

DENISON UNIVERSITY

Granville, OH | Founded 1831 | 931 Acres | 1,888,016 Total GSF

Undergraduate 2,394 Graduate N/A	20%	15%	19%	34%
Faculty 278 Staff 528 Total Population 3,200	reduction in source energy per unit of floor area from 2005 baseline	of energy from solar	reduction in potable water use per unit of floor area from 2005 baseline	of waste diverted from landfill (2019)



2020 COMPARING CAMPUSES Carbon Emissions

Carbon emissions contribute to climate change. The design industry has historically focused on minimizing operational carbon emissions from occupied buildings because building operations are responsible for approximately 30% of annual carbon emissions.¹ Missing from this dialogue has been a focus on the embodied carbon in the materials from which the built environment is constructed.

This poster compares eight institutions of varying size, geography, age, and classification to explore the extent to which colleges and universities are reinventing their spaces in place and thereby reducing embodied carbon. Renovations can breathe new life into existing buildings while reducing both embodied and operational carbon emissions. The comparisons build on a 20-year legacy of Comparing Campuses posters that support higher education institutions in finding their common ground and celebrating their unique differences. Visit our website at www.asg-architects.com/comparing-campuses to see how this poster has evolved and compare our collection of campuses side-by-side.

Built Pre-1940 Built 1940-1990 Built 1990-2020 💥 Renovated Since 2000



$www.asg-architects.com \cdot 410\text{-}347\text{-}8500 \cdot comparing campuses @asg-architects.com \\$

Our thanks to the colleges and universities that provided maps and information. All campus plans have been graphically reproduced to the same approximate scale and are intended for comparative use only. Recognizing that errors are inevitable, we apologize for any inaccuracies.
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CATHOLIC UNIVERSITY OF AMERICA

Washington, D.C. | Founded 1887 | 176 Acres | 2,448,919 Total GSF

Undergraduate 3,279 Graduate 2,492	3	100%	7M+	30%
Faculty 793	green roofs	of electricity	gallons of water saved	of waste stream
Staff 2,496	on campus	from renewable	annually from district	is recycled
Total Population 9,060	buildings	sources	system upgrades	(2019)



WHY WE CARE

The global scientific community agrees that preserving our way of life requires keeping global warming below 2°C. Past 2°C, climate change will accelerate and become irreversible - the planet will warm until humans can no longer survive. In order to stay below 2°C, the scientific community has established a carbon budget of 500 gigatons of CO_2 equivalent (GtCO₂e). This is the total amount of carbon human activities can emit from this day forward and stay below 2°C. Many industry leaders and anchor institutions







MONTCLAIR STATE UNIVERSITY

Montclair, NJ | Founded 1908 | 253 Acres | 5,281,810 Total GSF

Undergraduate 16,988 Graduate 4,127	3%	20%	0	5.7 TONS
Faculty 1,877 Staff 3,450 Total Population 26,442	reduction in carbon emissions per person from 2010 baseline	estimated annual utility cost savings from campus cogeneration plant and microgrid	permanent irrigation systems for campus landscapes	of electronic waste diverted from landfill (2019)

are working to meet this budget by achieving a 50% reduction in carbon emissions by 2030 and carbon neutrality by 2050. 2000 2025 2030 2035 2040 2045 **2050** Source: Architecture 2030

Building operations are one of the

emissions and represent 28% of the

global total each year. These emissions

The production of concrete, steel, and

carbon emissions across the globe and

Added together, over one-third of the world's carbon emissions are tied to the

construction and operation of our built environments. The time to act is now and

a critical role to play.

practitioners in the built environment have

are termed "embodied carbon" emissions.

aluminum, typically used in building construction, represents 11% of annual

largest sources of annual carbon

are termed "operational carbon."



Source: 2018 Global ABC Report, IEA

UNIVERSITY OF NEBRASKA-LINCOLN

Lincoln, NE | Founded 1869 | 623 Acres | 14,605,533 Total GSF

Undergraduate 20,478 Graduate 4,912	41%	71%	29%	60%
Faculty 1,485	reduction in	of electricity from	surplus stormwater	of waste diverted
Staff 3,838	energy use from 2005	renewable sources (hydro, wind, solar,	storage in projects built since 2018	from landfill (2019)
Total Population 30,713	baseline	and nuclear)	20110 2010	(=====)



TEXAS A&M UNIVERSITY

College Station, TX | Founded 1876 | 5,576 Acres | 28,900,146 Total GSF

Undergraduate 54,476	34%	22%	90%	59%
Graduate 14,989	JT /0		3070	3370
Faculty 3,950	reduction in source	of energy from	of runoff is	of waste
Staff 7,301	energy per unit	renewable sources	retained	diverted
Total Population 80,716	2002 baseline	(solar)	UII-SILE	(2019)

WHAT TO KNOW

Evolving topics require fresh vocabulary. Learn the definitions below and engage your institutions and its consultants in robust conversations about how to reduce environmental impact.



(noun) greenhouse gas emissions associated with the manufacturing, transportation, and construction of materials, together with end-of-life emissions

A life cycle analysis is completed to quantify the environmental impact of bringing a material to market, using it in the field, and disposing or recycling it at the end of its useful service life. This analysis is made available in a condensed format called an Environmental Product Declaration (EPD).

Building envelopes and structural systems are inherently durable and typically have high embodied carbon values. Efforts made to renovate existing campus assets while maintaining these systems can support an institution's efforts to achieve a more sustainable future.

operational carbon

(noun) greenhouse gas emissions associated with the in-use phase of a building

A major renovation that includes upgrades to a building's HVAC systems, insulation, and glazing systems can reduce its operational carbon impact. Buildings highlighted in this Comparing Campuses poster as having received renovations since 2000 have a scope that encompasses one or more of these elements for at least 50% of the noted building's square footage.



ARIZONA STATE UNIVERSITY

Tempe, AZ | Founded 1886 | 663 Acres | 19,086,639 Total GSF

Undergraduate 44,461 Graduate 8.825	30%	51%	28%	42%
Faculty 2,972 Staff 13,400	reduction in source energy per unit	of campus energy from renewable	reduction in potable water use per unit	of waste diverted
Total Population 69,658	2007 baseline	hydro, and biomass)	2007 baseline	(2019)



GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, GA | Founded 1885 | 400 Acres | 16,800,012 Total GSF

Undergraduate 16,159	22%	100%	2KT	11%
Graduate 20,331		100 /8	LIT	
Faculty 1,100	reduction in total	of Kendeda Building for	trees planted	of waste
Staff 7,805	greennouse gas	Innovative Sustainable	since 2012	diverted
Total Population 45,395	to 2008 baseline	by onsite renewable energy		(2017)







UNIVERSITY OF CALIFORNIA SAN DIEGO

San Diego, CA | Founded 1960 | 1,158 Acres | 18,000,000 Total GSF, estimated

Undergraduate 30,800	57%	72%	47%	37%
Graduate 7,900 Faculty 1.600	reduction in source	of the campus's	reduction in potable	of waste
Staff 17,600	energy per unit of floor area from	annual electricity needs supplied by	water use per unit of floor area from	diverted from landfill
Total Population 57,900	2008 baseline	cogeneration plant	2006-2008 baseline	(2017)