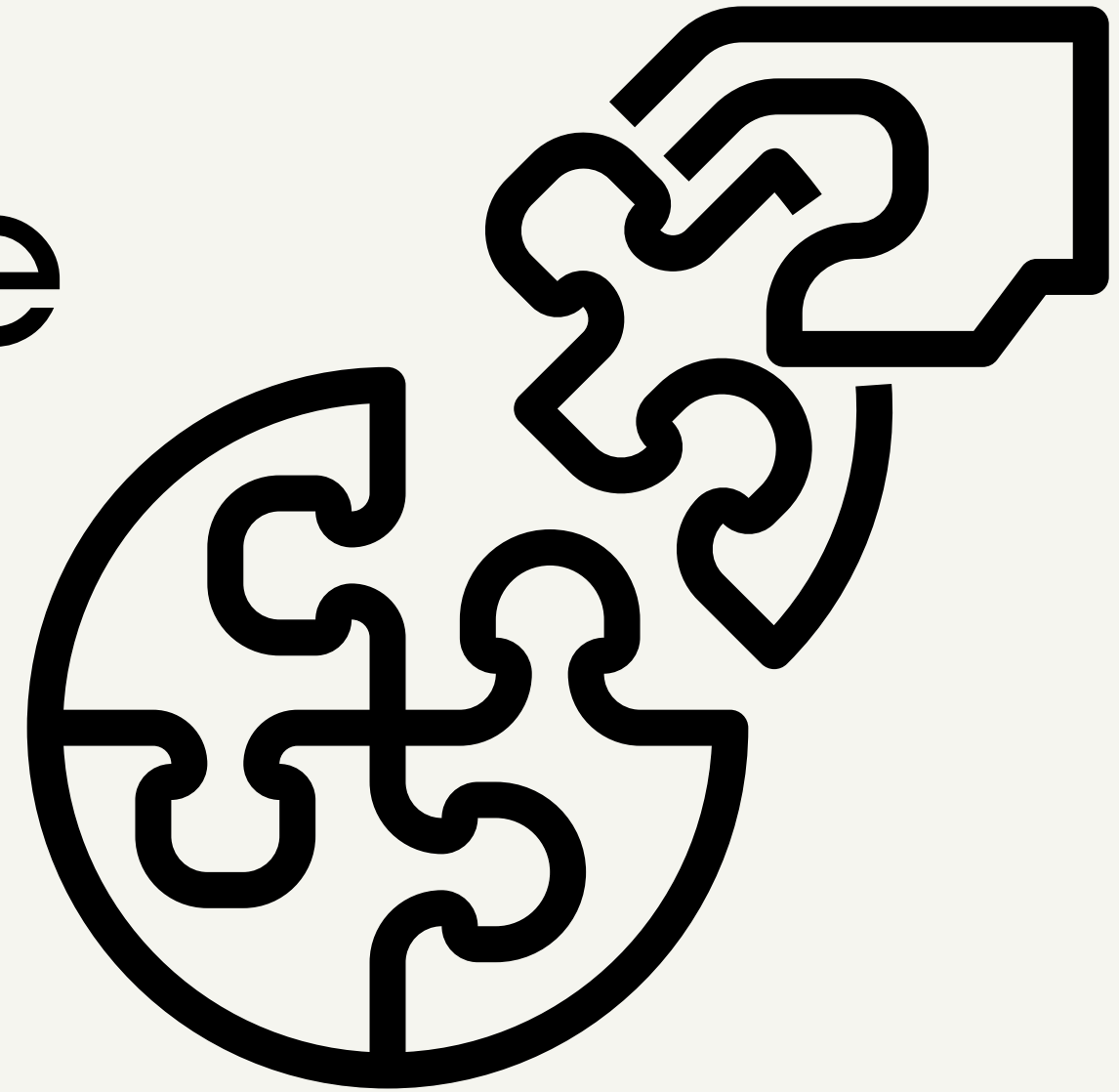
