



CITY OF MILWAUKIE

Climate Action Plan



Milwaukie Climate Action Plan
Educational Materials and Goal Setting

Meeting Overview



Purpose

- Provide information related climate change and setting science-based community and operations greenhouse gas (GHG) reduction targets

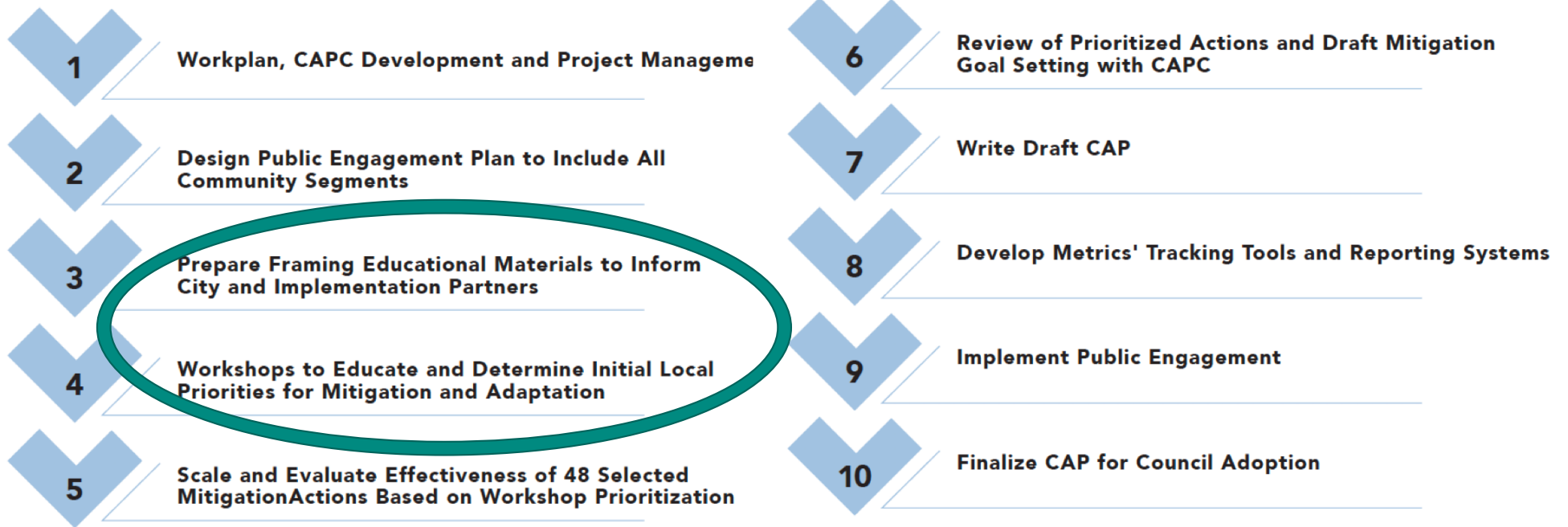
Agenda

- Project overview and schedule
- Review information papers
- Discussion of climate goals and targets

1. CAP Process



TASK



1. CAP Workshops

Mitigation



Building Energy Sourcing & Efficiency		
Renewables & Supply	Conservation & Efficiency	Building Codes & Adaptive Reuse



Land Use and Transportation Planning				
Transit	Active Transportation	Density & Walkable Communities	Zoning Standards	Intellegent Transportation Systems



Vehicle Fleet and Fuels		
Electric and Low-Carbon Fueled Vehicles	Right Sizing	Telematics & Controls



Materials Purchasing, Use and Recovery				
Reducing Consumption	Low Carbon Purchasing	Reuse, Repair & Education	Recycling & Energy Recovery	Biogas & Compost



