



America's Top Colleges for Renewable Energy

Who's Leading the Transition to 100% Renewable Energy on Campus?



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Written by:

Abigail Bradford and Jonathan Sundby

Frontier Group

Bronte Payne and Jake Taber

Environment America Research & Policy Center

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Executive Summary

America's colleges and universities are leading the transition to a 100 percent renewable energy system. Small liberal arts colleges, large public universities and community colleges alike, from every corner of the U.S., are taking the lead in reducing energy consumption, deploying renewable energy technologies, and switching to electric vehicles (EVs).

The nation's leading campuses for clean energy – from the University of Minnesota, Morris to Southwestern University in Texas – are setting a strong example for other colleges and the nation as a whole to follow. **More than 40 colleges and universities now obtain 100 percent or more of their electricity from renewable energy sources.**¹ And, of the 180 schools that have reported their renewable energy data to The Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment & Rating System (STARS), 91 percent are using some amount of renewable energy.

Campuses are also leading in cleaning up our transportation system. **Each of the top 10 schools for EVs in this ranking have switched over 60 percent of their campus-owned vehicles to EVs.** Of the 261 campuses reporting their campus fleet details to STARS, 88 percent have at least one EV.

Leading campuses are taking action on multiple fronts. The University of Missouri is among the leading schools for producing renewable electricity

on-campus, purchasing electricity from off-campus renewable energy projects, and providing for other building energy needs – such as heating and hot water – with on-campus renewable energy sources. The University of Minnesota, Morris, and Skidmore College in New York are leaders in two of these categories.

College campuses are ideal places to lead the renewable energy transition. Colleges are large energy users, and are uniquely suited to employ microgrids and district heating and cooling systems that expand the potential uses for renewable energy.² Schools that seize these opportunities draw the attention of potential students. A 2019 Princeton Review survey of nearly 12,000 college applicants found that 64 percent would factor in schools' environmental commitments – including commitments to adopt renewable energy – when deciding where to attend.³

America's leading clean energy colleges and universities are setting a shining example for other schools to follow. Colleges and universities across the country should follow their lead by pledging to move toward 100 percent renewable energy.

Leading campuses are well on the way to 100 percent renewable energy.

The following campuses are realizing the promise of renewable energy – installing solar panels and wind turbines on campus and purchasing power from off-campus renewable energy sources.

Table ES-1: The Top Five Schools for Renewable Electricity per Full-Time Equivalent Enrolled (FTE) Student*

Rank	School	State	Total Amount of Renewable Electricity per FTE Student (MMBtu)
1	Southwestern University	TX	40.8
2	Austin College	TX	40.7
3	Whitman College	WA	39.8
4	Haverford College	PA	38.1
5	University of Tennessee at Knoxville	TN	34.8

*The rankings in this report are based on schools' reports to AASHE STARS from 2016 through 2018. See Methodology for full details.

Southwestern University in Texas is ranked first for renewable electricity use – the school purchases Renewable Energy Credits (RECs) from wind farms equivalent to 100 percent of its electricity consumption.⁴

Some schools are utilizing renewable energy resources – including rooftop solar panels and wind turbines – on campus, to both meet their energy needs and provide students and faculty with valuable research opportunities. The following schools are leading in producing renewable electricity on their own campuses.

Table ES-2: The Top Five Schools for Renewable Electricity Generated on Campus per Student

Rank	School	State	Amount of Renewable Electricity Generated on Campus per FTE Student (MMBtu)
1	University of Minnesota, Morris	MN	10.0
2	University of Missouri	MO	7.7
3	Carleton College	MN	6.9
4	Skidmore College	NY	3.3
5	Sterling College	VT	3.1

The University of Minnesota (UMN), Morris leads in producing renewable electricity on its own campus. The university produces about 60 percent of its electricity needs with two commercial-scale wind turbines, and also powers one of its residence halls with a 20-kW solar PV installation.⁵

Some schools are leading the renewable energy transition by purchasing their electricity from off-campus renewable energy projects – an important option for campuses without the space or resources to make on-campus renewable energy viable. The following schools are leading on that front.

Table ES-3: The Top Five Schools for Renewable Electricity Purchased from Off-Campus Sources per Student

Rank	School	State	Amount of Renewable Electricity Purchased from Off-Campus Projects per FTE Student (MMBtu)
1	George Washington University	DC	11.9
2	American University	DC	7.5
3	Luther College	IA	5.1
4	University of California, San Diego	CA	4.6
5	Skidmore College	NY	3.4

The George Washington University in Washington, D.C. leads surveyed campuses nationwide for purchasing renewable electricity from off-campus projects. In conjunction with American University and The George Washington University Hospital, the university purchases electricity from large, off-campus solar arrays to cover 53 percent of its electricity consumption.⁶

Leading campuses are not just cleaning up their electricity use – they are replacing all fossil fuel-powered systems, including for heating, cooling

and hot water, with systems that run on electricity or renewable energy, such as solar thermal panels and geothermal heat pumps.

Colgate University is ranked first on this list for providing its non-electrical energy needs, including heating and hot water, with renewable energy sources. The school has multiple renewable energy systems, including solar thermal panels that heat water, and a geothermal system that draws from the earth’s stable temperature to provide heating in the winter and cooling in the summer.⁷

Table ES-4: The Top Five Schools for Renewable Heating, Cooling, Hot Water and other Non-Electric Energy Produced per Student

Rank	School	State	Amount of Non-Electric Renewable Energy Produced on Campus per FTE Student (MMBtu)
1	Colgate University	NY	33.5
2	Cornell University	NY	23.6
3	University of Iowa	IA	22.4
4	University of New Hampshire	NH	20.9
5	University of Missouri	MO	20.2

Leading schools are switching their campus fleets to electric vehicles.

Leading campuses are not just cleaning up their buildings, but also their transportation systems by transitioning away from fossil fuel-powered vehicles and toward EVs.

The top school in this ranking, Ringling College of Art and Design, operates 41 campus-owned vehicles, 35 of which are powered entirely by electricity.

Table ES-5: The Top Five Schools with the Highest Percentage of Campus-Owned Vehicles that Are 100 Percent Electric

Rank	School	State	Percent of Campus-Owned Vehicles that Are 100 Percent Electric
1	Ringling College of Art and Design	FL	85.4%
2	California State University, San Marcos	CA	78.8%
3	Rice University	TX	75.8%
4	University of the Pacific	CA	73.9%
5	Harvey Mudd College	CA	73.1%

Leading schools are reducing energy consumption by improving the energy efficiency of campus buildings and encouraging students and employees to conserve energy.

Colleges and universities are reducing energy consumption on campus to make it easier to power themselves with 100 percent renewable energy. Leading campuses are cutting their energy consumption through various energy efficiency improvements, such as adopting central control facilities that manage heating, cooling and ventilation needs in real time to prevent waste. Schools are also cutting consumption through energy conservation programs, such as initiatives that encourage students and laboratory workers to close fume hoods, which provide necessary ventilation, but can leak large amounts of energy if left open.

Numerous schools have adopted ambitious renewable energy commitments for the future.

Harvard University is aiming to be carbon neutral by 2026 and fossil fuel-free by 2050.⁸ To achieve these goals, the campus has been dramatically reducing its energy consumption through efficiency upgrades and initiatives to encourage energy conservation habits. Thanks to these efforts, Harvard cut its total energy consumption by 10 percent between 2006 and 2016, even as its campus grew.⁹

The University of Hawai'i (UH) is committed to produce as much renewable energy as its campuses use by 2035.¹⁰ In 2019, UH Maui College is anticipated to become the first UH campus to generate 100 percent of its energy from on-campus renewable energy sources once its solar PV plus battery storage system is brought online.¹¹

The University of California system (UC) is committed to be carbon neutral – in both its buildings and campus fleets – by 2025.¹² One of the most impressive parts of UC’s commitment is its plan to convert its buildings to be “all-electric” for heating, cooling and other needs that are currently supplied by gas.¹³

To follow in the footsteps of leading campuses, all colleges and universities should:

- Set a goal to obtain 100 percent of their energy from renewable sources – including for electricity, heating and other building energy needs, and campus-owned vehicles. To achieve this goal, schools should:
 - Reduce energy consumption through energy efficiency improvements and energy conservation initiatives.
 - Use renewable energy sources, such as wind and solar power, to supply 100 percent of their electricity.
 - Transition all other building energy systems – including heating, hot water and cooling – to be electric or powered by renewable energy sources, such as solar hot water or ground-source heat pumps.
 - Swap all fossil-fuel powered vehicles for EVs.
- Encourage and enable students and employees to commute to and from campus sustainably by walking, biking, taking transit or using EVs.
- Purchase goods and services – such as food and travel – that minimize the use of fossil fuels.

Introduction

Sterling College is a tiny school tucked away in northern Vermont. You would not think that this rural college focused on environmental stewardship would be an example for large research universities or urban liberal arts colleges. But as students, professors and citizens call for action on climate change, colleges across the country are stepping up as natural leaders in the transition to a 100 percent renewable energy system – and they have a lot to learn from Sterling College.

Recognizing that “the most critical issues of our time involve our climate, soil, water, food, energy, and wilderness,” Sterling College’s mission is to train environmental stewards – and the school carries that mission into every aspect of how it operates.¹⁴

Like many colleges and universities, Sterling’s campus is made up of older buildings that tend to leak a lot of energy. To address this, Sterling recently renovated buildings across campus with new windows and insulation to conserve energy and increase energy efficiency.¹⁵

Sterling is not only reducing how much energy it consumes, but the college is also cleaning up how

it produces that energy. In 2016, Sterling installed enough solar panels on its campus to produce over 80 percent of its energy needs. These solar panels move with the sun to maximize the amount of energy they produce.

Sterling is a national leader for producing renewable energy on campus, ranking fifth among surveyed schools in this report. But Sterling is far from alone. From Skidmore College in New York to Rice University in Texas, schools across the country are turning to renewable energy to reduce their emissions, attract students, provide training and research opportunities, and reduce costs.

Institutions of higher learning have always been places where society explores its future. Academics have been researching and improving renewable technologies for decades in the laboratories of our colleges and universities. It’s time for these institutions to put into practice the knowledge that has been fostered under their roofs – and commit to powering their campuses with 100 percent clean, renewable energy.

Colleges and Universities Can Lead the Transition to 100 Percent Renewable Energy

We need to move away from fossil fuels and create a 100 percent renewable energy system to tackle global warming and the other problems caused by fossil fuels, including public health threats and environmental destruction.

America has enough renewable energy potential from the sun and wind to power the nation several times over. Many studies suggest that high penetrations of renewable energy are possible using technologies available today at costs that society can



The University of Illinois at Urbana-Champaign's entry to the 2009 U.S. Department of Energy Solar Decathlon. Credit: stantontcady via Flickr, CC BY-ND 2.0.

afford, indicating that we can move toward an energy system powered by 100 percent renewable energy.¹⁶

College and university campuses are great places to accelerate the transition to 100 percent renewable energy. Colleges are major energy users, so their commitments to renewable energy can have big impacts. Educational buildings, including colleges and K-12 schools, were responsible for 10 percent of all energy consumption in the commercial sector in 2012.¹⁷ Colleges are often geographically constrained collections of buildings, enabling them to take advantage of solutions such as microgrids and renewable district heating and cooling that expand the potential to take advantage of renewable energy.¹⁸ College campuses are also hotbeds of technical training and innovation, making them perfect places to develop, test and deploy new clean energy technologies – and use every stage of that process to educate students. Lastly, college students tend to be climate-conscious and tech-savvy, so campuses that deploy clean energy technologies can attract students.¹⁹ A 2019 Princeton Review survey of nearly 12,000 college applicants found that 64 percent would factor in schools' environmental commitments – including commitments to adopt renewable energy – when deciding where to attend.²⁰

To power their campuses with 100 percent renewable energy, colleges and universities are reducing their energy consumption; obtaining their electricity from renewable energy sources; meeting their heating, cooling and other building energy needs with electricity or renewable energy sources; and transitioning their campus-owned vehicles away from fossil fuels. Small private colleges, large public universities and community colleges from Maine to Texas are already taking these steps – laying the path for all campuses to follow their lead.

