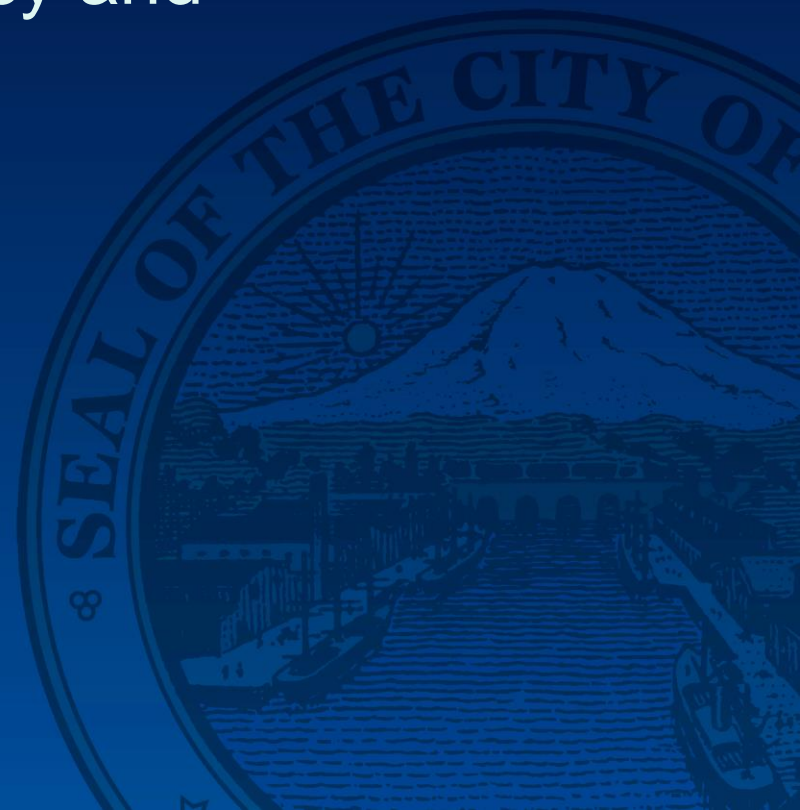


2016 Greenhouse Gas Emissions Inventory

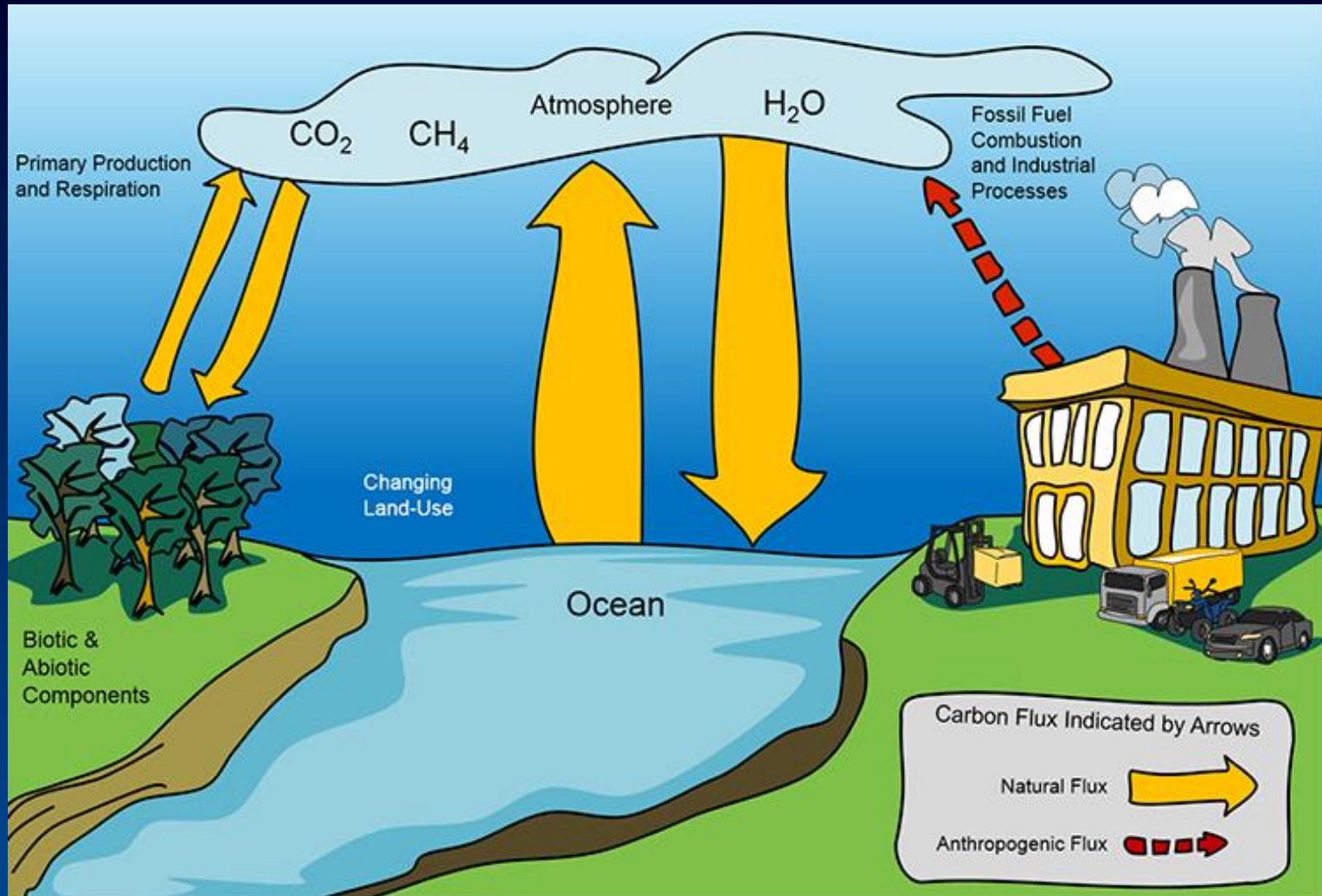
City of Tacoma

Office of Environmental Policy and
Sustainability

December 18, 2017



Greenhouse Gases Trap Heat



Importance of GHG Inventories

- Tacoma's 2008 Climate Action Plan calls for aggressive reductions of 80 percent below 1990 emissions by 2050
- Tacoma is party to the Global Covenant of Mayors for Climate and Energy, which committed to reduce and track GHG emissions
