



Net Zero Collaborative

April 11, 2024



SEDAC

SMART ENERGY DESIGN ASSISTANCE CENTER

Who We Are

- We assist buildings and communities in achieving energy efficiency, saving money, and becoming more sustainable.
- We are an applied research program at University of Illinois.

Our goal: Reduce the energy footprint of Illinois and beyond.



SEDAC Net Zero Team

Program Manager



Ryan Siegel

Technical Support

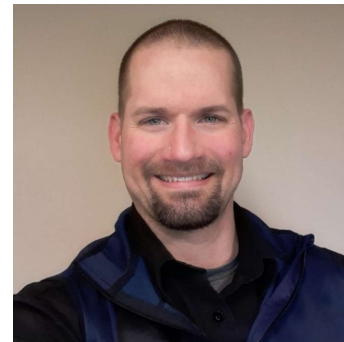


Todd Rusk

Outreach & Education



Stacy Gloss



Shawn Maurer



Robert Schlorff

Goal of Net Zero Collaborative

To help community colleges identify a **pathway to carbon neutrality** through

Collaboration, Technical Support & Education



Capital Planning for Moving your College toward Net Zero

Review - Capital process from concept to construction

Incorporate goals in scope description

Update estimates routinely

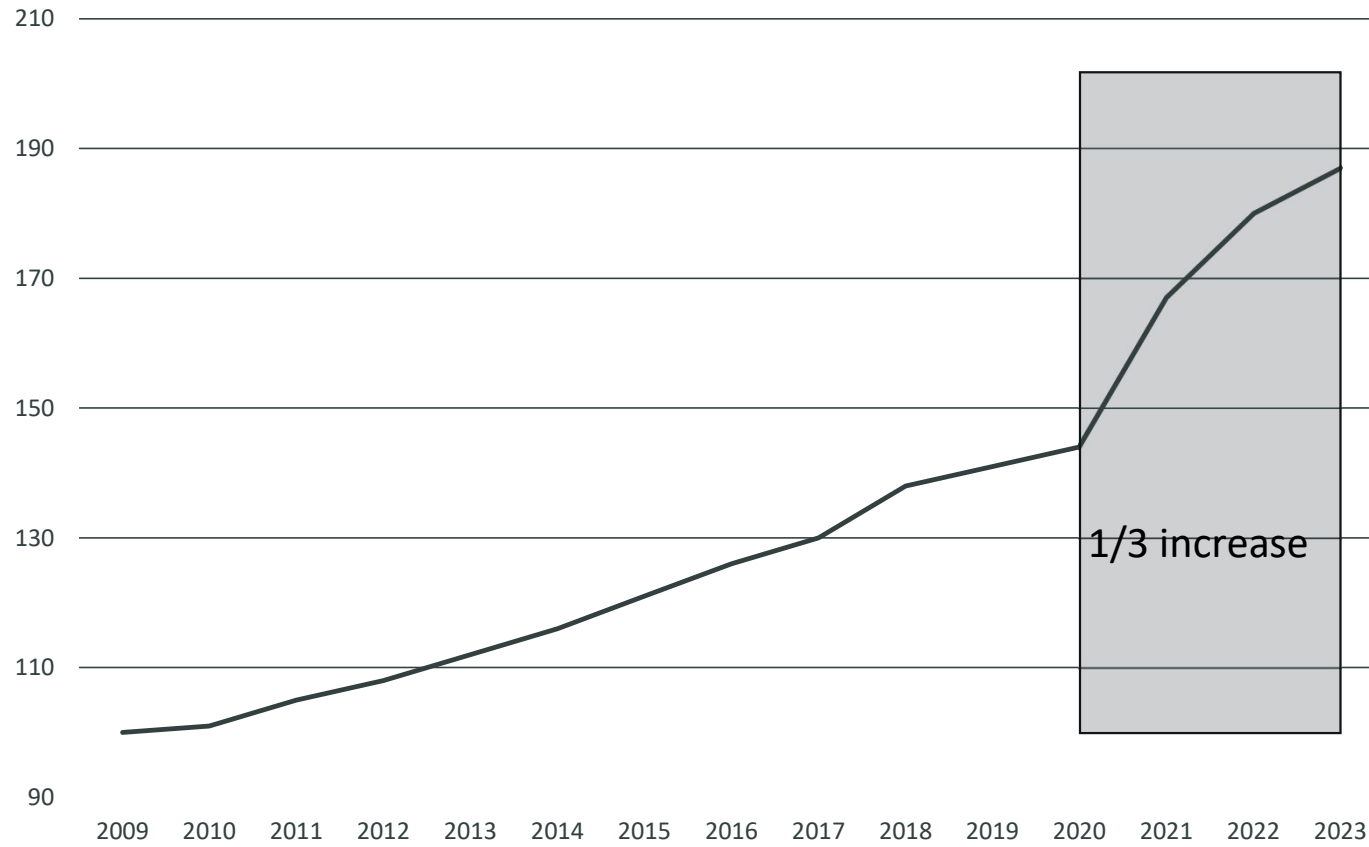
CDB Projects have stretch code as minimum starting July 1