Adaptation

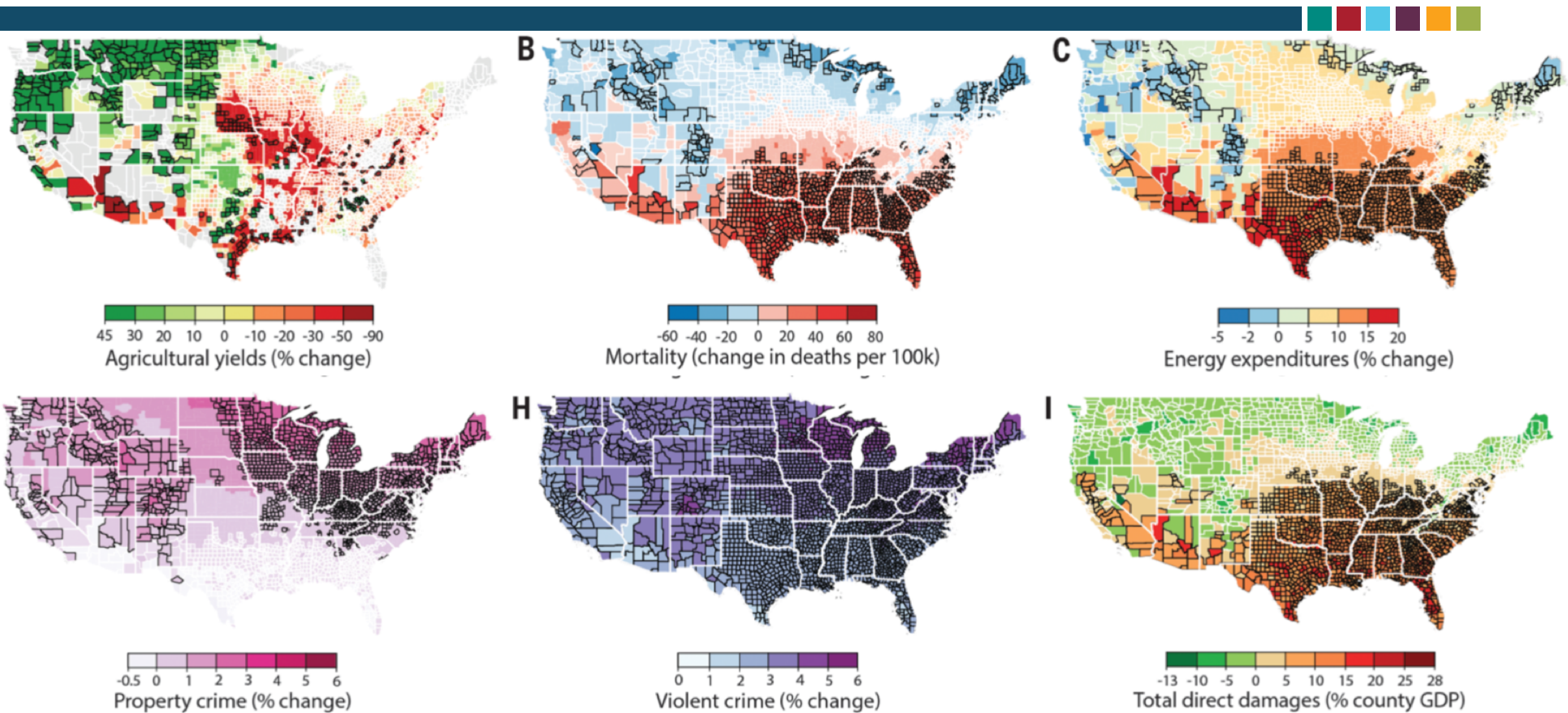


Public Health and Emergency Preparedness				
Disaster Preparedness	Drinking Water Supply	Local Food Supply	Cooling and Warming Centers	Physical and Mental Health



Natural Resources			
Water Access & Infrastructure	Urban Canopy	Habitat	Ecosystem Services

3. Future Physical Conditions – Less vulnerable than most of US



Estimating economic damage from climate change in the United States Hsiang et al., Science 356, 1362–1369 (2017) 30 June 2017

3. Physical: Changes and Impacts



Heat



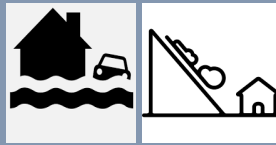
Summers are getting hotter and by 2100 temperatures could rise as much as 10-13 °F in the summer.

Impacts:

- Human health risk
- Physical activity and recreation
- Natural resources

Example: Increased temperatures and duration lead to greater rates of death in vulnerable populations and increased rates of violent crime

Flood, Drought & Winter Storms



Increased storm intensity leads to more flooding and landslide risk. Also precipitation will fall as rain rather than snow reducing water flows and supply.

Impacts:

- Landslide risk
- Ice storm frequency
- Drinking water supply
- Food insecurity
- Fish habitat
- Decreased hydro generation

Example: Greater variability in our weather patterns and more rain vs. snow will impact our everyday lives -- energy, economy, agriculture, and recreation

Wildfire



Wildfire is unlikely to be a direct threat to Milwaukie residents but fires in the region, similar to the summer fires in 2017 are anticipated to increase and impact residents.

Impacts:

- Air and water quality
- Property loss and displacement
- Occupational risk

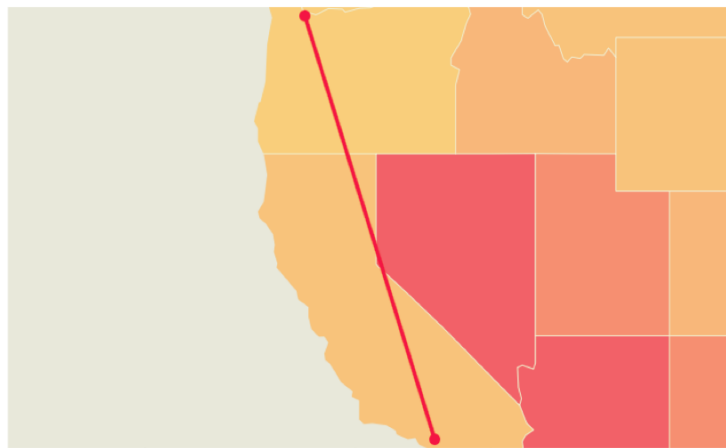
Example: By 2080, median annual forest areas burned will be four times the median annual area of 1916-2007.

