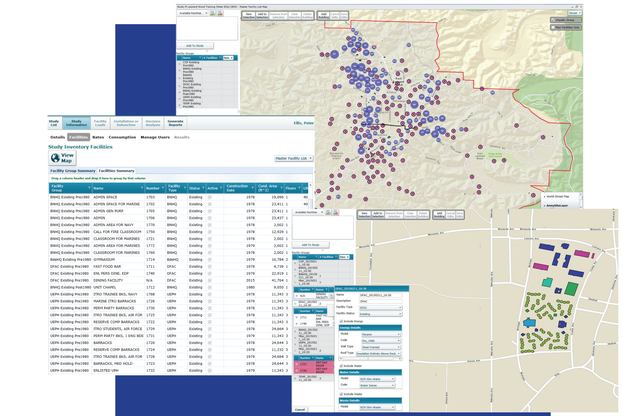
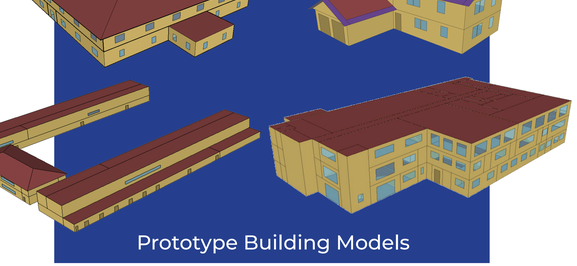
DISTRICT ZERO

a decision-making tool for net-zero communities



Geospatial Mapping



Detailed Building Modeling

Prototype Building Models

Objective

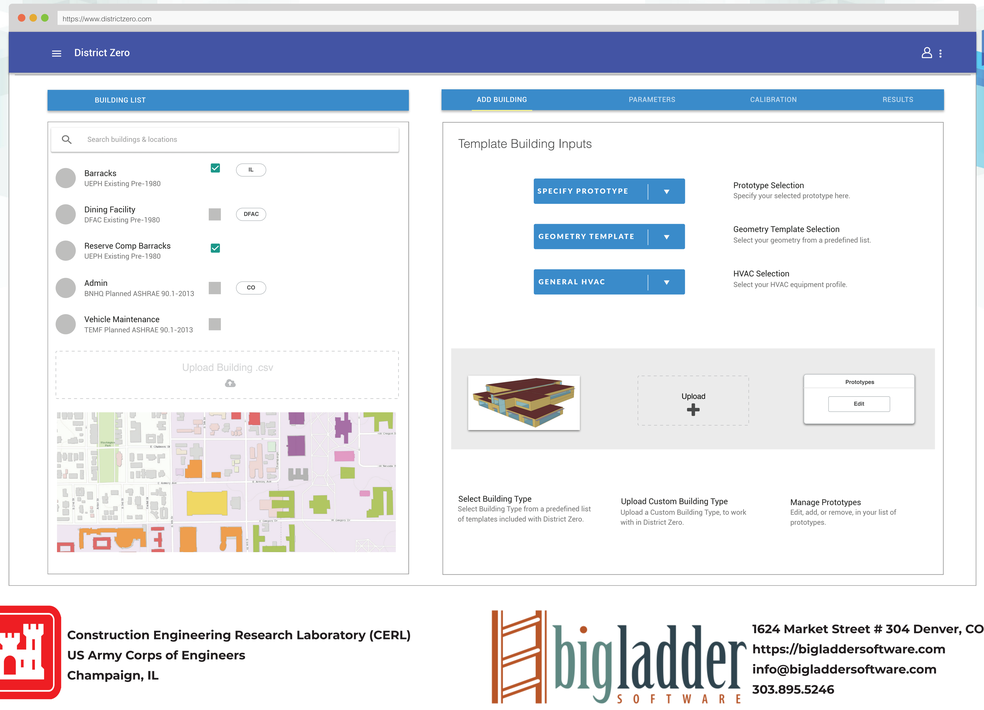
In 2011 ERDC began developing a computational framework called the *Net Zero Planner (NZP) Tool* to automate a significant portion of the modeling and analysis required for energy master planning at DoD installations. The tool aims to greatly reduce the cost and time requirements for master planning and enables a robust engineering analysis at the community scale for an entire installation. The *District Zero* tool has now been applied at over 60 military installations. While the *NZP tool* represents a major step forward in reducing the cost and time needed for an integrated approach to modeling at the community scale, there are barriers that severely limit technology transfer of the tool within DoD and beyond the military. The tool requires extensive training and subject matter expertise to effectively use it. The user interface design is not conducive to new users. The *NZP Tool* is also no longer compatible with most major web browsers due to a deprecated GUI framework. These issues are a significant obstacle to adoption. The overall objective is to resolve the technical drawbacks of the existing tool and facilitate the technology transfer, adoption, and deployment of this innovative technology to new DoD users and government contractors. Target users are energy managers, resource managers, master planners, and other practitioners that are involved with planning at DoD installations.

