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UNIVERSITY OF MICHIGAN

# Michigan Athletics Greenhouse Gas Emissions Analysis

A GUIDE FOR THE UNIVERSITY OF MICHIGAN ATHLETIC DEPARTMENT  
TO TRACK AND MEASURE GREENHOUSE GAS EMISSIONS

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While the input of these individuals informed our work, any opinions expressed in the following manual are those of the students and not of the University of Michigan or the Erb Institute.

### **About the Erb Institute at the University of Michigan**

The Erb Institute is a partnership between the Ross School of Business and the School for Environment and Sustainability (SEAS) at the University of Michigan. The institute's mission is to create a sustainable world through the power of business. We do that through research, teaching and business engagement—all focused on preparing and supporting bold business leaders who can adeptly transform companies, industries and entire economies for systemic sustainability.

## EXECUTIVE SUMMARY

Climate change is altering all aspects of life on Earth, and reducing the greenhouse gas emissions in our atmosphere is imperative to fighting global warming. The University of Michigan is a global leader in higher education and is committed to fighting climate change. Yet, as we learn about sustainability in class and watch global temperatures inch closer to a 1.5°C increase since pre-industrial times<sup>11</sup>, we know that positive change needs to accelerate. Likewise, as avid U-M sports enthusiasts, we see the great potential of U-M Athletics to be a leader in the sustainability space.

The University of Michigan has released goals to achieve carbon neutrality by eliminating Scope 1 emissions by 2040, reaching net-zero Scope 2 emissions by 2025, and setting goals for Scope 3 emissions by 2025. However, the steps to achieve these goals across the university largely remain unclear or unpublicized. U-M is highly bureaucratic, with many independently operating departments, each of which has its own unique facilities, operations and activities. While many departments are making efforts to become more sustainable, few are making independent efforts to calculate and reduce emissions—this job is assumed to be for Michigan’s campus-wide sustainability efforts centralized through the Office of Campus Sustainability (OCS).

Given the steady but slow progress at the university level to achieve its carbon neutrality goals, this monumental task rests on OCS. Our Erb Institute–sponsored team has taken the lead with an experimental project investigating what a complete carbon emissions audit for Michigan Athletics might look like. We chose to focus on U-M Athletics for five primary reasons:

- **U-M Athletics is the most public-facing organization within the university.**
- **The department’s influential social platform offers an opportunity to make a difference through education and increased awareness of environmental issues.**
- **The “Big House” (Michigan Stadium) is the largest stadium in the U.S. and brings in more than 100,000 fans for every home game, not to mention other stakeholders.**
- **Athlete and fan travel contributes significantly to university-wide emissions, raising challenging problems that can’t be ignored.**
- **Sustainability in sports often goes unaddressed. U-M Athletics has a legacy and reputation of excellence and has a great opportunity to be a public “Leader and Best” when it comes to sustainability in sports.**

U-M Athletics Scope 1 and 2 emissions are publicly available via OCS. These two categories are well-defined and the data are well-documented. As a whole, U-M is taking action to reduce Scope 1 emissions by completing an expansion of the Central Power Plant. This includes introducing a 15-megawatt combustion turbine as well as installing geo-exchange heating and cooling systems in newer buildings.<sup>29</sup> The university is also collaborating with DTE Energy to decrease the percentage of non-renewable energy sources in the fuel mix, lowering Scope 2 emissions.

For Scope 3 emissions, the university has barely scratched the surface—its goal is to simply establish more goals by 2025. For the Athletic Department, this was no different. However, with helpful stakeholder interviews from U-M Athletics and the 15 Scope 3 categories from the GHG Protocol as a guide, our team made significant headway in understanding the Athletic Department’s Scope 3 emissions. Once we understood the Athletic Department’s activities and the type of data they might generate, we could then ideate on how to potentially collect and track this data in the future. We hope the data will indicate the most effective mitigation measures for the future.

We hope that the below document demonstrates that tracking Scope 1, 2 and 3 emissions can be done at U-M right now if the right efforts are made. Although this project is focused on athletics, it could be used as a framework to extend to other U-M departments. We believe that, because of the university’s bureaucracy and the individual nature of each campus department, emissions tracking and mitigation can be much more effective when done on an individual, department-by-department basis. We look forward to watching the university transform its emissions portfolio and operations over the following years and hope this document serves as a helpful tool in advancing this crucial transition.

**Julia Kaplan, Abigail Williams and Zachary Marmet**

## BACKGROUND

### 1.1 Introduction

Climate change is one of the most pressing issues of our time. The global climate crisis is accelerating, and the University of Michigan (U-M) must work harder than ever to develop solutions and reduce its carbon footprint. In May 2021, U-M announced university-wide carbon neutrality commitments across all greenhouse gas emission scopes.<sup>12</sup> U-M will eliminate Scope 1 emissions by 2040, achieve carbon neutrality for Scope 2 emissions by 2025 and establish net-zero goals for Scope 3 emissions categories by 2025.

In September 2022, U-M published its [first climate action report](#) detailing the university's progress toward its sustainability and carbon neutrality goals during the 2022 fiscal year.<sup>13</sup> According to the report, U-M reduced its total greenhouse gas emissions by 25% from 2010 to 2022, which includes a 4% reduction in emissions in the past fiscal year.<sup>13</sup> The university is also on track to reduce both Scope 1 and 2 emissions by 50% by 2025, highlighted by a 13% year-over-year Scope 2 emissions reduction in the past fiscal year.<sup>13</sup>

The bulk of emissions fall under value chain emissions, also known as Scope 3 emissions.<sup>31</sup> They are also considered some of the hardest emissions to measure, report on and reduce. As U-M continues to define its university-wide goal and timeline for Scope 3 emissions categories by 2025, the Office of Campus Sustainability (OCS), a focal point for U-M's sustainable campus efforts, is crucial in collecting the data and developing strategies to meet the commitment. Our project is intended to support this process and create an approach that can be shared with other stakeholders, including universities and sports organizations.

U-M's carbon neutrality commitments cover the entire university, including 40 million square feet in buildings at the Ann Arbor, Flint and Dearborn campuses, as well as Michigan Athletics and Medicine facilities.<sup>12</sup> As the core of campus sustainability, OCS acts as a centralized sustainability data hub for U-M.

### **To accurately and fully account for the value chain emissions on campus, the initiative requires a collective effort from each school and campus (such as the Ross School of Business, Medicine and Athletics).**

With over 900 athletes across 29 varsity teams, Michigan Athletics is a massive organization and globally renowned brand. Equally important, the regular travel of all these athletes, team personnel and fans means that travel-related emissions are significant contributors to U-M's emissions overall.<sup>37</sup> While universities bring research, campus life, operations and community together, U-M is uniquely positioned to promote sustainability at a much larger scale than other institutions thanks to the reach of its athletic programs.

**1.2 About the GHG Protocol**

The Greenhouse Gas Protocol (GHG Protocol) is a multi-stakeholder partnership of businesses, nongovernmental organizations (NGOs), governments and others convened by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Launched in 1998, the GHG Protocol’s mission is to develop internationally accepted greenhouse gas (GHG) accounting and reporting standards and tools, and to promote their adoption in order to achieve a low-emissions economy worldwide.<sup>1</sup> Since then, the development of many more GHG Protocol reporting frameworks has provided guidance for organizations to measure, manage and reduce their GHG emissions throughout their value chain.

The GHG Protocol defines Scope 1, Scope 2 and Scope 3 as categories of different types of activities that generate GHG emissions:

<b><u>The GHG Protocol</u></b>	<b><u>University of Michigan’s Commitment</u></b>
Scope 1: Direct emissions from business operations.	By 2040, eliminate direct, on-campus greenhouse gas emissions.
Scope 2: Indirect emissions from business energy requirements: their purchased electricity, steam, heat and cooling.	By 2025, reduce emissions from purchased power to net zero.
Scope 3: Other indirect emissions from the organization’s value chain: upstream (supply chain) and downstream (consumer and waste stream emissions) for products and services.	By 2025, establish goals for a wide range of indirect emission sources.

