INTEGRATED DESIGN
CHARRETTE TOOLKIT

Integrated Design Charrette Toolkit

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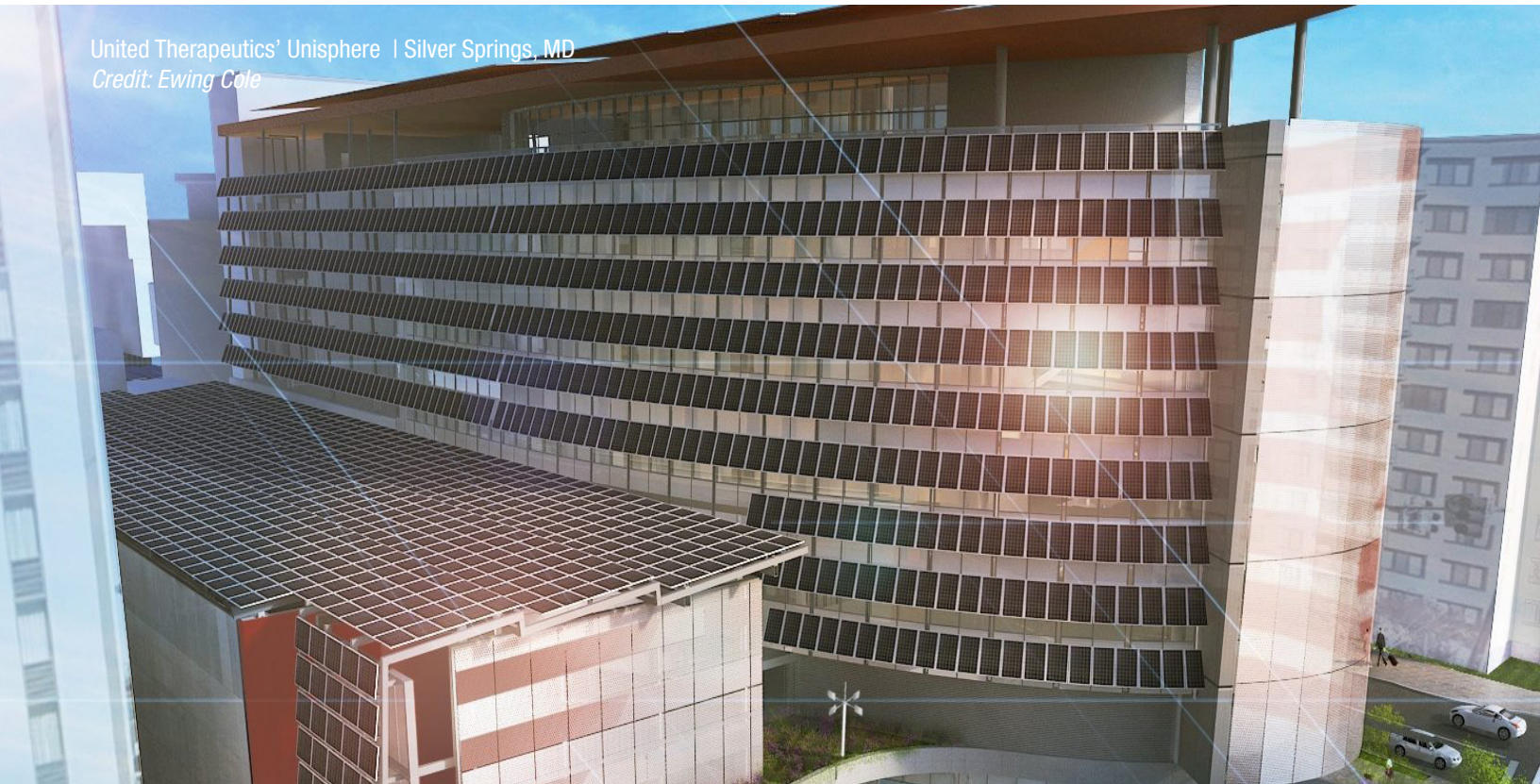

United Therapeutics' Unisphere | Silver Springs, MD
Credit: Ewing Cole

Integrated Design Charrette Toolkit

The *NZE Charrette Toolkit* provides you with materials to help plan and lead a successful charrette. It can be used for almost any team aiming for high levels of building energy efficiency and/or sustainability whether actively pursuing NZE or other high-performance design goals. The toolkit lays out a step-by-step process, starting with pre-charrette planning through post-charrette actions and includes information specifically for a NZE building. All materials are easily customized to meet the needs of a particular project.

Introduction: Using Charrettes for an Integrated Design Process

The integrated design process breaks the siloed work of disciplines to create a collaborative, efficient team capable of developing a high performing building. Charrettes set the ground stage for the success of this process. A charrette is a focused work session where a project team kicks-off the integrated design process, reviews project expectations, and explores design strategies that are most appropriate to achieve a project's sustainable design goals. Zero Net Energy (NZE) charrettes take an additional step of outlining the path to NZE by establishing absolute energy outcome targets and a plan to achieve them.