Reducing Energy Consumption

Leading colleges and universities are reducing their energy consumption, making it easier to power their campuses with 100 percent renewable energy. Colleges are reducing energy consumption through energy efficiency improvements in their buildings and appliances, and through programs that encourage students and employees to conserve energy.

Buildings consume over four-fifths of the energy used on college campuses and improving building energy efficiency can cut overall campus energy use by up to 60 percent.²¹ Many campuses have older buildings that can be made more energy efficient by adding insulation, replacing windows or adding storm windows, as well as by upgrading appliances, lighting and heating and cooling equipment. When campuses construct new buildings, they have the opportunity to use the most advanced energy efficient building practices, appliances and heating and cooling systems.

Certain campus facilities, such as research laboratories, are highly energy-intensive, so reducing energy use in these facilities can lead to big savings. Campuses across the country are taking measures to reduce operational costs in labs by using appliance timers and storing samples at slightly higher temperatures when appropriate. Labs often contain fume hoods that provide ventilation to protect lab workers. Shutting the front of these fume hoods can save a lot of energy, so many campuses have adopted programs to encourage this behavior.²² Harvard University, for instance, has competitions amongst its labs to “shut the sash” and turn off the lights.²³

Many campuses also reduce energy consumption through programs that encourage students and staff to conserve energy. Simple shifts in how students and employees use energy on campus could save as

much as 20 percent of energy consumption and help colleges achieve their clean energy goals.²⁴ Social interaction programs like competitions are relatively cheap and easy to implement and can result in big energy savings, but ongoing programs that continually encourage conservation are best. Many colleges also use smart sensors and displays to show employees and students their energy use in real time to encourage conservation.²⁵

Shifting to Renewable Electricity

Leading colleges and universities are obtaining 100 percent of their electricity from on- and off-campus renewable energy sources like solar energy and wind power. Already, over 40 colleges and universities in the U.S. are obtaining 100 percent or more of their electricity from renewable sources.²⁶ (For complete list, see page 16.)

On-campus solar photovoltaic (PV) energy is a great choice for schools because it can be installed on existing rooftops and is becoming increasingly affordable. Arizona State University (ASU), for example, has deployed solar panels and solar heating systems at 89 locations on its four campuses and its research park. These on-campus installations can supply nearly half of the campus' peak electricity demand.²⁷ Solar PV is becoming available to more and more schools thanks to plummeting prices – between 2010 and 2018, solar installations dropped in price by 70 percent, making solar energy often cheaper than energy from fossil fuels.²⁸

Many universities are also good locations for wind energy installations with the potential to install full-scale turbines in open fields or microturbines on rooftops. For example, the University of Delaware has the only commercial-sized wind turbine in Delaware, which produces enough electricity to power the buildings at its Lewes campus, as well as 108 homes in the city of Lewes.²⁹

Wind and solar energy systems on campus are not only powering universities, but are also being used to train future renewable energy industry workers and provide engineering students with the opportunity to do cutting-edge research. To create a renewable energy system throughout the U.S., we will need many more students trained in these fields.

While some campuses have ample opportunities to install solar and wind power on site, colleges with limited space or cash reserves can purchase renewable energy generated off-campus or help finance its production. Purchasing options like power purchase agreements (PPAs) and renewable energy credits (RECs) enable colleges to purchase clean energy and drive the deployment of new renewable energy installations without incurring the upfront costs of installing renewable energy themselves.

Colleges can even team up with one another to collectively fund renewable energy projects. In 2018, five New England schools – Bowdoin, Smith, Amherst, Hampshire and Williams colleges – partnered with NextEra Energy Resources to construct a solar PV installation in Farmington, Maine. All of the colleges will share in the clean, renewable electricity generated by the new project.³⁰

Repowering Buildings with Clean Energy

Heating, hot water, cooling, cooking, laundry and other activities are often powered directly by fossil fuels on college campuses. Over half of universities' energy consumption – 53 percent on average – comes from water heating and space heating, which are primarily powered by gas and other fossil fuels.³¹ Increasingly, colleges are transitioning these systems to be powered by electricity or renewable energy sources such as solar thermal or geothermal energy, helping these campuses move toward 100 percent renewable energy.

Stanford University in California, for example, swapped its natural gas heating and cooling system for one primarily powered by electricity in 2015 to cut emissions and costs.³² In Stanford's system, cold water circulates through campus buildings to provide cooling and hot water circulates to provide heating. At a central facility, electric "heat recovery chillers" transfer heat from the cold water to the hot water to chill the cold water and heat the hot water.³³ This system is twice as efficient as natural gas heating systems, which leads to significant cost savings – \$420 million over 35 years for Stanford's system. This system also features storage tanks that allow the university to heat and cool the water in the tanks at night when electricity costs are low and circulate it through the buildings during the day when demand is high.³⁴

Solar heating and hot water systems are another option campuses are using to clean up their buildings' energy use. While solar photovoltaic panels convert sunlight into electricity, solar thermal systems capture heat from freely available sunshine to heat up water for cooking, bathing or laundry. These systems can cut hot water costs by more than half.³⁵ Solar thermal systems can also heat or cool air in buildings using efficient and cost-effective solar air heat collectors. Campuses can also heat or cool buildings through passive solar design, laying out the building, choosing materials, and placing windows to best use the sun's heat without mechanical systems.³⁶

In addition to renewable electricity and solar thermal energy, campuses are reducing energy demand for hot water, heating and cooling needs by using ground-source heat pumps that take advantage of the stable temperature of the earth. These systems consist of geothermal wells in the earth that are connected to pipes that weave through buildings. In the summer, excess heat from buildings is captured in fluid and circulated into the wells where it cools and is re-circulated to provide air conditioning. Likewise, in the winter, fluid is warmed in the wells and circulated through the buildings to provide heating.³⁷ Ground-source heat pumps have lower operating and maintenance costs than

some conventional heating systems and can be scaled to work in individual buildings or whole campuses.³⁸ According to a report by the National Wildlife Federation, 160 campuses in 42 states were already using geothermal energy for heating and cooling by 2011.³⁹

Adopting Sustainable Transportation

To create 100 percent renewable energy systems, colleges are also transitioning their campus-owned vehicles away from fossil fuels. Electric vehicles (EVs) can serve this purpose and provide additional benefits, such as reducing vehicle exhaust, heat and noise.⁴⁰ Currently in the U.S., it costs roughly half as much to drive an EV each mile than a gasoline-powered car.⁴¹ Also, adopting EVs makes it easier to integrate more wind and solar power on college campuses because they can use the excess electricity produced to charge.⁴² Electric campus shuttles may charge at night in a campus garage, or even along their route. In induction charging systems, charging plates at each bus stop charge the buses from underneath. This is ideal for campus buses that make frequent stops on fixed routes.⁴³

Cleaning up campus vehicles is critical, but the majority of transportation emissions associated with any college campuses come from travel by students and faculty to campus, often in private cars. Because of this, campuses are also providing infrastructure and programs to encourage and enable their students and employees to commute using sustainable means. Campuses are encouraging biking by providing bike lanes, covered bike storage and showers to commuters. Schools are also encouraging commuters to use transit by providing free, electric shuttles around campus and the local community, and by providing free local transit passes to students and employees. Lastly, some schools are encouraging EVs by providing charging infrastructure on campus and by providing students and faculty with access to shared EVs and programs that facilitate carpooling.⁴⁴



A Stanford University 100 percent electric bus. Credit: blount.photos via Flickr, CC BY-NC-ND 2.0.

America's Leading College Campuses Are Moving Rapidly Toward 100 Percent Renewable Energy

Small liberal arts colleges, large research universities and community colleges alike, from every corner of the U.S., are deploying renewable energy. The following lists rank the top 10 colleges and universities currently leading the way in producing or purchasing renewable energy for electricity, heating, hot water and other building energy needs, and in adopting clean, campus-owned vehicles.

Leading campuses are taking action on multiple fronts. The University of Missouri is among leading schools for producing renewable electricity on-campus, purchasing electricity from off-campus renewable energy projects, and providing other building energy needs, such as heating and hot water, with on-campus renewable energy sources. The University of Minnesota, Morris, and Skidmore College in New York are leaders in two of these categories.

These rankings are based on schools' self-reported data in the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment & Rating System (STARS). Only schools that have reported since 2016 are included in the analysis. See the Methodology section for full details on how these rankings are generated.

Some schools featured in these rankings use forms of energy that are often considered "renewable" but that are not necessarily clean. These forms of energy include biomass and renewable fuel oil such as biodiesel. The environmental sustainability of these forms of energy depends critically on how they are obtained. Because schools do not report the share of their renewable energy that comes from particular sources, there is no consistent way to exclude sources of energy that are not clean from the data used for the rankings.

Renewable Electricity

Colleges and universities from across the U.S. are leading the transition to 100 percent renewable energy. Of the 180 schools that reported data on their renewable electricity use to AASHE, 91 percent report using some form of renewable energy. And more than 40 colleges and universities now obtain 100 percent or more of their electricity from renewable energy sources.⁴⁵

Southwestern University in Georgetown, Texas, is ranked first for renewable electricity use. In the late 2000s, realizing the immense potential of renewable energy in the state, students at Southwestern

lobbied the university administration to source its electricity with wind power.⁴⁶ In January 2010, the university agreed and began purchasing RECs equivalent to 100 percent of its electricity use from wind energy projects.⁴⁷

The university's decision to source 100 percent of its electricity with renewable resources spurred off-campus action, too. Unsatisfied with its current electricity contract and inspired by Southwestern's success, the university's home city of Georgetown became the first city in Texas, and one of the largest cities in America, to obtain 100 percent of its electricity from renewable sources starting in 2017.⁴⁸

Table 1: The Top Ten Schools for Renewable Electricity per Full-Time Equivalent Enrolled (FTE) Student

Rank	School	State	Total Amount of Renewable Electricity per FTE Student (MMBtu)
1	Southwestern University	TX	40.8
2	Austin College	TX	40.7
3	Whitman College	WA	39.8
4	Haverford College	PA	38.1
5	University of Tennessee at Knoxville	TN	34.8
6	Bryn Mawr College	PA	34.6
7	Swarthmore College	PA	32.7
8	Dickinson College	PA	27.7
9	Knox College	IL	26.9
10	University at Buffalo	NY	26.6

Some schools are utilizing renewable energy resources – including rooftop solar panels and wind turbines – on their own campuses, to both supply energy and provide students and faculty with valuable research opportunities. The following schools are leading in producing renewable electricity on campus.

Overlooking the prairie of Morris, Minnesota, stand two, 230-foot-high, 1.65 MW wind turbines.⁴⁹ These turbines provide power to the University of Minnesota (UMN) Morris, earning the university the top spot for producing its own renewable electricity.