While the scope of emissions reporting is the most well-known system for GHG emissions measurement, the GHG Protocol has standards for a wide variety of situations and use cases. The standards are updated periodically with developed tools and training for better carbon emissions calculations. The GHG Protocol includes the Corporate Accounting and Reporting Standard, GHG Protocol for Cities, Project Protocol, Mitigation Goal Standard, Policy and Action Standard, Corporate Value Chain (Scope 3) Standard and Product Standard.

According to the Corporate Value Chain (Scope 3) Standard, Scope 3 emissions are broken down into 15 categories, sorted as either upstream or downstream emissions in a company’s operations.<sup>7</sup> This guide aims to align these categories with sports-related operations, using U-M Athletics as an example.

### 1.3 Climate Action and Reporting in Sports

## **Sports both contribute to and are negatively affected by climate change. According to the Rapid Transition Alliance’s report, the global sports sector contributes the same level of emissions as a medium-sized country.<sup>2</sup>**

In a cyclical manner, the sports sector is severely affected by climate change. Heavier precipitation, higher sea levels, and the increase in the number of extreme weather events are having disruptive consequences on sports.<sup>8</sup> For these reasons, the United Nations Framework Convention on Climate Change (UNFCCC) and some of the leading sports entities launched the UN’s Sport for Climate Action Framework (S4CA) in 2016.<sup>2</sup> Aimed at sports leagues, federations, teams, clubs, media, universities and governing bodies, the movement mobilizes the sports industry to reduce its emissions.

UNFCCC’s S4CA announced in November 2021 that new and existing signatories are called upon to halve GHG emissions by 2030 and reach net zero by 2040 at the latest.<sup>34</sup> In addition, signatories need to submit plans to outline concrete actions that will be taken to implement 2030 targets as well as report on overall progress with commitments on an annual basis. Schools such as the Ohio State University, the University of Colorado, Wake Forest University, and the University of Miami have joined to lead the charge on climate change in collegiate athletics.<sup>30</sup>

Signatories are asked to measure and provide information on applicable categories of Scope 3 emissions in alignment with the GHG Protocol Scope 3 guidance. With Scope 3 emissions often representing the majority of carbon emissions in an organization’s total GHG emissions, a full understanding of the relationship between the 15 categories and a sports operations value chain is essential to measure, manage and reduce them. Better tracking and disclosure of Scope 3 emission sources offer more emissions reduction opportunities.

Professional sports organizations have disclosed their GHG emissions, with more likely to follow.<sup>17</sup> The International Olympic Committee and its organizing committee have published the inventories of their GHG emissions.<sup>20</sup> FIFA has published GHG emissions reports on its World Cup.<sup>15</sup> Other organizations, such as the Forest Green Rovers, a professional UK football club, have pursued more advanced initiatives.<sup>4</sup>

The complexity and uniqueness of how these sports organizations and events operate increases the challenge to standardize and make apples-to-apples comparisons. While professional sports organizations operate to generate profits, university and collegiate sports organizations often operate at a loss because their main goal is to support all student-athlete teams. With that in mind, this research guide is intended to share lessons learned and help organizations ask the right questions to accelerate the process as soon as possible.

## METHODOLOGY

Sponsored by the Erb Institute at the University of Michigan, the project team consisted of five Erb undergraduate Fellows (Abby Williams, Zach Marmet, Julia Kaplan, Chloe Valentino and Zane Jones), one Erb Fellows alum (C.Y. Cheng) and a faculty advisor (Prof. Sara Soderstrom).

After the kickoff meeting in late September 2022, the team finalized the scope of the project with three deliverables:

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### 1. Scope 1 and 2 Emissions Dashboard on Michigan Athletics

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### 2. Scope 1, 2 and 3 Emissions Research Guide for Sports Organizations

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### 3. A landscape assessment, complete with research on best practices for sustainability in other university and professional sports organizations

To begin, we conducted two virtual interviews with key internal stakeholders from the University of Michigan. We first interviewed representatives from the Office of Campus Sustainability, including Ken Keeler, Senior Sustainability Representative, and Alison Richardson, Zero Waste Program Manager, to understand U-M's current campus-wide sustainability initiatives. Then, our team interviewed Paul Dunlop, Associate Athletic Director of Facility Operations at U-M Athletics, to understand the department's operations and value chain. From October to December 2022, our team worked closely with Keeler and Dunlop to collect the necessary data (see "Data Collection"). Then, using Tableau, the team created a Scope 1 and 2 Emissions Dashboard (see "Emissions Dashboard"). In developing this research report, the team referenced terms and definitions according to the GHG Protocol.

#### 2.1 Data Collection

Ken Keeler pulled GHG emissions data from 23 Athletic Department buildings from FY 2006 to FY 2022 (U-M fiscal years run from July to June). The initial dataset was located in a Google Sheets spreadsheet, available to team members in mid-October. Each row contained one account of GHG emissions, measured in metric tonnes of carbon dioxide (MTCO<sub>2</sub>), broken down by building, date and description (such as electric, recharge stormwater, water, natural gas or steam).

The original dataset was downloaded as a CSV file. The data went through a cleaning process in a JupyterLab notebook using the Python language. Extraneous columns with identical data (such as unit label and account name) were dropped. Rows containing data relating to water and recharge stormwater were also dropped. Shepherd Donald Softball Center was merged with Shepherd Women's Gymnastics Center. Next, functions were created to assign latitude and longitude to individual buildings. Coordinates were determined by searching the building name on Google Maps and collecting the latitude and longitude. Latitude and longitude were applied to all columns except the Golf Course Practice Range Building, which did not appear on Google Maps. The modified data was saved as a new CSV file.

On December 14, 2022, Ken sent an updated dataset containing five more buildings, totaling 27 buildings. The updated dataset was run through the JupyterLab notebook and an updated cleaned CSV file was saved. The CSV file was used to generate the Tableau Emissions Dashboard.

# SCOPE 1 AND SCOPE 2

## 3.1 Scope 1

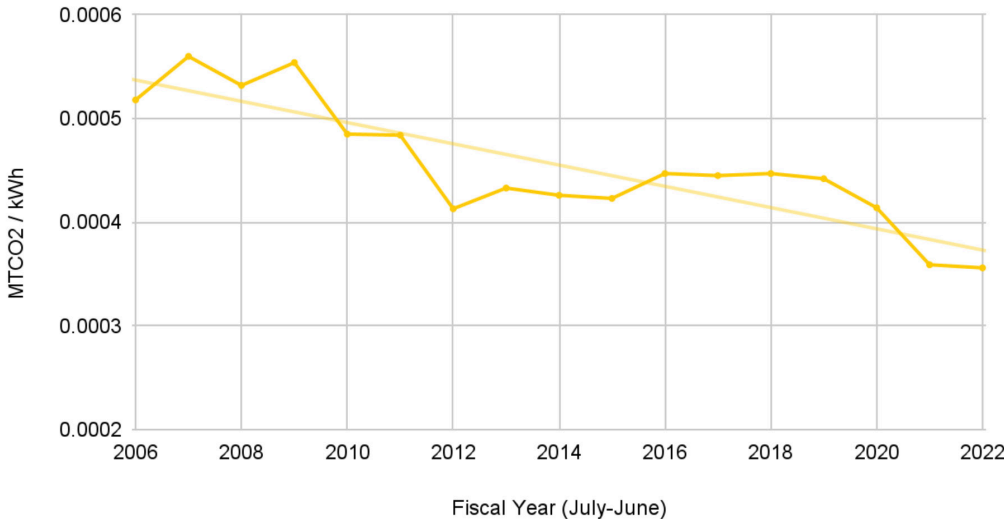
Scope 1 emissions are defined as “direct greenhouse gas (GHG) emissions that occur from sources that are controlled or owned by an organization.”<sup>32</sup> This includes all emissions produced onsite. At the university specifically, Scope 1 emissions are defined as emissions produced from the Central Power Plant (CPP) and fuel emissions from buses and other campus vehicles.<sup>21</sup> The CPP provides energy in the form of steam, electricity, compressed air and hot water to buildings on U-M’s Central and Medical campuses. The university also owns and operates the Hoover Heating Plant, located on South Campus. Emissions produced from vehicles include those from buses and other campus vehicles that run on gasoline and diesel.

