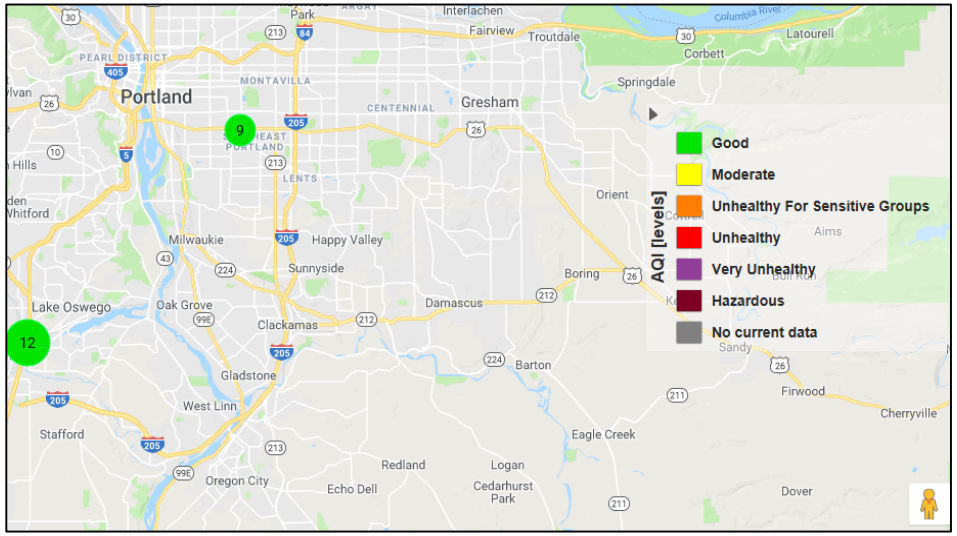
Greenhouse gas reduction programs at DEQ

David Allaway, Senior Materials Management Policy Analyst

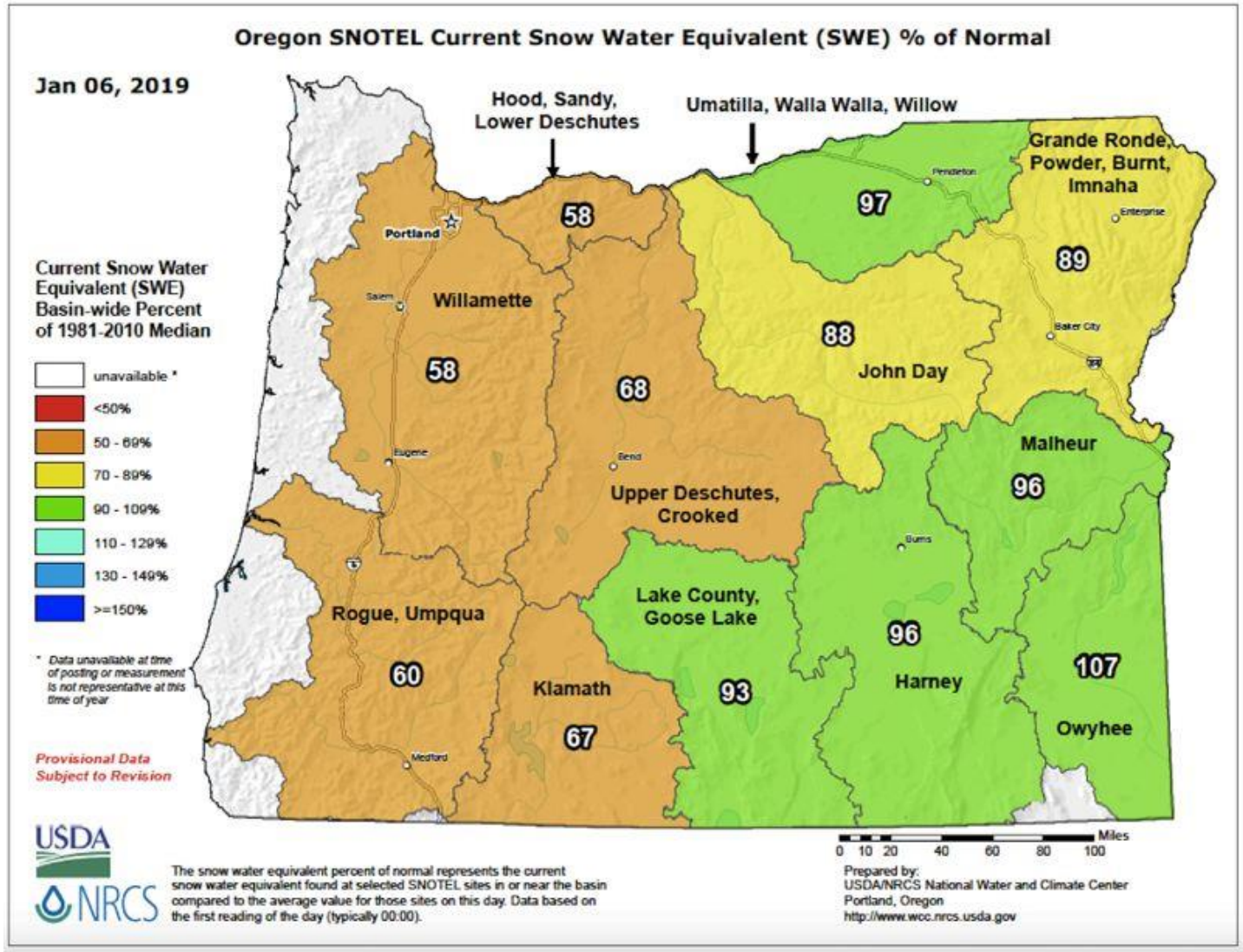
Colin McConnaha, Senior Climate Policy Advisor

Climate change effects in Oregon



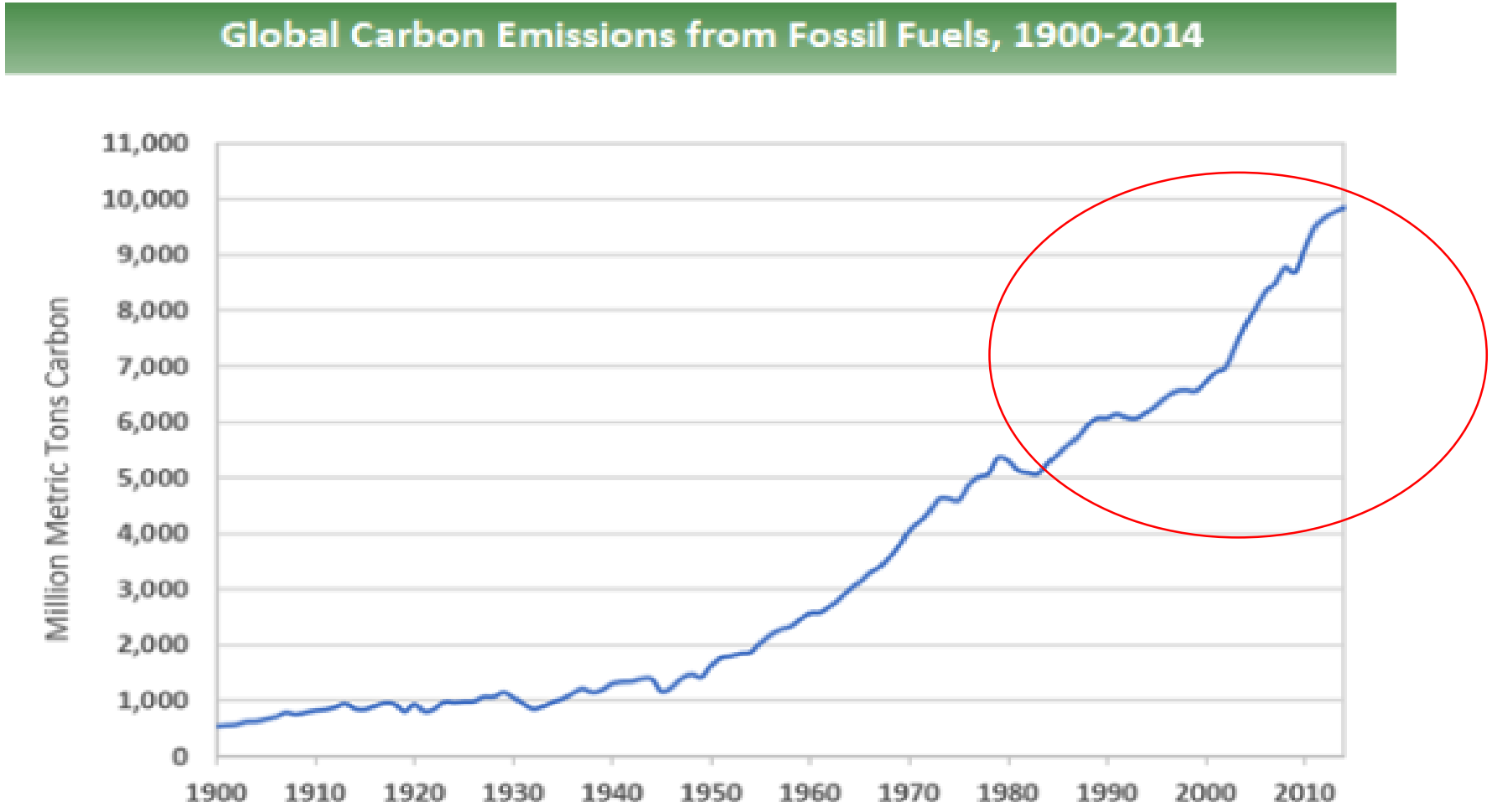
Jan. 22, 2019, ozone levels in Portland

Haze in the Columbia River Gorge



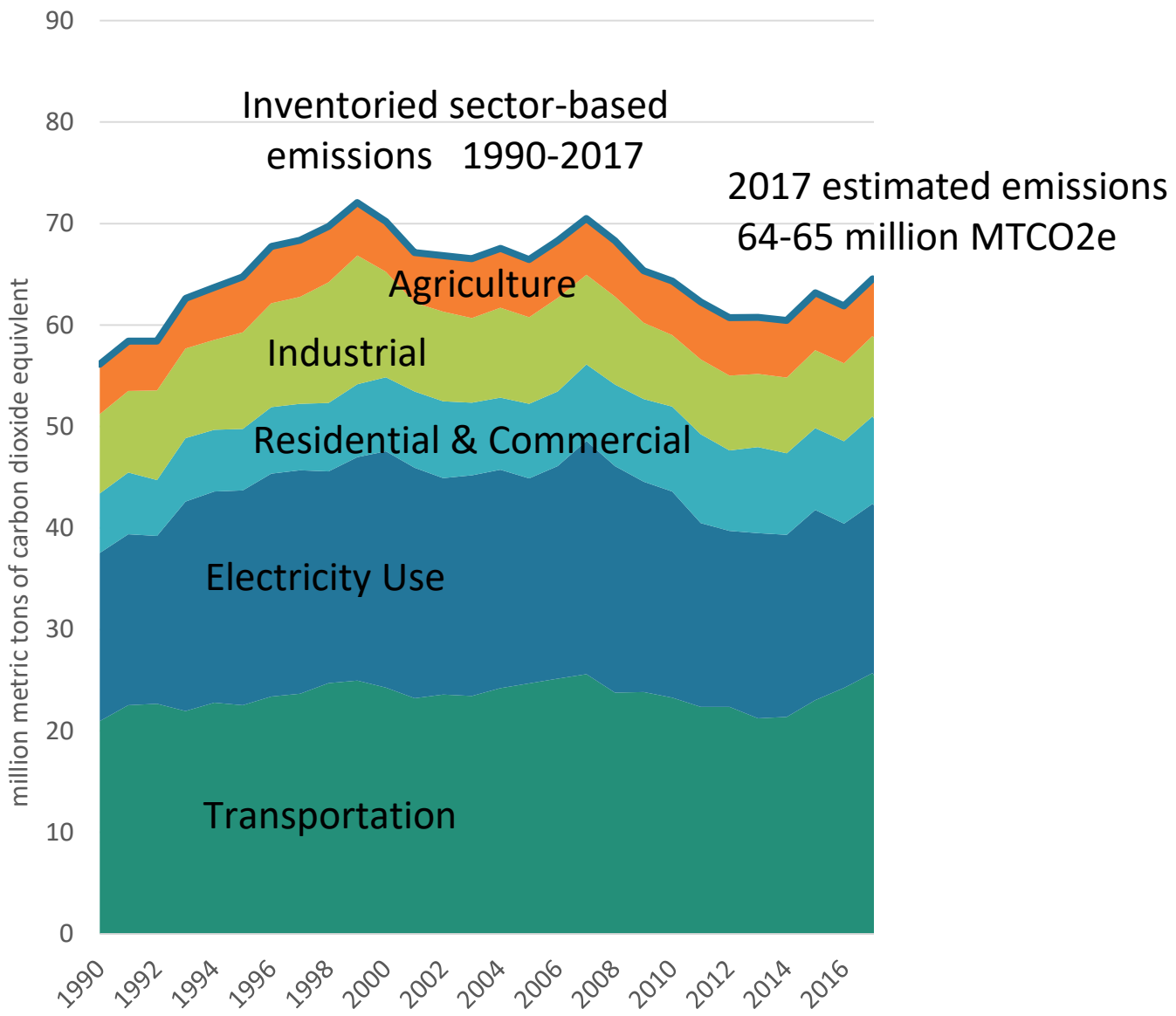
2019 snowpack and water levels across Oregon

