

# Loyola Marymount University

## Climate Action Plan Draft

### 2017 Update (8/21/17)

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# Introduction

LMU strives to infuse sustainability into all campus decision-making processes in order to promote economic, social, spiritual and environmental well-being. The lens of sustainability provides a powerful vision for community engagement in initiatives of equity, spirituality and stewardship. Thus, the linking of our mission to environmental sustainability and resilience will be integrated into our curricular and co-curricular programs so that we can be a leader in best sustainable practices. Our planet's current environmental stressors, such as climate change and the local drought, are largely due to anthropogenic contributions. Therefore, we feel it is imperative that we focus on programs benefiting LMU's social, ecological, and financial factors.

Since the early 1990s, with the help of dedicated students, staff, faculty, and local partnerships LMU's commitment to green campus practices has grown into an innovative program known as "Green LMU" with a sustainability office housed in the facilities management department. Through this program the office of sustainability tracks, updates, and sets future goals for numerous public commitments the university has made before through community influence and presidential approval.

Loyola Marymount University has a rich history of commitment to environmental sustainability including our strategic plan, master plan, and public commitments including;

- In March of 2007 former President Lawton created the Environmental Stewardship and Sustainability Committee to identify how we as a university could ideally care for our planet in our actions, while balancing real world complexities such as fiscal constraints. The committee is comprised of students, faculty, and staff.
- On October 17, 2007, former President Lawton signed the American College & University President's Climate Commitment (ACUPCC). This landmark event allowed the implementation of comprehensive plans in pursuit of climate neutrality. In accordance with this commitment the university has taken the following steps:
  - Produced a baseline Greenhouse Gas inventory in 2008, committed to update it every other year after to track progress.
  - Created Climate action plan in 2010, committed to updating in future as needed.
  - LMU has set a goal of climate neutrality.
- Environmental education centers, and areas of study were established on campus since the early 90's including: The Center for Urban Resilience (CUREs), Center for the Study of Los Angeles, Environmental Science major, Environmental Studies minor, and emphases on sustainability in courses in engineering, business, chemistry, sociology, and others.
- LMU's 20-year Master Plan was released on April 16, 2011. Many aspects of the plan's commitments consist of goals to fulfill environmental initiatives.
- The university strategic plan for 2012-2020 was released on May 7, 2012. A major objective is to strengthen the university's commitment to stewardship, ethical sustainability, environmental justice and human resilience in the following ways:



- Be a national leader among universities in sustainable practices by making progress on the implementation of sustainability objectives in LMU's 2011 Master Plan and the Climate Action Plan.
- Engage students, faculty, staff, and administrators in learning about, teaching to and celebrating the traditions of resilience and sustainability in the support of social justice, earth care and deeper understanding of human-nature interactions.
- Partner with the broader community in sustainability and environmental justice efforts through interdisciplinary centers, programs in underserved neighborhoods, and off-campus facilities, such as schools, urban gardens and parks.

This document presents the 2017 Climate Action Plan (CAP) Road Map for LMU. The purpose of this CAP is to provide a roadmap to achieving greenhouse gas (GHG) reductions as prescribed by LMU, the state of California, and the ACUPCC. This CAP Road Map is a “living document” that has been prepared with data that was available at the time and includes plans for refinement over the next few years. This roadmap will be utilized by LMU to outline the steps to be taken to reduce our GHG emissions, and ultimately achieve climate neutrality. As we continue to refine our data collection, programs, and future carbon modeling a more comprehensive CAP will be completed in the future.

This CAP Road Map will be implemented in association with the Master Plan and the Strategic Plan for the university. With sustainability as one of the central drivers of LMU’s decision making, the goal of the university is to improve the quality of LMU’s campus as a whole, while reducing our impact on climate change.

LMU has looked to California legislation for guidance in this process. In 2006, the Global Warming Solutions Act (AB 32) was passed, mandating that California reduce GHG emissions to 1990 levels by 2020. To maintain policies and practices that are in accordance with state laws and trends, LMU will utilize the provisions of AB 32 to guide our GHG emissions reduction strategies. The following consists of a set of general targets toward the goal of LMU becoming a climate neutral campus: 2000 levels by 2015, 1990 levels by 2020 and climate neutrality by 2050. Although LMU did not and cannot accurately measure GHG emissions before our baseline of 2008, the levels can be estimated based on statewide and local trends.

This roadmap document will provide a pathway for LMU to set goals and take actions toward climate neutrality. Although these targets have been agreed upon, it is understood that LMU’s CAP is a living, flexible document that can and will be adjusted to reflect new challenges, opportunities, or scientific understanding. This flexibility should allow LMU to reach climate neutrality before 2050. However, the implementation timeline may need to be adjusted beyond 2050 if LMU determines that it is not feasible to reach this goal. As a living document, LMU will re-visit these goals and strategies on an on-going basis to assess our progress and make changes as needed.

# Greenhouse Gas Accounting

Greenhouse gas emissions for LMU are broken into three general categories or “scopes” in accordance with the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) standards for Greenhouse Gas reporting.

## **Scope 1, Direct Sources** (produced on campus):

- These include onsite production of electricity, heat, or steam; fleet transportation, products, and fugitive emissions (from unintentional leaks).
  - For this report at LMU information includes
    - Natural Gas Purchased,
    - University Fleet Fuel use Diesel, Gasoline,
      - electric fleet contributes to purchased electricity.
    - Refrigerants and other chemicals
    - Fertilizer purchased
- Sources that reduce the carbon footprint
  - Alternative Power generation on campus such as Solar

