings are online, so employees don't have to drive across the state to attend.

# Liquor and Cannabis Board

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 100                          |
| Fossil Fleet Energy Use Emissions | 522                          |
| Annual Fossil GHG Emissions       | 622                          |

The Liquor and Cannabis Board (LCB) emissions dropped significantly when they sold the state-owned liquor stores between 2011 and 2013. In 2020, they were 87 % below their 2020 limit. In 2021, LCB’s emissions increased slightly to 85 % below their 2020 limit. They are 77 % below their 2030 limit.

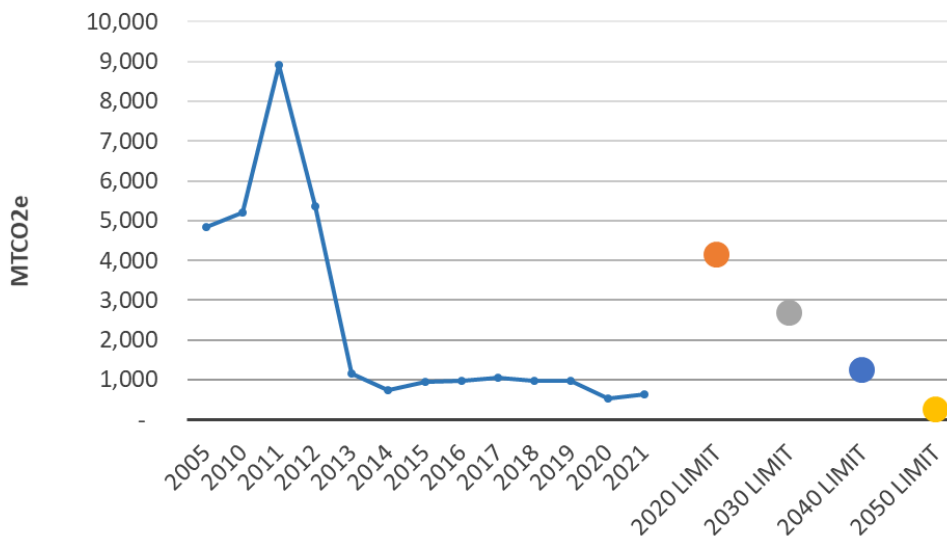


Figure 27. Liquor and Cannabis Board Historic Emissions and Future Limits

In 2021, the LCB reported that 16 % of emissions were from buildings and 84 % were from transportation. They reported 79,626 sf of building space, 98 % privately leased and the remaining 2 % leased from other state agencies. An additional 15,740 sf of space (7 facilities) is leased with utilities included. They do not have data for those facilities. They are working with property owners to acquire the data, but spaces may not be sub metered as they are all under 5,000 sf each (the average space is about 2,300 sf).

In 2021, 21 % of building emissions were from natural gas combustion and 79 % was indirect electricity emissions.

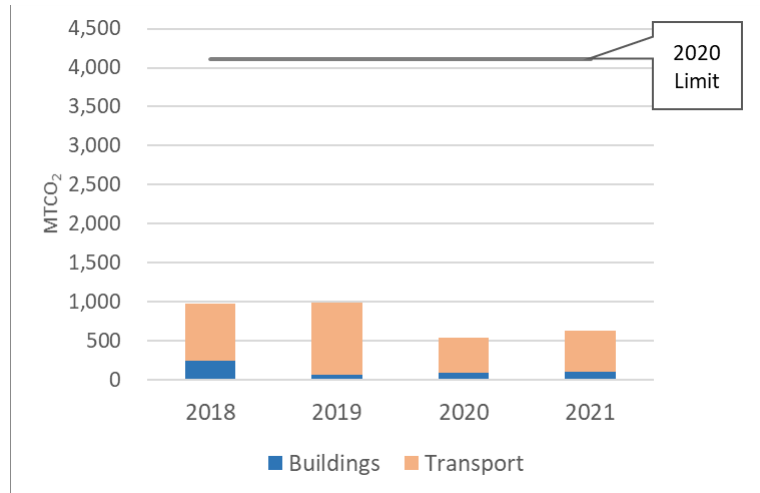


Figure 28. Liquor and Cannabis Board Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

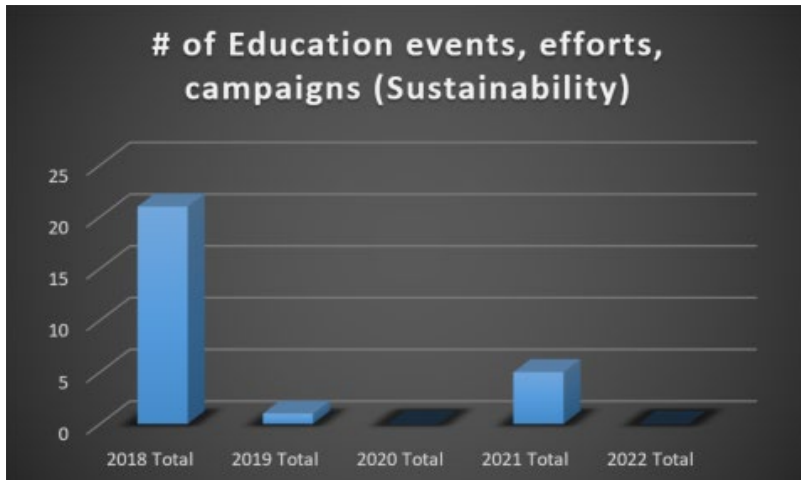
In 2020 and 2021, the Liquor and Cannabis Board took actions to reduce GHG emissions that included the following.

### Communication & Education

The Operational Support Team started a newsletter to include a section for environmental and DEI updates to staff. The newsletter is sent out monthly. In addition, the links to the newsletter are included in agency wide communications every other week. The team also has a dedicated page for announcements where current data can be published daily for employee access. Examples of the items listed are: current training documents created for EPP purchasing, SEEP newsletters, New Master Contracts availability, DEI information, DES Contracts Connection news, Commute Trip Reduction news, and Facility news. Newsletter and announcement page are included as attachments.

The Human Resources division also has a safety intranet site that has a Safety Data Sheet (SDS) listing (with hyperlinks) for all products purchased. This list is reviewed annually by the Operational Support Team to “green up” products and provide educational materials around reducing toxics in the workplace. Included as attachment.

The Operational Support Team worked to educate IT on EPEAT compliance, to ensure electronic purchases meet EPEAT Silver rating as outlined in the [SEEP guidelines](#). In 2020, the agency purchased EPEAT Silver laptops.



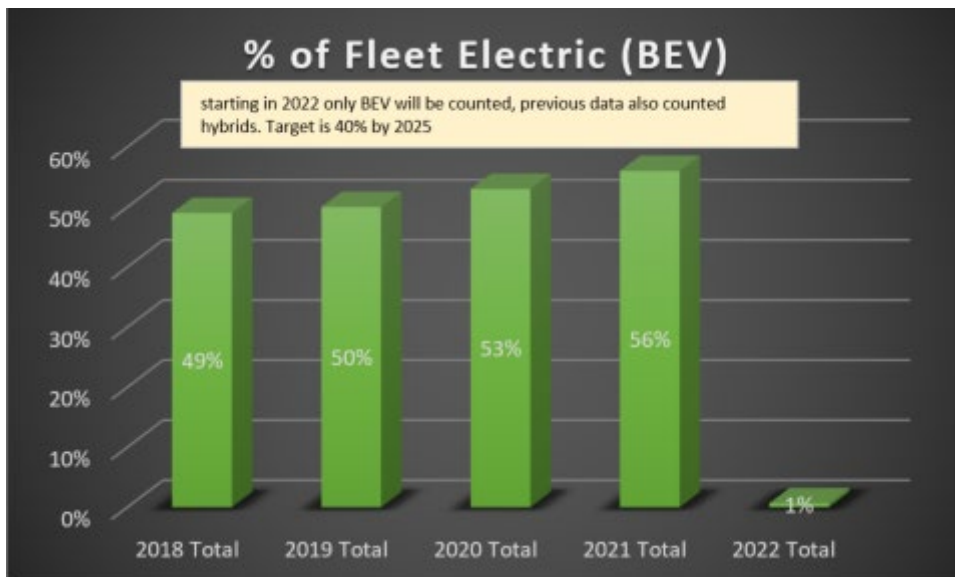
## Transportation

The Operational Support Team created a vehicle replacement plan to help measure progress with EO 21-04. In late 2021, Enforcement Division submitted six vehicle replacements to DES that adhere to the EO. Vehicles are due to be delivered in May and July 2022. Attachment is included with this plan.

The team was also able to collaborate with our partner WSDOT to share charging stations at a Vancouver facility where we lease space. The team is working to secure charging stations at the remainder of the field offices in collaboration with DES Real Estate Services.

LCB entered an IAA (K1524) with SBCTC to share charging stations at our HQ facility.

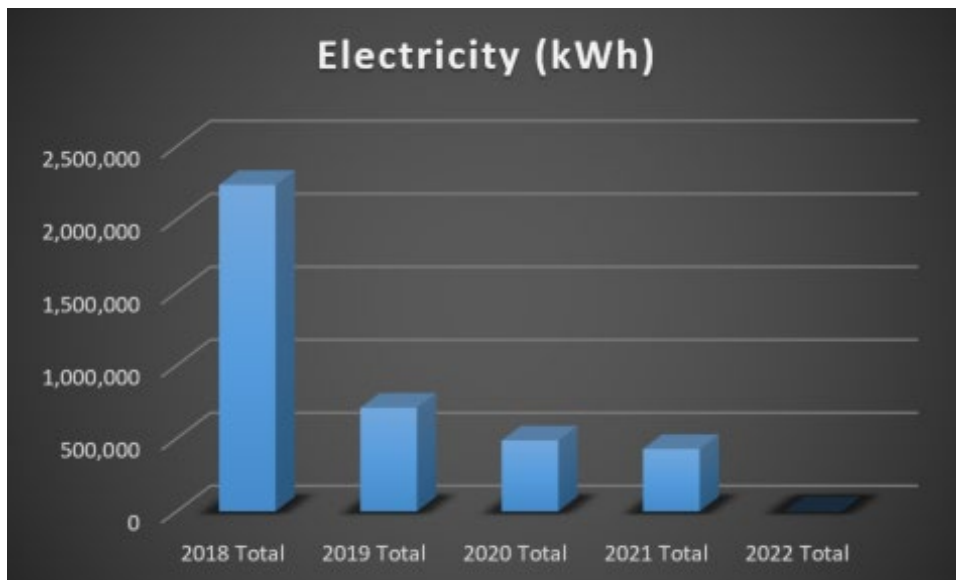
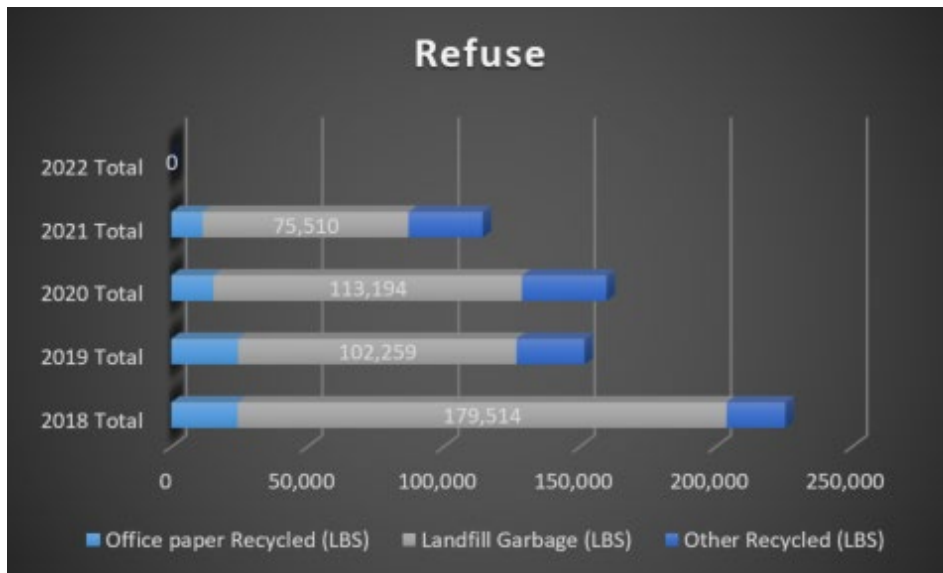
The LCB fleet is over 50% hybrid.



## Facilities

LCB continues to contribute to our long-term lease investment through 2029 as outlined in our 2019 CRIB submittal and as included within this report.

The Operational Support Team reduced services in facilities during COVID shutdowns for garbage and recycle. This reduced the amount of money the agency was paying for these services as well as reduced pickups to the facilities when refuse and recycling were minimal. Electricity and heating could not be reduced as we still had minimal staff entering the facilities on a regular basis for core functions. The agency did see declined use overall as shown below.



## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, LCB is planning to take the following actions to reduce GHG emissions:

- As DES environmental purchasing policies are updated, LCB will mandate training to affected staff, alter processes, and update templates to ensure compliance.
- LCB is working with DES Real Estate Services to install charging stations at field offices.
- LCB will support EO 21-04 zero emissions vehicles whenever feasible. The LCB is due to replace vehicles as follows:
  - 2022 = 16
  - 2023 = 35
  - 2024 = 35
  - 2025 = 30
  - 2026 = 14
  - 2027 = 15

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

LCB has met the established 2030 GHG limit as of 2013. LCB has invested in energy savings at the HQ facility. In addition, the agency fleet has potential to be transformed to BEV, which the agency is pursuing as of late 2021. As the agency reviews its leasing portfolio through the six-year plan process, space needs will be evaluated to reduce energy and space where practicable.

The Liquor and Cannabis Board (LCB) is committed to education of our staff around environmental justice and equity. The agency will continue to serve as a SEEP Governing Council representative and provide support to initiatives as they arise by updating policies and procedures, pilot testing alternatives, and conducting outreach to achieve results.

The agency's current key focus areas are:

- Equity
- Transportation electrification
- EPP



## Natural Resources, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 1,550                        |
| Fossil Fleet Energy Use Emissions | 9,875                        |
| Annual Fossil GHG Emissions       | 11,425                       |

In 2020, Department of Natural Resources (DNR) emissions were 4 % above their 2020 limit. In 2021, DNR's emissions increased to 28 % above their 2020 limit. They remain 98 % above their 2030 limit.

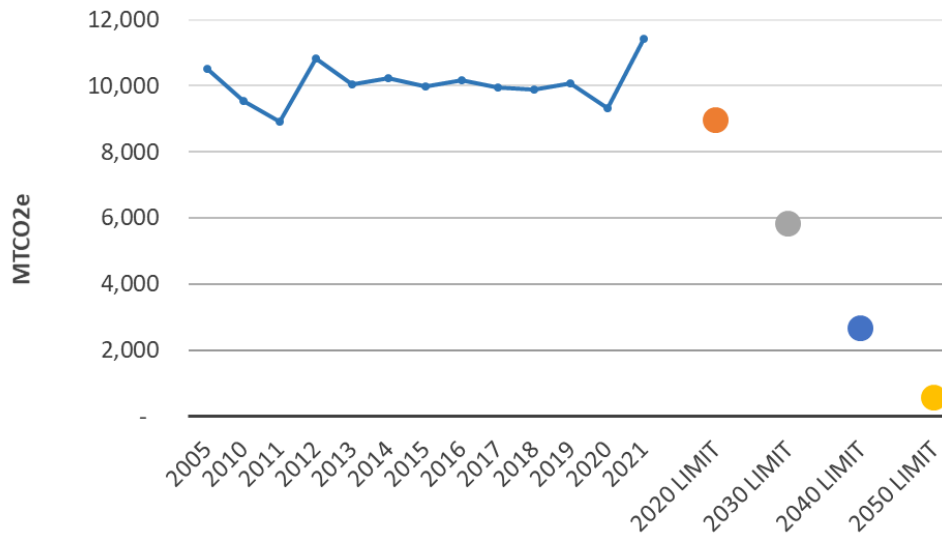


Figure 29. Dept. of Natural Resources Historic Emissions and Future Limits

In 2021, DNR reported 14 % of emissions were from buildings and 86 % were from transportation. The department reported 1,107,264 sf of building space, 78 % of which they owned, 14 % leased by DES, and 8 % privately leased. In 2021, 40 % of building emissions were from natural gas combustion, 60 % was indirect electricity emissions and a small remainder was from propane.

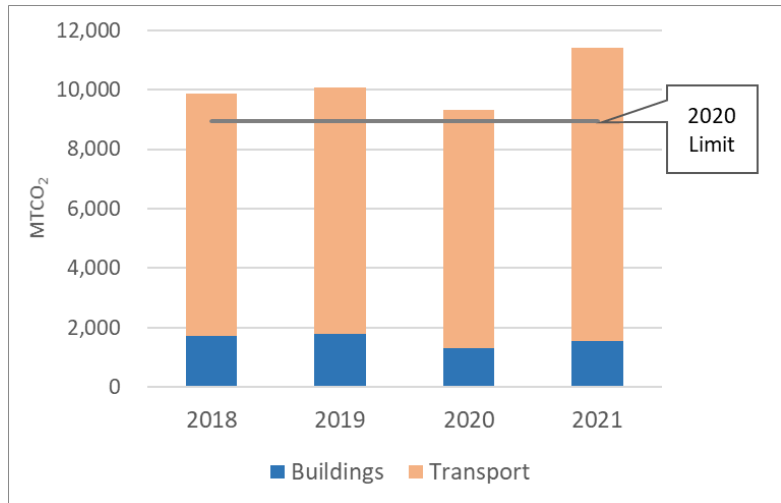


Figure 30. Dept. of Natural Resources Emissions from Building and Fleets 2018-2021

Table 3 DNR's transportation emissions by vehicle type

|                       | MTCO <sub>2</sub> | % Of transportation emissions |
|-----------------------|-------------------|-------------------------------|
| <b>Motor vehicles</b> | 8,593             | 87%                           |
| <b>Boats</b>          | 240               | 2%                            |
| <b>Aircraft</b>       | 1,004             | 10%                           |

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, DNR completed planning activities to support the development of short and long-term strategies to reduce GHG emissions.

As identified in DNR's 2020 GHG Strategy, agency fleet operations and workforce commuter programs offer the greatest return on achieving agency GHG emissions reduction. DNR will continue to seek improvements within the following program areas:

- Improving the fuel efficiency of DNR's fleet will have a cumulative impact on reducing emissions
- Reducing vehicle miles traveled through commuter reduction programs, and/or telework programs.

**Fleet Electrification (EV/BEV).** To date, DNR has a total of 11 electric vehicles all of which are compact sedans. The remainder of DNR's fleet (listed below) is expected to grow to match the

expected agency staff growth over the next two years. DNR’s current fleet capacity includes over 1,638 vehicles detailed in Table 1.

**Table 1.**

| <b>DNR Fleet Powertrains</b> |             |               |                 |              |
|------------------------------|-------------|---------------|-----------------|--------------|
| <u>Type</u>                  | <u>ICE</u>  | <u>Hybrid</u> | <u>Electric</u> | <u>Total</u> |
| <b>Light Duty</b>            | <b>999</b>  | <b>57</b>     | <b>11</b>       | <b>1067</b>  |
| Pickup                       | 902         | 0             | 0               | 902          |
| Sedan                        | 0           | 25            | 11              | 36           |
| SUV                          | 71          | 32            | 0               | 103          |
| Van                          | 26          | 0             | 0               | 26           |
| <b>Medium Duty Trucks</b>    | <b>262</b>  | <b>0</b>      | <b>0</b>        | <b>262</b>   |
| <b>Heavy Duty</b>            | <b>65</b>   | <b>0</b>      | <b>0</b>        | <b>65</b>    |
| Trucks                       | 40          | 0             | 0               | 40           |
| Equipment                    | 25          | 0             | 0               | 25           |
| <b>Marine/Boat</b>           | <b>23</b>   | <b>0</b>      | <b>0</b>        | <b>23</b>    |
| <b>Off Road</b>              | <b>155</b>  | <b>0</b>      | <b>0</b>        | <b>155</b>   |
| ATV                          | 111         | 0             | 0               | 111          |
| Snowmobile                   | 44          | 0             | 0               | 44           |
| <b>Farm/Utility Tractors</b> | <b>33</b>   | <b>0</b>      | <b>0</b>        | <b>33</b>    |
| <b>Fleet Totals</b>          | <b>1570</b> | <b>57</b>     | <b>11</b>       | <b>1638</b>  |

Current policy for fleet replacement standards include product purchasing that meets a minimum efficiency standard. DNR fleet replacement standard for SUV’s is a Hybrid (40+ mpg), our standard replacement for sedans are EV’s, and in the near future we will explore hybrid pickups that have just become available. As of 2022, DNR has ordered 15 electric Ford F-150 “Lightning” pickups with delivery expected in 2023.

**Workforce Commuter Programs**

DNR created a telework policy in 2018 which was revised and expanded in 2020. During the 2020 COVID-19 pandemic, DNR directed employees to telework wherever possible to help lower the risk of infections from COVID-19, slow the spread of COVID-19 in the DNR community, and ensure DNR continuity of operations. The pandemic protocols resulted in a significant reduction in vehicle miles traveled.