Charrettes build consensus, formalize the project vision, streamline the design process, and by supporting setting specific goals, set the team up for success. They are most effective when they happen early in Conceptual or Schematic Design. This allows key stakeholders like owners, facility managers, and building occupants to share their perspective at a time when their input can still be easily—and inexpensively—incorporated into the design. The charrette also provides design team members an opportunity to share their early design ideas and experiences on other projects.

The History of Charrettes

During the 19th century, students of l'Ecole des Beaux Arts in Paris would ride in a cart, or charrette, sent to retrieve their final art and architecture projects. While in-route to the school in the cart, students frantically worked together to complete and improve these projects. Today, in practice the word has evolved to represent a collaborative effort around a collection of ideas or a session of intense brainstorming.

The key to a successful charrette is to prepare in advance so the time during the charrette is used wisely and the key outcomes and objectives are achieved. Design team members should be prepared to speak to specific sustainable, high-performance building strategies that might be appropriate for the project. All participants should be prepared to share their vision of a healthy, productive environment.

Charrette Formats

A charrette format depends on the number of attendees, team brainstorming styles, and project goals. Presentation-style charrettes are the most common and involve a prepared presentation of project ideas from each major team member, followed by a facilitated conversation on suggested strategies. With 10-20 attendees, this conversation can happen as a group. However, a larger group may require break-out sessions with each party reporting back to the whole. The benefits of the latter are that shy or quiet people may feel more comfortable talking to a smaller group and presenting group ideas, illustrating that independent ideas are often in alignment with others.

Interactive charrettes may start with a tour of the project site or an inspirational project and include the group creating a physical building model as a brainstorming activity. In a classroom setting, the attendees may break into groups and sketch ideas for the major topics (site, water, energy, materials, indoor environmental quality (IEQ), operations, community.) Groups present back to everyone and further facilitated discussion identifies potential strategies for future exploration.

1 For more information on energy targets see Energy Goals and Targets in NBI's Getting to Zero: NZE Building Guide
2 NREL Technical Feasibility Study for Zero Energy K-12 Schools. EUI targets table: page viii. http://www.nrel.gov/docs/fy17osti/67233.pdf

Integrated teams may organize a "problem and solution" charrette after design and at a major turning point. The larger project team meets to brainstorm identified problems in a fast and dynamic manner. The benefit is that everyone concentrates on a few issues, solving them as an interdisciplinary team.

All NZE charrettes should focus part of the agenda on energy outcomes and expectations for the project. In order to do this, some teams review existing building benchmarking data, industry average buildings, and resources to help define an achievable energy target appropriate for their building. Resources such as GARD Analytics ASHRAE 1651-RP energy targets for commercial buildings, and Commercial Building Energy Consumption Survey (CBECS), provide EUI targets in US climate zones. Other teams use solar calculators like The DC Solar Map or PVWatts to determine a solar budget which defines the energy budget for the building when the area for solar generation is known.

Notes on how to use the Charrette Guide

- Notes in italics reference another piece like a sample template or an appendix to this document.
- In the sample templates, we have ***bolded and italicized*** each piece needed to replace with your project information.

Charrette Activities

Since charrettes support alignment of project vision through the integrated design process, it's helpful to engage in activities that encourage teamwork and thinking outside the box. Below are a few brainstorming exercises that can inspire new project ideas.

Silent Visioning – All attendees close their eyes as the facilitator leads the group through the opening day celebrations. The facilitator asks the attendees to imagine the experience of arriving in the neighborhood and approaching the building—the sounds, the smells, and what it feels like to open the door for the first time. The intent is to experience the space, not the sustainability measures, though they may arise.

Role Swapping – After creating design solutions, ask the architect to be the owner and the mechanical engineers to view the project through the building operator's eyes. Review the project through this new view. Ask other "role swappers" questions about the design and comment as someone in that role would.

Voting – Brainstorming generates a plethora of ideas, some of which may not be appropriate for the project due to location, budget, or other constraints. With all strategies displayed, give each attendee three stickers (commonly referred to as "dots") per category, and ask them to place a sticker on the top three strategies, per section, that they would like to see implemented. This process builds consensus and prioritizes the strategies requiring further investigation.