### Connection to UM Athletics

The Central Power Plant supplies power to athletic buildings and facilities in the form of electricity.<sup>26</sup> Many athletic buildings get electricity from both the CPP and DTE (Scope 2).

The carbon intensity of this electricity is measured using the unit metric tonnes of carbon dioxide emitted per kilowatt-hour of electricity provided—this is abbreviated as  $MTCO_2/kWh$ . The annual carbon intensity measurements for each building’s CPP electricity changes based on the CPP’s fuel mix. Over time, the CPP is using a cleaner fuel mix to create electricity, producing less GHG emissions.

## Central Power Plant Carbon Intensity



The Hoover Heating Plant supplies Athletic Campus with steam. Emissions produced from campus vehicles are tracked by fuel type but are not distinctly categorized for vehicles that are used for athletics.<sup>27</sup>



### 3.2 Scope 2

Scope 2 emissions are “indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.”<sup>32</sup> Electricity, steam, heat and cooling are often collectively referred to as electricity.<sup>33</sup> Primary sources of energy (such as coal, natural gas and solar energy) are converted into electricity, a secondary energy source.<sup>9</sup>

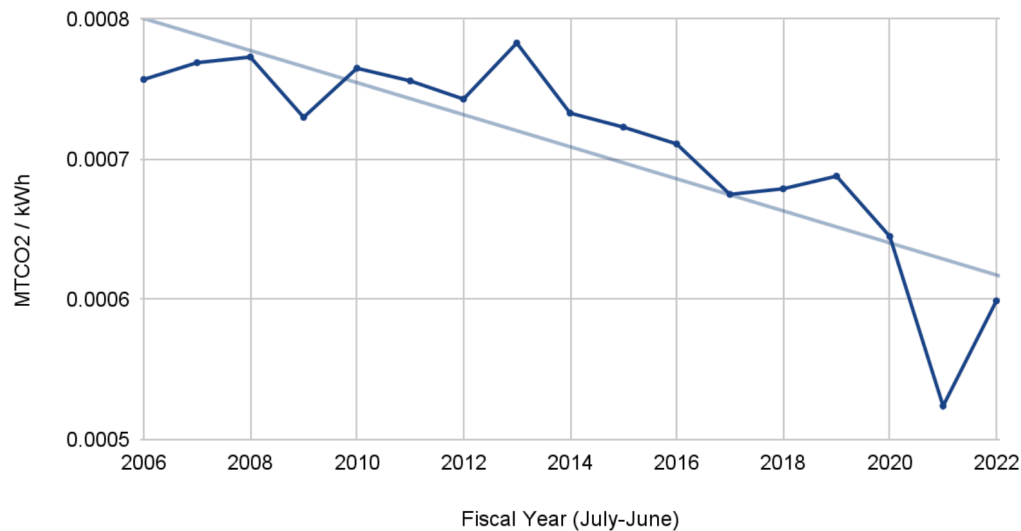
The generation of electricity represents at least a third of GHG emissions globally.<sup>33</sup> To reduce GHG emissions, the fuel mix of primary energy sources must be shifted from non-renewable sources (such as coal and natural gas) to renewable energy sources (such as wind and solar).

*U-M is committed to achieving carbon neutrality for all purchased electricity on all three campuses by 2025.*

#### Connection to U-M Athletics

U-M Athletics buildings receive electricity from energy supplier DTE Energy (Scope 2) and the U-M Central Power Plant (Scope 1). Like CPP electricity, DTE’s electricity GHG emissions are dependent on DTE’s fuel mix. For example, in FY 2006, the DTE grid electricity MTCO<sub>2</sub>/kWh rate was 0.000757. In FY 2022, the MTCO<sub>2</sub>/kWh rate was 0.000599, indicating an increase in renewable primary sources in the fuel mix. DTE’s fuel mix emissions are expected to continually decline.

### DTE Electricity Carbon Intensity



In 2019, U-M entered a power purchase agreement (PPA) with DTE, with a commitment to buy 200 GWh/year of renewable energy from DTE, starting in January 2021.<sup>10</sup> Most of the renewable energy was to be derived from Michigan-based wind and solar projects. In 2022, U-M entered another large renewable energy PPA, buying renewable energy credits (RECs) to cover 30% of U-M’s electricity purchasing.

### 3.3 Emissions Dashboard

#### Overview

To analyze and visualize Scope 1 and 2 emissions data provided by OCS, we created a Tableau dashboard to examine emission trends for each building over time. The dashboard is housed within a story on [Tableau Public](#). The story contains eight slides, three of which are informational and five of which visualize data. The dashboard is based on U-M Athletics fund building utility data from the Electronic Billing System database. The data outlines the quantity of electricity and natural gas emissions produced by each building in terms of MTCO<sub>2</sub>.

#### Analysis


For our analysis, we wanted to focus on trends of emissions—examining the amount of carbon dioxide emitted per athletic building and the quantity of carbon emissions produced from athletic buildings over time. To normalize emissions produced from each building, we calculated the quantity of emissions produced in each building per square foot. During analysis, we found that multiple buildings share the same metering system for electricity and water.<sup>27</sup> This is important to note as it can potentially confound our overall analysis.

#### Final Results

The major conclusions that we drew from our analysis are the buildings that produce the most CO<sub>2</sub>, least CO<sub>2</sub>, and emissions trends over time. From our analysis, we determined that the Big House produces the most CO<sub>2</sub> on a year-to-year basis, and the Radrick Farms Caretaker house produced the most CO<sub>2</sub> per square foot.


#### UM Athletics Scope 1 and 2 GHG Overview

Background	Phase 1: Interviews	Phase 2: Data Collection	Calculations	Total Emissions	Map	Emissions by Building
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**UM Athletics Background**

The University of Michigan Athletic Department is the comprehensive department that houses everything that has to do with Michigan Athletics. This includes Michigan's 27 women's and men's sports, fan experiences, event team, and resources for athletes. Athletic competition at the university began in 1865 starting with baseball, then expanding to football and women's sports to become the program that it is today.



**Project Context**

This project is a partnership with the Erb Institute and UM Athletics to explore scope 1, 2, and 3 emissions of the athletic department. This storyboard particularly focuses on emissions data produced from athletic buildings. The main goal of this storyboard is to determine trends of emissions from athletic buildings over time. The contents of this project discuss our initial research process including interviews, data collection, calculations, and findings which can help determine which buildings are the largest contributors to emissions and where improvements can be made...