3. Future Conditions – Drought and Fire

Summer Temperature

- By 2100, summer is more like San Diego, CA

I live in Portland, OR



By 2100 summers in

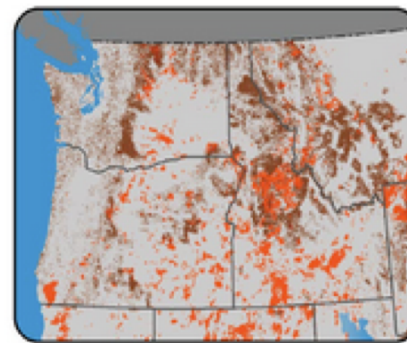
PORTLAND, OR **77.74 °F**

will be like summers now in

DIAMOND BAR, CA **87.75 °F**

CLIMATE CENTRAL

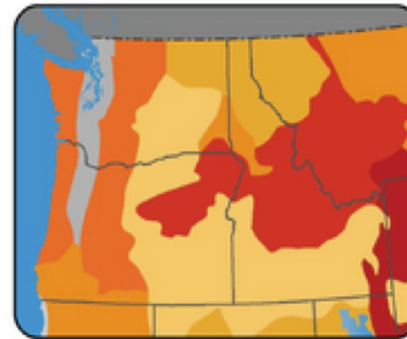
Regional Wildfire Risk



Recent Disturbance

Fire area

Insect and disease area



Projected Increase in Area Burned

600% to 700%

500% to 600%

400% to 500%

300% to 400%

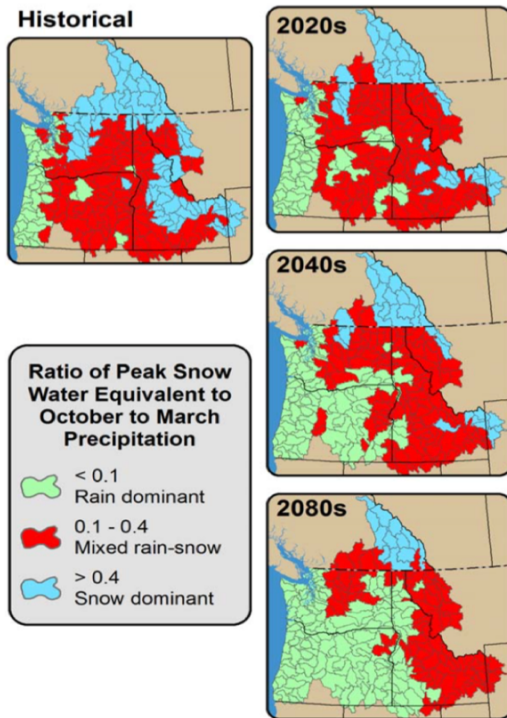
200% to 300%

100% to 200%

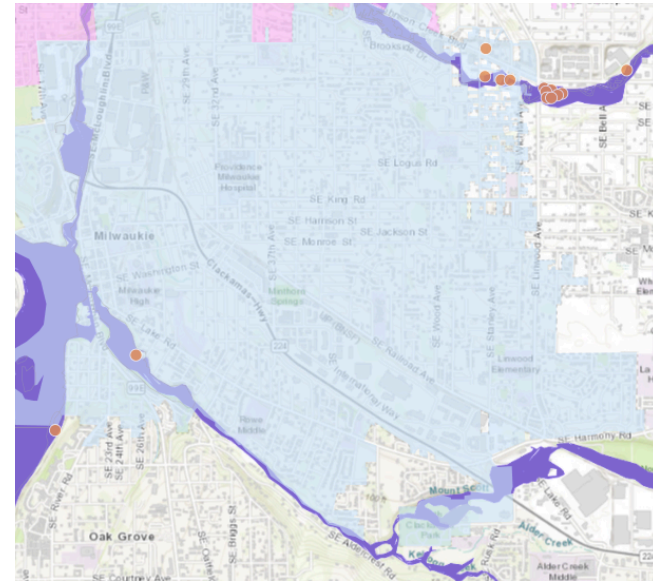
Not modeled

3. Future Conditions- *No Snow, Same Precip*

Water Source Risk



Flood Risk



Locations: SE Johnson Creek Boulevard, Island Station, Lake Road, and Linwood neighborhoods

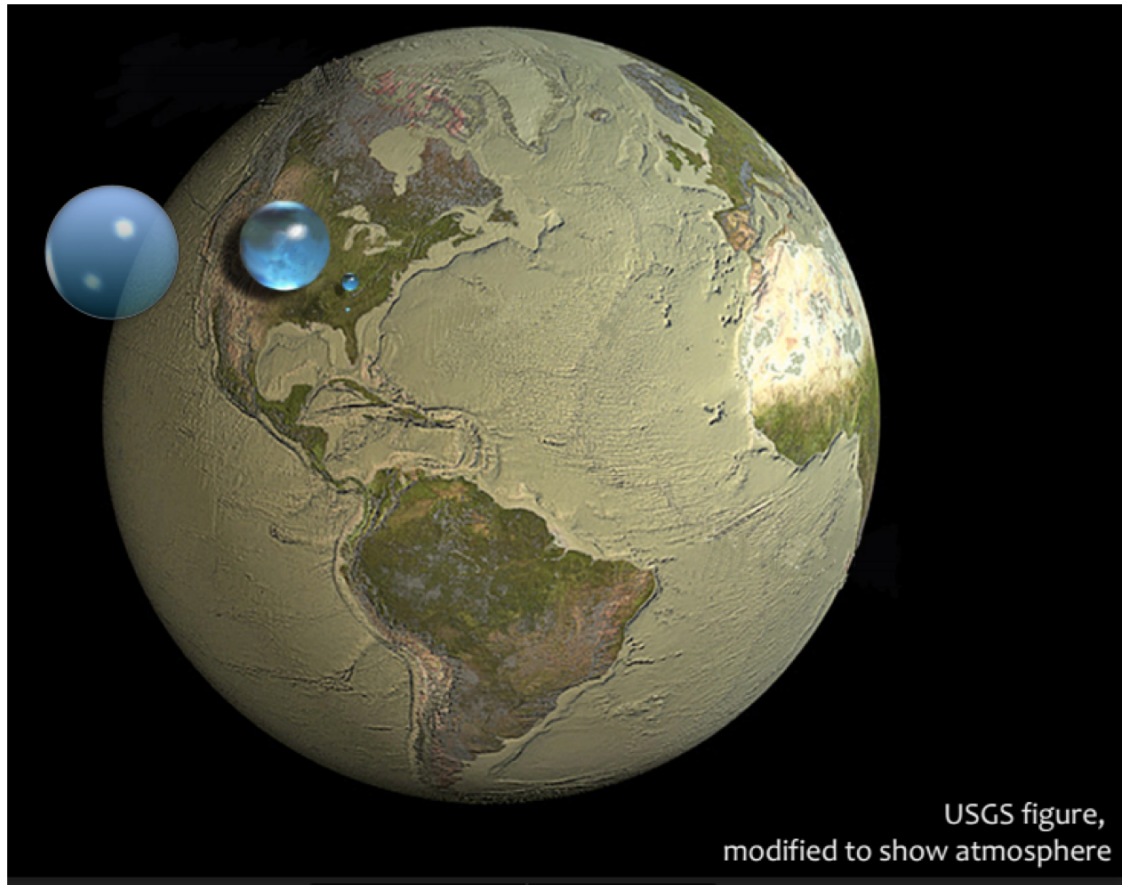
4. 2016 GHG Inventory and BAU Emissions Forecast to 2035



Community emissions inventory considers:

- Building energy
- Transportation
- Refrigerants
- Solid waste
- Water & wastewater energy
- Household consumption of goods, food and services
- City operations

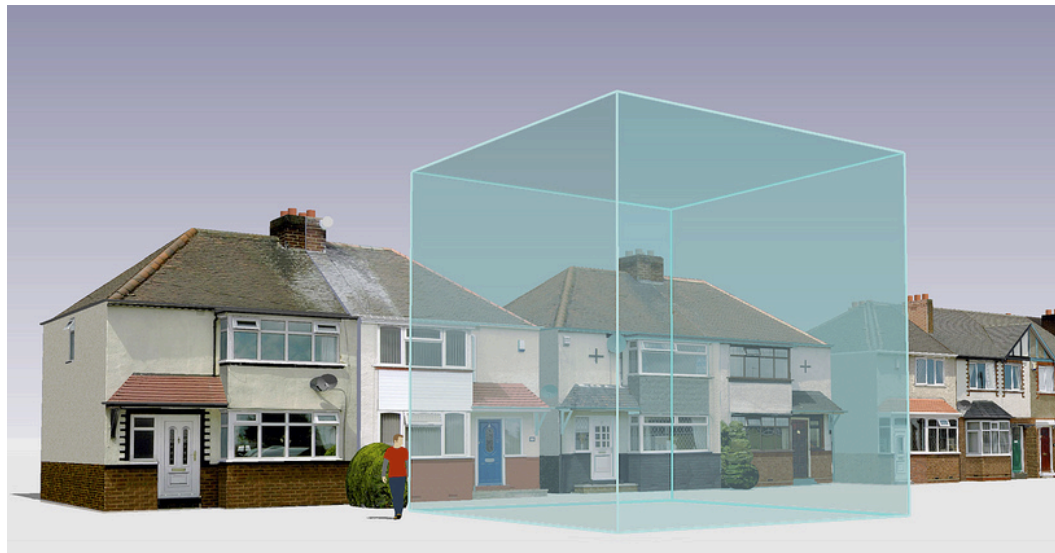
4. GHG: *Context* Our atmosphere is a finite resource