Charrette Vision, Goals, & Objectives

- Provide an overview of the project vision, goals, timeline, and green building approaches
- Foster teamwork and an integrated design process
- Examine constraints and identify possible synergies and solutions
- Solicit feedback from decision makers, future operators, and occupants
- Clarify NZE energy targets and anticipated Energy Use Intensity (EUI) outcome
- Identify and engage stakeholders in the process of NZE
- Define next steps and a path forward

Anticipated Charrette Outcomes

- The owner, design team, and all stakeholders understand and are committed to the project vision and goals and have a better understanding of how to work with each other
- NZE EUI energy targets are set between 20-25 kBtu/ft^2/year, location dependent
- Funding, financing, and incentive options for the project are identified and discussed
- Operators and occupants understand the importance of their ongoing role in a successful NZE building
- All team members understand that post-construction measurement and verification of performance involves commitment by all involved with the project
- Next steps are outlined for engaging additional stakeholders
- Action items for the project are defined and assigned to each team member

Steps for a Successful Charrette

Stakeholder Identification and Engagement

When key stakeholders are involved from the outset, they are more likely to feel a sense of ownership and contribute to the success of the project. Since NZE buildings require optimal operations, achieving buy-in from facility managers and building occupants is critical to ongoing success.

Below is a list of potential key stakeholders to invite to the charrette and a sample email invitation you can customize.

Stakeholders	Design/Construction Team	Optional Attendees
• Owner/Owner's Representative	• Architect	• Commissioning Agent
• Board Member(s)	• Mechanical Engineer	• Controls Integrator
• Finance/Business Officer	• Electrical Engineer	• Acoustical Consultant
• Facilities Director/Staff	• Lighting Designer	• Local Community Leaders
• Sustainability Manager	• Plumbing Engineer	• Members of Business Community
• Charrette Facilitator	• Civil Engineer	• Future Occupants
	• Green Building Consultant	• Community Members
	• Other Consultants	• Neighbors
	• General Contractor	
	• Utility Representative	

Sample Email Invitation

XX Date

To: ***XX Charrette Attendee(s)***

From: ***Charrette Facilitator or Owner/Owners Representative***

Subject: ***XX NZE Planning Charrette***

Dear _____,

I invite you to participate in the Zero Net Energy (NZE) planning charrette. This is the start of an integrated design process for ***XX***. The meeting date is scheduled for ***XX date*** at ***XX time*** at ***XX location***.

The purpose of this charrette to promote a collaborative planning process that incorporates the expertise, ideas, and goals of all interested parties. This charrette is happening at the beginning of the design process to fully integrate the design team and other key stakeholders. During the charrette, we will clarify goals for the project, solicit your ideas, and develop an actionable plan.

In preparation for the event, we encourage you to watch the following videos and review these articles.

- ***XX***
- ***XX***

Please respond this email to let us know if you will be able to attend the charrette. We value your participation and insights.

Sincerely,

[Your Name Here]

[Your Title and Contact Information]

Host Charrette Preparation Calls

The charrette facilitator should organize preparation calls with the owner and key design team members to review the draft agenda (See *Sample Charrette Agenda* for an example), set expectations, and define roles and responsibilities. Architects, mechanical and electrical engineers can meet in advance to develop graphics to help guide conversation at the charrette. Explore opportunities to reduce energy loads through building orientation, passive systems like daylighting and natural ventilation, as well as high-efficiency systems that can realistically serve these loads. Likewise, they can host a call with civil and plumbing engineers to uncover synergies between stormwater and plumbing systems.

Be sure to address concerns regarding NZE, including energy targets, design strategies, and renewable energy systems. The following is a list of questions that might be considered during these preparation calls. They can also be used as a way to encourage discussion during the charrette itself.

Charrette Planning and Preparation

DOEE has template materials (shown in parenthesis below) to help with the following steps:

- ☐ **Set the date, time and location – four to six hours may be sufficient for the charrette**
- ☐ **Finalize the agenda** (See the *Sample Charrette Agenda*)
- ☐ **Invite participants and share the agenda** (See the *Sample Email Invitation*)
- ☐ **Prepare presentations**
- ☐ **Arrange logistics** (See the *Charrette Checklist*)

Process:

- What green building standard will be used for the project and what elements of the standard are most important to address in the design?
- Are there regulatory constraints?

Site, Stormwater, and Water Strategies:

- How will the building design take advantage of climatic factors and passive systems (building orientation, daylighting, solar tubes/skylights, natural ventilation, operable windows, etc.)?
- What is the water budget for the building?
- How and where can stormwater be managed on site? What are the infiltration characteristics of the soils?
- Might rainwater or stormwater be reused for irrigation or plumbing?
- What low water use fixtures will be used in the plumbing system?

Energy Strategies:

- How do high-performance strategies promote an enhanced the environment?
- What are the sustainable design goals for the building? What is the energy target?
- How can occupancy patterns and uses be considered in the building design? Are there opportunities to locate spaces with common use types/patterns near each other to share systems? How will this impact operators and occupants?
- What are the HVAC needs?
- What high-performance HVAC systems might be considered? How will they be controlled? What are the operational implications?
- What are the lighting needs for the space and how will they be addressed? Is daylighting the primary source of illumination? How will it be controlled?
- What size energy renewable system is needed and where might they be located?
- What is the inventory of plug load equipment for this building and how can we optimize plug load energy use?
- Are there any biases for or against particular system types?

