Carbon Emissions and Reductions at UConn

Facilities Operations
Mike Jednak

January 24, 2020

Climate Change Drivers

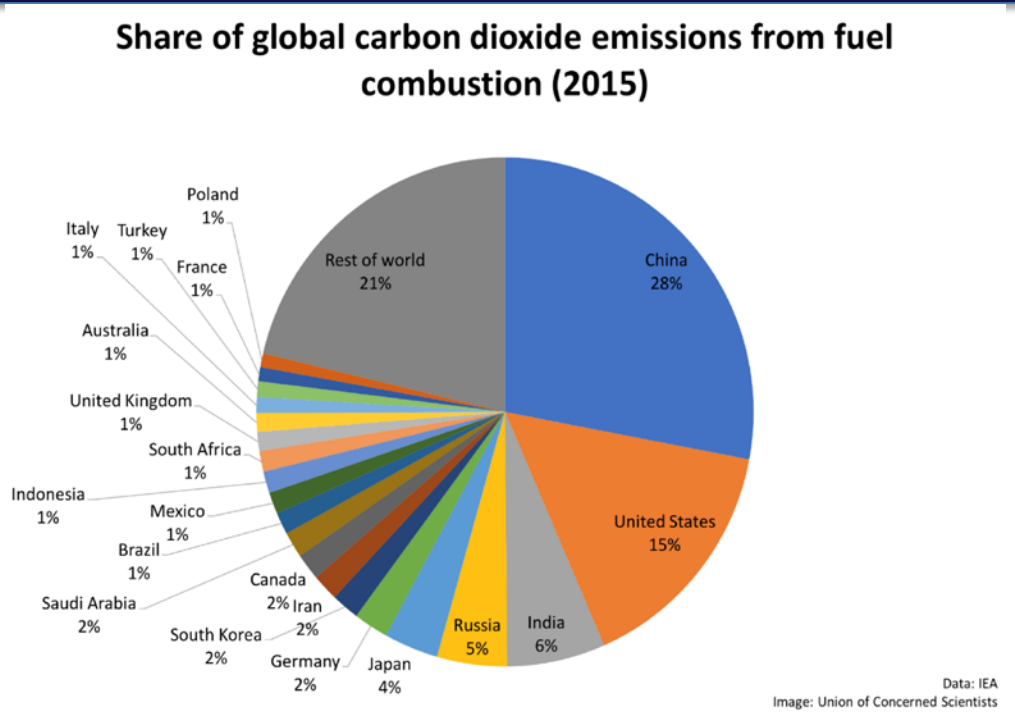
Six (6) Primary Greenhouse Gases

- **Carbon Dioxide (CO_2):** Burning of fossil fuels and deforestation.
- **Methane (CH_4):** Livestock enteric fermentation (i.e. cows) and manure management.
- **Hydrofluorocarbons (HFCs):** Refrigeration, air conditioning, foam blowing, aerosols, fire protection suppressants, solvents.
- **Perfluorocarbons (PFCs):** Refrigeration, electrical equipment, solvents.
- **Nitrous Oxide (N_2O):** Anesthetic, analgesic, oxidizer in rocketry and in motor racing to increase the power output of engines.
- **Sulfur Hexafluoride (SF_6):** Medium to High-voltage (5 kV and above) circuit breakers, switchgear, other electrical equipment. Never intentionally discharged.

Commonly expressed as Carbon Dioxide Equivalent (CO_{2e}) corrected by the Global Warming Potential (GWP) Factor

United States GHG Policy

- Energy Policy Act of 2005
- Executive Order 13834 (5/17/2018)
- Goals
  - Increase efficiency
  - Optimize performance
  - Eliminate unnecessary use of resources
  - Protect the environment



Connecticut GHG Policy

- Comprehensive Energy Strategy 2018
- 2018 Act Concerning Climate Change Planning and Resiliency
- Conn. Gen. Stat. § 22a-200a reduce to 80% below 2001 levels by 2050
- Governor Lamont's Executive Order 1
  - 45% Reduction from 2001 Baseline by 2030
  - 34% Reduction from 2014 Baseline by 2030
  - 70% Reduction from 2016 Baseline by 2040
  - Net Zero GHG Emissions by 2050
- Governor Lamont's Executive Order 3
  - 100% Zero Carbon Electric Sector by 2040