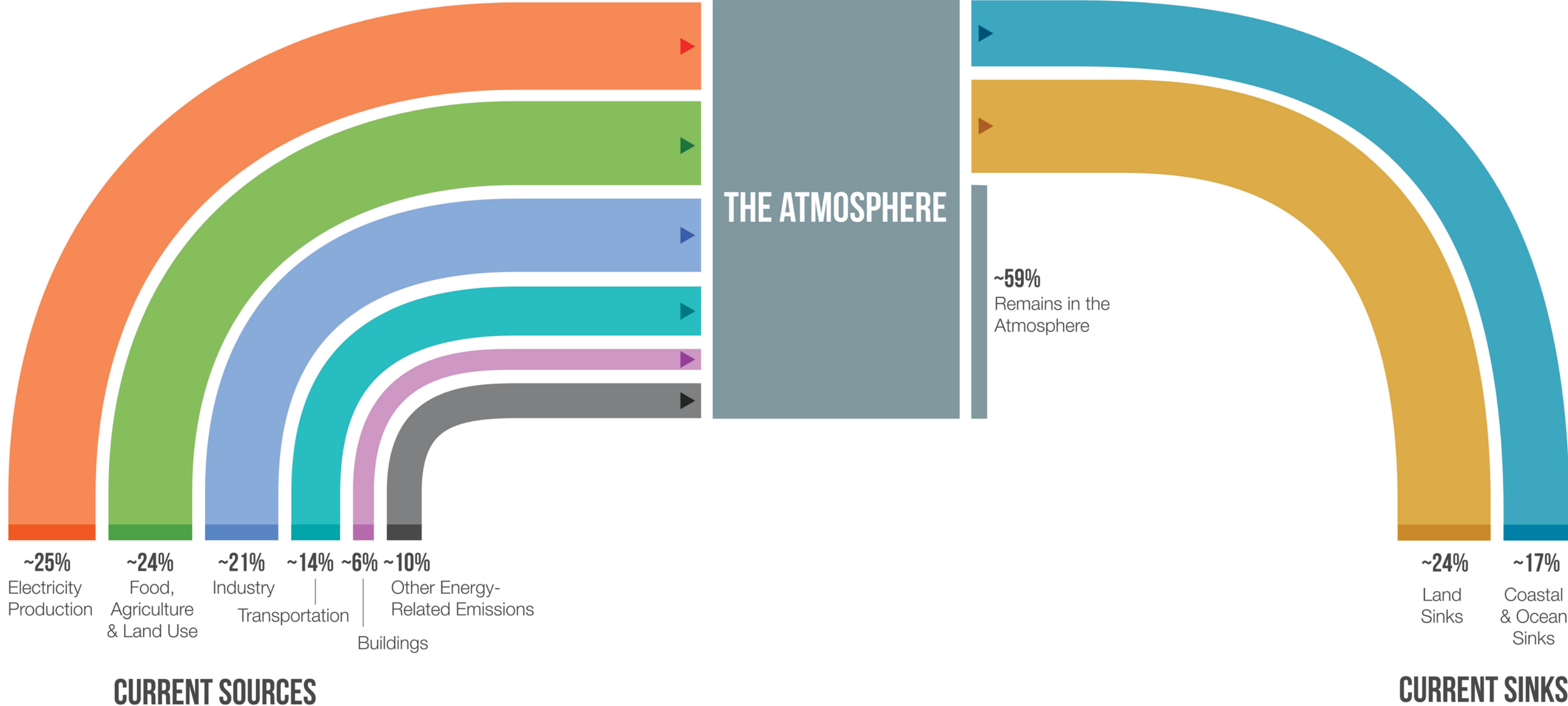