Indoor Environmental Quality:

- How will the design promote high standards in indoor air quality?
- What recycled, reused or salvaged materials might be used in construction?
- How can nature be incorporated into the building?
- What materials can support a healthy environment?

Operations and Maintenance:

- What operational considerations need to be made?
- How will energy use and generation be tracked and verified?
- What sort of behavior change initiatives should be used?
- What are the funding and financial constraints? Are there incentives that could be pursued to offset any of these costs?

Community Connection:

- Does the neighborhood offer community-scale systems?
- Can the building contribute to the community?

Potential High Performance, Sustainable Design Topics

This list of high-performance building design topics could be considered during the pre-work or in the charrette.

Design Process

- [ ] NZE Champion
- [ ] Stakeholders, Drivers, and Messaging
- [ ] Owners Project Requirements
- [ ] Contract structures, include NZE
- [ ] Team Selection and Integrated Approach
- [ ] Energy Targets
- [ ] Design Charrette
- [ ] Early Design Phase Modeling
- [ ] Life Cycle Costing Analysis

Site Design

- [ ] Orientation
- [ ] Solar Access: Orientation, Income, etc.
- [ ] Passive Design
- [ ] Climate
- [ ] Views
- [ ] Topography
- [ ] Soils, Vegetation, and Habitat
- [ ] Heat Island

Envelope

- [ ] Infiltration Rates
- [ ] Window to Wall Ratio
- [ ] Window Types
- [ ] External and Internal Shading
- [ ] Insulation Levels and Types
- [ ] Cool and Green Roofs
- [ ] Thermal Bridging

Space Conditioning

- [ ] Passive Systems
- [ ] System Type Considerations
- [ ] Load Reduction Implications
- [ ] Efficiency Specifications
- [ ] Fault Detection and Diagnostics

Ventilation

- [ ] Separating Ventilation from Conditioning
- [ ] Dedicated Outside Air Systems
- [ ] Ventilation Rates
- [ ] Heat/Energy Recovery Systems
- [ ] Demand Control Ventilation

Controls and Metering

- [ ] Whole Building Controls
- [ ] End-Use Level Controls
- [ ] Controls Integration
- [ ] Sub-metering
- [ ] Open Source vs. Proprietary Systems
- [ ] Reporting / Energy Dashboard

Interior and Site Lighting

- [ ] Daylighting
- [ ] Lighting Power Density
- [ ] All LED Interior and Site Lighting Technology
- [ ] Interior and Site Lighting Controls

Renewables and Energy Storage

- [ ] Solar Budget and Sizing
- [ ] On and Off-Site Renewable Options
- [ ] Battery Storage
- [ ] Thermal Storage
- [ ] Grid Friendliness and Integration

Water

- [ ] Stormwater Detention/Retention
- [ ] Stormwater Runoff Quality
- [ ] Low Water/Maintenance Vegetation
- [ ] Bioswales
- [ ] Erosion and Sedimentation Control
- [ ] Efficient Plumbing Fixtures
- [ ] Water Reuse and Grey Water
- [ ] Treat Wastewater Onsite

Material Conservation and Efficiency

- [ ] Recycling for Building Occupants
- [ ] Construction Waste Management
- [ ] Reduce Materials and Finishes
- [ ] Recycled Content in Materials
- [ ] Salvaged Materials
- [ ] Forest Stewardship Council (FSC) Certified Woods
- [ ] Material Durability

Indoor Environmental Air Quality:

- [ ] Daylighting
- [ ] Natural Ventilation
- [ ] Operable Windows
- [ ] Low VOC Products (carpets, cabinet frames, paints, adhesives, etc.)
- [ ] Indoor Plants
- [ ] Sound of Water
- [ ] Acoustics
- [ ] Mechanical Ventilation Filters

Community Connectivity:

- [ ] Connections to Neighborhood/Campus
- [ ] Respect for Social Equity, Diversity, and Culture of Neighborhood
- [ ] Education of Visitors
- [ ] Service to Community (public spaces, conference rooms, etc.)
- [ ] Electric Vehicles
- [ ] Bike Parking and Access

Operation and Verification:

- [ ] Plug Loads
- [ ] Equipment Specifications and Purchasing
- [ ] Operations and Performance Drift
- [ ] Conduct Occupant Education and Training
- [ ] Benchmark Energy Performance
- [ ] Share Energy Use with Occupants
- [ ] Commission Building Systems Post-occupancy
- [ ] Collect One Year of Energy Use and Production
- [ ] Verify NZE Performance (after 1+ year)

Sample Charrette Agenda

Below is a sample agenda for an Integrated Design Charrette. A more detailed, *Facilitator's Version of the Agenda* is located at the end of this document.