Connecticut CES Strategies

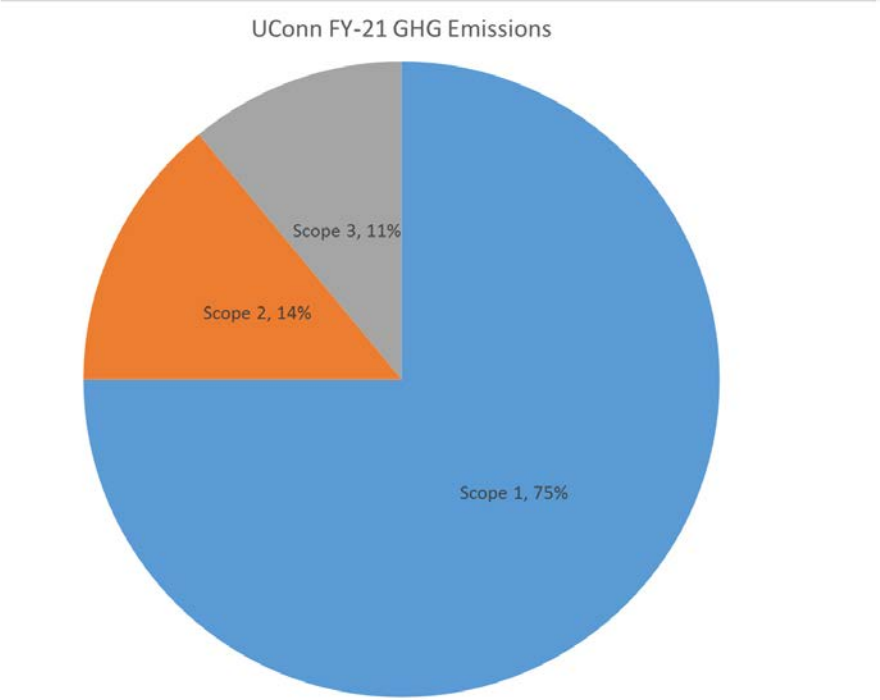
- **Strategy 1:** Ensure sustainable and equitable funding for efficiency
- **Strategy 2:** Advance market transformation of the energy efficiency industry
- **Strategy 3:** Grow and sustain renewable and zero-carbon generation in the state and region
- **Strategy 4:** Expand deployment of all cost-effective distributed generation (“behind the meter”) programs in a sustainable manner

Connecticut CES Strategies

- **Strategy 5:** Continue to improve grid reliability and resiliency through state and regional efforts
- **Strategy 6:** Reduce transportation greenhouse gas emissions by accelerating adoption of low- and zero-emission vehicles and strengthening alternative-fueling infrastructure
- **Strategy 7:** Increase mobility, connectivity, and accessibility by advancing smart-growth, mixed-use transit-oriented development, and innovative transportation partnerships
- **Strategy 8:** Modernize the grid

Common Sources at UConn

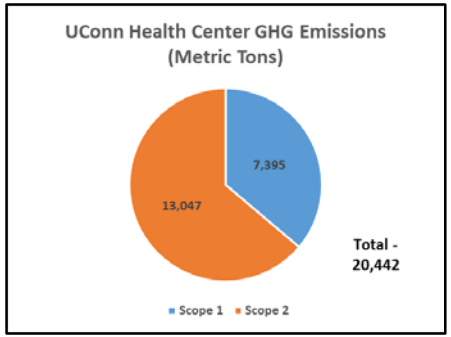
- **SCOPE 1** – GHG emissions from sources that are owned or controlled (FY-21 75%)
- **SCOPE 2*** – GHG emissions resulting from the generation of electricity, purchased (FY-21 14%)
- **SCOPE 3** – GHG emissions from sources not owned or directly controlled but related to our activities (FY-21 11%)