The broad goals of this Policy are to:

- Promote increased use of telework where this benefits DNR’s mission as well as improving employees’ productivity and quality of life.

- Capture efficiencies and cost savings that may be attainable through increased use of telework.
- Promote effective communications commensurate with flexible work locations.

DNR is currently transitioning from DNR-directed Emergency Telework to Elective Telework. The agency deadline for completing telework enrollment is September 1st, 2022. Once the transition is completed, our workforce development team will release program participation data expected in December of 2022.

## **DNR Facility Operations**

### **Facility Infrastructure**

DNR removed three (via salvage, reutilization, or demolition), highly inefficient mobile office trailer facilities from our inventory in 2021 in conjunction with renovations or replacement with more energy efficient structures.

1. At Coleville, DNR removed a mobile office trailer that pre-dated HUD regulation (1976) for safety and energy efficiency. This project occurred in conjunction with a capital funded (supplemental) ESCO project that both installed a more efficient heating system into the Armory Building replacing a failing boiler system and made it possible to reclaim unused space to support NEWWIC and NE Region Fire operations from the Armory.
2. At Chehalis, DNR removed a mobile office trailer that was well past its usable life cycle and utilized a capital (supplemental) funded ESCO project to reclaim more than 5000 SF of space in an existing building that had been vacant for more than a decade due to a failed heating system.
3. At Belfair, DNR removed a mobile office trailer that was well past its usable life cycle with a new building.

### **Facility Energy Efficiency**

DNR continued to execute facility and infrastructure upgrades throughout WA State under Energy Performance Contracting for Facilities (ESCO) project guidance. These projects improved energy performance and efficiency grades including but not limited to HVAC units, insulation replacement, and window and door installations. Facility improvements were carried out across WA State including facilities located in Port Angeles, Tumwater, Deer Park, Goldendale, Colville, Cle-Elum, and several others.

### **Project Example- DNR Cle Elum Work Center**

Contract initiated in August of 2020, completed in December 2020. Project replaced existing single-phase overhead electrical service with new buried three-phase electrical service. Single pane windows replaced with new vinyl thermal pane windows. The entire exterior of the building was properly abated, re-sided and painted. Existing chimney was domed, and roof repaired. Electrical savings will not be less than 8,552 kWh per year corresponding to 90% estimated energy savings.

Cost of upgrades: \$615,054.62

DNR still operates approximately 10-12 buildings that rely on wood stoves as primary or secondary heating (mostly old shop buildings). We do intend to eliminate some of those sites over the next three biennia. DNR is reliant on natural gas or propane for heating at a number of sites, particularly in snow zones (heavy heating loads) and sites that involve industrial processes (Tumwater Compound, Webster, fire camps and corrections camps). DNR will continue to evaluate our facilities to improve energy efficiency and increase use of renewable energy. Several projects are now in pre-design phases to move forward in the next few biennia.

### **Facility Renewable Energy**

DNR has augmented two of its smaller buildings with solar power and is now routinely evaluating solar where this can be accomplished as part of overall project goals. At the same time that DNR is striving to reduce its facilities energy footprint, the agency must address a substantial backlog of basic facilities needs required to ensure employee health and safety and maintain agency operations. Additional funding is needed to accomplish both goals in an integrated and efficient manner. DNR had two facility sites that have incorporated renewable energy into operations:

- Cypress Island Natural areas uses a small solar system.
- Webster Nursery has a small set of solar panels on building FL0107. Power generation from the panels feeds the primary power grid as most solar systems do in WA. The system does not offset power requirements at Webster Nursery in any statistically significant way.

### **Climate Resilience & Emissions**

As outlined in DNR's 2020 Plan for Climate Resilience, Climate mitigation— stopping carbon pollution and reducing atmospheric greenhouse gas concentrations—is the only way to prevent ever-escalating temperatures and increasingly dangerous and uncertain outcomes. With this in mind, DNR is working in two main areas— reducing carbon emissions and sequestering carbon already in the atmosphere—to go beyond adaptation and reverse the trends in greenhouse gas levels.

### **Forest Health & Resilience**

In 2020, DNR released the Forest Action Plan which includes identifying priority landscapes that integrate carbon sequestration policies and investments into forest health priorities and strategies. This approach identifies strategies to include forest restoration, forest health treatments, and community wildfire preparedness. The direct result of better forest management will yield less frequent wildfire (lowering wildfire emissions) as well as encouraging carbon sequestration through replanting or conservation methods.

### **Carbon Sequestration Advisory Group Report**

DNR formed the Carbon Sequestration Advisory Group (CSAG) in November of 2019. The group was formed to guide DNR's work in 1) conducting carbon inventories and 2) compiling and providing access to information on existing incentive-based carbon sequestering programs for Washington landowners, as outlined in the Engrossed Substitute House Bill 1109

(ESHB 1109 Sec 308(24)) proviso. Based on the December 2020 report findings, CSAG produced two recommendations to Improve Carbon Inventories:

1. The CSAG recommends that DNR lead the development of a template (aka 'nutrition label') that could be used to communicate inventory results to policy makers in an easy-to-digest format but is granular enough to reflect the nuanced information needed for accurate interpretation.
2. The CSAG recommends that the Legislature direct DNR to build on and enhance existing inventory information and link this inventory information with incentives tools and resources to inform new targeted assistance or investments. Combined with modeling the effectiveness of incentives on carbon sequestration, this effort should show policymakers the areas where carbon impacts can be improved as identified by the inventory, the range of potential incentives, who they best incentivize, where they're most applicable, and their potential impact on carbon flux.

### **Carbon Project**

In April of 2022, Commissioner of Public Lands Hilary Franz signed a Commissioner's Order No. 202202 conserving 10,000 acres of forest for storing carbon. The areas identified as part of the carbon project will be entered into leases, similar to existing DNR leases for businesses like renewable energy or agriculture, which stipulate their use for storing carbon and generating revenue for state trust land beneficiaries through carbon markets.

### **Watershed Resilience Action Plan (WRAP)**

Released in January of 2022, the WRAP identifies and prioritizes actionable goals and outcomes for the Snohomish watershed in support of salmon recovery. Goal 5 of the WRAP is to reduce and combat climate impacts. DNR will sequester carbon and mitigate growing climate risks with the following action items:

- Conduct a baseline analysis of carbon storage on the landscape by 2024.
- Implement 10,000 acres of carbon sequestration projects in the Snohomish Watershed by 2026.

### **Clean Energy Program**

DNR has set a goal of 500 megawatts of solar on DNR lands by 2025.

DNR entered its first wind lease in 2007 and the first solar lease in 2019. Currently DNR manages 23 wind leases, 3 solar leases, and one biomass sale.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

**DNR will focus on two priority areas within the next two biennia to reduce GHG emissions.**

- **Initiative 1.** Fleet and Facility improvements (emissions reductions and energy efficiency)
- **Initiative 2.** Carbon Sequestration & Climate Resilience measures

### **Initiative 1. Fleet and Facility Improvements**

DNR sees an opportunity for additional improvements and expansion for GHG Emissions reduction across all internal programs and policy initiatives. We see the significant work before us that will require expediency and accountability in the face of significant climate change. In order to deliver results and to offer transparency in meeting these improvements, the agency has identified several near-term milestones to seek out partnerships and funding opportunities to invest in significant policy and program goals:

- Secure funding to hire a GHG Program Manager (2023-2027).
- Secure funding to continue EV/BEV upgrades or new acquisitions for fleet vehicles (2023-2027).
- Evaluate and expand Commuter Reduction Programs or telework opportunities (2023-2027).
- Conduct a cost-benefit analysis of existing facility infrastructure to prioritize and evaluate improvements for energy efficiency and retrofitting improvements including power grid and EV charging station utility planning (2023-2027).
- Secure funding to begin upgrades and improvements to the power grid including installation of chargers need to support an electrified fleet (2023-2027).
- Secure funding to begin upgrades and improvements to facility infrastructure and energy efficiency including utility, renewable energy, or carbon emission reduction projects (2023-2027).

### **2023-2025 and 2025-2027 Biennia-Strategic Implementation**

#### **Hire a GHG Program Manager**

Requesting GHG programmatic funding to increase staff capacity and development of an agency wide GHG Program in 2023.

#### **Secure Funding to continue EV/BEV upgrades or new acquisitions for fleet vehicles Fleet Electrification**

The DNR is a fleet dependent organization with nearly as many vehicles as employees. As operational capacity grows, so will the expected vehicle emissions, unless we convert to EVs. We also do not take employee commute or telework into forecasted models. As discussed in the previous section, DNR's current policy for fleet replacement standards include product purchasing that meets a minimum efficiency standard. While many of the activities supported by DNR (wildfire, timber harvesting, forest practices) require significant vehicle and equipment performance standards, we are continuing to seek out other classes of vehicles that offer viable options (meaning, available quantities and supporting services) including electric half ton pickups.

DNR currently operates with roughly 700 half ton pickups. Of those qualifying vehicle types, fifteen (15) F150 lightnings (full EV) are currently ordered with an expected arrival of 2023. These vehicles will be supported by currently existing level 2 charger networks and will be the

first product of its kind to be used in DNR business applications. This first vehicle trial will provide an opportunity to learn about the performance and feasibility of this vehicle class within DNR operations.

Additional Fleet Improvements for near term implementation:

DNR continues to seek opportunities in updating and transitioning our fleets to electric vehicles. As outlined in the 2020 strategy, DNR will continue to engage with appropriate actions and methods in an effort to diversify our approach in emissions reduction within our fleets. Actions outlined below (Table 2.) include some of the available approach methods.

**Table 2.** Near term actionable items

| Action  | Description   | Method                     |
|---|---|----------------------------|
| <b>1. Replace Diesel Generators</b>                       | Replace diesel generators with battery storage and solar where feasible and electricity exists.   | Capital/<br>Infrastructure |
| <b>2. Electric Tools</b>                                  | Convert to electric/ battery operated tools for trail maintenance, brush cutting.   | Capital/<br>Infrastructure |
| <b>3. Fleet Sustainability Dashboard</b>                  | Install FleetDASH technology, which allows DNR to monitor its fleet's fuel characteristics and view when opportunities are missed to purchase alternative fuels to better coordinate fuel purchasing and consumption. | Capital/<br>Infrastructure |
| <b>4. Increase Fuel Efficiency of Vehicles/ Equipment</b> | Provide information to all DNR staff to familiarize employees with EV operation and reduce range anxiety.   | Volunteer/<br>Incentive    |
| <b>5. Fleet Right-typing</b>                              | Identify ways to right-type the current fleet by adding EV's/ Hybrids/ PHEVs/ mid and heavy-duty vehicles. Once technology becomes available, use the price point as a trigger to purchase more EVs.                  | Plan/ Study                |

**Evaluate and expand Commuter Reduction Programs or Telework Opportunities**

Using the enrollment data in 2022 DNR can seek opportunities to expand or refine the program across job roles and functions. In areas where in office work is required or preferred DNR can re-evaluate current facility utilization to consolidate and offer additional access points to maximize current facility operations and reduce commute times.



**Cost-benefit analysis of existing facility infrastructure to prioritize and evaluate improvements for energy efficiency and retrofitting improvements including power grid and EV charging station utility planning.**

As of May 2022, DNR owned 600 facilities encompassing a total owned 1,877,695 sq. ft. This number includes our commercial portfolio as well as administrative sites. DNR defines a ‘facility’ to be inclusive of at least one wall, a roof, and a connection to the ground similar to a foundation (semi-permanent). Focusing on the building classification types will allow our agency to prioritize and optimize what structures can be retrofitted and provided infrastructure and utility upgrades in line with WA Clean buildings performance standards released in 2019, and 2020.

The majority of the operational buildings (administrative/main hubs) were built between 1950 and 1979 including all six-region headquarters, Webster and Meridian nurseries and the two fire and correctional camps (**Table 3.**). The age and the conditions of these buildings factor considerably into how DNR will prioritize and seek opportunities to fund upgrading utilities, broadband communications, charging or refueling stations, and overall capital improvements. Typical costs and return on investment for comprehensive building wide green/energy improvement retrofits can vary. Whole-building green retrofits have variable costs per retrofit (HVAC, lighting, refrigerant flow, etc.) depending on the buildings age, existing design, purpose, and the level of savings being targeted. Market values for these upgrades including the availability and supply chain issues can create significant barriers to which DNR will seek additional funding sources.

A cost analysis of current infrastructure will assist DNR in executing facility upgrades where appropriate. With the enactment of the Federal Infrastructure Investment and Jobs Act in November of 2021, billions of dollars may be available nationwide for such projects within energy efficiency improvements, clean energy upgrades, and LEED certification, and EV charging stations. These, and other potential federal funding opportunities, will be pursued over the next two biennia.

As DNR facilities can be both leased and owned, building improvements for efficiency upgrades or LEED certification can be complex in determining approvals and cost bearing responsibilities. Within DNR’s commercial portfolio, DNR will prioritize buildings to meet the WA Clean Buildings Performance Standard compliance deadlines of:

- June 1, 2026, Commercial buildings more than 220,000 sq. ft.
- June 1, 2027, Commercial buildings more than 90,000 sq. ft. but less than 220,001 sq. ft.
- June 1, 2028, Commercial buildings more than 50,000 sq. ft. but less than 90,001 sq. ft.

**Table 3.** State of Washington Facilitates Portfolio Management Tool. Owned Facilities Summary Report. Report Date 5/16/2022

| <b>BUILDING AGE BY DECADE</b> |     |
|-------------------------------|-----|
|                               | 0   |
| 1900-09                       | 3   |
| 1910-19                       | 2   |
| 1920-29                       | 6   |
| 1930-39                       | 11  |
| 1940-49                       | 4   |
| 1950-59                       | 51  |
| 1960-69                       | 114 |
| 1970-79                       | 60  |
| 1980-89                       | 61  |
| 1990-99                       | 80  |
| 2000-09                       | 91  |
| 2010-19                       | 95  |
| NONE                          | 20  |

**Secure funding to begin upgrades and improvements to the power grid including installation of chargers need to support an electrified fleet.**

This may occur in the 2025-2027 session as fleet inventory and site assessments would be required prior to securing funding for utility (power grid/EV Charger) installation.

**Secure funding to begin upgrades and improvements to facility infrastructure and energy efficiency including utility, renewable energy, or carbon emission reduction projects.**

This will be the final phase of the next two biennia but will be dependent on what projects will offer the greatest benefit, cost efficiency, and any additional criteria as identified in the assessment report.

**Initiative 2. Carbon Sequestration and Climate Resilience**

**Urban & Community Forestry Programs**

Urban forests-like any forest-help mitigate climate change by capturing and storing atmospheric carbon dioxide during photosynthesis, and by influencing energy needs for heating and cooling buildings; trees typically reduce cooling costs. DNR’s Urban & Community Forestry Program is targeting to maintain and increase statewide urban tree canopy over to 40% by 2040.

**Urban, Commercial and Industrial DNR Trust Lands;**

In addition to complying with laws of general applicability, as a trust manager DNR follows the common law duties of a trustee.

These include, but are not limited to:

- Administering the trust in accordance with the provision that created it.
- Making the trust property productive.
- Reducing the risk of the loss to the trusts.

The importance of managing undue risk demonstrates how DNR will need to create a strategic framework around policy, funding, and implementation of energy efficiency and GHG emission on leased properties to maximize the successful implementation of said programs while minimizing risk or financial burden on lessees. In the next two biennia, DNR will be evaluating internal policies and programs in incorporate climate resilience, GHG emissions, and energy efficiency targets across all programs including urban, commercial and industrial trust lands. As commercial leased buildings are added, DNR's annual emissions reporting there will be an initial increase in the total emissions calculation as the entire portfolio of assets increases. Currently there is no budget or allocated general funding to achieve these goals, but the agency will seek additional funding and resources over the next biennium.

### **Clean Energy**

The clean energy program is in a growth phase, shifting to an efficient and fully developed program. The current focus is expending the solar leases on DNR lands to meet the Commissioner of Public Lands' goal of 500 megawatts of solar on DNR lands by 2025. A solar mapping project is currently underway with expected data analysis to be released in 2023.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

The Washington State Department of Natural Resources (DNR) manages 5.6 million acres of Washington's lands and waters. As a steward of these areas, we have a responsibility to ensure that we are protecting them for present and future generations, and that means preparing for and adapting to the impacts of our changing climate. As an agency, DNR must incrementally reduce the current emission of greenhouse gas to 95% of the 2005 greenhouse gas emissions by 2050 in accordance with the 2020 Engrossed Second Substitute House Bill 2311. DNR intends to achieve this through continued fleet and facility infrastructure improvements, Carbon Sequestration and Climate Resilience initiatives, and by seeking partnerships across public and entities to achieve these actionable goals. DNR will continue to build innovative and strategic solutions by prioritizing energy efficient technologies in our fleet and facilities, workforce behavior to promote telework and commuter programs, and expansion of climate resilience tools across all our agency's programs. As an agency, we will continue to leverage the internal expertise of our staff across all of WA state communities with the additional responsibility to consider equity and environmental justice within our policies and planning decisions.

DNR will continue to seek innovative strategies to meet emissions limits as set in RCW 70A.45.050. The following program areas are highlighted as long-term and strategic goals for the program development.

### **Risk and cost-benefit analysis for DNR program operations**

Deep dive analysis of what current operating costs are and areas to partner with local communities or private partnerships for GHG emission reduction and energy efficiency.

### **Standardization and centralized data reporting systems**

Due to the complex nature of DNR's work the agency does not currently support a centralized or standard process for supporting GHG emission tracking. By creating an information management system for GHG emissions and carbon reduction strategies, DNR can utilize real time monitoring and reporting data to evaluate implementation and gaps across our programs. As of 2022, DNR recognizes and will seek funding for data driven policies which can improve both internal accountability and public transparency in meeting WA state emission reduction goals. Funding and resources support will require significant capital to establish staff and technology systems support for long-term operations viability.

### **Climate Resilience Program Expansion**

DNR's Plan for Climate Resilience detailed how as an agency we can target not only emissions reductions across our programs, but also explore new and innovative tools to remove CO2 and other greenhouse gases from the atmosphere making our communities and natural resources more resilient to the climate-influenced changes that are projected to come.

### **Think Big & Work Efficiently**

DNR's GHG plan for emission reduction will be strategically prioritized starting with the highest contributing factors of vehicle emissions and workforce commuter programs. Beyond these, DNR will continue to seek new ways and drill down to all program areas that can be streamlined into energy efficient low carbon emissions.

### **Development & Construction**

- Support high standards for energy efficiency and sustainability of materials through certification programs such as LEED (Leadership in Energy and Environmental Design).
- Promote the use of sustainably sourced advanced forest-based building materials such as cross-laminated timber and wood-carbon composites that have lower levels of embodied carbon than other materials.

### **Clean Energy & Alternative Fuel Sources**

DNR is capitalizing on the demand for clean electricity by developing the Clean Energy Program to lease state trust lands for clean energy development and sell products, such as timber slash, for use in the clean energy sector. Unfortunately for DNR, some utilities are choosing to invest in renewable energy development outside of Washington.

Another potential project is alternative fuel sources. Specifically, utilizing biofuels or other alternative strategies to lower emissions where BEVs are not feasible. DNR fleet vehicles and equipment that are powered by diesel engines have access to WSDOT fuel sites that distribute a biofuel blend. Usually 20% bio but varies some by location. In CY 2021, 48,706 gallons of diesel fuel is estimated to have been purchased from WSDOT. No other alternative fuels (CNG, propane etc.) are used by the DNR fleet because of limited access to refueling infrastructure in rural environments.

### **Flexibility in Workforce Culture**

DNR supports and encourages appropriate use of telework. While DNR assigns employee duty stations, the agency recognizes that flexibility in work locations can help achieve organizational health goals like recruiting and retaining employees, enabling increased productivity and performance, fostering an engaging work environment, supporting health and wellness, and reducing carbon emissions.

### **IT and Technology Services**

There are four common high-level goals for green computing or green IT:

- Maximize energy efficiency and reduce the consumption of natural resources.
- Reduce the use of environmentally harmful substances.
- Promote improved durability and recyclability.
- Minimize waste through systematic management approaches.

ITD can have the greatest control over the efficient use of energy consumed by ensuring the equipment it purchases to support the work of DNR is energy and cost efficient and managed. Additional projects such as virtualization and print management will also reduce the IT related carbon footprint at DNR

# Office of Financial Management

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 132                          |
| Fossil Fleet Energy Use Emissions | 2                            |
| Annual Fossil GHG Emissions       | 134                          |

In 2020, the Office of Financial Management (OFM) began reporting in 2020. The agency's emissions increased 23 % in 2021.

