NET ZERO BUILDINGS

Dane County Office of
Energy & Climate Change

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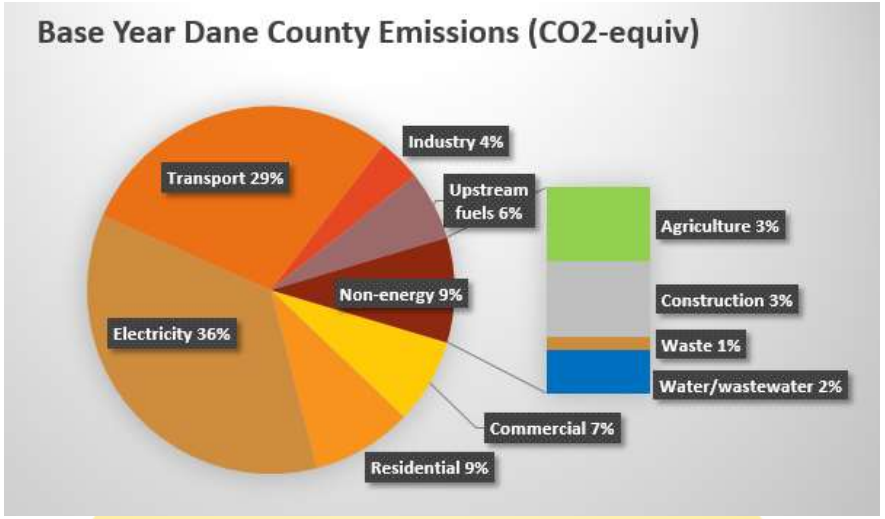
Dane County's Climate Commitment

- ***Today's Opportunity for a Better Tomorrow: 2020 Dane County Climate Action Plan***
  - Aiming to cut emissions in half by 2030
- Energy use in buildings is about half of the county's total emissions
  - Electricity 36%
  - Heating fuels (mostly natural gas) 16%
- Buildings last for 50-100 years
  - Shifting toward net-zero buildings helps us achieve our climate goals