Consider better than minimum for both local and state funded projects

Understand project team knowledge gaps

May impact options considered or lead to poor implementation

Chicago Construction Cost from Mortenson – 2009 = 100



Review - Capital process from concept to construction

Incorporate goals at all levels of design

Master plan, design criteria, project criteria

Adopt continuous improvement program for construction

Better designs can cost less than poor design

Start with a good envelope

Work top down

- Incorporate net zero goals into campus master plan & design culture
- Incorporate goals into A&E/Design guides
- Use good design first, then add renewables
- Use net zero ready construction
- Stack funding as feasible
- 2050 is nearly as close as 2000
- Verify heat pumps are Cold Climate design
- Include maintenance staff in design process

Incorporate goals into A&E/Design guides

- Campus A&E/Design guides set tone
- Include performance goals
 - Energy Code assumes EUI of 39 kbtu/sf for IL Schools

Incorporate net zero goals into campus master plan & design culture

- Consider renovation/repurposing over new construction
 - Reduce impact from resource extraction/disposal
 - Recognizing shifted expectations
- Incorporate renewable energy locations on plan
- Can have separate plan, reference in master plan

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BUILDINGS AND GROUNDS DESIGN SERVICES: APPROACH & PROCESS

1. Approach to the Design of Buildings and Grounds

Overview of the physical campus today and framework for future development of the campus to support the Harper College Mission.

2. Approach to Sustainability

Overview of Harper College's achievements in implementing sustainable design practices to date, current initiatives, and plans for reaching carbon neutrality in the future.

3. Process: Traditional Phases of Building Design Services: SD-DD-CD-Bidding-CA

Harper College expectations for the working process and deliverables provided by architects and engineers in the traditional phases of building design.

4. Process: Buildings and Grounds Assessments

Overview of current facility assessment practices at the campus, objectives for successful maintenance and operations and minimizing deferred maintenance.

5. Process: Master Planning and Master Plan Updating

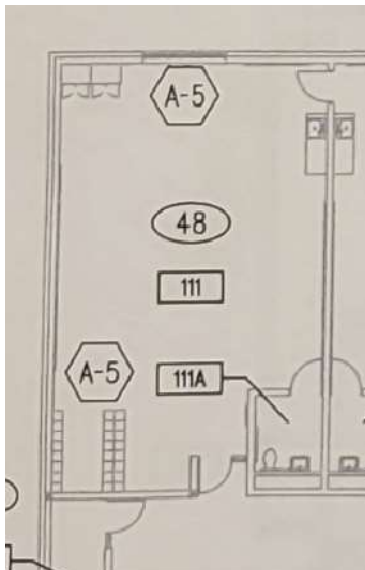
Description of the most recent campus master planning process and deliverables, and process for updating the master plan midway through each ten-year master plan cycle.