Global emissions trends

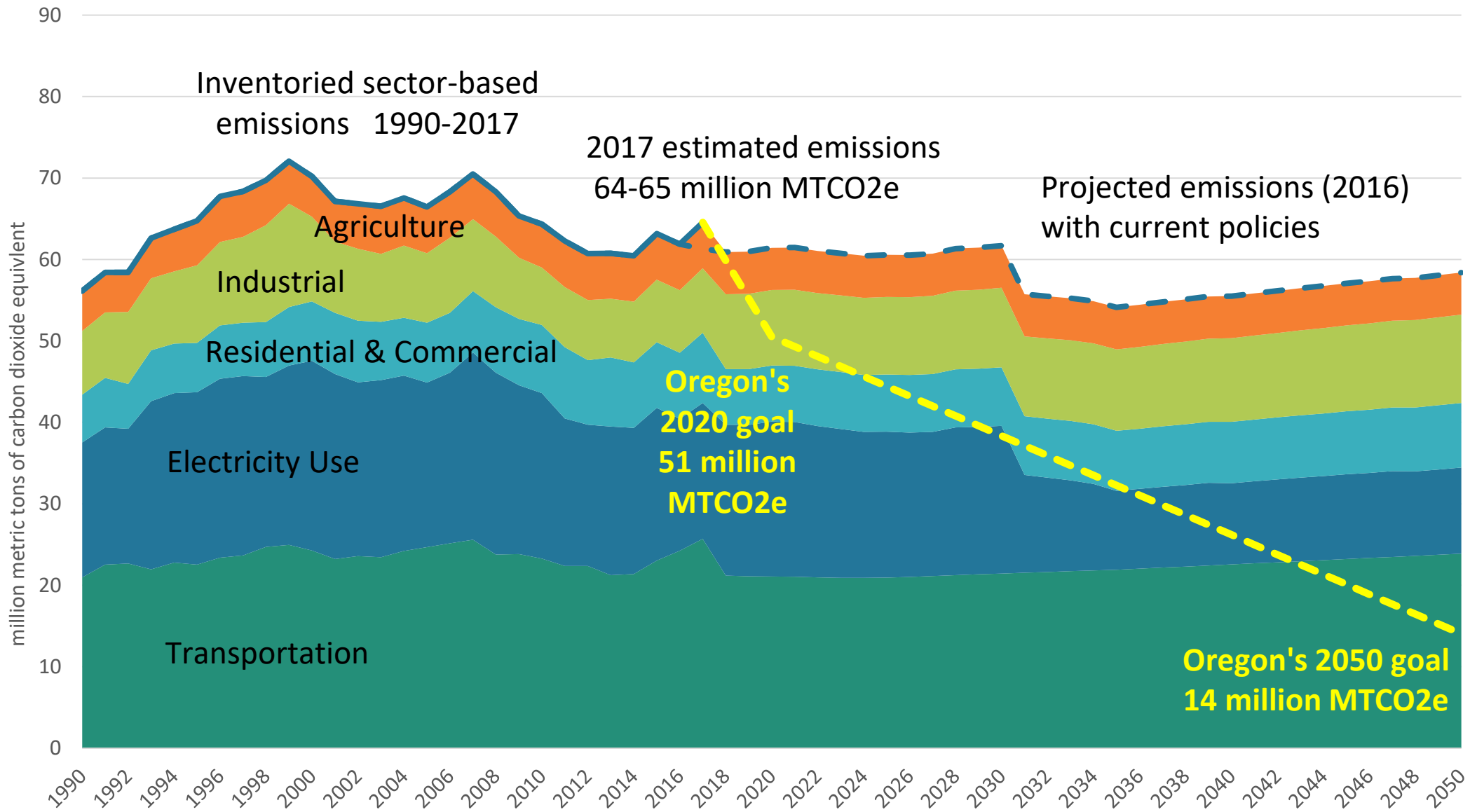


Source: Boden, T.A., Marland, G., and Andres, R.J. (2017). Global, Regional, and National Fossil-Fuel CO2Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. doi 10.3334/CDIAC/00001_V2017.

Oregon's sector-based GHG emissions



Oregon's past and projected sector-based GHG emissions compared to goals

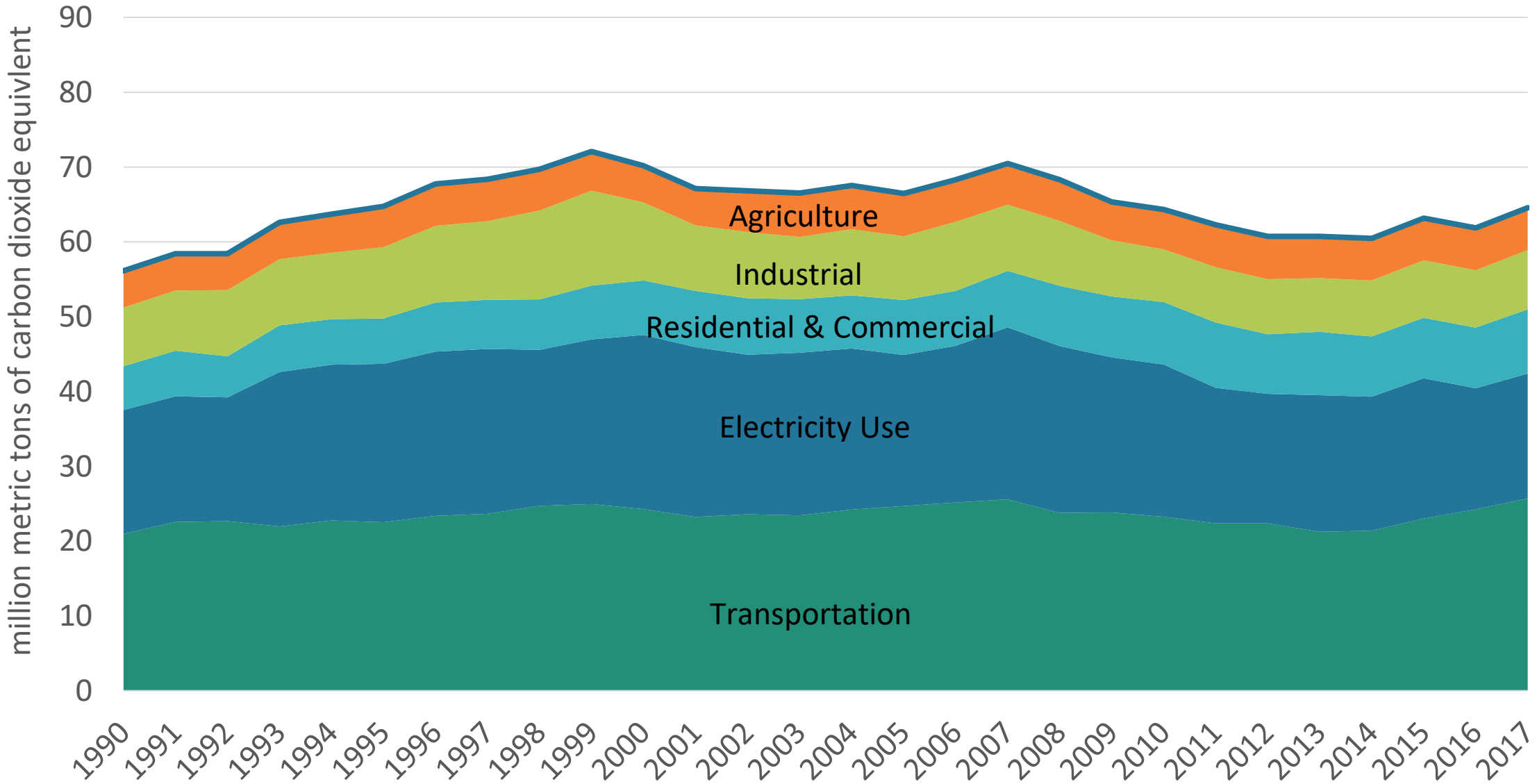


Oregon's sector-based GHG emissions

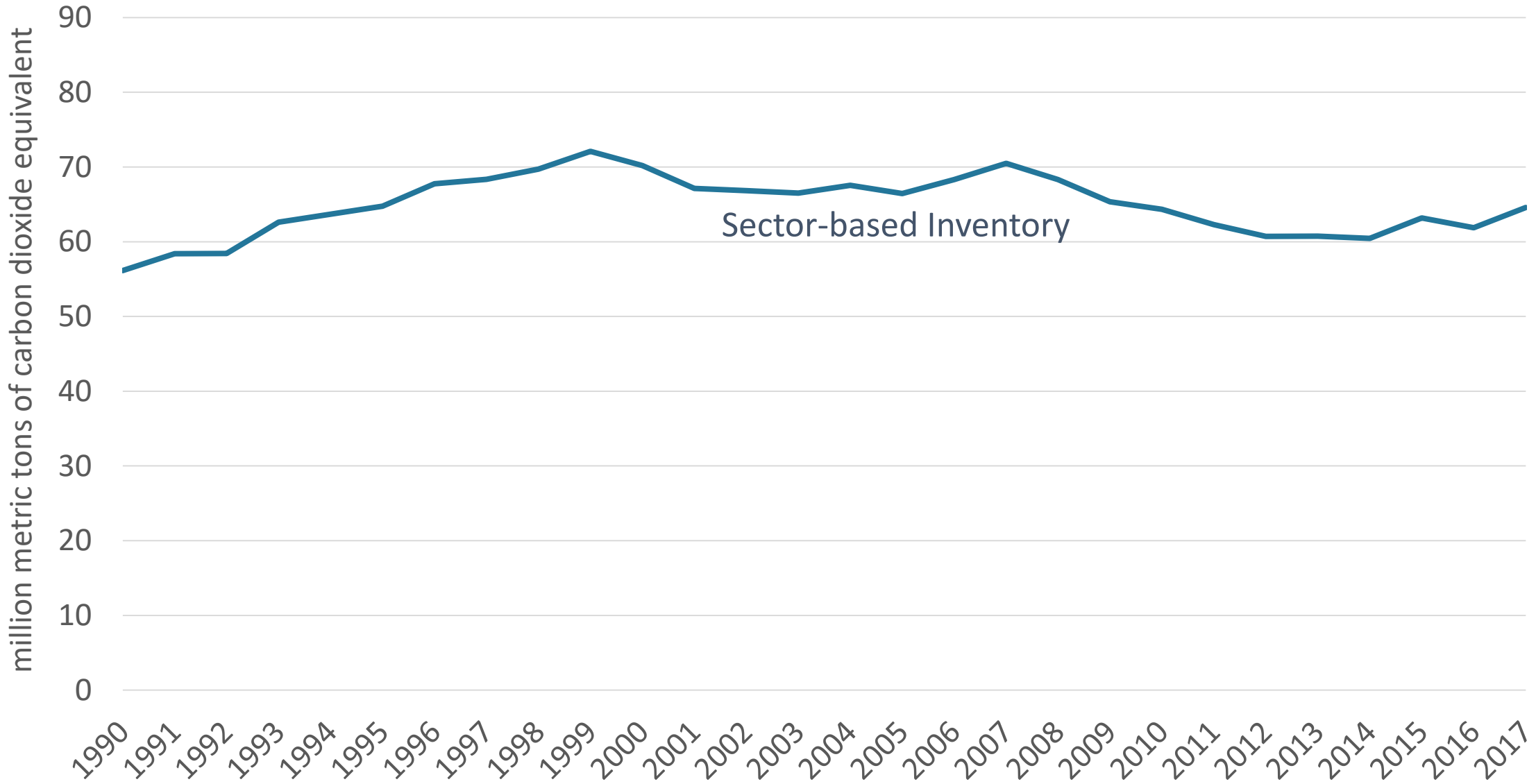
	1990	1995	2000	2005	2010	'11	'12	'13	'14	'15	'16	2017
Transportation	21	23	24	25	23	22	22	21	21	23	24	25.7 (prelim)
Electricity Use	17	21	23	20	20	18	17	18	18	19	16	17.1 (prelim)
Natural Gas Use	5	7	8	7	8	8	8	8	8	7	7	7 (2016 data)
Other Residential & Commercial	3	3	4	4	4	4	4	4	4	4	4	4 (2016 data)
Other Industrial	5	6	6	5	4	4	4	4	4	4	4	4 (2016 data)
Agriculture	5	5	5	6	5	5	6	6	6	6	6	6 (2016 data)
Total	56	65	70	66	64	62	61	61	60	63	62	64-65 (prelim)