4. GHG: Context

One MT CO₂e is equal to any one of the following:

- 110 gallons of gasoline
- one passenger vehicle driven 2,500 miles
- 10% of one home's energy use for a year
- 34 incandescent bulbs to LEDs over LED lifespan
- 40 propane cylinders for home BBQs
- 1.2 acres of US forest for 1 year

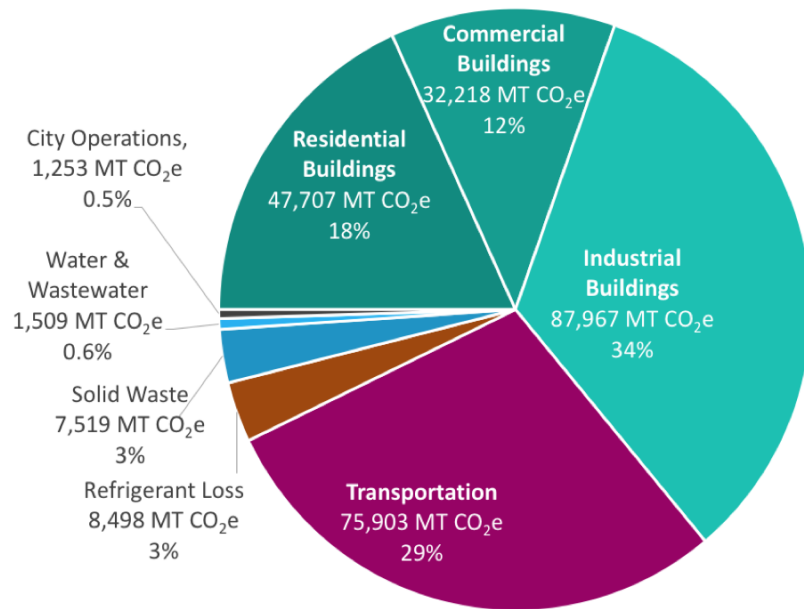


4. GHG: *Inventory Results*

Milwaukee Sector-Based Greenhouse Gas Emissions

262,574 MT CO₂e