From Harper College
Master Plan



Tailor project specifics

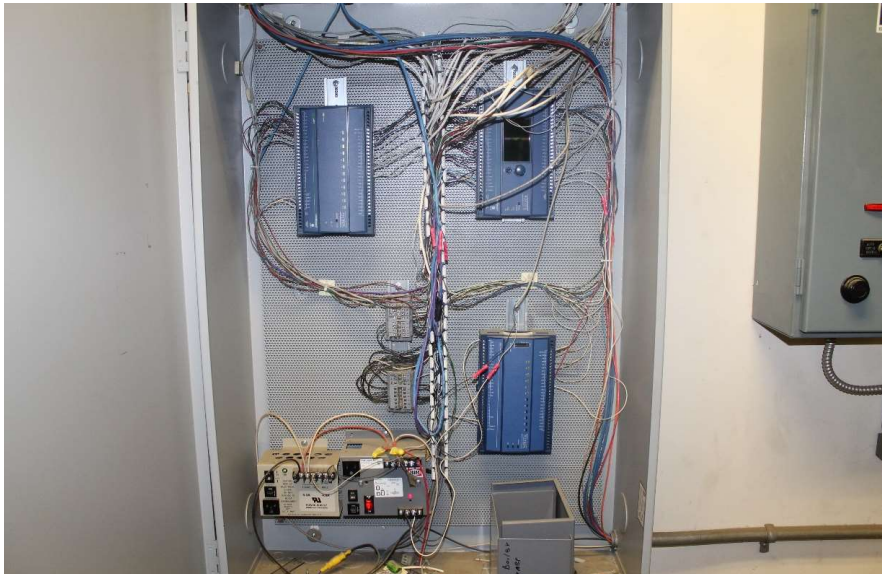
- Projects likely to have occupant loads different from standard assumptions
- List site specific requirements ie. building orientation, prohibited construction areas, protected pedestrian flow, etc



Kindergarten classroom
w/ 48 occupant load

Use good design first, then add renewables

- Good design reduces consumption and improves resiliency
- Passive solutions are more reliable
- Renewables can then provide for that consumption



Use net zero ready construction

- Net Zero often just adds renewables at the end
- Net Zero ready helps focus on reducing the need/provisions, then considering the renewables



Stack funding as feasible

- Many sources of funding:
 - State of Illinois (ICCB/CDB)
 - Local money
 - Grants (IGEN, Foundations)
 - Incentives/rebates (utilities)

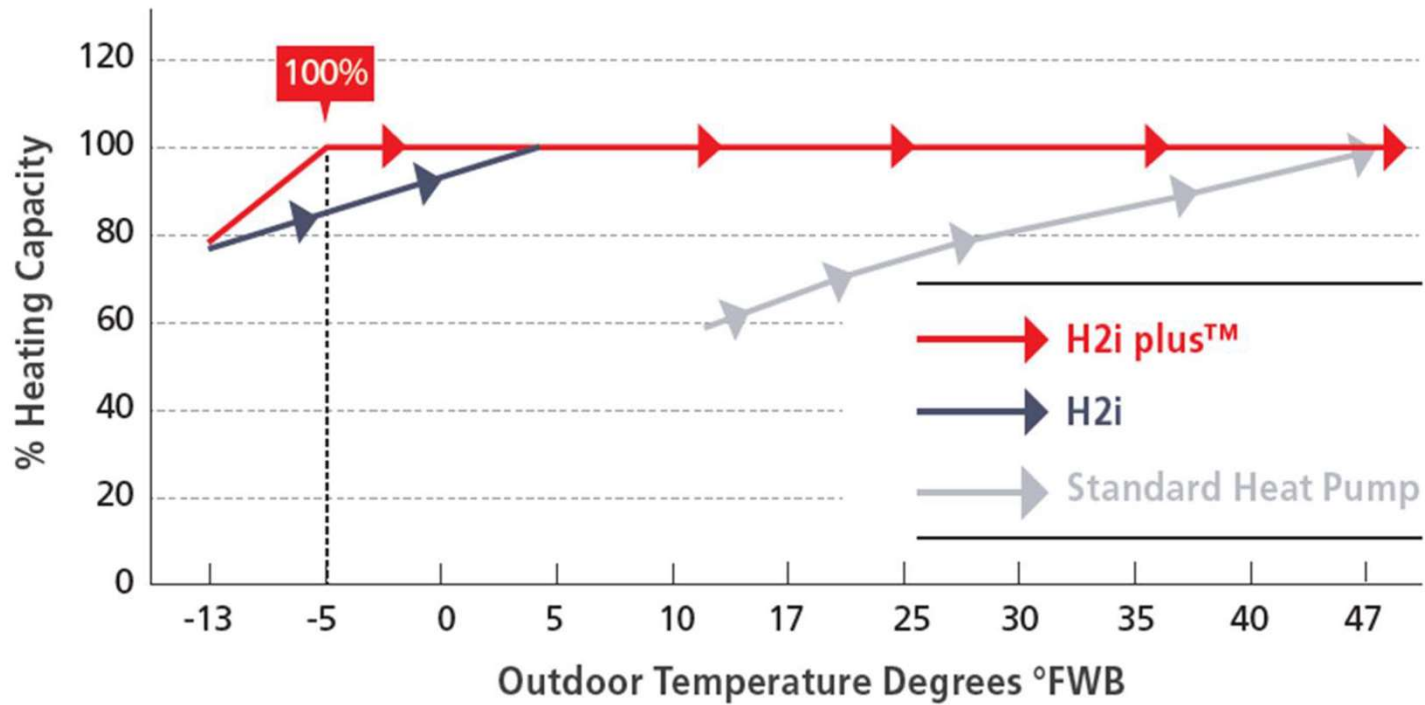
Verify heat pumps are Cold Climate design