- Mayor Strickland is a signatory to the Mayors National Climate Action Agenda, including a commitment to adopt, honor and uphold the Paris Agreement goals

Regional Impact of GHG Emissions

Tacoma's 2016 Climate Change Resilience Report

Observed Changes in the PNW:

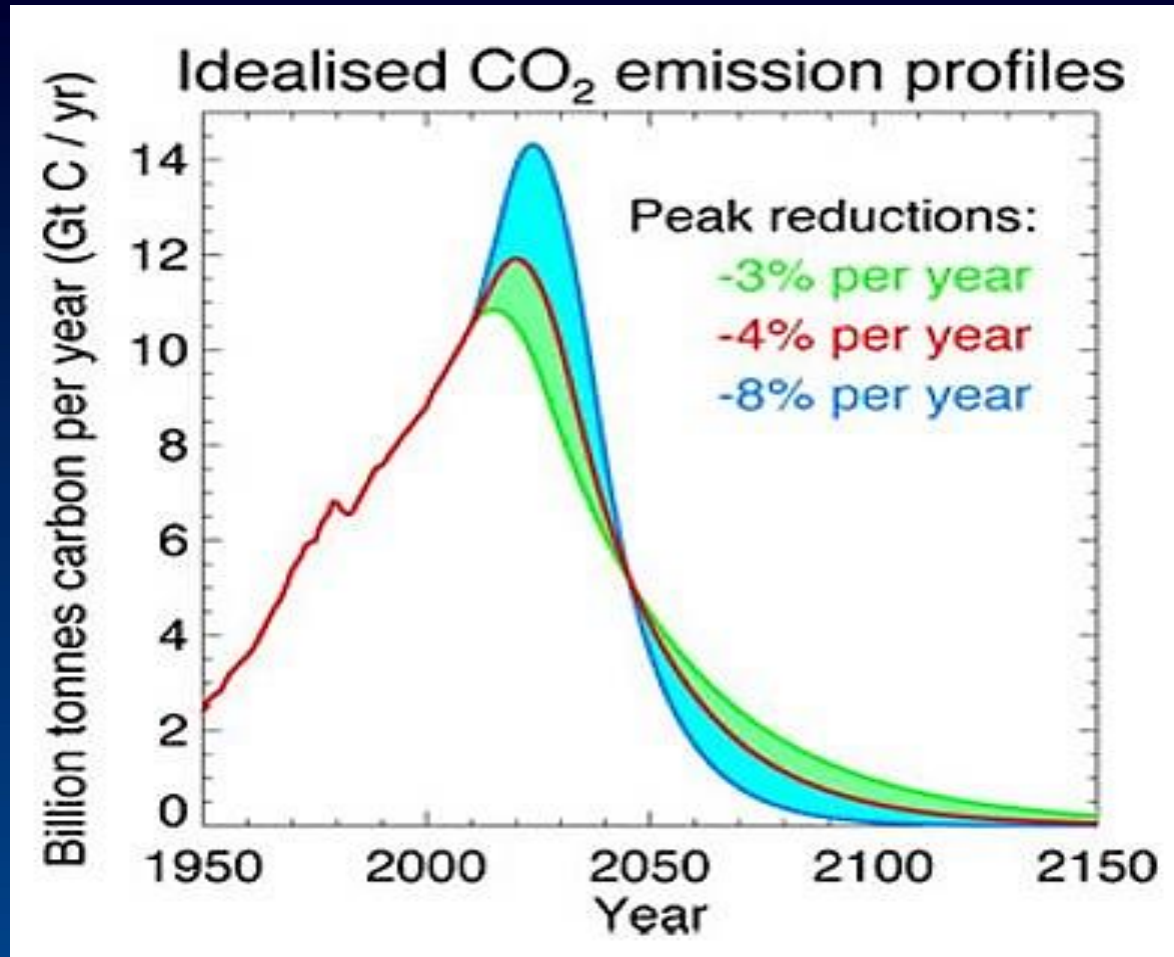
- Average annual temperature increased by 1.3°F
- Frost-free season lengthened
- Nighttime heat waves have increased
- Snowpack has lessened
- Peak Spring streamflow is happening earlier
- Mt. Rainier's glaciers are shrinking
- Sea level (global) has risen by 7.8" over last century
- More evidence of increase in extreme precipitation