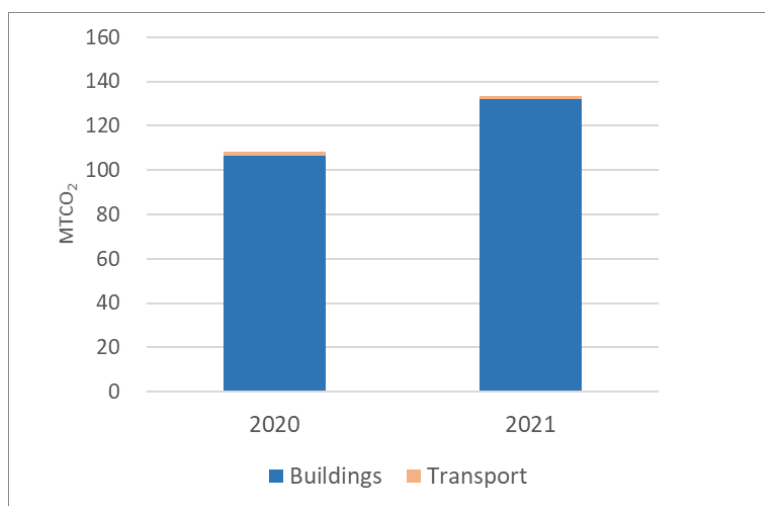


Figure 31. Office of Financial Management Emissions from Building and Fleets 2020-2021

In 2021, OFM reported that 99 % of emissions were from buildings and 1 % was from transportation. They reported 137,725 sf of building space, 49 % leased from DES, 25 % privately leased and 26 % leased from other state agencies. In 2021, 99 % of building emissions were indirect electricity emissions and 1 % was from natural gas combustion.

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, OFM promoted virtual meetings and telework as directed according to pandemic response practices. This situation has helped OFM exceed our teleworking goals. Not only has this reduced our employee travel and drive alone rate, but it has forced staff and leadership to experience teleworking for themselves. Many people who previously didn't think teleworking could work for them or their team, now have a different perspective.

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

In the 2023-25 and 2025-27 biennia, OFM plans to focus our efforts on meeting the 80% space use efficiency goals that will reduce additional GHG emissions through elimination square footage where appropriate. We will also continue to leverage virtual meetings to reduce our drive alone trips and that of our partners that we previously asked to physically attend meetings.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

To meet established GHG emissions limits, OFM will continue to work with DES on reducing GHG emissions within our leased facilities and we will continue to review and optimize our telework policy with GHG emissions in mind. We will review the use of our agency vehicles and travel policy to minimize travel and use electric vehicles whenever possible.

OFM does not own any of our facilities and the majority of our leased square footage is owned by DES. OFM prioritizes our GHG emission reduction goals in the work we do through space efficiency, environmental design, policy decisions, and social justice. Although we do not directly control energy projects for the buildings in which we reside, we champion these initiatives.

# Puget Sound Partnership

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 0                            |
| Fossil Fleet Energy Use Emissions | 0.55                         |
| Annual Fossil GHG Emissions       | 0.55                         |

Puget Sound Partnership (PSP) began reporting emissions in 2021. All the emissions reported were from transportation. They reported 1,382 sf of building space, all leased from DES.

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, Puget Sound Partnership (The Partnership) reduced building energy use by reducing its building footprint. The Partnership moved out of the main office in Tacoma in 2020 and has not yet established a new lease for occupancy. The new footprint will be approximately one-third the size of the old space.

### Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)

The Partnership is small; efforts to reduce GHG emissions in the 2023-25 and 2025-27 biennia will focus on heavy use of telework while providing drop-in physical space. The only other reduction action will be switching fleet vehicles over to electric as required by executive order.

### Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050

Puget Sound Partnership will take steps towards reducing emissions in the long-term. The Partnership's footprint is very small we are not seeing viable opportunities for reducing emissions past working with our landlords (DES and private) to make improvements that support the goals of the RCW.

The Partnership is focused on creating a business operations environment that aligns with both the GHG reduction requirements and supports the environmental recovery mission of the agency. Our ability to move the needle on the facility and fleet vehicle side is limited. However, our policies, in regard to how where we require our staff to work and how much travel we engage in, do have an impact but will not be measurable for this report.



# Seattle Community College

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 6,647                        |
| Fossil Fleet Energy Use Emissions | 38                           |
| Annual Fossil GHG Emissions       | 6,685                        |

In 2020, Seattle Community College (SCC) emissions were 20 % below their 2020 limit. In 2021, SCC’s emissions increased to 15 % below their 2020 limit. They remain 32 % above their 2030 limit. SCC’s emissions have fluctuated significantly due to changing emission factors assigned to indirect emissions from electricity purchases. In some years, SCC has used an emission factor specific to Seattle City Light. In 2020 and 2021, Ecology required all state agencies to use the same statewide three-year average emission factor. Emissions resulting from electricity are not in the direct control of agencies.

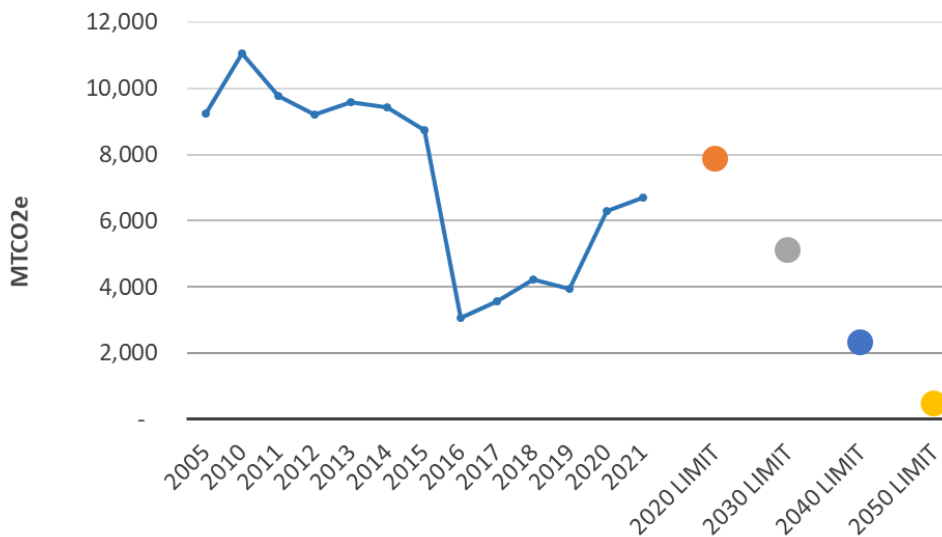


Figure 32. Seattle Community College Historic Emissions and Future Limits

In 2021, the SCC reported 99 % of emissions were from buildings and 1 % was from transportation. The agency reported 2,196,187 sf of building space, all of which they owned. SCC’s building space increased with the addition of a new wellness center and renovated Automotive Technology building. They also reduced space as they no longer own the International Student Center building.

In 2021, 15 % of building emissions were indirect emissions from a steam district heating system. Natural gas combustion accounted for 58 % of building emissions and the remaining 26 % was indirect electricity emissions.

Motor vehicles accounted for 61 % of SCC’s transportation emissions, 32 % were from boats and the remaining 7 % were from vehicles using propane.

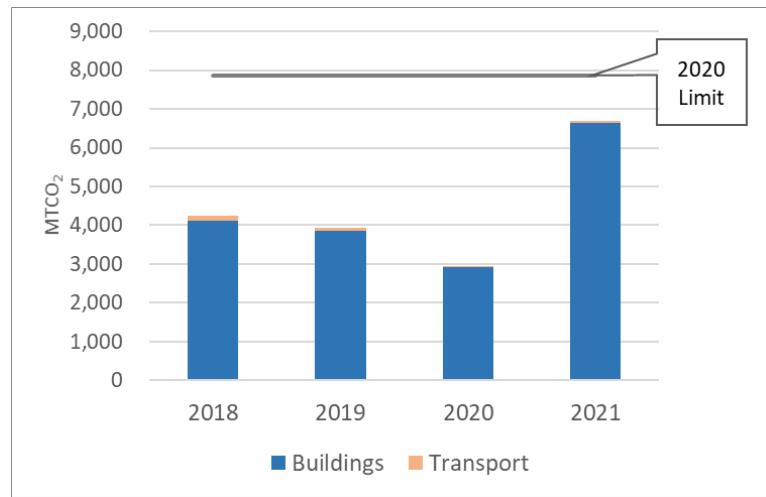


Figure 33. Seattle Community Colleges Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

Reflecting on the 2020 and 2021 calendar years, student and faculty expectations for sustainability are at an all-time high, particularly when considering environmental justice initiatives around decarbonization. Seattle Colleges is committed to being a leader in reducing Greenhouse Gasses (GHG). We must balance this commitment in the face of overstretched operational resources and limited capital allocations.

Seattle Colleges has undertaken aggressive resource conservation and energy efficiency projects system-wide and are planning for strategic initiatives including an EcoDistrict at Seattle Central and a sub-metering project at South Seattle. Furthermore, we are actively pursuing support for renewable energy installations and maximizing capital funding in new projects to generate energy through rooftop solar. We look to the SBCTC and programs like SEEP to provide additional resources and tools to assist our already significant progress towards decarbonization to bridge Washington State’s goals under RCW 70A.45.050 and our operational reality. We are excited at the opportunity to partner with our faculty and students to harness their ingenuity and provide STEM learning as we work towards a zero-carbon future.

### Strategy

Seattle College’s strategy is reliant on centralizing operational function under District Leadership to improve performance and productivity. From that investment we will build upon significant campus-level successes with facility energy efficiency and resource conservation and use available funding to take pragmatic steps towards decarbonization via facility and vehicle electrification. We have key steps for fundamental measurement and strategic infrastructure in process. Using our facility master planning process and working in tandem with our academic

programs that are driving the conversation related to climate-based education and sustainable construction we will be a leader in Washington State in GHG reduction.

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

Seattle colleges plans to take a number of steps to reduce emissions in the 2023-25 and 2025-27 biennia. Seattle Colleges has undertaken a comprehensive building-focused energy savings performance program led by McKinstry. We have also completed Building Tune Ups required by City of Seattle. Further we are actively investing in renewable energy on all new buildings and installing rooftop solar at each campus funded by Commerce Clean Energy Funds.

Beginning in 2017, the Seattle Colleges Office of Sustainability partnered with McKinstry to conduct a district-wide review of our buildings and infrastructure. Through a holistic approach to resource conservation, this partnership prioritized potential energy, water, and greenhouse gas reduction projects across all Seattle Colleges building stock. Through years of partnership, McKinstry has gained deep knowledge of our personnel, buildings, and energy systems, which greatly contributed to our recent grant awards. The Seattle Colleges were awarded the following grant amounts in May 2021:

- **North Seattle College (NSC): \$386,974**
- **Seattle Central College (SCC): \$268,443**
- **South Seattle College (SSC): \$351,297**

Each of the Seattle Colleges campuses are unique and thus require different approaches for energy efficiency improvements. A quick summary<sup>14</sup> of the approach for this grant is provided below.

**North:** North Seattle College has many educational buildings that suffer from HVAC systems, controls, lighting, & water systems inefficiencies. Campus-wide energy conservation measures (ECMs) target improvements to building envelopes, lighting retrofit, and water conservation. At College Center, two separate systems fight with each other for air, causing comfort and pressurization problems, which requires frequent maintenance. The solution will reduce electric/gas related heat losses and provide improved indoor air quality (IAQ).

Campus lighting mostly consists of fluorescent lighting throughout the interior and HID sources for the exterior. This project targets most of campus lighting; installing LED lamps where every possible. The primary benefit of this scope will be energy savings attributed to the significant reduction in lamp wattage. Additionally, this project will yield lower yearly maintenance due to the longer lamp life of LED products and reduced labor time absorbed in replacing failing lamps and ageing ballasts. Water conservation measures will include flushometer recommissioning and aerators.

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<sup>14</sup> Project summaries taken from WA State Dpt. of Commerce Energy Efficiency Grant proposals

Overall improved efficiencies will yield reduced energy and water use and cost, reduced carbon and GHG emissions, reduced maintenance cost, eliminated hazardous material/disposal costs with fluorescent lights, simplified and standardized lighting stock, optimized light levels, improved heating, lighting and visibility comfort-related issues within the work and learning environment, and improved safety and security of the campus. It also addresses six buildings (> 50,000 ft<sup>2</sup>) that will be mandated by the WA Clean Building Act (HB 1257), potentially avoiding costly annual fines due to energy use intensity (EUI) violations.

**Central:** The Broadway Edison Building is a heavy steam user. It has an air-water heat pump for the Edison portion, but not for Broadway Phase 1 and 2, which are by far the largest wings of the building. The purchased steam is created by burning natural gas and distributing the steam over two miles to Seattle Central College. This project will reduce steam usage via an air-water heat pump installed on the Broadway Phase 2 roof that serves the Broadway Phase 1 and Phase 2 wings.

Also, the Science and Math (SAM) building has inefficient fluorescents, which will be upgraded to LED as part of this project. The primary benefit of this scope will be energy savings attributed to the significant reduction in lamp wattage. Additionally, this project will yield lower yearly maintenance due to the longer lamp life of LED products and reduced labor time absorbed in replacing failing lamps and ageing ballasts.

Overall improved efficiencies will yield reduced energy use and cost, reduced carbon footprint and GHG emissions, reduced maintenance cost, eliminated hazardous material and disposal costs with fluorescent light sources, simplified and standardized lighting stock, optimized light levels, improved heating, lighting and visibility comfort-related issues within the work and learning environment, and improved safety and security of the campus. It also addresses two buildings (> 50,000 ft<sup>2</sup>) that will be mandated by the WA Clean Building Act (HB 1257), potentially avoiding costly annual fines for above allowable energy use intensity (EUI) levels.

**South:** The campus has numerous educational and trades buildings that suffer from inefficiencies with their HVAC systems, controls, lighting, and water systems. The campus-wide energy conservation measures (ECMs) target improvements to building envelopes, duct sealing, lighting retrofit, and water conservation plus control solutions at larger hangar-like buildings. As many systems use natural gas, this project will reduce electric and gas related heat losses. Students and staff often leave large hangar doors open with systems on, so we proposed AMT door contactors, Georgetown doors and Grounds motion sensors that will allow for lighting, fan and heating savings by setting back the HVAC when doors are open and shops are vacant. Water conservation measurements will include flushometer recommissioning and aerators.

The campus lighting mostly consists of fluorescent lighting throughout the interior and HID sources for the exterior. This project targets most of campus lighting; installing LED lamps where every possible. The primary benefit of this scope will be energy savings attributed to the significant reduction in lamp wattage. Additionally, this project will yield lower yearly

maintenance due to the longer lamp life of LED products and reduced labor time absorbed in replacing failing lamps and ageing ballasts.

Overall improved efficiencies will yield reduced energy and water use and cost, reduced carbon and GHG emissions, reduced maintenance cost, eliminated hazardous material and disposal costs with fluorescent lights, simplified and standardized lighting stock, optimized light levels, improved heating, lighting and visibility comfort-related issues within the work and learning environment, and improved safety and security of the campus. It also addresses 2 buildings (> 50,000 ft<sup>2</sup>) that will be mandated by the WA Clean Building Act (HB 1257), potentially avoiding costly annual fines due to EUI violations.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

In the long-term, Seattle Colleges plans to aggressively pursue energy efficiency and resource conservation strategies in line with our District Sustainability Plan. A key element to support reducing GHG emissions will be an administrative centralization of Seattle Colleges facilities management from separate teams at each college to a unified team reporting to the District's Vice Chancellor for Finance and Administrative Services. This will allow for capital project management and reporting to be under a single structure and effect strategic planning related to GHG emissions in the coming biennia.

Specific efforts related to GHG reduction will include review of our building stock for compliance with Washington State Clean Building Performance Standards (CBPS). As the Colleges emerge from disruption caused by the COVID-19 pandemic, the first order of business will be to establish new operational baselines for our facilities.

The core focus for GHG reduction will be on colleges' facilities.

### **Transportation**

Seattle colleges will investigate moving to EVs as funding permits. At this time college-owned fleet vehicles are not a major GHG emitter (especially when compared to facilities).

Currently a pilot program is underway for moving to leased vehicles to support South's security fleet. The current vehicles being leased have internal combustion engines (ICE). If additional funds were made available to cover the leased cost difference between ICE and all electric vehicles, the colleges could reduce fossil fuel use for fleet operations.

The largest source of transportation-related emissions at the college are commuters to campus. Several steps have been taken to support GHG reductions in this area (although no longer tracked / reported to ECY / COM):

- Electric vehicle charging infrastructure has been upgraded to provide rapid charging capabilities
- Parking fees have been increased to encourage alternative transportation and carpooling

## **Facilities**

To meet CBPS and enhance building-level benchmarking, our campuses will have to implement an enhanced metering / sub-metering strategy as the majority of our North Seattle College, South Seattle College (SSC) main campus, and SSC Georgetown campus have campus-wide electrical service. SSC is undertaking a sub-metering design with plans for implementation in the coming biennia.

Seattle Central College (SCC) has no major renovations planned for the 23-27 biennia; however, we do have Major Project Requests submitted for a Broadway Performance Hall renovation and BE Building Phase 1/Edison renovation, but those projects are awaiting state funding, and likely won't have even the design phases funded for years.

Strategically decarbonizing buildings on the SCC campus will rely upon a planned renovation whereby the buildings will be connected to the campus EcoDistrict.

The most significant action Seattle Colleges is planning to take in the coming biennia for decarbonization is the development of an EcoDistrict at SCC's campus. Building an electrically fueled high temperature hot water central plant and distribution system capable of meeting heating demand for campus buildings and beyond will remove the college's dependence on natural gas fueled steam that is being served from aging piping run from CenTrio's generation facility in downtown Seattle.

South Seattle College has completed a major remodel of its Auto Building. That remodel has no natural gas for space or water heating (years ahead of code requirements). This is accomplished via air-to-water heat pumps. The project includes 60 kW rooftop solar array. The college's new wellness center is also all-electric and equipped with rooftop solar PV.

## **Clean and Renewable Electricity**

The colleges continue to invest in on-site rooftop solar. Each college is adding nearly 100 kW of solar supported by Commerce grants.

This is in addition to existing solar installations from prior grants and capital projects. New capital projects (such as SSC Wellness) are being planned with structural and service capacity to incorporate additional rooftop solar as funds become available.

Escalating construction costs mean difficult tradeoffs between core mission (education and student service) and renewable energy during capital projects. Having a state-provided fund solely to efficiently deliver additional rooftop solar to new buildings, and building remodels, would allow the colleges to meet their mission for students while expanding their clean energy footprint and reduce GHGs.

## Social and Health Services, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 16,311                       |
| Fossil Fleet Energy Use Emissions | 1,242                        |
| Annual Fossil GHG Emissions       | 17,553                       |

In 2020, Department of Social and Health Services (DSHS) emissions were 26 % below their 2020 limit. In 2021, DSHS’s emissions decreased further to 62 % below their 2020 limit. They are 42 % below their 2030 limit.

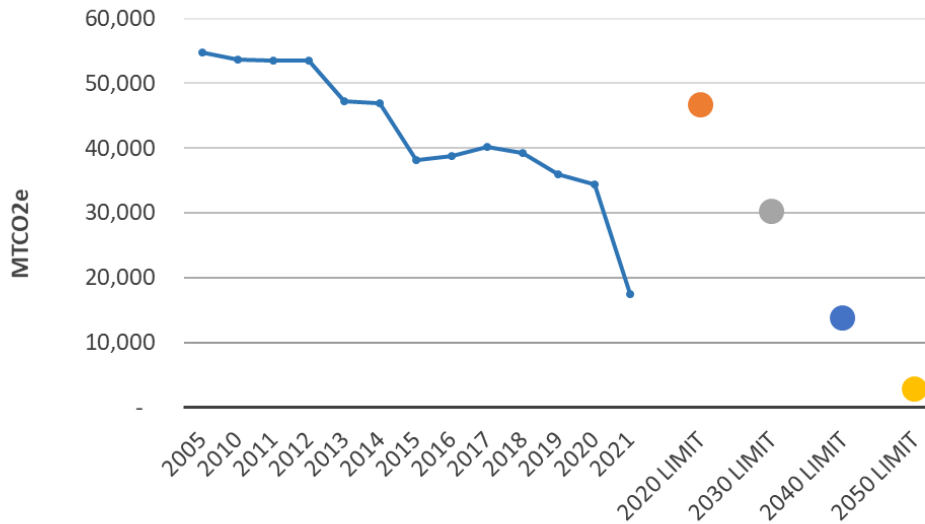


Figure 34. Dept. of Social and Health Services Historic Emissions and Future Limits

In 2021, the DSHS reported that 93 % of emissions were from buildings and 7 % were from transportation. The department reported 7,074,852 sf of building space, 65 % of which they owned, 30 % privately leased and the remaining 5 % leased from other state agencies. All their building emissions come indirectly through electricity purchases.