## **Scope 2, Indirect Sources** (produced off campus but imported on):

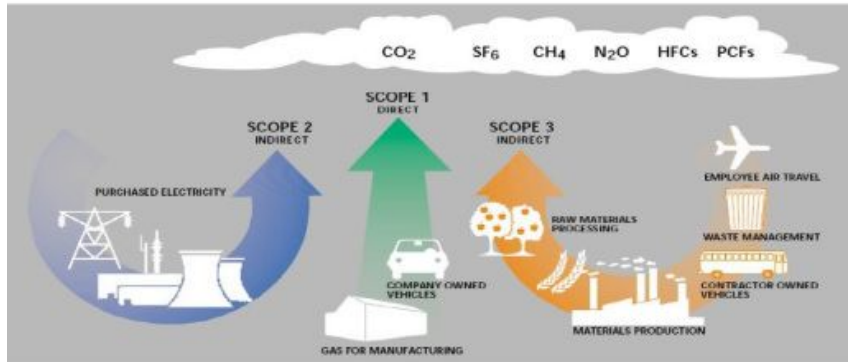
- Includes GHG emissions from imports of electricity, heat or steam
  - For this report at LMU information includes purchased electricity

## **Scope 3, Indirect sources** (produced off campus but related to institution):

- These result from the institution’s activities, but occur from sources owned or controlled by another company. Includes: business travel, outsourced activities and contracts, emissions from waste generated by the institution when the GHG emissions occur at a facility controlled by another company.
  - For this report at LMU information includes
    - Daily Commuting (Student, Staff, Faculty)
    - University Funded Air Travel
    - Study abroad air travel
    - Solid Waste (Landfill)
- Sources that reduce the carbon footprint
  - Solid waste diversion, donations, recycle, compost, source reduction

## **Other, Renewable Energy Credits or offsets**

- This reduces the carbon footprint through purchase of green power to offset carbon footprint or sequestration through such things as forest tree canopy carbon offsets.



<http://www.ghgprotocol.org>

Loyola Marymount University is committed to reducing campus emissions from a variety of sources, including the Scope 1 emissions sources of stationary combustion, mobile combustion, and fugitive emissions. Additionally, LMU is committed to reducing Scope 2 and Scope 3 emission sources including purchased electricity, commuting, air travel, and solid waste. By reducing emissions from each of these categories, LMU will continue to move closer to achieving climate neutrality. An essential step to reducing emissions is to improve collection methods and integrate fragmented past historical data into new software that will allow for improved future modeling, and data analysis. Additionally, institutionalizing data collection will help. Table 1 (below) consists of a summary worksheet of LMU’s emissions as reported to the ACUPCC using the former Clean Air-Cool Planet Calculator tool.

On this Worksheet: Enter data related to emissions. If a column does not apply or the data is unavailable, leave it blank.

**MODULE Summary**  
**WORKSHEET AUCPCC Reporting**  
 NOTE: Grey columns indicate an ACUPCC reporting category that the Campus Carbon Calculator either does not use or defines differently. You may simply consider these placeholders, or you may use them to enter your data as you gather information for your report. For more information on ACUPCC definitions of data categories, reference the [ACUPCC Implementation Guide](#).

**UNIVERSITY** Loyola Marymount University

Fiscal Year	-- Scope 1 Emissions Sources --				-- Scope 2 Emissions Sources --				-- Scope 3 Emissions Sources --			-- Biogenic Sources --		-- Carbon Offsets --	-- RECs --			
	Stationary Combustion	Mobile Combustion	Process Emissions	Fugitive Emissions	Purchased Electricity	Purchased Heat	Purchased Cooling	Purchased Steam	Commuting	Air Travel	Solid Waste	Biogenic emissions from stationary combustion	Biogenic emissions from mobile combustion	Carbon Offsets Purchased	Renewable Energy Credits Purchased	Percent of electricity consumption offset	Divisions	Reductions from RECs
	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	kWh	%	MT eCO <sub>2</sub>	
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	2,266	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	3,117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	3,050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	3,211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	3,143	111	-	109	9,436	-	-	5,737	3,914	2,169	-	-	-	-	705,069	0	12%	
2005	2,927	111	-	109	9,143	-	-	5,904	3,914	2,169	-	-	-	-	441,731	0	12%	
2006	3,181	111	-	109	9,614	-	-	6,160	3,914	2,169	-	-	-	-	716,882	0	14%	
2007	3,303	111	-	109	9,802	-	-	6,173	3,914	2,129	-	-	-	-	762,445	0	15%	
2008	3,443	111	-	109	9,926	-	-	6,173	3,914	2,043	-	-	-	-	2,000,000	0	16%	
2009	3,251	87	-	124	10,117	-	-	6,307	4,288	1,802	-	-	-	-	2,000,000	0	16%	
2010	3,491	95	-	123	10,330	-	-	6,443	4,163	1,834	-	-	-	-	-	-	-	-

Note: The data points for years 2009 and beyond are pulled from the Projection Module. Please check the CA-CF website for guidelines on how to calculate these values using inventory data.  
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**WORKSHEET AUCPCC Reporting**  
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**UNIVERSITY** Loyola Marymount University

Fiscal Year	-- Sequestration -		Normalization and Contextual Data															
	Due to commuting	Due to Grants	Gross Building Space	Net assignable laboratory space	Net assignable health care space	Net assignable residential space	Total Student Enrollment	Residential Students	Full Time Commuter Students	Part Time Commuter Students	New-Credit Students	Full Time Faculty	Part Time Faculty	Full Time Staff	Part Time Staff	Endowment Size	Heating Degree Days	Cooling Degree Days
	MT eCO <sub>2</sub>	MT eCO <sub>2</sub>	Square feet	Square feet	Square feet	Square feet	# FTE	#	#	#	#	#	#	#	#	\$	#	#
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3452.00	948.00
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2482.00	948.00
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2452.00	948.00
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2428.00	948.00
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2422.00	948.00
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2693.00	844.00
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2029.00	1030.00
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2151.00	1068.00
1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2636.00	882.00
1999	-	-	1,543,060	-	-	-	-	-	-	-	-	-	-	-	-	-	2845.00	867.00
2000	-	-	1,387,089	-	-	-	-	-	-	-	-	-	-	-	-	-	2148.00	914.00
2001	-	-	2,093,834	-	-	-	-	-	-	-	-	-	-	-	-	-	2664.00	912.00
2002	-	-	2,096,422	-	-	-	-	-	-	-	-	-	-	-	-	-	2350.00	849.00
2003	-	-	2,253,923	-	-	-	-	-	-	-	-	-	-	-	-	-	2376.00	887.00
2004	-	-	2,253,923	-	-	-	-	-	-	-	-	-	-	-	-	-	2336.00	887.00
2005	-	-	2,253,923	-	-	-	-	-	-	-	-	-	-	-	-	-	2336.00	887.00
2006	-	-	2,336,746	-	-	-	-	-	-	-	-	-	-	-	-	-	2336.00	887.00
2007	-	-	2,434,460	-	-	-	-	-	-	-	-	-	-	-	-	-	2336.00	887.00
2008	-	-	2,434,460	-	-	-	-	-	-	-	-	-	-	-	-	-	2424.00	1038.00
2009	-	-	2,434,460	-	-	-	-	-	-	-	-	-	-	-	-	-	2452.00	948.00
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2452.00	948.00