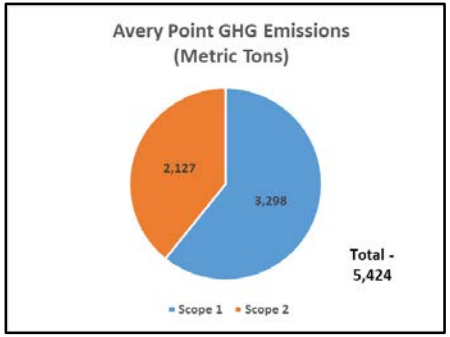


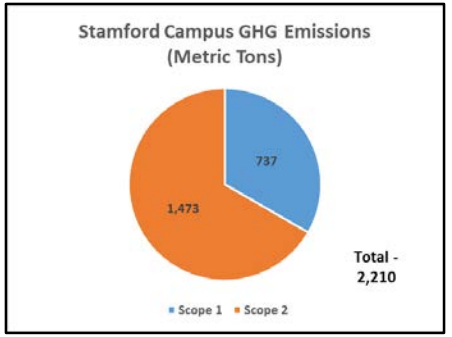
*Scope 2 emissions are offset by the purchase of Renewable Energy Certificates generated from 100% renewable zero carbon sources

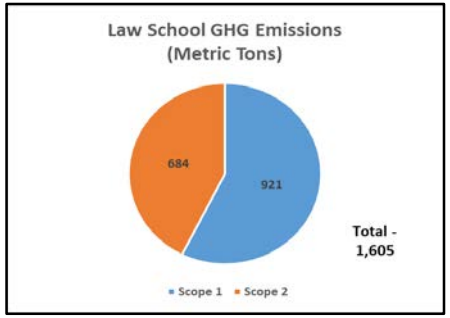
Greenhouse Gas Emissions

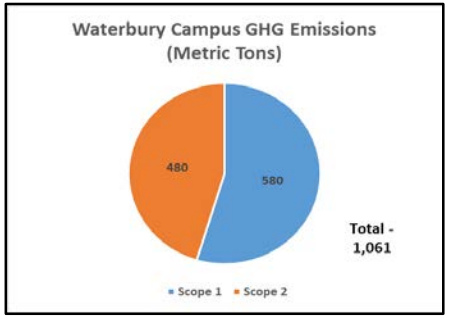
Regional Campuses GHG Emissions (CY 2018)*