# Climate Change Solutions

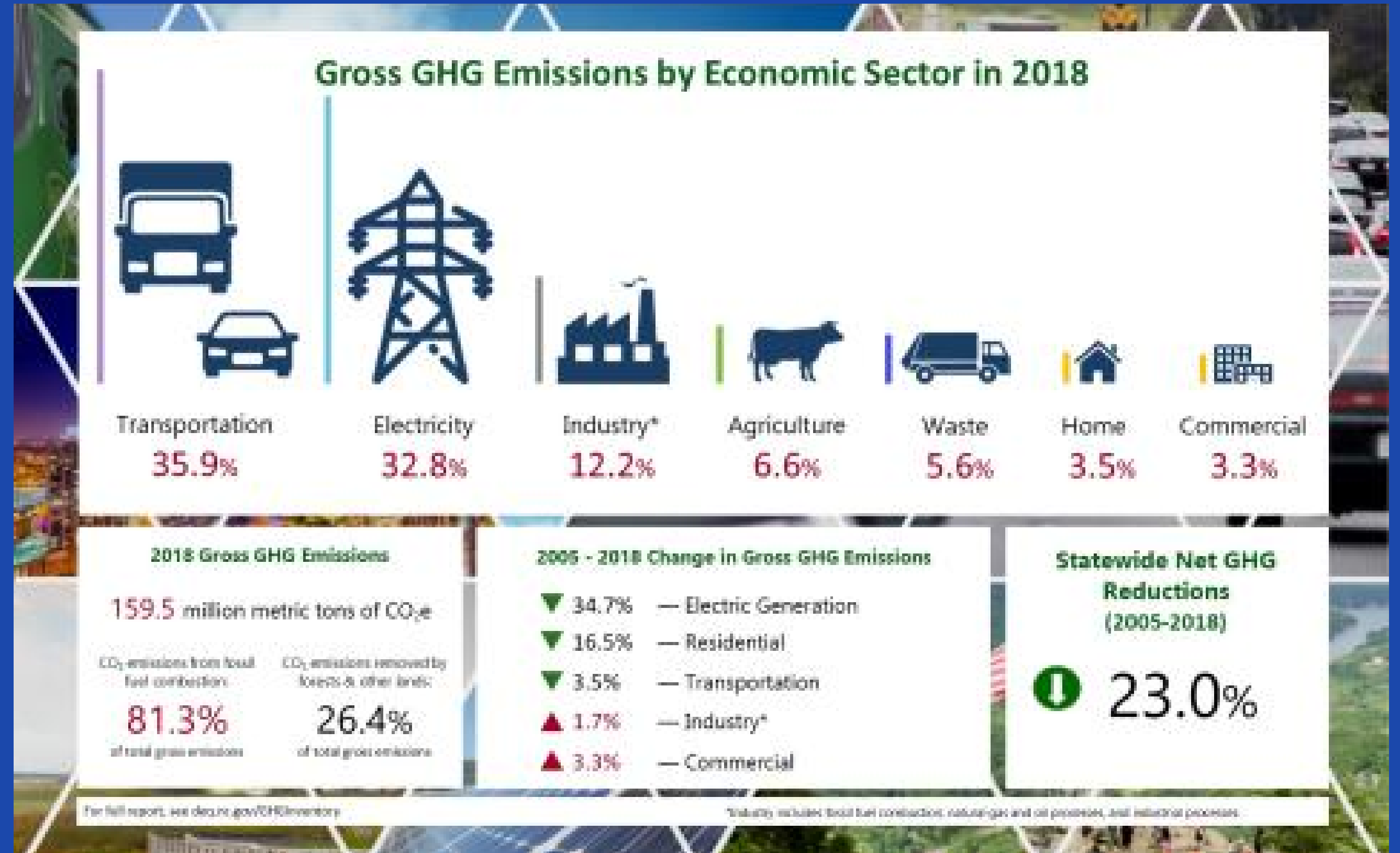


Part 3: Climate Change Program

# EMISSIONS SOURCES & NATURAL SINKS GLOBAL

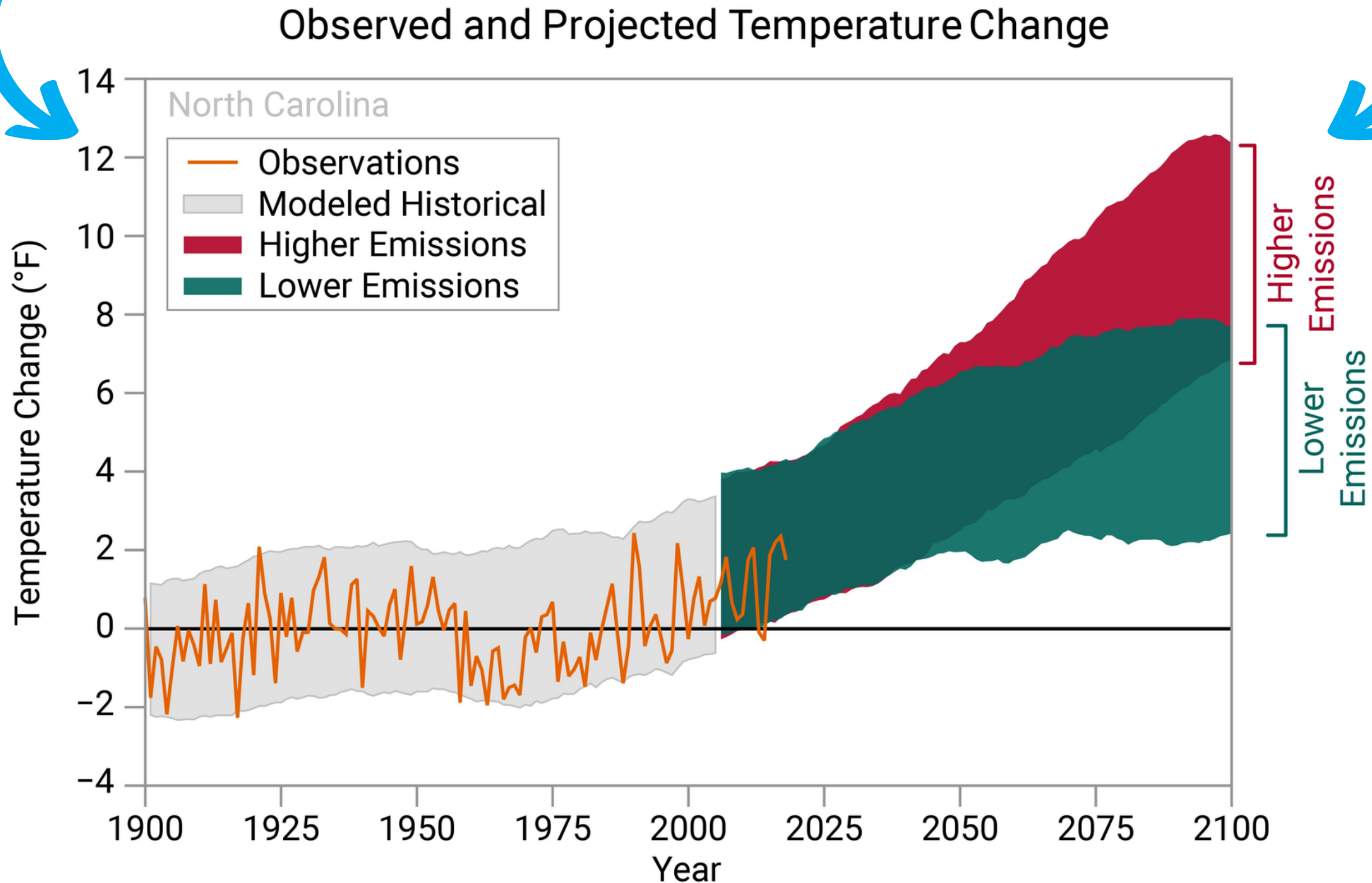