DEQ

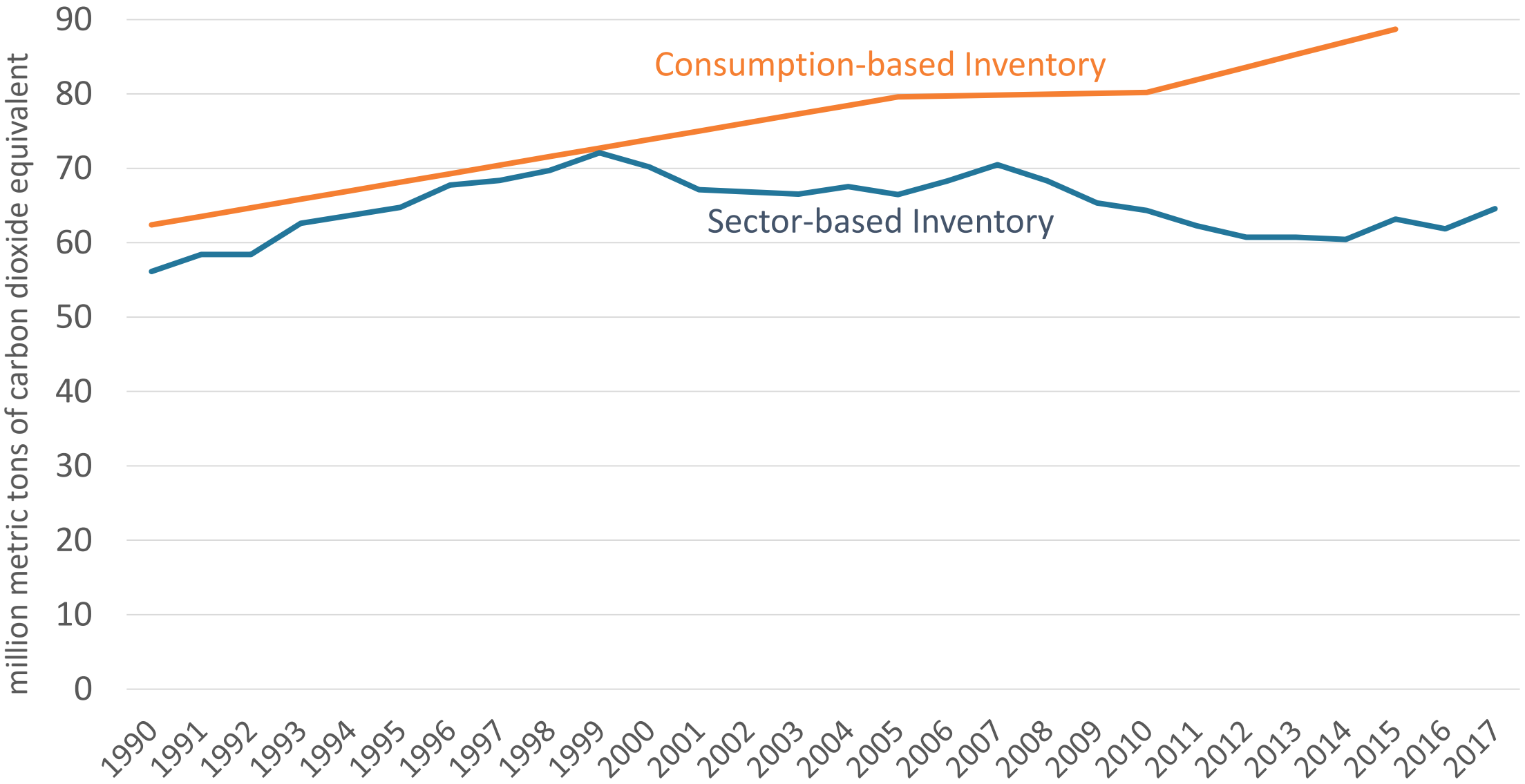
Oregon's GHG emissions 1990 – 2017



Oregon's GHG emissions 1990 – 2017



Oregon's GHG emissions 1990 – 2017



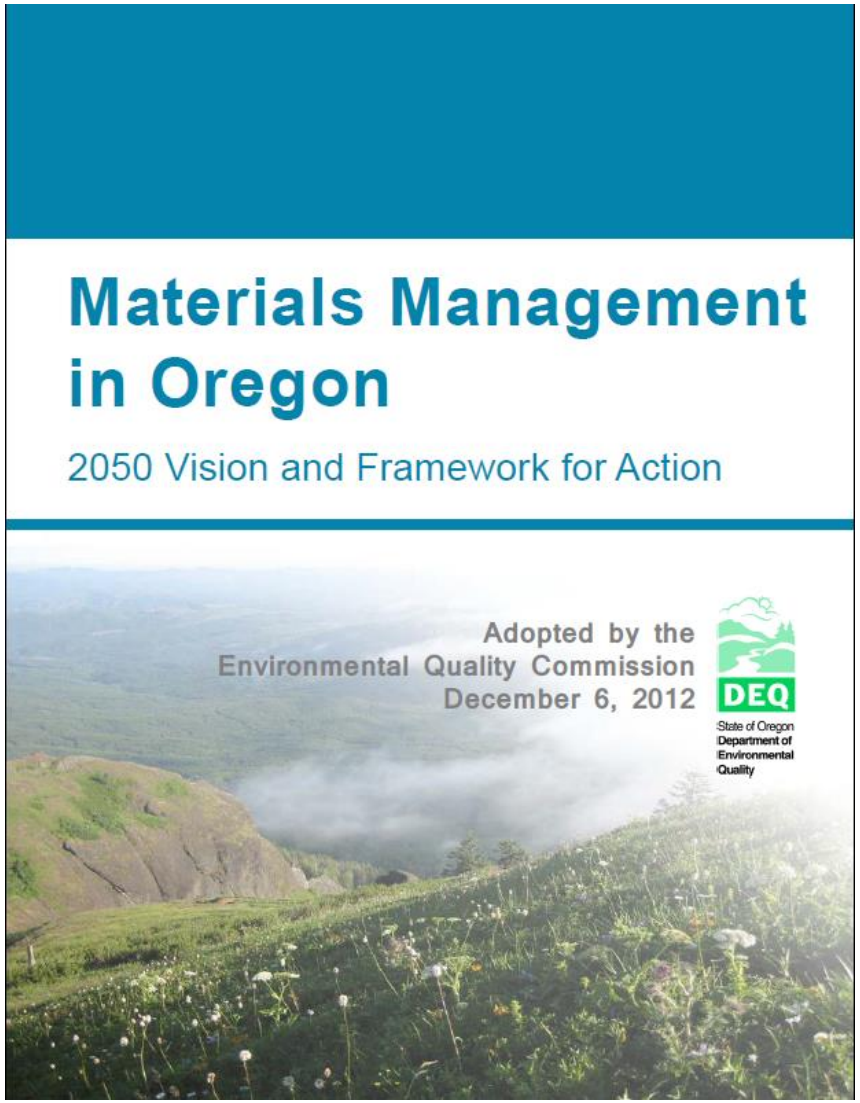
Reducing Greenhouse Gas Emissions through Materials Management

David Allaway

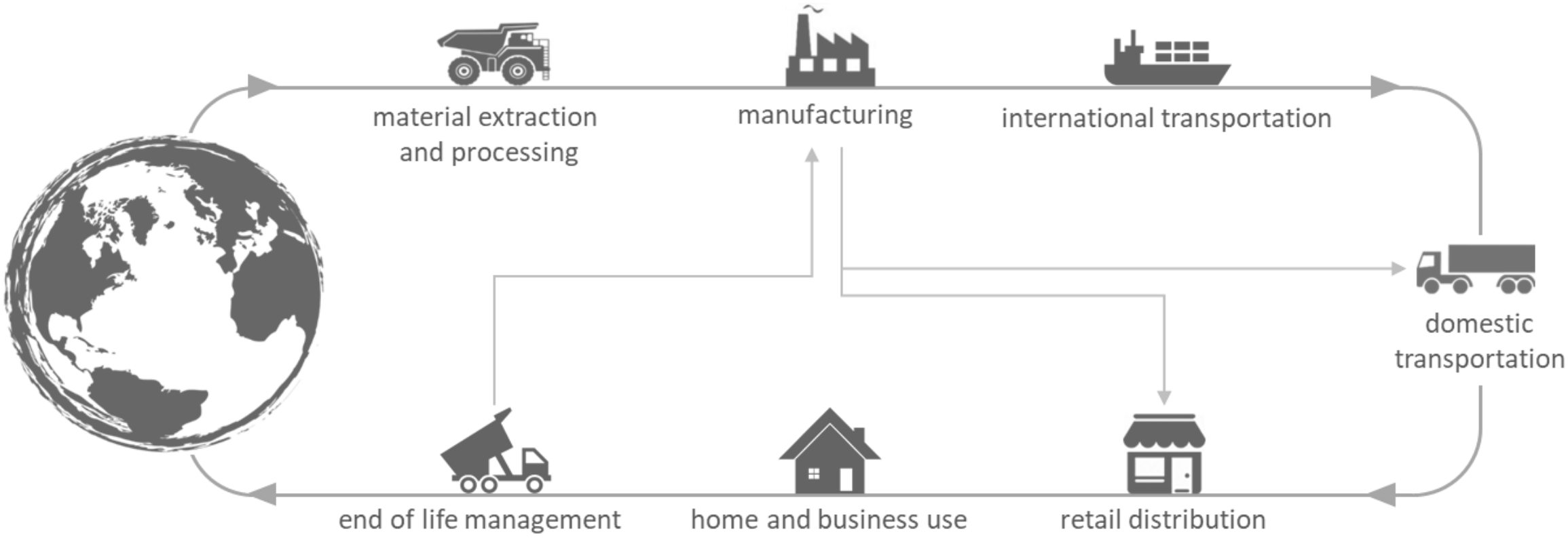
Environmental Quality Commission

Jan. 24, 2019

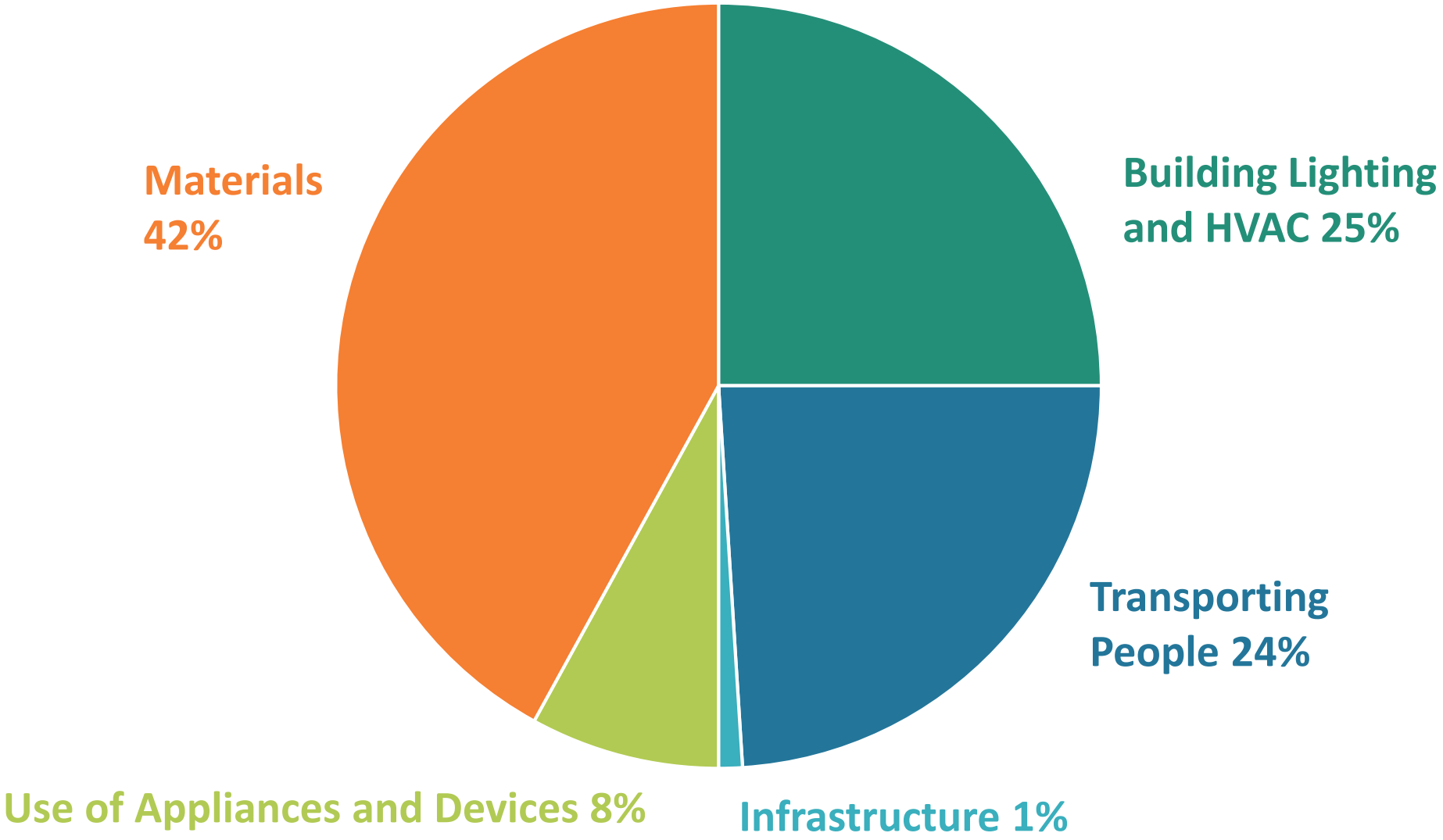
Materials Management



Materials Management: a “life cycle” perspective



U.S. “system-based” GHG emissions inventory (2006)