Event Title

Day of the Week, Date, Year

Time (Hour AM – Hour PM)

Address: **Street**
City, State Zip
XX Room Number

Map

Time	Content	Who
8:30-9:00 am	GATHER AND SETTLE IN	All
9:00-9:10 am	Welcome and Introductions	All
9:10-9:20 am	Purpose, Agenda, and Expectations	Facilitator/Owner
9:20-9:30 am	Overview of Sustainable, NZE Buildings	Facilitator
9:30-9:50 am	Activity: What is Your Vision of a Sustainable, NZE Building?	All
9:50-10:05 am	Project Overview and Goals	Owner/Architect
10:05-10:45 am	Site, Stormwater, and Water Strategies/Discussion	Civil & Plumbing Engineers/All
10:45-11:00 am	BREAK	All
11:00-11:40 am	Energy Strategies to Achieve NZE/Discussion	Architect, Mechanical, Electrical Engineers, Lighting Designer/All
11:40 am-noon	Strategies to Support Superior Indoor Environmental Quality/ Discussion	Architect/All
12:00-12:20 pm	Designing and Operating to NZE/Discussion	Facilitator/All
12:20-12:40 pm	Review Sustainability and Energy Targets and Identify Action Items	Facilitator/All
12:40-12:45 pm	Wrap Up and Next Steps	All

Charrette Prep Checklist

The facilitator should assist the project team in assigning pre-work so everyone is prepared in advance for the charrette. A complete checklist for the charrette facilitator is included at the end of this guide. Below are some ideas about specific assignments for various participants.

Owner Representative:

- ☐ Identify charrette outcomes
- ☐ Prepare a welcome statement for the charrette
- ☐ Identify vision and broad goals for the project
- ☐ Clarify operational, financial, and sustainability goals
- ☐ Provide Owner's Project Requirements

Architect:

- ☐ Collect photographs, aerial images, and site plans
- ☐ Prepare short presentation (10-15 minutes) of early design concepts. Presentation should address project goals, specifically addressing educational, sustainability, daylighting, health, indoor environmental quality, and acoustics

Mechanical, Electrical, Plumbing and Civil Engineers:

- ☐ Prepare short presentation (approximately 10 minutes for each discipline) of early design concepts
- ☐ Provide case studies where suggested low-energy and low-water approaches have been implemented
- ☐ Conduct bioclimatic analysis to understand the site opportunities and constraints
- ☐ Suggest NZE energy target (expressed in Energy Use Intensity in kBtu/ft^2/year)

All Stakeholders:

- ☐ Watch facilitator assigned videos that introduce high performance buildings. There are many to choose from though a few good ones include:
  - The Greenest Building, Director Jane Turville, A Wagging Tale Production, 2013.
  - How Behavioral Science Can Lower Your Energy Bill – TED Talk by Alex Laskey: www.ted.com/talks/alex_laskey_how_behavioral_science_can_lower_your_energy_bill
  - Building Brighter Futures Through Zero Energy: Discovery Elementary School: www.youtube.com/watch?v=2kTS4UODWwc

- ☐ Read background articles. Again, there are many to choose from, and here are some to start:
  - Healthy buildings: why workers are demanding sustainable offices: www.theguardian.com/sustainable-business/healthy-buildings-sustainable-offices-employees
  - Cognitive Benefits of Healthy Buildings: http://harvardmagazine.com/2017/05/cognitive-benefits-of-healthy-buildings
  - DOE's Jeffrey Baker: Building green, saving green www.washingtonpost.com/wp-dyn/content/article/2010/11/08/AR2010110805941.html
  - Read fact sheets and case studies available in NBI's library at http://newbuildings.org/hubs/zero-net-energy/

Discovery Elementary School | Arlington, VA
Credit: VMDO Architects

Host the Charrette

The pre-charrette preparation has set the workshop for success. The facilitator can leverage the NBI tools, especially the *Facilitator's Agenda* and the discussion questions above to engage participants and direct the group toward a successful result.

During the charrette, the facilitator's role is to create space for all participants to share their thoughts and ideas and meet the owner's desire for outcomes. A seasoned facilitator is an effective listener who is able to assimilate a variety of perspectives and points of view. A well-conducted charrette brings together the right people to make decisions in a short period of time and reduce work later. The aim is to have all decision-makers and stakeholders understand the project goals, concepts, and implications for long-term operations. At the end of the day, the team should have an actionable plan to achieve the project's sustainable design and NZE goals.

The charrette should be participatory. Starting the day with introductions is a way to get everyone talking. The owner can welcome everyone and introduce the goals of the project. An early activity such as "imagining a NZE building" is another way to encourage participation. This activity explores what a zero net energy building looks, feels, smells, and sounds like. The facilitator can take notes on flipcharts to record everyone's ideas. In brainstorming exercises, all ideas are welcome, so the facilitator should limit critical feedback at this time.

