

Case Study Heartland Community College Net Zero Plan

September 2021

Heartland Community College is committed to sustainability and environmental stewardship. They have demonstrated this commitment by reducing their emissions through energy efficiency and renewable electricity generation. In the last decade, Heartland has made impressive reductions in emissions that have only been possible through the commitment of forward-thinking Board of Trustees, administrators and facility personnel. Their accomplishments include the installation of a 1.65MW wind turbine in 2012 and the installation of geothermal heat pump systems in several of their newer buildings. One of their new facilities received a net zero designation. Although they have much to be proud of, they knew that there was still plenty to do.

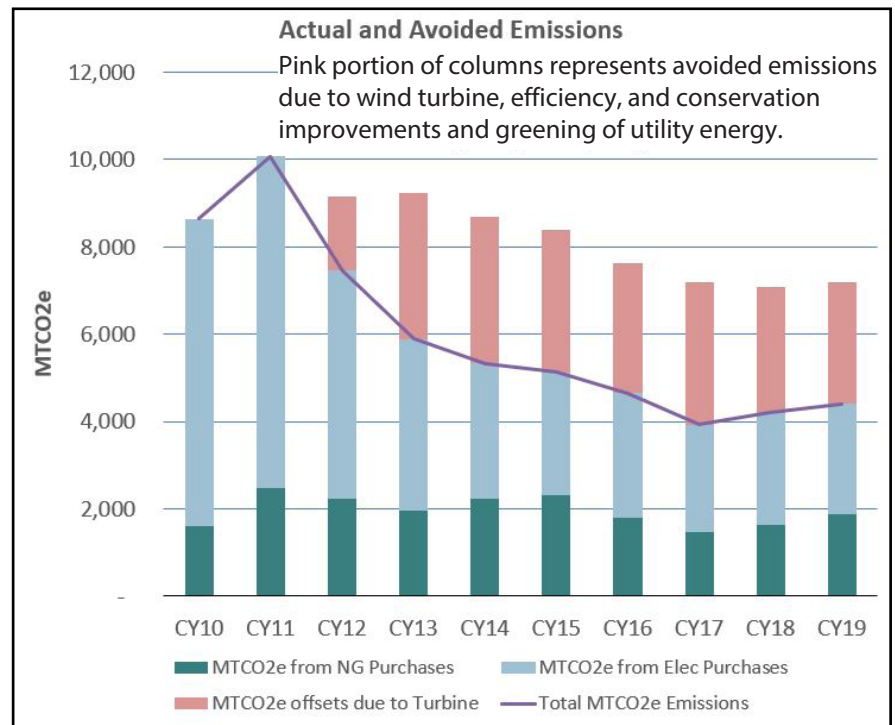
When the Illinois Green Economy Network (IGEN) announced that they were partnering with SEDAC to offer net zero planning services to community colleges, Mr. James Hubbard, Director of Facilities, jumped at the chance. He wanted SEDAC's help to chart a course to achieve net zero building emissions by 2050 or before.

Emissions Inventory

Mr. Hubbard provided SEDAC with a wealth of data about building energy usage over the past decade at Heartland. The figure to the right shows scope 1 emissions (natural gas) and scope 2 emissions (electricity) in their facilities; scope 3 emissions were not considered at this time.

Scope 2 emissions from electricity have declined significantly over the past decade, primarily due to the installation of the windmill in 2012, energy efficiency improvements, conservation and reductions in emissions from Ameren Illinois power production.

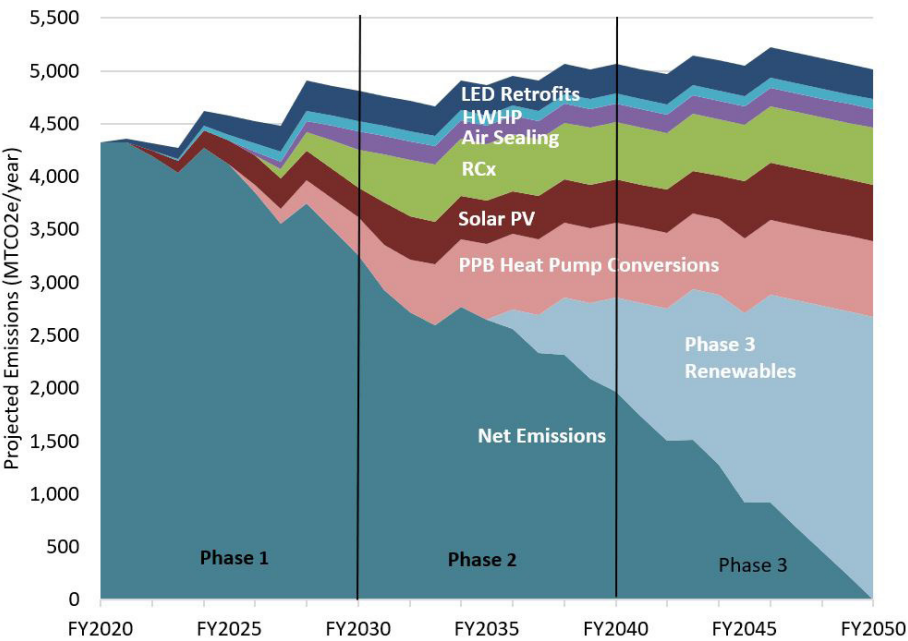
We used the most recent emissions (from 2019) as a baseline to chart a course to net zero by 2050.



Pathway to Net Zero

SEDAC used a “Conserve and Load” strategy to chart a course to net zero. First, we recommended reducing the overall energy use in the facilities through efficiency and conservation. Then, we identified ways to satisfy the much more manageable load with renewable energy resources.

SEDAC identified strategies to reduce building energy use by about 47%. To achieve net zero emissions, the college will need to convert its remaining natural gas systems such as boilers to electricity-powered systems such as heat pumps. Solar PV generation and renewable resources can then satisfy the remaining electrical load, as shown in the figure (left).



SEDAC outlined a timeline to reduce emissions in three phases, as shown in the table below. **Phase 1** focuses on low capital cost, easy-to-implement measures. **Phase 2** focuses on moderate capital cost projects and more complex measures. **Phase 3** focuses on additional college-related emissions from commuting, wastewater, food and more, and will require HCC to consider potential new policy directions.

“SEDAC’s ability to research items, your experience, and the professional report writing were all very useful. This was a good update to what we had done in the past. The next steps are to start implementing projects and developing those projects that are less defined.”
-James Hubbard, Director of Facilities

Phase 1: 2021-2030	Phase 2: 2031-2040	Phase 3: 2041-2050
1. LED retrofits		
2. HPWHs		
3. Envelope improvements		
4. Retrocommissioning		
5. Solar development		
6. Convert PPB to geothermal		
7. Vehicle charging stations		
	8. Electrify fleet vehicles	
	9. Planting trees	
	10. Waste & procurement reductions	
	11. Commuting improvements	
	12. Renewable energy procurement & offsets	

Who we are

The Smart Energy Design Assistance Center assists buildings and communities in achieving energy efficiency, saving money, improving indoor air quality, and becoming more sustainable. SEDAC is an applied research program at the University of Illinois at Urbana-Champaign. SEDAC services to save energy and money include quick advice, energy assessments, new construction design assistance, long-term climate action planning, and retro-commissioning.