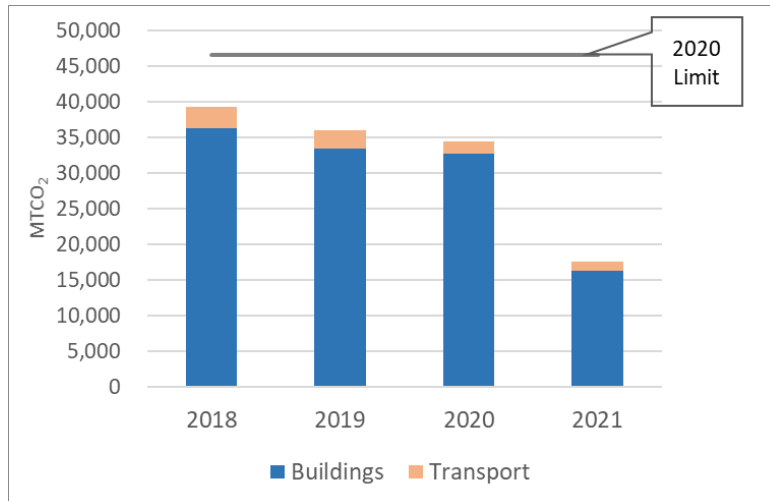


Figure 35. Dept. of Social and Health Services Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

DSHS took the following actions to reduce GHG emissions during the 2020 and 2021 calendar years:

### Office of Capital Programs (OCP)

- Performed an energy and meter audit at the Administration Building located on the Eastern State Hospital Campus. This work will support the Department in gathering data in order to meet the Clean Building Act (WAC 194-50) requirements.
- Installed two electric level 2 charging stations for a total of four heads at our Rainier School campus in Buckley WA. This work was in support of State Efficiency and Environmental Performance Executive Order 20-01 and the Washington State Electric Vehicle Fleets Initiative.
- Completed the installation of the variable refrigerant flow heating, ventilation, and air conditioning systems at 15 cottages at the Rainier School campus in Buckley, WA.
- Completed the installation of the variable refrigerant flow heating, ventilation, and air conditioning systems at 1 cottage at the Fircrest School campus in Shoreline, WA.
- Provided additional energy improvements including new heat pumps, condensing boiler, and modern controls at Activities Building at the Fircrest School campus in Shoreline, WA.

### Leased Facilities and Maintenance Operations (LFMO)

- Installed (24) level 2, double-headed electric chargers at nine leased facilities:
  - Ellensburg 4 charging ports
  - Kennewick-AL TSA 6 charging ports
  - Kennewick-ESA 6 charging ports
  - Moses Lake 8 charging ports



- Mount Vernon            4 charging ports
- Port Townsend           4 charging ports
- Spokane Valley           8 charging ports
- Union Gap                4 charging ports
- Vancouver                4 charging ports



- Upgraded from fluorescent lighting to LED lighting in 276,693 square feet of leased office space:
  - 1949 S State St, Tacoma                    152,926 SF
  - 2121 S State St, Tacoma                    33,997 SF
  - 8517 Trent Ave, Spokane Valley            9529 SF
  - 500 S 1<sup>st</sup> Ave, S, Seattle                    80,244 SF
  
- Relocated DSHS facilities from older leased facilities to new energy efficient facilities:
  - Port Townsend – 9,946 SF
  - Bremerton SOLA – 4,449 SF
  - Lynnwood SOLA – 3,753 SF
  - Union Gap – 23,800 SF (includes photovoltaic array)
  - Kennewick ALTSA – 21,229 SF
  - Kennewick ESA – 26,234 (includes photovoltaic array)
  
- Reduced DSHS leased facilities portfolio by 40,000 square feet.

## **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

**DSHS plans to take the following actions in the 2023-25 and 2025-27 Biennia to reduce GHG emissions**

### **Leased Facilities and Maintenance Operations (LFMO)**

- Request funding to install electrical infrastructure to support the planned increased use of battery electric vehicles (BEVs) for both DSHS fleet and staff-owned vehicles. Endorse the use of electric vehicles at leased facilities.
- Negotiate for the installation of BEV chargers at every lease renewal.
- Negotiate for LED fixture upgrades at every lease renewal.
- Include language in RFPs for leased facilities which encourages proposers to include energy efficiency measures in their proposals.
- Reduce the leased facilities footprint state-wide by a minimum of 5% per biennium in the 2023-25 and 2025-27 biennia.

### **Office of Capital Programs (OCP)**

- Request funding to install electrical infrastructure to support the planned increased use of battery electric vehicles (BEVs) for both DSHS fleet and staff-owned vehicles. Endorse the use of electric vehicles on all our campuses.

### **Western State Hospital**

- Construct a state of the art 350 bed forensic hospital and 120 bed nursing facility. Both facilities are planned to be Zero Energy.
- Demolish several older buildings on the Western State Hospital campus to make room for the new 350 bed forensic hospital.

### **Eastern State Hospital**

- Install additional photovoltaic systems on campus to support energy independence.

### **Fircrest School**

- Remove the Fircrest School campus from a distributed steam heating to decentralized heating sources. The Legislature has approved funding to continue to the installation heating and cooling systems for the living cottages.
- Request funding to install decentralized heating systems at multiple buildings at the Fircrest School Campus.

### **Rainier School**

- Evaluate the thermal load for the campus related to the existing centralized steam plant.
- Increase the efficiency of HVAC units on the campus by installing modernized systems.

### **Yakima Valley School**

- Interior lighting upgrades to LED fixtures in Administration Building.
- Exterior lighting upgrade to LED fixtures campus wide.

### **Total Confinement Center, McNeil Island**

- Update existing heating, ventilation, and air conditioning units to meet current energy code.
- Replace existing failing roofing systems. Installation will follow current building and energy code.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

DSHS provides some type of shelter, care, protection, or support to 2.4 million of our state’s 7.2 million residents – typically the lowest-income, most diverse, and most vulnerable. The Fourth Nation Climate Assessment lays it out clearly: the risks of climate change are “often highest for those that are already vulnerable, including low-income communities, some communities of color, children, and the elderly”.

Because DSHS clients are most impacted by climate change, DSHS has integrated an energy efficiency and greenhouse gas emission reductions lens into every aspect of planning, prioritizing, and contracting for capital and leased facilities projects as well as all maintenance activities on DSHS campuses. All new building and significant renovations of capital facilities will be all-electric, zero energy (ZE), or zero energy capable (ZEC). Our Leased Facilities strategic planning is right-sizing our leased facilities footprint in response to expanded telework and actively seeking new energy efficient facilities. We are currently developing a BEV infrastructure and fleet replacement implementation plan to meet EO 21-04 targets.

### **DSHS’ long-term strategy to meet established emissions limits:**

- Request funding for all projects identified as priorities in DSHS long-term GHG emissions reduction strategy.
- **Owned facilities** – Retrofit existing facilities to all-electric or zero-energy (ZE) standards and build new facilities to all-electric, zero energy (ZE). Install on-site energy generation systems.
- **Leased facilities** – Lease energy efficient and all-electric facilities as available and funding permits. Right-size leased facilities to meet business needs with 80% occupancy. Design office space to be as flexible as practical.
- **Transportation** – Replace internal combustion engine (ICE) vehicles with battery electric vehicles (BEVs) and use biofuels or other alternative strategies to lower emissions where BEVs are not feasible.
- **Business Operations** – Support telework/remote work to minimize commute trips.

# State Parks and Recreation Commission

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 4,290                        |
| Fossil Fleet Energy Use Emissions | 2,498                        |
| Annual Fossil GHG Emissions       | 6,788                        |

In 2020, Washington State Parks and Recreation Commission (WSPRC) emissions were 23 % below their 2020 limit. In 2021, WSPRC’s emissions increased to 9 % below their 2020 limit. They are currently 40 % above their 2030 limit.

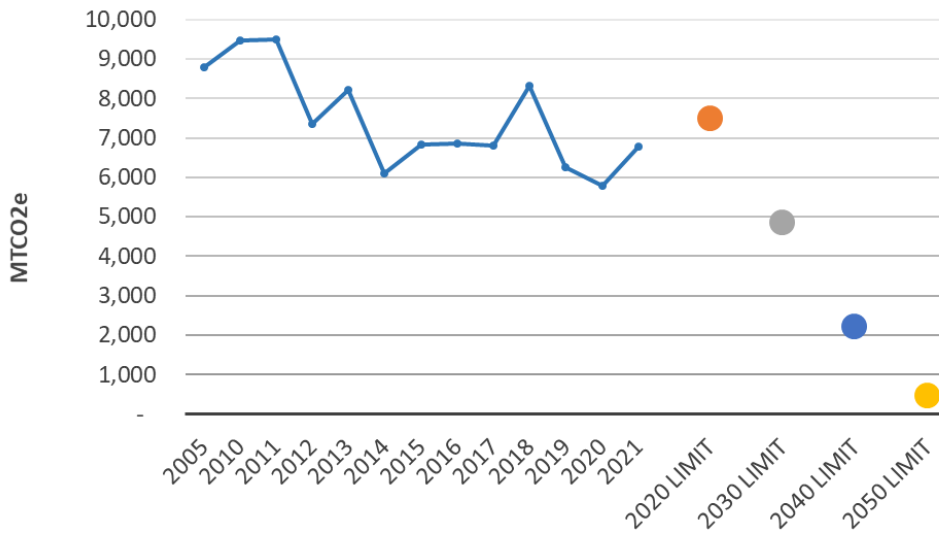


Figure 36. State Parks and Recreation Commission Historic Emissions and Future Limits

In 2021, the WSPRC reported that 63 % of emissions were from buildings and 37 % were from transportation. The department reported 3,272,916 sf of building space, 93 % owned by the agency, 7 % leased by Dept of Enterprise Services. In 2021, 15 % of building emissions were from fossil fuel combustion (mostly propane and fuel oil) and 85 % was indirect electricity emissions. 99 % of WSPRC’s transportation emissions are from motor vehicles and the remaining 1 % are from boats.

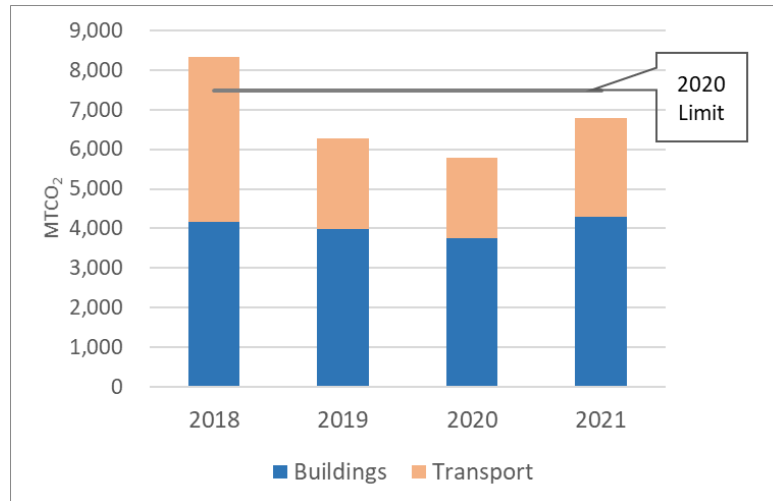


Figure 37. State Parks and Recreation Commission Emissions from Building and Fleets 2018-2021

## **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the calendar years of 2020 and 2021 the WSPRC took several actions to reduce GHG emissions. Following is a summary of scope of work completed by activity:

### LED-lighting

Several parks received lighting system efficiency investments. The scope of conversion from fluorescent or incandescent lighting to LED systems involved over 50 structures, including the following parks:

- Maryhill
- Lake Sammamish (including statewide shop facility)
- Deception Pass
- Peace Arch
- Fort Ebey
- South Whidbey
- Fort Casey
- Fort Townsend
- Fort Worden

### HVAC

Deferred maintenance projects in the following parks resulted in replacement of HVAC systems to meet or exceed current energy code and efficiency standards:

- Deception Pass (upgraded three furnaces)
- Ginkgo Petrified Forest (Residence #1)
- Lake Wenatchee (Residence #1)
- Lincoln Rock (Residence #1)

- Lake Easton (mainly furnace repair)
- Riverside (main office)

### Renovation and weatherization

Several parks received renovation investments to increase energy efficiency and building performance:

- Saint Edward (major [\$55+ million] renovation to seminary building resulting in significant upgrades to modern energy code in our largest building in the system)
- Bay View (septic system renovation to replace poor efficiency electrical pump systems)
- Moran (systematic replacement of windows and installation in several ELC cabin structures)
- Sun Lakes (replaced Deep Lake comfort station with pre-cast unit; eliminated electricity use)
- Lincoln Rock (renovation of shop/office to meeting current energy and lighting codes)
- Alta Lake (replace comfort station # 7 with pre-cast unit; eliminated electricity use)
- Moran (bunk house renovation, new electrical system, windows and roof)
- Deception Pass (Bowman Bay sewer system upgrade to reduce energy use)
- Birch Bay (comfort station remodel with lower energy heating systems, new electrical systems)
- Larrabee (Manager's house remodel, new windows and doors to meet modern energy code)
- Peace Arch (restroom renovation to modern building codes)
- Fort Worden (bathroom renovation with new hot water tanks, insulation for energy efficiency)

### Investment in energy efficient equipment and appliances

Several investments were made to increase energy efficiency in common equipment and appliances:

- Twenty-Five Mile Creek (upgrade electrical systems at campsites 1-9)
- Maryhill (converted two propane water heaters to 220 Volt high efficiency electric water heaters; day use restroom – high efficiency tankless electric units installed)
- Camp Wooten (three new energy efficient water heaters installed in restroom)
- Curlew Lake (new energy efficient water heaters installed)
- Lake Wenatchee (converted all public sinks to touch free, reducing heating cost)
- Marine Crew (Seahawk vessel: replaced two new diesel outboard motors for fuel efficiency; Thunderbird vessel: fixed fuel leaks, rebuilt engine for higher fuel efficiency, replaced batteries with higher energy efficient, and installed new electrical panels)
- Northwest Region (upgrade exhaust systems for Dump Truck and Bobcat Mini X; upgrade all battery-operated tools; replaced with new system)
- Moran (upgraded two restroom water heaters with high efficiency energy use)

### Operational changes

- Purchased two additional hybrid vehicles for fleet

- Long-Distance Trails (purchased four e-bikes for management of trails)
- Larrabee (purchased two battery powered weed trimmers)
- Moran (purchased battery powered chainsaws and weed trimmers)
- Central Whidbey (changed to battery powered chainsaws, saws, weed trimmers and blowers)
- Fort Worden (change to battery powered tools for landscaping maintenance)

#### Other action to reduce GHG emissions

- Moran (construction of new Summit Visitor Center using timber salvaged from the park and milled nearby to reduce emissions from transportation off and back onto island)
- Nolte (removal of a barn structure, not replaced—permanent reduction in GHG emission)
- Deception Pass (removal of building, not replaced—permanent reduction in GHG emission)

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

To position the agency to achieve emission reduction targets established for 2030, additional investment in the 2023-27 biennial timeframes will be required. Following are key areas of emphasis.

#### Establishing an interdisciplinary GHG emissions reduction work group

The formalization of a GHG emissions reduction work group is an important step forward in the planning and implementation of near-term GHG emission reduction strategies. Optimizing workflow and reporting of GHG emission reduction activities will require a durable, interdisciplinary team structure. It is important that team structure be adaptable to changes in staff and program organization over time. This effort is currently underway.

#### Establishing a comprehensive GHG emission inventory

Based on a recent assessment of existing GHG data systems there is a clear need to have a more complete and accurate understanding of our carbon footprint. Additional capacity is needed to inventory and assess the quality and comprehensiveness of historical and current data used to satisfy GHG emission reduction reporting. Key areas of focus will be:

- Assess historical agency GHG emission data reported to Department of Ecology for facility energy use and fleet emissions to establish a more accurate agency GHG emission profile.
- Standardize methodologies for direct GHG emission and energy consumption data collection and use in reporting systems.
- Conduct a statewide assessment of facility energy use to better understand performance level and scale of energy consumption at the park and building level (metering opportunities).
- Establish a statewide inventory of GHG emissions resulting from vessel use.
- Establish a statewide inventory of gas-powered equipment and tools.

### Electric Vehicle Infrastructure Investments

The transition to an electrified fleet will require a multi-phased strategy. The agency received \$150,000 in funding in the 2022 Supplemental Budget to initiate fleet electrification.

Implementation of this first phase of internal EV charging stations has identified additional strategic investments that will be needed to ultimately deliver a sustainable statewide system of charging stations and BEV fleet. Following are some key EV infrastructure investments that should be prioritized in the 2023-27 biennial timeframes:

- A statewide assessment of existing electrical utility conditions within agency administrative areas and docks to identify existing opportunities and constraints related to implementation of a statewide EV charging station network.
- Develop a Fleet Electrification Plan that identifies desired level of service goals and objectives, alignment of level of service networks with electric service capacity, and prioritizes the site planning, permitting and installation of EV charging infrastructure over multiple biennia.
- Build upon existing EV charging inventory through additional purchase and installation of EV charging stations that align with statewide level of service goals and objectives.
- Increase funding to accelerate compliance with EO 21-04 and the conversion of ICE vehicles to BEVs based on market availability, including guidelines for purchasing of new vehicles to ensure the most efficient vehicles are used to conduct agency activities.
- Invest in the purchase of electric and battery powered vocational equipment to reduce fuel use.
- Invest in alternate fuels where electric is not an option, including larger vessels and specialized heavy equipment such as garbage trucks and snow groomers.

### Facility Energy Use Reduction Investments:

The agency's path to achieving long-range emission reduction targets includes a comprehensive approach to reducing energy use and improving performance within a wide range of facilities. Following are some key facility investments that should be prioritized in the 2023-27 biennial timeframes:

- Leverage investments in GHG emission inventory assessment to identify facilities with the greatest opportunity for energy efficiency projects.
- Review agency's 10-Year Capital Plan and deferred and preventative maintenance database to identify project elements with greatest opportunity for energy efficiency enhancements.
- As part of the planning process for the 2025-27 biennium, develop a programmatic budget request to prioritize "energy conservation" projects and consider other programmatic opportunities such as "gas to electric" systems conversions (HVAC, hot water, residential, etc.).
- Incorporate GHG emission and energy use parameters (metrics) into update of agency's facilities condition assessment program database (known as FiCAP).



- Invest in a Renewable Energy Opportunity Assessment to identify which facilities have the greatest opportunity for renewable energy projects, including solar and wind demonstration.
- Develop design criteria to integrate renewable energy into existing and new facility projects.
- Upgrade maintenance project management systems to better track the scoping and implementation of energy conservation project elements.

### Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050

The WSPRC has a long way to go to reach the GHG emission limits codified in RCW 70A.45.050. To maintain the pace of reducing our GHG emissions 3% a year for the next 30 years, a long-term commitment from agency leadership and the legislature is vital. To be successful a long-range *Clean Energy Transition Strategy* focused on transforming the operation of agency infrastructure to net zero carbon emissions is proposed. This approach will be incorporated as part of our agency Sustainability Plan. This strategy can be organized into four general initiatives—each targeting a specific area of agency activity (see Figure 38).

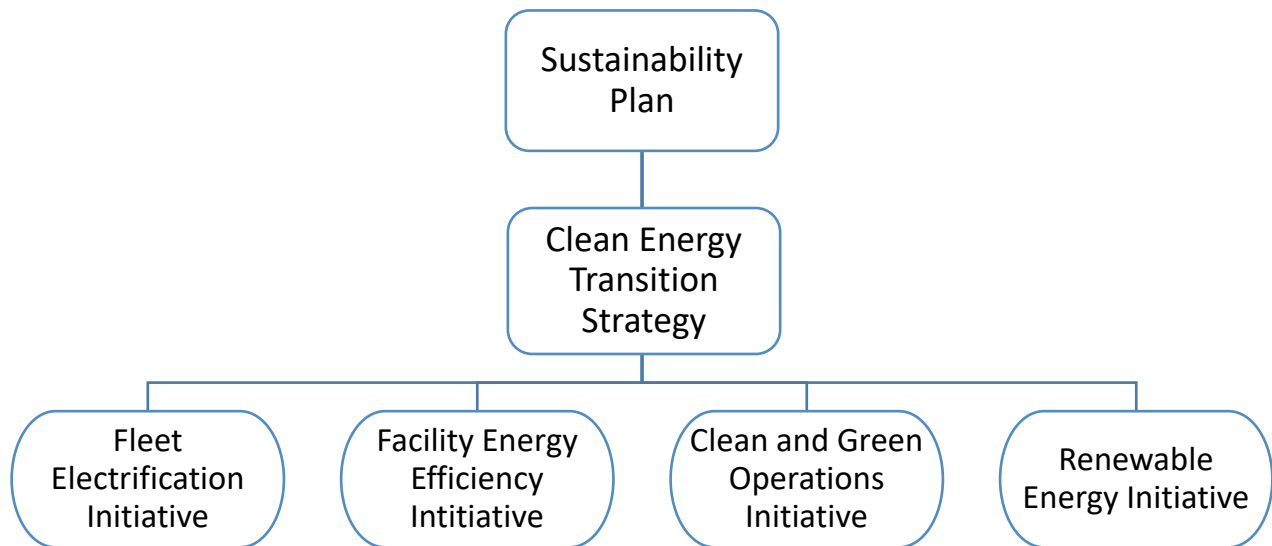


Figure 38. Proposed Clean Energy Transition Strategy and key supporting initiatives

This plan involves the development of an interdisciplinary implementation framework that targets the 2030, 2040 and 2050 benchmarks outlined in the RCW (see Figure 39. Red arrow indicates 2021 emission levels). This strategic framework must be reviewed and updated as operational and technological assumptions change over time.

