

# American Solar Energy Society (ASES) Net-Zero Annual National Solar Conference Carbon Footprint & Reduction Strategy



Transforming the Energy Landscape for All

August 8-11, 2023  
University of Colorado, Boulder



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## Introduction

The American Solar Engineer Society (ASES) is taking the steps to make their SOLAR 2023 conference as sustainable as possible by hosting a Net-Zero emissions event! Being Net-Zero entails balancing emissions of carbon dioxide by eliminating emissions from society or by removing carbon dioxide from the atmosphere. This can be achieved in many ways such as resource and energy conservation practices, using electricity produced by renewable energy, and preserving ecosystems that are natural carbon sinks. ASES is taking all reasonable steps to minimize the amount of greenhouse gases (GHGs) released from producing electricity, space heating, food, travel, and other resources used during the 2023 event. Neither ASES nor the University of Colorado have the infrastructure and capacity to completely offset carbon emissions for this event on their own. Therefore, the organization must seek the utilization of carbon-neutral vendors and event practices; while offsetting the remaining GHGs emissions from the conference by purchasing RECs (Renewable Energy Credits) and carbon offsets, which in turn funds local mitigation projects. ASES went through the process of defining the operational boundaries of the event, then categorizing baseline emissions, and finally purchasing RECs and carbon offsets to achieve Net-Zero!

## EPA Baseline Emissions Methodology

Environmental Protection Agency's (EPA) Simplified Guide to Greenhouse Gas Management for Organizations<sup>1</sup> offers a basic GHG inventory tool compared to the formal EPA Greenhouse Gas Reporting Program.<sup>2</sup> The method follows these steps:

- Define Operational Boundary Questions - Emissions Sources to Include
  - Energy consumption at the CU Boulder University Memorial Center (UMC)
  - Emissions from attendee & ASES employee travel
  - Attendee hotel & lodging energy consumption
  - Emissions associated with catering services
- Simplified GHG Emissions Calculator<sup>3</sup>
  - Scope 1 –Emissions from sources that the organization owns or controls, like natural gas-fired boilers or vehicle fleets. Scope 1 is defined as direct emissions.
  - Scope 2 – Emissions that are a consequence of the operations of the organization but occur at sources owned or controlled by another organization, most typically electricity, heat, or steam. The EPA methodology calls these indirect emissions.
  - Scope 3 –Indirect emissions that are not incorporated in scope 1 or 2, include business travel, employee commuting, and product transport.

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<sup>1</sup> "Simplified Guide to Greenhouse Gas Management for Organizations," August 2022, 20, [https://www.epa.gov/system/files/documents/2022-09/Simplified\\_Guide\\_GHG\\_Management\\_Organizations.pdf](https://www.epa.gov/system/files/documents/2022-09/Simplified_Guide_GHG_Management_Organizations.pdf).

<sup>2</sup> OAR US EPA, "Greenhouse Gas Reporting Program (GHGRP)," Other Policies and Guidance, June 10, 2014, <https://www.epa.gov/ghgreporting>.

<sup>3</sup> OAR US EPA, "Simplified GHG Emissions Calculator," Overviews and Factsheets, August 5, 2015, <https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator>.

## Event Baseline Emission Calculations

Emissions produced at the conference are categorized into three scope categories and summarized in Figure 1. Descriptions of ASES Solar 2023 activities for each scope 1, 2, and 3 emissions follow by specific activity and divided by the boundaries outline in the EPA Baseline Emissions Methodology.

### Scope 1: Direct Emissions

ASES has a small group of staff that is based locally who support the event. They will be driving to and from the event daily throughout the Denver Metro Area. Additionally, there is direct natural gas combustion equipment located within the event facility such as furnaces and stoves.

### Scope 2: Indirect Emissions

There are many sources of energy consumption that the University Memorial Center (UMC) facility uses on a typical August day when supporting conferences. The facility purchases electricity, chilled water, and steam from offsite generators that reside on campus and throughout the state.