In 2005, the UMN West Central Research and Outreach Center erected the first of these turbines – the first commercial-scale wind turbine to be installed at a public university.⁵⁰ Collectively, the wind turbines generate more than 10 million kWh of electricity every year and meet about 60 percent of the campus’ annual electricity needs.⁵¹ In addition to the turbines, the university has installed a 20-kW solar PV installation to power its new Green Prairie Community residence hall.⁵²

Table 2: The Top Ten Schools for Renewable Electricity Generated on Campus per Student

Rank	School	State	Amount of Renewable Electricity Generated on Campus per FTE Student (MMBtu)
1	University of Minnesota, Morris	MN	10.0
2	University of Missouri	MO	7.7
3	Carleton College	MN	6.9
4	Skidmore College	NY	3.3
5	Sterling College	VT	3.1
6	Antioch College	CT	1.4
7	Soka University of America	CA	1.1
8	Agnes Scott College	GA	1.1
9	Colorado College	CO	0.9
10	University of San Diego	CA	0.8

Some schools are leading the renewable energy transition by purchasing their electricity from off-campus renewable energy projects.

The George Washington University in the heart of Washington, D.C., is ranked first for purchasing renewable electricity from off-campus projects. Together with American University and The George Washington University Hospital, the university worked with Customer First Renewables to contract with Duke Energy Renewables to construct three so-

lar farms with a combined capacity of 53.5 MW. That's enough to produce about 121 million kWh of electricity for the three institutions each year – meeting about 53 percent of each school's electricity needs and 32 percent of the hospital's.⁵³

By offsetting the use of fossil fuels, the project is projected to collectively reduce greenhouse gas emissions at the three institutions by nearly 85,000 metric tons of carbon dioxide per year – equivalent to the emissions produced by nearly 9,000 homes.⁵⁴

Table 3: The Top Ten Schools for Renewable Electricity Purchased from Off-Campus Sources per Student

Rank	School	State	Amount of Renewable Electricity Purchased from Off-Campus Projects per FTE Student (MMBtu)
1	George Washington University	DC	11.9
2	American University	DC	7.5
3	Luther College	IA	5.1
4	University of California, San Diego	CA	4.6
5	Skidmore College	NY	3.4
6	University of Missouri	MO	2.9
7	Hobart and William Smith Colleges	NY	2.3
8	Vassar College	NY	2.1
9	St. Lawrence University	NY	1.5
10	Arizona State University	AZ	1.5

Not all schools report to the AASHE STARS database used to generate these rankings, and additional colleges, universities and community colleges from around the country are leading in obtaining their electricity from renewable energy resources. The following are the 44 schools reporting to the U.S. Environmental Protection Agency (EPA) Green Power Partnership (GPP) that are obtaining 100 percent or more of their electricity from renewable sources.

This long list of schools obtaining 100 percent or more of their electricity from renewable energy sources includes small, private liberal arts colleges in New England, large public research universities in the Midwest and a few community colleges. This diverse list of schools is laying the groundwork for all schools to shift to 100 percent renewable energy.

Table 4: The 44 U.S. EPA Green Power Partnership (GPP) Colleges and Universities Obtaining 100 Percent or More of Their Electricity from Renewable Sources

School	State	Percent of Electricity from Renewable Sources
Chatham University	PA	162%
Georgetown University	DC	133%
Whitman College	WA	132%
Emerson College	MA	118%
St. Mary's College of Maryland	MD	117%
Bentley University	MA	109%
Hobart and William Smith Colleges	NY	108%
Swarthmore College	PA	108%
American University	DC	107%
The New School	NY	107%
Jefferson (Philadelphia University + Jefferson University), East Falls Campus	PA	106%
Raritan Valley Community College	NJ	105%
Drexel University	PA	104%
Paul Smith's College	NY	102%
Eastern University	PA	101%
Knox College	IL	101%
Adelphi University	NY	100%
Allegheny College	PA	100%
Bates College	ME	100%
Boston Architectural College	MA	100%
Bryn Mawr College	PA	100%
Bunker Hill Community College	MA	100%
Carnegie Mellon University	PA	100%

School	State	Percent of Electricity from Renewable Sources
Colby-Sawyer College	NH	100%
College of the Atlantic	ME	100%
Gettysburg College	PA	100%
Goshen College	IN	100%
Goucher College	MD	100%
Haverford College	PA	100%
Lebanon Valley College	PA	100%
Lewis and Clark Community College	IL	100%
Prescott College	AZ	100%
Principia College	IL	100%
Saint Mary's College of California	CA	100%
Southern Illinois University Edwardsville	IL	100%
Southwestern University	TX	100%
St. Olaf College	MN	100%
The Catholic University of America	DC	100%
The Evergreen State College	WA	100%
University at Buffalo, the State University of New York	NY	100%
University of Central Oklahoma	OK	100%
University of North Texas	TX	100%
University of Wisconsin - Stevens Point	WI	100%
Wells College	NY	100%

Renewable Heating, Cooling and Other Building Energy Needs

To achieve 100 percent renewable energy, schools are not just deriving their electricity from renewable energy sources – they are also meeting their heating, cooling, hot water and other building energy needs without the use of fossil fuels. The following 10 schools are leading this charge by making use of various technologies, including solar hot water panels and geothermal heating and cooling systems.

Thanks to its efforts to become carbon neutral during 2019, Colgate University is ranked first on this list for

providing its non-electrical energy needs, including heating and hot water, with renewable energy.⁵⁵ Chapel House, the campus’ spiritual retreat center, recently installed a closed-loop geothermal heating and cooling system. This system draws from the stable temperature of the earth to cool the building in the summer and heat it in the winter – without the use of polluting fossil fuels.⁵⁶ The university also recently installed a 600 square-foot solar thermal installation on one of its dormitories to provide hot water for the building. Most of Colgate’s renewable heat and hot water come from its biomass boiler. In 2009, the school planted a 7.5-acre willow tree plot one mile from campus to produce some biomass for the boiler.⁵⁷

Table 5: The Top Ten Schools for Renewable Heating, Cooling, Hot Water and Other Non-Electric Energy Produced per Student

Rank	School	State	Amount of Non-Electric Renewable Energy Produced on Campus per FTE Student (MMBtu)
1	Colgate University	NY	33.5
2	Cornell University	NY	23.6
3	University of Iowa	IA	22.4
4	University of New Hampshire	NH	20.9
5	University of Missouri	MO	20.2
6	Bates College	ME	19.5
7	University of Minnesota, Morris	MN	12.5
8	Binghamton University	NY	10.7
9	College of the Atlantic	ME	9.3
10	Missouri University of Science and Technology	MO	7.8

Campus-Owned Electric Vehicles

College and university campuses across the country are moving their vehicles away from fossil fuels and are switching to electric vehicles (EVs). Of the 261 schools included in this ranking, 229 – or 88 percent – have at least one EV. And over 60 percent of the campus-owned vehicles at the top 10 schools in this ranking are EVs. Schools in California are overwhelmingly leading this charge – claiming six of the top 10 spots in this ranking.

The top-ranked school on this list – Ringling College of Art and Design in Florida – operates 41

campus-owned vehicles, 35 of which are powered solely by electricity.

The technologies needed to create a 100 percent renewable energy system have been developed in colleges and universities around the country. As the leaders in these rankings demonstrate, those same institutions are now leading the transition to 100 percent renewable energy by transforming their own campuses to reduce energy consumption, adopt renewable energy for electricity, heating and other energy needs, and by switching to electric vehicles.

Table 6: The Top Ten Schools with the Highest Percentage of Campus-Owned Vehicles that Are 100 Percent Electric

Rank	School	State	Percent of Campus-Owned Vehicles that Are 100 Percent Electric
1	Ringling College of Art and Design	FL	85.4%
2	California State University, San Marcos	CA	78.8%
3	Rice University	TX	75.8%
4	University of the Pacific	CA	73.9%
5	Harvey Mudd College	CA	73.1%
6	Loyola Marymount University	CA	71.6%
7	California State University, Dominguez Hills	CA	67.2%
8	California State University, Long Beach	CA	63.4%
9	Florida Gulf Coast University	FL	63.2%
10	University of North Carolina, Pembroke	NC	62.0%

The Next Leaders: Colleges and Universities with Impressive Renewable Energy Goals

There are colleges and universities all over the U.S. that are transitioning to renewable energy systems. Most of the following schools do not appear in the top 10 for any category in this report, either because they do not have up-to-date reports in the database used, or because their renewable energy projects have not yet been completed. However, these schools have some of the most impressive commitments to renewable energy in the country and are taking action on multiple fronts – showing other schools how to transition to 100 percent renewable energy.

Harvard University

Harvard University aims to be carbon neutral by 2026 by dramatically reducing its energy consumption, investing in renewable energy projects, and purchasing offsets for its remaining emissions.⁵⁸ The university has also committed to stop using fossil fuels entirely by 2050.⁵⁹ To achieve this goal, the university will purchase 100 percent of its electricity from renewable energy sources; transition to emission-free vehicles; obtain heating, cooling and other building energy needs from fossil-fuel free energy sources; and purchase goods and services, such as food and travel, that minimize the use of fossil fuels.⁶⁰

The first step Harvard is taking toward these goals is rapidly cutting energy consumption through efficien-

cy upgrades and conservation efforts. For example, Harvard used a competition to encourage students, faculty and staff to conserve energy in research laboratories by turning off the lights and closing fume hoods, which provide ventilation and can leak large amounts of energy if they are left open. This is an impactful program because research laboratories account for 44 percent of Harvard's energy use.⁶¹ Thanks to efforts such as this, Harvard cut its total energy consumption by 10 percent between 2006 and 2016, in spite of a growing campus.⁶²

University of Hawai'i

In 2015, the University of Hawai'i (UH) committed to produce as much renewable energy as its campuses use by 2035.⁶³ To achieve this goal, UH is creating an energy management system, increasing energy efficiency in its buildings, encouraging energy conservation, and deploying solar energy and energy storage systems.⁶⁴

This year, UH Maui College is anticipated to become the first UH campus to generate 100 percent of its energy from renewable energy sources once its 2.8 MW solar PV system and 13.2 MWh of battery storage are brought online. Five community colleges in the UH system are also deploying solar PV plus battery storage systems, which, combined with energy efficiency measures, will reduce those campuses' fossil fuel use by 70 to 98 percent.⁶⁵

University of California

In the fall of 2018, the University of California (UC) system committed to obtain 100 percent of its electricity from renewable sources and hydropower, and to power all heating, hot water and other energy in new buildings with electricity.⁶⁶ This commitment will help UC achieve its goal to be carbon neutral – in both its buildings and campus fleets – by 2025.⁶⁷ UC's campuses are among over 600 across the country that have committed to tackle climate change as part of Second Nature's Climate Leadership Network, in which schools can publicly track their climate progress, awards and commitments.⁶⁸ To achieve its goals, UC is increasing energy efficiency, deploying renewable energy sources, transitioning away from gas for building energy needs such as heating, and switching to electric campus-owned vehicles.⁶⁹

One of the most impressive parts of UC's commitment is to convert its buildings to be "all-electric" in their heating, cooling and other systems that are currently supplied by gas. In a scoping study, UC found that increasing energy efficiency over time will be more feasible in all-electric buildings than in buildings combining electricity and gas. The study also determined that all-electric buildings will be comparable in cost or slightly cheaper than combined electric and gas buildings over time.⁷⁰

Brown University

In February 2019, Brown University committed to reduce its greenhouse gas emissions by 75 percent by 2025 and to eliminate the use of fossil fuels for heating and cooling by 2040. To achieve these ambitious goals, Brown is reducing its energy use, transitioning to 100 percent renewable electricity, and switching to renewable energy sources for campus heating and cooling.⁷¹