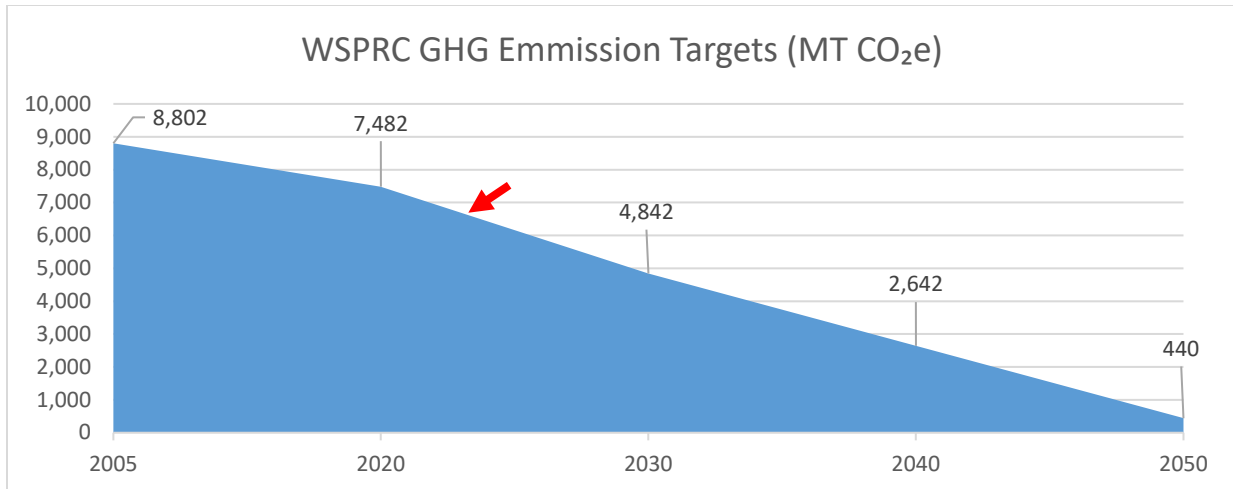


Figure 39. WSPRC greenhouse gas emission reduction targets for 2030, 2040 and 2050.

### 45% Reduction Target by 2030

Given our current capacity and access to technology, to achieve our 2030 GHG emission reduction target of 4,842 MT CO<sub>2</sub>e investment in priorities will be essential.

#### Near Term Priorities

Increased investment towards conversion of our fleet to BEVs and more high-efficiency or alternate fuel use is a key piece of our 2030 strategy. Additional investment in energy use assessments (electrical, lighting, heating, cooling, etc.) is necessary as we undertake a comprehensive approach to optimize the operation of our building infrastructure and our ability to permanently reduce GHG emissions. Another key to achieving our 2030 target is the need to prioritize and integrate GHG emission reduction strategies into a wide range of project scoping and budget development activities, including ongoing 10-year capital project and deferred and preventative maintenance budget development.

### 70% Reduction Target by 2040

Agency-wide investment and commitment to the ongoing implementation and update of our Sustainability Plan, and its role in our broader *Clean Energy Transition Strategy*, is necessary to achieve our 2040 GHG emission reduction target of 2,642 MT CO<sub>2</sub>e.

#### 20-Year Planning Considerations

Successful enforcement and implementation of statewide energy policy will also be critical—specifically, implementation of CETA which will play an important role in GHG emission reduction, and the sourcing of electricity used to operate our facilities. Additionally, strategic investment in our capital program and related deferred maintenance planning is key to building the internal capacity needed to make the scale of systematic changes to facility infrastructure necessary to meet this 2040 benchmark.

### 95% Reduction Target by 2050

To achieve our 2050 GHG emission reduction target of 440 MT CO<sub>2</sub>e we must be successful in acquiring the resources necessary to invest in and implement our proposed *Clean Energy*

*Transformation Strategy.* At this time, we have several built-in assumptions that will need to play out to make this target a reality. Perhaps the most promising assumption is that technology will continue to drive the scale of innovation necessary to transform our fleet to be battery-powered, and to sustainability operate our diverse range of facilities using net zero-emission energy sources.

#### Long-Range Assumptions

There are assumptions within regulatory and legislative environments that must also be maintained. Most notably, the legislative commitment to maintain existing legal direction and provide resources necessary for large scale investment in, and maintenance of, net zero-emission energy systems as demand for state park services grows over time. Based on current population estimates by the OFM we assume Washington State will grow by 20% with a population of nearly 10 million by 2050 (9,757,000 is estimate at time of this report). Thus, we assume our infrastructure and demand for energy use will expand accordingly, as state park visitations grows above current levels of 43+ million visitors a year.

The WSPRC employs 800+ FTEs distributed throughout 150+ state park properties. We are predominately a natural resource agency with a facility profile more common to residential institutions. We provide day use, camping and retreat services to 43+ million visitors each year. The agency currently manages 2,500+ buildings and a fleet of 650+ vehicles plus a range of operation and maintenance equipment reliant on energy use.

A notable barrier facing pursuit of GHG emission reduction targets, codified in RCW 70A.45.050, is our lack of resources to invest at the scale necessary to reach net-zero carbon emissions while demand for services grow over time. Success will require a fundamental shift in our approach to sustainability and permanent reduction of GHG emissions. Thus, as a key element of our agency Sustainability Plan, we propose development of a *Clean Energy Transition Strategy* to guide decision making and prioritization of actions to achieve the reality of a net-zero emission operated park system.

This strategy will focus in four specific areas:

- 1) Systematic fleet electrification.
- 2) Optimizing facility performance and energy consumption.
- 3) Reducing carbon footprint of routine operations and maintenance.
- 4) Production of renewable energy where feasibility and appropriate.

# The Evergreen State College

## Emissions Profile

| Total Emissions Source                   | 2021 GHG emissions (MT CO2e) |
|--|------------------------------|
| <b>Building Energy Use Emissions</b>     | <b>6,201</b>                 |
| <b>Fossil Fleet Energy Use Emissions</b> | <b>153</b>                   |
| <b>Annual Fossil GHG Emissions</b>       | <b>6,354</b>                 |

In 2020, The Evergreen State College (TESC) emissions were 53 % below their 2020 limit. In 2021, TESC’s emissions increased to 21 % below their 2020 limit. They remain 22 % over their 2030 limit.

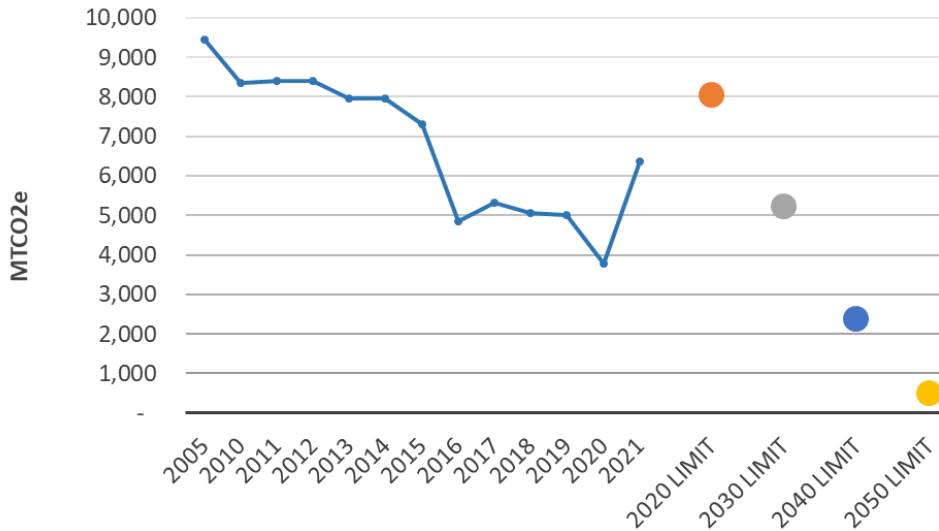


Figure 40. The Evergreen State College Historic Emissions and Future Limits

In 2021, TESC reported that 98 % of emissions were from buildings and 2 % were from transportation. They reported 1,667,964 sf of building space, all owned by the college. In 2021, 64 % of building emissions were from natural gas combustion and 36 % was indirect electricity emissions. Small amounts of diesel, propane and fuel oil also contributed to emissions from buildings. TESC purchased renewable energy credits equivalent to their electricity emissions, however, this report requires a contract for green power to be considered zero emissions.

The College has three solar photovoltaic arrays: 9 kW and 5 kW systems on the Olympia Campus, and a 20.4 kW system on the Tacoma Campus building. The Olympia systems produced 13,790 kWhs in 2021. The Tacoma array dashboard connection was offline last year, so they do not have production data for this system.

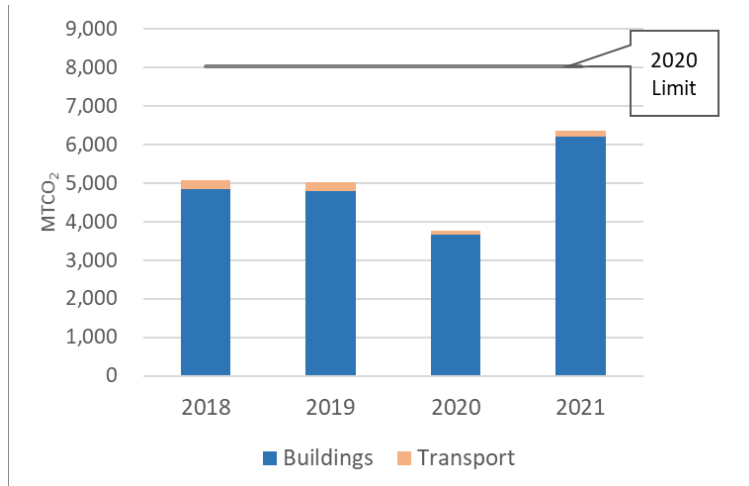


Figure 41. The Evergreen State College Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

Despite the challenges of the pandemic, restricted in-person activities, and supply-chain shortages Evergreen was able to complete multiple energy and resource-efficiency projects in the 2020 and 2021 calendar years:

Lab 1 building HVAC upgrade (this previously scheduled project was able to leverage SPI funds to add energy conservation measures)

- Replaced single centrifugal supply fan with new redundant fan wall (electric savings)
- Replaced old exhaust fans with new redundant exhaust fans (electric savings)
- Replaced glycol heat recovery with heat wheel heat recovery (increased gas savings)
- Added laboratory grade air controls to improve air quality and safety and save energy lowering fan speeds overnights and whenever rooms are not occupied by using sensors on the lighting circuits to determine when spaces are occupied or not. This has reduced or eliminated the number of alarms that the fume hoods experience.

Campus Steam System efficiency upgrades

- Repaired and replaced 100 steam traps to save steam and natural gas
- Added a surge tank in the central plant to save gas and water
- Added heat recovery on the De-aeration tanks to save gas (heating demand)

Tacoma Campus building LED lights

- Replaced all internal fluorescent lighting with LED

Olympia Campus Parkway Lighting

- Replaced over 100 street light fixtures with LED lamps on the Evergreen Parkway

#### Utility Infrastructure Master Plan Design Competition

- The 2019 Legislature awarded the College a special appropriation to fund a design competition for future campus utility infrastructure which began in late '19
- Design teamwork and the final selection all occurred in 2020. This resulted in a plan for future low-carbon campus heating/cooling infrastructure

#### Installed building electric sub-meters

- Olympia campus has ~50 buildings on one utility meter
- Sub-meters have been installed in all buildings over 50K gsft. (Tier 1 Clean Buildings group) as well as a few smaller buildings. Plans are currently in development to sub-meter additional building clusters (student housing) and smaller academic buildings.

#### Upgraded existing EVSE

- The College had installed two Blink Level 2 chargers in December of 2012. Both were replaced with new generation Level 2 chargers (also Blink) in the summer of '21.

#### Cooling Towers for campus chilled-water loop

- Replaced 1970's era drives with variable frequency drives
- Upgraded return water filtration system to improve system efficiency (reducing both water and electrical demands)

#### Longhouse Heating

- Installed electric heating hot water boiler in the Longhouse, removing that building from the campus steam system and allowing us to shut down a leaking, buried steam line.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, Evergreen plans to focus on final design and initial construction phases of our plan to replace our natural gas-fired boilers and central steam system with heat pumps as defined in the master plan referenced above.

- Finalize desired system details and our strategic path
- Replace natural gas-fired domestic hot water boilers in the Campus/Student Activities Building with compressed CO2 heat pump water heaters
- Begin moving other discrete building heating & DHW systems off of steam, with an emphasis upon student residences (a feasibility study has been initiated), buildings already scheduled for renovation projects (Lab 2 and Seminar 1), and the swimming pool
- Complete engineering pre-design(s) for decentralized heat pump systems on a medium-temp hot water loop connecting central campus buildings

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

Evergreen State College plans to use the following strategies to meet GHG emissions limits:

- Apply energy efficiency & renewable energy projects wherever and whenever feasible
- Replace Natural Gas heating infrastructure with electric systems
- Use Renewable Energy Credits for supply electricity until PSE is fully renewable
- Actively support multi-modal and electric transportation options for fleet, business travel, and commuting (where practicable)

Evergreen also plans to replace the 50-yr old central steam (natural gas boilers) with electrical systems and upgrade central chillers, while pursuing building envelope and HVAC efficiency upgrades.

- Our electrical suppliers are moving to 100% renewable, and we are doing our part to ensure future efficiencies and onsite generation wherever possible.
- Our existing Natural Gas fired infrastructure is our largest single point of emissions, over 90% of Scopes 1 & 2 (absent electricity).
- Replacing this 50-year-old infrastructure with new, long-lasting infrastructure is our greatest and best approach to substantially reducing the College's GHG emissions.

**Transportation.** Other strategies Evergreen will use to meet GHG limits include transitioning fleet vehicles to battery electric, electrifying vessels and equipment where possible, limiting vehicle trips by using remote meeting options, and utilizing alternative fuels.

**Facilities.** Evergreen is also taking steps to ensure compliance with Clean Buildings Performance Standards for seven Tier 1 buildings (over 50,000 SF) and nine Tier 2 buildings (between 20,000-50,000 SF). Energy efficiency measures will be applied at individual building levels as well as through upgrades to the distributed heating and cooling loop systems.

**Renewable Electricity.** Evergreen has 34.4 kW of solar PV, distributed between two arrays on the Olympia campus and one on our Tacoma campus. The college is currently exploring opportunities to host a community solar array.

# University of Washington

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 97,784                       |
| Fossil Fleet Energy Use Emissions | 1,312                        |
| Annual Fossil GHG Emissions       | 99,096                       |

In 2020, the University of Washington (UW) emissions were 28 % below their 2020 limit. In 2021, UW’s emissions increased to 26 % below their 2020 limit. They remain 15 % above their 2030 limit.

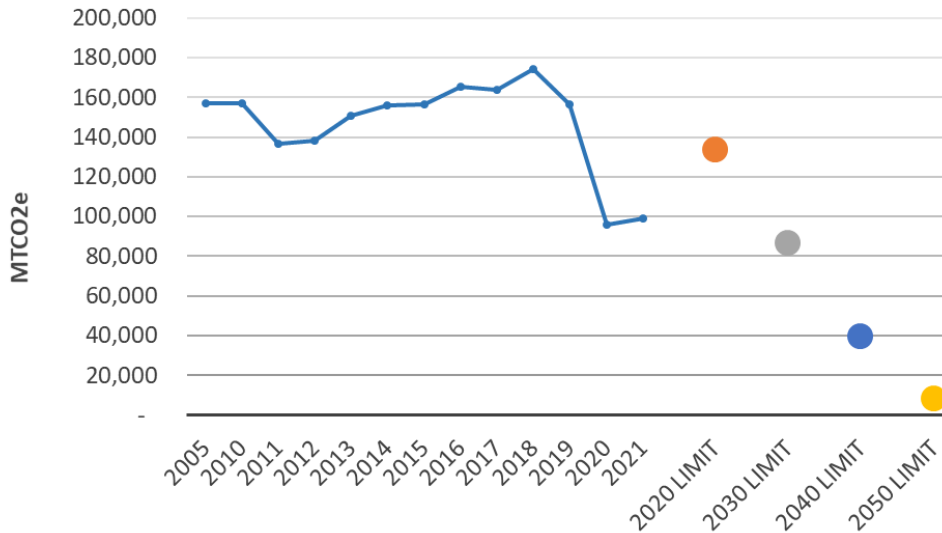


Figure 42. University of Washington Historic Emissions and Future Limits

In 2021, UW reported that 99 % of emissions were from buildings and 1 % were from transportation. They only reported emissions from buildings owned by the university, which totals 28,877,441 sf of space. In 2021, 97 % of building emissions were from natural gas combustion and 2 % was indirect electricity emissions. 96 % (337,369,420 kWh) of UW’s electricity was purchased using a zero-carbon green power contract. All the transportation emissions UW reported were from motor vehicles.

UW has solar panels on several dorm buildings, but production data is not available.



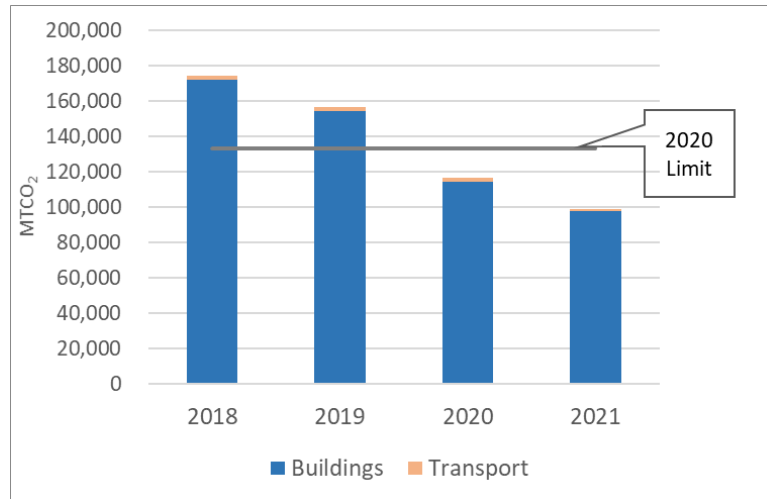


Figure 43. University of Washington Emissions from Building and Fleets 2018-2021

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

| Category              | Actions  |
|-----------------------|--|
| <b>Buildings</b>      | <p><b>Green Building Standard:</b> In the 2018-2019 academic year, the UW developed a <a href="#">Green Building Standard</a> that requires new buildings to achieve LEED gold, consume 15% less energy than required by code and 50% less water than required by code. The <a href="#">linked document</a> indicates which buildings have met that standard during the last 2 years. In November 2021, we reconvened the Green Building Standard Committee to review and upgrade the standard. We’ve made the decisions to model the <a href="#">standard and plan developed at the University of British Columbia</a>.</p> <p><b>Green Revolving Fund:</b> A team from UW Facilities, UW Treasury and one faculty member has been working over the past 2 years, to establish a Green Revolving Fund.</p> <p><b>Sustainability Plan:</b> The UW Sustainability Action Plan, launched in 2020 includes descriptions of how we plan to “Repower the Seattle Campus” (part of <a href="#">target X</a>), and how we plan to achieve “15% lower energy usage intensity by 2025” (<a href="#">target VIII</a>).</p> |
| <b>Transportation</b> | <p><b>Non-ICE vehicle purchases:</b> In 2020-2022, UW Transportation purchased 3 electric vehicles, 13 flex fuel vehicles, 8 hybrid vehicles and 1 renewable diesel vehicle.</p> <p><b>Plan to electrify:</b> The <a href="#">UW Sustainability Action Plan</a> includes a description of how we plan to “Electrify the UW Fleet” as part of our effort to reduce GHG emissions 45% by 2030.</p>   |

| Category                                | Actions  |
|---|--|
| <b>Planning &amp; Capacity Building</b> | <p><b>RFI to assess the market:</b> In 2020, the UW conducted an RFI process to assess services available in the market to support the effort to update and decarbonize UW’s energy infrastructure.</p> <p><b>Hired Executive Director of Energy, Utilities and Operations:</b> One outcome of the RFI was a commitment to identify a high-level champion for this work. In 2021, UW created a new position: Executive Director of Energy, Utilities and Operations and hired David Woodson to fill that position.</p> <p><b>Hired Director, Capital Planning Strategy:</b> This is a new position in the Office of Planning and Budgeting that has been filled by Bob Simonton. In this role, Bob will lead the Capital Planning Advisory Team and provide support for buildings and utility infrastructure as part of the Campus Strategic Planning process.</p> |

**Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

UW’s priority actions for the 2023-25 and 2025-27 biennia involve several key components:

1. Continue the work of refining and expanding the Green Building Standard as mentioned above (using the [University of British Columbia’s work](#) as a model).
2. Investing in infrastructure renewal by optimizing the resilience of the existing power plant. The project involves de-rating two high-pressure steam boilers. This will not only enhance the stability of the existing boiler plant, but it will also enable the plant to run more efficiently and be less dependent upon the older less efficient boilers. Enhanced plant efficiency directly corresponds to less fossil fuels being used. Further, this project will invest in a new uninterruptible power supply (UPS) and a new back-pressure turbine to replace the existing unreliable turbine that previously was dependent on the high-pressure boilers. The combination of all these projects will make the existing power plant more efficient and reliable as we transition away from the use of fossil fuels.
3. UW’s Long-Term Capital Plan includes a strategy to limit growth to 0.5% per year: <https://facilities.uw.edu/planning/capital-budget>
4. Make systemic adjustments for how we account for energy consumption. These efforts will include creating a green revolving fund, assessing our present cost of service model for heating and cooling, and evaluating the potential to self-finance energy infrastructure recapitalization through an expanded cost of service model.
5. Accelerate our energy management activities. While the UW has benefited from its smart metering initiative and active energy conservation program for several years, there is an opportunity to accelerate that effort and further enhance our energy conservation efforts. Additional thermal metering, direct digital control upgrades, and

enhanced over-arching data-analytics will not only reduce our demand for energy but will provide us with robust data that will assist with evaluating options when transitioning the entire district energy system. Electrical conservation savings will be essential to ‘free up’ existing electrical capacity to decarbonize the steam plant. The metering upgrades are anticipated to be complete by December 2023. The DDC upgrades and data-analytics will extend into 2027.