Table 1: Summary Worksheet of LMU's GHG Emissions as reported to the ACUPCC (2004 – 2009).

# LMU Baseline GHG data

The GHG emissions inventory project began at LMU in 2008. To begin this process, LMU worked with Sightlines Inc. to obtain an initial GHG emissions inventory. Through their “GreenLine” program, Sightlines provided LMU with GHG emissions data for 2008 and extrapolated to 2004 to provide a trend analysis. Beginning in 2009, LMU conducted a GHG emissions inventory project in-house, enabling LMU staff to widen the scope and improve the accuracy of the data collected. Table 1 (above) displays data collected by Sightlines in 2008 as well as by LMU staff in 2009. This report provides a baseline for GHG data.

The data collected in 2008 and 2009 provides LMU with a snapshot of GHG emissions associated with a variety of campus activities. Data collection of LMU’s GHG emissions is continuing on an ongoing basis, and data collection methodologies will be refined over time. Figure 1 (below) illustrates LMU’s total emissions for 2008, indicating the percentages of emissions derived from individual categories. Figure 2 (below) provides the same breakdown of emissions sources for 2009.

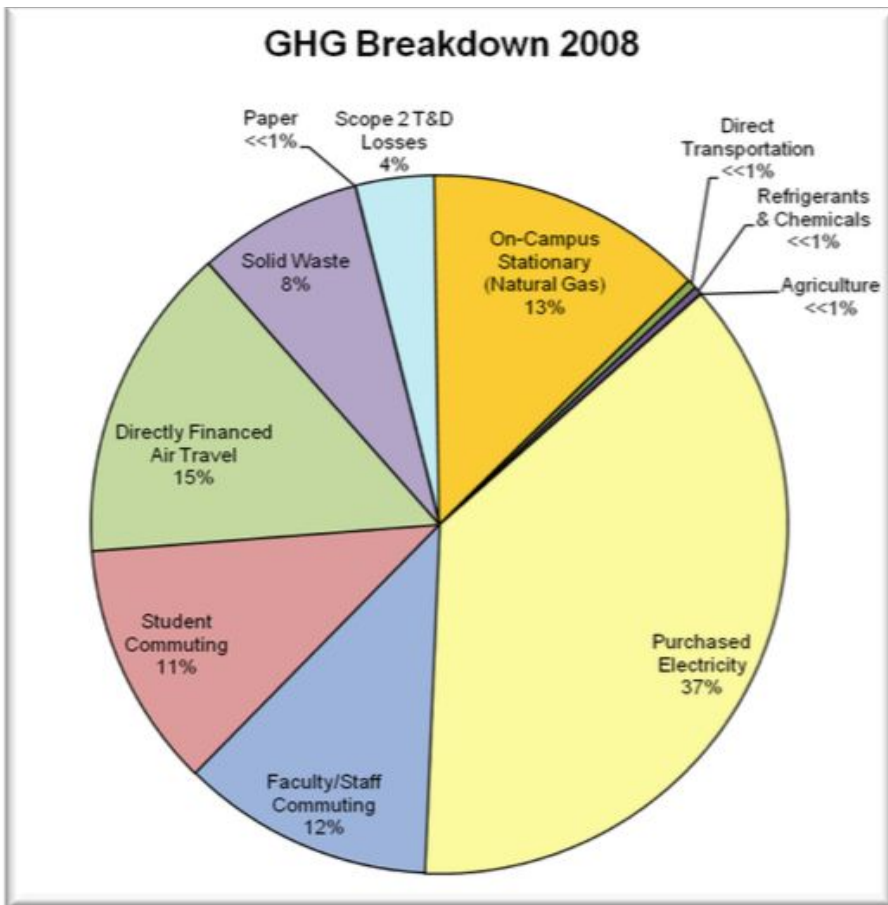


Figure 1: Graph illustrating the contribution to the institution's total emissions from each emissions source in 2008.



