



PREPARE FOR THE NEW ENERGY FUTURE™



## AIA+2030 Professional Series Overview + Learning Objectives

### Session I: The 2030 Challenge: setting + achieving energy goals with integrated design™

Integrated design is fundamental to the creation of next-generation 2030 Challenge compliant buildings. In this kickoff session to the AIA+2030 Professional Education series, we will explore how the Integrated Design Process (IDP) and Integrated Project Delivery (IPD) are critical components of high performance building design. We will explore how it can be used to select collaborative strategies that collectively achieve the targets outlined in the 2030 Challenge, and how this process can be used as a roadmap throughout the entire design process. In particular, we will examine the utility of IDP in defining core, early design decisions such as building form and orientation.

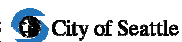
#### Learning objectives:

Upon completion of this session, attendees will be able to:

- Explain how the Integrated Design Process differs from traditional design.
- Identify specific characteristics of Integrated Design and its implications for building energy performance.
- Summarize the potential benefits gained by employing the Integrated Design Process

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## Session II: Getting to 50: the power of targets + load reduction™

The goal of the 2030 Challenge is to create buildings that are designed to meet a fossil fuel, greenhouse gas emitting, energy performance standard of 50% less than the regional (or national) average for that building type now, with the standard rising to a 60% reduction in 2010 and incrementally increasing 10% in efficiency every five years until 2030, when the goal of zero emissions is met. One of the more compelling aspects of dramatic energy reductions is the mounting evidence that if done well, such ambitious goals can actually be done with no added costs. This session will explore the use of EPA's Target Finder (ENERGY STAR) as a design target and reference tool, and metrics critical to the target setting exercise, such as Energy Use Intensity (EUI). The session will include multiple examples of projects that have achieved exemplary energy performance by setting and pursuing energy targets, offer tested approaches for incorporating targets into the design process, and explore how providing targeting and EUI information can be a value-added service for a design firm.

### Learning objectives

Upon completion of this session, attendees will be able to:

- Describe the energy/carbon objectives of the 2030 Challenge.
- Use the Energy Star Target Finder tool to set an Energy Use Intensity target for a project.
- Summarize the concept of Energy Use Intensity and describe why it is an important tool for setting energy targets for a project.

## Session III: Accentuate the positive: climate responsive design™

The conventional modern building design approach presumes that a building's energy will be imported in the form of electricity and fuel. Integrated design accounts for the resources sites offer, as well as minimizing unwanted environmental conditions. In this session, we'll explore using climate data, site characteristics and other tools to conduct a Site Resource Inventory, which in turn is used to inform the building design and lower building energy load. This session will set the stage for future sessions addressing specific strategies in more detail by first addressing the question, "What do we need to know in order to create an informed design?" and examine the synergies and tradeoffs of major design decisions.

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Learning objectives:

Upon completion of this session, attendees will be able to:

- Produce a building form and orientation strategy that is responsive to site and climatic factors.
- Explain why climate responsive design reduces the energy load of a building.
- List the site and climate factors that impact a building's performance.

## Session IV: Skins: the importance of the thermal envelope™

A building's skin is a critical interface between occupant comfort and the variations of season and climate. A high performance building requires a high performance envelope, tuned to the site conditions that can control for unwanted heat gain and loss. This session explores the design and technology approaches to wall and window assemblies, from low cost methods to minimize thermal bridging to advanced double skinned wall approaches, as well as addressing the need to address moisture issues in concert with insulation approaches.

Learning objectives:

Upon completion of this session, attendees will be able to:

- State the critical elements of thermal envelope responsible for building energy expenditure.
- Specify strategies for minimizing thermal bridging.
- Defend the use of added design, materials, and construction investment related to a high performance thermal envelope in order to reap building operational savings.

## Session V: Aggressively passive: employing passive systems for load reduction™

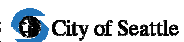
Properly designed, a building captures existing resources such as light, wind, and heat/cool to provide for the comfort and needs of occupants. Passive systems work in concert to allow the building to manage energy demand by design. This session will build on the concepts introduced in Sessions 3 and 4 to flesh out a holistic strategy to designing passive systems.

