ULI Charlotte

A ROADMAP TO NET ZERO

FOR NEW COMMERCIAL BUILDINGS

Technical Assistance Panel (TAP) Report
Charlotte, NC | May 30-31, 2023

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Introduction

ULI – The Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 80 countries.

ULI conducts research; provides a forum for sharing of best practices; writes, edits and publishes books and reports; organizes and conducts educational meetings; directs outreach programs; and provides expert advice and technical assistance to cities and organizations on real estate and land use challenges.

More information is available at uli.org.

ULI Charlotte

ULI Charlotte is a District Council of the Urban Land Institute. The mission of ULI Charlotte is to complete the ULI experience at a local and regional level through education, research and the exchange of ideas and experiences.

Sponsor

With a grant from ULI Greenprint and the Net Zero Imperative, ULI Charlotte convened a group of ULI member experts to provide technical assistance. The ULI Net Zero Imperative (NZI) is a growing, collaborative network of ULI District and National Councils, including ULI staff, local governments, real estate leaders, and community stakeholder groups focused on decarbonizing cities and real estate.

Additional support was provided by Crescent Communities to move this initiative forward in Charlotte.

Technical Assistance Panel (TAP) Program

TAP Objective

The Technical Assistance Panel (TAP) program is offered by ULI Charlotte to provide objective and responsible advice on land-use planning, development and redevelopment issues to local municipalities and community-based nonprofits.

Program Description

The District Council TAP is a service offered as part of ULI's national Advisory Services program. Since 1947, the Advisory Services program has assisted communities by bringing together real estate, planning and development experts to provide unbiased, pragmatic advice for addressing complex land-use planning and development issues.

The ULI Charlotte TAP program provides similar services to local governments, private developers, community development corporations, and many other organizations. Once a project is designated for a TAP, ULI Charlotte assembles a panel of volunteers with expertise in areas necessary to focus on the sponsor's problem or issues.

Through TAPs, ULI Charlotte can evaluate a broad array of issues because of the diverse backgrounds of local ULI members. ULI members are real estate and land use professionals with expertise in land use policy and practice, including retail, office, industrial, residential, and mixed land uses in a multiplicity of urban forms.

TAPs generally focus on issues surrounding a particular site or topic that impacts a larger study area or jurisdiction. Panelists analyze community and neighborhood goals, consider land-use strategies in the context of preliminary feasibility analysis, and make recommendations for next steps.

The sponsor organization is responsible for gathering the background information necessary to understand the project and presenting it to the panel. TAP members typically spend a day and a half developing an understanding of the problem, generating recommendations, and presenting findings to the sponsoring organization.

Acknowledgements

Committee Chair

ULI Charlotte's TAP Committee is chaired by Jessica Rossi of Kimley-Horn. The committee is responsible for the marketing, review, and implementation of the Technical Assistance Panels. When a TAP is engaged, the committee selects volunteer members of ULI who most appropriately fit the engagement objectives and provide a wide variety of experiences.

TAP Panelists

Full biographical sketches are included in the appendix to this report. Panelists for this study were:

Panelists

Jeff Benavides Sustainability & Performance Officer *USGBC*	Local Energy & Government Policy
Chris Cayten Partner & Head of Strategy *CodeGreen Solutions*	Sustainable Real Estate Development & Operations
Emma Hughes Director, Climate & Energy *RE Tech Advisors*	Decarbonization Strategy, Climate Risk Management
Sara O'Mara Director, LEED/Environmental Services *Choate Construction*	Sustainable Construction
Jill Ziegler Senior Director, Sustainability *Brookfield Properties*	Environmental, Government & Social Strategy

Program Support/Management

Theresa Burnett Executive Director *ULI Charlotte*	Program Manager
Chris Perkes Senior Manager *The Urban Land Institute*	Greenprint + Net Zero Imperative
Kaushambi Shah	Contract Writer

Assignment Overview

Engagement

ULI Charlotte, Crescent Communities and the City of Charlotte applied for and received the Net Zero Imperative Grant from the ULI Foundation. Crescent Communities provided further support for the group to learn and collaborate through cohort discussions. The pre-planning team developed objectives for this TAP and its engaged panelists.

Project Scope

Charlotte seeks to become a low carbon city by reducing greenhouse gas emissions and creating a healthy, sustainable community. More than half of the community's greenhouse gas emissions comes from powering its buildings, while 23 percent comes from the commercial building sector. As climate-related goals grow more urgent, the green building community is setting its sights on zero. Charlotte wants to be at the forefront. According to the U.S. Green Building Council, a net zero carbon building is a highly efficient building that achieves a zero balance of carbon emissions during operations.

TAP Vision & Guiding Questions

The goal of this Technical Assistance Panel was to identify ways to encourage developers to create a net zero road map for new commercial development. The panel used city, state, federal and utility programs to provide examples of programs successfully implemented in other jurisdictions.
The following guiding questions were used.

1. What are some community resources and programs for implementation of net zero initiatives in commercial development?
2. What additional financial and/or regulatory incentives can be offered to achieve net zero implementation in commercial buildings?
3. What is the business case for net zero in commercial development, considering monetary and non-monetary benefits to development?

ULI Net Zero Imperative

ULI has continued to be a partner in decarbonization endeavors. The ULI Net Zero Imperative (NZI) is a multi-year initiative to accelerate decarbonization in the built environment. A significant aspect of ULI's work is to advance its net zero mission priority. The program is designed to help building owners, cities, and other relevant constituents reduce carbon emissions. The ULI Net Zero Imperative is a growing, collaborative network of District and National Councils, including ULI staff, local governments, real estate leaders, and community stakeholder groups.

ULI Net Zero Imperative – Program Overview

Given the climate need and the growing global mandate for zero carbon buildings, how can we accelerate market transformation toward a net zero built environment?

The Net Zero Imperative is an initiative from ULI headquarters that primarily consists of a funding opportunity for district and national councils to use the network to tap into and advance their progress toward achieving net zero. Below is a program overview:

ULI New Zero Imperative – Program Overview

Leveraging a 2-day technical assistance event in each city to help the public and private sector develop a "roadmap to decarbonization"

Running long-term on-the-ground campaigns in 5-8 global cities to accelerate decarbonization of the built environment

Building a global cohort who csn receive ongoing technical assistance to refine their on the ground campaigns, and work together to share best practices and lessons learned

Creating global resources (research, toolkits, and other tools) to help all ULI members accelerate decarbonization in their real estate operations (and in their cities)

Image: ULI Greenprint's Net Zero Imperative program overview

Why is this important?

Real estate has a responsibility and opportunity to address the climate crisis and reach net zero:

- For five years, nearly every country and more than 300 U.S. cities have made a commitment to achieve the Paris Climate targets; however, as of 2020, only a handful have made meaningful progress in developing climate action plans to accelerate decarbonization of the built environment. The built environment generates 40% of annual global CO2 emissions. Of those total emissions, building operations are responsible for 27% annually, while building and infrastructure materials and construction (typically referred to as embodied carbon) are responsible for an additional 13% annually.
- Cities, countries, investors, and tenants are looking to the building sector to meet comparable greenhouse gas reduction goals.
- Leading investors are including environmental social goals (ESG) in their real estate debt and equity considerations; leading tenants are including ESGs in their leasing decisions; and regulators are incorporating a path to net zero into their building codes and regulations for new and existing buildings.