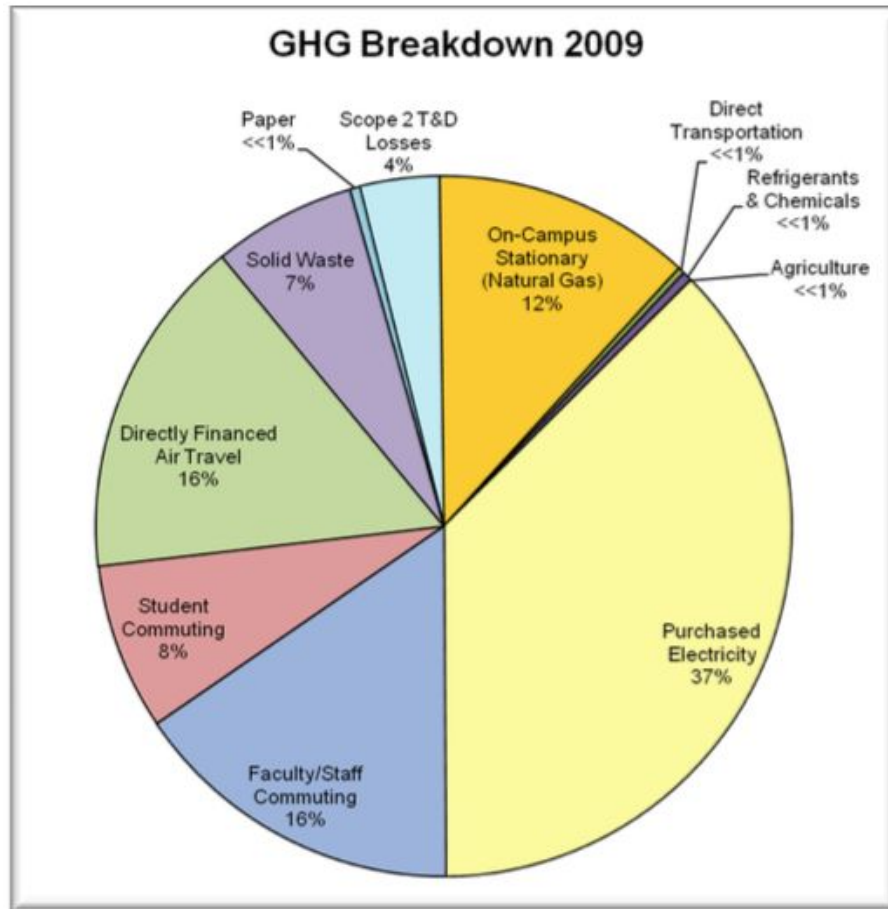


Figure 2: Graph illustrating the contribution to the institution's total emissions from each emissions source in 2009.

An analysis of the snapshots of 2008 and 2009 GHG emissions data demonstrates that the largest source of GHG emissions at LMU is purchased electricity. Moving forward, LMU must address energy management in efforts to reduce emissions from electricity use on campus.

An area of equal concern in terms of impact relates to modes of transportation both on and off campus. Taken together, direct travel, student commuting, faculty/staff commuting, and directly financed air travel account for approximately 40 percent of LMU's GHG emissions. To address GHG emissions sources derived from modes of transportation, LMU will need to implement a variety of programs to minimize these impacts.

Another area of concern is the solid waste generated on campus, which accounts for 7 percent to 8 percent of LMU's total GHG emissions. Although more than 50 percent of solid waste generated on campus is diverted from landfills, there are still many waste reduction strategies that must be explored.

# Latest GHG data

The GHG emissions inventory project began at LMU in 2008 data has been collected and expanded upon since this time. Currently we are looking for a streamlined software solution and migrating/collecting all historical data to get a yearly up to date carbon emissions data. The data collected for 2014 fiscal year was using the Campuscarbon.com. Carbon Management and Analysis Platform (CarbonMAP) a new online version of the past ACUPCC using the Clean Air-Cool Planet Calculator tool. The fiscal year 2015 ( 6/1/2013 to 5/31/2014). We are working on gathering all data to update new fiscal year 2015 ( 6/1/2014 to 5/31/2015) and also past data since 2008 baseline (that is in multiple systems) we will combine this data in one software for proper trend analysis. Figure 1 (below) illustrates LMU’s total emissions for 2014, indicating the percentages of emissions derived from individual categories. Figure 2 (below) provides the same breakdown of emissions sources for 2014 in Metric Tons of eC02. This is an industry standard done by breaking down the amounts of each emission source and converting them to a C02 value.

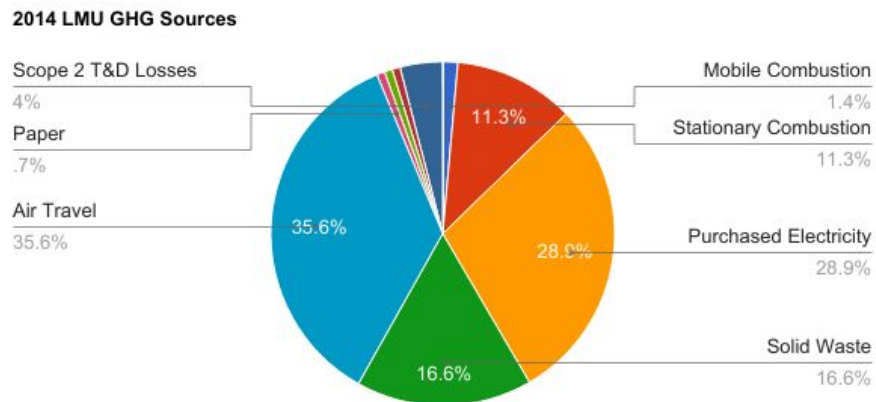


Figure 1: Graph illustrating the contribution to the institution's total emissions from each emissions source in 2008.

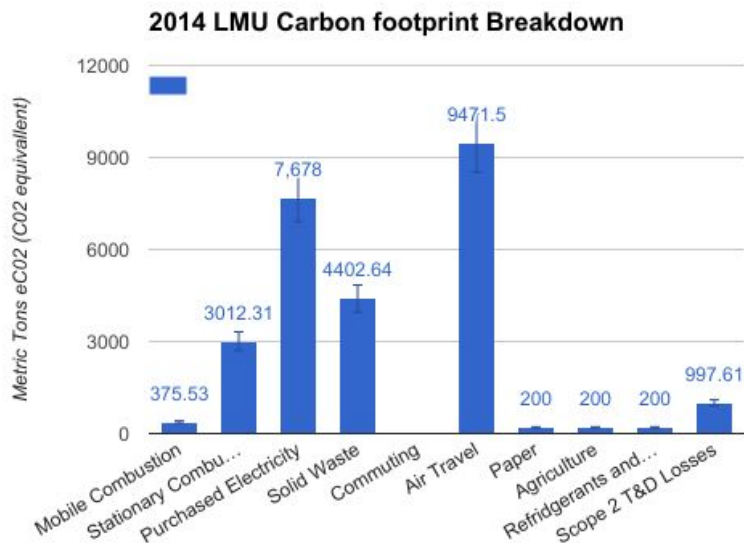


Figure 2: Graph illustrating the contribution to the institution's total emissions from each emissions source in 2014.