Next, design team members can present their early ideas about how to achieve the project's sustainability and NZE goals. This sets a level playing field among all key stakeholders. It also provides an opportunity for concerns to be voiced and heard. Keep in mind that not everyone can brainstorm in a quick fashion so allow attendees to submit comments after the charrette so that all ideas and opinions can be heard.

At the end of the charrette, the facilitator can recap highlights of the day and thank everyone for their participation, time, and input. The recap might include reviewing project goals, strategies, ideas, and concerns that were discussed. The facilitator should clearly outline next steps including post-charrette follow up. This may also be an opportunity to recap other thoughts that may have come up but may have been put in a "bike rack" for later consideration.

In some cases, not all attendees are interested in the sustainability goals and may have their own agenda. The charrette is a place to discuss concerns, educate others, and find conscience with the attendees. The facilitator should allow all opinions to be heard and the group should engage in conversation to understand the root of the issue. The concern may require additional research and conversation outside of the charrette. If the topic is large enough, consider developing a "task force" to investigate and report back to the group. Make a note of any follow-up in the "bike rack" and continue with the set agenda to say on time.

Post Charrette Follow Up

Documenting the charrette is an important step because it provides a record of key activities and outcomes. After the charrette, the facilitator should type the notes and share with all participants. Some participants might be interested in having copies of the presentations which can be included as an appendix in the report.

Follow-up on the charrette goals with regular check-ins with people responsible for particular tasks that were identified in the meeting A charrette follow-up meeting may be necessary at the start of construction documents. This is a good opportunity to revisit the project goals, discuss if these goals have changed, and realign project goals before detailing the project.

A well-conducted charrette brings together the right people to make decisions in a short period of time and reduce work later.

Discovery Elementary School | Arlington, VA
Credit: VMDO Architects

Sample Facilitator's Charrette Checklist

Prior to the Event:

- ☐ Preliminary meeting/prep call
- ☐ Team members identified and invited
- ☐ Venue arranged with workshop seating
- ☐ Verify that venue has projector, screen, microphones, easels, wall charts
- ☐ Arrange meals/snacks
- ☐ Agenda distributed to participants
- ☐ Assign pre-work for team
- ☐ Owner prepared for brief introduction
- ☐ Design team prepared for project overview
- ☐ Prepare presentations
- ☐ Make name tags
- ☐ Prepare sign-in sheet (sample one attached to this list)
- ☐ Make copies of agenda
- ☐ Pack pens, name tags, tape, etc.
- ☐ Travel research and reservations
- ☐ Other:

Items to Bring:

- ☐ Copies of agenda
- ☐ Copies of the presentations
- ☐ Copies of other documents: _____
- ☐ Attendee list
- ☐ Sign-in sheet
- ☐ Pens, markers, dot stickers, name tags, business cards
- ☐ Wall charts for brainstorming: poster-size sticky backed easel pad, and easel if needed
- ☐ Laptop and zip drive with presentation, power, and extension cords
- ☐ Digital Projector and laptop connector
- ☐ Camera
- ☐ NZE/eco materials: case studies, fact sheets, articles, etc.
- ☐ Resources: Living Building Challenge, CHPS, LEED, Utility Incentives etc.
- ☐ Directions (map, driving directions), parking pass
- ☐ Other: _____

_____

Day of Event:

- ☐ Set-up attendee list and name tags
- ☐ Set-up projector and computer
- ☐ Arrange for coffee, snacks
- ☐ Distribute handouts
- ☐ Facilitate meeting
- ☐ Clarify next steps
- ☐ Say thank you!

Post Event:

- ☐ Next day: thank you email
- ☐ Following week: draft report and distribute
- ☐ Continue to follow up with team at key milestones

EcoCharrette Sign-In Sheet

Month Date Time

Name	Organization & Role	Email

Ground Rules for Facilitators

Charrettes provide an opportunity for unencumbered ideas to flow. The importance of a third-party facilitator is to encourage all ideas, distilling their essence, while filtering freeform brainstorming from derailing the agenda. Inspire the attendees to dream big and provide facts that can root the idea in reality for project implementation. When off-topic questions arise, or those that require additional research, write them down in a "parking lot" or "bike rack" of ideas that require further exploration.

