

# Transforming New Multifamily Construction to Zero--Strategies for Implementing Energy Targets with Design Pathways

Paul A. Torcellini, *Principal Engineer, National Renewable Energy Laboratory*

Zachary Craun, COOKFOX Architects

## ABSTRACT

Creating zero energy mid- to high-rise multifamily buildings represent significant challenges compared to typical commercial or residential buildings. Loads in these buildings are often dominated by hot water use and plug-in equipment. Tenants often take responsibility for some of the utilities. Cost models for creating these buildings are well entrenched in industry, making some forms of energy efficiency difficult to implement. Five major professional societies and experts from the multifamily space created design guidance based on data driven results coupled with actual experiences and case studies. Pathways to achieve zero were established including whole building energy use intensity targets coupled with details on how to achieve success in this building sector. Designers experience significant risk in creating new sets of details, recommending new strategies, and working towards EUI targets. The guidance strives to overcome these barriers while working within the difficult context of funding multifamily buildings. This paper will provide an overview of the process to achieve zero energy or zero energy ready status in multifamily buildings, along with details on selecting energy targets, and strategy pathways to achieve the targets. It will also highlight case studies that show how the cost-sensitive solutions are achievable for the design community including energy efficiency strategies that were used.

## BIOGRAPHY

Paul Torcellini is a Principal Engineer for Commercial Buildings Research at the National Renewable Energy Laboratory and he is on the faculty at Eastern Connecticut State University. Paul has authored more than 50 papers and is a key contributor in the development of the Advanced Energy Design Guides (ASHRAE/AIA/IES/USGBC) including chairing several of the

technical committees that produced the guides. Paul is a registered Professional Engineer and an ASHRAE Distinguished Lecturer.