An analysis of the snapshots of 2014 GHG emissions data demonstrates that the largest source of GHG emissions at LMU is Air Travel and Purchased Electricity. Increased efficiency has allowed for more data and a more global world has allowed for travel to increase and we included study abroad in the 2014 numbers. Natural Gas is also a major contributor to our carbon footprint in the form of station combustion equating to 11.3% of our carbon footprint. Possible solutions will be provided in the future selection.

An area still of concern is transportation for faculty, staff, and students for air travel and commuting. Taken together, direct travel, student commuting, faculty/staff commuting, and directly financed air travel account for approximately 38 percent of LMU's GHG emissions. To address GHG emissions sources derived from modes of transportation, These programs can be purchased offsets for Air Travel. These percentages have increased since we have collected better data since 2008, air travel has gone up, while faculty staff and student commuting has gone down with better grasps on data. We will be streamlining all this data together to generate future reports.

Another area of concern is the solid waste generated on campus, which accounts for about 16 percent of LMU's total GHG emissions. Although more than 75% diversion rate compared to the 50% in our baseline year we have increased our ability to account for materials and expanded our campus so the emissions from trash has increased.

## Analysis of Results

When comparison to our baseline year including the understanding that we have a better accounting so that we have an ability to collect more data and we have added collection of information it is great news that we have actually decreased our carbon footprint by a significant amount almost 19%! From 32,624.00 Metric Tons eCO<sub>2</sub> down to 26,543.44 Metric Tons eCO<sub>2</sub>.

This is a very impressive fact when you consider that the square footage of the university has increased from about 3,500,000 to 3,789,576. This is also very impressive when you consider that we have increased student population from 7,187 and faculty/staff population of 1,716 in 2008 and now student population from 7,906 and faculty/staff population of 2,301 in 2014. This means overall despite an expanding university we have reduced our carbon footprint by two important measures (per person on campus, and per square foot). Below you can see the changes in each category especially the large reduction in energy achieved through infrastructure efficiency, solar, and behavior change.

	Metric Tons eCO2	Metric Tons eCO2
	<b>2008 baseline</b>	<b>2014 performance year</b>
<b>Scope 1</b>		
Stationary Combustion	3,309.00	3,012.00
Mobile Combustion	111.00	376.00
Refrigerants and Chemicals	104.00	200.00
Agriculture	5.00	200.00
<b>Scope 2</b>		
Purchased Electricity	16,213.00	7,678.00
Scope 2 T&D Losses	1,304.00	998.00
<b>Scope 3</b>		
Commuting	3,130.00	4.44
Air Travel	3,914.00	9,472.00
Solid Waste	3,762.00	4,403.00
Paper	772.00	200.00
<b>Total</b>	<b>32,624.00</b>	<b>26,543.44</b>

## Future

As LMU moves toward the ultimate goal of climate neutrality, it is imperative that the past and present are understood so a proper trend analysis can be performed. Accordingly, by plotting LMU's current trajectory against the goal of climate neutrality, it becomes possible to construct a visual representation of what climate neutrality would look like if the year for reaching this goal is set at 2050. Figure 3 (below) displays a visual representation of LMU's emissions trajectory under business as usual, as well as under the Climate Action Plan with climate neutrality being reached by 2050.

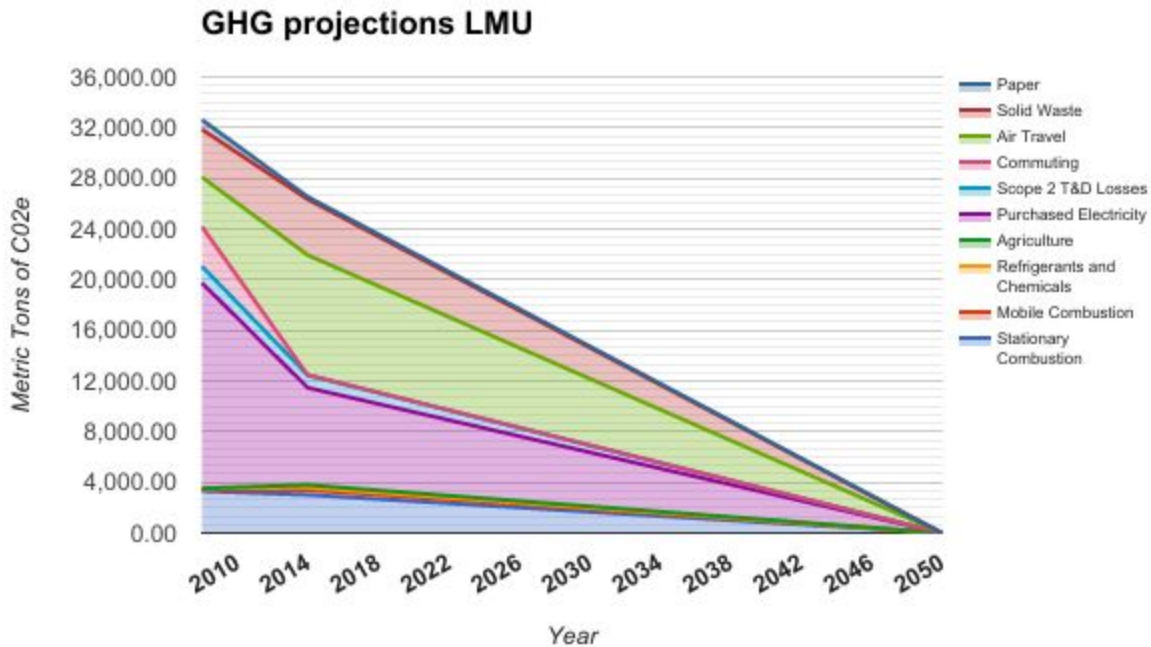


Figure 3: Visual representation of LMU's emissions trajectory under business as usual, as well as under the Climate Action Plan with climate neutrality targeted for 2050.