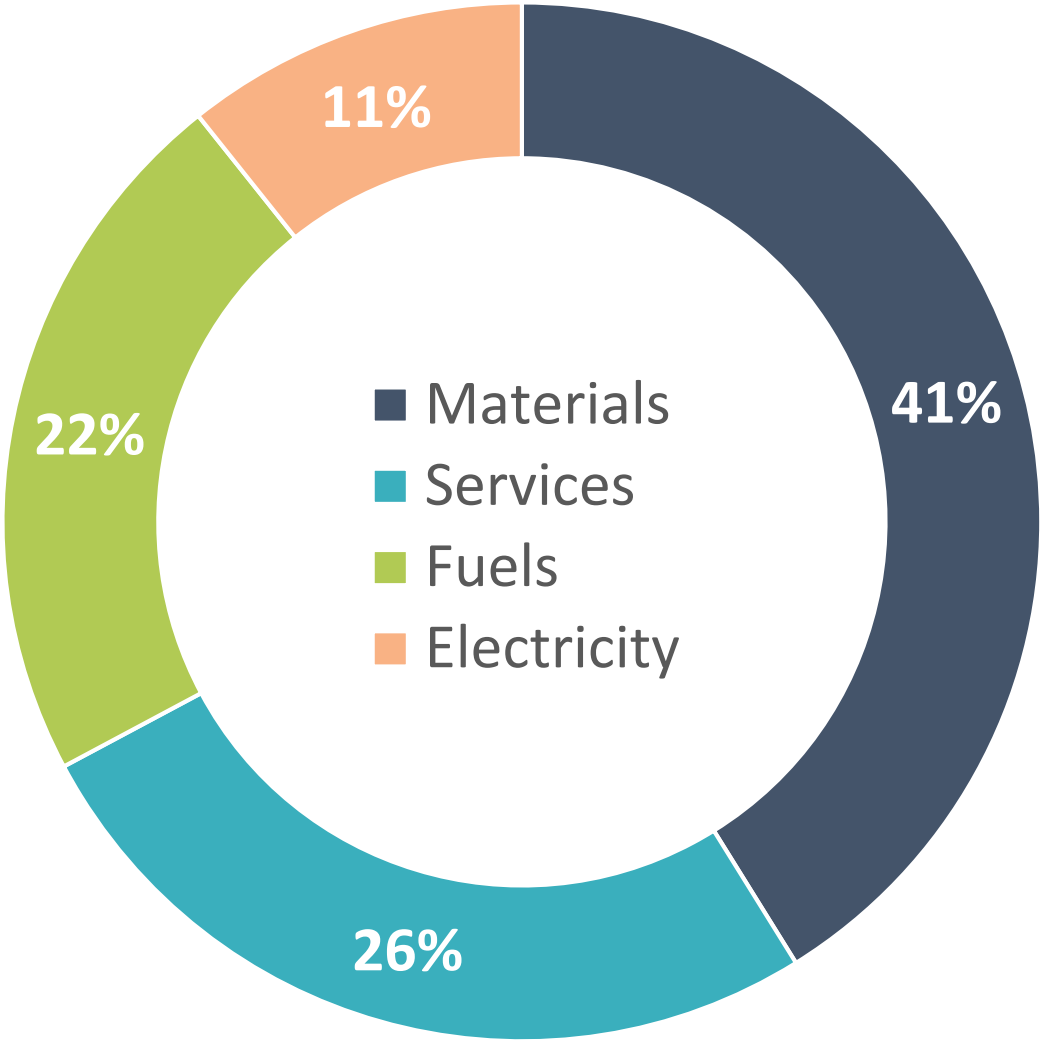
Foundations

- Greenhouse gases are a global pollutant - they have the same impact on Oregon whether they originate in-state or elsewhere
- If we contribute to emissions, then we also have an opportunity to contribute to reductions
- Acknowledging and accounting for emissions unveils opportunities for reduction
- Knowing additional reduction opportunities is helpful

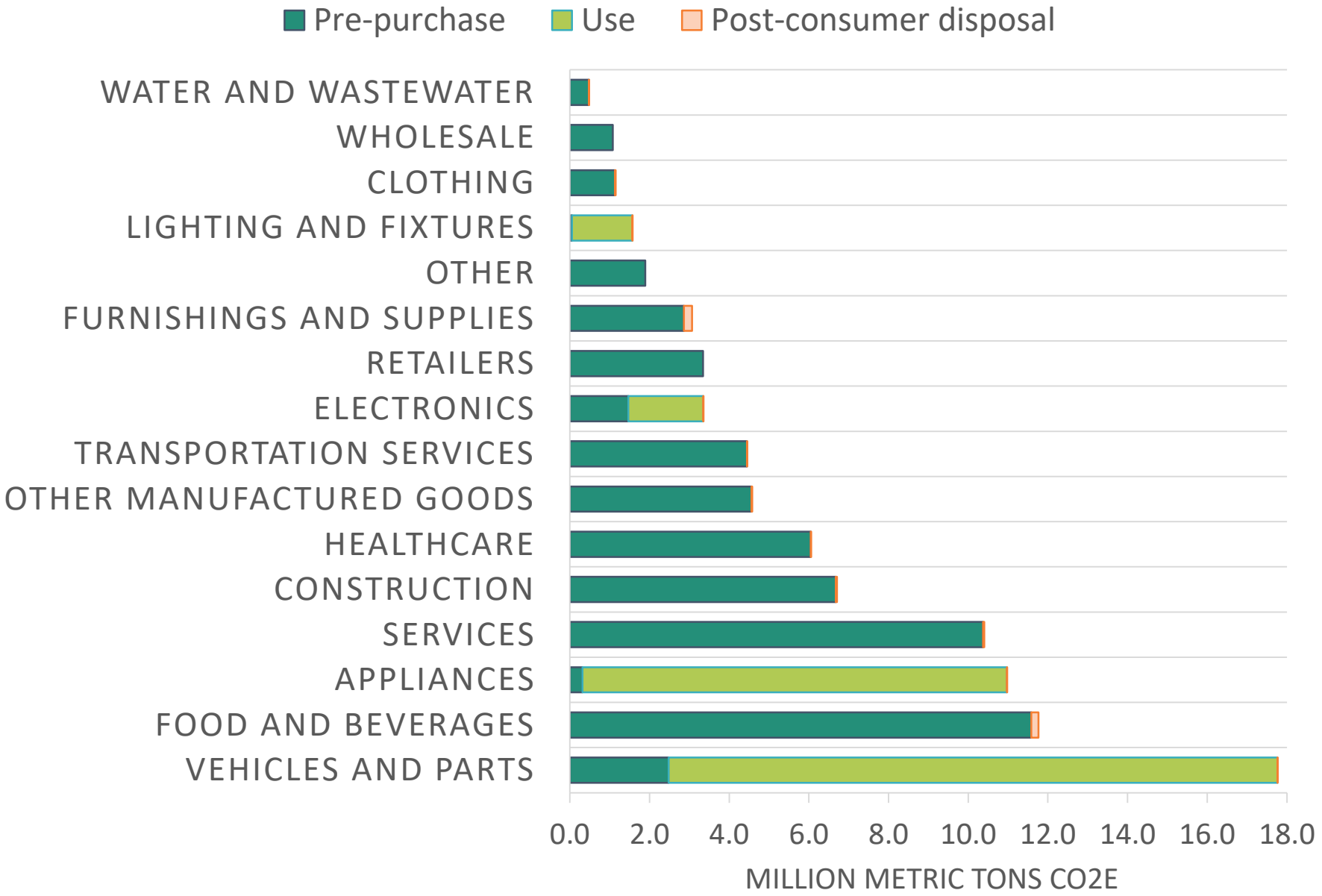
Earlier Commission Direction to DEQ

1. Ask state agencies to acknowledge that the sector-based inventory is incomplete
2. Develop an accounting system that tells a more complete story
3. Encourage other governments to do the same

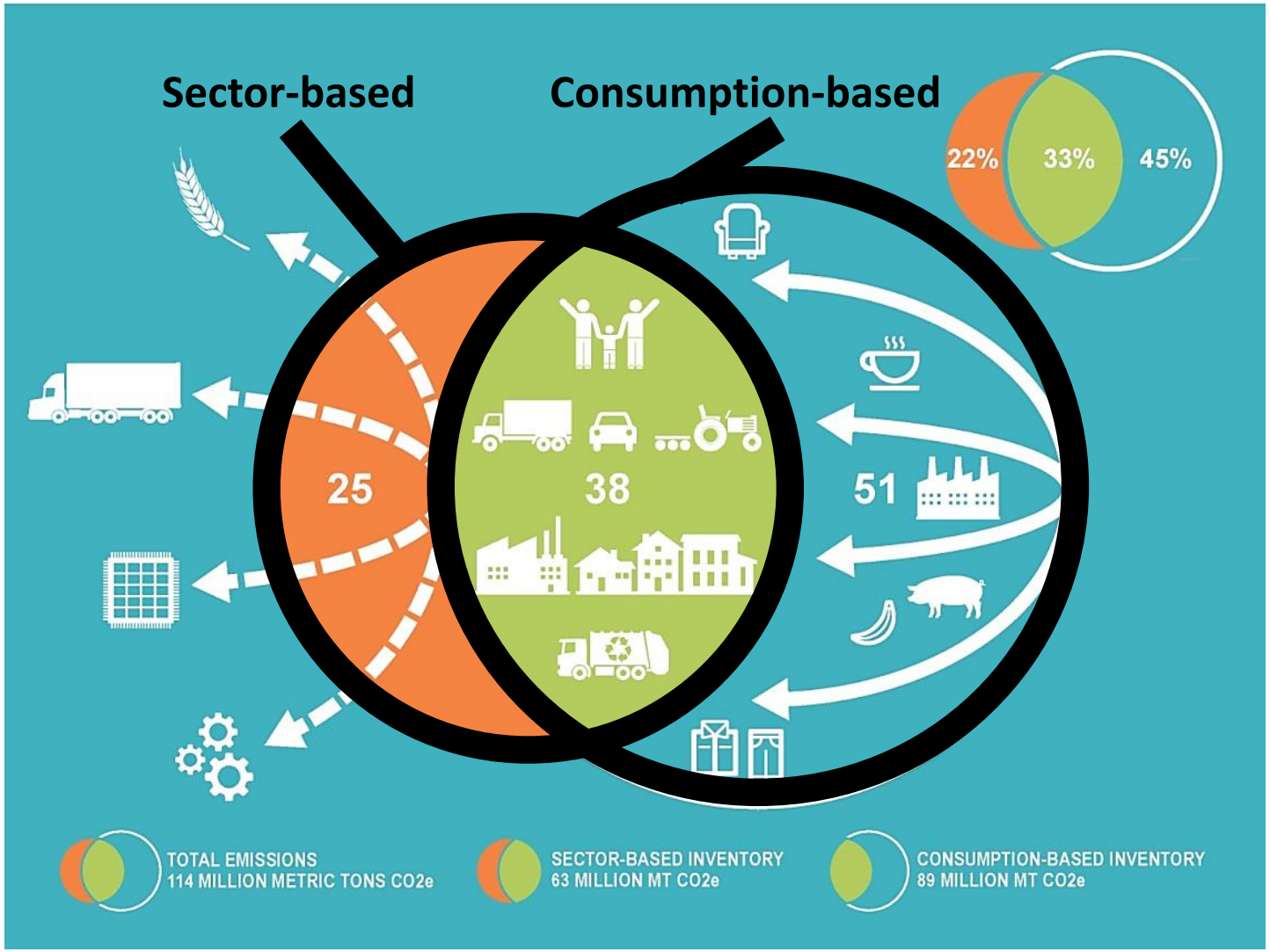
Materials matter: Oregon 2015 consumption-based GHG emissions (by type of consumption)



Oregon 2015 consumption-based GHG emissions, by category of consumption and life cycle stage