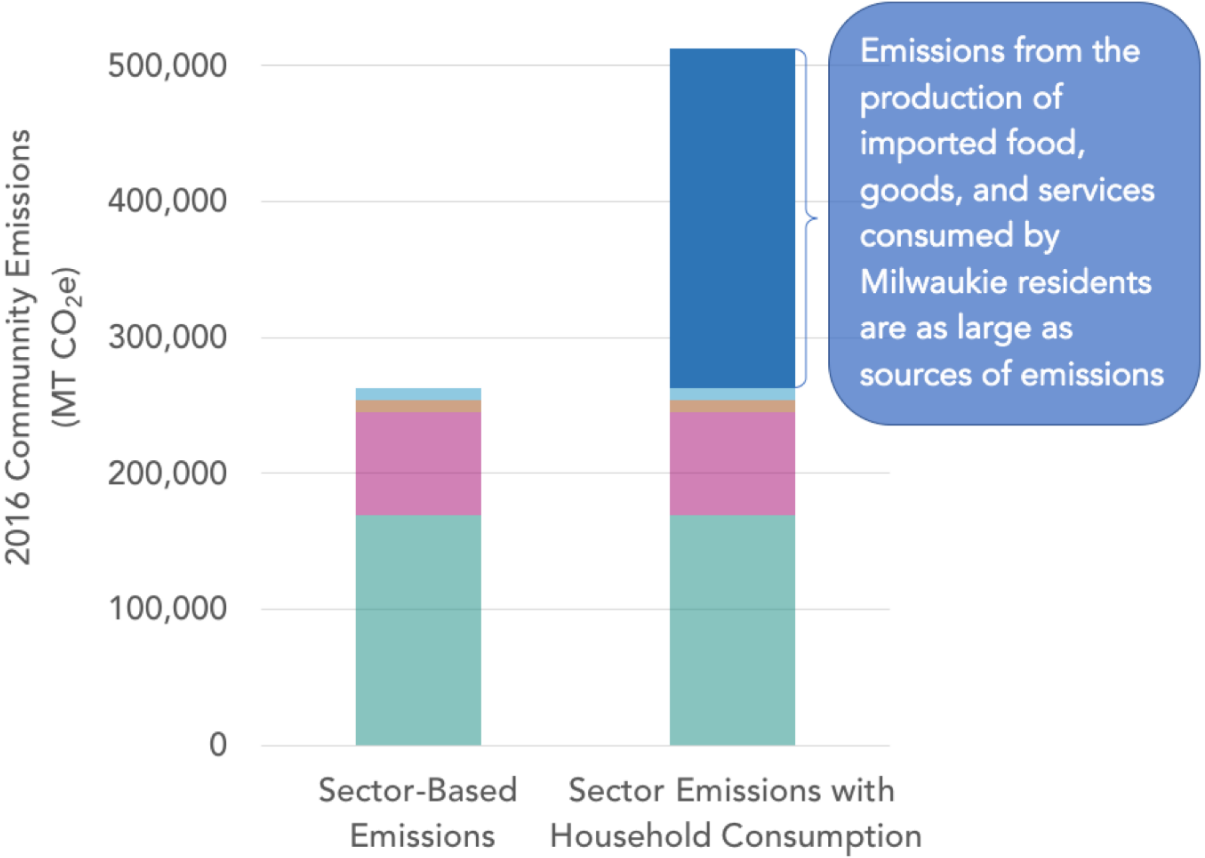
12.7 MT CO₂e per capita



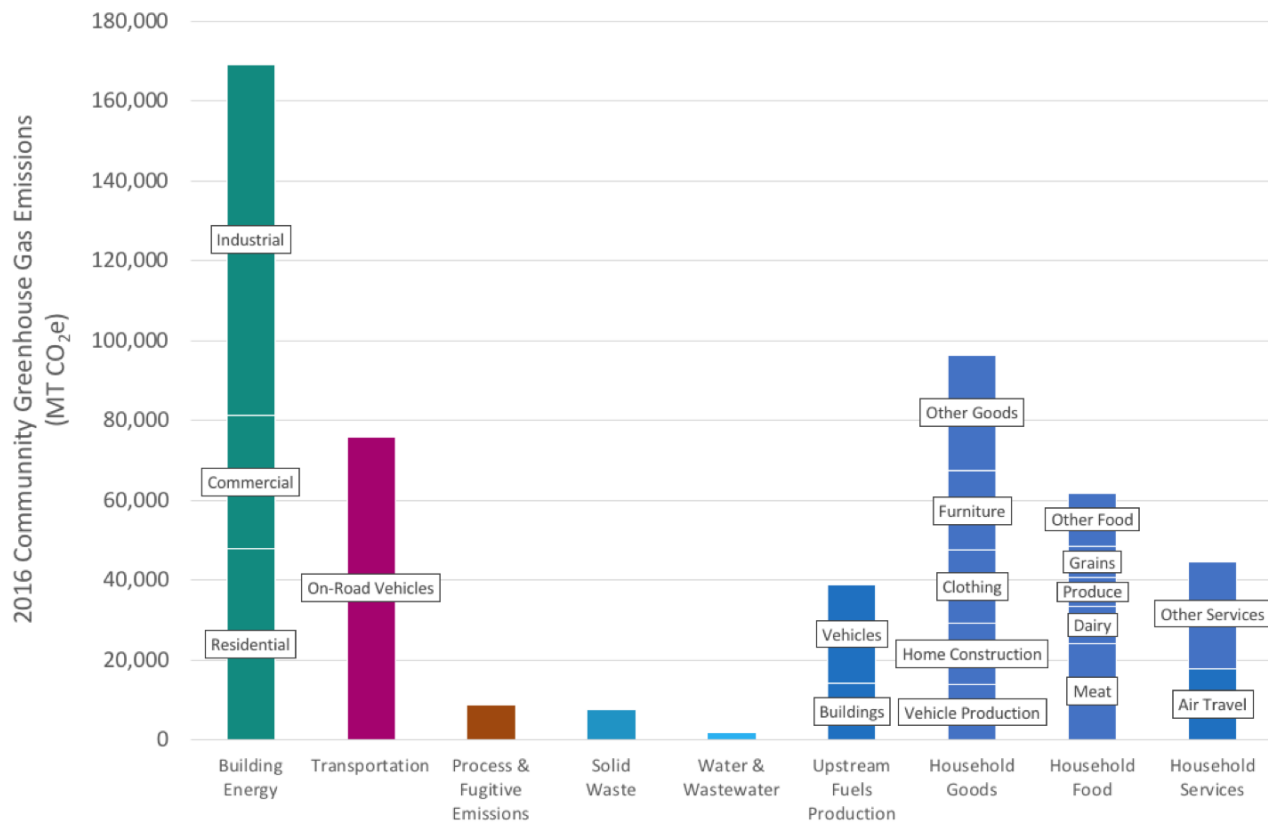
Emissions are the equivalent of:

- carbon sequestered annually by 300,000 acres of U.S. forest
- land area about 200x size of Milwaukee

4. Community Emissions – Household Consumption



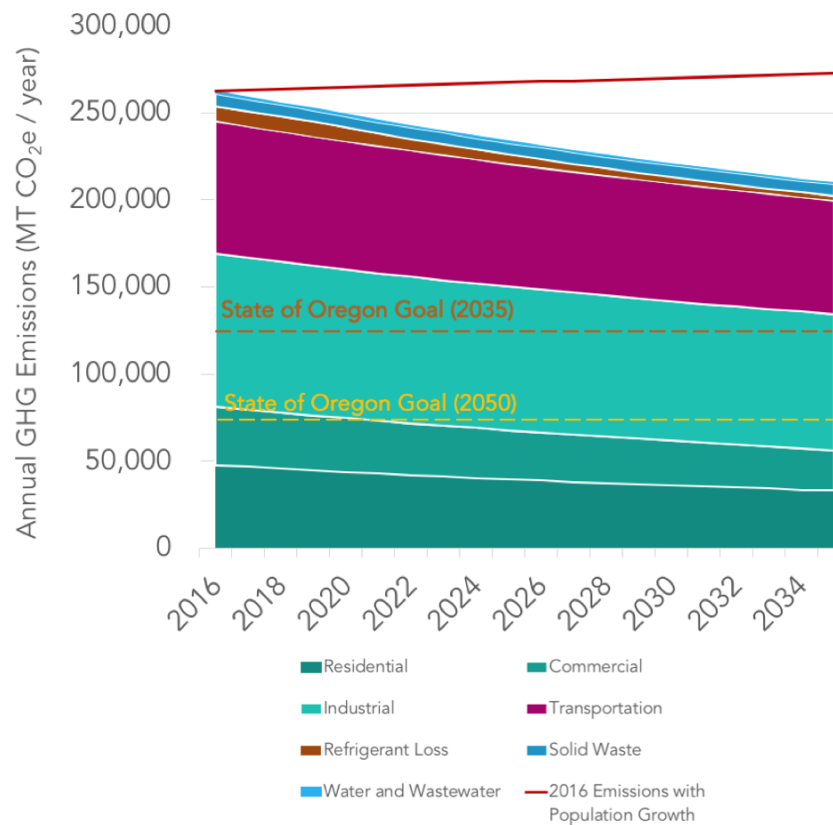
4. GHG: Consumption & Upstream Fuels



4. GHG: Existing Policy Reductions to 2C

Existing Policies:

- RPS: renewable energy
- CAFE standards: fuel economy
- Oregon SB263: food waste recovery
- Montreal Protocol: refrigerants
- Energy Trust of Oregon: cost-effective energy efficiency



Existing State and Federal policies will reduce Milwaukie's local emissions by 16% in 2035 compared to 2016

Emissions will need to be reduced by an additional 35%, by 2035, to meet the State of Oregon's current climate goal (75% reduction by 2050 versus 1990)

5. Policy Authority & Direction

- **Policy assessment:**
 - Reviewed 30 local, regional, state and federal policies by CAP chapter
- **Gaps**
- **Potential opportunities**

5. Policy - Milwaukie Policies



	Materials Purchasing, Use and Recovery	Building Energy Sourcing and Efficiency	Vehicle Fleet and Fuels	Land Use and Transportation Planning	Natural Resources	Public Health and Emergency Preparedness	Resilience
City Specific							
Milwaukie Community Vision	X	X		X	X	X	X
Comprehensive Plan	X	X	X	X	X	X	X
Milwaukie Vision Statement				X		X	
Central Milwaukie Land Use and Transportation Plan	X			X	X	X	
Milwaukie Downtown and Riverfront Land Use Framework Plan				X	X	X	
Transportation System Plan			X	X		X	
Water Master Plan				X	X	X	X
Wastewater Master Plan					X	X	X
Stormwater Master Plan				X	X	X	X
Park Plans: - Robert Kronberg Nature Park Master Plan - Bowman-Brae Park Master Plan - Balfour Park Master Plan				X	X	X	

5. Policy - Community & Regional Partners



	Materials Purchasing, Use and Recovery	Building Energy Sourcing and Efficiency	Vehicle Fleet and Fuels	Land Use and Transportation Planning	Natural Resources	Public Health and Emergency Preparedness	Resilience
Community and Regional Partners							
Clackamas County Sustainability Policy	X	X	X	X	X	X	X
Clackamas County Natural Hazards Mitigation Plan		X		X	X	X	X
North Clackamas Parks Recreation District - North Side Master Plan					X		X
North Clackamas SD#12		X					
Portland General Electric Integrated Resource Plan		X	X	X			X
Energy Trust of Oregon Strategic Plan & Annual Report		X				X	
Metro Climate Smart Strategy & Implementation		X		X		X	
Metro 2018 Regional Transportation Plan							
Oregon DEQ Materials Management Vision	X						
Regional Water Providers Consortium Strategic Plan					X	X	X

5. Policy - State and Federal



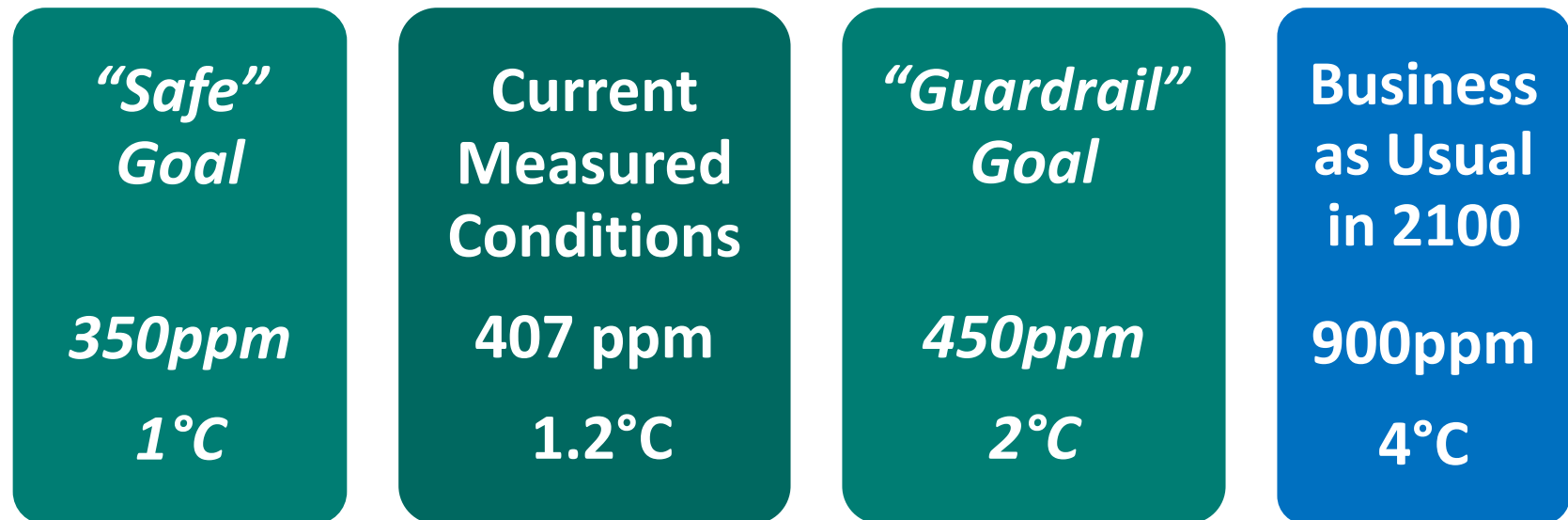
	Materials Purchasing, Use and Recovery	Building Energy Sourcing and Efficiency	Vehicle Fleet and Fuels	Land Use and Transportation Planning	Natural Resources	Public Health and Emergency Preparedness	Resilience
State and Federal Level							
Oregon Renewable Portfolio Standard (RPS)		X					
State of Oregon - Biennial Energy Plan	X	X		X			
Oregon 10 Year Energy Plan	X	X	X	X			
Oregon Statewide Planning Goals		X	X	X	X	X	X
State of Oregon - GHG Goals	X	X		X	X	X	
Climate and Health Resilience Plan						X	X
Oregon SB 263 Recovery Goals	X						
Senate Bill 1547 Oregon Clean Electricity & Coal Transition Plan		X				X	
Oregon Clean Fuels Program			X				
Federal CAFE Standards			X				

6. What is a science-based target (SBT)?



- **SBTs are aligned with keeping global temperature increases below 2°C compared to pre-industrial era**
 - Temperature targets commonly discussed are between 1°C (350ppm) and 2°C (450ppm)
 - All SBTs require zero emissions in the future
 - Imported emissions are not included
 - All SBTs include emissions reductions and implementation of “negative emissions” strategies and technologies