Defining Net Zero

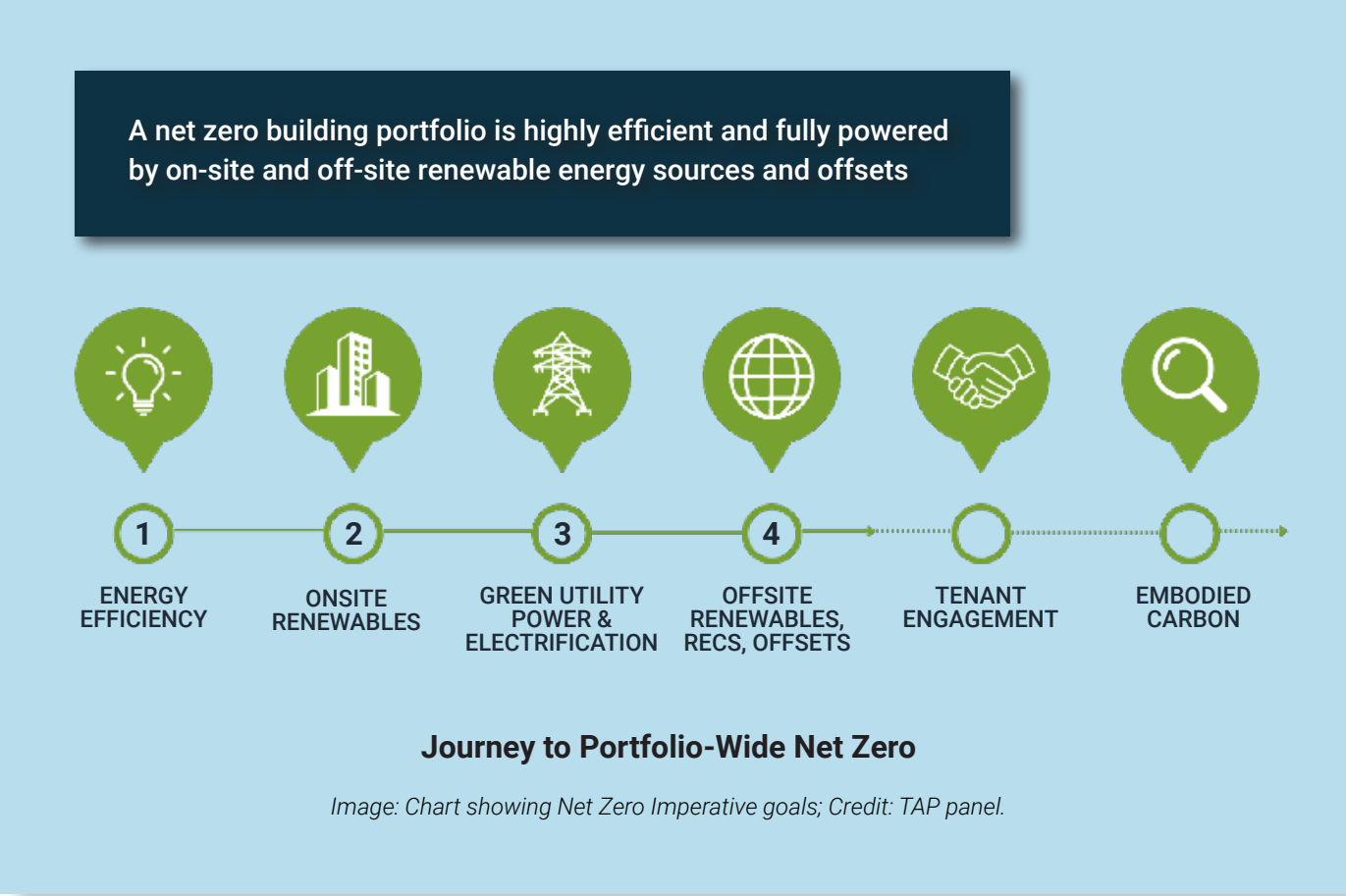

Image: Chart showing Net Zero Imperative goals; Credit: TAP panel.

Different cities all over the world have signed up for the Net Zero Imperative from ULI Pacific and ULI Europe. As seen in the chart below, Charlotte is a member of Cohort 2. The goal is to develop testing grounds for different ideas in the context of net zero so all members can find common threads, share best practices between cities, and join a global cohort.

NZI Cohort 1 & 2 Participants

15 participants accelerating the built enviornment to net zero across the globe

Cohort 1

- Austin
- Beijing
- Kansas City, MO
- Los Angeles
- Minneapolis
- San Jose, CA
- Shenzhen, China
- Toronto

Cohort 2

- Atlanta
- Berlin, Germany
- Charlotte, NC
- Chicago
- Hong Kong
- Minneapolis
- Monterrey, Mexico

Long Term Goals

1. Accelerate the decarbonization of the built environment in cities.
2. Chart a cost-effective path to zero for the real estate industry.
3. Leverage the power of ULI's global network to drive development and investment that supports this path to decarbonization.
4. Get the private sector working with cities on policy and incentives to help accelerate investment in decarbonization.
5. Develop case studies and tools based on global best practices highlighting cost- effective strategies across geographies, asset classes, and building types.

The TAP Process

Pre-planning

ULI Charlotte, Crescent Communities and the City of Charlotte applied for and received the Net Zero Imperative Grant from the ULI Foundation. Crescent Communities provided further support for the group to learn and collaborate through cohort discussions. The pre-planning team developed objectives for this TAP and its engaged panelists.

Technical Assistance Panel (TAP)

Through the TAP process, the panel met in a workshop setting May 30-31, 2023. During the workshop, panelists studied and discussed information provided in the briefing book; the sponsor briefed the panel; the panel met with key stakeholders to hear a variety of perspectives, problems, and concerns; panelists debated the issues and framed recommendations; the panel presented recommendations on May 31, 2023; and a final written report will be available in late summer.

Image: Panel members and client at the TAP workshop; Credit: ULI Charlotte. As shown left to right: Sarah Hazel, City of Charlotte; Chris Perkes, ULI; Chris Cayten, CodeGreen Solutions; Theresa Burnett, ULI Charlotte; Sara O'Mara, Choate Construction; Jill Ziegler, Brookfield Properties, Emma Hughes, RE Tech Advisors; Lisa Phocas, Crescent Communities; Jeff Benavides, USGBC; Aaron Tauber, City of Charlotte.

Image: Photo showing the stakeholders at the TAP workshop; Credit: ULI Charlotte.

Community Resources & Programs

Insights from Stakeholder Interviews – What We Heard

The first guiding question the panel addressed was what community resources and programs are available to implement net zero initiatives in commercial development. The panel learned from the stakeholders that resources pertaining to net zero buildings specific to Charlotte and North Carolina are severely lacking. Benchmarked energy data is not widely available and not immediately forthcoming from the utility. Access to data for comparing performance to other operational and/or net zero buildings would be beneficial.