6. Utility Master Plan—While UW’s last Utility Master Plan served as an effective reference for utility investments, it needs to be refreshed with a lens toward our decarbonization goals and alignment with the Campus Strategic Plan. The new utility master plan will align with our energy recapitalization goals which include:
  - a. Resiliency—mitigate service disruption risk,
    - no use of fossil fuels
    - future proofing
    - optionality
    - diversify commodity dependency
  - b. Lowest cost—lowest total cost of ownership (CapEx/OpEx).
  - c. Productive work environment—ensure building systems can perform to meet operational needs (data centers, research labs, clinical spaces, lecture theaters, etc....)
  - d. Inspire—lead by example and accelerate efforts.
7. It is our intention to apply to the Department of Commerce early adopters’ program and identify a series (2-3) of scalable pilots that will help inform our long-term initiatives. The first two initiatives will both focus on utilization of low-grade waste heat. The first involves re-use of waste heat from the data center at the UW Tower. The second involves the re-use of waste heat from year-round process cooling loads from a select group of research facilities on the western edge of the campus.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

UW’s long-term emissions reduction strategy is centered on the decarbonization of our steam plant. The use of natural gas to produce steam for heating of our campus buildings is the primary source of our scope 1 carbon emissions.

## 2021 Scope 1 Greenhouse Gas emissions for Seattle UW Campus

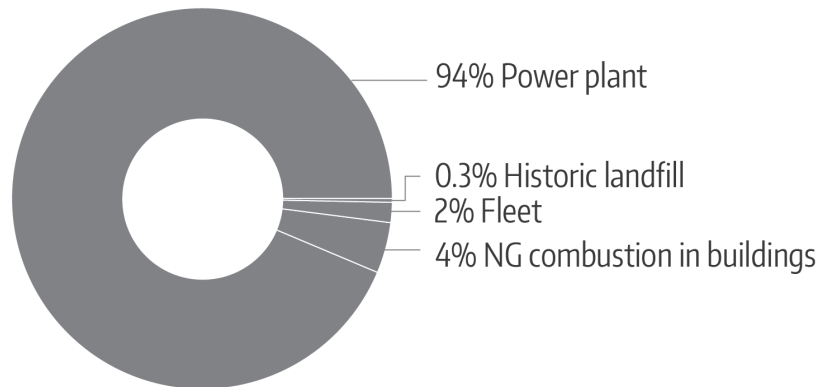


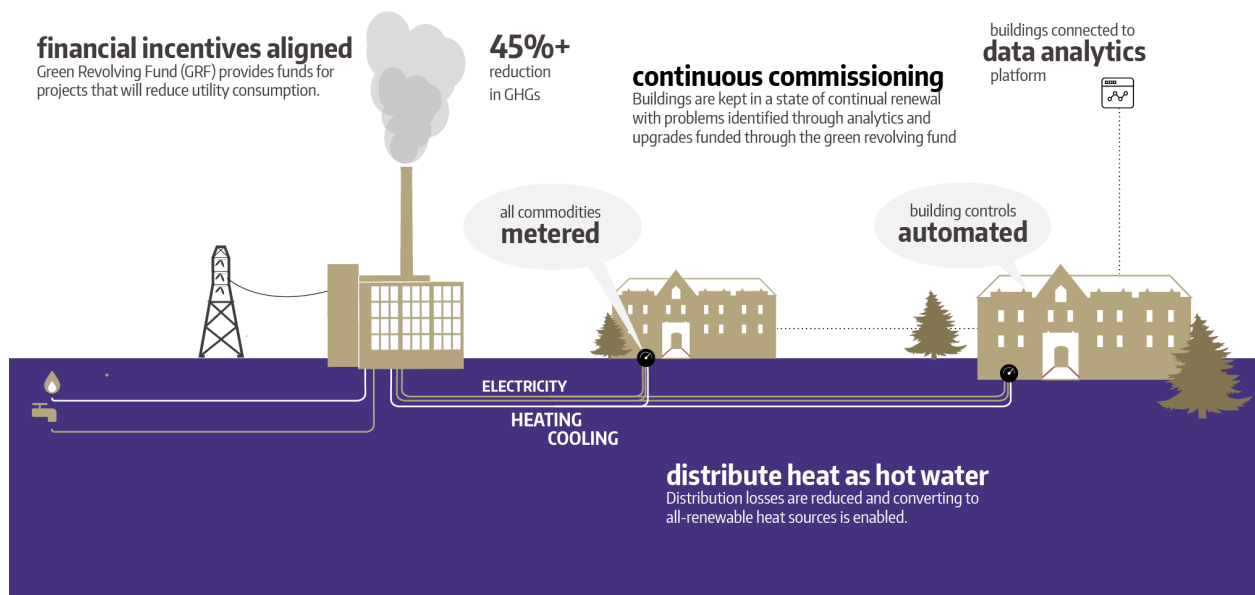
Figure 44. UW Scope 1 Emissions for Seattle Campus

At the heart of our plan to address our emissions is an update to our utility master plan emphasizing our need for resilient infrastructure that will mitigate service disruption risk, eliminate the use of fossil fuels, and diversify commodity dependency. Further, our vision of energy infrastructure on campus will target the lowest total cost of ownership options, while still providing for a productive work environment as it relates to temperature control. Lastly, we will endeavor to accelerate our efforts and inspire others. Our strategy includes:

1. Accelerating our energy conservation efforts (reduce demand and optimize building performance).
2. Transitioning the district energy system away from the steam distribution system to a hot water.
3. Introduce industrial scale heat pumps to transfer heat to the new hot water systems from low-grade waste heat sources.
4. Evaluate alternative means to provide supplemental heat to the hot water system and address winter peak conditions.

### **Strategies that will help us meet the 2030 goal of 45% reduction**

# 2030 Campus Energy Vision



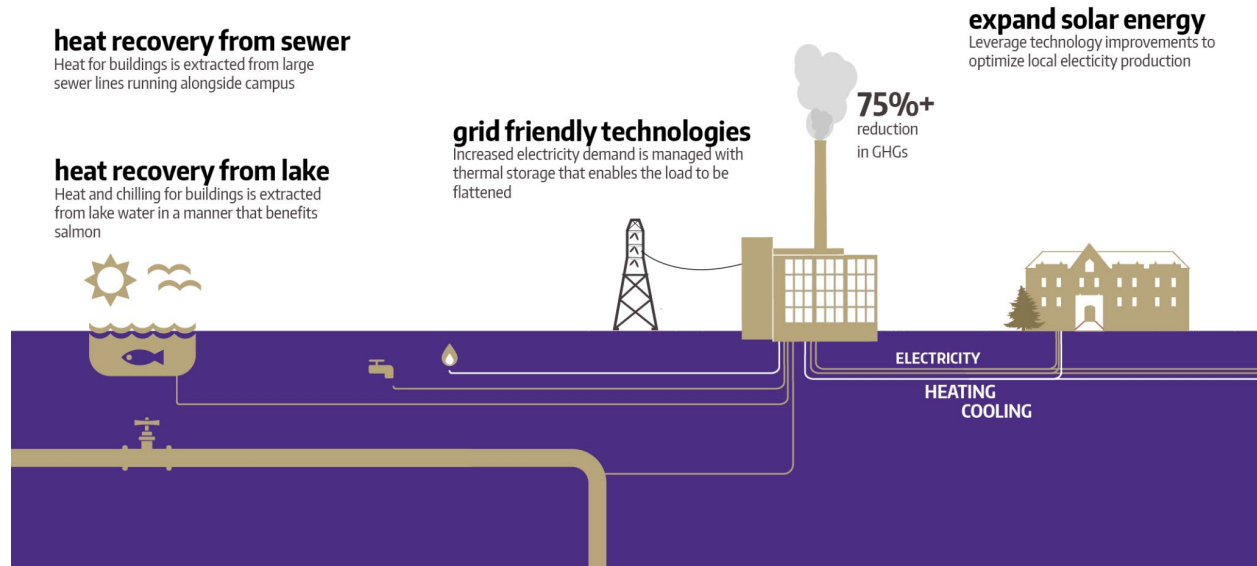
The University of Washington’s primary source of regulated GHG emissions comes from its steam plant that is primarily used to heat campus buildings on its Montlake campus. All our efforts within our long-term strategy are associated with decarbonizing our district energy system.

Ultimately our longer-term efforts will be driven by our Utility Master Plan and will be informed from our initial pilot projects. Presently our long-term vision is to leverage the existing district energy system assets as well as the variety of campus buildings and their respective diversified energy needs. While we optimize at the building level first to reduce our overall energy demand, we will use our district system to share excess energy and optimize our ability to re-use what is presently waste energy in our high-energy intensive research spaces. Our strategies for meeting the 2030 goal focus on reducing building demand through efficiency measures and enabling continuous commissioning through upgrading building controls, expanding our metering and meter monitoring programs and developing data analytics capacity.

In addition, we plan to complete building conversions from receiving steam to receiving hot water by 2030. This, combined with our energy conservation efforts will enable us to not only meet our 2030 goals, but will put UW in position, with transformational infrastructure, to achieve our 2030, and 2040 goals.

## Strategies that will help us meet the 2040 goal of 75% reduction

# 2040 Campus Energy Vision



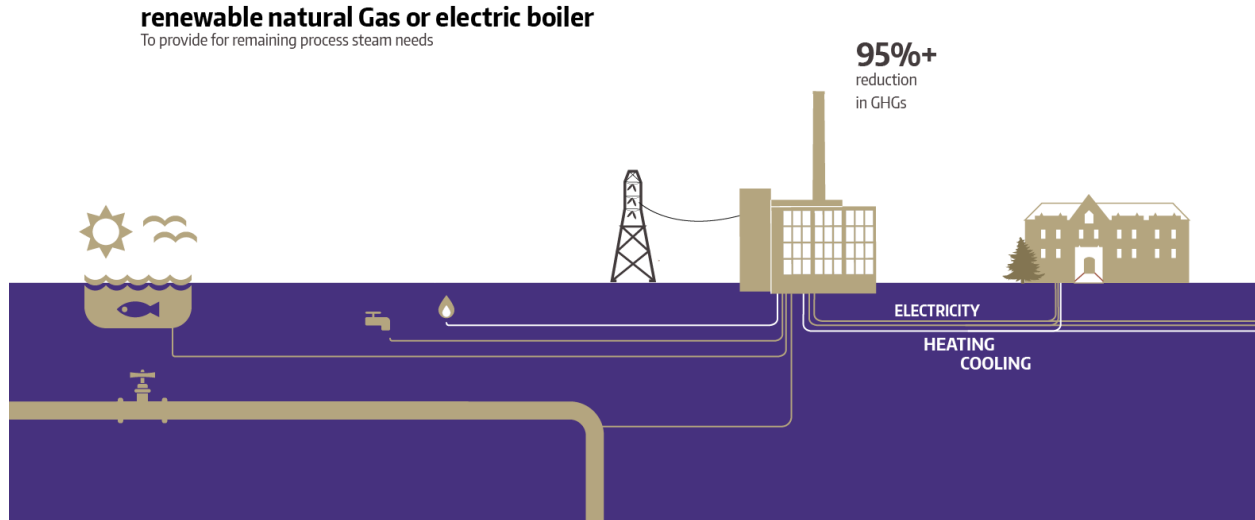
By 2030 UW will have its new hot water district energy system in place. The focus to meet the 2040 targets and beyond will be on finding alternative methods for heating the hot water grid. An industry scan of existing technology that would meet these goals would include the use of industrial scale water-sources heat pumps combined with energy storage.

This will enable the use of reclaimed waste heat from a variety of sources. The primary source of waste heat that we reclaim is from the heat that is presently rejected to the atmosphere via our cooling towers as part of the cooling system. Secondly, we would like to partner with SPU and tap into the regional sewer lines that are adjacent to our campus Utility plants. Utilization of Lake Washington as both a heating and cooling source will also be considered.

All our decarbonization efforts involve some form of electrification. We are very cognizant that the increased electrical demand associated with decarbonization will not be offset by our energy conservation efforts. Furthermore, we are concerned that significant electrical transmission upgrades will be required. To help mitigate/delay these investments, we are evaluating the potential to self-generate electricity via solar panels.

## Strategies that will help us meet the 2050 goal of 95% reduction

# 2050 Campus Energy Vision



The final push to 95% reduction (or higher) will be the most challenging. Use of renewable natural gas (RNG) or an electric boiler may be required to achieve our 2050 goals. Both options come with a significant on-going operational cost. Other technologies that are in need of development that could also be an option for consideration to eliminate our final GHG emissions include carbon capture and/or nuclear fusion. While those options presently are not commercially viable, that may change over the next 10-15 years, and should be a consideration to achieve our 2050 goals. Similarly, we will continue to scan other technological developments for alternative means of provisioning heat to our campus buildings.

## Veterans Affairs, Department of Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO <sub>2</sub> e) |
|-----------------------------------|---|
| Building Energy Use Emissions     | 14,786                                    |
| Fossil Fleet Energy Use Emissions | 242                                       |
| Annual Fossil GHG Emissions       | 15,029                                    |

Department of Veteran's Affairs (DVA) reported emissions for 2005, 2010 and 2011 and resumed reporting in 2021. Their 2005 emissions are included in establishing the statewide limits.

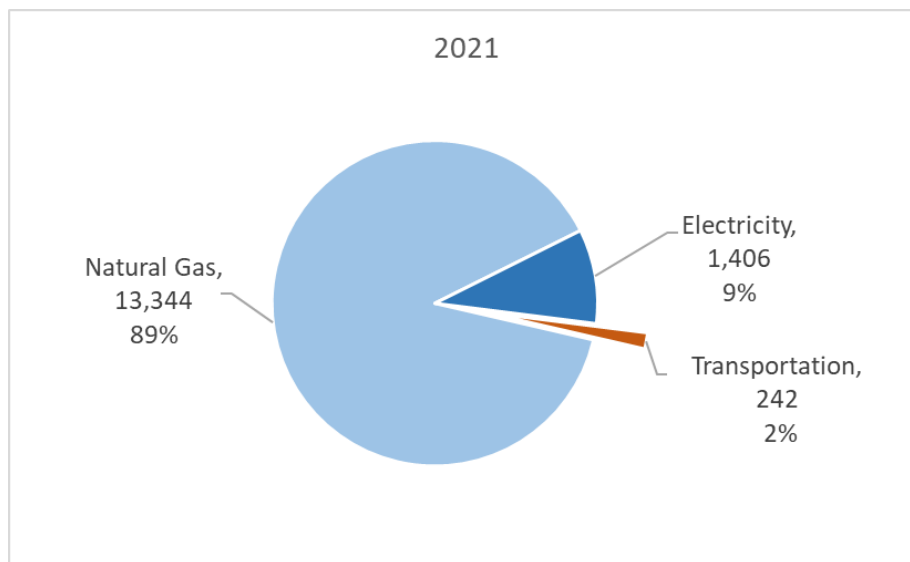


Figure 45. Department of Veteran/s Affairs, 2021 MTCO<sub>2</sub>e from Buildings and Transportation

In 2021, the DVA reported that 98 % of emissions were from buildings and 2 % were from transportation. The department reported 641,509 sf of building space, 96 % of which they owned, and 4 % privately leased. 90 % of building emissions were from natural gas combustion and 10 % was indirect electricity emissions.

DVA reported 2,553 kWhs of renewable electricity production (the renewable resource type was not specified) and 607 kBtus of renewable thermal energy.

### Actions taken to reduce GHG emissions during the 2020-21 calendar years

- The Washington Department of Veterans Affairs (WDVA) has installed new EV chargers at our Central Office location, the first for our agency in 2021.
- In 2021 WDVA received grant funding to replace HVAC units at the Spokane Veterans Home to more efficient units to replace 30-year-old units. The design is currently being completed.



- In 2021 WDVA removed two buildings on the Washington Veterans Home Campus totaling 45,000 SF and replaced it with new open space for activities. These building had been a warm shell state for nearly 14 years and now are no longer using energy.
- In 2020 and 2021 WDVA has worked on preliminary design and received funding to replace the existing steam heat at the 160,000 SF building at the Washington Veterans Home in Port Orchard. The steam heat will be replaced with new VRF system, design is currently ongoing.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, WDVA plans to take the following actions to reduce GHG emissions:

- WDVA is continuing to move away from our steam heat at our Washington Soldiers Home in Orting and Washington Veterans Home in Port Orchard. As part of that we will be moving forward with the removal of steam heat and install a new heating and cooling system at the Washington Veterans Home in Port Orchard. This will reduce the reliance on the inefficient steam system as we move over to an all-electric system for the heating and cooling of the building. This project is currently in design and will be under construction in 2023.
- WDVA will be working to transition vehicles to EVs in the next few years. This will also include the build out of infrastructure at our owned state facilities.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

To meet GHG emissions limits, the focus of WDVA’s long-term GHG reduction strategy is based on the need to get sub-meters in place at our Port Orchard and Orting Facilities. This will provide WDVA with the proper data to understand and truly prioritize areas of need. Without the information WDVA’s highest priority is to remove the overall reliance on steam heat at these facilities. This is currently being started at our largest building with the removal of steam heat and additional of electric HVAC systems for the 160,000 SF skilled nursing facility. Our current plan to add EV infrastructure at our owned facilities and start replacing vehicles to EV’s as they become available will help to support the reduction of admissions. WDVA looks forward to adding planning and growth as we continue to reduce emissions and understand our biggest emission uses.

Since WDVA’s largest source of emissions are the two steam plants at the Washington Soldiers Home in Orting and the Washington Veterans Home in Port Orchard, our agency will be working to remove the need for the steam plant of over coming years. These two facilities have more than three quarters of our agency’s owned footprint and the steam plants are operated on gas. Our first step in the process will be removing most of the 160,000 SF skilled nursing building in Port Orchard from steam heat. This will start in 2023 and continue through 2024. DVA is working to replace the skilled nursing building in Orting, and this will be a zero-net-ready structure, replacing another high use building from the steam plant.

DVA will be completing energy audits of our larger structures to see what other items can be done to address emission reductions and creating a more sustainable portfolio. This has already started at the Roosevelt Barracks in Orting as we have completed the study and will be adding energy upgrades to the building in our 10-year plan.

# Washington Department of Transportation

## Emissions Profile

|             | MT CO <sub>2</sub> e |                 |         |
|-------------|----------------------|-----------------|---------|
|             | Buildings            | Non-Ferry Fleet | Ferries |
| <b>2018</b> | 29,868               | 31,402          | 182,448 |
| <b>2019</b> | 33,063               | 32,662          | 180,658 |
| <b>2020</b> | 28,031               | 28,297          | 137,541 |
| <b>2021</b> | 26,561               | 31,134          | 144,603 |

In 2020, Department of Transportation (DOT) emissions were 6 % below their 2020 limit. In 2021, DOT’s emissions increased slightly but remained 2 % below their 2020 limit. They remain 52 % above their 2030 limit.

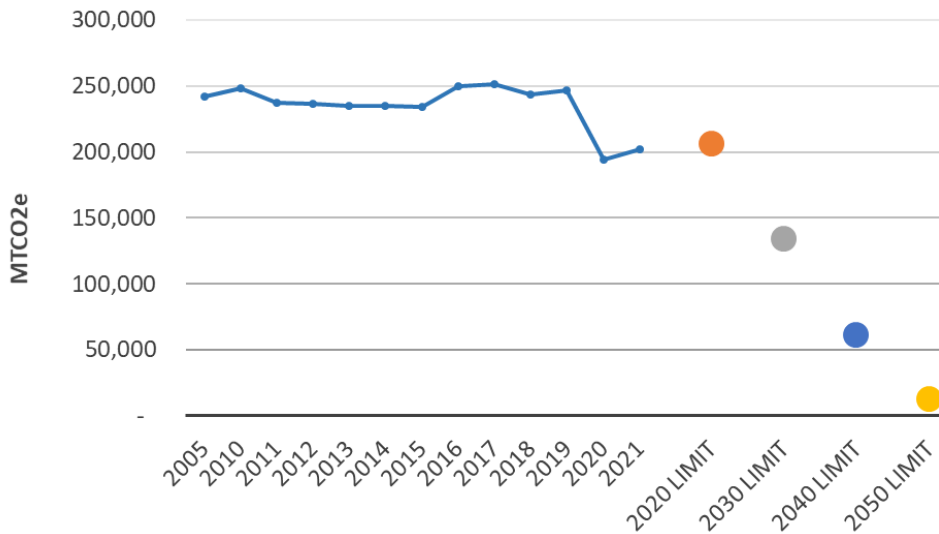


Figure 46. Dept. of Transportation Historic Emissions and Future Limits

In 2021, DOT reported that 13 % of emissions were from buildings and 87 % were from transportation. Excluding the ferries, 46 % of the DOT’s emissions would be buildings and 54 % transportation fleets. They reported 4,374,040 sf of building space, 90 % owned by the department, 7 % leased from DES and 3 % leased from private building owners. In 2021, 14 % of building emissions were from natural gas combustion and 82 % was indirect electricity emissions. Small amounts of diesel, propane and fuel oil also contributed to emissions from buildings.