1. **Remain as neutral as possible.** It is necessary to separate yourself from any message so that the group trusts your leadership throughout the process.
2. **Translate the ideas** of those less familiar with design into the language of the professional participants and vise versa to validate each concept brought forth and increase the likelihood that it is understood by the attendees.
3. **Ask more than you tell.** Ask facilitative questions like:
   - What specific outcomes or results do we want to accomplish?
   - Can you expand on that? How would you summarize that point?
   - Where's the common ground? Can we take that as an agreement and move on?
   - How are we doing? What course corrections do we need to make? What should I be doing more or less of to be more effective?
   - What would be the best use of our time right now?
4. **Document all ideas** for everyone to see and add new topics to a "bike rack" for future research.
5. **Manage the agenda closely** so that the meeting achieves the closure that is needed. Remind presenters of the time remaining for their section.
6. **Keep the group on task** by redirecting off-topic conversations to the current topic.
7. **Invite everyone to share ideas.** If someone is quiet, ask their opinion so that all side of ideas are represented.
8. **Be flexible.** If you find that the group needs to discuss an item not on the agenda, say something to the effect of, "Okay, it sounds like this topic is important. Do we want to continue this discussion or move it to the parking lot?"
9. **Get comfortable with mitigating conflict.** Contrarians are invaluable to an effective process and acknowledge the contributions of participants.
10. **Repeat questions** so everyone in the room can hear and bounce the question back to the entire group – thereby facilitating the group process. Remember, the group has the answers – you are not required to know everything.

Note:
Before starting the charrette, make sure to designate a note taker and someone to take photos of the event!

Facilitator's Version of The Agenda

Time	Content	Who	Materials
8:30-9:00 am	**Gather, Settle In** Introduce yourself and and ask attendees to wear name tag. Display the day's agenda, factsheets, and other items attendees can read while waiting.	All	• Nametags • Sign in sheets • Food/Beverage • Ancillary materials about NZE
9:00-9:10 am	**Welcome & Introductions** Charrettes provide an opportunity for unencumbered ideas to flow. The importance of a third-party facilitator is to encourage all ideas, distilling their essence, while filter freeform brainstorming from derailing the agenda. Inspire the attendees to dream big and provide facts that can root the idea in reality for project implementation. When off-topic questions arise, or those that require additional research, write them down in a "parking lot" or "bike rack" of ideas that require further exploration.	All	**Slide:** Welcome
9:10-9:15 am	**Purpose & Objectives** Discuss the purpose and objectives for the day highlighting: *These should be amended to fit your charrette's goals identified during prep.* • Provide an overview the project goals, timeline, and green building • Foster teamwork and an integrated design process • Examine constraints and identify possible synergies and solutions • Solicit feedback from decision makers, operators and occupants • Clarify NZE energy targets and Energy Use Intensity (EUI) outcome • Engage stakeholders in the process of NZE • Define next steps, action items and a path forward	Owner	**Slide:** Objectives determined during prep call
9:15-9:20 am	**Agenda & Expectations** Go over agenda and address any questions Ask charrette attendees for their expectations during the day – this may be similar to objectives or this may be different. This is a good exercise to engage people in the coming discussions. Some expectations from attendees could include: • The owner, design team, and all stakeholders understand and are committed to project goals • NZE is clearly defined, everyone understands the importance of the complementing efficiency with renewables, storage, and grid integration • NZE EUI energy targets are set • Funding, financing, and incentive options for the project are discussed • Operators and occupants understand the importance of their ongoing role in a successful NZE building • All team members understand that post-construction verification and measurement of performance involved commitment by all involved with the project • Action items are outlined for engaging additional stakeholders and the community • Action items for the project are defined and assigned to each team member	Facilitator	**Slide:** Agenda • Flipchart • Markers

Time	Content	Who	Materials
9:20-9:30 am	**Overview of Sustainable, NZE Buildings** Why NZE: Outline why going NZE is important and why we are starting with that goal in mind from the beginning. Illustrate a case study for inspiration. Definitions and language are important to set straight and make sure that the team is in agreement.	Facilitator	**Slide:** Why NZE from Charrette Presentation Template
9:30-9:50 am	**Activity: What is Your Vision of a Sustainable, NZE Building?** Ask the attendees to close their eyes and imagine what it's like to approach the building and walk through it. Consider the questions below and note attendees' ideas from the brainstorm on flipcharts • How do you arrive? • What does a healthy building feel like? • What do you notice as you look around? • What do you notice outside? • What do you smell? • What do you hear? Write down the key elements of their experiences. Prioritization of Experience: If you alone had to choose only three experiences from the list we've generated, which would they be? Use your stickers to vote - no explanation needed. If there is a pattern, point out the top 2-3 experiences/strategies and ask people why they prioritized them. Draw connections between strategies and help them see the meaning in the priorities that the group found. Try to elicit conversation about what these priorities could do to influence design decisions going forward.	All	• Flipchart • Markers • Sticker "dots" • List of Potential High Performance Sustainable Design Strategies
9:50-10:05 am	**Project Overview and Goals** Architects present the overview of the project scope including site characteristics, initial schematic designs, design timelines, technology packages being considered, or case study projects etc.	Architect	**Slides:** Project overview
10:05-10:45 am	**Site, Stormwater and Water Strategies** Civil Engineer/Plumbing Engineers present Site, Stormwater and Water strategies possible for the project including any initial schematic designs, design timelines, renderings, etc	Civil & Plumbing Engineers	**Slides:** Presentation from Civil & Plumbing Engineers • List of Potential High Performance Sustainable Design Strategies
10:45-11:00 am	**Break**		