# North Carolina Greenhouse Gas Inventory



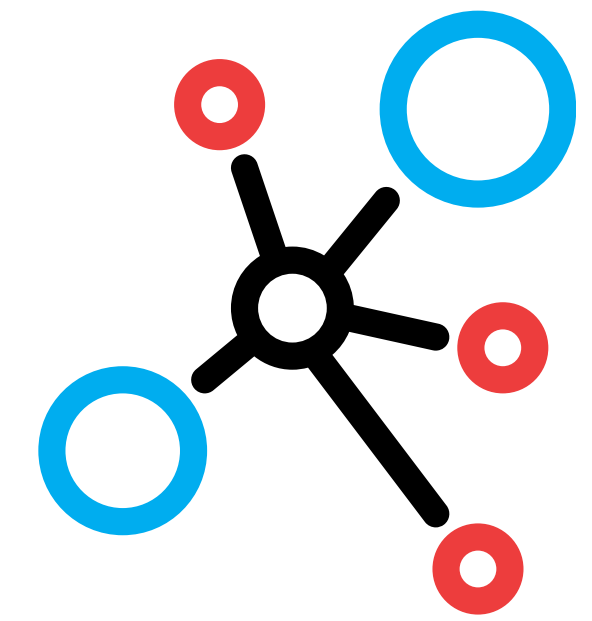
NC DEQ Greenhouse Gas Inventory:  
<https://deq.nc.gov/energy-climate/climate-change/greenhouse-gas-inventory>