Regional Impact of GHG Emissions

Projected changes in the PNW, by 2050:

- Average temperature increase of $\sim 4^{\circ}\text{F}$ to 5.3°F
- Summer months will warm more than winter months
- Maximum temperatures rise; more intense heat waves
- Stream temperatures will rise
- The ocean will continue to warm and acidify
- Sea level (WA average) to rise from -1 - 19"
- River sediment loads will increase, increasing flood risk
- Extreme precipitation events more intense & frequent
- Landslides will increase in frequency

Sooner vs. Later Paths

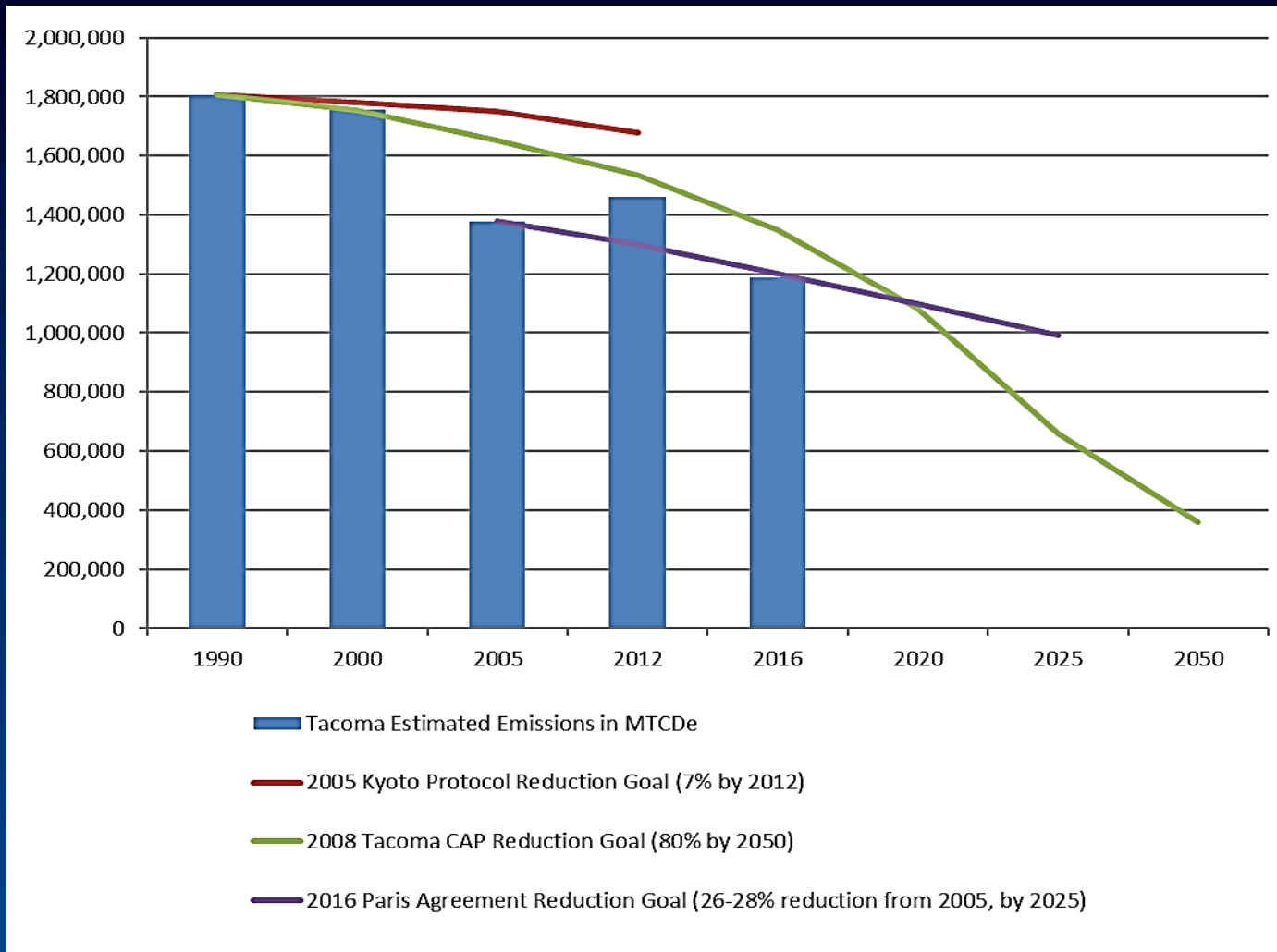


The longer the delay, the steeper the slope and further out the end target – the greater risk of peak CO₂ and high temperatures.

Comparing Inventories Year to Year

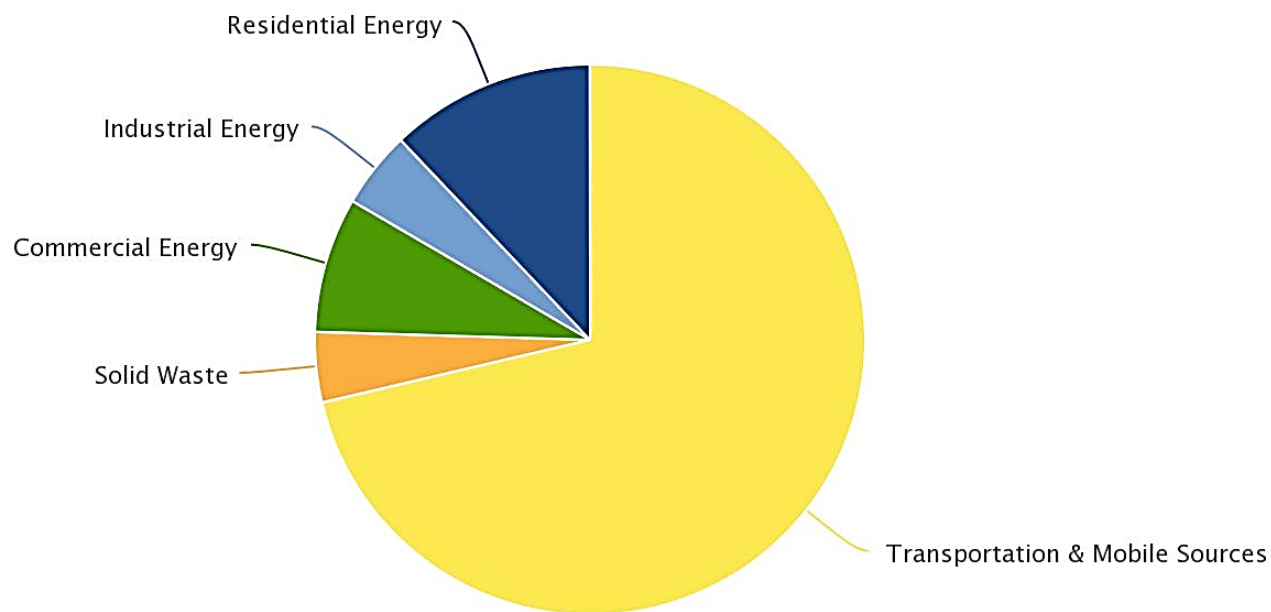
- In addition to the 2016 data, that from 2005 and 2012 was re-run using the new calculating tool for more consistent methodology over periods
- Transportation vehicle miles travelled (VMT) data for each year was provided by PSRC
- Solid waste inputs for 2005 & 2012 were updated to reflect data from waste characterization studies and therefore more specific results
- Emissions from flaring of Methane at landfill and CTP were added for last 3 reporting years

Estimated Emissions to Goals



2016 “Community” Emissions

CO2e across all categories for current inventory



Highcharts.com

“Community” GHG Emissions Buildings

Community Emissions Including Industrial				Emissions Excluding Industrial		
Emission Source	2012	2016	2012-16 % Diff	2012	2016	2012-16 % Diff
Buildings	579,539	270,050	-53.40%	265,303	220,209	-17.00%
Residential	150,318	132,823	-11.64%	150,318	132,823	-11.64%
Commercial	114,985	87,386	-24.00%	114,985	87,386	-24.00%
→ Industrial	314,236	49,841	-84.14%			

“Community” GHG Emissions

Transportation

Emission Source	2005-12 %			2012-16 %	
	2005	2012	Diff	2016	Diff
Transportation	720,729	741,820	2.84%	785,624	5.90%
Gasoline	559,211	556,389	-0.51%	589,189	5.90%
Diesel	135,735	156,897	13.49%	170,232	8.50%
Pierce Transit	25,783	28,534	9.64%	26,203	-8.17%