To supply 100 percent of its electricity with renewable energy sources, Brown is pursuing two projects. The university is partnering with two private companies to construct a solar array at a former gravel pit in

nearby North Kingstown, Rhode Island. This installation will produce electricity equivalent to about 70 percent of Brown's electricity consumption. The remaining 30 percent will be covered by RECs from a wind farm in Texas.⁷²

University of Richmond

In 2007, the University of Richmond in Virginia signed the Presidents' Climate Commitment to reduce greenhouse gas emissions and achieve carbon neutrality as quickly as possible – over 300 schools have also signed this commitment drafted by Second Nature.⁷³ To uphold that commitment, the school adopted a climate action plan that aims to cut the campus' greenhouse gas emissions 30 percent by 2020 and 100 percent by 2050.⁷⁴

The campus is moving toward those goals through energy efficiency upgrades and renewable energy adoption. On the energy efficiency front, the campus has adopted energy efficient lighting and appliances, thermal windows and an energy management system that optimizes heating, cooling and ventilation.⁷⁵ For renewable energy, the University of Richmond constructed a rooftop solar array on its recreation center in 2016, which classes use as a laboratory for research. This project was the first to be completed in Virginia under a new PPA pilot program.⁷⁶ The university has also contracted with the renewable energy company sPower to build an off-campus solar project that is expected to be completed in 2020 and produce as much electricity as the entire campus uses.⁷⁷

The University of Richmond has also done a lot to help its students and employees commute to and from campus sustainably – by foot, bike, bus or EV. The campus has 50 bikes that anyone can use and the school provides access to showers, covered bike parking and bike racks across campus. The university also pays for local bus passes for full-time students and employees and runs free, regular campus shuttles throughout the city of Richmond. The campus has five Zipcars for carsharing and partners with RideFinders to facilitate carpooling. Lastly, the campus has a

total of four charging stations in two parking lots for EV drivers.⁷⁸ This suite of infrastructure and programs demonstrates that colleges can do a great deal to encourage and enable their students and employees to get to campus without the use of fossil fuels.

Cornell University

Cornell University is currently ranked second on our list for deriving its heating, cooling and other non-electric building energy needs from renewable sources, but the school is aiming to go much further. Cornell is working to use 100 percent renewable energy and to be carbon neutral by 2035.⁷⁹ The school has adopted a climate action plan to achieve these goals that includes reducing energy consumption, supplying electricity with renewable energy sources, transitioning to clean campus-owned vehicles, encouraging students and employees to commute sustainably, and testing and deploying a renewable energy system to heat the campus.⁸⁰

Cornell is pursuing a diverse array of renewable energy technologies to power its campus, including solar PV, solar hot water, lake-source cooling and deep geothermal energy for heating. Currently, Cornell obtains 10 percent of its electricity from three on-campus solar PV installations, one on-campus hydro-electric plant and five off-campus solar PV projects.⁸¹



Cornell University's Lake Cooling System. Credit: Jon Reis Photography, used with permission of Cornell University.

Cornell also uses solar thermal panels to meet some of its hot water and heating needs.⁸²

One of Cornell's most innovative projects is its lake source cooling system, which uses the deep, cold waters of nearby Cayuga Lake to cool campus buildings. Water is pumped through pipes in the lake and heat exchangers cool the water by transferring its heat to the lake water. No energy is required except to move the water through pipes. The chilled water is then circulated through campus buildings to provide cooling needs, such as air conditioning. This project has reduced the campus' energy use for cooling by 80 percent and uses no refrigerants, some of which can contribute to global warming.⁸³ The campus is currently seeking funding to develop a deep, direct-use geothermal system that would provide heating for campus buildings, and would be a novel demonstration of such technology in the cold climate of Cornell's Ithaca, New York, campus.⁸⁴

Boston University

At the end of 2017, Boston University (BU) adopted the BU Bold Climate Action Plan, which commits the university to purchase 100 percent of its electricity from renewable energy sources starting in 2020 and to be carbon neutral by 2040.⁸⁵ The campus' plan to achieve carbon neutrality involves improving energy efficiency; utilizing renewable energy sources for electricity and heating; helping students and employees to travel to, from and around campus sustainably; and purchasing carbon offsets if necessary.⁸⁶

To achieve 100 percent renewable electricity, BU signed a PPA in 2018 to purchase wind power equivalent to its electricity usage.⁸⁷ The university will also purchase the RECs generated by the project, which will be certified by Green-e, an independent verification and certification program, to ensure that the renewable energy it purchases is not being double-counted by other entities. The energy is also coming from a project that would not have been built without the university.⁸⁸

Recommendations

To prevent the worst impacts of climate change, the U.S. needs to take bold action to reduce emissions as quickly as possible – including transitioning to a 100 percent renewable energy system. As centers for research and innovation, and the institutions training the leaders of tomorrow, colleges and universities are well positioned to lead this transformation.

All colleges and universities should set a goal to obtain 100 percent of their energy from renewable sources. To achieve that goal, each school should adopt a plan with defined steps and clear timelines.

As the schools featured in this report demonstrate, there are many ways to make progress toward 100 percent renewable energy, but to achieve the goal, campuses must:

- *Reduce energy consumption.* Reducing energy consumption will make it easier for colleges and universities to power their campuses with 100 percent renewable energy. Campuses can reduce consumption through:
 - **Energy efficiency** improvements and high efficiency standards for new buildings.
 - **Energy conservation**, which can be encouraged in the campus community through initiatives such as competitions and real-time feedback displays.
- Produce 100 percent of their electricity using renewable energy sources.
 - **On-Campus:** Most campuses have many rooftops suitable for solar PV installations and some have space for wind power. Campuses that install on-campus renewable energy systems can pair them with energy storage technologies, such as batteries, and connect their campuses through microgrids.
 - **Off-Campus:** Schools without enough space for wind or solar energy, or that are unable to finance the upfront cost of renewable energy systems, can purchase renewable energy and help finance the construction of new off-campus renewable energy projects through Power Purchase Agreements and Renewable Energy Credits.
- *Transition all other building energy systems – including heating, hot water and cooling – to be electric or powered by renewable energy sources, such as solar hot water or ground-source heat pumps.*
- *Transition all campus vehicles from fossil fuels to electricity.*

See the Environment America Research & Policy Center reports *Renewable Energy 101: Tools for Moving Your Campus to 100% Clean Energy* and *Renewable Energy 100: The Course to a Carbon-Free Campus* for more information, case studies and resources to transition to renewable energy.⁸⁹

While not necessary to achieve 100 percent renewable energy in their own operations, campuses should also:

- *Encourage and enable students and employees to commute to and from campus sustainably.* At most schools, thousands of employees and students commute to and from campus every day, generating significant amounts of carbon pollution. Luckily, there are numerous actions schools can take to encourage commuters to adopt sustainable habits.
 - **Biking:** Schools can provide bike lanes, covered bike storage and showers. Schools should also advocate for bike lanes and other safe infrastructure in their communities. Colleges and universities are often among the largest institu-

tions in their communities and can therefore influence local transportation decisions.

- **Transit:** Colleges should provide frequent, electric bus service around campus and through the local community and/or provide free passes for the local transit system to students and employees.
 - **Electric vehicles:** Campuses should offer access to shared EVs and install EV charging stations on campus.
- *Purchase goods and services that minimize the use of fossil fuels.* Campuses should purchase goods, such as food for dining halls, and services, such as travel for students and employees, that utilize the smallest amount of fossil fuels possible.

Methodology

The rankings in this report are based on colleges' and universities' reports to the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment & Rating System (STARS) database versions 2.0 and 2.1. Only reports submitted between 2016 and 2018 are included. During that time, 290 schools reported to STARS. Of those, 180 reported whether and how much renewable energy they used for at least one metric used in this report's rankings – on-campus renewable electricity produced, off-campus renewable electricity purchased, RECs purchased, or on-campus non-electric renewable energy generated (e.g. for heating, cooling and hot water). For the EV ranking, 261 schools reported data on their campus-owned vehicles.

AASHE provided access to the STARS data displays, which include all schools' entries in spreadsheet form. The following metrics were used to generate the building energy use rankings in this report:

- The on-campus renewable electricity ranking is based on the STARS metric: "Total clean and renewable electricity generated on site (MMBtu) during the performance year and for which the institution retains or has retired the associated environmental attributes."
- The off-campus renewable electricity ranking is based on: "Total clean and renewable electricity generated by off-site projects (MMBtu) that the institution catalyzed and for which the institution retains or has retired the associated environmental attributes, performance year."

- The total renewable electricity ranking is based on the sum of the two metrics above and: Total third-party certified RECs (MMBtu) and/or similar renewable energy products (including renewable electricity purchased through a utility-provided certified green power option) purchased during the performance year.
- The on-campus non-electric renewable energy ranking (for heating, cooling, hot water, etc.), is based on: "Non-electric renewable energy generated on-site, performance year."

For each ranking, the amount of energy schools produced or purchased was divided by "full-time equivalent student enrollment (undergraduate and graduate)" to account for the differences in size between schools.

Some schools featured in these rankings use forms of energy are often considered "renewable" but that are not necessarily clean. These forms of energy include biomass and renewable fuel oil, such as biodiesel. The environmental sustainability of these forms of energy depends critically on how they are obtained. Because schools do not report the share of their renewable energy that comes from particular sources, there is no consistent way to exclude sources of energy that are not clean from the data used for the rankings.

AASHE flagged several schools with potentially problematic data. We reached out to each school for more information. The University of North Carolina (UNC) Chapel Hill produces electricity on-campus that it sells, but does not retain the RECs for, so it was

excluded from the on-campus renewable electricity ranking. Mount Holyoke reported generating renewable electricity on-campus with the steam from its combined heat and power plant, but because the plant runs on oil, this electricity is not renewable, so it was excluded from the on-campus renewable electricity ranking. The University of Missouri reported an incorrect figure for its on-campus renewable electricity production to STARS, but provided a corrected figure, which we used in the rankings. Furman University reported incorrect figures for on-campus renewable electricity and was unable to supply corrected figures, so the school was removed from the ranking. The University of Tennessee, Knoxville,

Dickinson and Bryn Mawr Colleges reported incorrect figures for its RECs purchases to STARS, but provided corrected figures, which we used in the rankings.

The campus-owned vehicles ranking is based on schools' entries for "Total number of vehicles (e.g. cars, carts, trucks, tractors, buses, electric assist cycles) in the institution's fleet," "Number of 100 percent electric vehicles in the institution's fleet (including electric assist utility bicycles and tricycles)," and "Number of hydrogen-fueled vehicles in the institution's fleet." Using these entries, we calculated the percent of campuses' vehicles that were 100 percent electric or hydrogen-fueled. None of the top 10 schools had any hydrogen-fueled vehicles.

Appendix

The following table includes data from all schools' self-reporting data to AASHE STARS versions 2.0 and 2.1 for at least one of the metrics used in this report's rankings, organized alphabetically by state and then name. Schools with "-" listed do not report the metrics used in those rankings.