As Figure 3 (above) illustrates, if LMU continues on its current trajectory of GHG emissions, the total emissions will continue to decrease steadily at a rate of around 3% per year if we keep up the good work. However at some point we will have to introduce some more radical measures to truly have a significant impact as at some point we still will need to use natural gas, energy, vehicles etc etc. It is clear that more far-reaching goals must be set, and comprehensive mitigation strategies must be employed, if the goal of climate neutrality will be reached. By signing the ACUPCC in 2007, LMU has committed to these efforts. This Climate Action Plan Road Map has been compiled to provide documentation of LMU's GHG emissions reduction efforts, with a specific focus on why this is important, what LMU's goals are, and how LMU plans to achieve those goals. Below is a list of measures and general solutions that could make a significant difference per category.

## General discussion of solutions and categories

Emission Category	Factors	Reduction proposals	Current % footprint Approx	Projections?
<b>Scope 1</b>			15-20%	Long term incremental
Stationary Combustion	Natural Gas Use (heating, stoves, etc)	Long term efficiency upgrades to use less gas for Heat on campus. Can also produce more alternative energy to cover this as offsets.	11%	Long term planning change
Mobile Combustion	Fuel used for campus fleet	Switch to a completely alternative fleet for cars, carts, lawnmowers, grounds, and other equipment. Keep up work with electric carts over cars	2-5%	Long term change tech slowly phase out. Solar and Batteries need to be on campus to charge renewable fleet
Refrigerants and Chemicals	Chemicals for refrigerators a/c etc.	Efficiency upgrades and new tech we can reduce.	1%	Long term change tech slowly phase out.
Agriculture	Purchased fertilizer	Continue to alter plants, landscaping, and methods. Use more organic or alternative methods to reduce need for fertilizer	1%	Implement on campus compost system. Also eventually add more organic methods. Compost can be used to claim offsets as sequestering carbon.
<b>Scope 2</b>			28-33%	
Purchased Electricity	What we Pay LADWP for Power	Increase solar from 6% to 30% + on campus. Energy Storage battery and an innovative offsite solar via LADWP then we 100% energy independent, reduce rising energy costs, provide a live and learn opportunity	25-30%+	If we execute my plan within less than 1- 2 years we would have a campus in which 100% of our power is from renewable sources. Saves money and huge reduction in GHG. Quickest solution massive ramifications
Scope 2 T&D Losses	Infrastructure losses to get power	Offset more with surplus of clean power above	3%	Natural replace over time
<b>Scope 3</b>			45-50%	
Commuting	Student Commuting, Faculty Commuting Staff Commuting	Aggressively reduce single use trips, via Bike, electric car charging, public transit, carpool, etc.	5-10%	Long term behavior mod, industry makes more green vehicles, bike support, better surveys
Air Travel	University sponsored Travel for (faculty, staff, students)	This will not change and may increase, purchase offsets, or innovative program to offset.	15-30%	Long term behavior mod, industry makes more green airplanes, implement offset method per flight
Solid Waste	Trash, waste Recycling, compost decreases this.	source reduction (reduce single use items and waste on campus via purchasing). significant reduction via food waste disposal (estimate 5-6% + reduction in carbon footprint).	12-15%	Long term behavior mod, reduce packaging single use via contracts. Implement Compost system.
Paper	Paper purchasing	Go paperless, and the paper we do use make sure most eco friendly as possible. Eg 100% recycled	Less than 1%	Long term behavior change alter purchasing policy to include more eco friendly paper

## Specific impacts and projections per scope

<b>Emission Category</b>	<b>Factors</b>	<b>Reduction proposals</b>	<b>Current % footprint</b>	<b>Projections?</b>	
<b>Scope 1</b>			Approx 15%		
Stationary Combustion	Natural Gas Use (heating, stoves, etc)	Through efficiency upgrades reduce natural gas use on campus. This can reduce cost.. However, we will unlikely be able to eliminate the use so we must innovate with technology. The best method would be to increase solar (on/off site) or produce more alternative energy to cover the extra created or offsets	11%	Long term incremental	
Mobile Combustion	Fuel used for campus fleet	We can completely eliminate mobile combustion over 10 years if we switch to a completely alternative fleet for cars, carts, lawnmowers, grounds, and other equipment. Keep up work with electric carts over cars	2%	Long term planning of reduction	
Refrigerants and Chemicals	Chemicals for refrigerators a/c etc.	Through efficiency upgrades and new systems we can reduce. Unlikely to eliminate the use so we must innovate with tech. Long term.	1%	Long term change tech slowly phase out	
Agriculture	Purchased fertilizer	Continue to alter plants, landscaping, and methods. Use more organic or alternative methods to reduce need for fertilizer. Some of this will be essential to maintain grounds. So may have to offset in other areas.	1%	Implement on campus compost. Also eventually add more organic methods.	



Emission Category	Factors	Reduction proposals	Current % footprint	Projections?	
Scope 2			33%+		
Purchased Electricity	What we Pay LADWP for Power	<p>Switch to more solar on campus. By my calculations could increase solar from currently offsetting 6% to almost 30% on campus.</p> <p>Energy Storage with battery and an innovative offsite solar/wind/alternative energy to service campus would elim the other 70%</p> <p>we would be energy independent, reduce rising energy costs, provide a live and learn opportunity, and make us a true leader and save lots</p>	30%+	If we execute my plan within less than 1- 2 years we would have a campus in which 100% of our power is from renewable sources. Saves money and huge reduction in ghg. Quickest solution	
Scope 2 T&D Losses	Infrastructure losses to get power to us	transmission losses, try to improve systems, again offset more with surplus of clean power.	3% estimate	Natural replace over time	