Learning objectives:

Upon completion of this session, attendees will be able to:

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- Define passive systems and identify specific elements of a passive design
- Appraise the effectiveness of various passive strategies based on a site's available resources
- Determine which of a suite of strategies will be most likely to be successful on a particular site

## Session VI: Illuminating savings: daylighting and integrated lighting strategies™

Lighting constitutes 29 percent of a typical American office building's energy load. Proper lighting is also critical to occupant comfort and productivity—and an exploration of daylighting and efficient artificial lighting is and of itself an exploration of integrated design. This session will explore the nature of natural light as part of a site's resource inventory, and identify strategies for maximizing access to beneficial light while controlling for glare and unwanted heat gain. It will couple this discussion with the latest research and application of artificial lighting choices designed to meet residual lighting needs.

Learning objectives:

Upon completion of this session, attendees will be able to:

- Evaluate various building forms and orientations for optimal daylighting potential
- Compare competing designs to determine the most effective approach to daylighting
- Assess a lighting scheme for its compatibility with an accompanying daylighting design

## Session VII: Right-sized: equipment and controls for super-efficient building system™

After designing for maximum passive use of site resources and mitigating energy loads, the next step to a breakthrough building is properly sized equipment and employment of advanced controls. This session will explore the concept and application of designing and specifying equipment and controls for buildings that are already designed to take care of themselves, and need mechanical intervention only during periods of peak demand. Systems such as hybrid natural-mechanical ventilation systems and other approaches to engineer the mechanical system to be as small (efficient) and effective as possible will be explored.

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Learning objectives:

Upon completion of this session, attendees will be able to:

- Describe the concept of right-sizing as it applies to buildings employing passive energy conservation strategies
- Explain the importance of controls in optimizing the efficiency of equipment
- Enumerate energy efficient strategies to maintain occupant comfort

## Session VIII: Site power: renewable energy opportunities™

The ultimate goal of the 2030 Challenge is fossil fuel free buildings by the year 2030. As buildings approach zero for their carbon footprint, on-site renewable energy sources become a key element to the strategy. As the lower up-front cost conservation and efficiency measures are exhausted, renewable energy emerges as the final step to reaching aggressive carbon elimination goals. This session will explore the relationship between conservation and renewable energy, and explore current renewable energy opportunities, both onsite and offsite systems, such as combined heat and power and local district energy (valuable for load sharing).

Learning objectives:

Upon completion of this session, attendees will be able to:

- Describe the technology behind major on-site renewable energy strategies for buildings
- Propose an appropriate renewable energy strategy based on site characteristics and resources
- Enumerate the life cycle costs and benefits of on-site renewable energy
- Understand how district energy can provide thermal and electric services and balance neighborhood loads

## Session IX: The hand-off + staying in shape: operations, maintenance + education™

Design intent is important, but at the end of the day, how the building actually performs is really what matters. The closer the match between predicted and observed performance, the more likely a client will be happy. This session will explore the tools available to an architect to help match performance with expectations, including building commissioning, maintenance staff and occupant training, and building performance monitoring. Using building performance data

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to validate and improve on design and construction decisions will also be explored—providing a strong tool for iterative learning and innovation.

Learning objectives:

Upon completion of this session, attendees will be able to:

- Explain the benefits of monitoring, evaluation, and education to design firms, clients, and building occupants
- Explain and advocate for commissioning on projects
- Instruct building maintenance and operations staff on optimizing building performance

## Session X: Putting it all together: achieving 2030 goals on the project and at the office™

Success with advanced energy performance projects requires not only a detailed understanding of the individual strategies involved, but also a strategic understanding of the architect's role in the design and construction process and how to orchestrate an already dauntingly complex process. This session revisits the integrated design and target creating process, and then looks outward to contextualize the architect in the larger environment of the project and—equally important—the firm. Key to the success of the 2030 Challenge is movement from learning to action. This session will examine the movement from in-class exercise to on-site implementation. Additionally, the session will provide tools for helping your firm institutionalize the creation of high-performance buildings and becoming a change agent within your community.

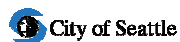
Learning objectives:

Upon completion of this session, attendees will be able to:

- Set energy performance targets early to inform design objectives
- Justify the inclusion of integrated energy efficiency strategies in projects
- Teach other design professionals in their firm and community about advanced energy efficiency strategies for buildings

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