School	State	Full-time equivalent student enrollment (undergraduate and graduate) (FTE)	Total Renewable Electricity (Including RECs)		On-Campus Electricity		Off-Campus Electricity		On-Campus Non-Electric Energy (Heating, etc.)		% of Campus-Owned Vehicles That Are Clean	
			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Auburn University	AL	-	-	-	-	-	-	-	-	-	145	4.7%
University of Alabama at Birmingham	AL	18,333	-	-	-	-	-	-	-	-	158	3.8%
University of Arkansas	AR	-	-	-	-	-	-	-	-	-	217	0.4%
Arizona State University	AZ	76,018	47	3.32	-	-	10	1.46	27	0.11	21	47.9%
Northern Arizona University	AZ	28,657	55	2.15	73	0.033	-	-	-	-	212	0.7%
University of Arizona	AZ	41,631	114	0.09	50	0.094	-	-	26	0.15	82	13.1%
California College of the Arts	CA	1,877	-	-	-	-	-	-	19	0.27	37	33.3%
California Polytechnic State University	CA	20,213	129	0.05	67	0.047	-	-	-	-	61	22.2%
California State Polytechnic University, Pomona	CA	19,741	92	0.33	28	0.335	-	-	-	-	26	41.0%
California State University, Bakersfield	CA	7,764	61	1.63	19	0.617	-	-	-	-	35	34.8%
California State University, Chico	CA	16,335	113	0.10	48	0.102	-	-	-	-	42	29.3%
California State University, Dominguez Hills	CA	11,325	-	-	-	-	-	-	-	-	7	67.2%
California State University, Long Beach	CA	31,175	123	0.06	62	0.058	-	-	-	-	8	63.4%
California State University, Los Angeles	CA	-	-	-	-	-	-	-	-	-	19	49.5%
California State University, Monterey Bay	CA	7,546	79	0.73	15	0.727	-	-	-	-	74	16.0%
California State University, Northridge	CA	-	-	-	-	-	-	-	-	-	12	58.4%
California State University, Sacramento	CA	-	-	-	-	-	-	-	-	-	16	53.4%
California State University, San Marcos	CA	10,924	-	-	-	-	-	-	-	-	2	78.8%
Harvey Mudd College	CA	844	-	-	-	-	-	-	-	-	5	73.1%
Humboldt State University	CA	8,228	140	0.01	89	0.013	-	-	-	-	81	13.7%

School	State	Full-time equivalent student enrollment (undergraduate and graduate) (FTE)	Total Renewable Electricity (Including RECs)		On-Campus Electricity		Off-Campus Electricity		On-Campus Non-Electric Energy (Heating, etc.)		% of Campus-Owned Vehicles That Are Clean	
			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Loyola Marymount University	CA	7,751	53	2.63	20	0.588	-	-	-	-	6	71.6%
Mills College	CA	1,222	138	0.01	84	0.014	-	-	-	-	-	-
Saint Mary's College of California	CA	-	-	-	-	-	-	-	-	-	104	9.0%
San Diego State University	CA	31,402	101	0.22	36	0.216	-	-	-	-	78	14.8%
San Francisco State University	CA	24,499	120	0.07	56	0.074	-	-	-	-	23	44.0%
San Jose State University	CA	-	-	-	-	-	-	-	-	-	14	56.2%
Santa Clara University	CA	8,702	31	7.91	70	0.039	-	-	16	0.48	22	47.0%
Soka University of America	CA	450	67	1.13	7	1.131	-	-	-	-	-	-
Stanford University	CA	15,887	103	0.19	39	0.193	-	-	-	-	29	38.1%
University of California, Berkeley	CA	42,103	128	0.05	90	0.013	-	-	41	0.02	146	4.6%
University of California, Irvine	CA	33,093	72	0.95	17	0.650	16	0.18	-	-	27	38.6%
University of California, Merced	CA	-	-	-	-	-	-	-	-	-	50	26.2%
University of California, Riverside	CA	-	-	-	-	-	-	-	-	-	70	18.9%
University of California, San Diego	CA	31,921	41	4.98	31	0.293	4	4.57	17	0.30	25	42.5%
University of California, Santa Barbara	CA	21,799	107	0.15	44	0.147	-	-	-	-	91	11.6%
University of California, Santa Cruz	CA	-	-	-	-	-	-	-	-	-	102	9.3%
University of San Diego	CA	7,671	75	0.85	10	0.848	-	-	-	-	77	15.2%
University of the Pacific	CA	-	-	-	-	-	-	-	-	-	4	73.9%
Colorado College	CO	2,277	58	1.69	9	0.871	14	0.82	33	0.06	114	8.5%
Colorado State University	CO	25,373	80	0.63	66	0.048	-	-	24	0.17	153	4.2%
Fort Lewis College	CO	3,168	38	6.03	69	0.046	-	-	-	-	-	-
University of Colorado Boulder	CO	26,124	-	-	-	-	-	-	-	-	129	6.5%
University of Colorado Colorado Springs	CO	10,475	39	6.02	113	0.003	17	0.16	20	0.21	118	7.5%
Antioch College	CT	133	64	1.44	6	1.444	-	-	-	-	63	21.4%
University of Connecticut	CT	21,776	62	1.63	86	0.013	-	-	-	-	147	4.6%
Wesleyan University	CT	3,574	143	0.01	100	0.008	-	-	-	-	86	12.7%
Yale University	CT	12,402	86	0.48	23	0.482	-	-	52	0.0005	220	0.2%
American University	DC	12,504	19	15.43	98	0.009	2	7.51	45	0.01	86	12.7%
George Washington University	DC	22,866	22	11.85	124	0.001	1	11.85	38	0.02	75	15.7%
University of Delaware	DE	20,512	-	-	-	-	-	-	-	-	160	3.7%
Florida Gulf Coast University	FL	12,551	77	0.76	11	0.759	-	-	-	-	9	63.2%

School	State	Full-time equivalent student enrollment (undergraduate and graduate) (FTE)	Total Renewable Electricity (Including RECs)		On-Campus Electricity		Off-Campus Electricity		On-Campus Non-Electric Energy (Heating, etc.)		% of Campus-Owned Vehicles That Are Clean	
			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Florida Institute of Technology	FL	4,509	-	-	-	-	-	-	-	-	40	30.7%
Florida International University	FL	30,620	159	0.00000	131	0.00000	-	-	-	-	53	25.1%
Nova Southeastern University	FL	18,000	-	-	-	-	-	-	-	-	141	5.0%
Ringling College of Art and Design	FL	1,321	-	-	-	-	-	-	-	-	1	85.4%
University of Central Florida	FL	40,071	83	0.58	85	0.013	-	-	47	0.005	71	17.5%
University of Florida	FL	-	-	-	-	-	-	-	-	-	167	3.2%
University of Miami	FL	16,188	155	0.001	123	0.001	-	-	-	-	49	26.3%
University of South Florida	FL	33,413	26	9.71	59	0.066	-	-	-	-	99	9.7%
University of South Florida St. Petersburg	FL	4,080	130	0.05	68	0.046	-	-	-	-	15	55.6%
Agnes Scott College	GA	917	68	1.11	8	1.105	-	-	13	0.87	64	21.1%
Emory University	GA	14,521	118	0.08	54	0.084	-	-	-	-	45	27.3%
Georgia College & State University	GA	-	-	-	-	-	-	-	-	-	24	42.6%
University of Georgia	GA	35,165	145	0.01	103	0.006	-	-	51	0.001	173	2.9%
University of West Georgia	GA	11,877	-	-	-	-	-	-	-	-	67	19.9%
Iowa State University	IA	34,347	65	1.35	96	0.010	12	1.34	-	-	-	-
Luther College	IA	2,327	30	8.26	42	0.166	3	5.06	-	-	183	2.1%
University of Iowa	IA	29,288	131	0.04	71	0.038	-	-	3	22.35	187	1.9%
College of Lake County	IL	8,365	-	-	-	-	-	-	43	0.01	181	2.2%
Illinois Institute of Technology	IL	5,456	-	-	-	-	-	-	-	-	38	32.3%
Knox College	IL	1,378	9	26.87	-	-	-	-	-	-	112	8.6%
Loyola University Chicago	IL	14,802	52	3.01	-	-	-	-	36	0.05	56	24.5%
Northwestern University	IL	-	-	-	-	-	-	-	-	-	132	6.3%
Southern Illinois University Carbondale	IL	-	-	-	-	-	-	-	-	-	188	1.8%
University of Illinois at Chicago	IL	24,509	90	0.42	81	0.017	-	-	21	0.18	-	-
University of Illinois, Urbana-Champaign	IL	43,917	93	0.31	30	0.305	19	0.001	-	-	221	0.2%
Butler University	IN	4,644	157	0.0002	-	-	-	-	-	-	166	3.3%
Earlham College	IN	-	-	-	-	-	-	-	-	-	31	36.4%
Indiana University Bloomington	IN	38,219	88	0.47	49	0.098	-	-	50	0.001	100	9.7%
Indiana University-Purdue University Indianapolis (IUPUI)	IN	-	-	-	-	-	-	-	-	-	31	36.4%
University of Notre Dame	IN	12,255	136	0.02	78	0.021	-	-	-	-	206	1.0%
Johnson County Community College	KS	22,372	134	0.03	76	0.028	-	-	-	-	185	2.0%

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			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Berea College	KY	1,635	105	0.18	40	0.184	-	-	49	0.002	101	9.5%
Eastern Kentucky University	KY	13,789	98	0.28	34	0.281	-	-	-	-	112	8.6%
University of Louisville	KY	-	-	-	-	-	-	-	-	-	208	0.9%
Western Kentucky University	KY	16,143	135	0.03	121	0.001	-	-	-	-	193	1.6%
Babson College	MA	3,471	69	1.04	94	0.011	-	-	37	0.03	109	8.7%
Bentley University	MA	-	-	-	-	-	-	-	-	-	55	24.6%
Boston College	MA	12,972	-	-	-	-	-	-	-	-	143	5.0%
Clark University	MA	3,000	-	-	-	-	-	-	-	-	31	36.4%
Endicott College	MA	-	-	-	-	-	-	-	-	-	43	28.6%
Hampshire College	MA	1,244	141	0.01	91	0.011	-	-	-	-	177	2.5%
Mount Holyoke College	MA	2,239	-	-	-	-	-	-	40	0.02	-	-
Smith College	MA	2,804	78	0.75	14	0.752	-	-	-	-	205	1.1%
University of Massachusetts Amherst	MA	28,412	154	0.001	119	0.001	-	-	48	0.003	134	6.1%
University of Massachusetts Lowell	MA	12,884	-	-	-	-	-	-	-	-	150	4.3%
Wentworth Institute of Technology	MA	4,051	-	-	-	-	-	-	-	-	34	35.3%
Williams College	MA	-	-	-	-	-	-	-	-	-	199	1.3%
Worcester Polytechnic Institute	MA	5,718	-	-	-	-	-	-	34	0.06	148	4.5%
Bates College	ME	1,772	15	22.43	129	0.00001	-	-	6	19.47	89	12.2%
Bowdoin College	ME	-	-	-	-	-	-	-	-	-	192	1.7%
College of the Atlantic	ME	325	27	9.41	13	0.754	-	-	9	9.31	150	4.3%
Saint Joseph's College - ME	ME	1,995	-	-	-	-	-	-	-	-	154	4.0%
Unity College	ME	712	42	4.81	79	0.020	-	-	11	2.16	184	2.0%
Calvin College	MI	4,104	142	0.01	95	0.010	-	-	-	-	-	-
Central Michigan University	MI	18,738	84	0.53	22	0.532	-	-	-	-	-	-
Delta College	MI	6,043	149	0.004	109	0.004	-	-	-	-	84	12.8%
Grand Valley State University	MI	-	-	-	-	-	-	-	-	-	17	50.6%
Hope College	MI	-	-	-	-	-	-	-	-	-	203	1.2%
Michigan State University	MI	-	-	-	-	-	-	-	-	-	170	3.1%
Northern Michigan University	MI	6,772	87	0.48	24	0.481	-	-	-	-	-	-
University of Michigan	MI	43,147	76	0.82	-	-	-	-	-	-	214	0.5%
Washtenaw Community College	MI	7,904	156	0.0002	127	0.0002	-	-	-	-	95	10.4%
Carleton College	MN	2,023	34	6.86	3	6.862	-	-	-	-	-	-
Concordia College - Moorhead	MN	2,092	48	3.29	-	-	-	-	-	-	162	3.6%
Macalester College	MN	2,121	115	0.09	120	0.001	20	0.000	-	-	28	38.5%
University of Minnesota, Duluth	MN	-	-	-	-	-	-	-	-	-	121	7.1%

