Program Requirements:

Program:
Architecture at Zero 2012 was a zero net energy design competition focusing on the challenge of designing a zero net energy (ZNE) student housing building for the University of California Merced in Merced, California. As part of the Architecture at Zero 2012 challenge, entrants were asked to create a diagrammatic district energy plan for the Bellevue Gateway development. The buildings were to be part of the Bellevue Gateway, a new mixed-use development located on the campus that will act as both the primary entrance to the University and as a bustling center of activity with sports facilities, dining, residential spaces, administration, and parking.

Site:
The site consists of two parking lots, a temporary trailer and grazing land situated on the campus of UC Merced. The UC Merced campus is located in California’s San Joaquin Valley. The San Joaquin Valley consists of a 250 miles long, 50 miles wide flat open landscape. Climate is the most impacting site constraint.

Solution:
In order to create a life force for a community one must first find a central point of connection from which that life force may flow. Beating as the heart of the campus, a source has been established within this solution which provides for a connection to the existing campus, the existing water features and the overall trajectories that are apparent to the site. Looking from both the macro and micro perspectives, this life force has been carried throughout the solution to create a living and breathing campus. The pivotal tower element of the master plan provides a focus of energy, organization and identity for that life force.
The pivotal point of this solution is the beating heart of the campus created by the integration of a central tower element. Flowing from this tower element are the energy, organization and identity of the campus.

In an otherwise orthogonal grid system, this conceptual site diagram provides a sweeping connection across the campus.
The central pivot of the tower provides a point of entry to the campus which then flows outward to the rest of the facilities surrounding. As the campus master plan progresses outward from this point, the sweeping forms of the campus structures provide a visual connection to the natural boundary of the waters edge which constitutes the edge of campus.

Along the way, the energy from this tower leads to points of activity throughout the campus. The sweeping organizational pattern provided by the central tower creates a dynamic campus environment for students to explore and enjoy.
Serving as the centralized force of the campus, the entry tower provides not only a visually striking icon but also is a sustainable energy collector, serving as a wind turbine for the campus.

The form of this turbine feeds the architecture surrounding it leading the structures adjacent to respond to its context and energy.
The energy flows from the central point into the buildings on campus to create living breathing structures which serve both their overall purpose while at the same time providing for a dynamic between sculpture and structural form. All the while, the energy of the sculpture is not just figurative. The buildings, along with the tower, are designed to provide a completely net zero approach to the built environment. These spaces create figurative energy while also providing their own sustainable needs.
The plan of the student housing facility feeds off of the context provided by the central tower and overall master plan. Connecting to the overall while at the same time creating within itself a self-sustaining microcosm of campus.

The layout is designed to not only provide a comfortable living arrangement for the students but also to react to the environmental needs of the net zero program.

Each bank of student apartments open onto a large atrium. Within this atrium stand sculptural cooling towers which provide the natural heating and cooling of the facility.
The cooling towers, which feed off of the conceptual energy of the overall campus plan and the pivotal entry tower, provide all of the required heating and cooling for the facility. This sculptural piece within the facility creates a micro weather system.

Driven by convection, the warm air travels to appropriate points in the facility. This heats the facility in the cold season and helps control the temperature throughout the building. Heat can enter the building from the void on demand by controlled openings.

Once it arrives on the north end it drops and starts traveling back on the bottom edge of the system. The whole circuit works like a weather system, where high pressure warm air travels to the low pressure cold air and causes a micro weather circuit.
Through large forms and sweeping geometries the students are surrounded by a living and breathing structure. These structures are formulated to provide a sense of place and energy for each individual that enters into them. The micro-climate of the facility makes each building its own small world. Once you enter it, it has its own identity and purpose, an identity which the students can hold as their own. It is their space and it is designed with their needs in mind.
From exterior to interior, from campus plan to building plan, from macrocosm to microcosm this solution to a net zero campus provides an identity to the campus and the students who inhabit it.

A centralized focal point sweeps through the large scale into the small scale making each integral part one cohesive system, all of which are working toward the final goal: Organize a campus, provide both figurative and real energy, and overall create a sense of identity for all to grasp onto.