

# A Green Case Study from the University of North Carolina at Charlotte

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# A Green Case Study from the University of North Carolina at Charlotte

## Agenda:

UNC Charlotte Overview

LEED vs Green Globes Case Study

- Costs

- Credits and Technical Details

- Third Party Review

New Science Building

Why Use a Rating System

The University of North Carolina at Charlotte

# Clark Nexsen

## Sustainability Firm Awards

- 2015 ENR MidAtlantic Top Green Design Firms - #10
- 2015 ENR Southeast Top Green Firms - #10
- 2015 ENR National Top Green Design Firms - #45
- 2014 ENR MidAtlantic Top Green Design Firms - #13
- 2014 BD+C Top Green Building Architecture Firms - #28
- 2014 ENR National Top 100 Green Design Firms - #39

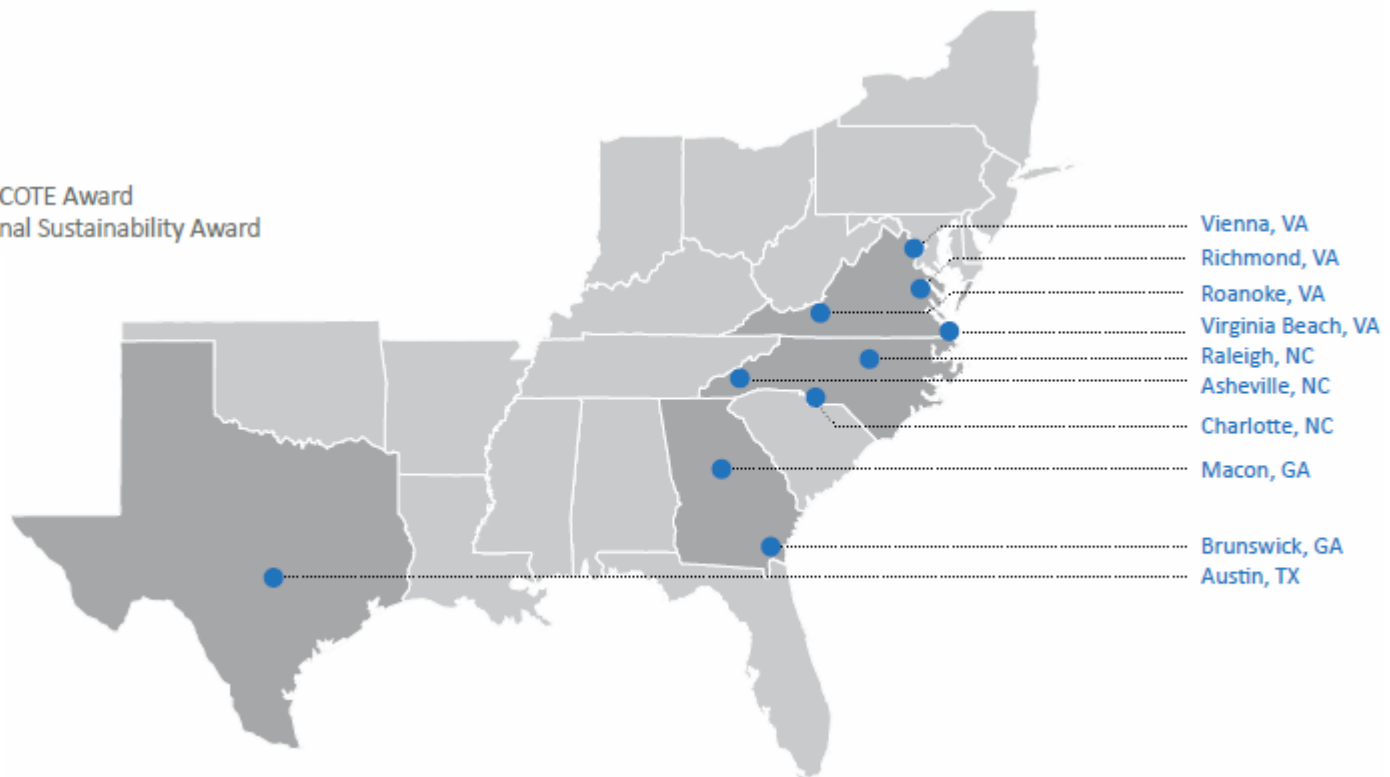
## 73 Total LEED certified projects

- 5 Platinum
- 19 Gold
- 28 Silver
- 21 Certified

## Design Awards

- 71 AIA Awards including 2016 AIA NC COTE Award
- 2015 Rethinking the Future International Sustainability Award

- Architecture and Engineering
- Founded in 1920
- 400 Employees
- 111 LEED AP, 10 GGP



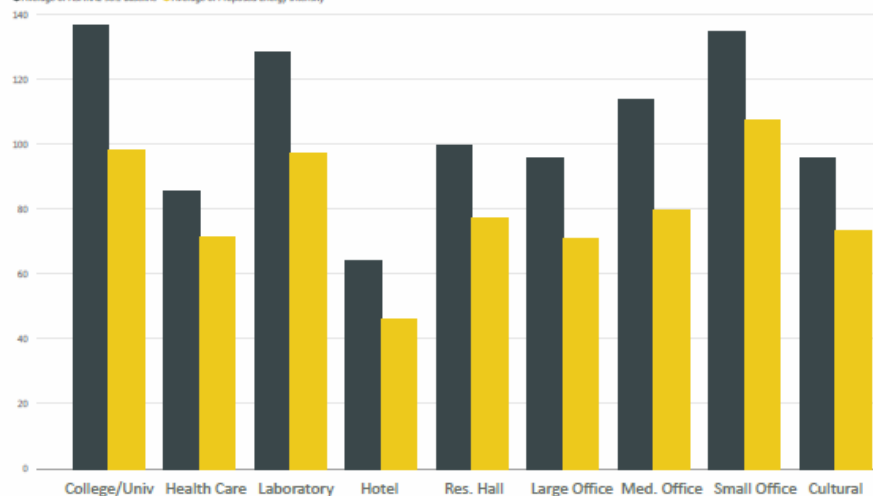
# Clark Nexsen

By signing on to the AIA 2030 Commitment, Clark Nexsen has joined the select list of firms that are measuring the energy performance of their buildings and working toward designing all new buildings and major renovations to be carbon neutral by the year 2030. The 2030 Commitment requires design teams to track the predicted Energy Use Intensity, “pEUI,” measured in kWhr/sf/yr. The 2030 Challenge has established a current goal to achieve energy performance of 70 percent better than the national average per building type, which requires design teams and building owners to work closely together and share performance priorities. Clark Nexsen is currently monitoring more than 50 projects over a cross section of building types. While the pEUI reduction is not reaching the 70 percent goal, the pEUI reductions are significantly less than the baseline across all building types.