Technology Description

The specific technologies for the project include both new software improvements and new services for users. On the software side, the existing technology stack for the *NZP Tool* will be upgraded to completely replace the deprecated GUI framework with a leading open source solution. The change in GUI framework will require the user interface to be completely rebuilt. The change will provide a natural opportunity for a comprehensive redesign and rethinking of the user interface and user experience. Together the new GUI framework and new user interface will address the main technical barriers for broader adoption and deployment. Along with software improvements, the project also includes new services to facilitate technology transfer. Services include the development of commercial grade training and user support services.

Expected Benefits

The direct benefit to DoD of the proposed project is a better tool that—along with associated training and support services—improves the prospects for technology transfer and readiness for broader adoption and deployment. By extension, improving the technology transfer of the tool to practitioners—both inside and outside of DoD—also acts as a multiplier for all of the benefits of the *District Zero* tool. The *District Zero* tool can help reduce the cost and time needed to perform integrated master planning studies for energy, water, and waste. Demonstration results under previous work suggest that the use of the *District Zero* tool dramatically reduces the cost (by more than 50%) of developing an energy master plan for an installation. Less expensive master planning can lead to more frequent and more rigorous planning—both of which can help improve environmental sustainability, resource efficiency, and operational resilience at installations. If broadly adopted and deployed, the *District Zero* tool has the potential for wide scale impact. The *District Zero* tool has already been applied at numerous installations and is likely applicable at the vast majority of DoD installations.



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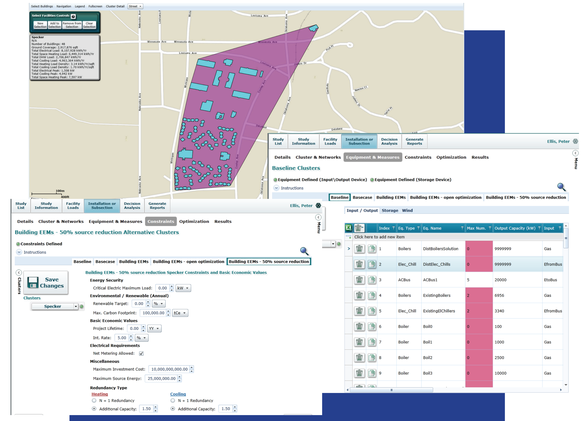
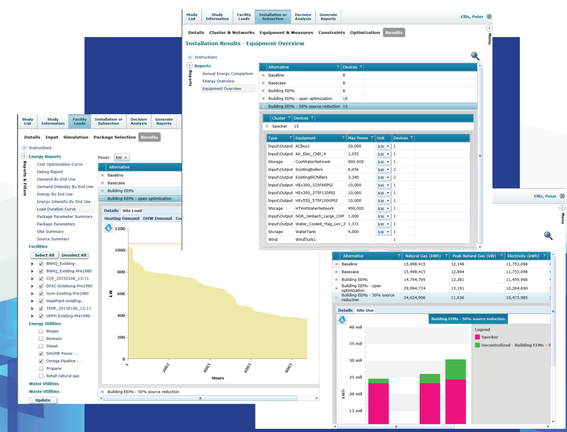
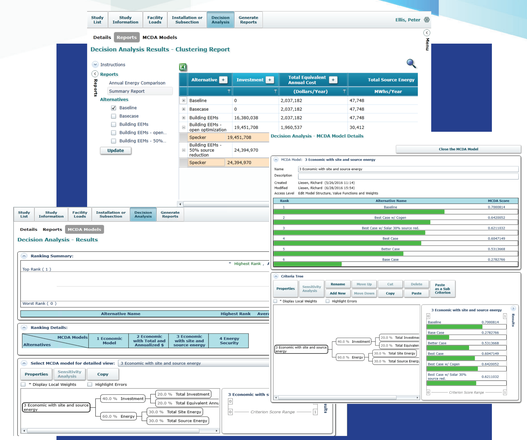


District / Cluster Optimization



Modeling / Optimization Results



Multi-Criteria Decision Analysis