Comparison of Oregon's 2015 sector-based and consumption-based GHG emissions



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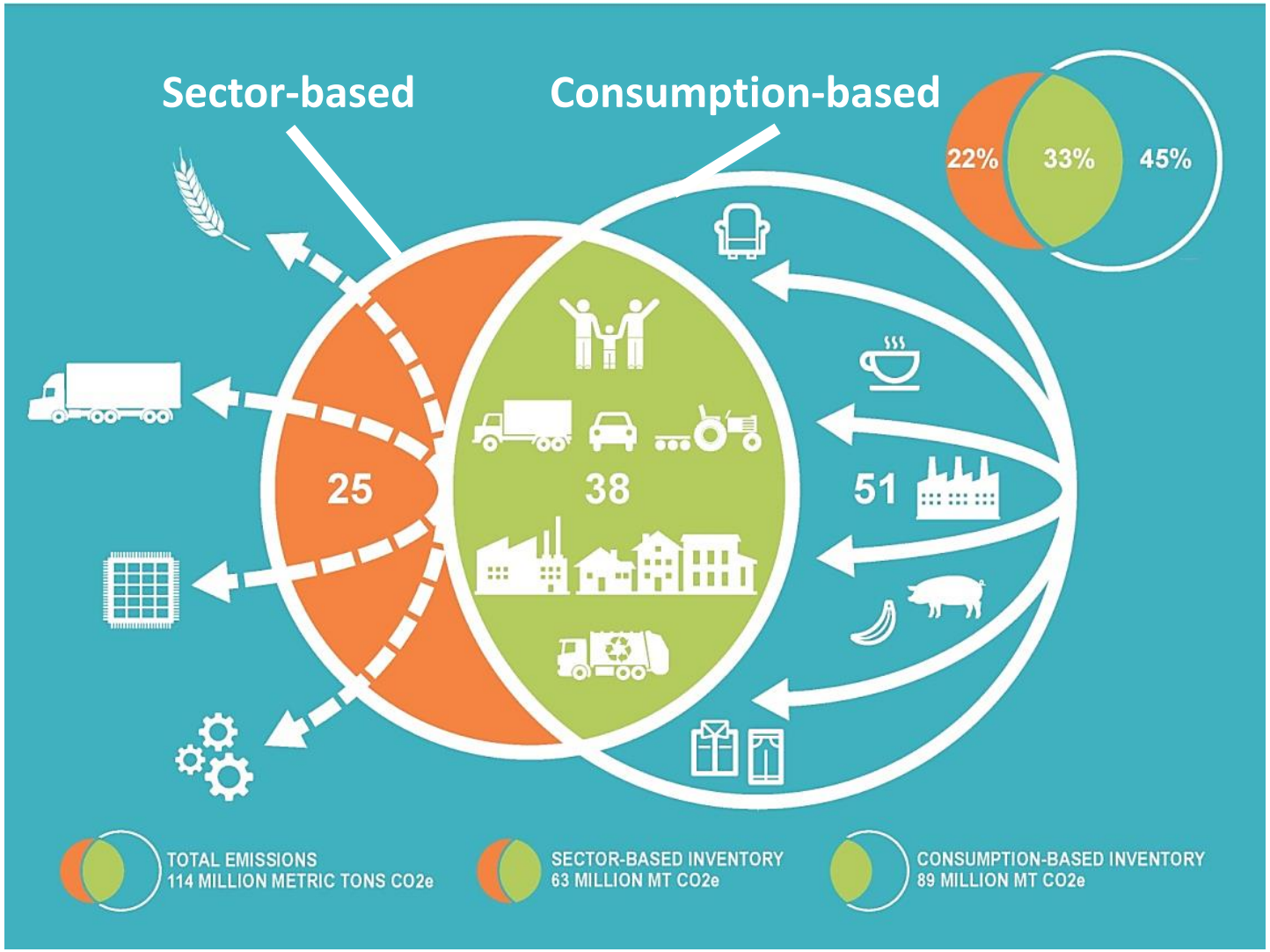
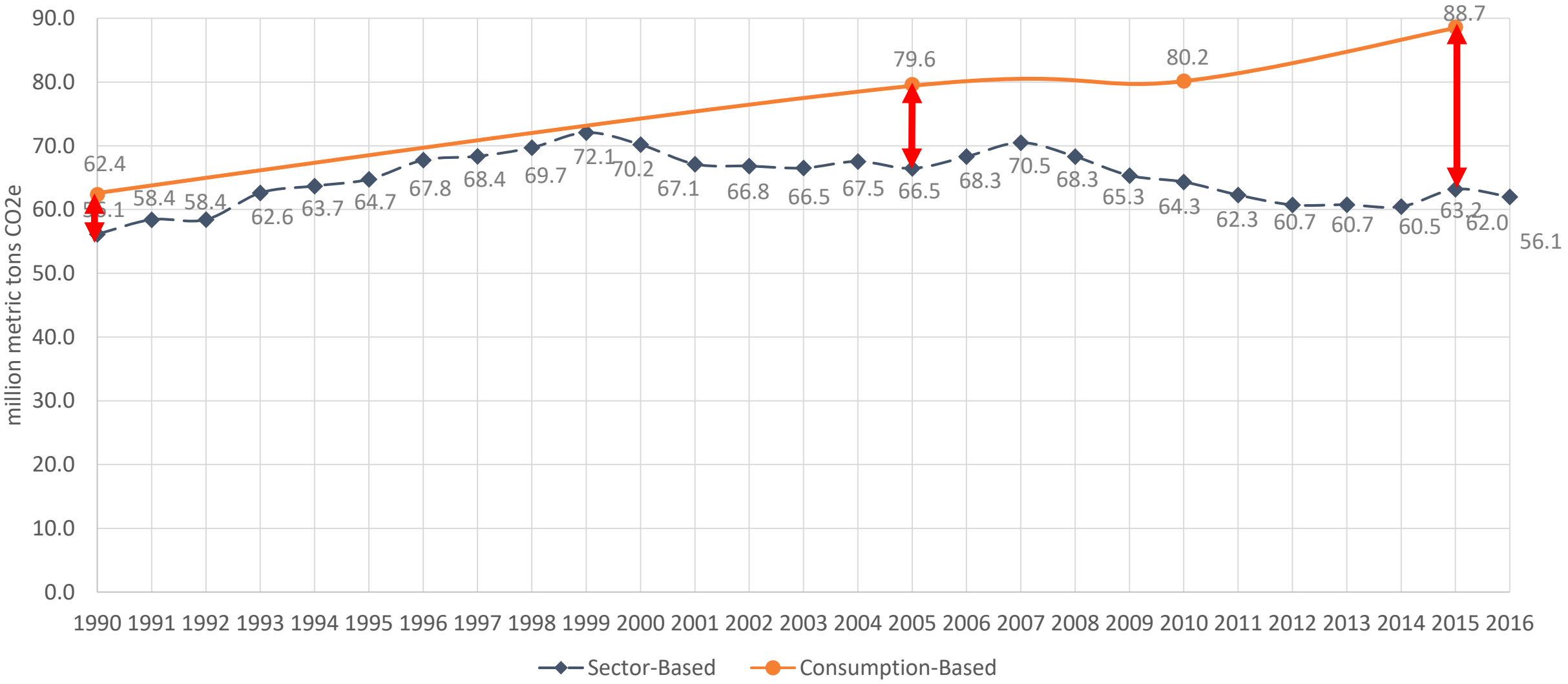
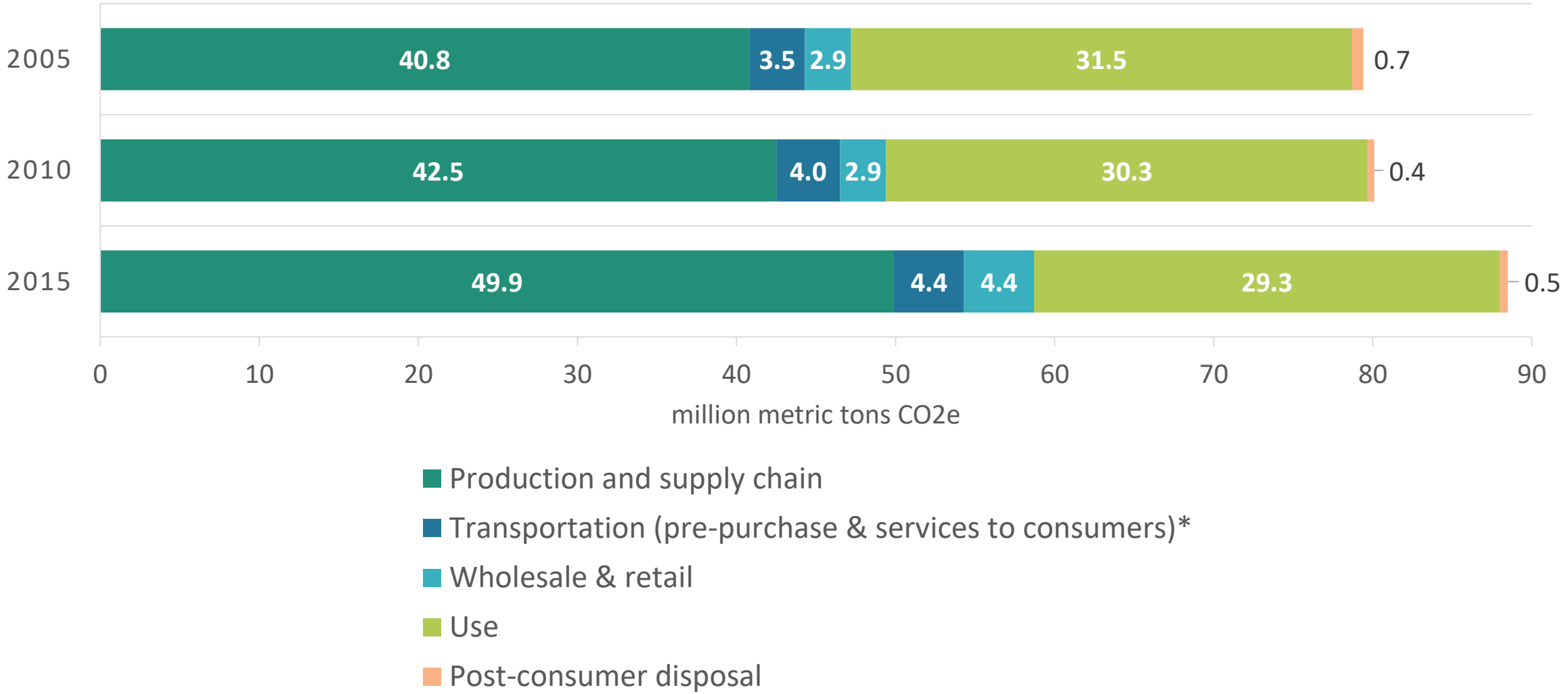


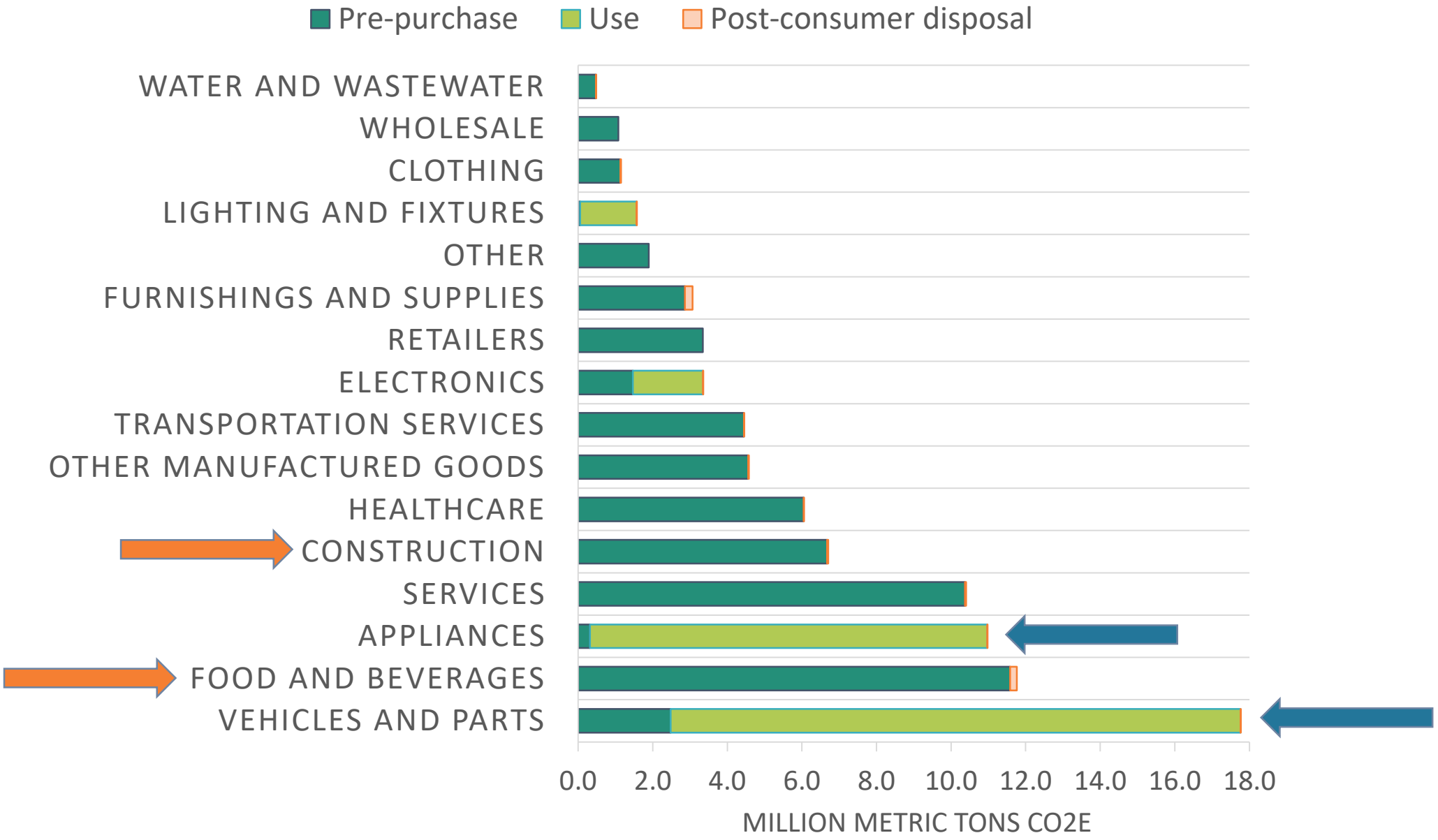
Oregon's GHG emissions inventories, 1990-2016



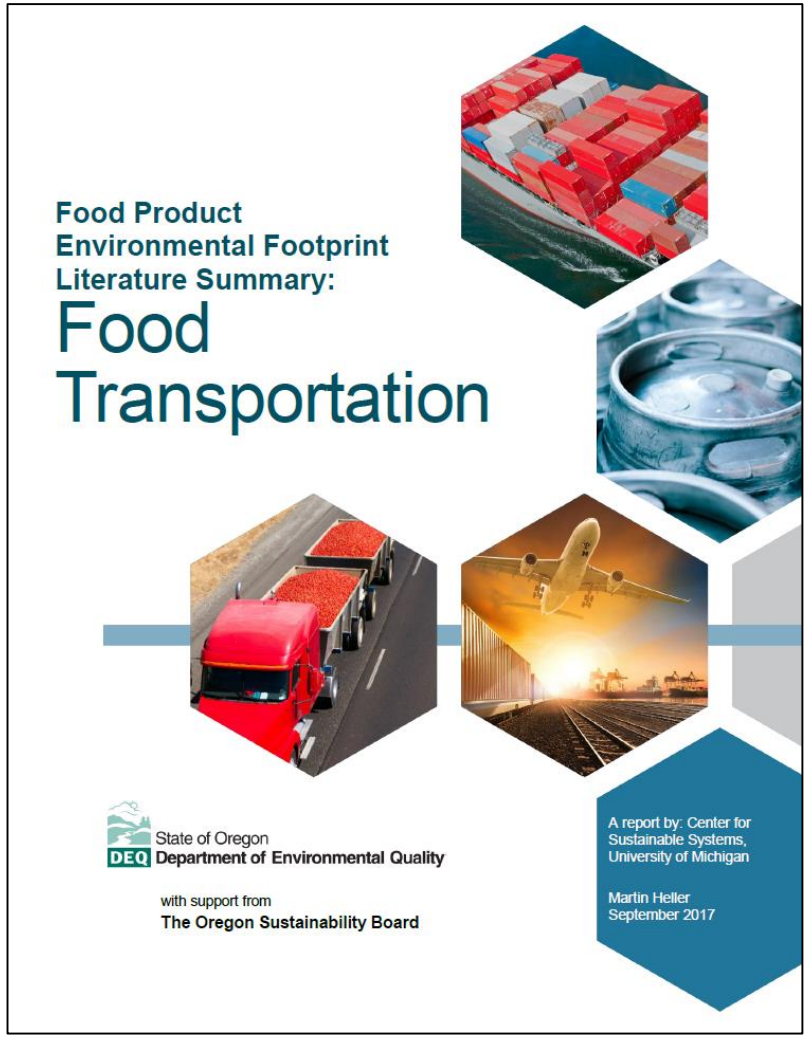
2005 – 2015 Oregon consumption-based GHG emissions, by meta-category