“Community” GHG Emissions

Solid Waste

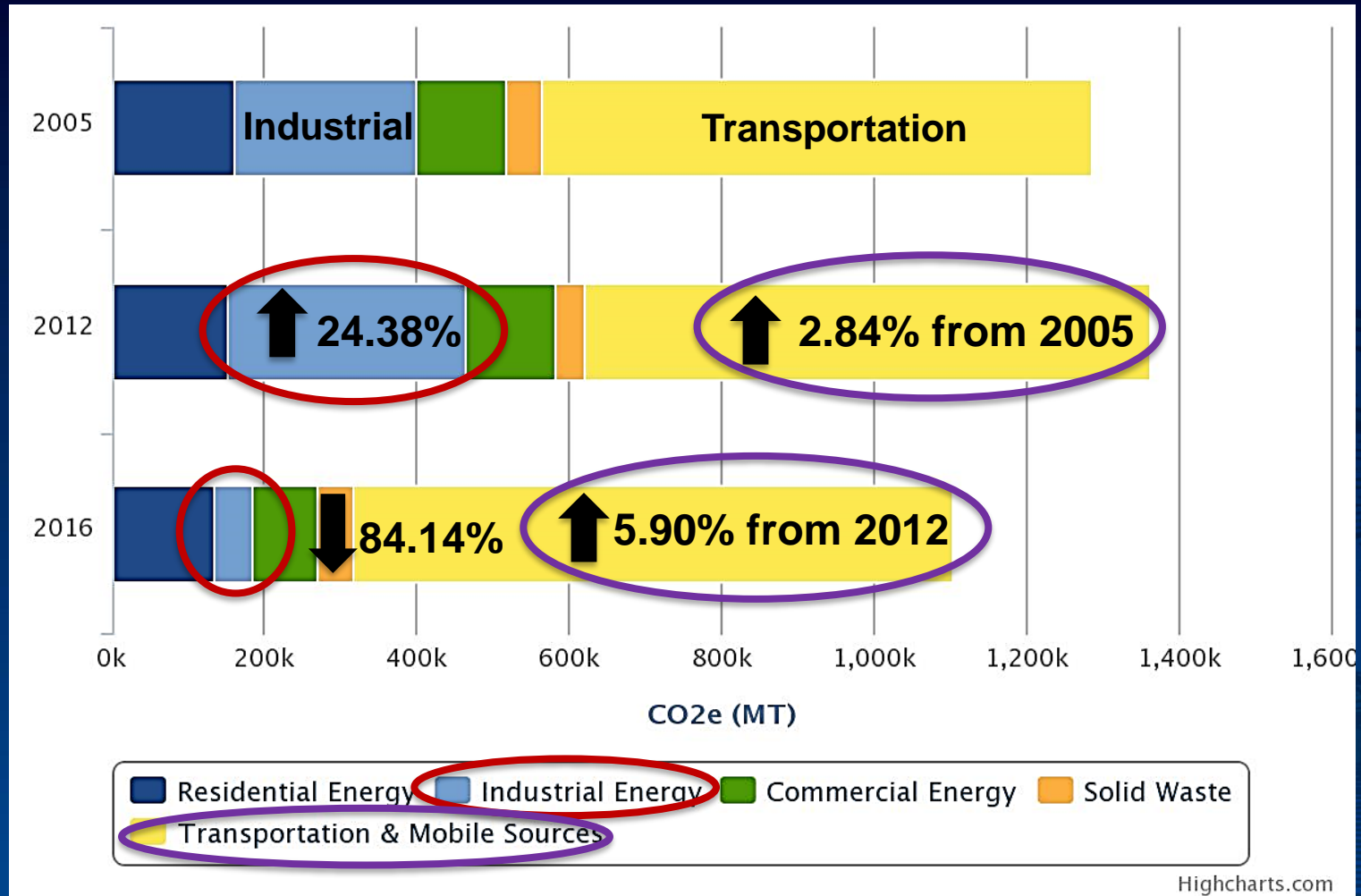
Emission Source	2005-12 %			2012-16 %	
	2005	2012	Diff	2016	Diff
Solid Waste	46,907	38,146	-22.97%	45,437	19.11%
Landfilled Materials	46,907	38,146	-22.97%	45,437	19.11%

“Community” GHG Emissions*

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Solid Waste	38,146	45,437	19.11%	38,146	45,437	19.11%
Landfilled Materials	38,146	45,437	19.11%	38,146	45,437	19.11%
Community Total	1,359,505	1,101,111	-19.01%	1,045,269	1,051,270	0.57%
Per Resident	6.73	5.30	-21.32%	5.17	5.06	-2.35%
Per household	18.19	13.46	-26.02%	13.99	12.85	-8.86%