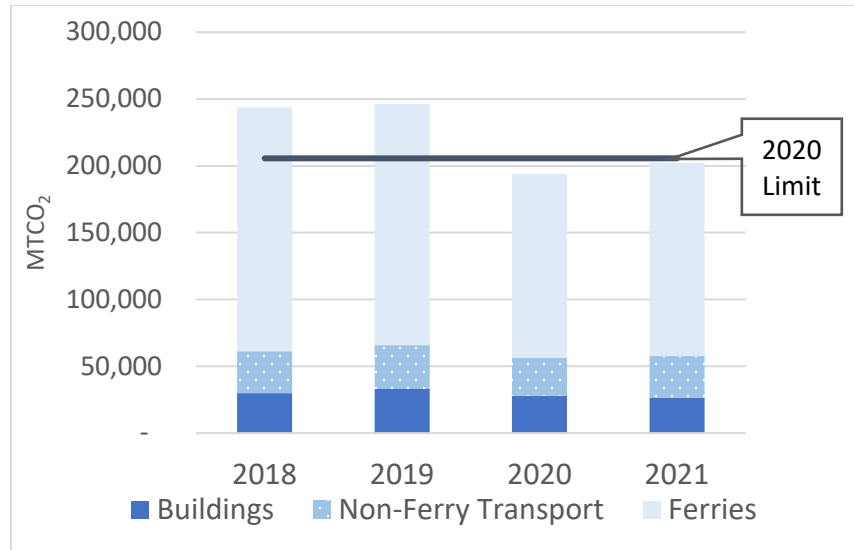


Figure 47. Dept. of Transportation Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

### SUMMARY of WSDOT Mitigation Activities for the 2020 & 2021 Calendar Years: Facilities

- Replaced 3 aging HVAC systems with modern energy efficient systems
- Purchased renewable energy through Avista’s Solar Select Program
  - 2020: 644,000 kWh
  - 2021: 646,000 kWh
- Started purchasing renewable energy through Puget Sound Energy’s Green Direct Program in 2021: 23,493,000 kWh.
- Completed installation of renewable solar power generation at Mukilteo and Bainbridge terminals.
- Completed energy efficiency upgrades at ferry terminals – LED lighting, low-flow plumbing fixtures, and web-enabled thermostat controls.
- Replaced HVAC systems at Edmonds and Kingston terminals with high efficiency units and converted from propane to electric heat pump at Eagle Harbor.
- Established zero net energy (ZNE) as a project goal in Dayton remodel and the new Olympic Region complex. Analysis estimates about 40% energy reduction over baseline between the two facilities. These buildings will be completed and begin being occupied in 2021.

### Vehicle Fleet

- Used biodiesel in vehicle fleet
  - 2020: 13.7%
  - 2021: 13.9%

### Vehicle and Equipment Acquisitions and Totals

| Equipment            | New in 2020    | New in 2021 | Total Owned |
|----------------------|----------------|-------------|-------------|
| BEV (Bolt)           | 1              | 0           | 32          |
| PHEV (Volt, Clarity) | 1(replacement) | 0           | 56          |
| EVSE L2              | 5              | 43          | 78          |
| EVSE DCFS            | 0              | 4           | 6           |

### Ferry Vessels

- Used biodiesel in ferry vessels
  - 2020: 9.8%
  - 2021: 9.05%
- Conducted engineering to convert one Jumbo Mark II ferry to a diesel-electric hybrid and build one new diesel-electric hybrid.
- Completed the ferries System Electrification Plan outlining longer-term efforts to electrify the vessel fleet.
- Assessed the reduction of engine use from 3 to 2 on Jumbo Mark II vessels. (Operational changes implemented in first quarter of 2022.)
- Continued work on ferry vessel operational efficiencies: implementation/improvement of fleet speed optimization, adjusting vessel trim, optimization of vessel assignments, optimizing fuel load and ensuring weather-deck doors are closed to reduced fuel used for heating.

### Highway Lighting

- Initiated a project to retrofit approximately 5,500 310W HPS pole mounted cobra head style luminaires to LED. The project will also remove 860 luminaires that are not illuminating a required design area. The construction phase of the project is being delayed due to a lack of personnel to deliver the project. The length of the delay is being determined at this time.

### Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)

The tables below outline WSDOT's immediate next steps in reducing agency emissions. Actions planned for the 21-23 biennium are currently underway and provided as background. Funding amounts for future biennia will be refined as the agency works through standard budget request processes. The information here is not a budget request nor an indication that these activities are funded. That work will need to take place through regular budget procedures. If these actions are substantially delayed, for budgetary, contracting, workforce, supply chain, or other reasons, WSDOT's ability to meet the statutory GHG limits may be jeopardized.

### 2021-2023 Biennium

This plan is being prepared as we are well into the 2021-2023 biennium and the actions currently underway lay the groundwork for the coming biennia. Exhibit 8 summarizes the biennia's actions and the narrative provides additional descriptions and highlights key challenges.

## 2021-2023 Biennium Actions

| Category         | Action   | Funding                               |
|------------------|--|---------------------------------------|
| Facilities       | Clean Building Act and SEEP Planning   | Being managed by existing staff       |
|                  | Replace 18 sedans <sup>15</sup> with electric vehicles as available – additional cost for EVs.                 | \$55,000 – funded                     |
|                  | Ordered 2 hybrid Ford F150 trucks  | In current budget                     |
|                  | Ordered 10 Outlander PHEV  | In current budget                     |
|                  | Ordered 36 Ford Maverick hybrid pickups  | In current budget                     |
| Vehicle Fleet    | Project scoping and engineering to plan for future EV infrastructure needs per EO 21-04. Due date not yet set. | \$100,000 – unfunded                  |
|                  | Install DCFC at Pasco, Moses Lake, and Colville  | \$180,000 – unfunded                  |
|                  | Install L2 at Okanogan, Electric City, and Ephrata   | \$20,000 – unfunded                   |
|                  | VW Settlement Funding – will be used for L2 EVSE, sites not yet identified                                     | \$156,000 – available                 |
| Ferry Vessels    | JMII hybrid conversion – Wenatchee – expected completion 2023  | \$30.3 M—funded                       |
|                  | Shoreside charging – Seattle – expected completion 2026  | \$41.2 M—funded                       |
|                  | Shoreside charging – Bainbridge – expected completion 2025   | \$19.3 M—funded                       |
|                  | Hybrid Olympic Class – expected completion 2025  | \$208 M—funded                        |
| Highway Lighting | Replace 310 W luminaires with LEDs – to be completed 12/2022   | Funded                                |
|                  | Eastern Region – replace 500 luminaires – in house   | Luminaires purchased with 19-21 funds |

### Facilities

Currently, Capital Facilities staff are making plans for meeting the Clean Building Act requirements. This biennium, the work is being managed by existing staff.

### Vehicle Fleet

The agency continues to replace sedans with EVs were they fit the business need. In addition, several larger vehicle types are becoming available: Plug-in hybrid Outlander are a new SUV option, and the Ford Lightning electric pickup is on order. Additional charging infrastructure is planned for several locations.

The agency will complete EV planning as requested under EO 21-04, the “EV EO,” once guidance is provided by the SEEP office. This planning is expected to include more detail on

<sup>15</sup> Vehicle counts from fleet replacement schedule submitted to SEEP Dec 2021.

which vehicles are candidates for replacement with EVs and the charging infrastructure needed to support EV expansion.

**Challenges**

- Long driving distances in some areas, especially more remote parts of the state, where employees may need to drive farther and charging stations are likely to be farther apart
- Educating drivers how to charge at publicly available stations
- Supply chain issues delaying vehicle availability

**Ferry Vessels**

WSF continues work to convert the first Jumbo Mark II vessel to diesel-electric hybrid and build the first Olympic Class hybrid vessel. In addition, work is continuing on vessel charging infrastructure at terminals.

**Highway Lighting**

WSDOT learned that replacements for the current highway lighting fixtures that use 310 W bulbs are no longer being made. These fixtures are being targeted for the current round of highway lighting retrofits, which will include more efficient LED bulbs. The contract has been signed and work is expected to be completed around the end of 2022. In addition, Eastern Region was able to purchase about 500 LED luminaires with funds from last biennium. Region maintenance staff are installing these replacements as they are needed or have time available. Having the fixtures on hand means that if a fixture needs to be replaced (damaged or no longer functioning) it can be upgraded at the same time.

**2023-2025 Biennium**

Actions WSDOT plans to take during the 2023 to 2025 biennium are listed in Exhibit 9. All actions are dependent on adequate funding for projects and staffing to implement. Funding requests will need to be made through regular agency budget procedures.

**2023-2025 Biennium Actions**

| Category      | Action   | Funding                     |
|---------------|--|-----------------------------|
| Facilities    | Develop Energy Management and Operation & Maintenance Plans to comply with Clean Building Act requirements   | \$200,000                   |
|               | Implement state of good repair Operation, Maintenance, and Preservation activities at Dayton and SWR HQ to comply with Clean Building Act requirements | \$3,259,691                 |
|               | RCM Staff Position (TE4)   | \$264,500                   |
| Vehicle Fleet | Replace vehicles with electric vehicles as available. Vehicles scheduled for replacement include 11 sedans, 3 SUVs, 3 passenger vans. <sup>16</sup>    | \$142,000 additional for EV |

<sup>16</sup> Vehicle types listed are likely to have EV options available during the biennium, how well options available suit WSDOT needs is uncertain.

| Category         | Action  | Funding          |
|------------------|---|------------------|
|                  | Install electric vehicle charging at WSDOT facilities – will have additional details when 21-04 planning is completed | Est \$300,000    |
|                  | Pilot EV trucks (Ford Lightning)  | Unknown          |
| Ferry<br>Vessels | JMII conversion #2 – Tacoma – completion expected 2024  | \$31.4 M         |
|                  | Olympic Class Hybrid – completion expected 2026   | \$200 M          |
|                  | Olympic Class Hybrid – completion expected 2027   | \$200M           |
|                  | JMII conversion #3 – Puyallup – completion expected 2024  | \$41.4 M         |
|                  | Shoreside charging – Clinton – expected completion 10/2025  | \$19.3 M         |
|                  | Shoreside charging – Colman – completion expected 08/2026   | \$41.2 M         |
|                  | Shoreside charging – Bainbridge – completion expected 10/2025   | \$19.3 M         |
| Highway lighting | Convert approximately 7,000 highway lights to LEDs  | \$10 M estimated |

### Facilities

During the 23-25 biennium, facility efforts to reduce emission will focus on getting buildings over 50,000 square feet ready to meet the requirements of the Clean Building Act. This work includes developing energy management and operation and maintenance plans, as well as implementing state of good repair practices and preservation activities. To complete this work, an additional Resource Conservation Manager position will be needed.

- Challenge – the Legislature has been slow to understand that if they pass requirements for all building owners (public and private), agencies need funds to meet these requirements. This is particularly challenging for the Clean Buildings Act because there are penalties for not meeting the requirements. SEEP continues to work on communicating this need.

### Vehicle Fleet

During the next biennium, WSDOT will continue to replace vehicles with EVs where models are available and meet the agency’s business need. We expect to continue piloting electric trucks that may be used as work trucks. The timing of these pilots depends on the delivery of purchased vehicles. When and how these trucks may be put into general use will depend on the experiences with the pilot vehicles, as well as vehicle availability.

EV infrastructure will continue to be expanded to support additional electric vehicles. During this time, publicly available charging infrastructure will continue to expand, which should make longer distance travel in state EVs easier, as well.

EV planning requirements will continue and are expected to be aligned with budget planning timelines during the 23-25 biennium.



## Challenges

- Likely continued supply chain issues and production backlogs affecting vehicle availability
- Continued education of staff on how to plan charging stops in long trips

## Ferry Vessels

Converting the ferry fleet and installing the associated charging infrastructure will continue during this biennium. In addition, the first new Olympic Class hybrid vessel is expected.

## Highway Lighting

WSDOT will work to replace about half of the remaining high pressure sodium highway lights with LEDs. The section to be converted will be based on payback (areas with higher electricity rates) and other operational considerations.

## 2025-2027 Biennium

Actions WSDOT plans to take during the 2025 to 2027 biennium are listed in Exhibit 10. All actions are dependent on adequate funding for projects and staffing to implement.

## 2025-2027 Biennium Actions

| Category                 | Action   | Funding                      |
|--------------------------|--|------------------------------|
| Facilities <sup>17</sup> | Implement state of good repair O&M and Preservation activities at all affected buildings to comply with CBA <sup>18</sup>                          | \$7,182,591                  |
|                          | RCM Staff Position (TE4) <sup>19</sup>   | \$264,500                    |
| Vehicle Fleet            | Replace vehicles with electric vehicles as available. Vehicles scheduled for replacement include 9 sedans, 3 SUVs, 3 passenger vans. <sup>20</sup> | \$106,000<br>(add'l for EVs) |
|                          | Replace work trucks with electric vehicles as available – will know more after piloting a few, 85 due for replacement.                             | Unknown                      |
|                          | Install electric vehicle charging at WSDOT facilities – will know more when EV EO planning is complete   | Unknown                      |
| Ferry Vessels            | Hybrid Olympic Class – completion expected 2027  | \$200 M                      |
|                          | Hybrid Olympic Class – completion expected – 2028  | \$200 M                      |
|                          | Shoreside charging – Kingston – completion expected – 2/2026   | \$21.5 M                     |

<sup>17</sup> 27-29 – estimate need \$22 million to comply with CBA requirements and similar requirements that extend to buildings down to 25,000 square feet.

<sup>18</sup> Includes modeled costs for the State Materials Laboratory O&M and Preservation but does not include the offset for planned/funded expenditures (will update this information soon).

<sup>19</sup> RCM Position is ongoing – funding need based on 21-23 labor pricing tool for a TE4

<sup>20</sup> Vehicle types listed are likely to have EV options available during the biennium, how well they may suit WSDOT needs is uncertain.

| <b>Category</b>  | <b>Action</b>  | <b>Funding</b>   |
|------------------|--|------------------|
|                  | Shoreside charging – Bremerton – completion expected – 2028  | \$23.1 M         |
|                  | Shoreside charging – Southworth – completion expected – TBD  | \$23.4 M         |
|                  | Shoreside charging – Vashon – completion expected – TBD      | \$27.3 M         |
| Highway lighting | Convert remaining approximately 7,000 highway lights to LEDs | \$10 M estimated |

### **Facilities**

During the 25-27 biennium, we will continue to invest in state of good repair practices and preservation activities, including getting buildings over 20,000 square feet ready to comply with the Clean Buildings Act. The Resource Conservation Manager identified in the previous biennium will continue to provide oversight and identify opportunities in this work.

### **Vehicle Fleet**

As we move into the 2025-2027 biennium, WSDOT expects that more vehicle types will become available as electric vehicles during the 2025-2027, making it possible to continue converting the sedan, SUV, passenger van, and work truck fleet to electric vehicles as they are replaced. It is also expected that the wait times between ordering vehicles and receiving them will begin to decrease, making it easier to get vehicles in a timely manner.

### **Ferry Vessels**

The legislature has signaled intent to continue funding new vessel construction.

### **Highway Lighting**

The last major group of highway lighting is planned for replacement during this biennium.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

WSDOT's GHG reduction strategy is to use energy more efficiently and switch to lower carbon fuels. This strategy will be carried out through many actions over the coming decades. This work takes time, investments, and planning. Not all the technologies we need are available today. This document's long-term strategy considered current and expected technologies by decade and includes meeting related requirements, such as those described above. State law requires updating this strategy every two years and improved assumptions and expectations will be updated.

### **2020-2030**

Additional information on actions planned for the 2020s is detailed in the sections covering the current and next two biennia.

### **Tracking Performance**

Between now and 2030, WSDOT will continue to gather data and track performance. This includes meeting building benchmarking and energy use intensity requirements, as well as annual GHG reporting. WSDOT has a well-established system for completing the agency's annual GHG emissions inventory and will continue to report emissions. This information will provide feedback on progress, will identify areas for further work, and inform decision making.

### **Clean Buildings Act Implementation**

During this decade, we will take actions to meet the Clean Building Act requirements, EUI requirements, and develop and implement operation and maintenance requirements. Meeting energy use intensity requirements will involve installing submeters on some buildings to gather individual building energy use, instead of campus energy use.

### **HVAC Refrigerant Use**

Although we do not track refrigerant use in building heating ventilating and air conditioning systems (HVAC), these compounds are potent greenhouse gases. WSDOT will comply with the new refrigerant management program that was enacted in 2021 in House Bill 1050. The program requirements are expected to start in January 2024. Ecology is working on the program rules.

### **Facilities Going Electric**

During the current decade, it is also important to set the stage for longer-term change. We must recognize the need to switch buildings off natural gas and make plans to transition to electric as systems are replaced.

### **Electric Vehicles**

Technology is changing rapidly, especially vehicle technology. WSDOT has been an early adopter of electric passenger vehicles and will continue to add EVs as our fleet turns over. As more vehicle types become available, we will expand their use to other types, such as vans, SUVs, and pickups. At the same time, we must ensure that vehicles meet the agency business need. To support increased EV use, the agency will need to increase our charging capacity. As electrical capacity at facilities is used for charging, further expansion of charging will require upgrading electrical supply.

### **Ferry Vessels**

WSDOT will continue to build and convert ferry vessels to be diesel-electric hybrid according to the current WSF 2040 Long Range Plan and System Electrification Plan.

### **Alternative Fuels**

The state's new Clean Fuel Program takes effect in January 2023. This program will require fuel suppliers to meet life-cycle carbon intensity standards that decline over time, which will create a marketplace for credits that move from suppliers of low carbon fuels to suppliers of higher carbon intensity fuels. Similar programs in Oregon and California have supported the expansion

of electric vehicle charging infrastructure and made liquid biofuels, such as renewable diesel, cost competitive. WSDOT will need to work with other state agencies to gain access to these fuels as they become available in the state for both the vehicle fleet and ferry vessels. As this will be a collective issue for state agencies, it should be worked on through the SEEP program and DES contract process.

### **LED Highway Lights**

In addition to using electricity in our buildings, WSDOT operates thousands of lights along our highways. The agency has started, and will continue, to replace these fixtures with LED lights. LEDs are being phased in over several biennia so that when the time comes to replace the fixtures that work is also staggered, easing workflow and budget efforts.

### **2030-2040**

During the 2030s, many of the same themes and strategies will continue:

- Maintaining and operating buildings for efficiency and compliance with Clean Buildings requirements
- Shifting from natural gas to electricity as building heat systems require replacement
- Planning for future highway lighting replacements
- Extending the use of electric vehicles as more vehicle options become available
- Expanding the use of diesel-electric hybrid ferries and planning for electrification beyond 2040
- Working with the private sector to test and pilot new vehicle technologies and equipment options

Throughout the 2030s, WSDOT will continue to track performance through agency inventory and other benchmarking requirements. This information will indicate where the agency is making planned progress and where the agency needs to consider new options. Although year to year emission changes are hard to pin to specific actions, over time, a downward trend should be clear. If the trend is not decreasing as expected, the agency will need to further identify where the desired progress is not being made and make adjustments.

### **2040-2050**

By the beginning of the 2040s, the agency should have made significant progress in reducing emissions and generally the same themes will apply. Key actions for the 2040s will include:

- Continue monitoring agency emissions and using data to understand where there are challenges
- Electrifying remaining vehicles where technology is available and suits the application
- Where vehicle electrification is not viable, use liquid renewable fuels (renewable diesel, gasoline, etc.)
- Convert remaining stationary natural gas systems to electricity
- Convert remaining ferry vessels to electric or hybrid electric propulsion

The early 2040s will be the time to closely consider what actions are needed to close the gap to zero out agency emissions. By this time, the agency should have extensive experience with EVs, and the availability of technologies and fuels should be clear.

WSDOT plans to improve energy efficiency and to switch to low- or zero-carbon energy sources. This transition will take time, but investments are underway. The agency already has electric vehicles, has upgraded building heating and lighting to improve efficiency, and is working on the first hybrid ferry vessels- one retrofit and one new build. In the next two biennia, the agency will focus on expanding electric vehicle use, improving building efficiency and meeting Clean Building Act requirements, and launching the first diesel-electric hybrid ferries. Over the longer-term, these same actions will continue as more types of electric vehicles become available and the vehicle charging infrastructure expands, as the agency continues to meet building efficiency requirements, and conversion of the ferry system to hybrid-electric propulsion continues. At the same time, fully meeting long-term GHG limits will depend on the availability of renewable fuels and new technologies. WSDOT will update this plan every two years, consistent with requirements to provide a plan to SEEP and Ecology.

# Washington State Patrol

## Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 3,350                        |
| Fossil Fleet Energy Use Emissions | 16,501                       |
| Annual Fossil GHG Emissions       | 19,851                       |

In 2020, Washington State Patrol (WSP) emissions were 54 % below their 2020 limit. In 2021, WSP's emissions increased slightly to 53 % below their 2020 limit. They remain 27 % below their 2030 limit.