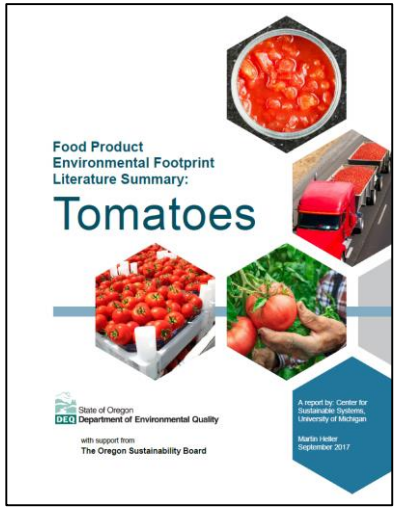


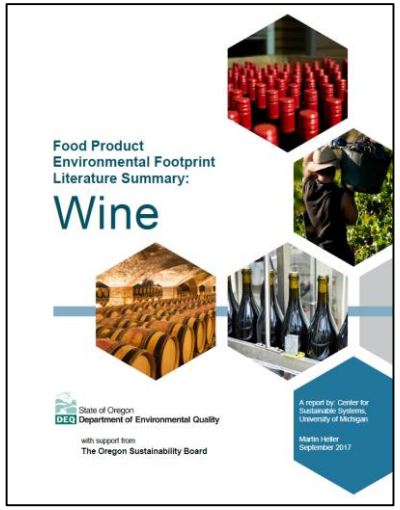
Oregon 2015 consumption-based GHG emissions, by category of consumption and life cycle stage

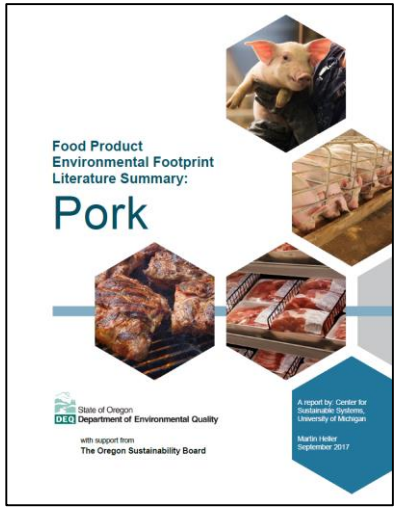


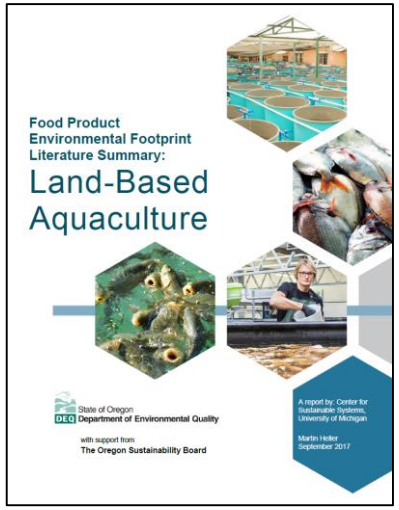
Food literature reviews

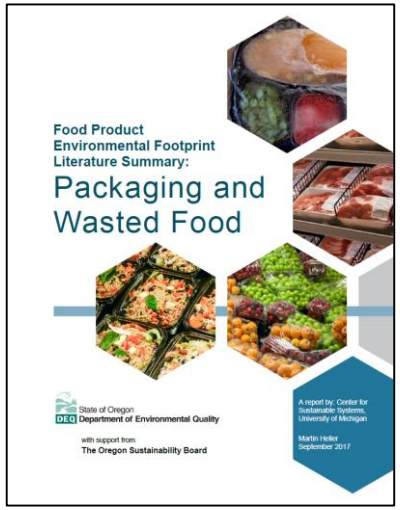


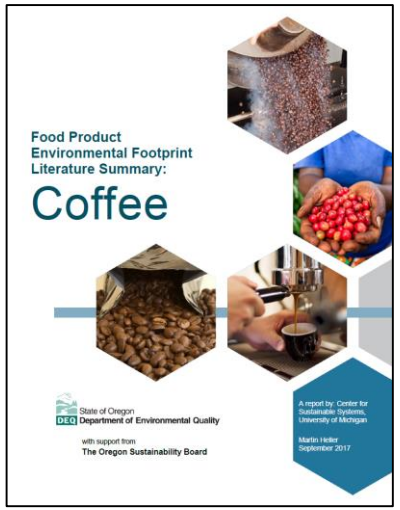


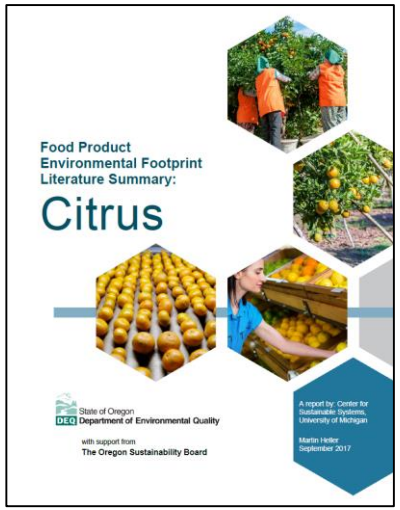


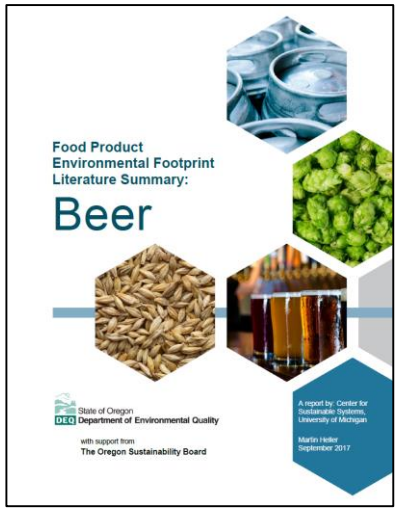




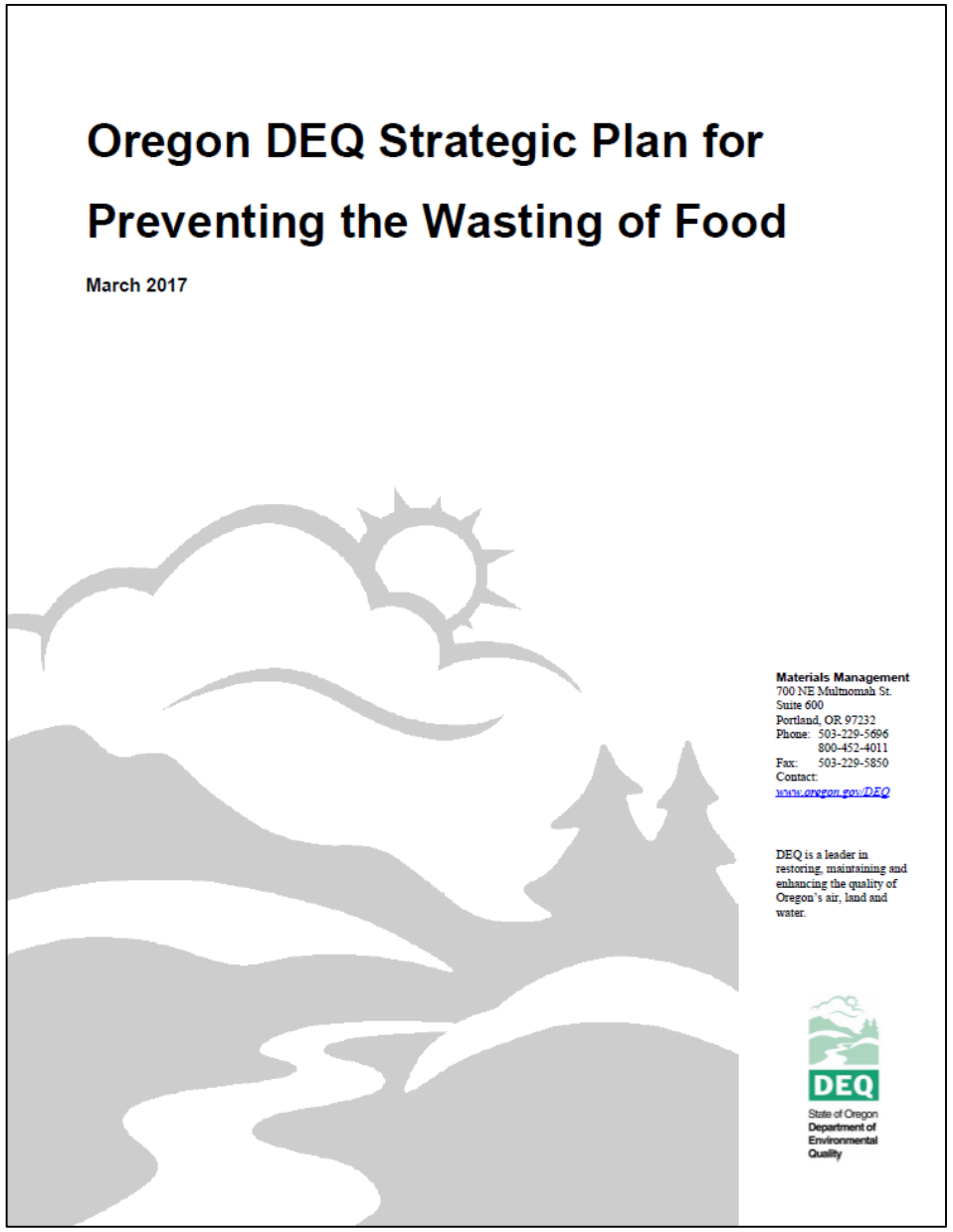








Preventing the wasting of food



Preventing the wasting of food: solutions

- Foundational measurement

Preventing the wasting of food: solutions

- Foundational measurement
- Grants

Preventing the wasting of food: solutions

- Foundational measurement
- Grants
- Communications and messaging

Conahan for Oregon Business The Wastrel

Preventing the wasting of food: solutions

- Foundational measurement
- Grants
- Communications and messaging
- Industry engagement

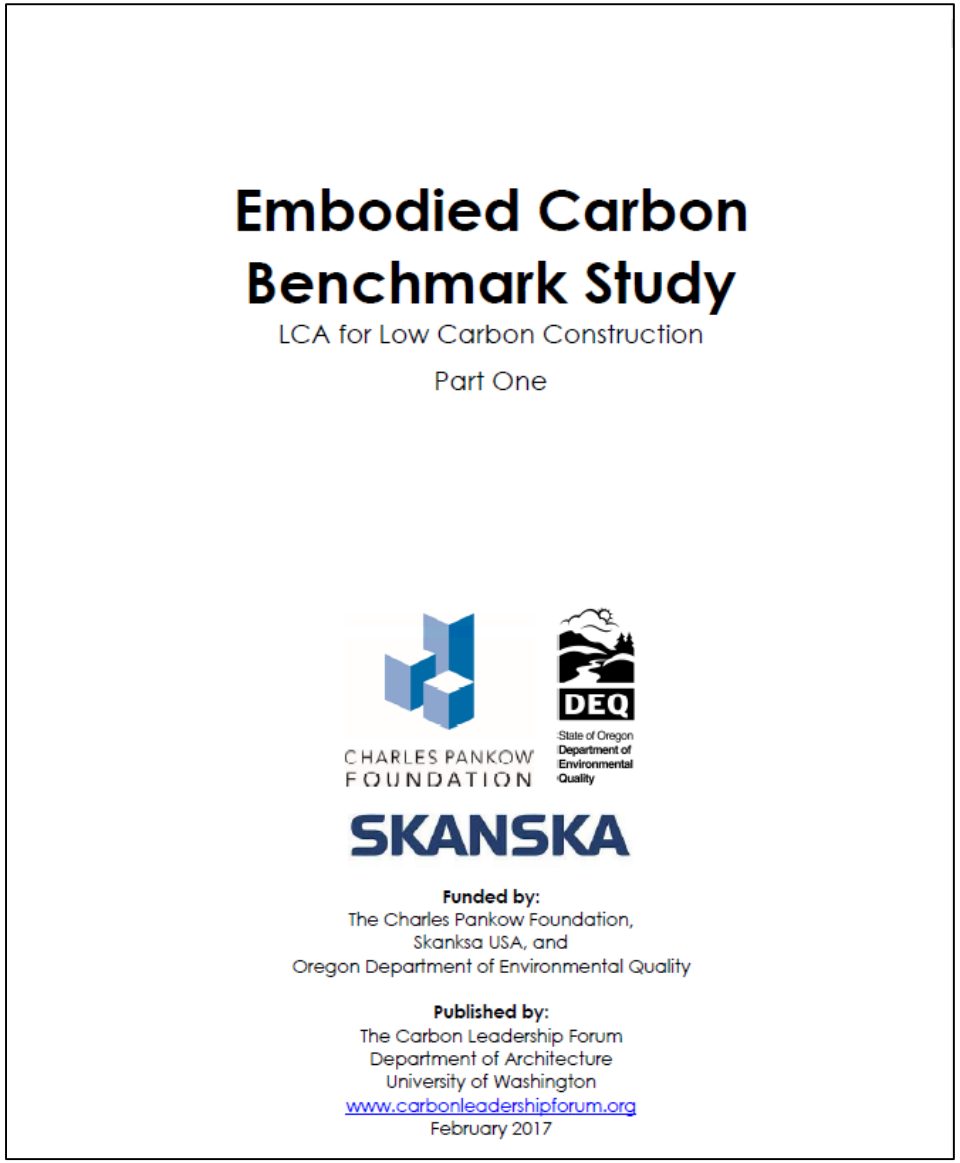
Preventing the wasting of food: solutions

- Foundational measurement
- Grants
- Communications and messaging
- Industry engagement
- Regional coordination and commitments