Clark Nexsen Average pEUI for Building Types

Average of ASHRAE 90.1 Baseline and Average of Proposed Energy Intensity by Use Type 1

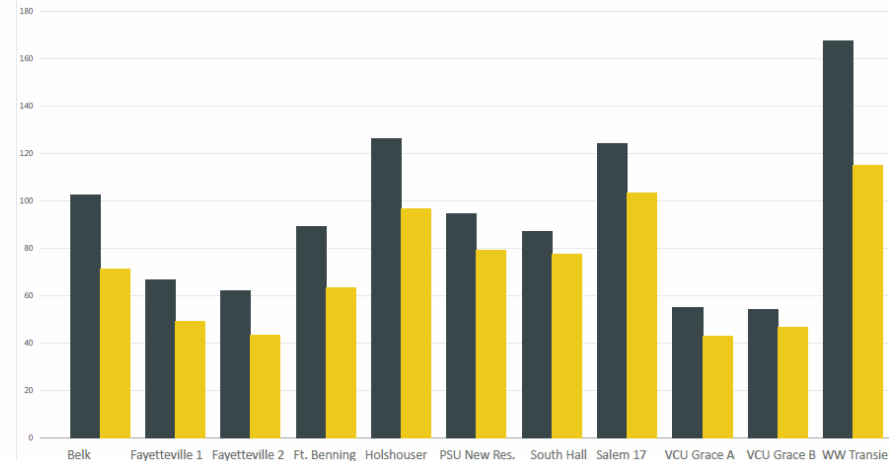
● Average of ASHRAE 90.1 Baseline ● Average of Proposed Energy Intensity



## pEUI RESIDENTIAL HOUSING ENERGY TRACKING

ASHRAE 90.1 Baseline and Proposed Energy Intensity by Project Name

● ASHRAE 90.1 Baseline ● Proposed Energy Intensity



# The University of North Carolina at Charlotte

- Originally founded 1946.

  - Moved to current location in 1961.