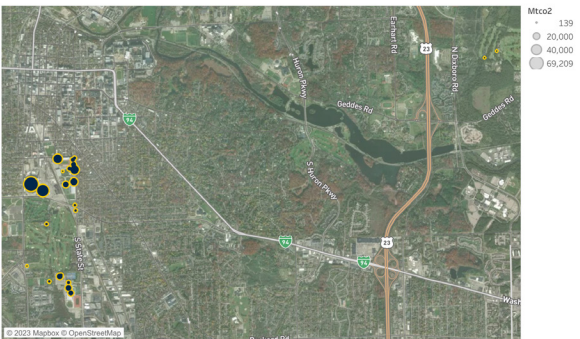
#### UM Athletics Scope 1 and 2 GHG Overview

Phase 1: Interviews	Phase 2: Data Collection	Calculations	Total Emissions	Map	Emissions by Building	Conclusions
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#### Geographic Visualization

Location coordinates were needed to accurately represent building location in Tableau, which were derived from entering the building address into Google Maps. To efficiently add coordinates to the large dataset, a Jupyter Notebook was created. We imported the dataset and created functions to add latitude and longitude columns allowing Tableau to automatically map the buildings.

Map



MTCO<sub>2</sub>

- 139
- 20,000
- 40,000
- 69,209

## SCOPE 3 CATEGORIES

The GHG Protocol breaks Scope 3 emissions down into 15 subcategories. While it's important to investigate each category in an exhaustive emissions audit, it's possible and even likely that not all 15 categories are material to any particular organization's value chain. This was true for Michigan Athletics. To get started, some questions we focused on included:

1. **What is the organization's emissions reduction commitment?**
2. **What Scope 3 calculations is the organization currently doing, if any?**
3. **Which Scope 3 categories does the organization want to capture? Are there any priority categories?**

### 4.1 Purchased Goods and Services (Category 1)

#### GHG Protocol Definition

Extraction, production and transportation from all goods and services purchased or acquired by the reporting company in the reporting year, not otherwise included in Categories 2 to 8. All upstream (cradle-to-gate) emissions of purchased goods and services.<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

As most sports organizations prioritize providing the best experiences and services for their athletes and fans, many have a significant scope related to this category.

Some commonly purchased goods and services include:

- **Food and beverages**
- **Medical services**
- **Packaging**
- **Merchandise**
- **Uniforms and sports equipment**
- **Cleaning and janitorial services**
- **Laundry services**
- **Cleaning and bathroom supplies**
- **Office supplies**
- **Marketing materials**
- **Online media**

U-M Athletics maintains a confidential database of its suppliers. However, the department ranked its top 50 suppliers by annual spending and shared the following breakdown of the largest categories:

1. **U-M's Central Campus Procurement Services. These purchases cover many Scope 3 categories.**
2. **Travel-related suppliers, such as airlines, buses and hotels. These fall under Category 6: Business Travel.**
3. **Cleaning operations, which are entirely outsourced. This falls under Category 1: Purchased Goods and Services.**
4. **An additional notable vendor recently replaced all lights in Michigan Stadium. The service provided falls under Category 1: Purchased Goods and Services, while the lights installed fall under Category 2: Capital Goods.**

U-M Athletics has a vast number of suppliers, estimated to be well over 1,000. Some of these suppliers are designated through specific multi-year contracts with U-M Athletics. A large contributor to this category is food and beverages, which includes meals and snacks provided for athletes as well as concessions for fans. Another major contributor includes all sports equipment, including uniforms, weights and other equipment.

In 2016, U-M Athletics signed an agreement with Nike to become the Wolverines' official athletic footwear, apparel and equipment provider.<sup>35</sup> The contract runs through August 2027, with an option to extend it to 2031.<sup>35</sup> In 2021, Centerplate, a Sodexo company and the leading hospitality partner to North America's premier sports entertainment venues, kicked off a multi-year agreement with the Athletic Department that grants Centerplate management of catering, food and beverage, and concessions services at all athletic venues.<sup>5</sup> In the statement, it committed to working with "U-M and Green Safe Products to help create a zero waste Michigan Stadium."<sup>5</sup>

U-M's Central Campus Procurement Services has a [Sustainable Procurement Program](#) with the following objectives:

- **Serve as an advocate for U-M's sustainability goals.**
- **Encourage the development of environmentally friendly practices within our supplier and campus communities.**
- **Promote suppliers whose businesses provide environmentally sustainable products or services.**
- **Reflect on our commitment to be an economic partner to the communities in which we conduct business.**

The full list of U-M's suppliers is available on the Procurement Services [website](#).

#### Future Data Collection

Many purchased goods and services are used across the university (such as toilet paper and paper towels for bathrooms), not only by the Athletic Department. In these instances, the university manages the competitive bidding process. Then, individual departments such as U-M Athletics make purchases from Procurement Services. Due to this process, U-M Athletics does not always have independent control over exactly which supplier it can use for a particular purchase.

While specific spending data on top suppliers are unavailable to the public due to confidentiality, a comprehensive understanding of spending patterns will allow U-M to account for and analyze its Scope 3 emissions. Emissions associated with Categories 1 and 2 are based on purchasing data and commodity type. Once gathered, these data can then build a foundation for reduction strategies. As Procurement Services manages larger contracts that funnel down to different departments on campus, a collaborative effort between Procurement Services, OCS and U-M Athletics would make this process much more accurate and effective.

To engage vendors to help gather emissions data, the emissions data from suppliers can be more thoroughly investigated. Which suppliers report their emissions? Are they already tracking emissions from their Scope 1 and 2 operations (which are Scope 3 for U-M Athletics)? Only once supplier emissions are tracked will U-M Athletics be able to estimate its own Scope 3 emissions in this category.

As U-M sets out to establish goals for Scope 3 emissions, a more stringent procurement policy may require suppliers to accurately report their own emissions. This also signals to vendors that U-M prioritizes emissions accountability.

## 4.2 Capital Goods (Category 2)

#### GHG Protocol Definition

Extraction, production and transportation of capital goods purchased or acquired by the reporting company in the reporting year. All upstream (cradle-to-gate) emissions of purchased capital goods. A capital good is any good worth over \$5,000 with a useful life greater than one year.<sup>16</sup>

The GHG Protocol defines capital goods as final products with extended life that are used to:

- **Provide a service**
- **Deliver, sell or store merchandise**

#### Connection to U-M Athletics and Sports Organizations

For sports organizations, capital goods may include building materials, vehicles, stadiums, larger athletic training equipment, maintenance equipment, computers, software and food equipment used to prepare concessions.

U-M Athletics procures capital goods just like it procures other goods—some independently, some via long-term contracts and some via Procurement Services. Historically, procurement decisions generally have been driven by cost-competitive bids, without major consideration of the supplier’s sustainability efforts. As the university continues to refine its Scope 3 emissions plan, the Sustainable Procurement Program sets a solid foundation. Also, U-M recently adopted an initial maximum emissions standard for all new building construction. Because capital goods have a higher cost and a longer useful life, it’s especially important to prioritize suppliers that track their Scope 1 and 2 emissions to accelerate the accounting process.

#### Future Data Collection

Category 1 and 2 data should be separated due to their useful life and long-term impacts. Likewise, capital goods expenditure should be separated from the rest of the data so that it can be analyzed independently. This breakdown will support more specific analysis, prevent accidental double-counting of capital goods in Categories 1 and 2, and allow the data collection to remain consistent with the GHG Protocol. Similar to Category 1, a campus-wide collaboration with OCS at the center is key to successful data collection.

Also, Procurement Services should implement a more stringent procurement policy for suppliers for more accurate data collection. Common policies include mandated disclosure of Scope 1 and 2 emissions for capital goods suppliers.