Built environment

Built environment: solutions

- Foundational research



Embodied Carbon Benchmark Study

LCA for Low Carbon Construction

Part One

CHARLES PANKOW FOUNDATION

DEQ State of Oregon Department of Environmental Quality

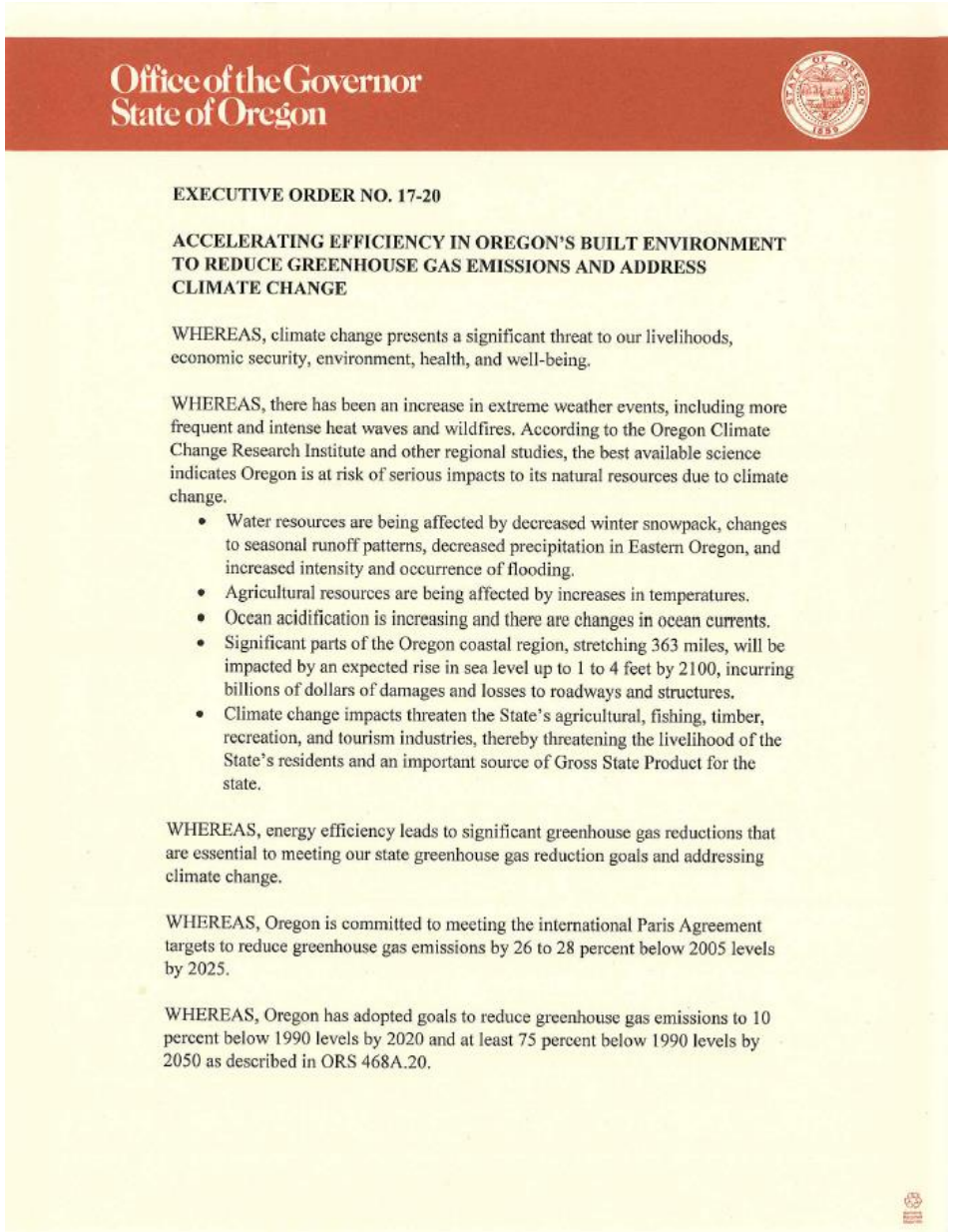
SKANSKA

Funded by:
The Charles Pankow Foundation,
Skanksa USA, and
Oregon Department of Environmental Quality

Published by:
The Carbon Leadership Forum
Department of Architecture
University of Washington
www.carbonleadershipforum.org
February 2017

Built environment: solutions

- Foundational research
- State-owned buildings



Office of the Governor
State of Oregon

EXECUTIVE ORDER NO. 17-20

ACCELERATING EFFICIENCY IN OREGON'S BUILT ENVIRONMENT TO REDUCE GREENHOUSE GAS EMISSIONS AND ADDRESS CLIMATE CHANGE

WHEREAS, climate change presents a significant threat to our livelihoods, economic security, environment, health, and well-being.

WHEREAS, there has been an increase in extreme weather events, including more frequent and intense heat waves and wildfires. According to the Oregon Climate Change Research Institute and other regional studies, the best available science indicates Oregon is at risk of serious impacts to its natural resources due to climate change.

- Water resources are being affected by decreased winter snowpack, changes to seasonal runoff patterns, decreased precipitation in Eastern Oregon, and increased intensity and occurrence of flooding.
- Agricultural resources are being affected by increases in temperatures.
- Ocean acidification is increasing and there are changes in ocean currents.
- Significant parts of the Oregon coastal region, stretching 363 miles, will be impacted by an expected rise in sea level up to 1 to 4 feet by 2100, incurring billions of dollars of damages and losses to roadways and structures.
- Climate change impacts threaten the State's agricultural, fishing, timber, recreation, and tourism industries, thereby threatening the livelihood of the State's residents and an important source of Gross State Product for the state.

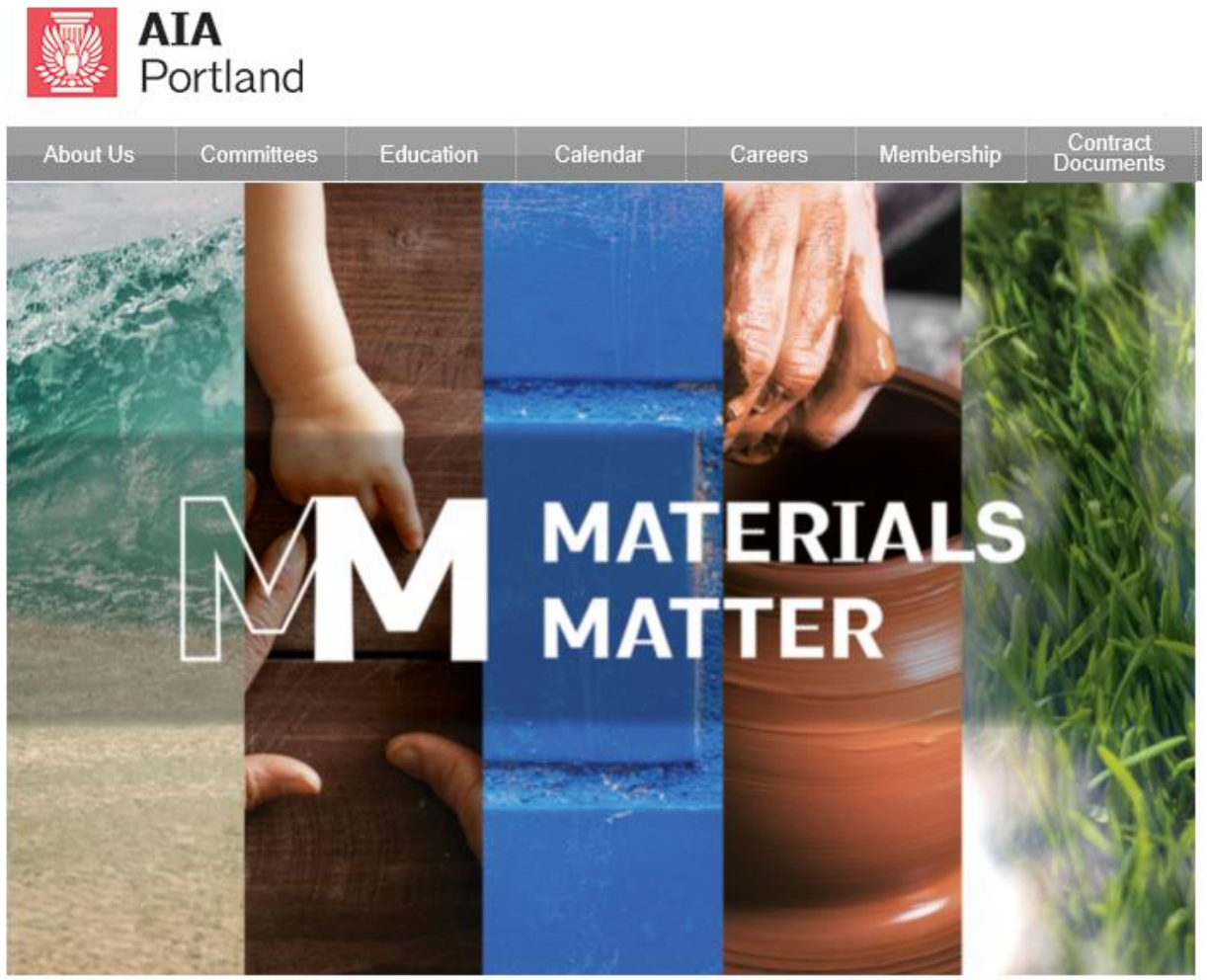
WHEREAS, energy efficiency leads to significant greenhouse gas reductions that are essential to meeting our state greenhouse gas reduction goals and addressing climate change.

WHEREAS, Oregon is committed to meeting the international Paris Agreement targets to reduce greenhouse gas emissions by 26 to 28 percent below 2005 levels by 2025.

WHEREAS, Oregon has adopted goals to reduce greenhouse gas emissions to 10 percent below 1990 levels by 2020 and at least 75 percent below 1990 levels by 2050 as described in ORS 468A.20.

Built environment: solutions

- Foundational research
- State-owned buildings
- American Institute of Architects



Materials Matter

OCTOBER 1, 2018

Built environment: solutions

- Foundational research
- State-owned buildings
- American Institute of Architects
- Concrete environmental product declarations

EPD "Nutrition" Label

Your Building Product

Amount per Unit

LCA IMACT MEASURES	TOTAL
Primary Energy (MJ)	12.4
Global Warming Potential (kg CO^2 eq)	0.96
Ozone Depletion (kg CFC- 11 eq)	1.80E-08
Acidification Potential (mol H^+ eq)	0.93
Eutrophication Potential (kg N^- eq)	6.43E-04
Photo-Oxidant Creation Potential (kg 03 eq)	0.121

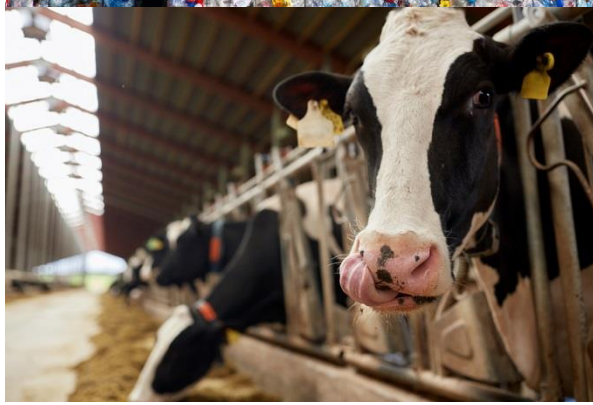
Your Product's Ingredients: Listed Here

Other programs

- Building deconstruction
- Reuse and repair
- Recycling, including mandatory extended producer responsibility programs
- Sustainable procurement
- Business partnerships

Conclusions

- Materials matter
- Oregon's consumption-based emissions inventory illuminates additional emissions, and reduction opportunities
- Materials-related emissions can be reduced with both supply- and demand-side solutions, which compliment both each other, and other investments
- DEQ's current materials work is largely voluntary, but regulatory options exist
- The EQC has established a solid framework for emissions reduction



materials management

conserving resources · protecting the environment · living well

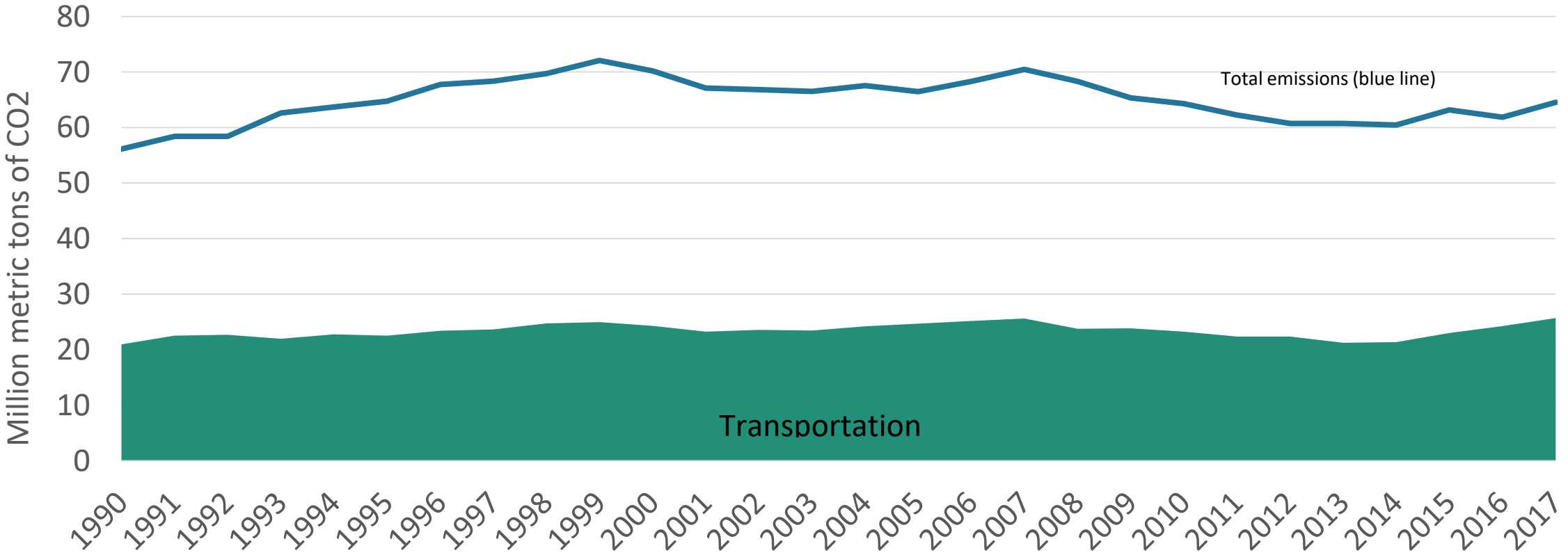
david allaway | allaway.david@state.or.us