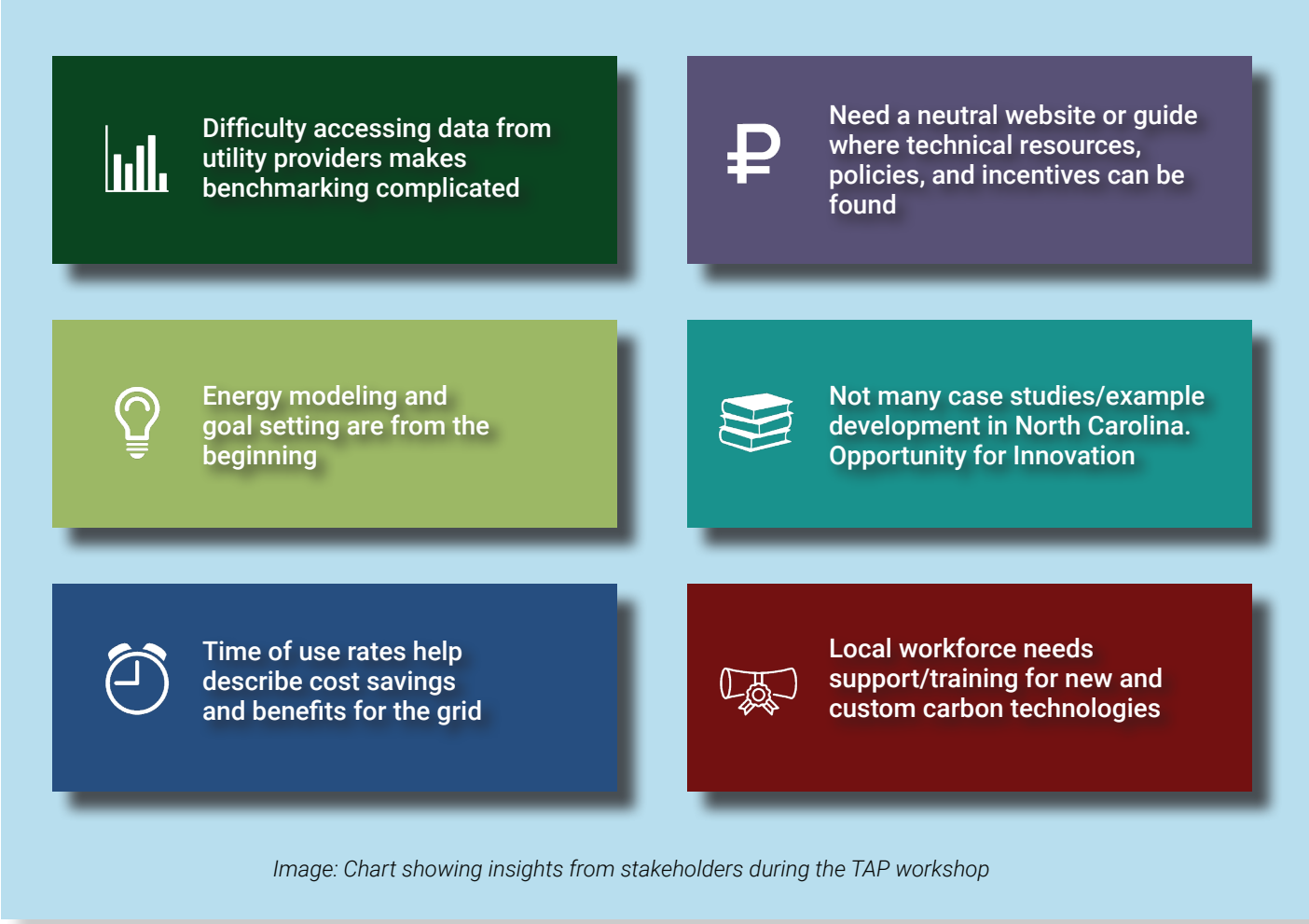

Image: Chart showing insights from stakeholders during the TAP workshop

The panel next heard from designers and technical experts supporting Crescent's River District Project. Energy modeling, goal setting, and iterative reviews are necessary for successful incorporation of sustainability features, according to the designers and experts. Early incorporation of net zero design guidelines and specifications helps mitigate engineering and construction costs.

The panel and stakeholders discussed time of use rates and how to highlight utility bill cost savings for developers and, eventually, building owners. One recommendation is that building operators manage peak energy demand at times of congestion or strain on the grid. The panel believes that the local utility can provide time of use rates upon request. The panel recommended incorporating a time of use rates energy model to inform design decisions relative to peak demand management; considering not only how much but when buildings consume energy as part of the design process will enable designers and owners to pursue utility cost savings while supporting the efficient and resilience operations of the larger electricity grid.

Resources pertaining to centralizing net zero design and construction in the City of Charlotte are insufficient, the panelists said, and the city has an opportunity to aggregate and centralize case studies, best practices, and policies to help developers find resources supporting net zero construction. The panel added that while examples of net zero in buildings in North Carolina are lacking, every challenge is an opportunity for innovation.

“Resources pertaining to centralizing net zero design and construction in the City of Charlotte are insufficient, the panelists said, and the city has an opportunity to aggregate and centralize case studies, best practices, and policies to help developers find resources supporting net zero construction.

Local workforce development and training to service, maintain, and operate higher performing buildings must consider social equity and underserved communities. Because few local companies can install and service solar, energy storage, controls, hybrid water heaters, heat pumps, and other unique components, many communities may hesitate to install equipment that cannot be serviced by local vendors or contractors.

The panel heard from the City of Charlotte and Chris Castro, Chief of Staff for the Office of State and Community Energy Programs at the U.S. Department of Energy. Among immediately available community resources and programs, two specific to Charlotte are:

1. **Trees Charlotte**, an initiative to plant more carbon sequestering resources in the form of trees.
2. **Power Down the Crown** (by the City of Charlotte), a newly launched voluntary energy benchmarking and reduction program for Charlotte businesses. The panel hopes that as this continues to expand and banks get involved, commercial and private owners and operators of real estate will increasingly participate, providing an opportunity for organizations to compare facility performance and trade best practices.

Other resources that are not Charlotte specific are:

1. **AIA Zero Code.** This code is used by the owner and design team when talking about setting project goals and having clear priorities. The schematic design phase is the time to get the gold standard or best practice in front of the design teams, and the MEP engineering team can help facilitate some of these more innovative discussions around high performance. The Zero Code comes with a technical

appendix on renewable energy that classifies and discusses the relative impacts of contract mechanisms for onsite or offsite renewable energy. This appendix is reportedly easy to follow for non-technical audiences. The panel emphasized this code as an important resource for addressing powering buildings with carbon free energy.

2. **DOE Zero Energy Building Resources Hub.** This is best for offices, schools, districts and beyond. It includes technical resources, tools, and a general compendium of useful information for high-performance buildings. It is a well-curated website and a starting place for anyone approaching this topic for the first time.
3. **GSA Sustainable Facilities Tool Net Zero Energy Guide.** This guide is available for public use and offers best practices for GSA's buildings. The resource provides information on how to design and operate those facilities.
4. **DOE Zero Energy Ready Home Toolkit.** The DOE Zero Energy Home program is a verification program for residential, and a starting point for residential developers and other stakeholders to learn the steps to take toward maximizing the efficiency of a single-family home or other types of residences.
5. **DOE Finance Navigator.** The Department of Energy has a financing navigator that is publicly available. The following diagram is an output of the free tool. It maps traditional loans, leases, and finance mechanisms, as well as nontraditional opportunities such as purchase agreements, energy as service agreements, etc.

In addition to a general map where you can see the landscape, one can click on any of the finance mechanisms in the chart will produce a pop-up webpage that dives deeper into the details. It clearly maps out with visuals the key stakeholders from the utility to the customer to the contractor. The panel emphasized the importance of this resource as a great starting place for alternative finance mechanisms.