# Future warming depends on future emissions



Graph Source: [National Climate Assessment State Climate Summaries](#)

# DIMENSIONS OF ACTIONS



## Adaptation

Actions taken at the individual, local, regional, and national levels to reduce risks from even today's changed climate conditions and to prepare for impacts from additional changes projected for the future.

## Mitigation

Actions to reduce the amount and speed of future climate change by limiting emissions or removing carbon dioxide from the atmosphere.

## Individual

Actions taken by individuals (e.g., things **you** can do)

## Collective

Things that can be accomplished by many people working together (e.g., governments)




Can YOU Fix Climate Change?



Share

**NO\***

Watch on  YouTube

[https://www.youtube.com/watch?v=yiw6\\_JakZFc](https://www.youtube.com/watch?v=yiw6_JakZFc)



# Video Reflection

What are 1-3 words that come to mind that describe how you're feeling about climate change after watching this video?

---

What is your reaction to the last point in the video? (about changing behavior for *systemic* change)

---

What questions do you have after watching this video?



# Climate Change Mitigation



Mitigation refers to activities that are intended to slow or stop climate change by reducing the amount of greenhouse gases in the atmosphere.

---

**What is mitigation?**

Brainstorm: what types of systemic changes are needed to mitigate climate change? How can actions in our own communities support climate mitigation?

---

**Systemic Change**

Individuals can implement behaviors that lower their personal carbon footprint, such as driving less, buying local produce or installing solar panels.

---

**Individual Action**





# Tools for Exploring Mitigation

## **En-Roads**

An interactive tool to explore global climate mitigation




<https://en-roads.climateinteractive.org/>

# Tools for Exploring Mitigation

## iTree

Estimates the amount of carbon dioxide and pollution a tree removes from the air, as well as the amount of stormwater it can help mitigate.

<https://mytree.itreetools.org/>

<b>MyTree Benefits</b> 	
tuliptree spp, ( <i>Liriodendron</i> )	
Serving Size: 24.00 in. diameter	
Condition: Good	
Total benefits for this year: <b>\$28.87</b>	
<hr/>	
<b>Carbon Dioxide (CO<sub>2</sub>) Sequestered</b>	<b>\$14.02</b>
Annual CO <sub>2</sub> equivalent of carbon <sup>1</sup>	602.96 lbs
<hr/>	
<b>Storm Water Runoff Avoided</b>	<b>\$1.94</b>
Runoff Avoided	217.57 gal
Rainfall Intercepted	2,523.74 gal
<hr/>	
<b>Air Pollution Removed Each Year</b>	<b>\$3.94</b>
Carbon Monoxide	0.41 oz
Ozone	24.49 oz
Nitrogen Dioxide	1.48 oz
Sulfur Dioxide	0.15 oz
PM <sub>2.5</sub>	2.17 oz

<b>Energy Usage Per Year<sup>2</sup></b>	<b>\$7.16</b>
Electricity Savings (A/C)	52.12 kWh
Fuel Savings (natural gas, oil)	0.07 MMBtu
<hr/>	
<b>Avoided Energy Emissions</b>	<b>\$1.82</b>
Carbon Dioxide	78.13 lbs
Carbon Monoxide	0.43 oz
Nitrogen Dioxide	0.16 oz
Sulfur Dioxide	2.13 oz
PM <sub>2.5</sub>	0.35 oz
<hr/>	
<b>CO<sub>2</sub> Stored To Date<sup>3</sup></b>	<b>\$570.55</b>
Lifetime CO <sub>2</sub> equivalent of carbon <sup>3</sup>	24,532.15 lbs

Benefits are estimated based on USDA Forest Service Research and are meant for guidance only.

<sup>1</sup> For large trees sequestration is overtaken by CO<sub>2</sub> loss with decay/maintenance.