- 27,980 students; 22,700 undergraduates

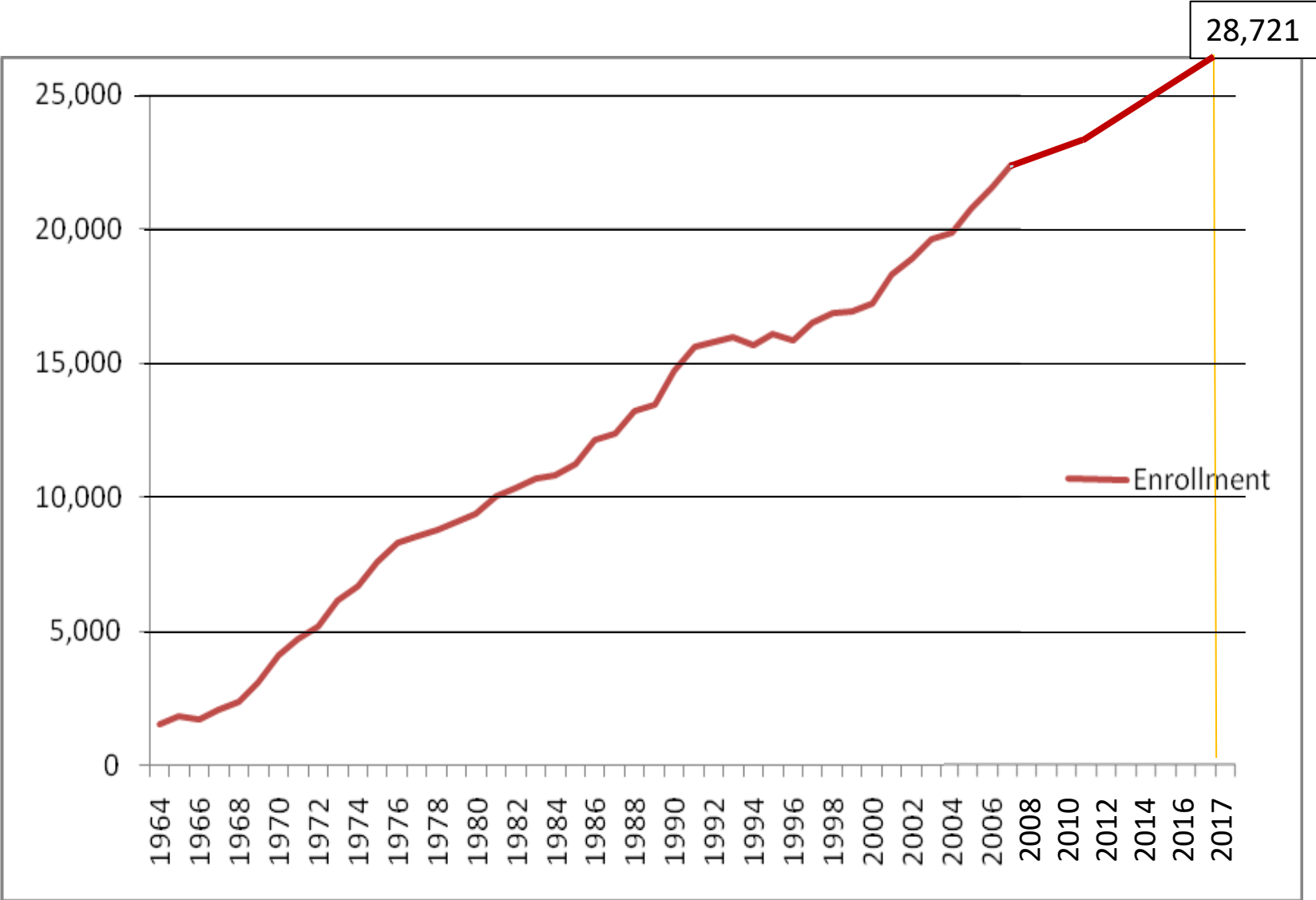
- 1,000+ faculty/3,200+ employees

- 78 Bachelor's, 61 Master's, and 21 Doctoral Programs

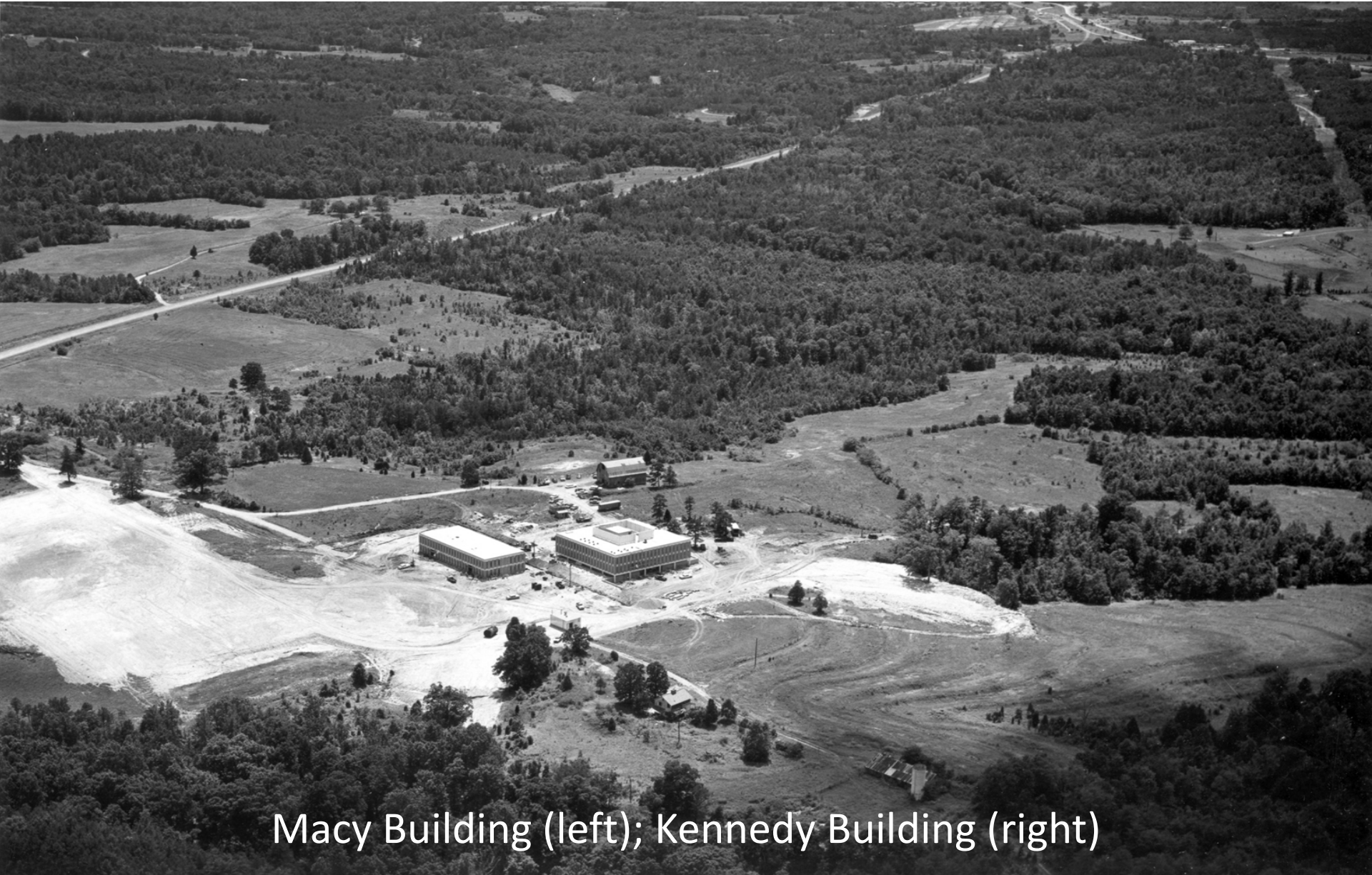
- 35% increase in enrollment in 10 years

- 46% of growth in UNC System in past 5 years

# Tremendous Student Growth 1964-2016



# UNC Charlotte 1961



Macy Building (left); Kennedy Building (right)