### 4.3 Fuel- and Energy-Related Activities (Category 3)

#### GHG Protocol Definition

Extraction, production and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in Scope 1 or Scope 2.<sup>16</sup>

- Upstream emissions of purchased fuels (extraction, production and transportation of fuels consumed by the reporting company).**
- Upstream emissions of purchased electricity (extraction, production and transportation of fuels consumed in the generation of electricity, steam, heating and cooling consumed by the reporting company).**
- Transmission and distribution (T&D) losses (quantity of electricity, steam, heating and cooling that is consumed, or lost, in the T&D process)—reported by the end user.**
- Generation of purchased electricity that is sold to end users (generation of electricity, steam, heating and cooling that is purchased by the reporting company and sold to end users)—reported by the utility company or energy retailer only.**

#### Connection to U-M Athletics and Sports Organizations

Category 3 excludes emissions from the combustion of fuels or electricity consumed by the reporting company because they are already included in Scope 1 or Scope 2.

U-M Athletics purchases the vast majority of its energy from the Central Campus Power Plant, which is owned by the University of Michigan and thus falls entirely under Scope 1. The main energy that falls into this category is the upstream emissions from the energy U-M Athletics purchases from DTE. Therefore, information about DTE's energy mix will be necessary to understand this category. If viewed separately, the quantities and types of fuel consumed by U-M Athletics operations will be used to calculate the emissions under this category.

#### Future Data Collection

Most data for this category will come from either the Central Campus Power Plant or other external energy providers. They will have the numbers for emissions per kWh of electricity or gallon of liquid fuel.

However, the Athletic Department still can track the use of this energy. It can track T&D losses from the electricity purchased, calculated using the difference between quantity purchased and quantity delivered. More important, the department can track fuel used by vehicles and maintenance/landscaping equipment. Because most U-M Athletics vehicles use an on-campus gas station, developing a tracking system for fuel is feasible. These data will allow more accurate Scope 3 emissions calculations and provide metrics by which to measurably reduce these emissions moving forward.

### 4.4 Upstream Transportation and Distribution (Category 4)

#### GHG Protocol Definition

1. Transportation and distribution of products purchased by the reporting company in the reporting year between a company's Tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company).
2. Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (such as sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company).

#### Connection to U-M Athletics and Sports Organizations

This category represents the emissions from transporting all the goods and services for U-M Athletics, which covers all department purchases such as meals and concessions, athletic and maintenance equipment, merchandise and giveaways, cleaning supplies, office supplies and more. The questions U-M Athletics needs to ask its suppliers to account for this category are: Where are the purchased products/services manufactured or prepared, how do they travel to U-M, and what is the total travel distance?

Another important factor for the university to consider is how equipment moves among buildings. These emissions may already be covered in vehicle fuel use but could be unaccounted for depending on whether U-M Athletics uses rented or owned vehicles.

#### Future Data Collection

Transportation providers for Categories 1 and 2 will need to provide their Scope 1 and 2 emissions. Building on the supplier database, U-M should also note each supplier's warehouse and/or manufacturing location, the distance from that location to U-M, and the mode of transportation for each purchase. To calculate the embedded emissions, the distance traveled can then be multiplied by the appropriate emissions factor.

## 4.5 Waste Generated in Operations (Category 5)

### GHG Protocol Definition

Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company).<sup>16</sup>

### Connection to U-M Athletics and Sports Organizations

U-M Athletics, like any other sports organization, produces significant amounts of waste. The amount and type of waste generated can vary widely depending on the facility and use of the venue (for training versus a game with many fans). Home games with high attendance, such as games in the Big House, Crisler Center and Yost Arena, tend to generate significantly more waste than other types of operation.

U-M Athletics has made ongoing efforts to reduce waste. In 2013, the department began to pilot events with Men's Soccer, Women's Field Hockey, Men's Basketball and Wrestling games as experiments.<sup>19,20</sup> Sodexo served all food and drink items in recyclable or compostable packaging, while U-M Athletics reduced the number of waste stations, installed recycling in every building by converting existing trash cans into compost or recycling, and organized teams of volunteers to educate fans and separate waste post-game. In the same year, Men's Gymnastics hosted the first ever "zero-waste" NCAA Championship.<sup>24</sup>

In 2016, waste reduction efforts expanded to home football games at Michigan Stadium, where more than 100,000 fans gather on Saturdays in the fall. At each game, U-M Athletics began to measure the waste diversion rate, which is the percentage of waste that is recycled or composted instead of thrown away. The zero-waste stadium initiative officially started in 2017, and Michigan Stadium achieved an average 88.17% diversion rate that year. In 2018, the waste diversion rate improved to 89.03%, thanks to the inclusion of Sodexo's food donation program that sent 1,000 pounds of excess food to rescue programs after each game. Then, 2019's rate dropped to 81.07%, while 2021 recorded a record low of 72.78%, most likely due to COVID precautionary measures.

Previous efforts have demonstrated that significant waste diversion and achieving practically zero waste is possible, but fan engagement and education must supplement the efforts. The waste reduction game plan from 2013 remains largely unchanged today, suggesting a lack of new efforts. Progress has certainly been made, but it is time to reevaluate and further advance waste reduction goals across campus.

### Future Data Collection

Diverting waste away from trash to recycling and composting is a valuable initiative that should be applauded and continued. The waste diversion rate for campus buildings can be viewed [here](#).

OCS continues to track waste diversion rates in all campus buildings, and the average waste diversion rate in 2022 was 46.9%. OCS and U-M Athletics should work together and use U-M Athletics' social platform to increase student and fan engagement efforts. These efforts could include A/B testing educational signs and other media messages, as well as working with student-athlete volunteers or representatives to reduce waste going to landfills. To reduce emissions associated with this category, campus-wide efforts should be implemented.

## 4.6 Business Travel (Category 6)

### GHG Protocol Definition

Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company). Scope 1 and Scope 2 emissions of transportation carriers that occur during the use of vehicles (such as from energy use).<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

Travel is essential to most sports teams. To account for all business travel–related emissions, U-M Athletics has to look into travel data for the team’s away games, staff’s business travel (such as recruiting) and fans’ travel to games.

U-M Athletics teams compete in the Big Ten Conference and regularly travel all over the country, including the East Coast, and soon to the West Coast to compete against the University of Southern California and the University of California, Los Angeles.<sup>3</sup> Apart from game travel, recruiting, award ceremonies and other special trips are routinely part of any U-M team’s annual calendar. For example, the Men’s Basketball team traveled to London for the Basketball Hall of Fame’s London Showcase against Kentucky in December 2022, while the Football team traveled across continents for cultural exchange trips in recent years.<sup>38</sup>

Through examining each team’s schedule, we estimate that the Men’s Basketball team travels the farthest in total distance due to the intensive travel schedule. When arranging travel for a team, U-M Athletics generally books a bus from campus to the Detroit airport, a round-trip flight to the destination city, a bus from that airport to a hotel, hotel rooms, and a bus from the hotel to the sports facilities. This transportation is used by players, coaches and staff. To manage these complex logistics, U-M uses a third-party travel agency, Anthony Travel, to book flights, hotels and ground transportation. To accommodate student-athletes’ class schedules, the most efficient method of travel and costs are usually prioritized, while carbon footprint has not yet been factored in.

Sports competitions and travel are highly integrated. It’s important to the players, the department and the Michigan brand of excellence that teams be able to compete at the highest level, no matter where that competition takes place. Finding the right balance between traveling enough and minimizing emissions will not be easy, but U-M has begun to investigate creative opportunities to reduce the impact of travel. In November 2022, the university agreed to a partnership with Delta on a sustainable aviation fuel (SAF) project to help spur the availability and widespread adoption of sustainable aviation fuel and to reduce life-cycle GHG emissions from university-sponsored travel.<sup>14</sup>

#### Future Data Collection

To make additional progress, U-M Athletics and OCS should begin to consistently account data for business-related travel. With many airline companies now publicly listing the emissions per flight and vast data available about vehicle fuel economy and associated emissions, estimating the current state of travel emissions should be possible. The university should also encourage Anthony Travel to provide emissions data. Finally, surveys should be sent out to fans traveling to games, especially for home games, to get a better understanding of where they are traveling from. With full disclosure of the emissions associated with fan traveling, fans may be encouraged to take alternative methods, such as public transportation and carpooling, to reduce the emissions associated with this category.