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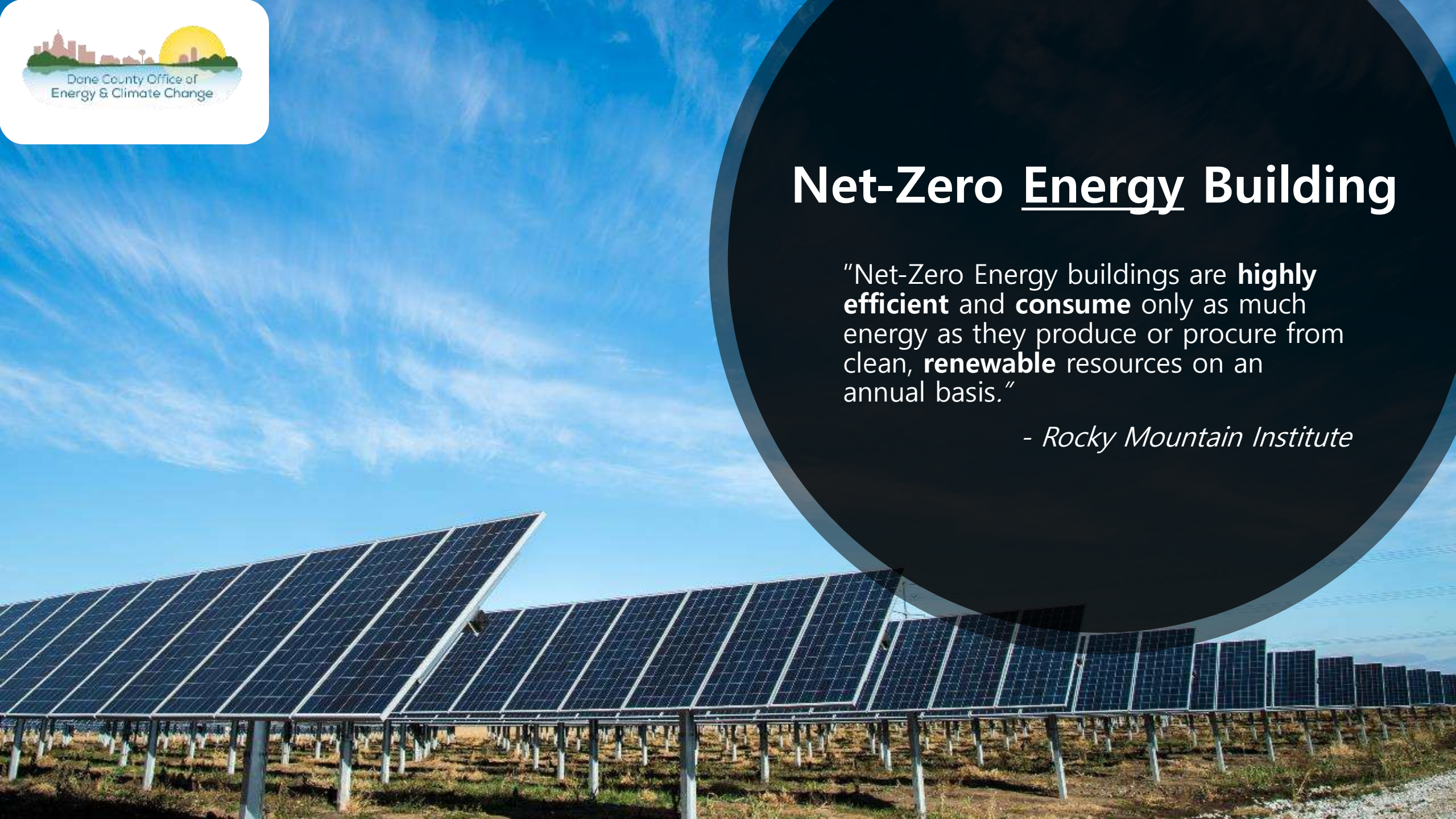
Net-Zero Energy Building

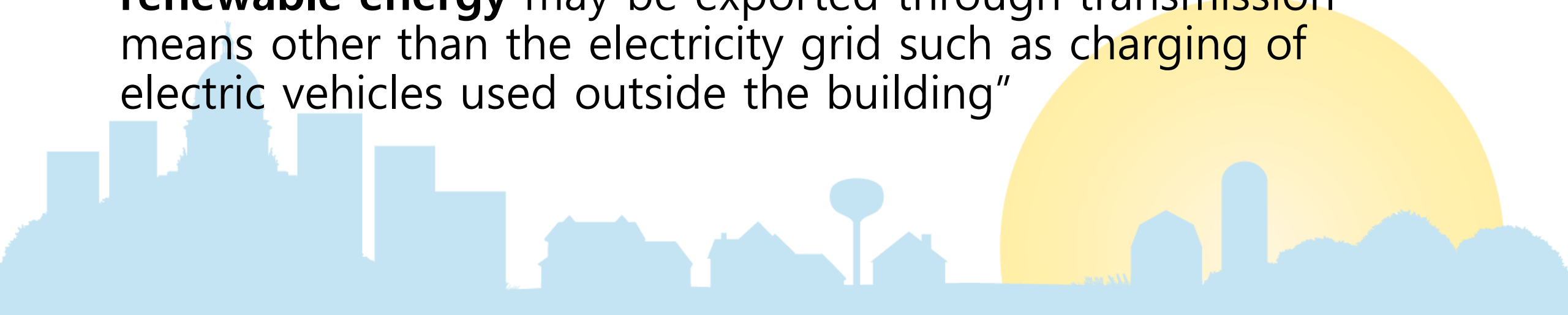
"Net-Zero Energy buildings are **highly efficient** and **consume** only as much energy as they produce or procure from clean, **renewable** resources on an annual basis."