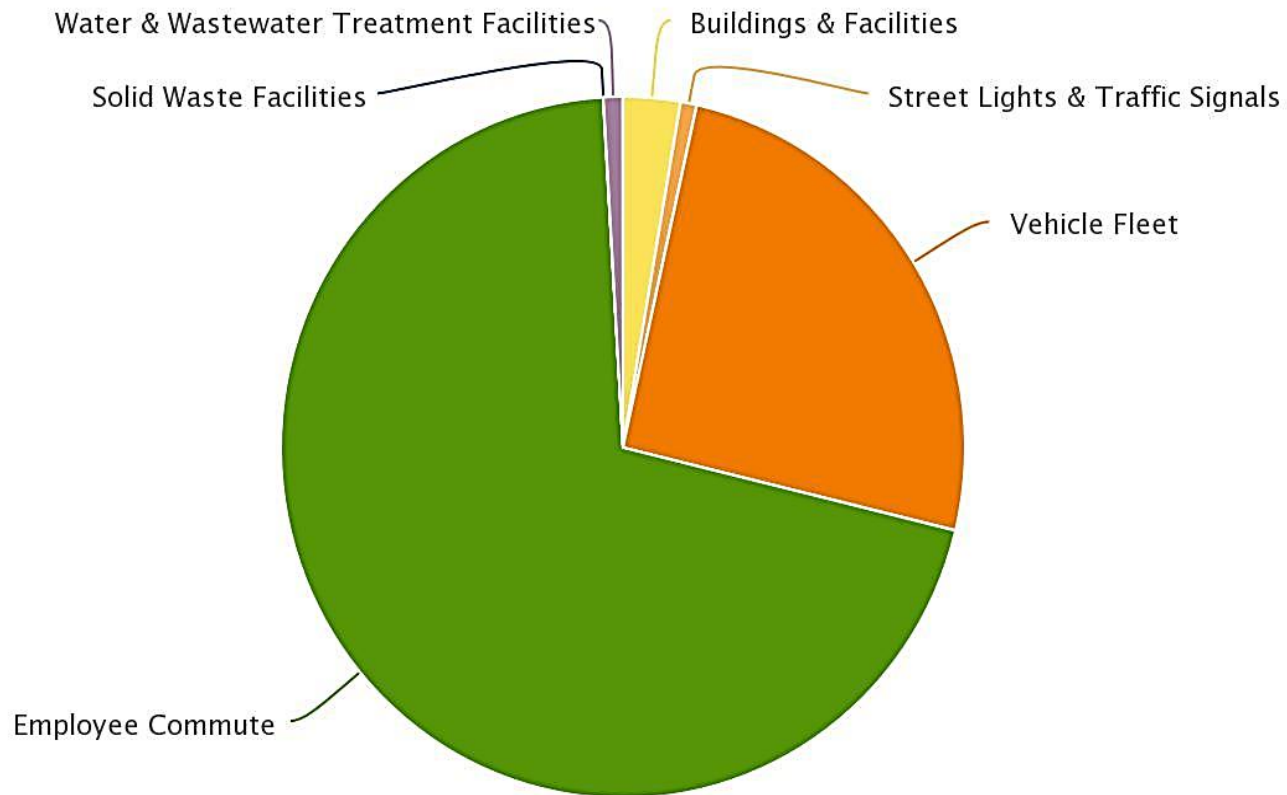
* 94% of total estimated emissions

3 Periods “Community” Emissions



2016 Gov't Operations Emissions

CO2e across all categories for current inventory



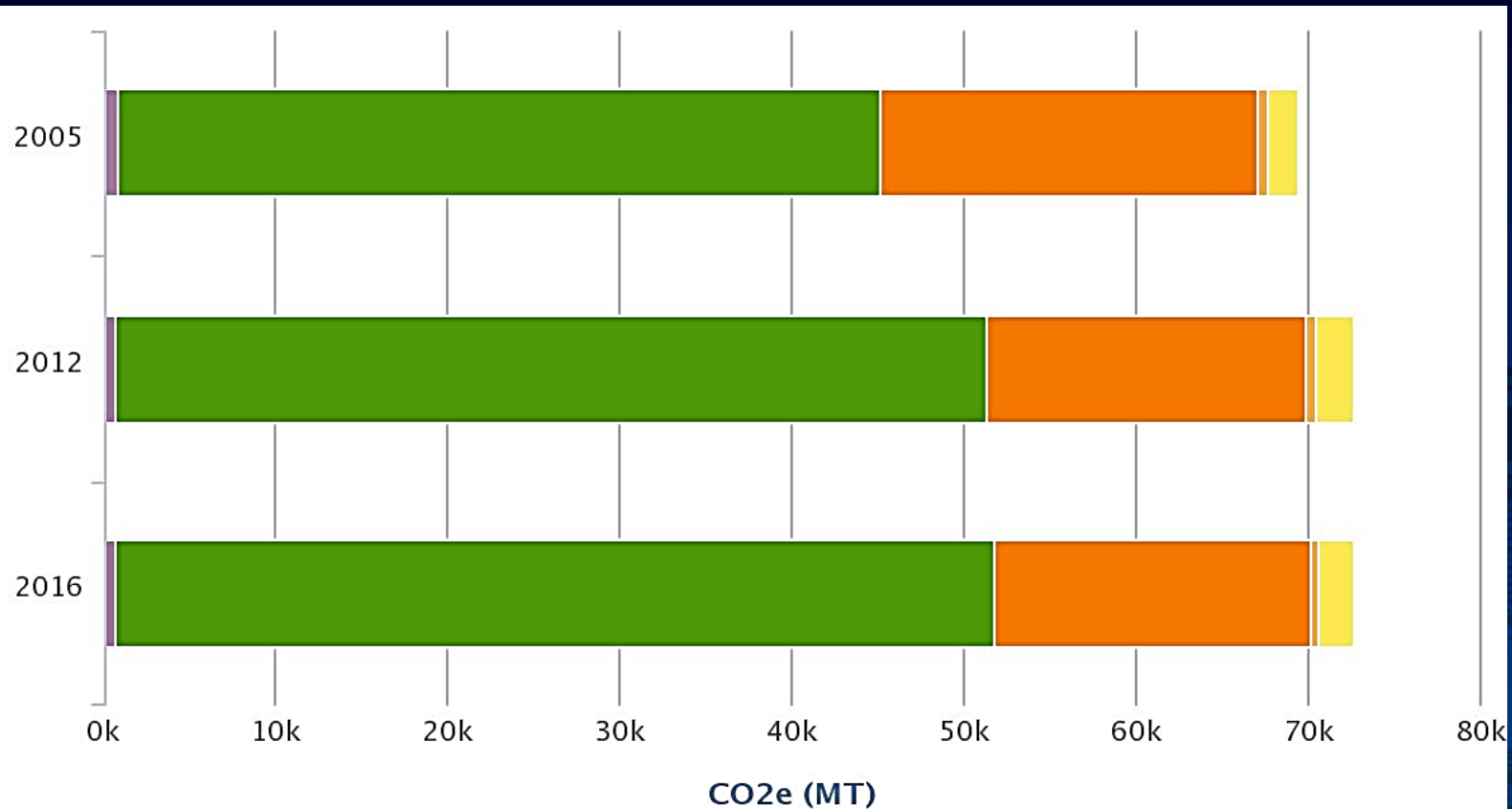
Highcharts.com

Gov't Operations Emissions*

Emission Source	2005	2012	2005 - 12 % Diff	2016	2012 - 16 % Diff
Buildings	1,797	2,263	20.59%	1,962	-15.34%
Fleet	21,912	18,576	-17.96%	18,380	-1.07%
Employee Commute	44,361	50,538	12.22%	50,961	0.83%
Streetlights/Signals	570	498	-14.46%	547	8.96%
Water/Wastewater	741	663	-11.76%	636	-4.24%
Solid Waste	0.04	0.04	0.00	0.04	0.00
Gov. Ops Total	69,381	72,538	4.35%	72,486	-0.07%
Per Employee	18.37	22.65	18.89%	20.71	-9.35%
City Total	1,351,879	1,432,043	5.60%	1,173,597	-22.02%
	2005	2012		2016	