## 4.7 Employee Commuting (Category 7)

#### GHG Protocol Definition

Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company).<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

The scope of employee commuting varies based on the number of employees, how far they live from campus, and their mode of transportation. For sports organizations and U-M Athletics, this includes the emissions associated with the commutes of employees, staff and student-athletes from their homes or classrooms to the facilities. U-M Athletics has around 450 employees and staff, and 900 student-athletes across 29 teams. The department currently does not track the emissions associated with this category.



OCS has performed surveys at the campus level about employee commuting, shown in the [SCIP Ann Arbor Report](#). Twenty thousand U-M employees commute, around 400 of whom are employed full-time by U-M Athletics. However, the survey received responses from only 1,574 faculty and staff. The survey revealed that 79% of faculty and 72% of staff surveyed drive their car alone to campus at least some of the time. Biking, walking and taking the Ann Arbor public bus were the next most popular options, each garnering around 10% of responses for “1-2 days a week.” Many stated in the survey that they work remotely more often than they did pre-pandemic. The survey is enough to indicate that much work remains to be done in reducing emissions from campus commuting, but it does not give a clear picture of the current situation.

#### Future Data Collection

For U-M Athletics, the first step would be to survey employees, staff and student-athletes on their day-to-day transportation methods. Each respondent should provide their home address, which may already be on file, inform the university of the transportation method they use to get to their primary facility on campus, and determine the average number of days per week they transit to campus. With this data, commuting emissions can be estimated. Building this dataset would be valuable for sustainability efforts as well as future infrastructure development around campus. On campus, common transportation methods are walking, mopeds, bicycles, buses and cars. U-M Athletics and other sports organizations can impose hybrid work schedules, limit the number of personal vehicles per team, and find ways to incentivize employees and athletes to live closer to facilities or use alternative methods of transport, such as bicycles, public transport and electric vehicles.

## 4.8 Upstream Leased Assets (Category 8)

#### GHG Protocol Definition

Operation of assets leased by the reporting company (lessee) in the reporting year and not included in Scope 1 and Scope 2, reported by the lessee.<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

The University of Michigan owns all the buildings and facilities that are used for athletics. Since the emissions associated with these buildings and facilities are included in Scopes 1 and 2, they will not be included in this category, to avoid double counting. A full analysis of U-M Athletics’ facilities can be viewed [here](#). Any sports organization that leases other organizations’ facilities would need to account for the emissions under this category.

#### Future Data Collection

For any leased assets that U-M operates, the lessor’s Scope 1 and 2 emissions for the leased asset would need to be accounted for under this category.

## 4.9 Downstream Transportation and Distribution (Category 9)

#### GHG Protocol Definition

Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company’s operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company).<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

This category can be complex for sports organizations that distribute their own merchandise and tickets. Since U-M Athletics does not own M Den, the officially licensed merchandise provider, the emissions associated with distributing the merchandise would fall under Category 14: Franchises, as explained below.

U-M Athletics used to mail physical tickets to season ticket holders, which would fall under this category. However, U-M Athletics transitioned to completely digital ticket sales during the COVID-19 pandemic, so these emissions have already been mitigated.

#### Future Data Collection

Since this category includes only emissions from transportation and distribution of products after the point of sale, this is currently not material for U-M Athletics. If material, the reporting organizations should include the Scope 1 and 2 emissions of transportation companies, distribution companies and retailers, and customers could be included as well.

### 4.10 Processing of Sold Products (Category 10)

#### GHG Protocol Definition

Processing of intermediate products sold in the reporting year by downstream companies (such as manufacturers). Intermediate products are products that require further processing, transformation or inclusion in another product before use, and therefore result in emissions from processing after sale by the reporting company and before use by the end consumer.<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

Since U-M Athletics does not produce or manufacture any goods, this category is not material. For sports organizations, the products are considered to be the experience of attending a game. These associated emissions are already accounted for in other Scope 3 categories. If the sports organization produces, manufactures, or vends any intermediate products, the organization can make this determination on an individual basis.

#### Future Data Collection

Not material to Michigan Athletics.

### 4.11 Use of Sold Products (Category 11)

#### GHG Protocol Definition

End-use of goods and services sold by the reporting company in the reporting year. The Scope 1 and 2 emissions of the reporting company's end users. The emissions from this category are split into two categories: direct use-phase emissions and indirect use-phase emissions.<sup>16</sup>

#### Connection to U-M Athletics and Sports Organizations

Similar to Category 10, this category is not material to U-M Athletics. The primary goods and services sold by U-M Athletics are tickets, concessions and merchandise. Tickets were moved to an entirely online system, which means the only emissions that could come from ticket sales are from the use of electricity and data to process transactions (upstream) and access tickets online (downstream). However, these are not material.

Team uniforms and other clothing items for student-athletes could be accounted for here. However, laundry services are done within U-M Athletics, so this is already covered in Scope 1.

#### Future Data Collection

Collecting data for the downstream use of products is difficult because they are entirely out of U-M Athletics' supervision and control. Emissions values in this category will likely have to be estimated based on quantities of each good or service sold and the average use-phase emissions for each product.

## 4.12 End-of-Life Treatment of Sold Products (Category 12)

### GHG Protocol Definition

Waste disposal and treatment of products sold by the reporting company (in their reporting year) at the end of their life (such as landfilling, incineration and recycling). This category includes the total expected end-of-life emissions from all products sold in the reporting year.<sup>16</sup>

### Connection to U-M Athletics and Sports Organizations

This category covers the final downstream phase of the goods and services sold or distributed by U-M Athletics. Category 11 covers the emissions from the products' useful lifetimes, and Category 12 covers their end-of-life treatment—landfill, compost or recycling.

Category 5 covers all waste from on-site activities. Products like pom-poms that enrich the fan experience, and concession items, are often disposed of right after use in the stadium, so those downstream emissions generally fall under Category 5. To prevent double counting, this category only pertains to how external actors (such as athletes and fans) dispose of products after they leave U-M Athletics property. This could include merchandise, pom-poms, seat covers, other giveaways and food/beverage waste thrown away outside U-M facilities.

### Future Data Collection

Similarly to Category 11, this is difficult to measure consistently as it depends on the independent decision-making of actors outside the control of U-M Athletics. However, data on disposal methods could be gathered by surveying fans. To improve in this category, educational initiatives can encourage fans to donate, compost or recycle the products they leave U-M Athletics events with.

## 4.13 Downstream Leased Assets (Category 13)

### GHG Protocol Definition

Operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in Scope 1 and Scope 2—reported by the lessor.<sup>16</sup> This category is applicable to lessors (companies that receive payments from lessees). Companies that operate leased assets should refer to Category 8 (upstream leased assets).

### Connection to U-M Athletics and Sports Organizations

U-M Athletics does not lease or rent out any of its facilities to other sports organizations. However, it does rent out its facilities, such as parts of Michigan Stadium and Crisler Center, for private events, tours and gatherings. At these events, all lessee use of the facilities causing Scope 1 and Scope 2 emissions should be incorporated into the lessor's (U-M Athletics') Scope 3 emissions.

### Future Data Collection

U-M Athletics would need to aggregate the Scope 1, Scope 2, and other 14 categories of Scope 3 emissions from when the leased/rented facilities are used by other lessees. However, many of these emissions, such as energy use and waste, are already accounted for in Scope 1, Scope 2 and other Scope 3 categories where the data is gathered over periods of time rather than on an event-by-event basis. Key to collecting data for this category is identifying which activities from leased events will provide new emissions to document and which will already be accounted for elsewhere.