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			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
University of Minnesota, Morris	MN	1,688	25	9.95	1	9.953	-	-	7	12.48	141	5.0%
University of St. Thomas	MN	8,546	153	0.002	118	0.002	-	-	-	-	135	6.1%
Missouri State University	MO	18,720	110	0.13	-	-	-	-	-	-	139	5.3%
Missouri University of Science and Technology	MO	7,941	102	0.21	37	0.214	-	-	10	7.84	180	2.3%
Saint Louis University	MO	12,281	121	0.07	57	0.073	-	-	-	-	196	1.4%
University of Missouri	MO	31,194	24	10.59	2	7.729	6	2.86	5	20.16	-	-
Washington University in St. Louis	MO	15,252	127	0.05	65	0.049	-	-	54	0.0000	107	8.8%
University of Montana	MT	10,223	148	0.004	108	0.004	-	-	-	-	132	6.3%
East Carolina University	NC	25,065	-	-	-	-	-	-	-	-	120	7.5%
Elon University	NC	6,610	150	0.003	112	0.003	-	-	-	-	106	9.0%
University of North Carolina at Chapel Hill	NC	27,518	-	-	-	-	-	-	-	-	168	3.2%
University of North Carolina, Charlotte	NC	-	-	-	-	-	-	-	-	-	36	33.8%
University of North Carolina, Pembroke	NC	-	-	-	-	-	-	-	-	-	10	62.0%
University of North Carolina, Wilmington	NC	-	-	-	-	-	-	-	-	-	140	5.1%
Wake Forest University	NC	6,829	147	0.01	105	0.005	-	-	32	0.07	83	12.9%
Warren Wilson College	NC	-	-	-	-	-	-	-	-	-	54	24.7%
Central Community College	NE	3,777	133	0.03	75	0.029	-	-	-	-	-	-
Creighton University	NE	8,228	119	0.08	55	0.083	-	-	-	-	137	5.8%
Metropolitan Community College	NE	9,771	-	-	-	-	-	-	-	-	124	7.1%
University of Nebraska - Lincoln	NE	23,340	-	-	-	-	-	-	-	-	210	0.9%
University of Nebraska at Omaha	NE	12,482	-	-	-	-	-	-	-	-	196	1.4%
Keene State College	NH	4,400	81	0.62	18	0.619	-	-	-	-	73	16.7%
University of New Hampshire	NH	14,292	16	16.89	-	-	-	-	4	20.87	-	-
Princeton University	NJ	8,032	-	-	-	-	-	-	-	-	65	20.3%
Stockton University	NJ	9,220	-	-	-	-	-	-	-	-	107	8.8%
Central New Mexico Community College	NM	-	-	-	-	-	-	-	-	-	80	14.3%
New Mexico State University	NM	18,255	117	0.09	52	0.088	-	-	-	-	222	0.1%
Bard College	NY	2,111	49	3.23	-	-	-	-	-	-	164	3.5%
Binghamton University	NY	16,925	85	0.53	74	0.031	-	-	8	10.66	20	48.0%
Clarkson University	NY	-	-	-	-	-	-	-	-	-	194	1.4%
Colgate University	NY	2,865	-	-	-	-	-	-	1	33.53	179	2.3%
Cornell University	NY	23,016	56	2.06	16	0.669	11	1.39	2	23.64	218	0.3%

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			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Hobart and William Smith Colleges	NY	2,204	12	23.88	114	0.003	7	2.31	30	0.09	152	4.3%
Ithaca College	NY	6,796	-	-	-	-	-	-	22	0.18	188	1.8%
Onondaga Community College	NY	-	-	-	-	-	-	-	-	-	88	12.3%
Rochester Institute of Technology	NY	13,699	50	3.10	21	0.568	-	-	-	-	144	4.9%
Skidmore College	NY	2,555	36	6.70	4	3.297	5	3.41	29	0.10	-	-
St. Lawrence University	NY	2,415	37	6.49	-	-	9	1.54	-	-	52	25.4%
State University of New York at Fredonia	NY	4,556	-	-	-	-	-	-	-	-	136	5.9%
State University of New York at Geneseo	NY	-	-	-	-	-	-	-	-	-	46	27.1%
State University of New York at New Paltz	NY	7,027	125	0.05	64	0.054	-	-	-	-	104	9.0%
State University of New York at Oneonta	NY	6,098	-	-	-	-	-	-	-	-	103	9.2%
State University of New York College of Environmental Science and Forestry	NY	2,067	57	2.02	43	0.161	-	-	15	0.48	92	11.5%
Stony Brook University	NY	-	-	-	-	-	-	-	-	-	155	4.0%
Syracuse University	NY	19,331	33	7.44	38	0.205	-	-	-	-	149	4.4%
The New School	NY	9,202	32	7.78	-	-	-	-	-	-	-	-
University at Albany	NY	-	-	-	-	-	-	-	-	-	121	7.1%
University at Buffalo	NY	28,125	10	26.62	53	0.086	15	0.24	-	-	-	-
Vassar College	NY	2,409	43	4.26	92	0.011	8	2.12	14	0.62	174	2.9%
Wells College	NY	510	20	13.25	-	-	-	-	-	-	-	-
Case Western Reserve University	OH	10,820	99	0.25	35	0.254	-	-	-	-	161	3.6%
Cleveland State University	OH	13,947	45	4.08	99	0.009	-	-	-	-	159	3.8%
Oberlin College	OH	-	-	-	-	-	-	-	-	-	157	3.9%
Ohio University	OH	24,654	29	8.28	93	0.011	-	-	53	0.0001	204	1.1%
The Ohio State University	OH	-	-	-	-	-	-	-	-	-	176	2.5%
The Ohio State University at Newark	OH	2,224	-	-	-	-	-	-	-	-	162	3.6%
University of Cincinnati	OH	28,922	-	-	-	-	-	-	-	-	207	1.0%
University of Dayton	OH	10,092	96	0.28	107	0.005	-	-	-	-	85	12.8%
University of Mount Union	OH	2,254	116	0.09	51	0.091	-	-	-	-	51	25.7%
Oklahoma State University	OK	21,240	18	15.66	-	-	-	-	-	-	201	1.2%
Lewis & Clark College	OR	3,250	21	12.36	80	0.018	-	-	-	-	48	26.7%
Oregon State University	OR	23,879	82	0.58	25	0.452	-	-	42	0.02	111	8.7%
Portland Community College	OR	28,019	111	0.12	46	0.117	-	-	-	-	211	0.8%
Southern Oregon University	OR	4,200	97	0.28	33	0.284	-	-	31	0.08	94	10.8%
University of Oregon	OR	-	-	-	-	-	-	-	-	-	125	6.8%

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			Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	per FTE Student (MMBtu)	Rank	% that Are EVs or Hydrogen-Fueled
Bryn Mawr College	PA	1,641	6	34.64	-	-	-	-	-	-	-	-
Dickinson College	PA	2,357	8	27.67	41	0.166	-	-	46	0.01	-	-
Gettysburg College	PA	-	-	-	-	-	-	-	-	-	198	1.3%
Haverford College	PA	1,268	4	38.14	83	0.014	-	-	35	0.05	79	14.5%
Lehigh University	PA	6,659	151	0.003	115	0.003	-	-	-	-	213	0.7%
Muhlenberg College	PA	2,504	146	0.01	104	0.005	-	-	23	0.18	44	27.7%
Pennsylvania State University	PA	45,661	73	0.93	122	0.001	13	0.93	-	-	215	0.4%
Pittsburg State University	PA	-	-	-	-	-	-	-	-	-	131	6.3%
Slippery Rock University	PA	-	-	-	-	-	-	-	-	-	119	7.5%
Susquehanna University	PA	2,150	35	6.75	-	-	-	-	-	-	18	50.0%
Swarthmore College	PA	1,619	7	32.66	110	0.004	-	-	-	-	58	23.1%
Temple University	PA	35,750	44	4.20	-	-	-	-	-	-	200	1.2%
University of Pennsylvania	PA	21,358	11	25.24	-	-	-	-	-	-	171	3.0%
University of Pittsburgh	PA	26,935	106	0.17	125	0.001	-	-	-	-	-	-
Villanova University	PA	9,942	-	-	-	-	-	-	-	-	126	6.8%
West Chester University of Pennsylvania	PA	15,622	54	2.62	-	-	-	-	-	-	-	-
Clemson University	SC	22,307	126	0.05	72	0.035	-	-	-	-	-	-
Furman University	SC	2,981	-	-	-	-	-	-	-	-	13	56.6%
University of South Carolina	SC	-	-	-	-	-	-	-	-	-	178	2.3%
Black Hills State University	SD	3,034	152	0.002	116	0.002	-	-	-	-	97	9.8%
South Dakota State University	SD	-	-	-	-	-	-	-	-	-	121	7.1%
Belmont University	TN	-	-	-	-	-	-	-	-	-	109	8.7%
Sewanee - The University of the South	TN	-	-	-	-	-	-	-	-	-	93	10.9%
Tennessee Technological University	TN	9,125	100	0.25	-	-	-	-	-	-	90	12.2%
University of Tennessee at Knoxville	TN	24,535	5	34.79	97	0.010	-	-	-	-	175	2.6%
Austin College	TX	1,232	2	40.71	-	-	-	-	-	-	68	19.5%
Baylor University	TX	16,001	-	-	-	-	-	-	-	-	156	4.0%
Rice University	TX	6,554	46	4.06	60	0.063	-	-	-	-	3	75.8%
Southwestern University	TX	1,508	1	40.84	-	-	-	-	-	-	11	60.9%
Tarleton State University	TX	-	-	-	-	-	-	-	-	-	115	8.0%
Texas A&M University	TX	57,682	-	-	-	-	-	-	-	-	127	6.7%
Texas Tech University	TX	33,595	94	0.31	29	0.306	-	-	-	-	138	5.4%
The University of Texas at Dallas	TX	-	-	-	-	-	-	-	-	-	39	31.9%
University of Texas at Arlington	TX	-	-	-	-	-	-	-	-	-	182	2.1%
University of Texas at Austin	TX	46,453	124	0.06	63	0.057	-	-	44	0.01	59	23.0%
University of Texas at El Paso	TX	-	-	-	-	-	-	-	-	-	98	9.8%