- **DOE Financing Navigator:** explore and compare financing options for energy efficiency and renewable energy
- https://betterbuildingssolutioncenter.energy.gov/financing-navigator/explore

		OPTION 1	OPTION 2	OPTION 3
		DEBT OR LOAN	CAPITAL LEASE	ON-BILL FINANCING/ REPAYMENT (OBF/OBR)
		CONNECT WITH PROVIDERS >	CONNECT WITH PROVIDERS >	CONNECT WITH PROVIDERS >
BASIC ATTRIBUTES	Applicable Sectors	✓	✓	○
	Building Ownership	✓	✓	✓
	Typical Project Size	✓	✓	○
	Project Type	✓	✓	✓
CONTRACT STRUCTURE	Contract Complexity	✓	✓	✓
	Performance Risk	✗	✗	✗
TAX & BALANCE SHEET	Balance Sheet Treatment	✓	✓	✓
	Tax Deductions	✓	✓	✓
CONTRACT TERMS	Typical Duration	✓	✓	✓
	Typical Close Time	✓	✓	✓

✓ MATCH ○ PARTIAL MATCH ✗ NOT A MATCH

Image: Chart showing output of Department of Energy's (DOE) financial navigation tool.

Financial & Regulatory Incentives

What we heard from Stakeholders

The second guiding question the panel addressed was how to identify additional financial and/or regulatory incentives that can be offered to achieve net zero implementation in commercial buildings.

Panelists learned from the stakeholders that, although many resources on this topic are publicly available, design and development teams do not know where to look for them. Also, Charlotte is in a low-cost energy market, which does not provide developers and owners with a substantial financial incentive to reduce energy.

Below is a list of concerns the stakeholders emphasized during discussions with the panel:

1. **Local energy codes/policies are state regulated.** Global energy codes and policies exist, but there is a conflict with state issues. Moreover, the local government is limited by state legislation to make building codes greener or stricter to meet local goals.
2. **Many monetary/non-monetary incentives and rebates for single family residential.** There are monetary and non-monetary incentives in the market targeting single family residential homeowners. According to the panel, these would be beneficial for those developing and building single family homes or small-scale multifamily buildings.
3. **A playbook for net zero development and financial incentives would be helpful.** This resource would be beneficial to stakeholders as a reference point to start the process for simple questions such as where to start, who to contact at Duke Energy, or where to look on the DOE website, etc.
4. **No financial incentives for utilizing existing building stock.** According to the panel, not offering financial incentives for commercial developers and municipal bodies is a missed opportunity. Art incentives are offered, and financial incentives should also be considered.
5. **Green financing and green bonds could be helpful with upfront/first costs.** There is an opportunity for green financing or green bonds, though these finance mechanisms are relatively new to the market. There is an opportunity to educate developers about leveraging these financial mechanisms to advance sustainability and energy reductions in the next year of development, which can be particularly helpful in a project with first costs.
6. **Incentives and subsidies exist for natural gas equipment but not the inverse.** There are incentives to get access to natural gas, and connections to a gas line are available for free. However, such incentives do not exist for electric, and that poses a huge challenge. In the case of Duke Energy, which handles both gas and electric, the two departments do not seem to communicate; there is an opportunity greater collaboration between the different

“ **Charlotte is in a low-cost energy market, which does not provide developers and owners with a substantial financial incentive to reduce energy.**

departments at the utility as well as the electric and natural gas arms.

7. **Implementing a newer energy code can fast track building modernization.** According to the panel, better energy codes fast track the process of improving building performance. Local regional developers typically seek to meet the code requirements and not go beyond basic requirements, even though going beyond the code could result in additional benefits such as faster tenant leasing, reduced operating costs, and the ability to take advantage of incentives.
8. **A premium expedited permitting process would be largely impactful.** According to the panel, time is money with a development project. Any number of days, weeks or months gained is a huge benefit. A development team that can expedite permitting and approvals for high-performance construction can have a huge impact and be meaningful to the project, especially if the team is trying to get LEED certification or meet a certain energy goal.
9. **New buildings and retrofits are needed to tackle climate challenge.** While the panel is focused on commercial development, that is only one piece of the pie. Retrofitting existing buildings is important, especially for a mixed-use development or an infill that includes both renovation and new construction.

Financial & Regulatory Incentives

The panel elaborated on the financial and regulatory incentives available under Duke Energy, the Unified Development Ordinance, and the Inflation Reduction Act.

1. Duke Energy has some good resources such as its New Construction (NCEEDA) design and model assistance, which reviews designs and runs scenarios on good, better, and best alternatives to determine how much energy can be saved through each scenario.

   Moreover, the panel has first-hand experience as a developer, and Duke Energy is willing to offer custom incentives as well. While Duke Energy may not proactively offer these bespoke incentives, if a design team were to create an energy reduction package (example: 30% to 40% reduction over baseline), it could discuss that with Duke Energy and seek help.

   The panel thinks Duke Energy would be receptive to this type of engagement and willing to discuss and provide more services and options. This would be important to convey to future developers, so they approach Duke Energy and negotiate for more incentives and not get stuck with limited options.

2. In 2023, the City of Charlotte's Unified Development Ordinance has included definitions for high performance construction and a menu of available development bonuses in section 16.3. This includes new language and bonuses awarded for qualifying actions such as residential density bonuses, commercial and mixed-use height bonuses, reductions or exemptions for parking requirements, modifications to buffer and landscape requirements, additional open space, electric vehicle charging infrastructure, and various tiers of bonuses for projects earning third-party certifications including (LEED, Energy Star, NGBS, Green Globes). The Ordinance operates as a single document that includes all development-related regulations and may serve as a guide for sustainability goals for the built environment.

3. The Federal Inflation Reduction Act has myriad incentives and tax code changes that benefit real estate companies. Four in particular – Section 1/9D, Section 48, Section 30C, Section 451 – are relevant to real estate companies, developers, property owners and operators. Even though they apply to real estate and commercial real estate, some companies such as Crescent do not take advantage of incentives, because merchant developers sell their assets in 2-5 years and do not hold on to them long term. Such developers do not realize the benefits of structure incentives or receive lower returns.

   An important educational component related to this Act highlights various incentives available; however, not every type of developer can take advantage of them. One needs to work around those hurdles and explore alternative opportunities, e.g., expedited permitting from local city government.

Business Case

What we heard from stakeholders

- Business case is critical for real action
- Difficult to identify the Business Case in non-regulatory environment
- Plan early, integrate sustainability in design/engineering process
- Low-cost energy and utility environment
- Start with the building envelope to maximize energy efficiency
- Mutual benefits for developer and the grid for net zero, but difficult to understand responsibilities
- Brown discount = lower performing buildings will sell for a lower price in the future
- Insurance companies will be reviewing risk of investments and potentially stranded assets
- Health and wellness are a key marketability aspect of net zero

The third guiding question was the business case for net zero, sustainable buildings and new developments.

According to the panel, early goal setting and the business case is critical for real action. Moreover, in the current market and given conditions in a light regulatory environment, the only way a team can advance toward net zero is to really understand the business case. It is difficult to identify the business case in a non-regulatory scenario with punitive laws and rules. In the absence of rules that drive the market, the entire stakeholder team needs to be creative to

> **According to the panel, early goal setting and the business case is critical for real action.**

articulate the business case. This includes engagement with and contributions from the residents, buyers, policing agents, and all other involved parties. Furthermore, to maximize the business case, the panel advises teams to start planning early, integrating sustainability right away, ideally even before a site is selected. It is important to discuss site selection, property type, and asset type in the pre-design stage and to explore how all the pieces come together to meet net zero or sustainability goals.

In this low-cost energy and utility environment, the easiest way to make the business case is by having energy savings on the table as a value proposition. In the absence of that, the team will have to dig deeper and explore additional areas with great paybacks. The building envelope and insulation are big drivers for long-term value. Events such as hot or cold blackouts can impact building performance. Ultimately, the question is, how does one monetize, advertise, and talk about the value to drive the business case?