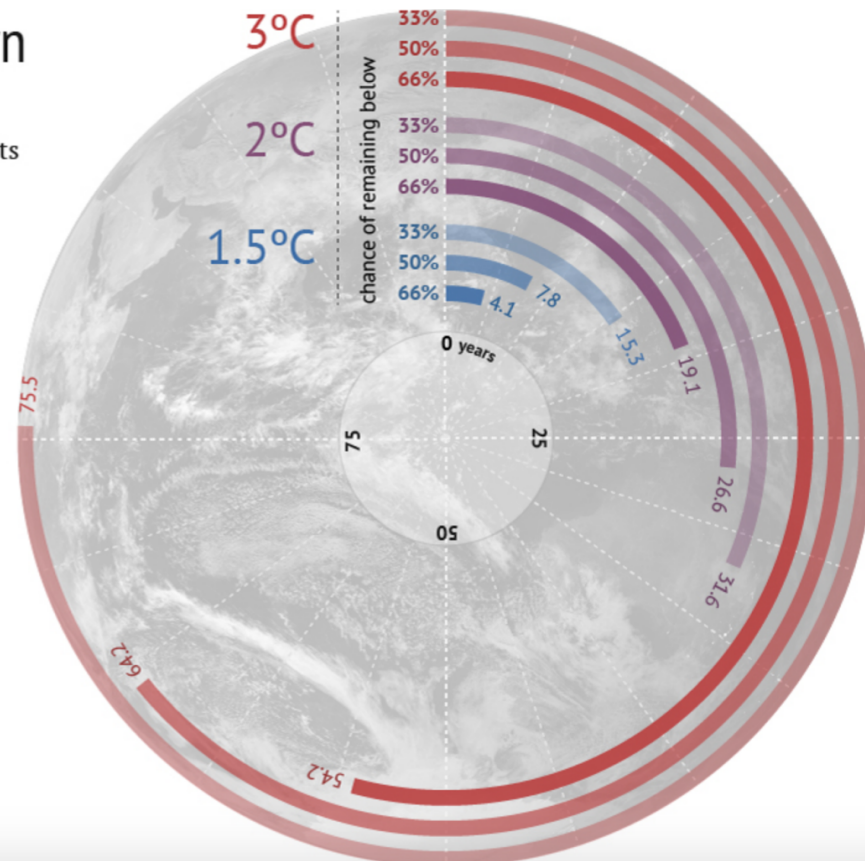
6. Comparing SBT with Current Conditions



6. SBTs and carbon budgets – as of 4/17

Carbon Countdown

How many years of current emissions would use up the IPCC's carbon budgets for different levels of warming?