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University of Texas Rio Grande Valley	TX	21,724	112	0.11	47	0.106	-	-	-	-	60	22.5%
University of Utah	UT	30,388	23	11.01	-	-	-	-	-	-	-	-
Utah State University	UT	14,288	95	0.29	32	0.288	-	-	-	-	219	0.3%
Westminster College - Utah	UT	-	-	-	-	-	-	-	-	-	69	19.0%
College of William & Mary	VA	8,332	-	-	-	-	-	-	-	-	185	2.0%
Eastern Mennonite University	VA	1,465	-	-	-	-	-	-	-	-	57	23.7%
George Mason University	VA	28,019	108	0.15	126	0.0003	-	-	-	-	41	30.0%
James Madison University	VA	20,877	70	1.00	117	0.002	-	-	-	-	195	1.4%
University of Richmond	VA	-	-	-	-	-	-	-	-	-	72	17.0%
University of Virginia	VA	22,405	137	0.02	82	0.016	-	-	-	-	-	-
Virginia Commonwealth University	VA	28,377	122	0.07	58	0.070	-	-	28	0.10	216	0.4%
Virginia Tech	VA	33,223	139	0.01	88	0.013	-	-	-	-	-	-
Washington and Lee University	VA	2,170	63	1.62	12	0.756	-	-	25	0.15	116	7.8%
Middlebury College	VT	-	-	-	-	-	-	-	-	-	191	1.7%
Saint Michael's College	VT	2,167	89	0.43	26	0.425	-	-	-	-	165	3.5%
Sterling College	VT	120	51	3.08	5	3.083	-	-	-	-	-	-
University of Vermont	VT	12,251	17	16.48	128	0.0001	-	-	-	-	117	7.6%
Cascadia College	WA	2,984	109	0.13	45	0.134	-	-	-	-	-	-
Gonzaga University	WA	-	-	-	-	-	-	-	-	-	202	1.2%
North Seattle College	WA	3,828	158	0.00001	130	0.00001	-	-	-	-	76	15.4%
Portland State University	WA	20,844	144	0.01	102	0.006	-	-	-	-	62	21.8%
Seattle University	WA	6,681	104	0.19	106	0.005	-	-	-	-	30	37.3%
South Seattle College	WA	4,562	-	-	-	-	-	-	-	-	47	26.9%
University of Washington, Seattle	WA	52,466	71	0.98	101	0.007	-	-	-	-	130	6.4%
Whatcom Community College	WA	3,771	-	-	-	-	-	-	-	-	66	20.0%
Whitman College	WA	1,465	3	39.79	61	0.062	-	-	-	-	-	-
Northland College	WI	579	91	0.41	27	0.407	-	-	18	0.30	128	6.7%
University of Wisconsin - Green Bay	WI	4,720	-	-	-	-	-	-	-	-	190	1.8%
University of Wisconsin - Oshkosh	WI	10,654	40	5.30	77	0.028	-	-	12	1.15	209	0.9%
University of Wisconsin - Platteville	WI	7,878	28	8.51	111	0.003	-	-	-	-	172	3.0%
University of Wisconsin - River Falls	WI	6,927	132	0.03	-	-	18	0.01	39	0.02	96	9.9%
University of Wisconsin - Stevens Point	WI	7,814	13	23.50	-	-	-	-	-	-	169	3.2%
University of Wisconsin - Whitewater	WI	10,888	59	1.64	87	0.013	-	-	-	-	-	-

Notes

1 U.S. Environmental Protection Agency (EPA), *Green Power Partner List*, accessed 4 March 2019, archived at <http://web.archive.org/web/20190303094359/www.epa.gov/greenpower/green-power-partner-list>.

2 U.S. Environmental Protection Agency (EPA), *Energy Use in Commercial Buildings*, accessed 19 December 2018, archived at http://web.archive.org/web/20181129150514/www.eia.gov/energyexplained/index.php?page=us_energy_commercial; Leia Guccione and Laurie Stone, “Higher Education’s Energy Lessons: Why Universities and Colleges Are Big Believers in Campus Microgrids” (blog post), *Rocky Mountain Institute*, 31 October 2013, archived at http://web.archive.org/web/20190130182200/rmi.org/blog_2013_10_31_higher_educations_energy_lessons/; Association for the Advancement of Sustainability in Higher Education, *How Do Campus Sustainability Initiatives Affect College Admissions?*, 2 March 2009, archived at <http://web.archive.org/web/20171007171202/www.aashe.org/campus-sustainability-initiatives-affect-college-admissions/>.

3 Princeton Review, *2019 College Hopes & Worries Survey Report*, downloaded 11 March 2019, available at <https://www.princetonreview.com/college-rankings/college-hopes-worries>.

4 Joshua Long and Peri Kincaid, “A Red City Goes Green: The Renewable Energy Partnership of Georgetown, Texas and Southwestern University,” *Sustainability*, 11 December 2018, available at <https://www.liebertpub.com/doi/10.1089/sus.2018.0017>.

5 University of Minnesota Morris, Sustainability, *Renewable Energy*, accessed 28 February 2019, archived at <http://web.archive.org/web/20170717123330/www4.morris.umn.edu:80/sustainability/renewable-energy>

6 George Washington University, Office of Media Relations, *Capital Partners Solar Project Fact Sheet*, accessed on 1 March 2019, archived at <https://web.archive.org/web/20190301150600/sustainability.gwu.edu/sites/g/files/zaxdzs2861/f/downloads/CPSP%20Solar%20Fact%20Sheet%202017%20update%20%281%29.pdf>; Association for the Advancement of Sustainability in Higher Education’s, Sustainability Tracking, Assessment & Rating System, *George Washington University Report*, 28 February 2018.

7 Colgate University, *Buildings and Land Management*, accessed on 1 March 2019, archived at <http://web.archive.org/web/20181201045235/www.colgate.edu/about/sustainability/campus/buildings-and-land-management>.

8 Harvard University, *Harvard’s Climate Action Plan*, accessed 6 February 2019, archived at <http://web.archive.org/web/20190131150528/green.harvard.edu/campaign/harvards-climate-action-plan>.

9 Harvard University, Sustainability, *We’re Reducing Energy Even as Demand is Growing*, accessed 30 January 2019, archived at <http://web.archive.org/web/20180207134258/green.harvard.edu/topics/climate-change-energy/energy-efficiency>.

10 University of Hawai’i, *Net Zero Energy by 2035*, accessed 30 January 2019, archived at <http://web.archive.org/web/20181030072348/www.hawaii.edu/sustainability/commitment/netzero2035/>.

11 Kelli Trifonovitch, "UH Maui College Aims to be First Net-Zero UH Campus," *University of Hawai'i News*, 19 March 2018, archived at <http://web.archive.org/web/20190130145916/www.hawaii.edu/news/2018/03/19/maui-college-aims-to-be-first-100-percent-renewable-energy/>.

12 University of California, *Carbon Neutrality Initiative*, accessed 13 February 2019, archived at <http://web.archive.org/web/20181210062758/www.ucop.edu/carbon-neutrality-initiative/global-climate-council/index.html>.

13 Point Energy Innovations, *Final Report: UC Carbon Neutral Buildings Cost Study*, 23 June 2017, available at https://www.ucop.edu/sustainability/_files/Carbon%20Neutral%20New%20Building%20Cost%20Study%20FinalReport.pdf.

14 Sterling College, *About Sterling*, accessed 17 February 2019, archived at <http://web.archive.org/web/20181022192303/sterlingcollege.edu/about-sterling/>.

15 Sterling College, *Sterling College Sets Fundraising Record*, 21 August 2018, archived at <http://web.archive.org/web/20181022082822/sterlingcollege.edu/news-room/sterling-college-sets-fundraising-record/>.

16 Studies detailing high or 100 percent renewable energy scenarios include:

- Christian Breyer et al., "On the Role of Solar Photovoltaics in Global Energy Transition Scenarios," *Progress in Photovoltaics Research and Applications*, DOI: 10.1002/pip.2885, May 2017.
- Cory Budischak, "Cost-Minimized Combinations of Wind Power, Solar Power and Electrochemical Storage, Powering the Grid up to 99.9% of the Time," *Journal of Power Sources*, 225: 60-74, 1 March 2013.

- M.M. Hand et al., National Renewable Energy Laboratory, *Renewable Electricity Futures Study*, December 2012. • Mark Jacobson et al., "100% Clean and Renewable Wind, Water, and Sunlight (WWS) All-sector Energy Roadmaps for the 50 United States," *Energy & Environmental Science*, DOI: 10.1039/C5EE01283J, 27 May 2015. • Alexander MacDonald et al., "Future Cost-Competitive Electricity Systems and Their Impact on U.S. CO₂ Emissions," *Nature Climate Change*, DOI: 10.1038/nclimate2921, 25 January 2016.

- James H. Williams et al., Energy and Environmental Economics, *Pathways to Deep Decarbonization in the United States*, 16 November 2015.

17 U.S. Environmental Protection Agency (EPA), *Energy Use in Commercial Buildings*, accessed 19 December 2018, archived at http://web.archive.org/web/20181129150514/www.eia.gov/energyexplained/index.php?page=us_energy_commercial.

18 Leia Guccione and Laurie Stone, "Higher Education's Energy Lessons: Why Universities and Colleges Are Big Believers in Campus Microgrids" (blog post), *Rocky Mountain Institute*, 31 October 2013, archived at http://web.archive.org/web/20190130182200/rmi.org/blog_2013_10_31_higher_educations_energy_lessons/.

19 Association for the Advancement of Sustainability in Higher Education, *How Do Campus Sustainability Initiatives Affect College Admissions?*, 2 March 2009, archived at <http://web.archive.org/web/20171007171202/www.aashe.org/campus-sustainability-initiatives-affect-college-admissions/>.

20 Princeton Review, *2019 College Hopes & Worries Survey Report*, downloaded 11 March 2019, available at <https://www.princetonreview.com/college-rankings/college-hopes-worries>.

- 21 E Source Companies, *Managing Energy Costs in Colleges and Universities* (fact sheet), accessed 22 September 2017, archived at web.archive.org/web/20170922135424/beatouchstoneenergy.com/sites/beabea/files/PDF/Sector/Colleges-Universities.pdf; Lawrence Livermore National Laboratory, *Estimated U.S. Energy Use in 2014: ~98.3 Quads* (infographic), March 2014; John A. "Skip" Laitner et al., American Council for an Energy-Efficient Economy, *The Long-Term Energy Efficiency Potential: What the Evidence Suggests*, 11 January 2012.
- 22 Harvard University, *Shut the Sash Program*, accessed 19 December 2018, archived at <http://web.archive.org/web/20171120124632/green.harvard.edu/programs/green-labs/shut-sash-program>.
- 23 See note 9.
- 24 McKinsey & Company, *Unlocking Energy Efficiency in the U.S. Economy*, 2009.
- 25 Mike Debraggio, "Building Dashboard Shows College's Energy Use in Real Time," *Hamilton College*, 28 August 2008, archived at <http://web.archive.org/web/20190108121716/hamilton.edu/news/story/building-dashboard-shows-colleges-energy-use-in-real-time>.
- 26 U.S. Environmental Protection Agency (EPA), *Green Power Partner List*, accessed 4 March 2019, archived at <http://web.archive.org/web/20190303094359/www.epa.gov/greenpower/green-power-partner-list>.
- 27 Arizona State University, *ASU Solar*, accessed 26 September 2018, archived at <http://web.archive.org/web/20180926191115/cfo.asu.edu/solar>.
- 28 Kyle Pennell, "Why Did Solar Get So Cheap in the Last 20 Years?," *Unplugged*, 18 January 2018, available at <https://www.ohmconnect.com/blog-post/why-did-solar-get-so-cheap-in-the-last-20-years>.
- 29 Karen B. Roberts, "Wind Turbine Turns 5," *UDaily*, 31 August 2015, archived at <http://web.archive.org/web/20180926191418/www1.udel.edu/udaily/2016/aug/wind-turbine-083115.html>.
- 30 Amherst College, *Five Leading Liberal Arts College Partner to Create New Solar Energy Facility in Maine*, accessed 2 March 2019, archived at http://web.archive.org/web/20190204100333/www.amherst.edu/news/news_releases/2018/4-2018/five-leading-liberal-arts-college-partner-to-create-new-solar-energy-facility-in-maine.
- 31 National Grid, *Managing Energy Costs in Colleges and Universities*, 2003, available at https://www9.nationalgridus.com/non_html/shared_energyeff_college.pdf.
- 32 "Stanford Electrifies Its Campus, Cuts Greenhouse Gas Emissions by 65%," *Epri Journal*, 17 May 2018, available at <http://eprijournal.com/electric-university/>.
- 33 Stanford University, "Envisioning Stanford's Future," *Notes from the Quad*, 17 May 2018, available at https://quadblog.stanford.edu/2018/05/17/envisioning-stanford-future_.
- 34 Stanford University, *Stanford Energy System Innovations*, accessed 28 September 2018, available at http://sustainable.stanford.edu/sites/default/files/documents/Stanford_SESI_General_Information_Brochure.pdf.
- 35 ENERGY STAR, *Save Money and More with ENERGY STAR Solar Water Heaters*, archived 21 September 2017 at web.archive.org/web/20170921194623/www.energystar.gov/products/water_heaters/water_heater_solar/benefits_savings.
- 36 U.S. Department of Energy, *Passive Solar Home Design*, archived 21 September 2017 at web.archive.org/web/20170921194628/energy.gov/energysaver/passive-solar-home-design.
- 37 North Shore Community College, *Geothermal Heating and Cooling*, accessed 26 September 2018, available at <http://www.northshore.edu/sustainability/zneb/about/geothermal.html>.