The panel emphasized the interplay between building owners and developers and the utilities in which they are building. Further discussion about mutual benefits may be required; for example, research to identify the mutual benefit of a lower energy building and how grid operations and infrastructure needs can benefit.

Several panelists discussed 'green buildings' vs. 'brown buildings' in various contexts of the ULI Charlotte TAP. 'Green buildings' are known for high performance and sustainability while 'brown buildings' are less efficient and have more costly capex requirements. Clear evidence or documented instances of green premiums or brown discounts in the Charlotte market are unknown. According to a recent article by Hines, one of the largest property owners in the world, 'green leases' command premium rents, and brown buildings offer reduced rents to compensate tenants. Many investors have stated a willingness to pay for green buildings (source: https://www.hines.com/news/the-green-premium-and-brown-discount). Related to the ULI TAP project, if the property owner intends to sell the property within the next 1 to 2 years, a brown discount or necessity of green certification may be less of a concern. The brown discount may take longer to impact the Charlotte market. The panel recommended trying to define the brown discount and develop metrics to track this over time.

The panel alluded to the physical risks, climate, and environmental stressors in the Charlotte area and how the risks will impact rates provided by insurance companies. There will likely be financial impacts in how the insurance industry addresses and values net zero sustainable buildings including those built more resilient and with higher standards than the North Carolina Building Code.

Regarding health and wellness, it is important to measure and quantify benefits in certain district areas and asset types such as residential buildings, i.e., non-energy benefits in efficient buildings. For example, research from Harvard's T.H. Chan School of Public Health has shown that improved indoor environmental air quality increases occupants' cognitive function, which has health and productivity impacts for building occupants; refer to the COGfx study for additional details.

Monetary Benefits

The panel broke down benefits into monetary and non-monetary benefits, emphasizing that the goal is to find these, maximize them and communicate this information in the market.

1. **Increase in property value** – The panel is seeing an increase in property values on net zero and green buildings in other jurisdictions and markets. Development teams need to

explore the markets to gather information from other jurisdictions, where they may have been successful in increasing property values for net zero and green buildings.

2. **Higher performance leads to higher cost premiums at sale** – It is difficult to determine if higher performing buildings are more beneficial in terms of lower energy costs, better health or more comfort. In addition to higher sale and lease rates, sustainable buildings could provide faster turnaround, resulting in shorter vacancy periods, which computes into real dollars.
3. **Investor approval and alignment with values-alignment investing/ESG/CSR** – The panelists said they see this a lot in the industry, depending on the joint venture partners and potential occupants. A broader push for environmental social governance or corporate social responsibility targets are not specifically about net zero, but a net zero building.
4. **Reduce energy costs** – The panel considers it important to look at future energy costs and estimates for Charlotte – in a potential scenario with massive new development, large new communities, and more people living, working, and putting strain on the grid. The local utility would have to build more infrastructure, deliver more power and, consequently, charge more to meet increased demand. Then reducing energy consumption and costs can be seen as a benefit.
5. **Reduce risk** – In the long-term, reducing energy costs has a benefit of reducing risk. If these benefits can be addressed, the risk of being stuck with an unsellable or unleasable building is lowered.

Non-monetary Benefits

According to the panel, some non-monetary benefits roll back into monetary benefits ultimately; however, these non-monetary benefits can provide a foundation for building the business case in an area without regulation and energy cost.

1. **Increased comfort, health and well-being for occupants** – In the absence of regulations and energy costs, teams will have to ask how they can build this business case. The answer might be to increase comfort and health for all. Buildings that are built better and better insulated make healthier and more comfortable spaces to occupy. In the summer when there are blackouts and brownouts with air-conditioned buildings, well-built and well-insulated buildings stay comfortable longer than a "leaky" building that sends out cold energy and cold air.
2. **Positive environmental impact, often regenerative** – Environmental impact is a benefit and there needs to be a grassroots process to educate the general population regarding theenvironmental benefits associated with a high-performing building.
3. **Reliable and affordable operations** – Passive systems and more efficient buildings can enhance reliability in case of energy service disruptions or mechanical equipment break-down by providing more time to maintain a comfortable indoor environment.
4. **Improved energy security and resilience** – The greater a building's ability to run potentially off the grid or without energy, the more resilient the operations are for that property.
5. **Decreased risk of selling at a discounted value in future** – As investor, insurer, and buyer expectations continue to evolve, high-performing buildings with minimal environmental impact will be prioritized. Buildings constructed and operated at or near net zero performance will have decreased risk of selling at a reduced value.
6. **Developer awards and brand recognition for industry leadership** – Brand recognition may represent a significant non-monetary benefit.

Developers, contractors, and architects have many forums in which they can talk about their flagship net zero projects to demonstrate market leadership and enhance industry visibility. According to the panel, a development team can construct a net zero building in Charlotte that could be highlighted on the ULI stage, ultimately gaining broader recognition that can be capitalized on.

7. **Employee engagement and retention** – Sustainable retail and commercial buildings allow employers to use the net zero status in their job postings to attract employees since the associated environmental and/or human health benefits from high-performing spaces would be desirable. Large multifamily properties and campuses that advertise as net zero or net zero waste are attractive as stewards of the environment. As mentioned above, Harvard T.H. Chan School of Public Health published a study in 2021 that quantifies the impacts of indoor air quality on cognitive function; this type of quantitative data can help developers articulate the value of high-performing building strategies, such as increased employee wellness and productivity resulting from adequately ventilated spaces.
8. **Community engagement and buy-in helps avoid construction delays** – According to the panel, developing a building that considers and is responsive to a community's needs can foster better buy-in from the community. Moreover, if other types of issues crop up, being engaged with the community can help during the resolution process.
9. **Opportunities for partnerships with leading design, architecture, MEP firms** – The design process begins by pulling together an amazing brain trust of skills that can help build more net zero buildings. A stellar team can garner attraction and attention, leading to partnership opportunities with like-minded firms in the design and construction industry.

Recommendations

Recommendations for a Developer

The panel made the following recommendations for developers, after understanding all the issues from stakeholders and brainstorming among themselves:

1. **Communicate full picture of scope and ambition for Duke Energy: e.g., "THIS is what we need and here are our goals – what can you offer?"**
   The panel advises the team to flip the script with Duke Energy. Instead of asking Duke Energy what it can offer, figure out the gaps and internal challenges for getting funding for the project, then go to the utility with a proposal. Basically, by telling Duke Energy where the money is needed, the development team can more effectively identify resources and potential new programs to enable achievement of project goals.
2. **Master meter buildings to capture all data and enable performance tracking of financing mechanisms.**
   According to the panel, one of the key asks is to have Duke Energy propose a master meter or an aggregating meter to capture all the data; the master meter could be either customer owned and installed by the developer or installed by Duke Energy. Either way, this would be an opportunity to capture and track performance over time.
3. **Share case studies highlighting successes and lessons learned.**
   The panel recommended sharing case studies of what is achieved with Duke Energy or with the city through outlets such as ULI and other organizations so other development teams can replicate and scale that.
4. **Pursue opportunities for public-private partnerships and knowledge-sharing with the city.**
   With the onset of rapidly changing technology and diverse funding/financing options for sustainable, resilient and net-zero developments, developers should approach the city with new information, methods, and proposals that support the City of Charlotte's Strategic Energy Action Plan and UDO. Developers are encouraged to contact the city with proposals for public-private partnerships in support of community-wide sustainability and resilience goals. For example: clean energy affordable housing, electric vehicle charging infrastructure, community outreach, building performance standards and stretch codes.