#### 4.14 Franchises (Category 14)

##### GHG Protocol Definition

Operation of franchises in the reporting year, not included in Scope 1 and Scope 2, reported by the franchisor.<sup>16</sup> A franchise is a business operating under a license to sell or distribute another company's goods or services within a certain location. This category is applicable to franchisors (companies that grant licenses to other entities to sell or distribute their goods or services in return for payments, such as royalties for the use of trademarks and other services). These franchisors should account for emissions that occur from the operation of the franchise, including the Scope 1 and Scope 2 emissions of the franchisees.

##### Connection to U-M Athletics and Sports Organizations

U-M Athletics does not own or operate the M Den, the officially licensed merchandise provider for Michigan apparel. Licensed apparel falls into this category due to the royalty fees implemented in the contract. As stated on its website, M Den contributes a great portion of each sale to the university.<sup>28</sup>

In 2016, U-M Athletics agreed on a long-term contract with Nike. Terms include Nike paying U-M a 15% royalty of net sales on non-footwear apparel and a 5% royalty on footwear.<sup>36</sup> U-M also receives no less than \$18.37 million in royalties over the 11-year term (or \$25.05 million in the 15-year deal).<sup>36</sup>

In 2021, about 28% of U-M Athletics' revenue came from corporate sponsoring, advertising and licensing.<sup>25</sup>

##### Future Data Collection

To calculate the emissions associated with this category, Scope 1 and 2 emissions data from M Den and Nike will be required. Many of these emissions will come from the process of producing and distributing merchandise, as well as the upstream materials of that merchandise and its downstream use phase. For OCS to accurately account for the emissions related to this category, any companies that pay U-M Athletics a licensing fee will need to disclose their emissions data.

#### 4.15 Investments (Category 15)

##### GHG Protocol Definition

Emissions from the operation of investments (including equity and debt investments and project finance) in the reporting year, not included in Scope 1 or Scope 2.<sup>16</sup> This category is applicable to investors (companies that make an investment with the objective of making a profit) and companies that provide financial services. Investments are categorized as a Scope 3 category because providing capital or financing is a service provided by the reporting company.

##### Connection to U-M Athletics and Sports Organizations

Since this category is designed primarily for private and public financial institutions, it often doesn't apply to sports organizations.

While U-M Athletics does not have investments, U-M does. Since 2021, U-M has stated the following sustainable investing initiatives<sup>22</sup>:

- **Discontinued direct investments in companies that are the largest contributors to greenhouse gases, and new investments in funds whose primary focus is oil reserves, oil extraction or thermal coal extraction.**
- **Shifted natural resource investments to renewable energy, low-carbon fuel and other investments to help build a sustainable economy.**
- **Pursuing a net-zero endowment by 2050.**

The university has also shared its progress in 2022 toward reaching a "net-zero" carbon footprint for its investment portfolio by 2050.<sup>23</sup>

##### Future Data Collection

While this category does not directly apply to U-M Athletics, OCS would need to collect data from U-M investment managers under the endowment portfolio and its associated emissions. The technical guidance for emissions accounting according to the type of financial investment can be found [here](#).

## CONCLUSION

After months of continuous effort, our team developed a thorough, although imperfect, understanding of all the emissions-generating activities that are a part of U-M Athletics' operations. Most of the necessary Scope 1 and 2 data, while complex to understand and not entirely consistent, was made available by OCS. As a result, our team was able to draw meaningful conclusions about the current state of Michigan Athletics when it comes to Scope 1 and 2 emissions. These were namely that the university is making solid progress toward its carbon neutrality goals for Scope 1 and 2, and this progress trickles down to positively affect U-M Athletics.

### **The main space to improve for both athletics and university-wide Scope 1 and 2 progress is more transparent reporting on the current state, progress made and distance to goals.**

For Scope 3, neither OCS, U-M Athletics nor any other campus department had much foundation for us to work with, so we started from scratch by having many conversations with athletics stakeholders about which athletics activities might fit into each Scope 3 subcategory of the GHG Protocol. Little quantitative data was available, but we developed a great deal of qualitative understanding that can be used to design mechanisms for collecting future quantitative data—as suggested in each section's "Future Data Collection" subheading. From the Scope 3 assessment, the categories that appear most material to Michigan Athletics' carbon emissions are purchasing and procurement, waste, business travel and franchises. Michigan Athletics should make developing strategies to track data for all Scope 3 categories a first priority, but it should also begin to consider how it might reduce emissions in these particularly intensive categories.

As we attempted to understand what data exists and how to gather it, we became aware of numerous complications that made a complete audit of athletics emissions very difficult. We lay these out below, to better explain the state of U-M Athletics and university-wide emissions tracking.

#### The Issue of Finances

When starting this project, we researched numerous sustainability and emissions tracking initiatives performed by professional as well as collegiate sports teams. **However, after speaking with Michigan Athletics stakeholders, we learned that university athletic departments cannot be fairly compared to any other type of sports organization.** They are uniquely designed in that they do not exist to run a profit—they are self- and university-funded in the interest of providing a great experience for student-athletes and fans. At U-M, only Men's Football and Basketball teams generate profits. A sports business interested in generating profits would likely make drastic changes to this system that would affect its operations and emissions, but the difference in mission means that U-M Athletics and other university athletic departments operate very differently from other sports organizations. This can have positive or negative implications for sustainability, depending on whether the changes to be made have the potential to alter profit margins or benefit student-athlete well-being.

#### Seasonality and Intermittent Usage Factors

The issue of seasonality came up when discussing Scope 1, 2 and 3 emissions. Even though many of the sports teams at U-M have their own training facilities and stadiums, these spaces are not used consistently throughout the year, because each sports team has a specific season in which it competes. As a result, many of the buildings operated by athletics have highly variable usage rates. The best example of this is Michigan Stadium, the largest stadium in North America. Although it's used for football practices and other events, the stadium is used at its full capacity only for Michigan Football home games, which occur only seven or eight days of the year. On those days, over 100,000 people travel to the stadium and use its facilities, generating a huge amount of emissions. On all other days of the year, the stadium generates only a fraction of what it does on game day. Other examples of facilities particularly affected by seasonality and/or intermittent usage are the campus Golf Course, the Indoor Track facility, indoor pools, Crisler Center and Yost Arena.

Seasonality and intermittent usage of facilities mean that collecting data on an annual or even monthly basis may not generate the best representation of what is happening at athletic events. The annual aggregate data for Michigan Stadium's emissions can change from year to year, but does that reflect behavior changes on game day or the fact that Michigan hosted more or fewer events at the Big House in a particular year? These factors do not render annual or monthly data useless or unreliable, but they indicate that the time scale by which data is measured is an important consideration that further complicates analyzing Athletic Department emissions.

#### The Bureaucracy of U-M (applicable to emissions tracking in any campus department)

U-M is highly bureaucratic, with academic departments, housing and dining facilities, administration units, a hospital and health care system, athletic programs, and many other departments that operate independently. Each of these individual departments has its own unique facilities, operations and activities, which means that each has its own unique complications when it comes to evaluating emissions. However, sustainability work at U-M is mostly centralized through OCS. A centralized sustainability office on campus offers many benefits, such as having numerous full-time staff working on sustainability initiatives and a central touchpoint for goal-setting and new action. However, the reality is that OCS does not have the bandwidth to understand each individual department, and the campus bureaucracy means that OCS has little power to enact deeper change (such as budgetary and operational) in other departments. Ultimately, OCS is a great organization, but it can't single-handedly reduce emissions of all scopes across campus.