- Rocky Mountain Institute



US DOE has a similar definition of NZE

"Zero-Energy Building energy accounting would include energy used for **heating, cooling, ventilation, domestic hot water (DHW), indoor and outdoor lighting, plug loads, process energy and transportation within the building. Vehicle charging energy for transportation inside the building** would be included in the energy accounting. **On-site renewable energy** may be exported through transmission means other than the electricity grid such as charging of electric vehicles used outside the building"



Resources

Net-Zero **Energy** buildings:

US Department of Energy – A Common Definition for Zero Energy Buildings

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard Method of Evaluating Net-Zero Energy Building Performance

New Building Institute – Five Steps to Net Zero Energy

New Building Institute – 2018 Getting to Zero Status Update and List of Zero Energy Projects

Benchmarking software and program options to assist building owners, designers, or contractors

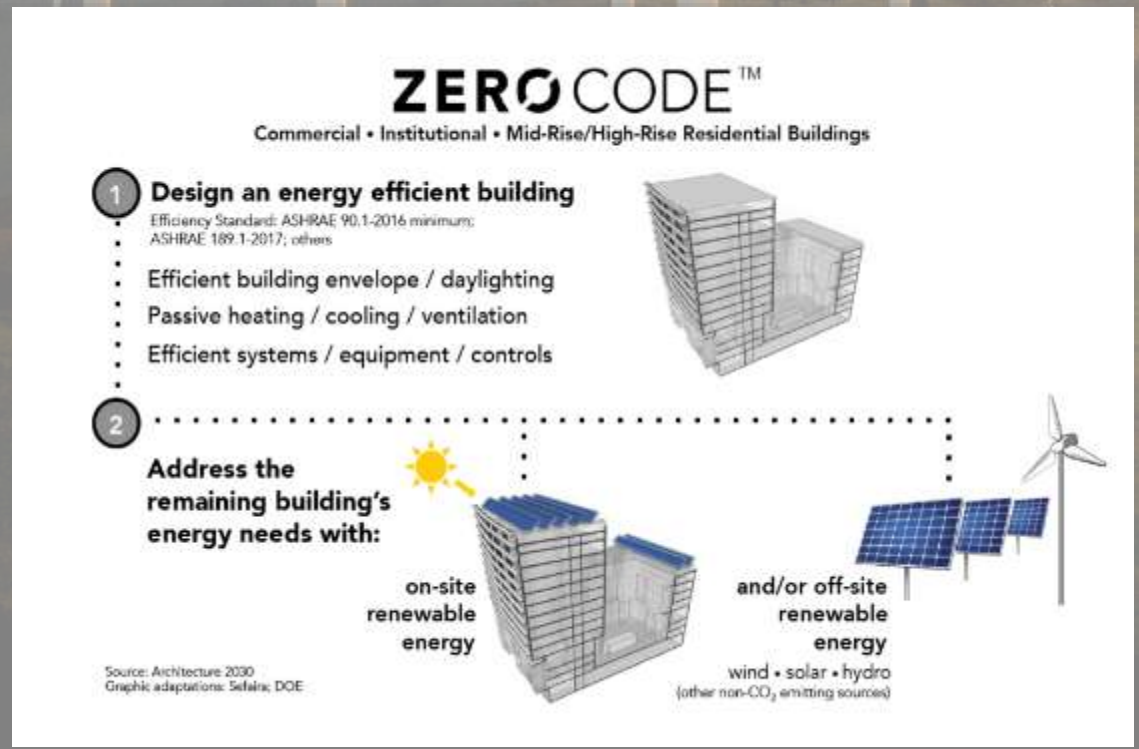
- ENERGY STAR Portfolio Manager by US Environmental Protection Agency
- Building EQ by ASHRAE
- FirstView by New Buildings Institute
- ZeroTool by Architecture 2030, an American Institute of Architects initiative

Net-Zero Carbon Building

- A **Zero-Net Carbon(ZNC) building**: a highly energy efficient building that produces *on-site*, or procures, enough carbon-free renewable energy to meet building operations energy consumption annually.