   In several jurisdictions with building performance standards, public-private partnerships in the form of "hubs" or "accelerators" have emerged that intend to provide industry with resources, technical assistance, rebates and incentives, and leadership recognition programs or awards to advance compliance with the standards and regulations. Examples include the Energize Denver Hub, the Building Innovation Hub in Washington, D.C., Building Exchange St. Louis, and Building Exchange Kansas. These programs are typically administrated by contractors and nonprofit organizations in coordination with city staff. While the city of Charlotte does not have building performance standards, developers, designers, and building owners could work with the city to advocate for and collaboratively develop a net zero accelerator hub that provides resources, training, and expert guidance to help building owners and industry professionals improve energy efficiency and reduce

carbon emissions from buildings.

5. **Explore opportunities to leverage green bonds, green banks, or energy efficiency investment funds (EEIF) to secure low-cost capital for clean energy projects including solar at favorable rates and terms to both traditional and otherwise challenging market segments.**
   For some developers, there seem to be challenges with long-term funding for, financing of, or paying for the first costs and then capital construction costs. As money is tight, it is important to understand the appetite for financing for some of these "upgraded amenities" or "upgraded features" that were not a part of the original budget.
   - **Green bank examples in US: CT, NY, CA, RI, Montgomery County, Hawaii. North Carolina Clean Energy Fund is a starting place.**
     Green bank markets in different states have grown significantly in recent years. North Carolina just opened its first green bank; while the focus appears to be low-income single-family homes and affordable housing, the panel thinks some additional financing for commercial development could be explored for the North Carolina Green Energy Fund.
   - **ICMA's Green Bond Principles provide best practices.**
     Green bonds are a type of bond instrument in which the proceeds or an equivalent amount are exclusively applied to finance or refinance, in part or in full, new and/or existing eligible green projects, including energy efficiency and renewable energy projects. The panel identified International Capital Market Association's (ACMA) Green Bond Principles as a best practice guide to issuing bonds serving social

New Charlotte UDO

The Charlotte Unified Development Ordinance (UDO) offers a number of incentives and new requirements that will help the City achieve its environmental goals:

- Development bonuses for implementing high performance construction in new facilities with the level of the bonus increasing with higher levels of green building certification. Development bonuses for exceeding the minimum required number of electric vehicle (EV) charging stations; multimodal mitigation points; transportation demand management mitigation points; and all required short-term bicycle spaces provided in secure, electronic lockers. See Table 16-1 for details of these bonuses.
- In Sec. 37.2, the UDO incentivizes efficient buildings and renewable energy generation when Exception District Zoning Map Amendments are requested by requiring applicants to include at least one action from at least two of the following categories: 1) sustainability; 2) public amenity; and 3) city improvement. Selected actions cannot count toward both these requirements and development bonuses, if applicable. Included in the eligible sustainability actions are the use of sustainable design and architecture standards, on-site renewable energy generation, and other non-specified actions may be allowed during review.
- Sec. 19.3 provides the minimum number of EV charging stations required for multi-family stacked dwellings, the residential component of mixed-use developments, hotels, and when parking lots or parking structures are the primary use. See Table 19-2 for specific requirements.
- Sec. 19.4 provides for required bicycle parking spaces. See Table 19-3 for specific requirements.
- Article 20 provides for landscaping and tree canopy, including minimum landscaping requirements and tree protection, including Tree Save Standards (Sec. 20.15(E)), to ensure the city's tree canopy remains intact. Included in this Article are incentives for preserving specimen or heritage trees and existing canopy (see Table 20-5).

and/or environmental purposes through global guidelines and recommendations that promote transparency and disclosure, supporting integrity of the market. Additional research and stakeholder mapping will be required for developers to understand how green bonds could be leveraged to cover upfront costs of net zero construction, as these are typically issued by development banks and corporations.

- **Consider aligning proposed projects for loans with OnePlanet imperatives for The River District.**
  The panel recommended aligning some of these loans and bonds, and the evaluations of the financing deals with the OnePlanet imperatives were specified in Crescent Communities' River District briefing materials.

6. **Duke Energy: Centralize/integrate efficiency and distributed energy resource workstreams and support for customers.**
   The panel recommended that Duke Energy and the city centralize and integrate energy efficiency and distributed energy resources (DER) under one fact sheet or somewhere on their website.
7. **Create an online Playbook and Resource Hub for developers to take advantage of all opportunities and locally available incentives.**
   The panelists recommended the creation of an online Playbook, resource hub or website for developers to easily find all the opportunities and incentives.
8. **Financial incentives: Ensure accrual to party making investment.**
   If there is ever a desire for the City of Charlotte to tack on a monetary green building development incentive, it will be important to ensure that the party making the investment is the one receiving the incentive. Sometimes developers, property owners and property managers get burned because only the owner qualifies for the incentive, but the owner may not be the same entity making the investment for a retrofit or capital project.
9. **Explore and formalize opportunities for public-private partnerships, provide forums for key stakeholders to share best practices, and educate the market regarding the benefits of high-performing buildings to generate increased demand.**
   - Convene a group of interested stakeholders across real estate developers, architects, engineers, and policymakers to create ongoing meetings to share ideas, challenges, and best practices in the development of zero carbon buildings in Charlotte.
   - Community education on the benefits of energy efficiency and net zero buildings (health, comfort, energy costs) to help increase market knowledge. Public outreach is an important part of the process according to the panel, and learning about organizations such as ULI, NAIOP, BOMA, and other community stakeholder groups and nonprofits that address net zero building is a great way to educate the public.
10. **Capacity building and workforce development for electric building technologies.**
    According to the panel, finding providers and the workforce to support new technology products will require specialized training. It is hard for the general population to install technologies that cannot be serviced quickly and easily, which presents a barrier for ongoing management if the local workforce is not properly trained to service and repair these systems.

Recommendations for the City of Charlotte

The panel made the following recommendations for the City of Charlotte, after understanding all the issues from stakeholders and brainstorming among themselves:

1. **Provide mechanisms to reduce pre-development costs (example: expedited permitting review and/or reduced permit, water, and sewer capacity fees).**
   According to the panel, even though every building department boasts expedited permitting, the city needs to work directly on a premium expedited permitting process for those projects that meet a certain pre-determined threshold. Time is money and something that can happen in 6 months could be expedited to 6 weeks, and leapfrogging in this process is a huge benefit. While the panel did not look at specific utility incentives or capacity construction fees, this was identified as an opportunity.
2. **Provide incentives to private developers that voluntarily adopt the municipal sustainable facilities policy (MSFP).**
   Rewarding private developers in Charlotte that voluntarily adopt the city's MSFP is another way to incentivize high-performance design and construction. The city could provide expedited permitting or explore other mechanisms by which developers can reduce pre-development costs by meeting the policy requirements for New Construction and Major Renovations.
3. **Explore opportunities to leverage municipal green bonds, green banks, or energy efficiency investment funds (EEIF) to secure low-cost capital for clean energy projects including solar at favorable rates and terms to both traditional and otherwise challenging market segments.**
   The panel was not sure if the city has ever considered a municipal bond for energy efficient retrofits for the city's facilities. A bond would be the best plan, according to the panelists, because the IRA funding from the city would be matched with federal funds.

   Below are some opportunities listed by the panel:
   - Green Bank examples in US: CT, NY, CA, RI, Montgomery County, Hawaii.
   - North Carolina Clean Energy Fund is a starting place.
   - ICMA's Green Bond Principles provide best practices.
   - How to Issue a Green Muni Bond Playbook.

