

# Many Shades of Green Ahead



**D**esigners and their airport clients are fully aware of the environmental and financial benefits of healthier buildings. Demand for such facilities continues to grow as airports realize energy, water and other resource savings. To help meet these goals many airports are either voluntarily or by mandate designing and building facilities to achieve LEED certification, or are adopting building codes and standards that are intended to target energy efficiencies and other sustainable features. Significant changes are on the horizon for the LEED rating system and various sustainability focused codes and standards that will further impact the design and construction of airport buildings.

## Rating Systems, Codes & Standards

In the world of airport development projects, a variety of rating systems, codes and standards come into play (see sidebar). Of course one of the best known rating systems is LEED (Leadership in Energy & Environmental Design), an internationally recognized voluntary green building certification program that was developed by the U.S. Green Building Council (USGBC).

Whether or not LEED certification is being sought, most airport projects are subject to meeting codes which are a minimum requirement that are linked to a law and therefore must be met. The International Energy Conservation Code (IECC) is the energy efficiency building code most frequently adopted by states and applicable

to many airport projects. In the near future many municipalities will likely be adopting some form of new, much stricter energy targets being developed by The International Code Council (ICC), called the International Green Construction Code (IGCC). Remarkably, this new code will exceed the minimum baseline performance of the 2006 IECC code by 30 percent.

Close to 1,500 cities, counties and airports and other entities have voiced public support for this new code. In anticipation of its approval, Rhode Island has identified it as “an equivalent standard” in compliance with requirements that all public agency major facility projects be designed and constructed as green buildings.

Maryland has gone a step farther in adopting IGCC as an alternative to the Maryland Building Performance Standards (MBPS) and amended the definition of “high performance building” to include a building that complies with the requirements of the IGCC, hence making it applicable to all owners, not just the state. The City of Richland, Washington became the first local government to adopt the IGCC last August. Dallas considered the adoption of the IGCC code as an extension of its Green Building Code which is currently based on the LEED system, but instead opted to work on a regional approach through the North Texas Council of Governments once the final version of the code is published in March of 2012.

In addition to voluntary rating systems and codes, there are standards which can be

mandatory and voluntary. Mandatory standards are typically set by the government while voluntary standards are not typically regulated by the government or required by a given industry.

Interestingly, USGBC participated in the development of an alternate compliance path to IGCC: ASHRAE Standard 189.1, *Standard for the Design of High Performance, Green Buildings Except Low-Rise Residential Buildings*. This standard is a set of technically rigorous requirements, which, like the IGCC, covers criteria including water use efficiency, indoor environmental quality, energy efficiency, materials and resource use and the building’s impact on its site and its community. However, it is partly intended for organizations responsible for the development of voluntary building rating systems. It is therefore potentially relevant to airports. Rhode Island uses it as the other acceptable compliance path to green buildings.

States, municipalities and/or quasi-governmental agencies that may be outside code requirements can implement this standard rather than pursuing LEED certification or adopting IGCC. It provides a standard in code language that may be easier to implement administratively, but is not necessarily easier to implement through design and construction. The U.S. Department of Energy (DOE), through the National Renewable Energy Laboratory, estimated that Standard 189.1 could achieve a 27 percent weighted average in energy savings over the ANSI/ASHRAE/IESNA Standard 90.1-2007, even when applying only the minimum set of



**LEED** Leadership in Energy & Environmental Design-Rating/credentialing system, [www.usgbc.org](http://www.usgbc.org)

**USGBC** U.S. Green Building Council, [www.usgbc.org](http://www.usgbc.org)

**IECC** International Energy Conservation Code

**ICC** International Code Council, [www.iccsafe.org](http://www.iccsafe.org)

**IGCC** International Green Construction Code, [www.iccsafe.org](http://www.iccsafe.org)

**ASHRAE** American Society of Heating, Refrigerating and Air-Conditioning Engineers, [www.ashrae.org](http://www.ashrae.org)

**ANSI** American National Standards Institute, [www.ansi.org](http://www.ansi.org)

**IESNA** Illuminating Engineering Society of North America, [www.iesna.org](http://www.iesna.org)

**EPA** Environmental Protection Agency, [www.epa.gov](http://www.epa.gov)

**DOE** Department of Energy, [www.dot.gov](http://www.dot.gov)

prescriptive recommendations. Clearly, the standard is robust.

### Future Directions in LEED

While it may appear that the USGBC helped establish LEED's replacement by assisting in the development of Standard 189.1, recall that the purpose of LEED is to help raise the minimum code and standard requirements so that more meaningful progress can be made at the leading edge. As it stands now, the LEED system rewards actions that are better than code, but are not necessarily representing sustainable practices, i.e. "zero impact." The future goal of LEED is to require zero negative environmental impact for a certification, but first, two things must happen. Code minimums need to improve to the point that the overall building stock works toward reduced impact, and the cost differential between a LEED and a code facility cannot exceed what those constructing the top 25 percent of buildings (what the USGBC is targeting with LEED) are willing to pay.

A major overhaul like the transition from LEED 2.2 to LEED 2009 will not be repeated. Instead, continuous improvements to LEED will be made using a refinement process assessing further credit alignments, impact categories and credit weightings, green building codes and, most important for aviation, project type adaptations. Project type adaptations are important to the aviation industry because LEED has been used for years at airports, even though it does not address many of the subtleties of terminals and airport operations. As more

airport terminals become LEED certified, strategies that are counterproductive to aviation, such as residential proximity and wildlife habitat, may be addressed and refined by the USGBC.

In keeping with the continuous improvement of LEED, the industry should be prepared for enhanced energy requirements relating to the move from ASHRAE 90.1 – 2004 to the ASHRAE 90.1 - 2007 standard. This critical refinement will help clarify outdated statistics and confusion regarding enhanced energy targets that were once available points, but have over time grown to become prerequisites due to aggressive benchmarks established by ASHRAE, EPA and DOE.

### Commissioning

Another important arena relating to designers and their airport clients is the changes that impact commissioning. The LEED commissioning process refers to a third-party reviewing and verifying that intended systems have been designed, installed and are operating according to their intended performance.

Previously, fundamental (required) commissioning was a prerequisite, enhanced commissioning was a credit, and envelope commissioning was an exemplary performance point. The focus of the scheduled change to the LEED commissioning process is on overall building performance through an integrated evaluation of all systems.

- Fundamental commissioning will expand to include the building envelope,

plumbing, irrigation systems, cooling towers, rain water harvesting and on-site wastewater treatment in addition to the current HVAC, lighting, domestic hot water and renewable energy systems.

- Enhanced commissioning currently entails increased involvement of the commissioning agent and additional activities for verification and tracking after the performance period. This will expand to include subterranean waterproofing and penetrations, exterior wall assemblies and fenestration systems, above grade penetrations, and storm water control with removal systems and associated pumping systems.

### Conclusion

As the aviation industry strives to do more with less while still being a leader in environmental responsibility, some of the changes will be bittersweet. Aviation design projects will continue to stress the commitment of organizations and differentiate leaders from followers. Hopefully, the future will provide a LEED for Aviation standard or similar acknowledgement of the industry's unique challenges, opportunities and interest in achieving the optimum outcome when taking into account the plethora of relevant factors. Regardless, as code and standard requirements are raised through various rating systems, those involved in airport development projects, including airport clients and agency partners, will benefit as the industry shifts from a focus on building performance to truly sustainable structures – a goal that can only be accomplished once zero impact buildings are achieved. ➔