<sup>2</sup> Positive energy values indicate savings or reduced emissions. Negative energy values indicate increased usage or emissions.

<sup>3</sup> Not an annual amount or value.

# Tools for Exploring Mitigation

## EPA Household Carbon Footprint Calculator

Estimates users' footprint in three areas: home energy, transportation and waste.

The screenshot shows the EPA Household Carbon Footprint Calculator interface. The main section is titled "[ - ] Your Current Emissions from Home Energy". It is divided into two parts: "Heating" and "Utility".

**Heating:** A question asks "What is your household's primary heating source?" with a dropdown menu labeled "Select Source".

**Utility:** A question asks "Enter your average monthly bill or other data for each source of energy your household uses." with a note "Click the icons, ⓘ below for each U.S. average". Below this are four input fields for different energy sources, each with a dropdown menu for the unit (all set to "Dollars") and a green bar at the bottom showing "0 lbs.":

- Natural Gas ⓘ:** Input field, "Dollars" dropdown, "0 lbs." result.
- Electricity ⓘ:** Input field, "Dollars" dropdown, "% electricity that is G ⓘ" input field, "0 lbs." result.
- Fuel Oil ⓘ:** Input field, "Dollars" dropdown, "0 lbs." result.
- Propane ⓘ:** Input field, "Dollars" dropdown, "0 lbs." result.

At the bottom of the utility section, it says "Estimated pounds of CO<sub>2</sub>/year".

**Your Carbon Footprint:** A sidebar on the right shows the overall results:

- Annual CO<sub>2</sub> emissions (lbs.) ⓘ
- Your Current Total: 0
- New Total After Your Planned Actions: 0
- U.S. Average\*: 0
- \*for a household of 2 people in Zip Code 27502
- Buttons: "Start Over" and "View Your Report"

<https://www3.epa.gov/carbon-footprint-calculator/>

# Mitigation Actions for Gardeners



# Factsheet

NC STATE

EXTENSION

## Climate Resilient Landscaping

Keys to adaptive, healthy home landscapes

[https://drive.google.com/file/d/1D0O4RNeqhnGDcKkVX\\_j1ldImrZk73Qsf/view](https://drive.google.com/file/d/1D0O4RNeqhnGDcKkVX_j1ldImrZk73Qsf/view)



**Recycle:** Green waste discarded in a landfill produces methane gas which traps 30 times more heat than carbon dioxide! Keep organic materials out of landfills by composting food and yard waste.



**Repurpose:** Let plants work for you! Strategically plant trees and shrubs for summer shade or winter sun. Grow your own food and plant woody plants that will store carbon.



**Rethink:** Your landscape can be a natural ecosystem that conserves soil and water and promotes biodiversity. Be purposeful in your plant selection, cultivate healthy lawns that reduce fertilizer needs, and include natural water features.



**Reduce:** Wasting resources contributes to unnecessary climate impacts. Capturing rainwater on site reduces demand and lessens the impact of stormwater on the environment.

# Factsheet

# Climate-Smart Gardening

<https://njclimateresourcecenter.rutgers.edu/wp-content/uploads/2020/08/Climate-Smart-Gardening.pdf>



**Compost** for healthy soils



**Be water wise**



**Plant native plants and embrace weeds**



**Plant a tree**



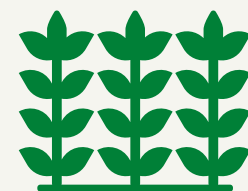
**Use manual tools** that don't require gasoline to run



**Do not disturb** soil to limit decomposition and releasing GHGs to the atmosphere



**Grow your own food:** reduce the amount of fossil fuels consumed to bring food to market



**Plant cover crops** during the off-season and allow plant residue to decompose in place



**Take an integrated pest management** approach to address garden pests



# End of Lesson Reflection

- What climate changes in North Carolina are most interesting to you or were you most surprised to learn about?
- How has learning about climate change altered your perception about future climate risks or vulnerabilities (for yourself or others)?
- What actions -- for either climate adaptation or climate mitigation -- have you observed in your community, county, or state?
- Where would you go to find more information about these activities and (if interested and able) become involved?



Thank you

**NC State Climate Office**

[climate.ncsu.edu](http://climate.ncsu.edu)

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