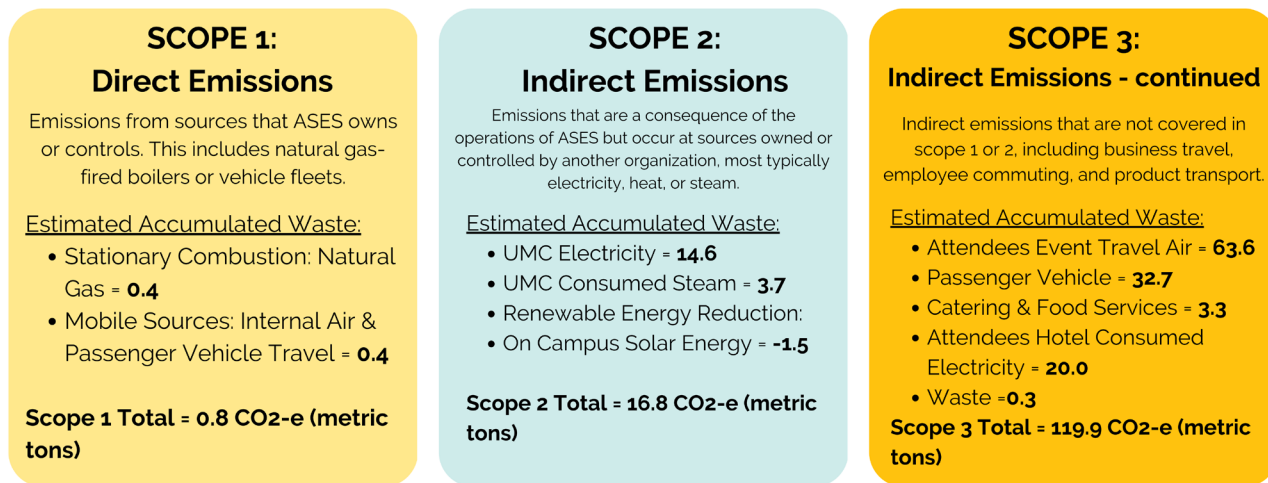
Electricity is generated onsite through a combined cycle natural gas power plant and PV solar arrays located throughout the campus; additionally, electricity is purchased from grid produced by Xcel Energy. Chilled water is produced by multiple chiller plants using electricity, and steam is produced using natural gas combustion and piped throughout the campus providing heating and cooling to UMC. Additional Heating Ventilation and Air Conditioning (HVAC) electricity consumption consists of fans, pumps, and packaged roof top units with other facility loads consisting of lighting, plugin loads (computers, monitors, audio, etc.). Overall, the UMC facility is estimated to consume 28 MWh of electricity from non-renewable energy sources during the event. with 38 MWh estimated for attendee logging.

### Scope 3: Indirect Emissions

Attendee travel produces the vast majority of the event emissions. Air travel takes the lion's share of carbon emissions with regional passenger vehicle travel accounting for about half of the emissions of air travel. Catering and food services emissions were cut down 41% by using a zero-waste catering service and providing only vegetable-based meal options. The University of Colorado provided an estimated daily waste count that the building typically generates in the summer. This includes items that go directly to the landfill and recyclable products. ASES is aiming to reduce event waste further through methods such as minimizing paper use and asking attendees to utilize reusable beverage containers. Additionally, most attendees will be indirectly using electricity purchased from the grid while they stay in lodging, estimated at 38 MWh, when attending the conference.

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SOLAR 2023 will be a **net zero emissions event** by offsetting direct conference emissions specifically within Scopes 1-3. The total event baseline emissions = **137.5 CO<sub>2</sub>-e (metric tons)**



Credit: Sustainable Engineering LLC

Figure 1 – ASES Solar Conference 2023 Expected Emissions

## Carbon Offset & Renewable Energy Certificate

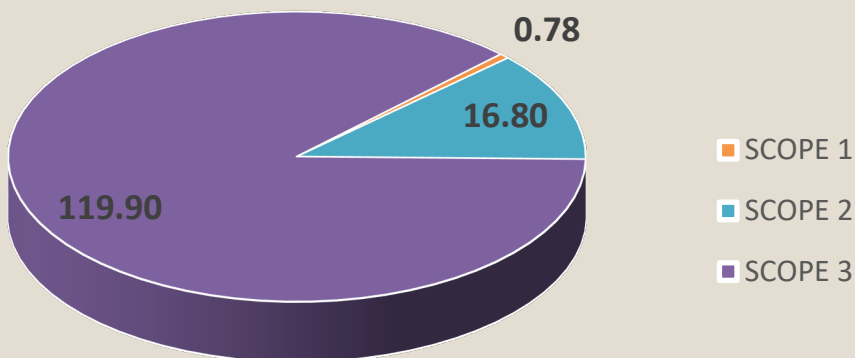
Carbon Offsets and Renewable Energy Certificates (REC's) are valuable for supporting our society's transition away from fossil fuel sources and supporting projects that reduce GHG emissions. Carbon offsets represent emissions reductions, provide support for emissions reduction activities, and may lower costs of GHG emission mitigation. RECs expand consumers' electricity service choices, convey environmental attributes and renewable electricity use claims, and support renewable electricity development. While there is no single standard or market for Carbon Offsets or REC's in the United States the following definitions are common to all standards:

- Carbon Offsets – A credit used to convey a net climate benefit from one entity to another. 1 carbon offset = 1 metric ton (1,000kg) CO<sub>2</sub>-e.
- Carbon Offsets are inventoried by several independent standards.
- Renewable Energy Certificate (REC) – A REC lays claim to renewable energy sold, but not the power itself. REC's are a tradable instrument that certifies 1 MWh of electricity.
- REC's are tracked through compliance and voluntary markets.

ASES proceeded with purchasing Carbon Offsets and REC's from Native Energy to offset their scope 1 and scope 2 emissions prior to the event. As the event date nears and the number of attendees is confirmed ACES will offset their remaining scope 3 emissions.

## Graphics

**ASES 2023 Emissions by Scope  
CO<sub>2</sub>-e Metric Tons**



**ASES 2023 Emissions by Source  
CO<sub>2</sub>-e Metric Tons**