Next Steps

General: Education and training

The panel emphasized the need for general education and training among developers regarding the benefits of net zero, noting that development teams should consider the human health and wellness aspects of a net zero built environment. The panel commended Atrium Health as a stakeholder for not doing it for monetary reasons, but to make people healthier and safer throughout their properties.

Developers: Clarify ambition and objectives for net zero development

The panel recommended clarifying the ambitions and objectives for the net zero development as early as possible. That goes a long way. It is important to get a buy in from everyone involved in a communicated company line.

Developers: Identify and communicate bundled requests for utility support

The local utility company has offerings, but the different teams need to come together and have a single point of contact who can direct development teams for specific needs.

Developers: Provide direction to architect and MEP design team that project needs to be solar ready and EV ready

The panel emphasized the need to provide direction to the architect and MEP team, so the team does not have to go back and retrofit their building to make it EV ready. There might be a slight upfront cost to make a building ready for solar, but it would be significantly less expensive than retrofitting a property to support solar.

Utility: Provide centralized contact and location for all efficiency and decarbonization resources

Utilities provide centralized contact, but the relevant information is not always there. All resources on energy efficiency and decarbonization should be in a central location so developers or businesses can find the information easily.

City: Expand City of Charlotte Buildings Working Group to accelerate discussions, information-sharing and best practices for achieving net zero

The panel mentioned that if the City of Charlotte Buildings Working Group expands and opens up to developers, then information sharing of best practices will be beneficial, especially in understanding how others outside of Charlotte have managed to achieve net zero.

Diversify local education & training for multiple audiences in various modes

This includes delivering education and training to tenants, developers, AEC professionals, elected officials, land use/planning professionals and the public.

Maintain communication, momentum, and focused implementation to ensure success by expanding the City of Charlotte Buildings Working Group to accelerate discussions related to this report, information-sharing, and best practices for achieving net zero.

Collaborate on industry requests and advocacy for the local utilities to provide clear and centralized contacts and technical resources for all efficiency and decarbonization programs available to developers.

	ULI Charlotte	Developer	City of Charlotte
Short Term	• Create a comprehensive report: A Roadmap to Net Zero for Commercial Buildings Playbook for Developers • Provide back up and support materials to Developer and City • Lead local request for developer-focused utility resources	• Define clear net zero design and construction specifications for project team. Specifically, direction to architect and MEP design team that project needs to be at least solar ready and EV ready • Identify and communicate a list of bundled requests specific to the project needs for streamlined utility support	• Identify potential financial incentives that could incentivize net zero investments such as: priority permitting and development review, one-time development fees/credits or ongoing fees like stormwater utility fees, tax abatement • Identify a variety of other non-financial incentives and standards to be included in the UDO that are relevant to greenfield developments, multifamily, retail and single family • Expanding the City of Charlotte Buildings Working Group to accelerate discussions related to this report, information-sharing, and best practices for achieving net zero
Mid Term	• Collaborate on local committees and educational opportunities such as expanding the City of Charlotte Buildings Working Group to accelerate discussions, information-sharing, and best practices for achieving net zero • Collaborate in creation of centralized "Net-Zero Development" website hosted by the City	• Integrate sustainability and wellness questionnaire in investment committee or project origination discussions • Research more applicable federal funding opportunities for commercial development through IRA, IIJA, etc (e.g. 179D) • Identify a variety of other non-financial incentives and standards to be included in the UDO that are relevant to greenfield developments, multifamily, retail and single family	• Create a "Green Building Resources" website in collaboration with ULI and other local/national partners • Research and apply for federal funding to utilize as seed money for net-zero developments • Include voluntary net-zero development standards in future UDO updates • Implement a voluntary program for priority permitting
Long Term	• Provide local and national support to monitor progress on this Net-Zero TAP • Identify national opportunities relevant to the local market	• Provide company-wide training on net-zero design, construction, and operations	• Implement Net Zero fee rebates or incentives for performing above code

Appendix A: The TAP Process

DAY ONE – May 30, 2023

Panel and Sponsor Introductions

The ULI panelists convened at the offices of Crescent Communities Charlotte, NC, for brief introductions to city staff and Crescent representatives. The sponsor and city staff conducted a briefing session for the panel to augment the original briefing materials and provide an opportunity for the panelists to ask clarifying questions.

Stakeholder Interviews

Panelists met with three groups of community stakeholders remotely and one group in person. The panel engaged in discussions with sponsor representatives, interviewees, and stakeholders in the project. The purpose of this discussion was for the panel to gain insight into the specific questions to allow them to provide practical recommendations. The list of stakeholders interviewed is listed in Appendix B.

DAY TWO – May 31, 2023

Panel Work Session

The panel brainstormed during a work session, followed by discussion with the sponsor and a working lunch in which the panel prepared a PowerPoint presentation with key findings to present.

Panel Presentation

The panel presented its final recommendations to the city and members of the public in the afternoon. After presenting their findings and recommendations, panelists fielded questions and comments.

Report Delivery

Report Preparation and Release

This TAP report was prepared under the leadership of ULI Charlotte and offers a summary of the activities during the program, key findings, and panel recommendations.

Appendix B: List of Stakeholders

The panel conducted four sets of stakeholder input sessions during the afternoon of May 30, 2023. Invitations to stakeholders were extended and arranged through the City of Charlotte. Interviewees included representatives of the following organizations. All attendees were recognized and given a few minutes to state their issues or concerns, and general discussion in a roundtable format followed.

City of Charlotte Team

- Sara Hazel
- Aaron Tauber

Crescent Communities Team

- Lisa Phocas

Stakeholders Interviewed

- David W. Callaway, MD, Atrium Health
- Chris Castro, U.S. Department of Energy
- Ashley Coleman, Duke Energy
- Joy Kim, Duke Energy
- Nate Doolittle, LandDesign
- Donald Green, Progressive AE
- Marcus Hassen, Truist
- Jeanne Huntsman, Willdan
- Summer Michew, Eco-Impact Consulting
- Will Teichman, Kimco Realty
- John Thigpen, JLL
- Jen Todd, LITTLE
- Brent Watkins, KLG Jones

Appendix C: Panelist Biographies

Jeff Benavides

Jeff serves as the lead for city and building performance at scale across international markets at USGBC and GBCI. Prior to his family's move to Raleigh, Jeff served as the first Chief Sustainability & Resilience Officer for Orange County/Orlando. He has built an agile and unique 17-year career as a co-founder of 4 women-led sustainability and energy startups, sustainability advisor Fortune 200 companies, Board President for a UN accredited NGO, and Professor. Jeff brings dynamic skills in infrastructure, public policy, net zero building design, and finance to his role leading Portfolios and Performance at Scale across USGBC, Arc, and GBCI.

Chris Cayten

Mr. Cayten is a Partner and Head of Strategy at CodeGreen Solutions, a leading sustainability and energy efficiency consulting firm based in New York City supporting over 500 million square feet of property across the country and over 150 million square feet of property in New York City to improve sustainability, target net zero emissions and comply with local energy policies. Mr. Cayten has more than 20 years of experience in sustainability consulting, architecture and development in commercial real estate. Mr. Cayten works with private and public sector leaders to improve the sustainability of the built environment while delivering positive value to building owners, occupants and investors. Mr. Cayten has worked with numerous city governments on energy and carbon policies for existing buildings including New York, Boston, San Francisco and Washington, D.C. Mr. Cayten holds a master's degree from the Yale School of Architecture and has spoken domestically and internationally about sustainable real estate and energy efficiency policy. He is Chair of the BOMA NY Energy and Sustainability Committee, a board member of the New York Energy Consumers Council, a member of the REBNY Sustainability Committee, a member of the Building Energy Exchange Industry Leadership Council and an active member of USGBC and Urban Green Council.