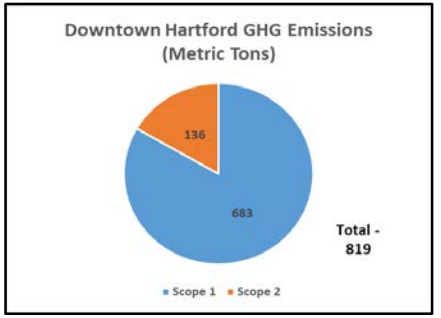












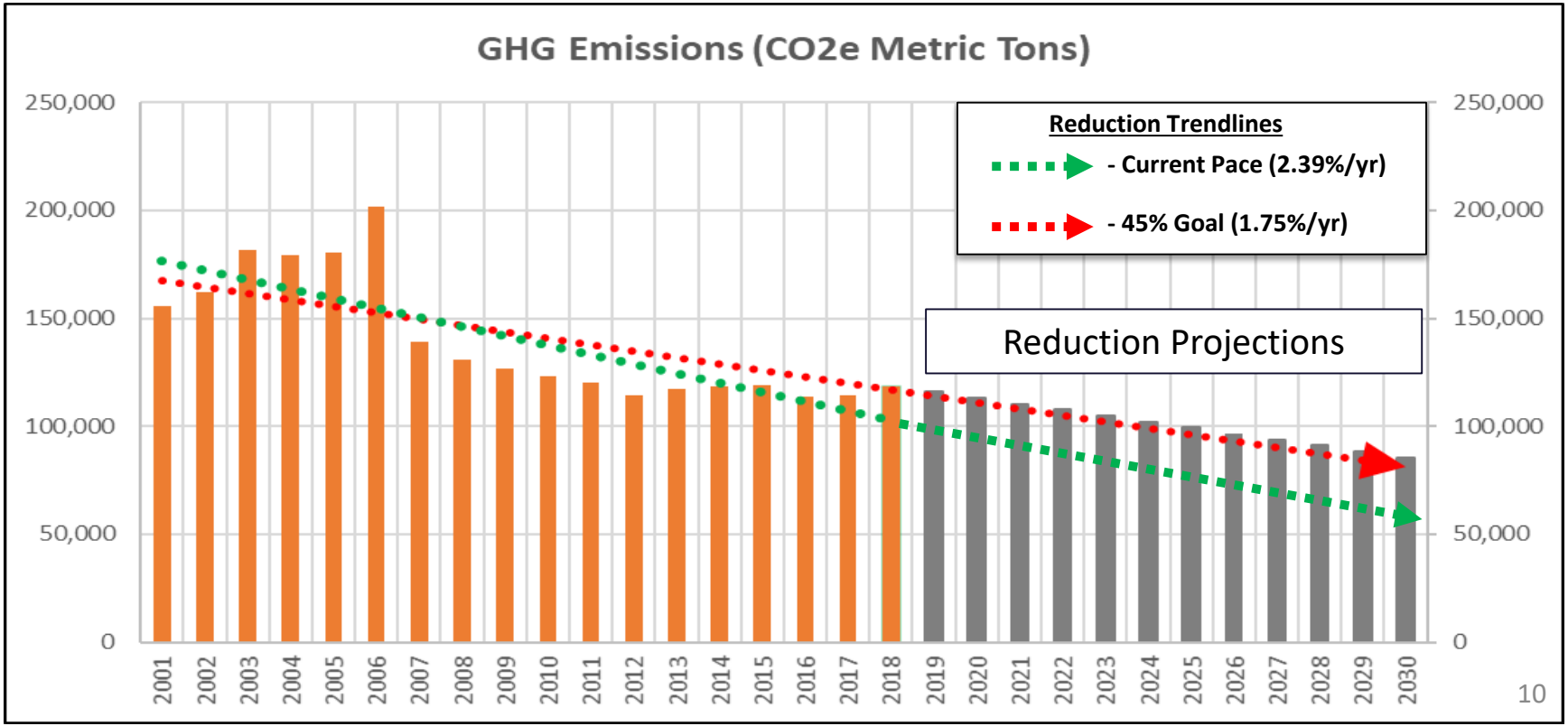
*Scope 2 emissions are offset by the purchase of Renewable Energy Certificates generated from 100% renewable zero carbon sources

Sources By Campus at UConn FY-21

UConn Greenhouse Gas Emissions (CO2e Metric Tons)									
Type	Avery Point	Downtown HTFD	Health Center	Law School	Stamford	Storrs and Depot	Waterbury	Total	Percentage
Scope 1	3,298	683	7,395	921	737	100,885	580	114,498	75%
Scope 2*	2,127	136	13,047	684	1,473	3,730	480	21,678	14%
Scope 3	?	?	?	?	?	15,592	?	15,592	10%
Total	5,424	819	20,442	1,605	2,210	120,207	1,061	151,768	100%
Contribution	4%	1%	13%	1%	1%	79%	1%	100%	

*Scope 2 emissions are offset by the purchase of Renewable Energy Certificates generated from 100% renewable zero carbon sources