# UNC Charlotte Today



- \$1.1B in Capital Construction in the last 10 yrs

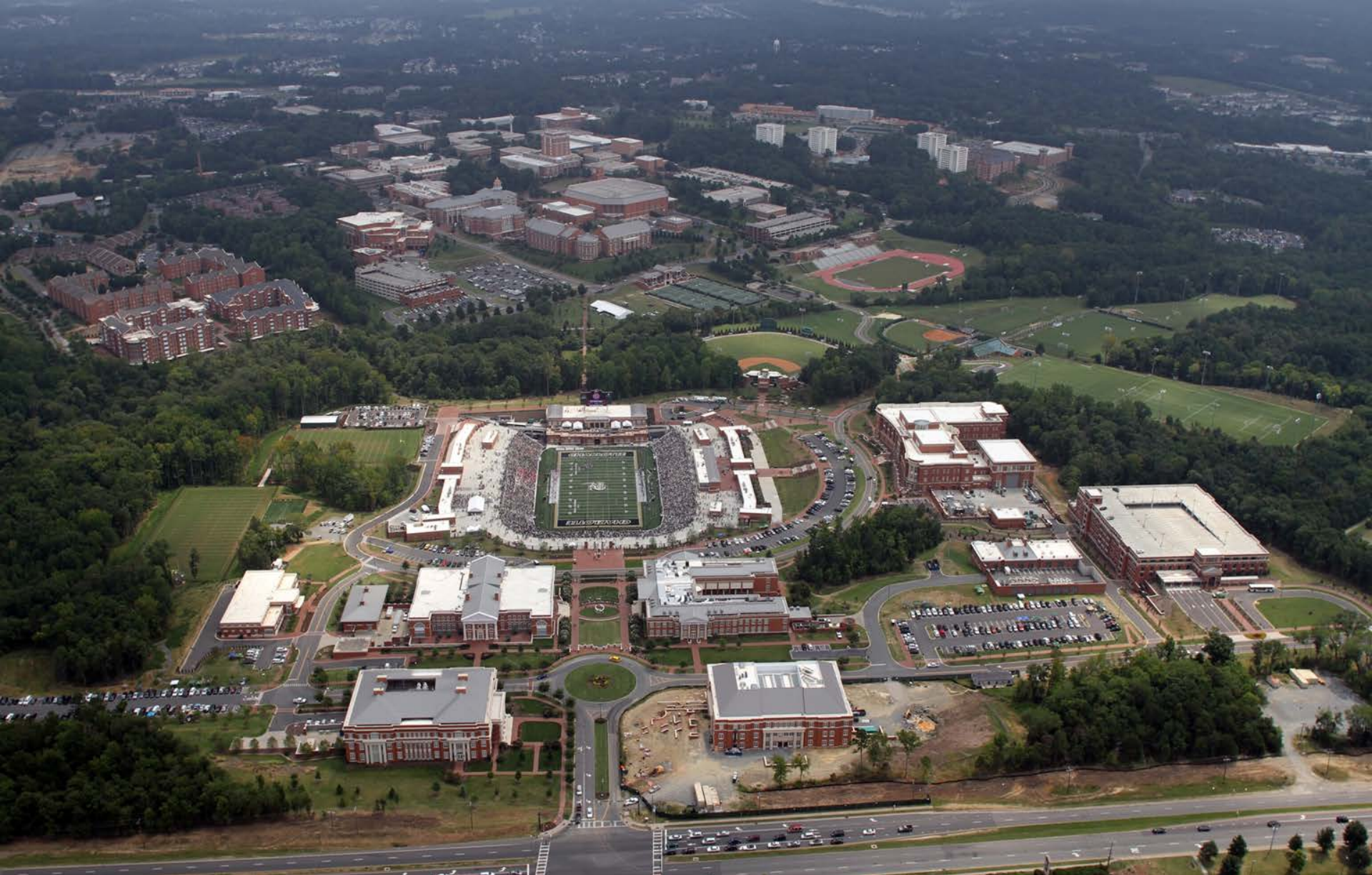


# Campus Master Plan 2010

## Building North Carolina's Urban Research University



# UNC Charlotte 2015



# Campus Master Plan Outcomes

- Build Out to 35,000 Students by 2020
- 20-24% Student Population Living on Campus
- Village Concept Embraced
- Pedestrian Development Embraced
- Housing Master Plan (HMP) initiated

# UNC Charlotte Housing Facilities

- 2.2 million SF of Housing  
(including Phase 14 opened in 2017)
- 6,250 Student Beds
- 30 Buildings (incl 13 in Greek Complex)
- Capital Replacement Value = \$450 million
- Average Age of Buildings = 22.5 years old
- Capital Construction from 2006 to 2015

# Housing Master Plan

- Commenced October 2007
- Concluded Summer 2008
- Studied local housing market
- Studied use of P3
- Conducted building assessment

# Housing Master Plan

Student Housing:

Proposed:

North Village (Suites & Apartments)

East Village (Apartments)

South Village (Traditional & Suite)



# Housing Master Plan



New Beds  
Suite Style: 1150  
Apt Style: + 1400  
**Total: 2550**

Beds Renovated  
High Rise: 1600  
Suite Style: 936  
Apt Style: 436  
**Total: 2972**



Beds Eliminated  
Phase III: 200  
Hunt Village: 222  
Martin Village: 312  
High-rise Renos: 400  
**Total: - 1134**



# Case Study: UNC Charlotte





# Case Study: UNC Charlotte

## Physical Comparison

### Phase IX (Miltimore)

- LEED Silver (33pts)
- Built in 2009
- 183,550 SF
- 144 units, 380 beds
- 12' Floor to Floor
- Curtainwall
- Centralized Laundry
- Structural Systems: Steel, CMU shafts
- Structural cost \$14.69 psf (economy)

### Phase X (Belk)

- 2 Green Globes (55%)
- Built in 2013
- 178,132 SF
- 121 units, 429 beds
- 11'-4" Floor to Floor
- Storefront
- Laundry room in each unit
- Structural Systems: Metal bearing walls, limited Steel, Shaft wall, CMU at stairs and Elevator
- Structural cost \$22.62 psf (economy)

\*Had to be \$2M cheaper than IX

### Same:

- 1" Continuous insulation +5 ½" batts
- Equipment- ERV, Elevators
- Low E glass
- 20% glazed wall area

## Green Globes for New Construction Certification of UNC Charlotte's Belk Hall

We announced today that the University of North Carolina-Charlotte's Belk Hall, a student housing facility for the college's upper division students, is the first building certified under the updated Green Globes for New Construction (NC) program. Belk Hall achieved 507 out of 918 available points for a score of 55 percent, which is equivalent to a [2 Green Globes](#) rating.

"An in-person review [by the Green Globes Assessor] of the actual building and systems is helpful in determining whether the strategies we described in our submittal have been implemented successfully," architect and project manager Tracy Randazzo, AIA, of [Clark Nexsen Architecture & Engineering](#), Charlotte, said. "We want the end product to be the best it can be."



The Belk Hall building project incorporated, in a very substantive manner, key criteria in the Green Globes NC Materials and Resources section, including current and cutting-edge materials performance criteria, with optional paths for a prescriptive approach dealing with a materials environmental characteristics. Besides earning the maximum credit in the life cycle assessment performance path for core and shell materials, Belk Hall's design team also developed a Building Life Service Plan, which sets the stage to optimize the entire building life cycle, ultimately assisting the building's future managers in maintaining and improving sustainability over time.