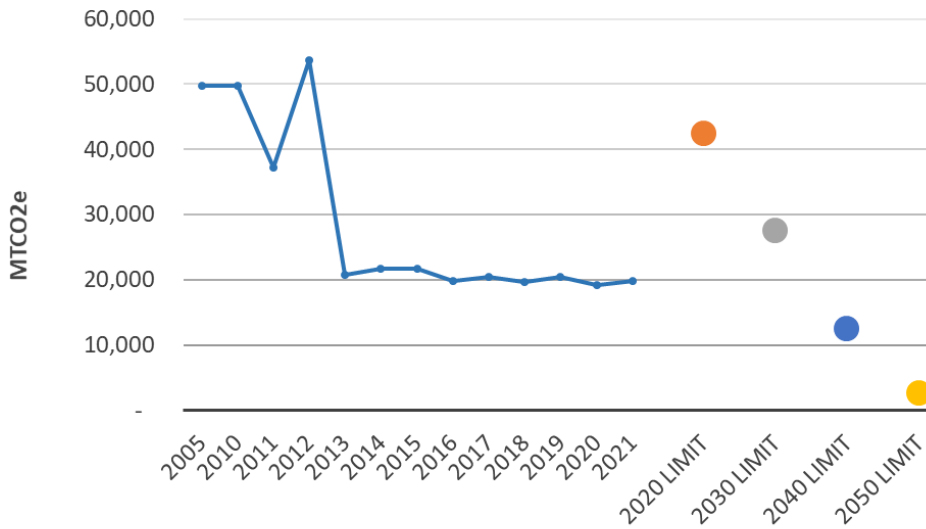


Figure 48. Washington State Patrol Historic Emissions and Future Limits

In 2021, the WSP reported that 17 % of agency emissions were from buildings and 83 % were from transportation. The department reported 857,145 sf of building space, 69 % of which they owned, 16 % leased from DES, 11 % privately leased and the remaining and 4 % was leased from other state agencies. In 2021, 44 % of building emissions was from natural gas combustion, 56 % was indirect electricity emissions and a small amount (less than half a percent) was from diesel or propane systems. The agency purchased 1,285,863 kWh (11 %) of its electricity through utility green power contracts. 96 % of WSP's transportation emissions were from gasoline used by motor vehicles, 1 % from diesel used in vehicles, .3 % from aviation gasoline and 2.5% was from jet fuel.

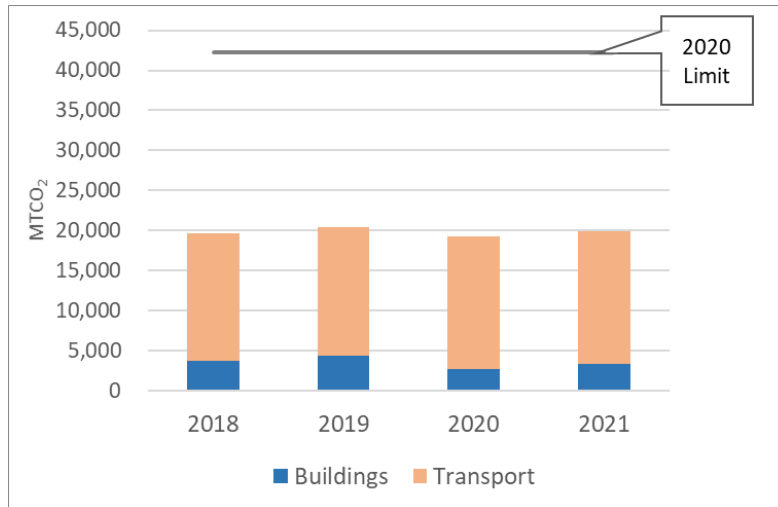


Figure 49. Washington State Patrol Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

The WSP is committed to reducing GHG emissions. Over the last two calendar years (2020 and 2021) the agency made efforts to reduce emissions in the following areas.

For Facilities:

- HVAC Systems – WSP replaced failing HVAC systems at five locations. The agency has also completed system improvements and upgrades to current HVAC systems in two facilities.
- Lighting Improvements/Upgrades – The agency completed various lighting improvements and LED replacement upgrades to five WSP facilities.
- Miscellaneous Energy Improvements/Upgrades – The agency completed a variety of energy improvements that included replacements of hot water heaters and freezer compressors.

For the Fleet Section:

WSP Fleet operations purchased and deployed 7 model 2020 Ford Police Interceptor Hybrids and 4 model 2021 Ford Police Interceptor Hybrids replacing a total of 11 older model Ford Police Interceptor non-HEV ICE vehicles. The WSP placed an order for 1 additional Ford Police Hybrid model during the 2021 calendar year. The WSP maintained 29 additional older HEV model vehicles and placed in service in off-line or non-police assignments throughout the 2020 and 2021 calendar years.

## Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)

WSP supports the requirements of RCW 70.235.050 and has planned actions for the 2023-25 and 2025-27 biennia. WSP adds energy efficient as priority to the agency 's Capital Budget

Requests. For the 23-25 budget request, the agency included the following emission reduction proposals:

- HVAC system upgrades to increase efficiency and performance. Some locations included:
  - Tacoma District office & Inspection Building – HVAC System Upgrade predesign
  - Fleet Operations Facility – HVAC Major System Upgrade
  - Shelton Academy – HVAC Major System upgrades
  - Agency Towers sites – HVAC Replacements

Outside of Capital projects, WSP also continues to assess and improve the needs and energy efficiencies in facilities. These included lighting upgrades, air compressors, and freezers. WSP has also strived to improve energy efficiency in the products used in roof replacement projects. The agency has switched to an all-white roof material to reflect heat and lower the amount of cooling required to operate the facility.

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

WSP will continue to upgrade owned facilities with energy efficient systems and products that will help reduce emissions. The agency will also make sure energy efficient systems and guidelines are included in new lease agreements.

- Continue to track energy usage through Energy Star
- Continue to ask for funds for energy improvements
- Continue to use energy efficient/green products

**Transportation.** WSP will continue to follow the vehicle purchasing guidelines as listed in Executive Order 21-04. This includes submitting vehicle replacement proposals to SEEP for review for all vehicle purchases to assist with transparency, and to ensure support for the vehicle models the WSP uses. The agency will continue to monitor BEV pursuit vehicle availability as it relates to emergency response and public safety assignments.

**Facilities.** WSP will complete energy upgrades and improvements, use Energy Star Portfolio Manager to track and monitor energy use, and incorporate energy efficiency with building leases.

**Renewable Energy.** WSP has two facilities participating in the Power Purchase Agreement.



# Washington State University Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 118,449                      |
| Fossil Fleet Energy Use Emissions | 2,064                        |
| Annual Fossil GHG Emissions       | 120,513                      |

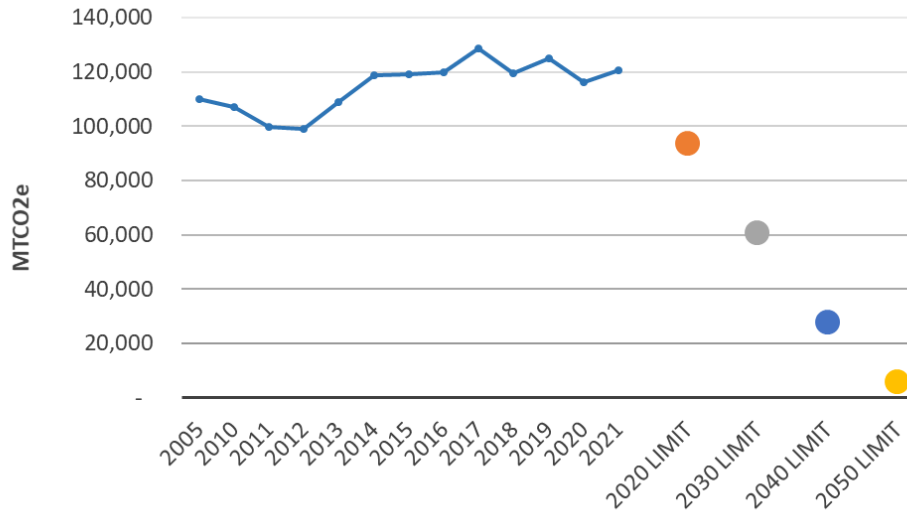


Figure 50. Washington State University Historic Emissions and Future Limits

In 2020, Washington State University (WSU) emissions were 25 % above their 2020 limit. In 2021, WUS’s emissions increased 29 % above their 2020 limit. They remain 99 % over their 2030 limit.

In 2021, WSU reported that 98 % of emissions were from buildings and 2 % were from transportation. The university reported 14,637,861 sf of building space, all owned by the university. In 2021, 64 % of building emissions were from natural gas combustion and 36 % was indirect electricity emissions. WSU has a solar system, but the production was not reported. All of WSU’s transportation emissions are from motor vehicles.

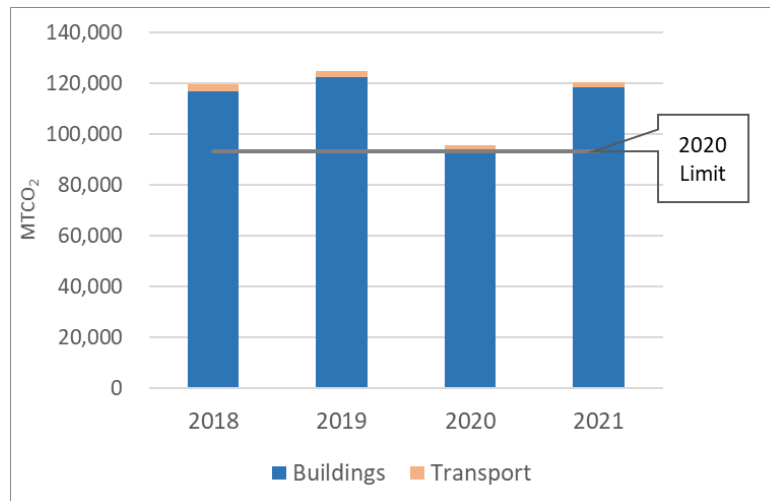


Figure 51. Washington State University Emissions from Building and Fleets 2018-2021

### **Actions taken to reduce GHG emissions during the 2020-21 calendar years**

During the 2020 and 2021 calendar years, Washington State University (WSU) took the following actions to reduce GHG emissions:

- Decommissioned Pullman campus incinerator.
- Investigated energy savings impact of increasing dead band temperature range in buildings on the Pullman campus.
- Developed in Revolving Energy Fund (REF) program focused on identifying and executing energy savings projects on the Pullman campus.
- Continued focus on improving metering infrastructure (installation, replacement, calibration, automation, data acquisition, etc.).
- Energy reduction through LED lighting upgrades in multiple facilities system-wide.
- Implemented a tenant engagement program in partnership with the Integrated Design and Construction Lab (ID+CL) on the Pullman campus to improve energy saving behavior amongst building occupants.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, WSU is planning to take the following actions to reduce GHG emissions:

- \$5M request in 2023-25 State Capital Budget to initiate compliance with the Clean Building Standard. Include a similar, reoccurring ask in 2025-27 to continue towards compliance.
- \$40M request in 2023-25 State Capital Budget for Minor Capital Renewal (MCR) projects focused on addressing deferred maintenance (in buildings and infrastructure) and optimizing space. Include a similar, reoccurring asking 2025-27.
- Continue identifying and executing energy savings project using the university’s internal REF program.
- Continue investing in the metering program.

- Continue LED lighting improvements.
- Continue ID+CL tenant engagement program.

## **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

To meet established GHG emissions limits, Washington State University is committed, both through our research and by incorporating sustainable practices into our day-to-day operations, to reducing our environmental impact and to finding ways for our society to do the same. WSU has established internal audit processes to efficiently use limited state funding to reduce emissions, by upgrading systems, optimizing space utilization, and eliminating inefficient buildings.

Additionally, WSU researchers continue to work with industry partners to develop technology around renewable energy sources and practices. Beyond technological advances, WSU believes behavior change is critical and has worked to educate the WSU community and communities we are in. We are proud of how far we have come at WSU and are fully aware that our efforts must continue.

In addition to enhancing the reoccurring funding requests and programs noted above, WSU plans to emphasize the following high-level strategies:

- Investigate emerging technology and alternatives for building heating and cooling.
- Explore affordable electrification opportunities.
- Establish an official sustainability management team to represent the entire WSU system.

**Transportation.** WSU is looking to support Pullman with the electrification of the transit fleet (which allows students and staff to ride buses for free), promote remote work options, and will continue to update fleet with EV options.

**Facilities.** Washington State University's (WSU) Capital Renewal and Development Plan is focused on identifying and prioritizing capital projects which balance continued stewardship and renewal of existing facilities and infrastructure within a framework for responsible growth. This plan recognizes the urgent need to address a large and rapidly growing deferred maintenance backlog (estimated at over \$1.6B) which has been identified as a significant risk to future operations at all the WSU campuses as they age. Capital projects identified in the plan contribute directly to a reduction in the deferred maintenance backlog through either significant renovation, rehabilitation, or replacement of existing facilities. In addition to the goals of reducing deferred maintenance and optimizing space, WSU's development plan also emphasizes energy efficiency improvements, greenhouse gas emission reduction, and water savings.

**Renewable Electricity.** WSU has two on-site solar arrays, one on the Pullman campus and the other on the Everett campus. In addition, WSU has utilized geothermal heating technology on the Pullman campus.

## Western Washington University Emissions Profile

| Total Emissions Source            | 2021 GHG emissions (MT CO2e) |
|-----------------------------------|------------------------------|
| Building Energy Use Emissions     | 10,717                       |
| Fossil Fleet Energy Use Emissions | 337                          |
| Annual Fossil GHG Emissions       | 11,053                       |

In 2020, Western Washington University (WWU) emissions were 9 % below their 2020 limit. In 2021, WWU’s emissions decreased further to 33 % below their 2020 limit. They are now 3 % above their 2030 limit.

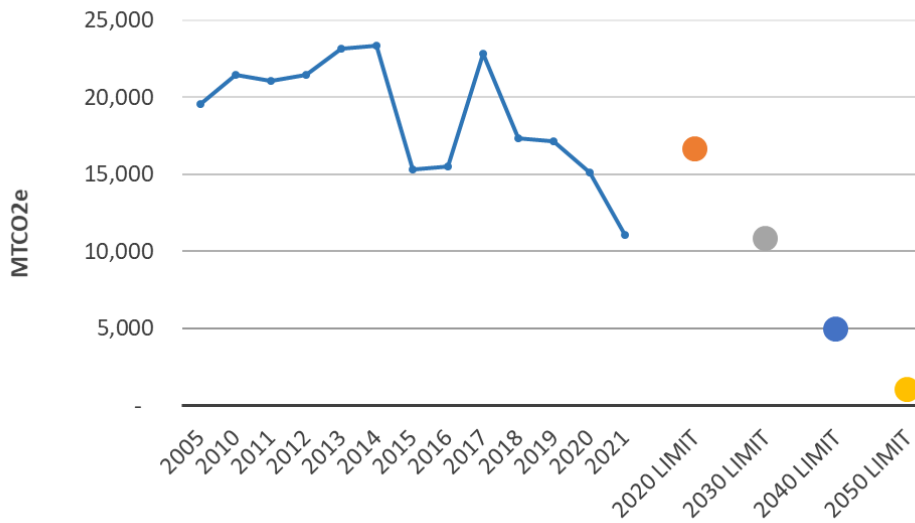


Figure 52. Western Washington University Historic Emissions and Future Limits

In 2021, WWU reported that 97 % of emissions were from buildings and 3 % were from transportation. The university reported 3,568,629 sf of building space, 99 % of which they owned, 1 % leased from a private building owner. In 2021, all of building emissions were from natural gas combustion. 100% of WWU’s electricity was purchased using a zero-carbon green power contract. 93 % of WWU’s transportation emissions are from motor vehicles and the remaining 7 % are from boats.

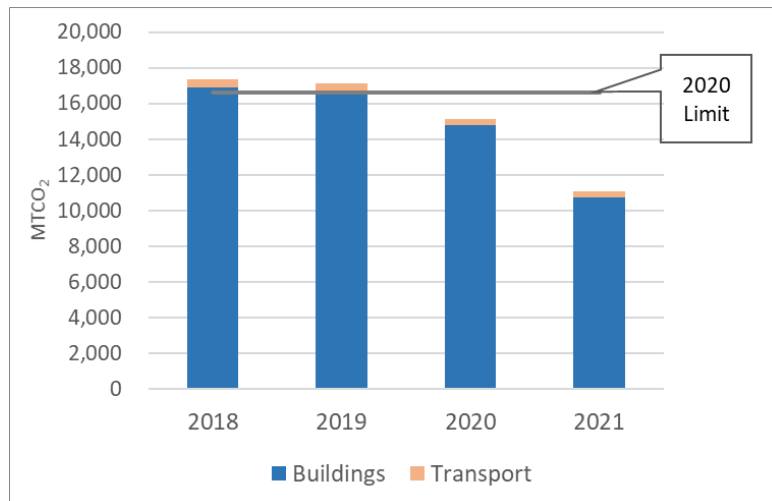


Figure 53. Western Washington University Emissions from Building and Fleets 2018-2021

## Actions taken to reduce GHG emissions during the 2020-21 calendar years

During the 2020 and 2021 calendar years, Western Washington University (WWU) took the following actions to reduce GHG emissions:

- Participated in the Puget Sound Energy Green Direct program through a power purchase agreement
- Retrofitted corridor and common area lighting at seventeen buildings
- Constructed a LEED Gold Interdisciplinary Science Building
- Began the design phase of a Living Building Challenge Certified Net-Zero Energy Electrical Engineering and Computer Science Building
- Managed building occupancy schedules through modified operations during the pandemic

Western Washington University (WWU) participated in the Puget Sound Energy (PSE) Green Direct electricity Power Purchase Agreement (PPA) which ensures that the greenhouse gas (GHG) emissions from our electricity use are offset through the development of the Skookumchuck wind energy farm. This agreement serves as a pilot program for the regulatory requirements of PPAs between the Washington Utility and Transportation Commission regulators, electricity providers and rate payers, and will serve as a model for future agreements throughout the state. Western Washington University has been an active participant in the regulatory process with our Institute for Energy Studies director Joel Swisher serving as subject matter expert supporting Green Direct participants.

WWU also focused on transportation carbon by participating in PSE's Up and Go electric vehicle charging program, installing public vehicle charging stations for commuters as well as a fleet charger for university fleet vehicle charging. The agency purchased an electric vehicle for the fleet to assess the battery range and resulting charging infrastructure needed to electrify the light vehicle fleet.

The university continued to focus on facility energy reduction, completing energy efficiency retrofit projects at seventeen existing buildings, constructing LEED Gold certified Interdisciplinary Science Building, beginning the design process for a net zero “Living Building challenge”-certified Electrical Engineering and Computer science building. In addition to these efforts, Western optimized our scheduling protocols during the pandemic remote learning and remote working adjustments to ensure that the increased ventilation required for indoor air quality was mitigated by setting buildings to unoccupied mode when they were vacant. This effort was successful in reducing the GHG emissions that would have been associated with conditioning additional outside air by managing the scheduled occupancy as buildings were unoccupied. The building automation shop also installed additional CO2 sensors in areas across campus to ensure indoor air quality was improved and that buildings were operating efficiently to meet the evolving fresh air goals of the pandemic response when areas were occupied and then conserving energy when they were unoccupied.

### **Priority actions planned for the 2023-25 and 2025-27 Biennia (short-term strategy)**

During the 2023-25 and 2025-27 biennia, WWU is planning to take the following actions to reduce GHG emissions:

- Installed electric vehicle charging stations on campus and purchased EV for fleet use
- Designated as a Bicycle Friendly University, Silver Level by the League of American Bicyclists
- Participates in Smart Trips program incentivizing alternative transportation
- Completed corridor and common area lighting upgrades at seventeen buildings
- Optimized building schedules through modified operations during the pandemic
- Constructed a LEED Gold Interdisciplinary Science Building and began the design phase of a Living Building Challenge Certified Net-Zero Energy Electrical Engineering and Computer Science Building

### **Long-term strategy for meeting GHG emissions limits in 2030, 2040, and 2050**

Western Washington University is committed to transitioning to a carbon neutral institution in all facets of our operations. Our long-term strategy includes converting our district heating system from natural gas steam boilers to carbon neutral systems, electrifying our fleet and small equipment, reducing demand on our electrical grid, increasing renewable generation, and utilizing carbon neutral design for new buildings. These cross functional efforts continue the work of the university’s Sustainable Action Plan implemented through the newly formed Sustainability Advisory Council to the President’s Office.

One of the highest priorities of this effort is to reduce the direct GHG emissions related to our district steam plant. The university launched the engineering feasibility study in 2021 and are developing a long-term implementation strategy to begin infrastructure upgrades necessary for GHG neutral campus energy supply. This plan includes deep energy savings in our existing buildings to reduce the size and cost of the new infrastructure, as well as support for the

decarbonization of the local utility grid generation sources that serve the campus. This campus wide transformation will happen concurrently with the initiatives noted above so that GHG emissions are neutral in the long-term.