  – Rocky Mountain Institute (same definition used by Architecture 2030 and New Building Institute)

- In a ZNC building, carbon-based energy consumption is reduced through
  1) Building design strategies and efficiency measures
  2) On-site renewable energy generation
  3) Procurement of locally produced off-site renewable energy



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Resources

Net-Zero **Carbon** buildings:

Architecture 2030, New Buildings Institute, and Rocky Mountain Institute - Zero Net Carbon white paper

World Green Building Council – Bringing embodied carbon upfront

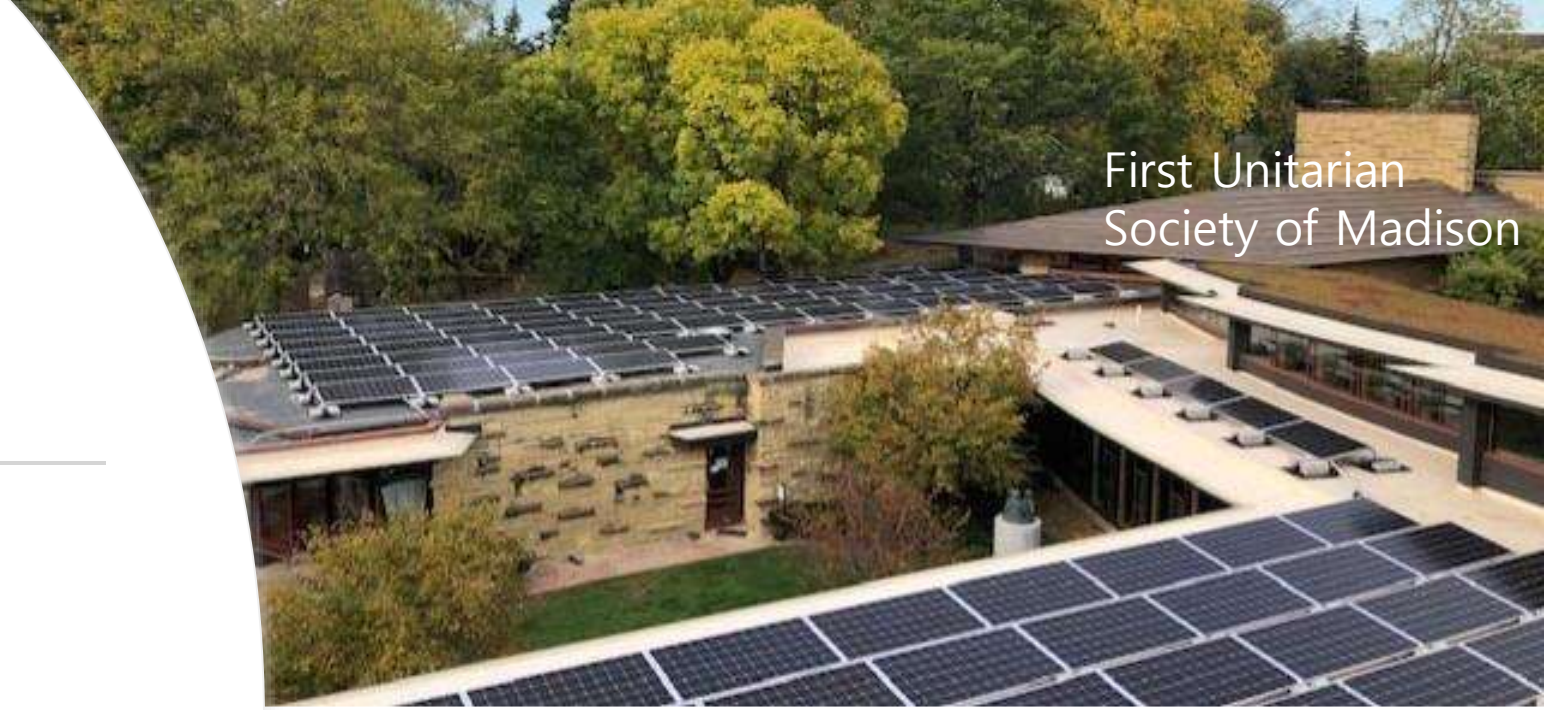
Find more resources and researches - Carbon Leadership Forum