- Have 100% heat capacity to 5F or colder
- Reduced capacity to -20F
- Size heating as supplemental/not backup



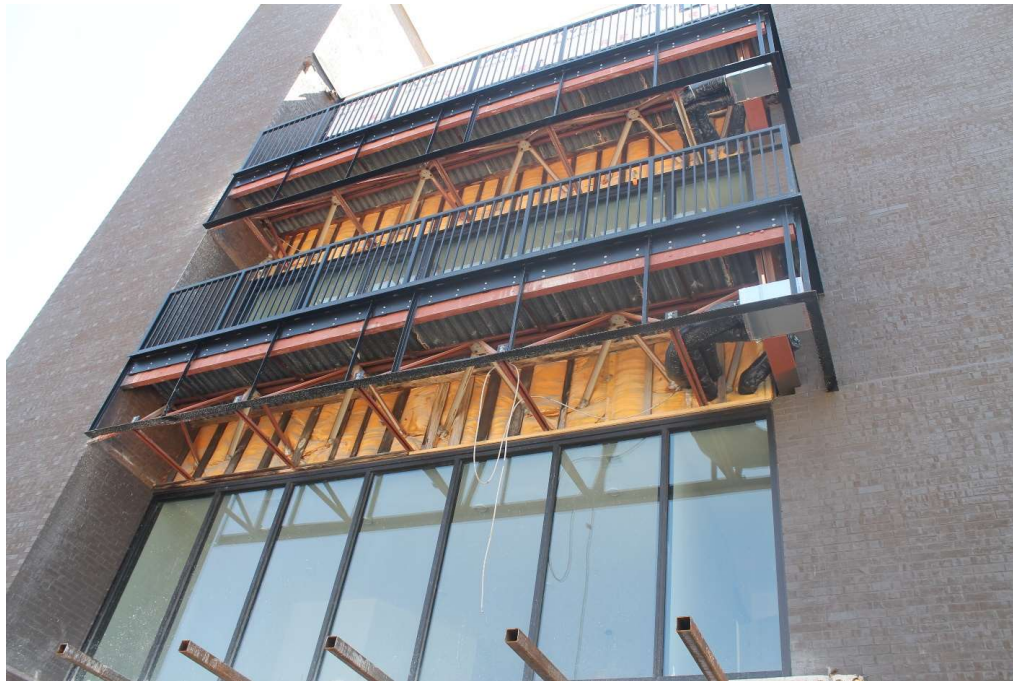
Verify heat pumps are Cold Climate design

Heating Capacity At Low Temperatures



Include maintenance staff in design process

- Building performance needs to be maintainable
- Can identify items that are difficult to maintain



Work outside in

- Start from a good envelope
- Minimize loads
- Determine accurate occupant loads
 - Minimizes ventilation requirement
- Separate and recover ventilation energy
- Then add renewables

Electrification Gone Wrong

- Heat Pumps with full electric backup +
- EV charging with no load sharing capability
- Appliances sized to all electric sizes despite being heat pumps

- Likely to lead to hiding issues and oversized services

Contact Us

Want to work with us? Need help with planning or implementation?

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Questions?

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