[See a full project profile here.](#)

For more information about this announcement or for other GBI news, please contact:  
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Issue: 02/23/2015

### Green Globes Rating System Strives for Gains in the Sustainability Game

02/19/2015

By [John Gregerson](#)

For University of North Carolina-Charlotte, the decision to construct Belk Hall—a 426-bed, 175,000-sq-ft student housing facility—in accordance with the Globes program marked a sea change in certification policy on campus.

The decision was a matter of math and increasingly arduous criteria promulgated by LEED, says Brian Kugler, UNC's senior project manager with facilities management. In comparison to Belk, Miltimore Hall, a housing facility UNC constructed in accordance with LEED, cost \$57,000 more to achieve certification, primarily due higher design fees, Kugler explains. "We had to convert all typical design documentation to a LEED-specified format," he says.

Globes, by comparison, allows users to submit in formats they desire. Also at issue were appeals to LEED decisions, each of which required a \$500 fee and a waiting period of weeks. "With Green Globes, we simply contact and discuss appeals with an assigned assessor, at no cost," says Kugler.

Globe proponents concur that ready access to assessors cuts through red tape while self-scoring lets users evaluate their efforts during any phase of a project. With LEED, UNC could only chart its progress generally and would over-design in expectation of losing points.

Some losses may be due to failure to meet criteria that don't apply to a project, says Yudelson. "If a criterion doesn't apply, we toss it," he says. "Rather than a baseline of 1,000 points, we may begin with a baseline of 987."

Yudelson believes a larger problem with LEED is its growing number of rating programs, making it difficult for industry members to remain abreast of them all. As a result, some firms seek out consultants, a potentially pricey proposition. "I received \$70,000 from my final LEED consultancy," says Yudelson.

Lehman believes cost disparities between the two programs depend on the experience and skill sets of a project's designer and builder. "Having managed 75 LEED-certified projects, I'm not going to experience difficulty getting up to speed," she says.

# Case Study: UNC Charlotte Certification Cost Comparison

## Phase IX – LEED v2.2

Construction GMP \$32,000,000

183,550 sf

\$1,500 Membership

\$900 Registration

\$6,880 Design Application

\$1,720 Construction Application

\$1,500 3 Appeals (25 days)

\$585 Plaque

\$13,085 Total LEED:

\$58,700 Design Fees

TOTAL COST ADD: \$71,785

## Phase X – Green Globes for New Construction

Construction GMP \$30,000,000

178,132 sf

\$1,000 GG Subscription

\$11,000 Stage 1&2 Assessment

\$1,500 Assessor Travel

-\$0-

-\$0-

\$945 Plaque

\$14,485 Total Green Globes

\$14,980 Design Fees

TOTAL COST ADD: \$29,425



# Case Study: UNC Charlotte

## Certification Cost

### Papadakis Integrated Sciences Building – Green Rating System Costs

Activity	Added Costs for Green Rating	
	Green Globes	LEED
Certification fee	\$9,000	\$40,000*
Certification consultant	N/A	\$85,000
Energy modeling	\$26,000	
Custom energy analysis	\$3,000	
Design cost premium	\$70,000	
Construction cost premium	\$980,000	
Owner time for certification process	\$2,800	\$12,800
Enhanced commissioning	N/A	\$37,000
Plaque	\$785	\$660
<b>TOTAL</b>	<b>\$1,091,585</b>	<b>\$1,254,460</b>
<b>Premium</b>	<b>–</b>	<b>15%</b>

\*Estimated by study's author; pulled from LEED administration fees, which were not itemized. See article text for more discussion.

Source: "A Study of Comparative Sustainability Certification Costs"

# Case Study: UNC Charlotte

## Cost of Time

### Time Required for LEED Certification

Project Tasks for New Construction	Estimated Hours
Overall project management. Team meetings, ongoing support	60-100
LEED charrette	14-20
Design documents review	6-12
Construction documents review	6-12
Design strategy and technical sustainability support	20-40
Individual meetings with team members to review strategies, tasks and expectations of LEED	10-20
Coordination, review and completion of LEED design documentation	30-50
Coordination, review and completion of LEED construction documentation	25-35
Response to LEED documentation comments	8-25
Recognition / Close out	1
<b>TOTAL HOURS</b>	<b>180-315</b>

Source: BuildingGreen, Inc.

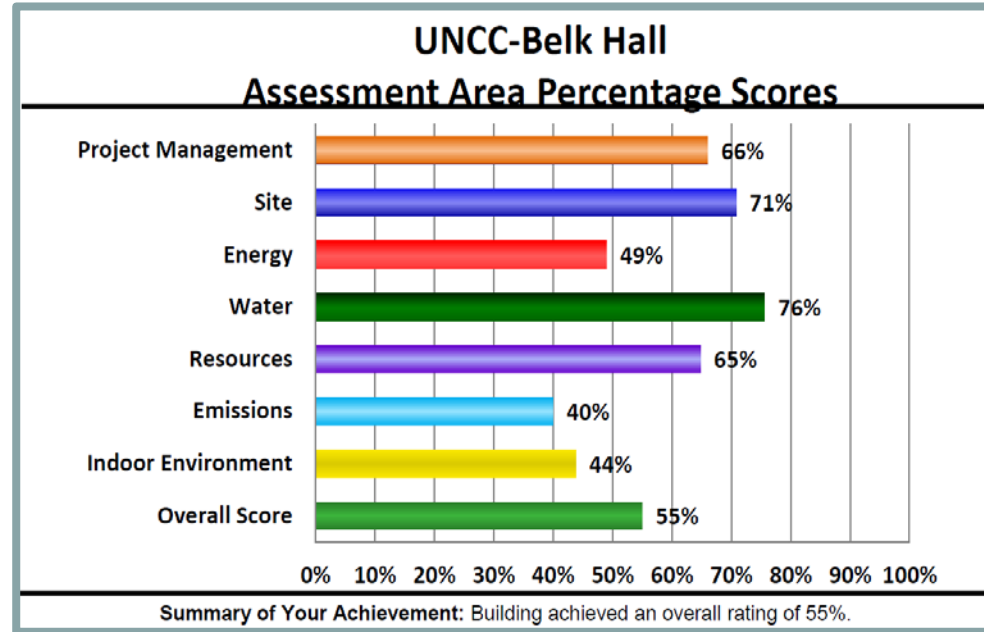

### Time Required for Green Globes Certification

Project Tasks for New Construction	Estimated Hours
Project management and client meetings	8-16
Gather and assemble data for the online questionnaire	6-10
Complete online evaluations	6-14
Prepare documentation package for the assessor for Stage I review	12-20
Prepare documentation package for the assessor for Stage II review	4-14
Plan and attend the Stage II onsite assessment	4-12
Post-assessment action items (review report and share results)	4-8
Recognition	1
<b>TOTAL HOURS</b>	<b>45-95</b>