UK Green Building Council – Net Zero Carbon Building: A Framework Definition

EC3 - Embodied Carbon in Construction Calculator

Beyond operational energy…

At the business level, the ultimate goal is that all operations—including the supply chain and the product life-cycle—are net zero carbon, creating a **carbon-neutral business**


First Unitarian Society of Madison


Job Center

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Consider all your business' associated energy and carbon

Carbon Footprint :
Both direct (operational) and indirect (embodied) carbon emissions

Business Travel

Employee Commuting

Leased Assets

Fuel and Energy related activities

Waste generated in operation

Transportation and Distribution

Construction

Manufacture and Production

End-of-life treatment of products

Consider **ALL** your business' associated energy, from the construction of your building to employee commuting strategies, to be **carbon-neutral.**

Buildings generate carbon from construction to operation **throughout the whole lifecycle**

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Resources

To reach **beyond operational energy** used in buildings:

US Green Building Council - LEED Zero program

US Department of Energy - Net-Zero **Water** Building and Ideal Net-Zero **Water** Building

Endeavour Centre - What is Embodied Carbon in buildings? Watch this video.

Compare your FOOTPRINT - What is the Difference Between Scope 1, 2 and 3 Emissions?

Project Drawdown - Employee commuting strategies: Carpooling, Electric Bikes, Telepresence.. MORE!

Resources

Make your building **save even more energy and reduce more carbon**:

Project Drawdown - Install Green Roof and Cool Roof
Dane County Green Infrastructure White Paper

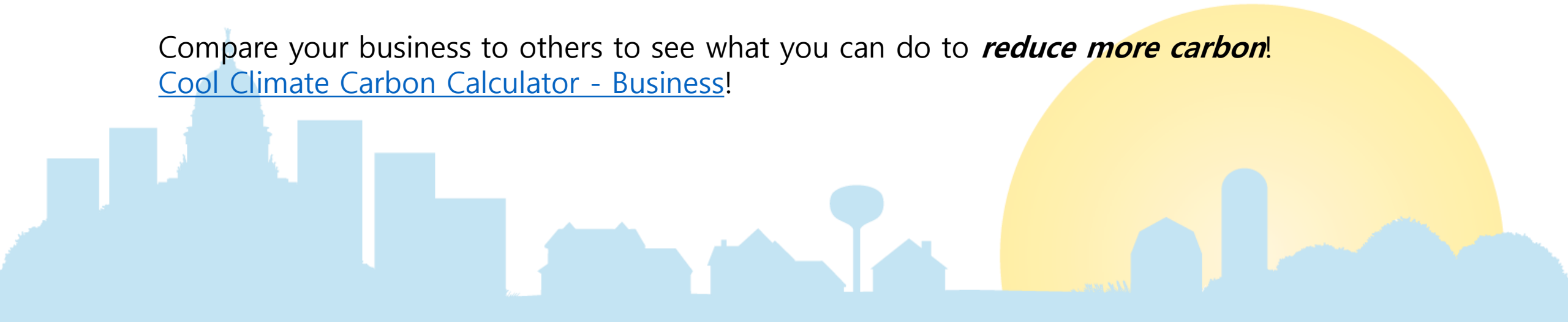
Project Drawdown - Building Automation System (BAS)

reTHINK WOOD - What are less carbon-intensive materials?

Project Drawdown - What is high-performance glass?

United States Department of Agriculture - Net-Zero Energy, Water, and Waste

Compare your business to others to see what you can do to ***reduce more carbon***!
Cool Climate Carbon Calculator - Business!



Contact us for more information

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DaneClimateAction.org

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