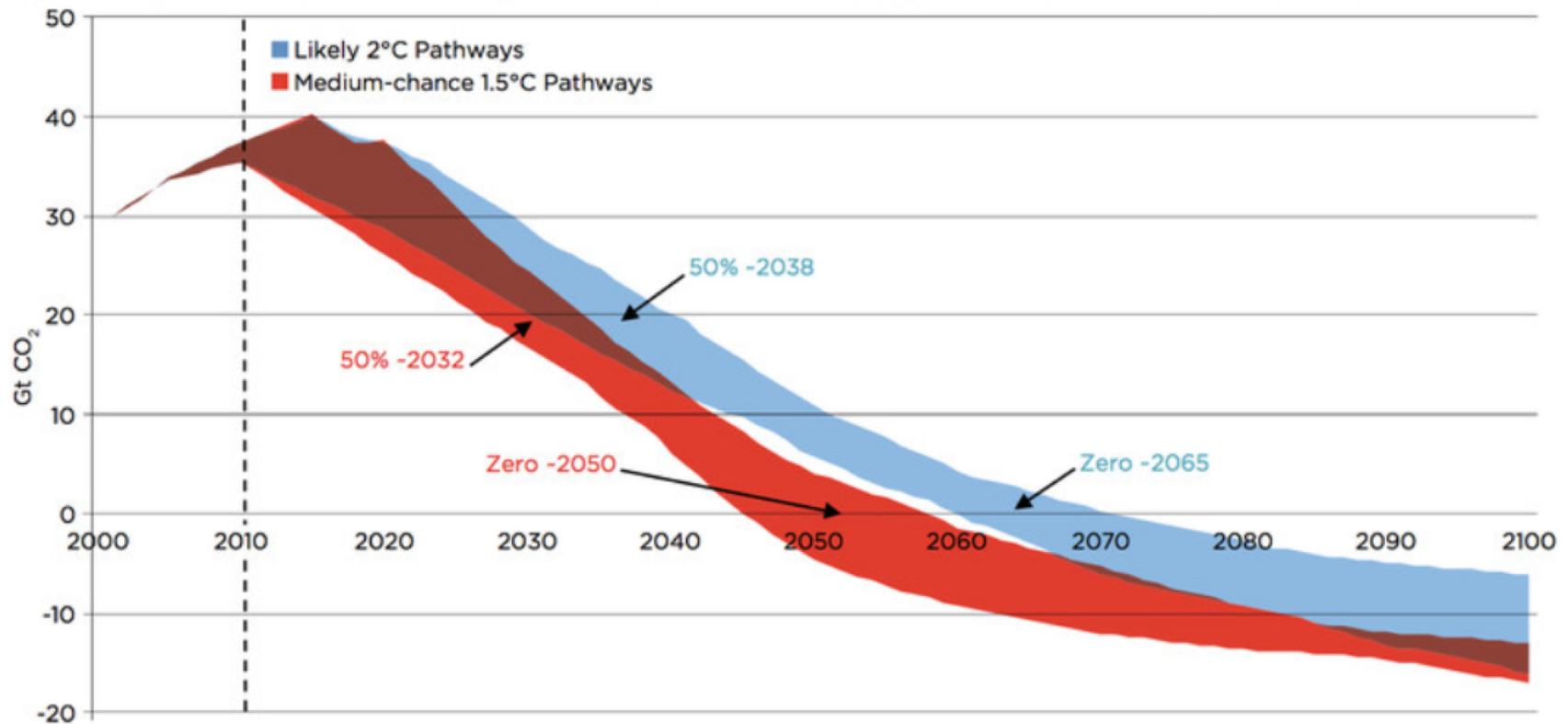


CarbonBrief
CLEAR ON CLIMATE

Photo: NASA Goddard Space Flight Center
Stopwatch icon: T-Kot/Shutterstock.com

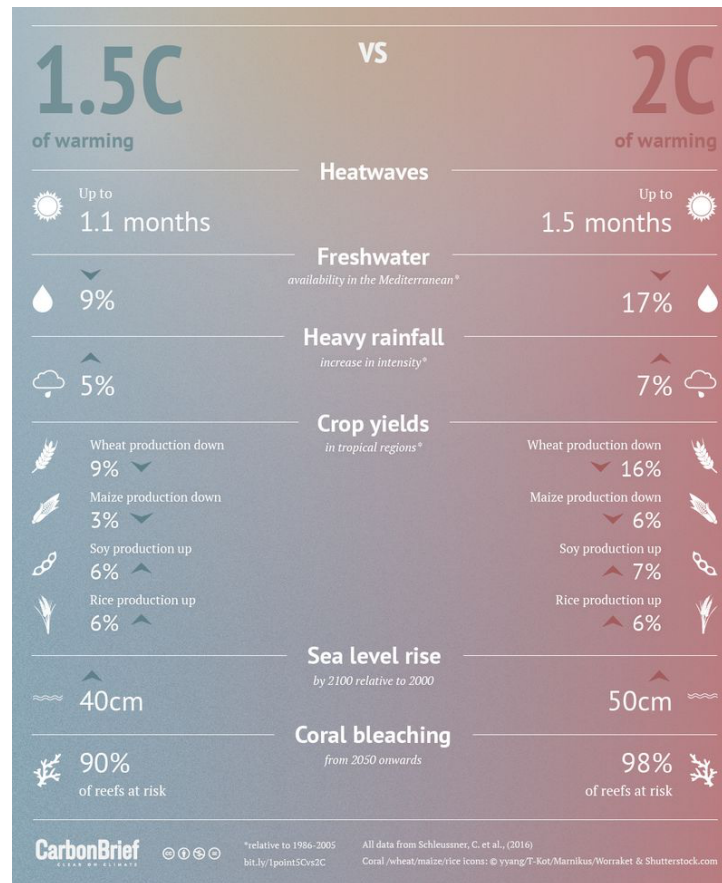
6. Comparing emissions reductions for SBTs

Figure 1: Range of Global Emissions Pathways in Scenarios Consistent with Likely Chance of 2°C or Medium Chance of 1.5°C¹⁸



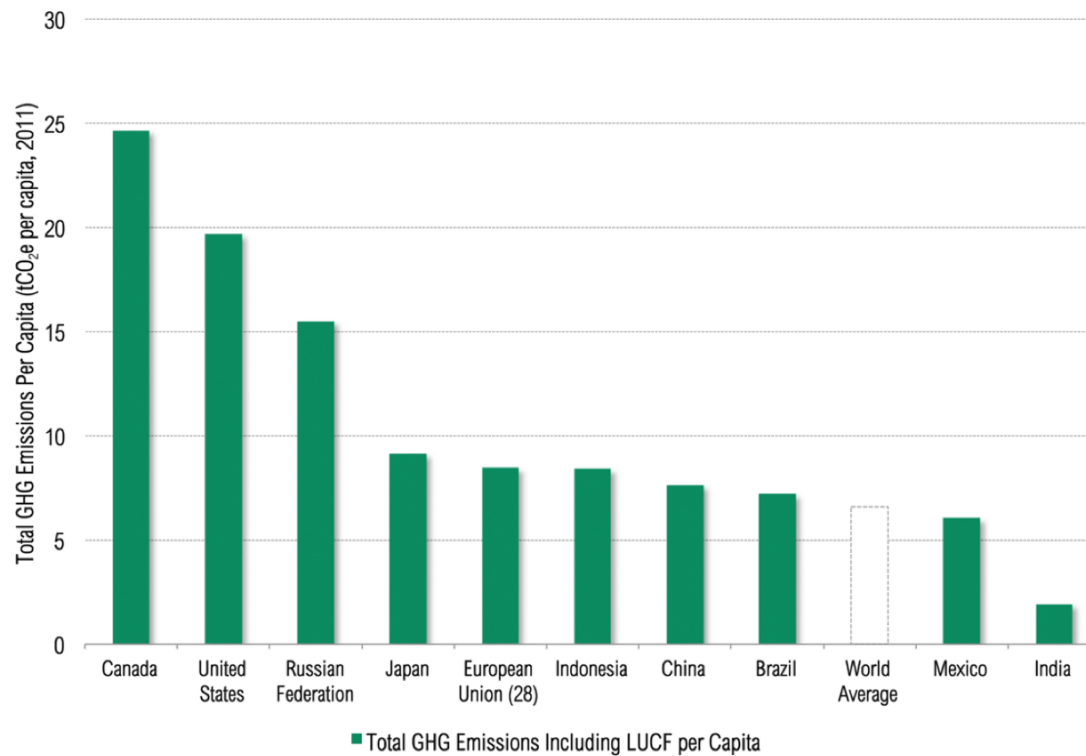
Sources: Joeri Rogelj et al

6. SBTs and physical impacts of climate change



6. Comparison of 2014 Global Per Capita Emissions

Per Capita Emissions for Top 10 Emitters



<http://bit.ly/11SMpjA>

6. Mitigation requirements compared to 2010

Target	Cummulative Reduction			Average Annual Reduction
	2020	2030	2050	
2°C	10%	35%	80%	2%
1.5°C	13%	50%	90%	5%
1°C	15%	70%	100%	8%

Note: All targets include negative emissions goals after 2030.

6. Benchmarking community targets



Community	Target(s)
State of Oregon	75% reduction by 2050 compared to 1990 (2°C Goal, 2% annual)
City of Portland	80% reduction by 2050 compared to 1990
City of Corvallis	75% reduction by 2050 compared to 1990
City of Eugene	8% annual GHG reduction (1°C Goal); 50% fossil fuel reduction by 2030; Government carbon neutral by 2020
City of Ashland	8% annual GHG reduction; 50% fossil fuel reduction by 2030; Government carbon neutral by 2030
City of Bend	40% reduction in fossil fuel use by 2030; 70% by 2050 (compared to 2010); Government carbon neutral by 2030

6. Reductions needed for 2°C Goal