Source: GBI

# Case Study: UNC Charlotte

## Credits and Details

### LEED-NC

#### LEED-NC Version 2.2 Registered Project Checklist - October 2005

UNC Charlotte Housing IX  
Charlotte, NC

Yes Mayb No Updated: 3/29/2011

7	7	Sustainable Sites
2	3	Water Efficiency
4	3	Energy & Atmosphere
7	6	Materials & Resources
8	1 6	Indoor Environmental Quality
4	1 3	Innovation & Design Process
<b>32</b>	<b>2 28</b>	<b>Project Totals (pre-certification estimates)</b>

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points

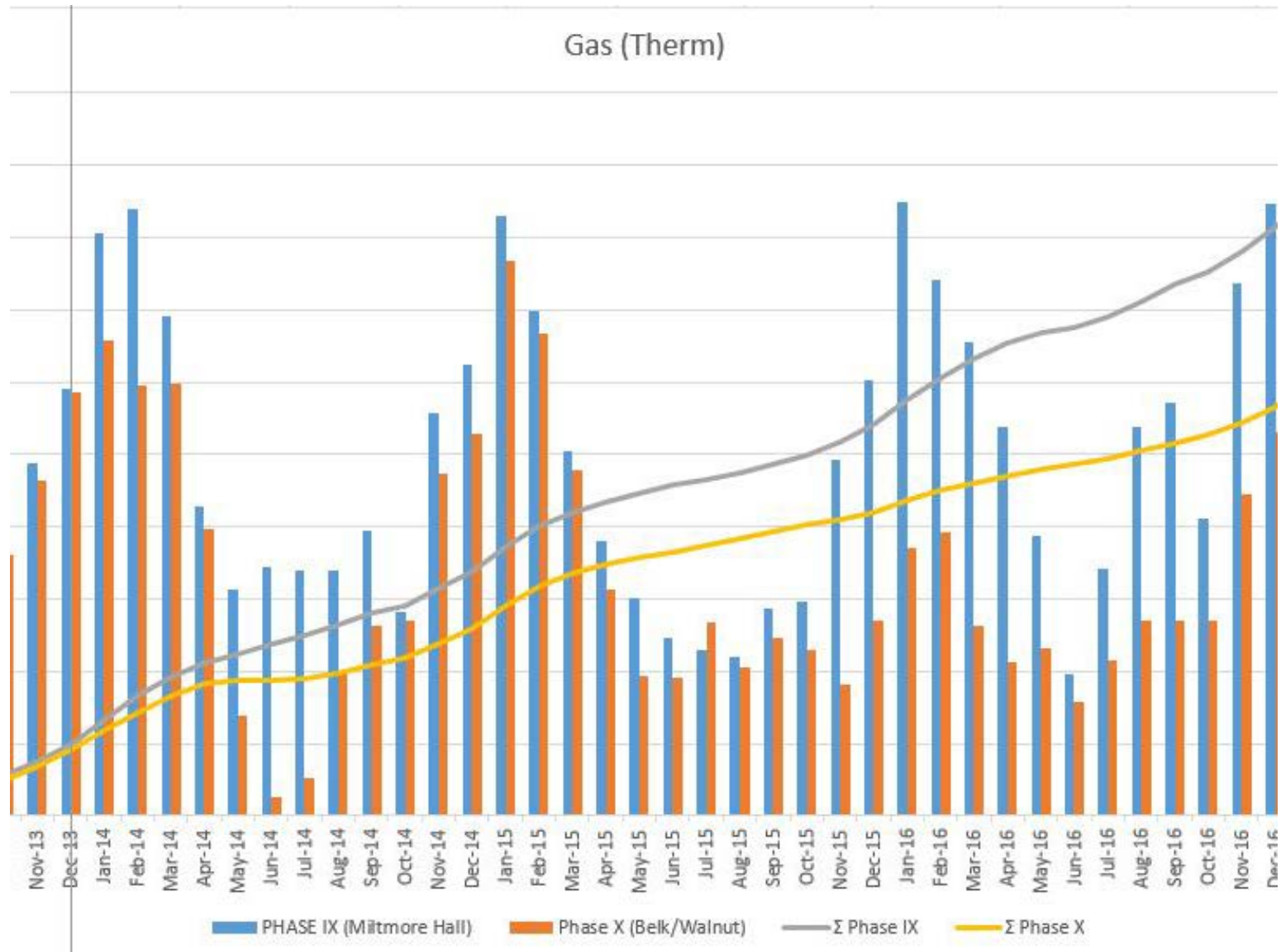
# Case Study: UNC Charlotte

## Performance measures



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## Performance measures

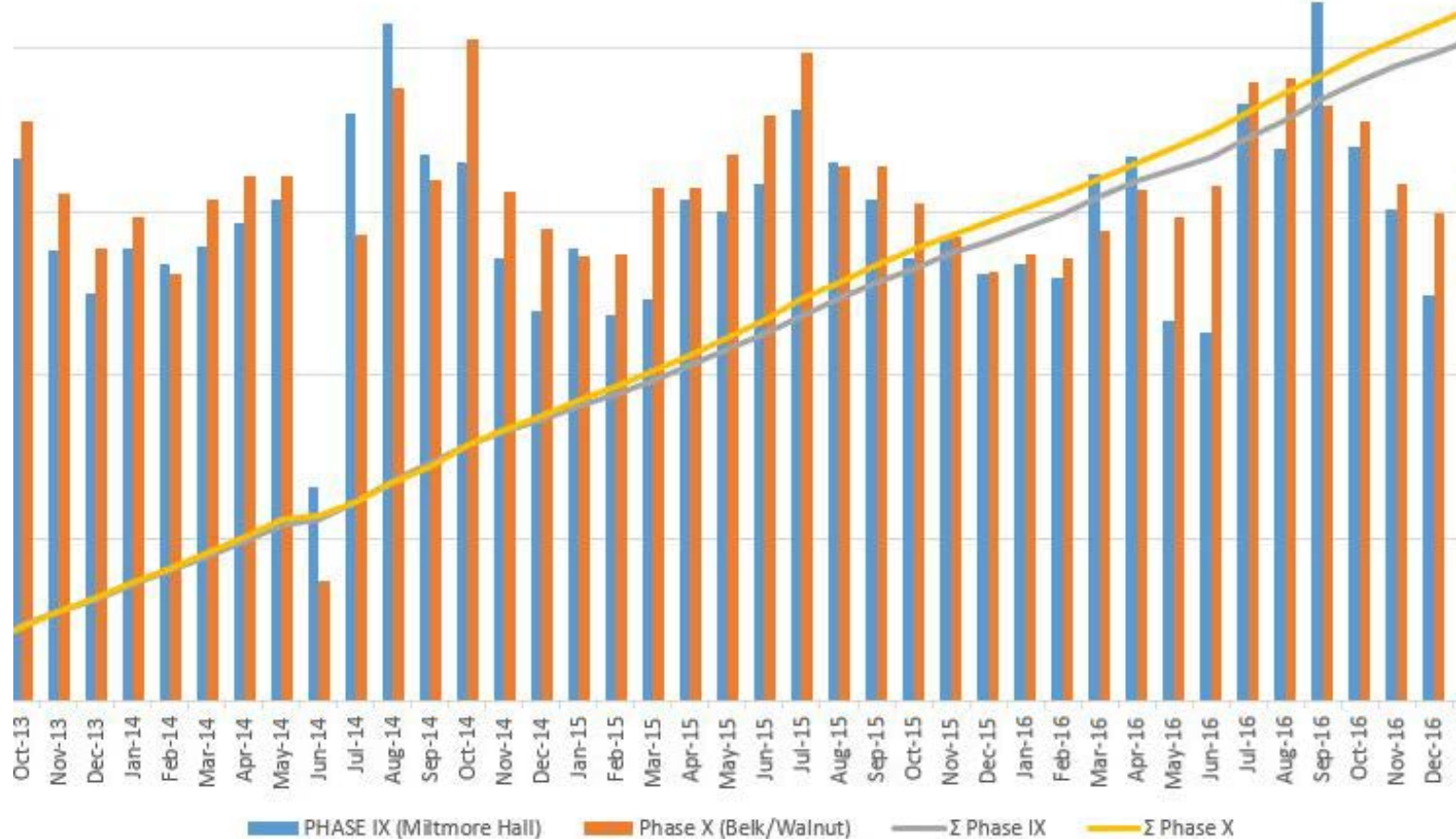




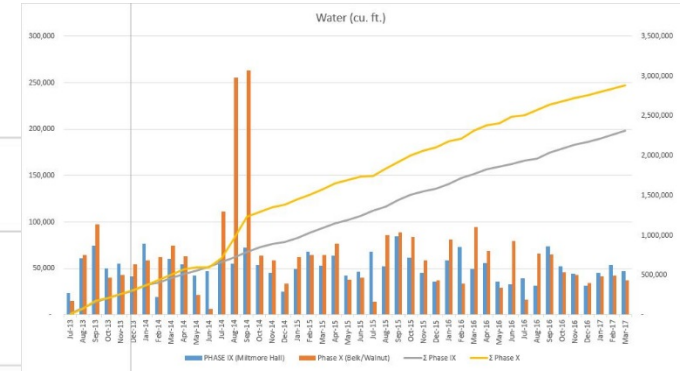
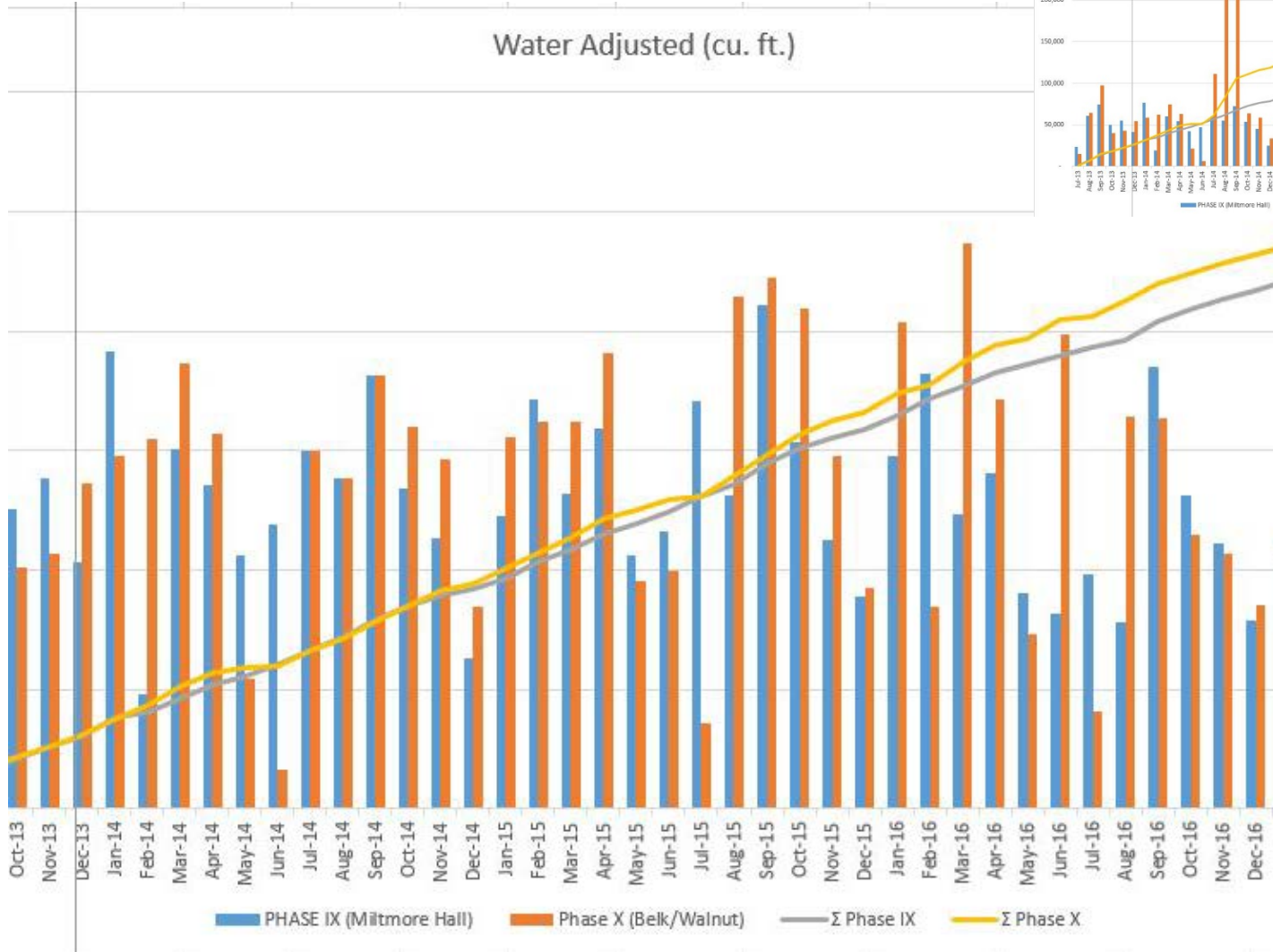
# Case Study: UNC Charlotte