Emission Category	Contributing factors	Reduction proposals	Current % of campus footprint	Projections?	
Scope 3			Approx 36%		
Commuting	Student Commuting, Faculty Commuting, Staff Commuting	To reduce this we need to reduce single use trips, provide alternative transit support (eg. Bike, car charging, public transit). Support these programs and incentivize alternative fuel vehicles. (charging stations etc)	Approx 5-10%	Long term behavior mod, industry makes more green vehicles, bike support, better surveys	
Air Travel	University sponsored Travel for (faculty, staff, students)	This will not change and may increase, purchase offsets, or produce offsets locally to offset travel needs. (such as community programs or expand alternative energy surplus to cover through off site systems).	Approx. 18-30%	Long term behavior mod, industry makes more green airplanes, implement offset method per flight)	
Solid Waste	Trash, waste Recycling, compost decreases this.	Add more composting, source reduction (reduce single use items and waste on campus via purchasing). Keep growing recycling rate above 76% as this will have significant reduction via food waste disposal (estimate 5-6% + reduction in carbon footprint). We have an incredible recycling rate and we need to reduce packaging/purchasing issues and increase compost to support that.	12-15%	Long term behavior mod, reduce packaging single use via contracts.	
Paper	Paper purchasing	Go paperless, and the paper we do use make sure most eco friendly as possible. Eg 100% recycled	Less than 1%	Long term behavior change alter purchasing policy to include more eco friendly paper	

## Mitigation Strategies

### Overview of Mitigation Strategies

LMU has been an innovator among colleges and universities for several years in campus sustainability efforts, and signing the ACUPCC has provided leadership from the highest levels of the university with respect to reducing our carbon footprint. Part of the ACUPCC involves choosing specific tangible actions that the university will commit to in our efforts to achieve climate neutrality. LMU has selected two tangible actions as a signatory of the ACUPCC:



- (1) Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.
- (2) Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.



These actions will reduce GHG emissions at LMU. There are a number of other actions that will be implemented as mitigation strategies to achieve climate neutrality. The following description of LMU's mitigation strategies are based on each individual source.

### Scope 1 Emissions

#### *Stationary Combustion*

The primary contribution to stationary combustion at LMU comes from utilizing the central plant boiler for the hot water loop on campus. To mitigate the effects of the boiler, LMU has updated boilers.

#### *Mobile Combustion*

To reduce the GHG emissions from mobile combustion of fossil fuels by institution-owned and controlled vehicles, LMU will take a comprehensive approach. In addition to maintaining and operating vehicles optimally and efficiently, LMU will strive to purchase fuel-efficient vehicles when purchases must be made. If feasible, LMU will consider purchasing alternative-fuel vehicles or zero-emissions vehicles. Additionally, LMU will continue improving the efficiencies of carts and other smaller transports on campus.

### *Fugitive Emissions*

Fugitive emissions result from intentional or unintentional releases of GHGs, including the leakage of HFCs from refrigeration and air conditioning equipment. The LMU central plant staff work diligently to detect leaks and repair them immediately. By focusing more on preventive maintenance, LMU will be better able to ensure the minimization of fugitive emissions.

### *Scope 2 Emissions*

#### *Purchased Electricity*

All electricity purchased by LMU is supplied by the Los Angeles Department of Water and Power (LADWP). As LADWP continues to add renewable energy to its mix, LMU will benefit from being able to purchase cleaner energy.

In addition, LMU will continue to increase efficiencies, reduce consumption, promote conservation and implement new energy policies. The university should plan to increase its use of renewable energy from about current 12 percent or so with solar and offsets to about 30 percent onsite 70% off site renewables and energy storage to mitigate the generation of the total campus electricity consumption by 2030.

Additionally through retrofits, new tech, and awareness we can reduce energy use by 20% per square foot by 2030.



LMU is also committed to expanding its use of reclaimed water for irrigation from 75 percent of landscaped area to 100 percent by 2030. Additionally, all new and renovated buildings shall incorporate water conservation measures such as ultra low flush water closets and urinals, low flow faucet aerators, and low flow shower heads.

This central irrigation system controls water use for irrigation based on daily weather conditions, enabling LMU to save energy as well as reclaimed and potable water.

### *Scope 3 Emissions*

#### *Commuting*

In the LMU Master Plan, there is an increase in on-campus student residency that will reduce the need for students to drive to and from campus. Additionally, LMU is working to implement a variety of transportation initiatives to address GHG emissions derived from commuting such as a Zip Car© program, increased bus service, promoting Metro use, improving bicycling opportunities on campus, encouraging carpooling, developing a shuttle service for staff and

faculty for transportation to key locations, and expanding telecommuting opportunities. Through this diversified approach, LMU will continue to reduce its carbon footprint.

### *Air Travel*

To reduce the impacts associated with air travel, LMU will promote technologies that allow meetings and seminars to be conducted utilizing webinars, videoconferencing, and teleconferencing. Additionally, opportunities will be made available for travelers to purchase Carbon Offsets and/or Renewable Energy Credits (RECs) to offset the GHG emissions resulting from air travel.

### *Solid Waste*

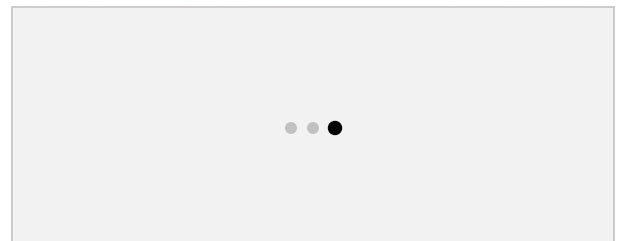
The solid waste management and recycling program at LMU has been on the cutting-edge of technology and best management practices for two decades. To build on these efforts, LMU will continue to increase waste diversion programs on campus, with the ultimate goal of zero waste. Projects that will focus on the short term include implementing a food waste composting program campus wide, increasing the presence of recycling opportunities on campus, and implementing a Green Office Program to increase source reduction, reuse, and recycling.

The composting program will consist of capturing food waste from the dining halls and other locations on campus and composting that food waste, converting it into a usable, organic soil amendment. The food waste composting program will divert thousands of pounds of food waste from landfills, and will decrease the amount of compost currently being imported as a soil amendment for our campus grounds. These practices will increase LMU's overall diversion rate and will contribute to the goal of climate neutrality.

Although LMU continues to manage one of the most successful collegiate recycling programs in California, it is imperative that LMU expands recycling opportunities on campus. There are many areas of campus that would benefit from an increase in recycling opportunities, and decrease in sources of trash/recycling by working with purchasing.

As the recycling program evolves in line with the LMU Master Plan, it will be imperative to improve efficiencies and increase recycling rates to divert as much solid waste from landfills as is feasible.