**Our research has revealed that U-M should take a bottom-up approach when it comes to measuring, tracking and goal-setting for Scope 3 emissions. Although the top-down approach of OCS has proved effective for Scopes 1 and 2, our conversations have demonstrated the immense value of having Scope 3 activities worked out by an expert from within the department who understands it well. With a more specialized understanding, goals that are more accurate, specific and achievable can be created.**

## RECOMMENDATIONS

This project set out to measure and track emissions—a very numerical, data-driven, mathematical activity. However, as we got into the details of Scope 3, we realized that collecting such complex data is as much an organizational problem as it is a mathematical one. As a result, our team recommends both data strategies and organizational changes to help the University of Michigan achieve its sustainability goals with the greatest efficiency possible.

### 6.1 Prioritize Commitment to (Data) Transparency

U-M intends to publish an interactive website to increase sustainability engagement, including dashboard refinement and additional data visualizations. However, the university needs to take more action to increase transparency relating to the process of achieving carbon neutrality, not just the results.

The publicized [Building Energy Data](#) is fairly comprehensive but fails to tell a story of the university's efforts in reducing Scope 1 and 2 data. The dashboard serves minimal use to audiences that are uneducated on utilities and sustainability—it should contextualize the data and describe what the visualizations represent. Also, the dashboard should use trend lines and plot the university's goals to add more context to the data. In the annual utility [reports](#), buildings are grouped by fund, and data indicates what utilities came from the CPP; both of these statistics should both be represented on the public-facing dashboard.

U-M is committed to establishing Scope 3 goals by 2025, and we strongly recommend that the university design and publicize the metrics that will be used to track Scope 3 emissions. Data collection will be imperative in tracking indirect emissions trends, and processes need to be established as soon as possible. **This report demonstrates that tracking Scope 3 emissions brings difficulties but is feasible. Scope 3 goals should be presented with transparency, which means demonstrating where the university stands, how it has progressed and what still needs to be accomplished.**

### 6.2 Commit Financially to Sustainability Work by Hiring a Full-Time Employee

Gathering data to track and measure emissions of all scopes for the University of Michigan Athletic Department is a huge undertaking. Transparently committing to measuring and reducing emissions means designing metrics for all the Scope 3 categories, tracking those emissions along with Scope 1 and 2, building out informative visualizations of the available data, finding new ways to mitigate emissions and implementing them, and producing summary impact reports that effectively communicate the progress over time. It's immensely complex, and it requires large-scale vision, attention to granular details and critical interpretations of apparent trends.

At the same time, there is a clear lack of available human resources in both U-M Athletics and OCS to dedicate their time to creating a complete emissions audit. OCS is structured as the centralized sustainability oversight over all of the university, but it is simply not big enough (in staff) to properly dedicate the attention to athletics that accurate and transparent reporting and mitigation require. Michigan Athletics has no dedicated sustainability employee, so this work is undertaken by people volunteering their time. As a result, valuable sustainability initiatives in the Athletic Department seem to be inconveniences that draw resources away from other tasks important to the department's mission. It's critical that the university empower the Athletic Department to embrace ideas for sustainability, but the current system is inhibiting positive change.



**We recommend that the university enable the Athletic Department to make the most effective sustainable change by providing sufficient human resources. A dedicated employee within athletics who is paid full time is the best financial commitment the university can make; while expanding OCS would also be helpful, each campus department, and especially the Athletic Department, is unique and independent enough that an internal employee would be far more effective in understanding the inner workings of activities and engaging with key stakeholders. This person's job description would consist of understanding the inner workings of the Athletic Department, tracking the impacts of department activities, ideating on how to improve, collaborating with other departmental sustainability roles on campus, and communicating results to an external audience.**

### **6.3 Change Requirements for New Deals, Development and Construction**

One of the challenges to making sustainable change that was identified through interviews with U-M Athletics is that the department often joins large, multi-year contracts with suppliers. Some of the most visible examples of these deals include the exclusive merchandise deal with Nike and the partnership with Coca-Cola, but the university and Athletic Department are involved in hundreds of these. Multi-year contract partnerships appear in concessions, merchandise, equipment, construction materials and more. They build a relationship between the university and supplier companies, and they often earn the department significant revenue. These deals are currently made taking into account the financials and quality of procured goods.

Changing existing deals is an unrealistic request, but it is possible to ensure that all future deals take sustainability into account and consider emissions implications. **Our team recommends that the Athletic Department develop sustainable contract standards so that new merchandise, concessions, equipment and construction deals advance sustainability goals at the highest standard. As old deals gradually expire, a strong standard for the future will aid a smooth transition toward sustainability over time.**

#### **6.4 Prioritize Categories 1, 5, 6 and 14 for Mitigating Scope 3 Emissions**

Scope 3 emissions, with its 15 complex categories, can be overwhelming to tackle. Just tracking these emissions is a difficult task, while mitigating the upstream and downstream effects of every activity can feel nearly impossible. But because Scope 3 emissions are by far the largest category for most organizations, it's critical that U-M Athletics does not wait for a perfect measurement system or an arbitrary point in time to begin the mitigation process.

**Prioritizing specific categories over others is a helpful way to get mitigation work started, as it narrows the focus and leads to more tangible and rapid change. Given the especially high visibility of the Athletic Department, our team believes that category priorities should be based on not only what is the most emissions-intensive but also what is the most visible to external stakeholders and can be used for positive publicity. Even without concrete data, our conversations with athletics stakeholders and sustainability experts on campus have led our team to believe that four of the 15 Scope 3 categories stand out based on these priority criteria. The categories are: 1—Purchased Goods and Services, 5—Waste Generated in Operations, 6—Business Travel and 14—Franchises. These four categories likely make up over 50% of all Scope 3 emissions from U-M Athletics.**

Category 1 stands out because the Athletic Department procures a massive amount of goods and services for its teams and fans, so it can have a large emissions and publicity impact by shifting to a more sustainable procurement policy. Category 5 is especially relevant to large home sporting events like football, basketball and hockey games, and waste reduction efforts can be one of the best ways to drive fan engagement for sustainability. Category 6 is likely to be far and away the most emissions-intensive—all 29 Michigan Athletics teams travel regionally and nationally many times a year to compete. Creative solutions here, such as strategically scheduling double-headers for multiple teams to take the same bus/flight, and implementing new sustainable aviation fuels, need to take shape as soon as possible. Reductions here can also be highly visible, as U-M's teams are often on national stages. Finally, Category 14 is critical, because most of the U-M Athletics merchandise is sold through the M Den, a franchise. Making sustainable changes to the clothing and goods loved by fans around the world can have a significant emissions and visibility impact.

Our team recommends that while OCS and the Athletic Department work through the challenges of tracking and measuring Scope 3 emissions as a whole, they also prioritize inventing mitigation strategies for these four key categories to accelerate the most effective changes.

#### **6.5 Encourage Student Engagement at the Intersection of Sustainability and Athletics**

Students are major stakeholders at the university, so they are crucial in furthering sustainable change in athletics. Students play a large role in creating a culture of sustainability at the university, as they have been the primary driver of changing the narrative and culture around sustainability from the beginning. Students also are a vast majority of the university's population and the university's primary customer. It is essential to keep students involved at this intersection, as this will only further efforts to integrate the Athletic Department and OCS.

**To achieve this, our team recommends creating sustainability-focused roles for the Athletic Department internship program, or creating an internship focused on sports sustainability through another department (such as OCS or the Erb Institute).**

The Athletic Department currently has a wide variety of internship opportunities for students to partake in during the academic year, and adding a sustainability-based role would further support engaged students in this space. Student-athletes could also be visible leaders in U-M Athletics sustainability marketing, which could lead to future name, image and likeness (NIL) deals with sustainable companies and sponsors. Students have expressed an interest in gaining practical experience at the intersection of sports and sustainability, and these opportunities would not only benefit students but also aid the university in preparing more people to work on these initiatives.

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