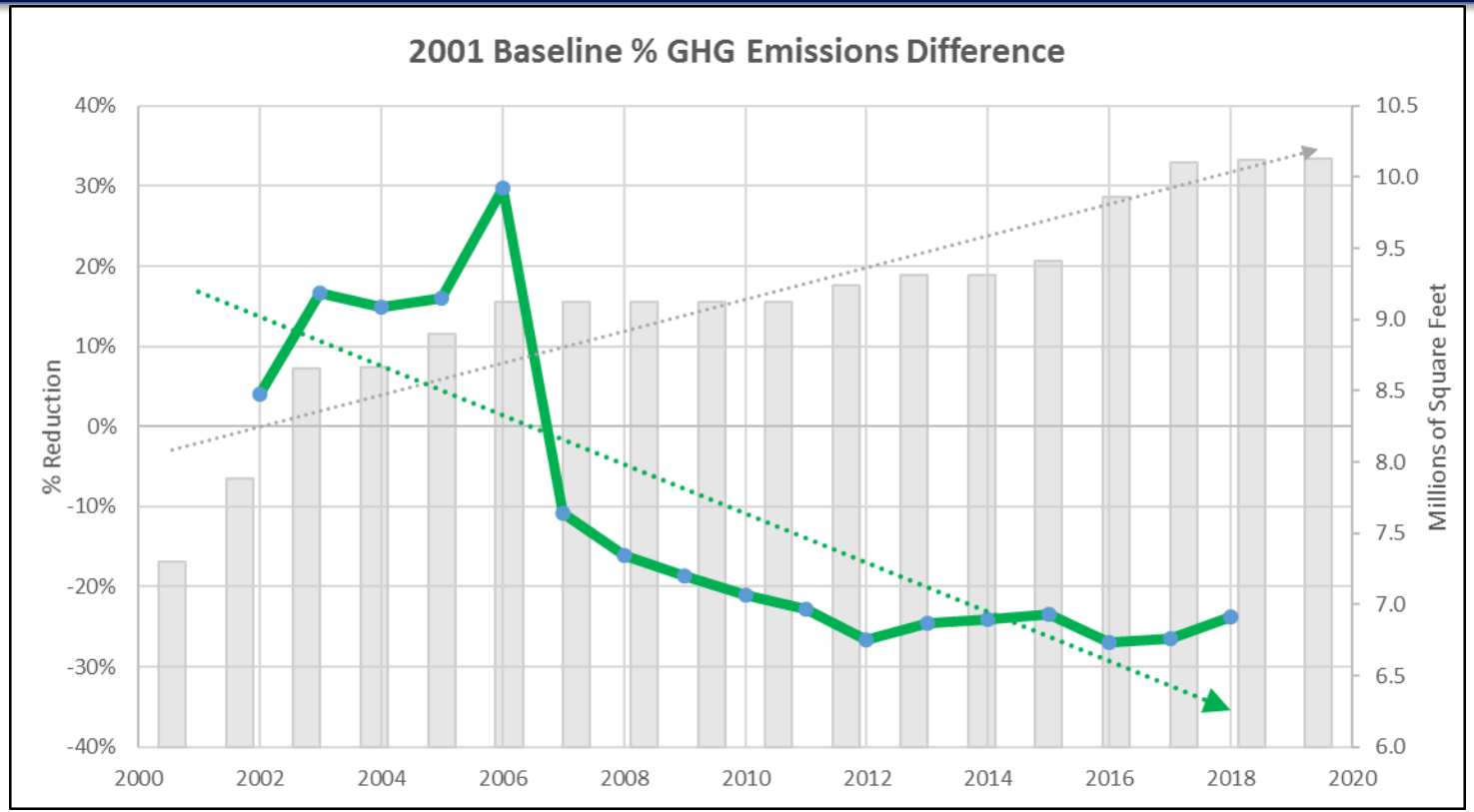
UConn Storrs/Depot GHG Emissions



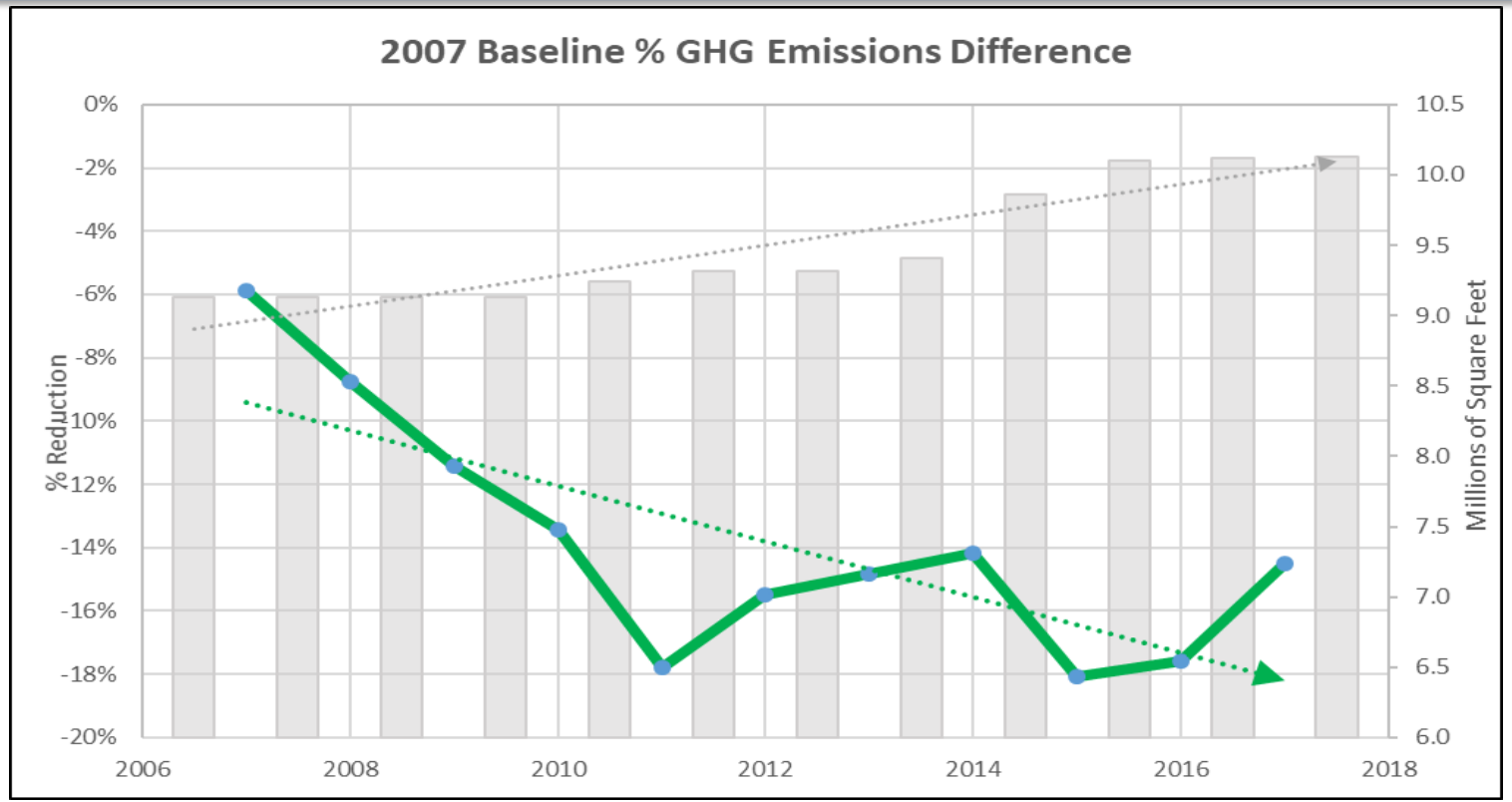
UConn Reductions to Date

Storrs and Depot Campus GHG Emissions (CO2e Metric Tons)				
Type	**2001**	**2007**	**2014**	**2021**
Scope 1	67,532	116,562	104,736	100,885
Scope 2	71,577	9,432	2,592	3,730
Scope 3	20,460	16,721	15,581	15,592
Total	159,569	142,715	122,909	120,207
Reductions from Baseline Year	2001:	10.56%	24.44%	26.64%
	2007:		13.88%	16.08%
	2014:			2.20%

UConn Reductions to Date



UConn Reductions to Date



UConn Reductions to Date

Conservation Efforts

- 2017 Investment $2.8 Million
  - 40 Individual Projects
  - Saved 1,632 Metric Tons
- 2018 Investment $5.1 Million
  - 77 Individual Projects
  - Saved 4,689 Metric Tons
- 2019 Investment $2.0 Million
  - 55 Individual Projects
  - Saved 2,591 Metric Tons