Emma Hughes

Emma Hughes, Director of the Climate & Energy practice at RE Tech Advisors, works closely with real estate investment companies and a team of consultants across RE Tech to build innovative, tailored programs that accelerate carbon reductions, enhance portfolio resilience, and mitigate climate transition risk while driving measurable progress toward clients' ESG goals. Emma previously spent 8 years at the U.S. Green Building Council helping to develop the LEED green building rating system and LEED Zero program via collaborations with diverse industry stakeholders and volunteer professionals serving on LEED technical committees. A New Hampshire native, she now lives in West Palm Beach. Emma earned her B.S. in International Relations from Boston University and graduate certificate in Corporate Sustainability and Innovation from Harvard Extension School.

Sara O'Mara

Sara O'Mara is a groundbreaking leader in the construction market who has led Choate to the top of the class in sustainable construction in the Southeast. She is a LEED Fellow and held the "Constructor of Buildings" seat on USGBC's National Board of Directors as well as USGBC's Advisory Council. Sara's 22 years of construction experience and knowledge in the field of sustainability is vast, having worked on over 140 high-performance buildings (17.5 million square feet) each earning a third-party certification through such sustainability programs as LEED, WELL, Fitwel, and Green Globes. Thorough knowledge of these rating systems allows for a variety of approaches that are tailored to each client's needs. Sara is always looking at new innovative marketplace solutions that can provide owners with healthier building features while delivering maximum return on investment.

Jill Ziegler

Jill Ziegler is a Senior Director leading the Brookfield Properties development group's Environmental, Social, and Governance (ESG) strategy. She also collaborates with Brookfield's Global Real Estate ESG team on annual ESG reporting, net zero implementation, investor relations, and other strategic ESG initiatives. Ms. Ziegler joined Brookfield in 2007. Previously, she led Forest City Realty Trust's ESG and Corporate Responsibility efforts and consulted for federal government clients, including the U.S. Environmental Protection Agency. Ms. Ziegler holds an MPA with an Environmental Science & Public Policy concentration from George Mason University and a Bachelor of Arts from Miami University. Ms. Ziegler is a LEED Accredited Professional in Building Design and Construction.

Appendix D: Select Readings and Links

As referenced in the report:

Government

- City of Charlotte
  https://www.charlottenc.gov/Home
- Department of Energy (DOE)
  https://www.energy.gov/
- Office of State and Community Energy Programs
  https://www.energy.gov/scep/office-state-and-community-energy-programs
- Power Down the Crown
  https://community.charlottenc.gov/pages/power-down-the-crown
- Zero Energy Building's Resource Hub
  https://www.energy.gov/eere/buildings/zero-energy-buildings-resource-hub
- GSA Sustainable Facilities Tool Net Zero Energy Guide
  https://sftool.gov/plan/420/net-energy
- DOE Better Buildings Finance Navigator
  https://betterbuildingssolutioncenter.energy.gov/financing-navigator/explore
- Unified Development Ordinance
  https://charlotteudo.org/
- Inflation Reduction Act of 2022 Fact Sheet: Clean Energy Tax Incentives Relevant to U.S. Real Estate (Real Estate Roundtable, May 25, 2023)
  https://www.irs.gov/inflation-reduction-act-of-2022
- North Carolina Clean Energy Fund
  https://www.nccleanenergyfund.com/

Commercial Organizations & Real Estate Developers

- Crescent Communities
  https://www.crescentcommunities.com/
- The River District
  https://www.theriverdistrict.com/
- Duke Energy
  https://www.duke-energy.com/home
- New Construction Energy Efficiency Design Assistance Application
  https://energyassistance.willdan.com/DukeEnergy?State=NC
- The International Capital Market Association - ICMA's Green Bond Principles
  https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/

- OnePlanet
  https://our.oneplanet.com/
- Atrium Health
  https://atriumhealth.org/

Non-profit Organizations

- ULI – The Urban Land Institute
  https://uli.org
- U.S. Green Buildings Council
  https://www.usgbc.org/
- Trees Charlotte
  https://treescharlotte.org/
- Architecture 2030's AIA Zero Code
  https://architecture2030.org/zero-code/
- NAIOP and the NAIOP Foundation
  https://naiop.org
- Building Owners Management Association (BOMA)
  https://boma.org
- LEED Certification
  https://www.usgbc.org/leed
- USGBC IRA Policy Brief: Inflation Reduction Act: Buildings Provisions
- DC Volunteer Net Zero Energy Guide:
  https://dob.dc.gov/page/zero-energy-zero-carbon
- 4 Federal Tax Credits for Developers:
  i. 25D – Residential energy efficiency tax credit
  ii. Efficiency and renewable investment tax credits:
    - 45-L tax credit: new energy efficient home credit
    - 48-E: low-income tax credit (ITC) adder - If installing solar in a low-income household, get an additional 10% adder for tax credit – now it is 40%

  iii. If installing solar in a low-income household, get an additional 10% adder for tax credit – now it is 40%
- Impacts of Indoor Air Quality on Cognitive Function:
  https://thecogfxstudy.com

Clean Energy & Renewables Financing

- DOE Financial Allies
  https://betterbuildingssolutioncenter.energy.gov/financing-navigator/allies
    i. Market-leading financing companies that have committed to funding energy efficiency and renewable energy projects
- Institute for Market Transformation – Green Bonds Primer
  https://www.imt.org/resources/green-bonds-primer/
- NRDC, CDP, C40 Cities, Ceres, as you Sow: Green Muni Bonds Playbook
  https://www.nrdc.org/sites/default/files/greencitybonds-ib.pdf
- NREL Green Banks Overview
  https://www.nrel.gov/state-local-tribal/basics-green-banks.html

Public-Private Partnerships and Accelerators

- Energize Denver Hub
  https://energizedenver.org/
- D.C. Building Innovation Hub
  https://buildinginnovationhub.org/
- Puget Sound Clean Building Accelerator
  https://www.pse.com/en/business-incentives/energy-management-programs/clean-buildings
- Cascadia CleanTech Accelerator
  https://cascadiacleantech.org/
- LA Better Buildings Challenge
  https://www.la-bbc.com/
- Building Exchange St. Louis
  https://www.be-exstl.org/
- Building Exchange Kansas
  https://www.be-exkc.org/
- NYC Accelerator
  https://accelerator.nyc/

LEED

- LEED Rating System: Credit Grid Harmonization
  https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-35
- LEED Pilot Credits – Social Equity
  i. Social Equity in the Community
  https://www.usgbc.org/credits/se-community?return=/pilotcredits/New-Construction/all
  ii. Social Equity within the Project Team
  https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-10
  iii. Social Equity within the Supply Chain
  https://www.usgbc.org/credits/IPpc144-v4
- LEED Pilot Credits – Resilient Design
  i. Assessment and Planning for Resilience
  https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-50?view=resources
  ii. Design for Enhanced Resilience
  https://www.usgbc.org/credits/enhancedresilience?return=/pilotcredits/new-construction/v4
  iii. Passive Survivability and Back-Up Power during Disruptions
  https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-48

Educational Institution

- Harvard University
  https://www.hsph.harvard.edu/healthybuildings/2021/09/09/impacts-of-indoor-air-quality-on-cognitive-function/