Reducing Greenhouse Gas Emissions through Air Quality programs

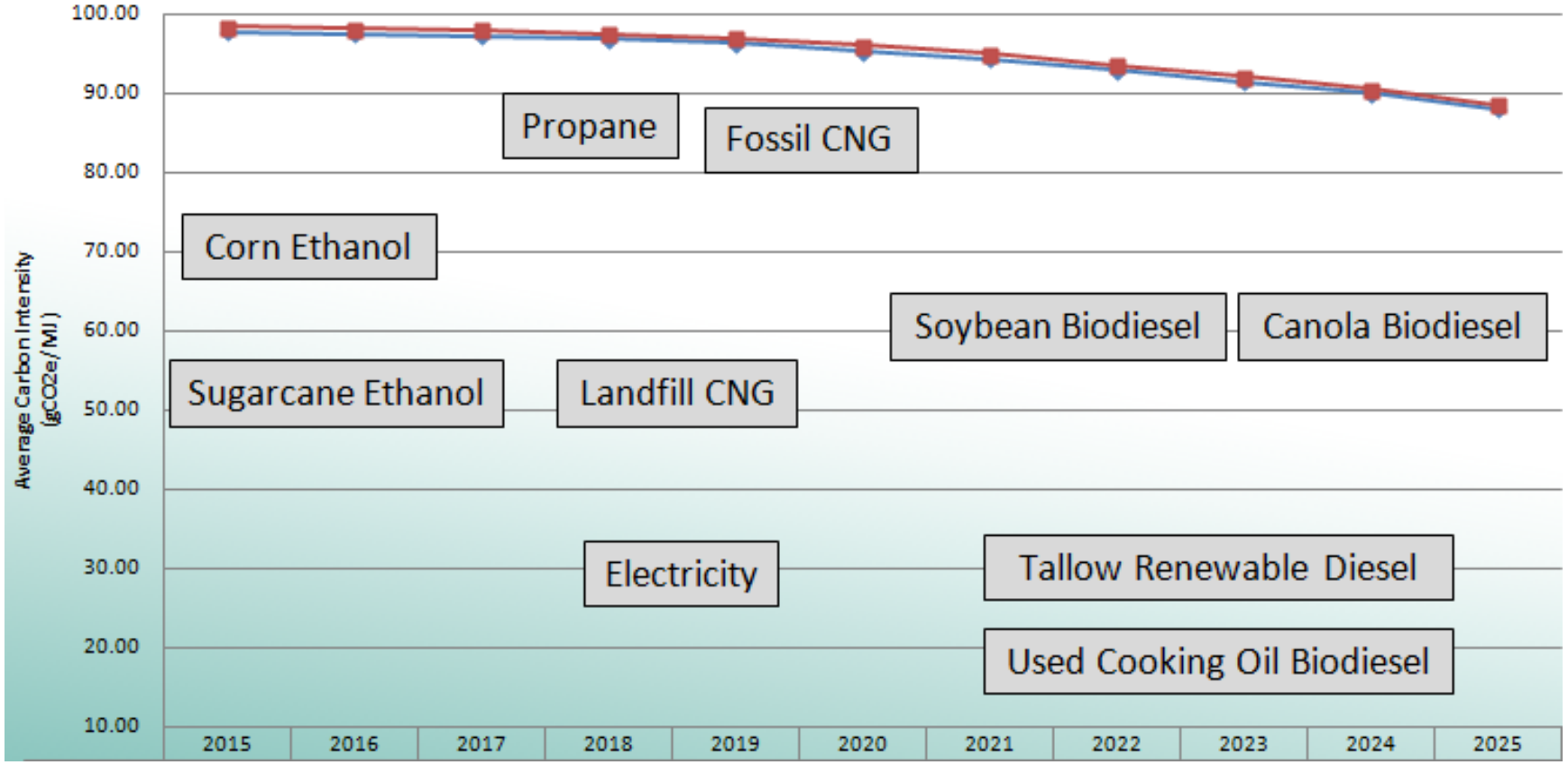
Colin McConnaha
Environmental Quality Commission
Jan. 24, 2019

Transportation GHG emissions

	1990	1995	2000	2005	2010	'11	'12	'13	'14	'15	'16	2017
Transportation	21	23	24	25	23	22	22	21	21	23	24	25.7 (prelim)



Clean Fuels Program



- Reduce the average carbon intensity of fuels in Oregon by 10 percent between 2015 and 2025
- Technology-neutral and market-driven

ZEV Requirement

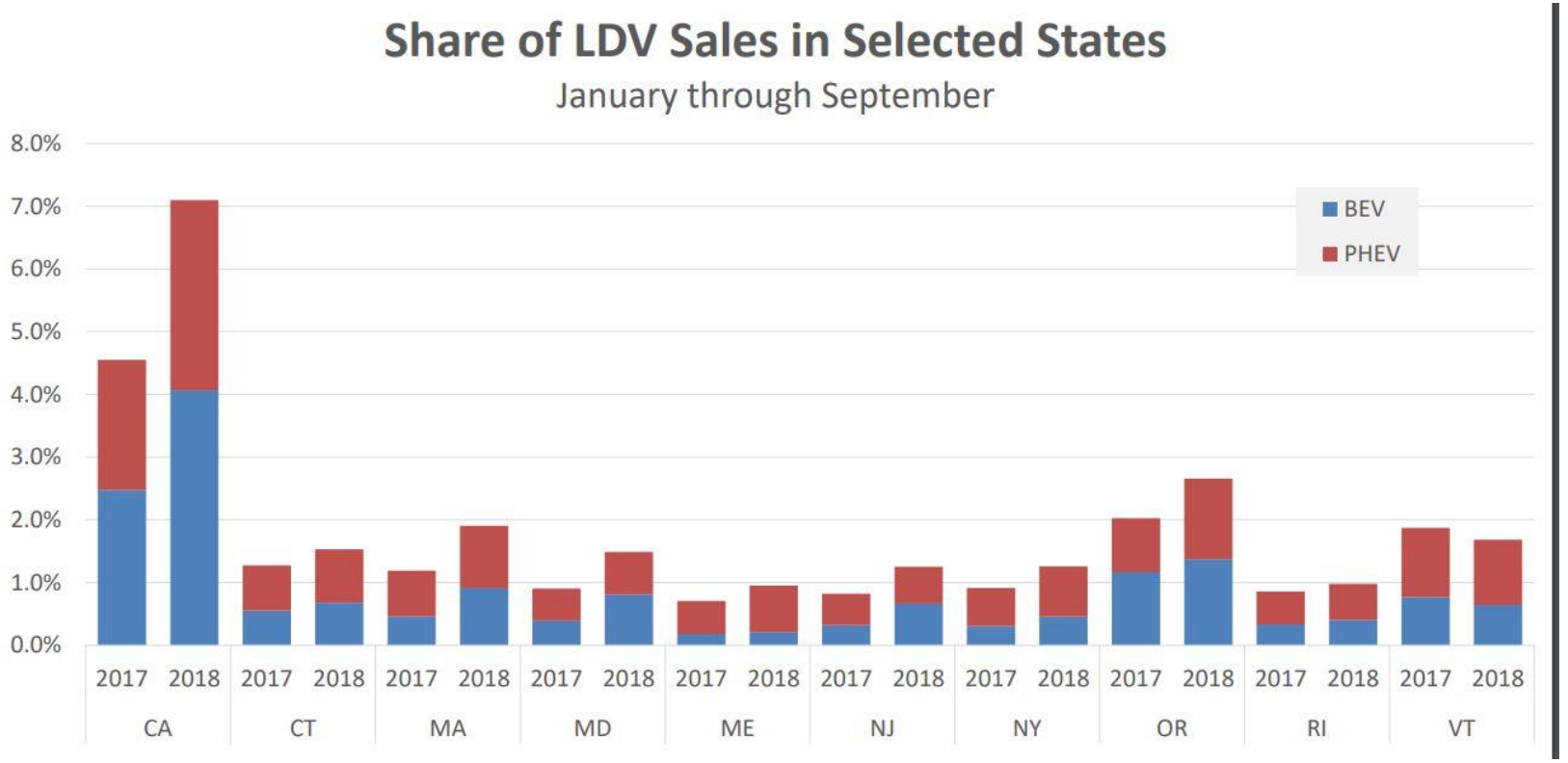
- Oregon adopted the Zero Emission Vehicle program effective with the 2009 model year.
- Requires auto manufacturers to sell electric cars and trucks in Oregon
- Portion of manufacturer sales must be EVs
- Aligned with California requirements for manufacturers
  - Eight other states have also adopted the California requirements

Oregon's EV Rebate Program

- 2017 Legislature funded program to encourage EV purchases in Oregon
  - Purchases after Jan. 1, 2018, eligible
  - Standard rebate up to $2500
  - Charge Ahead Rebate up to additional $2500
- DEQ has started to issue the standard rebates, via agency and retailer mechanisms

ZEVs in Oregon

- Governor Brown issued an Executive Order in 2018
- Goal: 50,000 EVs in Oregon by 2020
- Established an inter-agency work group to accelerate adoption of EVs by state agencies



GHG Reporting Program

2008

EQC adopts GHG reporting rules for industrial facilities

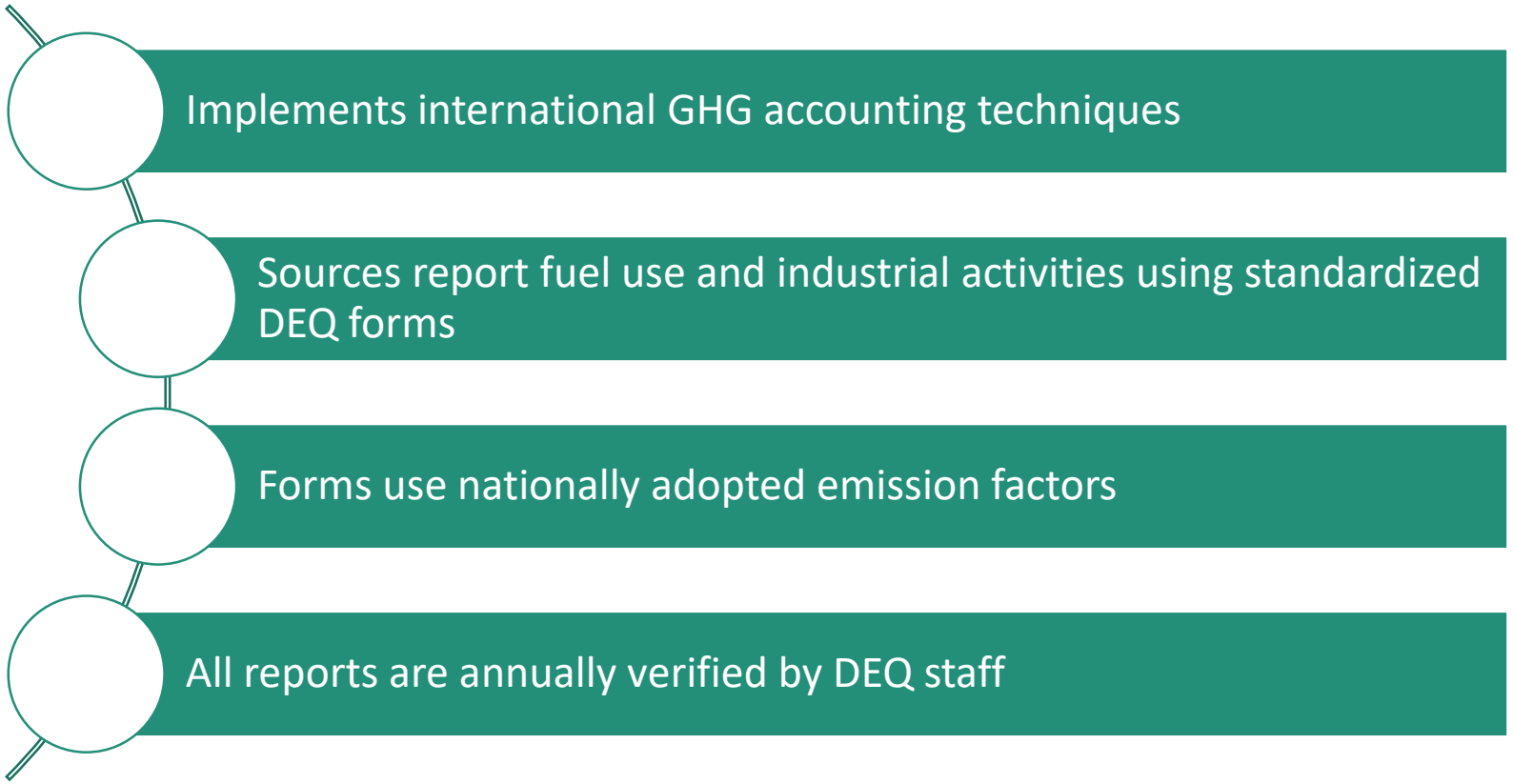
2009

Legislature gives EQC additional authority to collect GHG data from fossil fuel suppliers and utilities

2010

DEQ annually collects GHG data from most sources of emissions in Oregon

Mandatory GHG reporting



2019 Legislative Session

- Cap and Trade Bill: Expected in early February
- Oregon Climate Authority proposed by Gov. Brown