* 6% of total estimated emissions

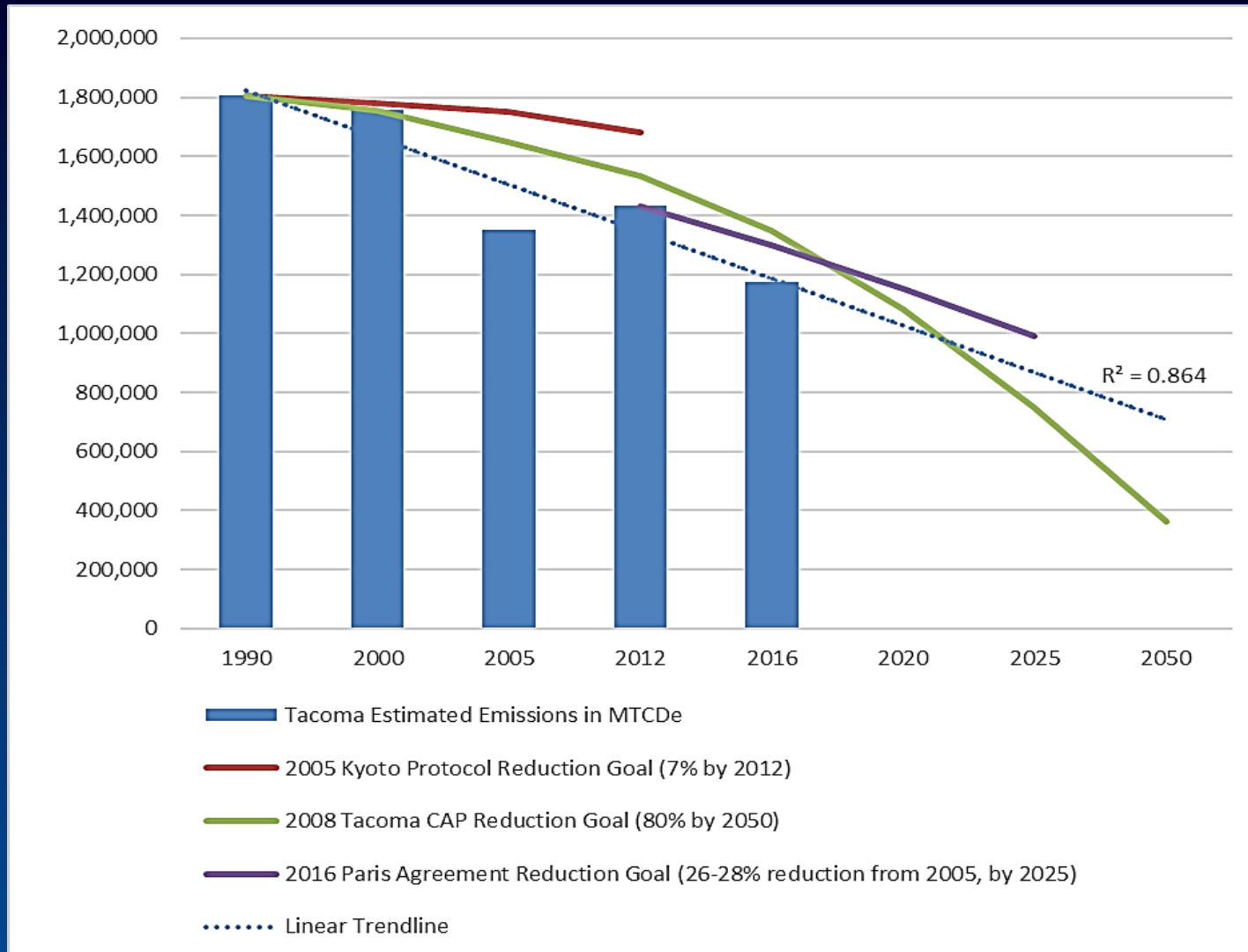
3 Periods Govt Ops Emissions



■ Solid Waste Facilities ■ Water & Wastewater Treatment Facilities ■ Employee Commute
■ Vehicle Fleet ■ Street Lights & Traffic Signals ■ Buildings & Facilities

Highcharts.com

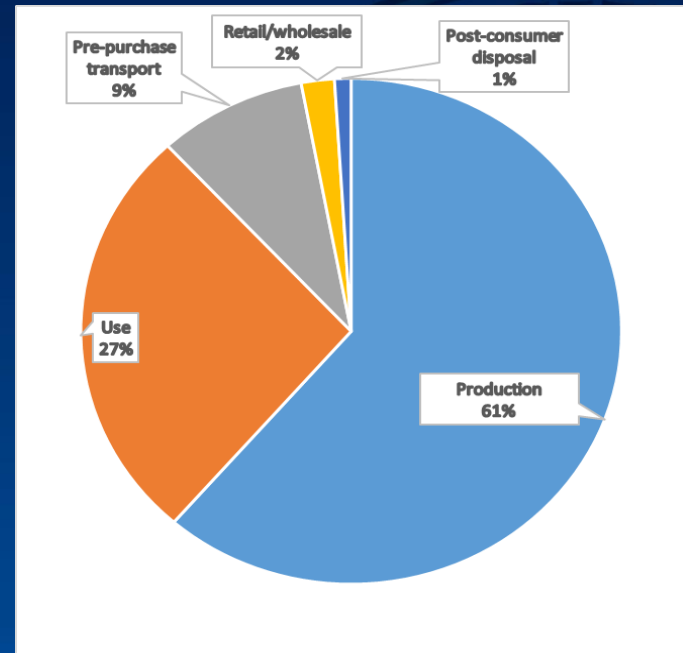
Emissions to Goals with Trend Line



Other GHG Inventories

Consumption-based Inventory

- Emissions beyond geographic boundaries of jurisdictional inventories
- Includes LCA of services and products
 - Extraction of raw materials
 - Manufacture or processing
 - Transportation
 - Use
 - Disposal



Actions

- Use the inventory to focus on high GHG areas
- Use Transportation Master Plan and Environmental Action Plan to reduce VMT and encourage EV uptake
- Continue to expand the urban forest canopy
- Expand food waste prevention and diversion
- Implement Biogas to renewable natural gas (RNG) for vehicle fleet; sell remaining on the market
- Increase local production and purchases
- Use the results of the NOAA WA Coastal Resilience Project to evaluate specific SLR impacts in Tacoma
- Conduct further studies to develop a community adaptation plan

2016 Greenhouse Gas Emissions Inventory

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