Time	Content	Who	Materials
11:00-11:40 am	**Energy Strategies to Achieve NZE** Engineers present the local climate analysis and passive, mechanical and electrical strategies possible for the project including any initial schematic designs, design timelines, renderings, etc.	Mechanical & Electrical Engineers	**Slides:** Presentation from Mechanical & Electrical engineers List of Potential High Performance Sustainable Design Strategies
11:40 am-noon	**Strategies to Support Superior Indoor Environmental Quality** Architects present indoor environmental quality strategies possible for the project including any initial schematic designs, design timelines, renderings, etc.	Architect	**Slides:** Presentation from Architect • List of Potential High Performance Sustainable Design Strategies
12:00-12:20 pm	**Designing & Operating to NZE Discussion** Facilitate a discussion around "The Arch of Continuity" and the hand off to maintenance & operations. • Building are operated to NZE – not just designed to NZE • Defining the ongoing role of occupants and operators • Commissioning, Fine Tuning & On-going Evaluation • Verifying Energy Use & Recognition of Success	All	**Slides:** Designing and operating to NZE • NBI's Getting to Zero: NZE Project Guide
12:20-12:40 pm	**Review Sustainability & Energy Targets and Identify Next Steps** Address targets identified in initial discussion and see if any changes need to be made Identify next steps & action items for team members. Highlight what actions, by whom and by when. Review timeline for integrated design process and team assignments	All	**Flip chart:** document targets after they are readdressed, note next steps, action items and timeline • Markers
12:40-12:45 pm	Wrap up and Conclusion Address any remaining housekeeping items or team assignments Set plan for next meeting or check in points	All	• Closing slides • Markers

NZE Resources

In digital format the resources below are linked to the online source.

NZE Communication Tools:

- NZE Project Guide—Combines the steps that successful NZE building teams implement with NZE tools and resources
- NZE Messaging Platform—Provides strong, overarching core messages and supplemental supporting message targeting key audiences.
- NZE Presentation Template—A basic slide deck introducing the core messages and activities in California.
- NZE Action Paths for Jurisdictions—The Action Paths described here present the most effective options for cities and states to systematically plan and make progress toward comprehensive NZE policy.

Fact Sheets:

- NZE for Architecture & Engineering—Why architects and engineers should be focused on building capability to design for NZE in the future.
- NZE for Real Estate and Developent Professionals—NZE buildings provide compelling selling points.
- Appendix Z—Guidance and strategies for incorporating DC's future zero energy code into today's projects.

NZE Resources:

- Zero Energy Policy Library—leading examples of policies and goals of states and local jurisdictions (strategic plans, energy plans, and climate action plans), programs working toward zero energy, and state and local jurisdiction energy codes and stretch codes.
- Technical Resources Hub—Resources on feasibility and cost studies of zero energy on district, state, and national levels.
- Zero Energy Educational Resources—Definitions, tools, and links to webinars.
- Zero Energy Schools Resources —Highlights state policies and national programs working toward zero energy schools.

District of Columbia Resources

- Sustainable DC Plan
- Sustainable DC 2018 Progress Report
- Sustainable DC 2017 Progress Report
- Climate Ready DC Plan
- Clean Energy DC Plan
- Clean Energy DC Tableau site
- Build Green DC

Cover Photos: Top:Mary Black Foundation
Bottom: Discovery Elementary School | Arlington, VA.

New Buildings Institute (NBI) is a nonprofit organization driving better energy performance in commercial buildings. We work collaboratively with industry market players—governments, utilities, energy efficiency advocates and building professionals—to promote advanced design practices, innovative technologies, public policies and programs that improve energy efficiency. We also develop and offer guidance and tools to support the design and construction of energy efficient buildings.

Throughout its 20-year history, NBI has become a trusted and independent resource helping to drive buildings that are better for people and the environment. Our theory of change includes setting a vision and defining a path forward. We then set out to create the research that serves as the basis for tool and policy development necessary to create market change.

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The Department of Energy and Environment (DOEE) is the leading authority on energy and environmental issues affecting the District of Columbia. Using a combination of regulations, outreach, education, and incentives, DOEE administers programs and services to fulfill our mission to improve the quality of life for the residents and natural inhabitants of the nation's capital by protecting and restoring the environment, conserving our natural resources, mitigating pollution, increasing access to clean and renewable energy, and educating the public on ways to secure a sustainable future. We work collaboratively with other government agencies, residents, businesses, and institutions to promote environmentally responsible behavior that will lead to a more sustainable urban environment.

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DEPARTMENT OF ENERGY & ENVIRONMENT
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