## Performance measures

Power (kWh)

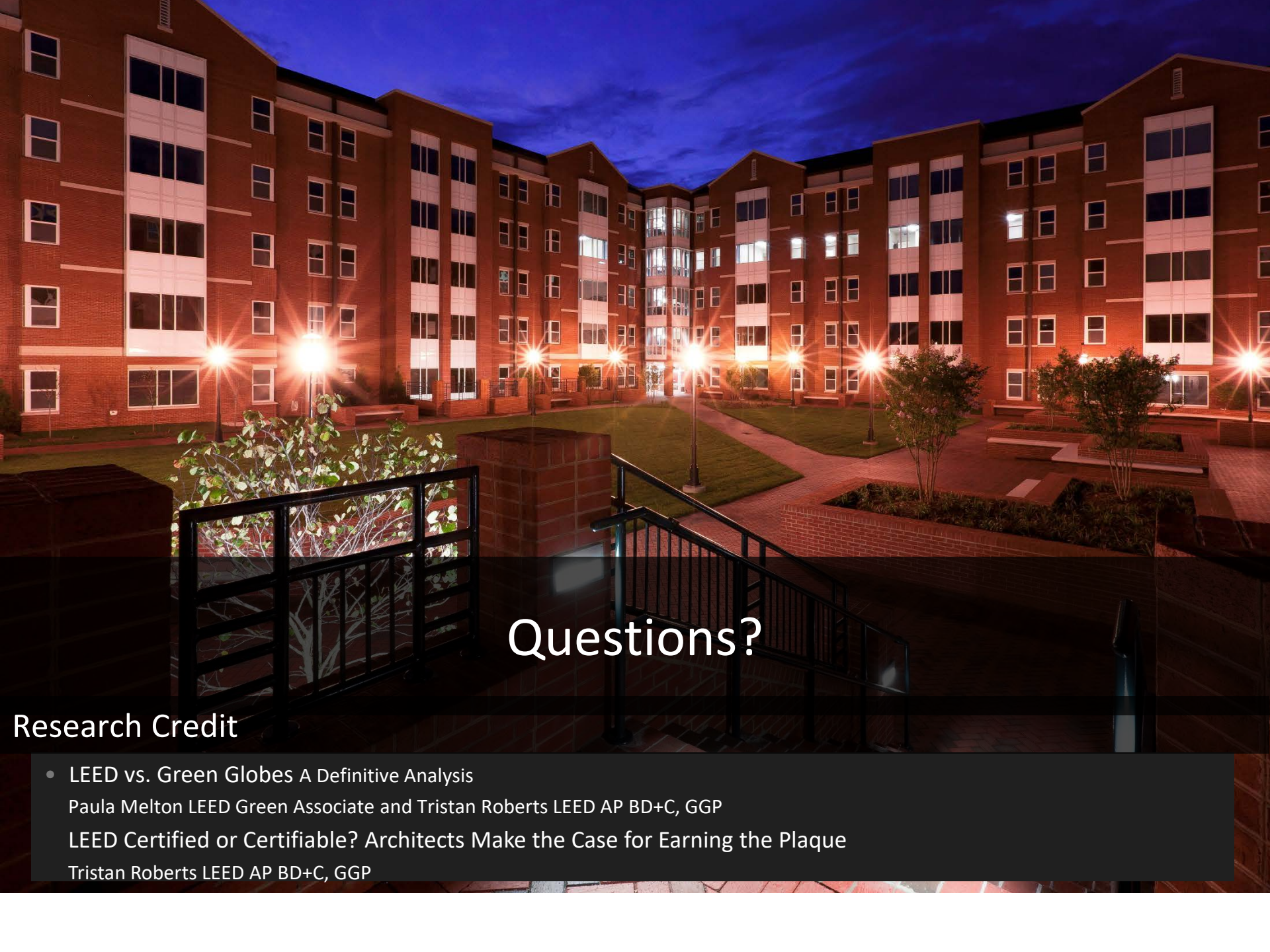


# Case Study: UNC Charlotte Performance measures



# UNC Charlotte Science





# Questions?

## Research Credit

- LEED vs. Green Globes A Definitive Analysis  
Paula Melton LEED Green Associate and Tristan Roberts LEED AP BD+C, GGP
- LEED Certified or Certifiable? Architects Make the Case for Earning the Plaque  
Tristan Roberts LEED AP BD+C, GGP

Thank You