To increase source reduction, reuse, and recycling on campus, LMU has implemented a Green Office Program for all campus offices. This program provides education and outreach to campus offices, informing and encouraging best management practices to use fewer resources, reuse assets when appropriate, and recycle as many waste materials as is feasible. To incentivize participants in this program, a competition will be devised that provides offices with the opportunity to be certified as a "green office."



Between increasing recycle collection points, working on purchasing, minimizing packaging and waste, and continuing to run an innovative recycling plant we can exceed state goals of 75% by 2020. Specifically LMU has set the following goals

75% by 2015

100% by 2025

## Education, Research, and Community Outreach Efforts

### Education

To achieve climate neutrality, it is essential for our university to provide educational resources to our entire campus community. These educational resources must raise awareness about sustainability issues, LMU's specific goals to address these issues, as well as how individuals can participate. This education needs to be provided to students as well as staff, faculty, and administrators. All campus constituents need to know how they can contribute to reducing our carbon footprint and promoting a healthier environment. LMU will continue to increase our offerings of classes on sustainability, natural science, environmental ethics and related topics.



### Goals

track number of sustainability courses via inventory 2018

label sustainability courses 2019-2020

set goals on number of sustainability courses 2020

### Research

As our campus sustainability programs grow and become more sophisticated, LMU will harness the power of our research facilities to study the effectiveness of our programs as well as create innovations for the future. Our engineering and natural science programs have already contributed significant research supporting LMU's sustainability initiatives over the last several years. LMU will increase this research, and involve students in campus sustainability research as much as is feasible.



In addition to science and engineering, LMU will work to incorporate research from as many other departments on campus as are willing to participate. It is just as important to involve students from humanities backgrounds, such as art, history, political science, philosophy, literature, communication, film, and education. These students have much to offer in terms of understanding and expressing the theoretical basis for

sustainability, as well as articulating the significance of working toward climate neutrality. Although science and engineering students will work toward many of the important infrastructural projects needed to reduce GHG emissions, the work conducted by humanities students provides an equally important role of understanding and communicating the significance of sustainability as a paradigm for decision making.

### Goals

Increase sustainability Research on the LMU campus through partnerships between all educational centers.

create new method to track sustainability research programs by 2020

set goals for research numbers 2022

### Community Outreach

In addition to infusing sustainability into the formal education curriculum and research projects, it is also of great significance that LMU continues community outreach campaigns, providing access to the knowledge and resources needed to actively contribute to campus sustainability efforts. Community outreach efforts to be expanded include website enhancement, an increased presence at community events, creation of a campus sustainability newsletter, implementation of “green” e-mail reminders and messages, hosting of workshops and other educational events to raise awareness, and a variety of other creative programming.



### Goals

Increase student engagement in sustainability. Increase number of students involvement in social media and email lists. Get more students involved in sustainability clubs, programs, contests etc.

Track number of students by 2019 doing sustainability internships

Continue to develop continuing education programs in sustainability. via number of those courses vs other continuing education

Track faculty/staff/student engagement through email campaigns, social media, surveys.

Introduce faculty staff sustainability survey

2021- certify all campus offices as green offices

2020- host a green jobs fair.

Track number of community outside programs related to sustainability by 2022. Set plan to increase that my 2023

### Financing



To finance the mitigation strategies, LMU will undertake a multifaceted approach. Through the combined efforts of these financial mechanisms, LMU will be able to fulfill the goals of our Master Plan and Strategic Plan, while also reducing our GHG emissions. The following consists of a brief description of ten financial mechanisms that other universities have taken, and LMU will begin to consider:

- 1) Improve efficiencies of our various infrastructure systems to reduce consumption
- 2) Minimize waste across campus to save precious resources
- 3) Expand our Environmentally Preferable Purchasing (EPP) program
- 4) Invest funds saved from sustainability programs into new sustainability projects
- 5) Implement a “TGIF” (The Green Initiative Fund) that is student focused
- 6) Establish a Revolving Loan Fund to increase funding available for new projects
- 7) Organize fundraising events and programs for our sustainability program
- 8) Coordinate with various university departments to identify external sources of funding
- 9) Provide education to the campus community to increase participation in green initiatives
- 10) Purchase renewable energy credits and carbon offsets to mitigate our impacts

Through this diversified approach, LMU will be well positioned to invest financial resources in a sustainable manner. These strategies will enable the university to save money and resources while also improving human health and reducing LMU’s impact on climate change.

#### Purchasing

Set comprehensive purchasing policies on sustainability by 2020 for standardization across campus. Eg. Epeat, Energy Star. etc all in an effort to reduce waste, and resource use.

## Tracking Progress

It is imperative that LMU implements an effective system for tracking the progress of our Climate Action Plan. To this end, LMU plans to build on what is in place and expand data tracking and data analysis methodologies in the future. The following is a list of tracking mechanisms that LMU is considering:

- Enhancing GHG Emissions Inventory Efforts using Clean Air-Cool Planet© Calculator;
- Participating in Sustainability Tracking, Assessment & Rating System (STARS®);
- Joining The Climate Registry™ to refine GHG emissions reporting protocols;
- Forming a Climate Action Council (CAC) at LMU to keep reporting methods consistent;
- Writing a CAP Manual for internal use to preserve LMU institutional knowledge;
- Planning at Environmental Stewardship & Sustainability Committee meetings; and
- Conducting research and data analysis to refine our CAP targets and milestones.

Through all these efforts, as well as by involving as many campus stakeholders as feasible, LMU will work diligently to track the progress of our GHG emissions reduction efforts, and monitor our progress toward the goal of climate neutrality. The LMU campus community takes great pride in knowing that the university is doing its part to reduce impacts to climate change. Through the efforts outlined in this Climate Action Plan Road Map, LMU has refined its commitment to these ends, and will continue to do so into the future. This Road Map has paved the way for the next version of our Climate Action Plan, which will be more comprehensive and detailed. By building on our past and present achievements, LMU is well positioned to address the challenges of the future.