38 National Wildlife Federation, *Going Underground on Campus: Tapping the Earth for Clean, Efficient Heating and Cooling*, 2011, available at <https://www.nwf.org/EcoLeaders/Campus-Ecology-Resource-Center/Reports/Going-Underground-on-Campus>.

39 Ibid.

40 Michael Casey, "A Surprising Benefit of Electric Cars: Cooler Cities," *CBS News*, 19 March 2015, archived at web.archive.org/web/20170921201406/www.cbsnews.com/news/a-surprising-benefit-of-electric-cars-cooler-cities/; U.S. Department of Energy, *Reducing Pollution with Electric Vehicles*, archived at web.archive.org/web/20170921201510/energy.gov/eere/electricvehicles/reducing-pollution-electric-vehicles/; U.S. Department of Energy, *Fuel Prices*, accessed 8 September 2017 at www.afdc.energy.gov/fuels/prices.html.

41 U.S. Department of Energy, *The eGallon: How Much Cheaper Is It to Drive on Electricity?*, accessed 6 February 2019, archived at <http://web.archive.org/web/20181214082143/www.energy.gov/articles/egallon-how-much-cheaper-it-drive-electricity>.

42 Mia Yamauchi, "Driving on Electricity Is Cheaper than Gas in All 50 States," *Plugless*, 2016, archived at web.archive.org/web/20170727162954/www.pluglesspower.com/learn/driving-electricity-cheaper-gas-50-states/; Climate Solutions, *Why Electric Vehicles Are a Climate Solution*, March 2016, available at www.climatesolutions.org/sites/default/files/uploads/why_evs_are_a_climate_solution_final.pdf.

43 Keith Barry, "Induction Charging Comes to Public Transit," *Wired*, 3 December 2012, archived at web.archive.org/web/20170921201632/www.wired.com/2012/12/induction-charging-bus/.

44 University of Richmond, *Transportation*, accessed 5 February 2018, available at <http://web.archive.org/web/20190206232421/sustainability.richmond.edu/campus/transportation/index.html>.

45 U.S. Environmental Protection Agency (EPA), *Green Power Partner List*, accessed 4 March 2019, archived at <http://web.archive.org/web/20190303094359/www.epa.gov/greenpower/green-power-partner-list>.

46 See note 4.

47 Ibid.

48 City of Georgetown, *Georgetown's energy 100 percent renewable with solar plant*, accessed on 1 March 2019, archived at <http://web.archive.org/web/20190127125032/georgetown.org/2018/06/29/georgetown-s-energy-100-percent-renewable-with-solar-plant/>.

49 University of Minnesota Morris, Sustainability, *Renewable Energy*, accessed 28 February 2019, archived at <http://web.archive.org/web/20170717123330/www4.morris.umn.edu:80/sustainability/renewable-energy>.

50 First Commercial-scale Wind Turbine: University of Minnesota Morris, Sustainability, *Renewable Energy*, accessed 28 February 2019, archived at <http://web.archive.org/web/20170717123330/www4.morris.umn.edu:80/sustainability/renewable-energy>; University of Minnesota, West Central Research and Outreach Center, *Wind Turbine*, accessed on 28 February 2019, archived at <http://web.archive.org/web/20170713002020/wcroc.cfans.umn.edu/research-programs/renewable-energy/wind-turbine>.

51 See note 49.

52 Association for the Advancement of Sustainability in Higher Education's, Sustainability Tracking, Assessment & Rating System, *University of Minnesota Morris Report*, 28 February 2018.

- 53 George Washington University, Office of Media Relations, *Capital Partners Solar Project Fact Sheet*, accessed on 1 March 2019, archived at <https://web.archive.org/web/20190301150600/sustainability.gwu.edu/sites/g/files/zaxdzs2861/f/downloads/CPSP%20Solar%20Fact%20Sheet%202017%20update%20%281%29.pdf>; Association for the Advancement of Sustainability in Higher Education's, Sustainability Tracking, Assessment & Rating System, *George Washington University Report*, 28 February 2018.
- 54 George Washington University, Office of Media Relations, *Capital Partners Solar Project Fact Sheet*, accessed on 1 March 2019, archived at <https://web.archive.org/web/20190301150600/sustainability.gwu.edu/sites/g/files/zaxdzs2861/f/downloads/CPSP%20Solar%20Fact%20Sheet%202017%20update%20%281%29.pdf>.
- 55 Colgate University, *Buildings and Land Management*, accessed on 1 March 2019, archived at <http://web.archive.org/web/20181201045235/www.colgate.edu/about/sustainability/campus/buildings-and-land-management>.
- 56 Chaveli Miles, Colgate University Sustainability Office, *Just Scratching the Surface: A Beginner's Guide to Geothermal Energy*, 19 July 2017, archived at <http://web.archive.org/web/20181201152209/blogs.colgate.edu/sustainability/2017/07/19/just-scratching-the-surface-a-beginners-guide-to-geothermal-energy/>.
- 57 Colgate University, *Buildings and Land Management*, accessed on 1 March 2019, archived at <http://web.archive.org/web/20181201045235/www.colgate.edu/about/sustainability/campus/buildings-and-land-management>.
- 58 See note 8.
- 59 Harvard University, *2017 Sustainability Report*, accessed 6 February 2019, archived at <http://web.archive.org/web/20180605092455/report.green.harvard.edu:80/>.
- 60 See note 8.
- 61 Harvard University Sustainability, *Green Labs*, available at <https://green.harvard.edu/programs/green-labs>
- 62 See note 9.
- 63 See note 10.
- 64 Jan Gouveia et al., University of Hawai'i, *University of Hawai'i Office of Sustainability 2016 Annual Report*, 26 January 2017, available at http://www.hawaii.edu/sustainability/wp-content/uploads/2017/04/2016-UHOS-Annual-Report_Jan-2017-1.pdf.
- 65 See note 11.
- 66 Environment America, *University of California system commits to 100% renewable electricity by 2025* (press release), 4 September 2018, archived at <http://web.archive.org/web/20181224020730/environmentamerica.org/news/ame/university-california-system-commits-100-renewable-electricity-2025>.
- 67 UC Office of the President, "President Proposes Tuition Freeze, New Systemwide Initiatives" (press release), 13 November 2013, archived at <http://web.archive.org/web/20180909075217/www.universityofcalifornia.edu/press-room/president-napolitano-proposes-tuition-freeze-new-systemwide-initiatives>.
- 68 Second Nature, *The Network*, accessed 2 March 2019, archived at <http://web.archive.org/web/20190302205726/secondnature.org/climate-action-guidance/network/>.
- 69 Point Energy Innovations, *Final Report: UC Carbon Neutral Buildings Cost Study*, 23 June 2017, available at https://www.ucop.edu/sustainability/_files/Carbon%20Neutral%20New%20Building%20Cost%20Study%20FinalReport.pdf.
- 70 Ibid.
- 71 Environment America, "Brown University Announces Plan To Reduce Greenhouse Gas Emission To Net-Zero" (press release), 12 February 2019, archived at <http://web.archive.org/web/20190217232812/www.go100renewablecampus.org/brown-university-announces-plan-to-reduce-greenhouse-gas-emission-to-net-zero/>.
- 72 Jill Kimball, "Solar and wind energy projects ex-

pected to offset 100 percent of Brown's on-campus electricity use," *News from Brown*, 17 January 2019, archived at <http://web.archive.org/web/20190123161200/news.brown.edu/articles/2019/01/renewable>.

73 Second Nature, *Reporting Platform: University of Richmond*, accessed 2 March 2019, archived at <http://web.archive.org/web/20190302211111/reporting.secondnature.org/institution/detail!4071>.

74 University of Richmond, *Climate Action Plan*, available at <https://sustainability.richmond.edu/common/pdf/climate-action-plan.pdf>.

75 University of Richmond Sustainability, *Energy*, accessed 3 March 2019, archived at <http://web.archive.org/web/20190303224433/sustainability.richmond.edu/campus/energy/index.html>.

76 University of Richmond, *UR Announces Transformative Solar Agreement*, accessed 3 March 2019, archived at <http://web.archive.org/web/20190206233148/sustainability.richmond.edu/campus/renewables/index.html>.

77 University of Richmond, *UR Announces Transformative Solar Agreement*, accessed 5 February 2019, archived at <http://web.archive.org/web/20190206233148/sustainability.richmond.edu/campus/renewables/index.html>.

78 University of Richmond, *Transportation*, accessed 5 February 2018, available at <http://web.archive.org/web/20190206232421/sustainability.richmond.edu/campus/transportation/index.html>.

79 Cornell University, *Our Sustainability and Climate Leadership*, accessed 3 March 2019, archived at <http://web.archive.org/web/20190303225043/sustainablecampus.cornell.edu/our-leadership>.

80 Cornell University, *Planning for Carbon Neutrality by 2035*, accessed 3 March 2019, archived at <http://web.archive.org/web/20190303225326/sustainablecampus.cornell.edu/our-leadership/cap>.

81 Blaine Friedlander, "With Three New Solar Farms, Cornell Skims Energy From The Sun," *Cornell Chronicle*, 6 January 2017, archived at web.archive.org

82 Cornell University, *Solar Thermal*, accessed 9 February 2019, archived at web.archive.org

83 Cornell University, *Lake Source Cooling Home*, accessed 30 January 2019, archived at web.archive.org

84 Cornell University, *Deep Geothermal Heating*, accessed 30 January 2019, archived at web.archive.org

85 Environment America, *Boston University Commits to 100% Renewable Electricity* (news release), 8 December 2017, available at environmentamerica.org

86 Boston University, *Boston University Climate Action Plan*, 2017, available at http://www.bu.edu/climateactionplan/files/2017/12/ClimateActionPlan_Report_FINAL.pdf.

87 Rich Barlow, "University Announces Massive Wind Power Purchase," *BUToday*, 18 September 2018, available at <http://www.bu.edu/today/2018/boston-university-announces-wind-power-purchase/>.

88 See note 86.

89 The "Renewable Energy 101" factsheets are available for download at environmentamerica.org; and the "Renewable Energy 100" report is available at frontiergroup.org