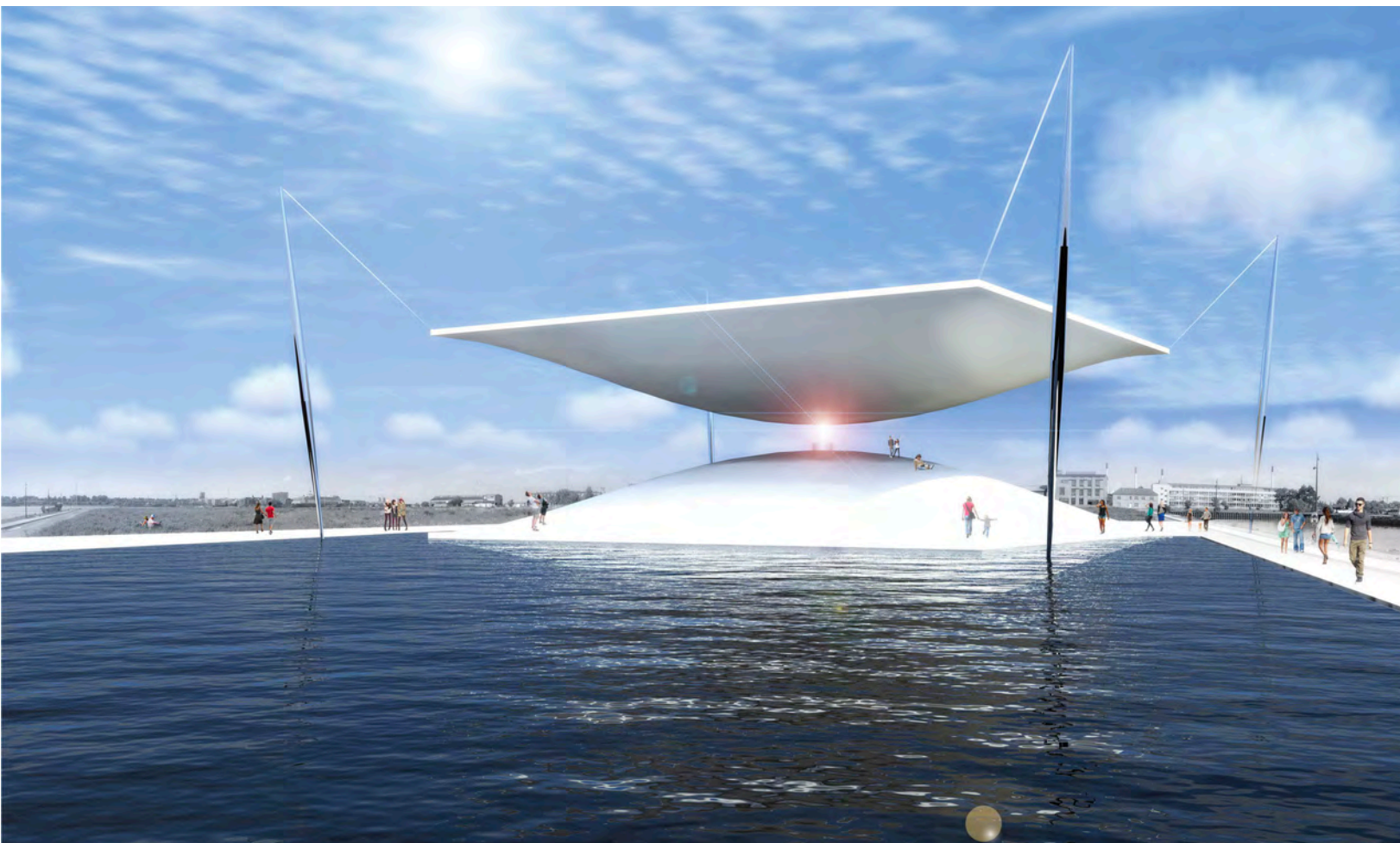


HELIOStudio

designing urban solar transition

Christine Mondor

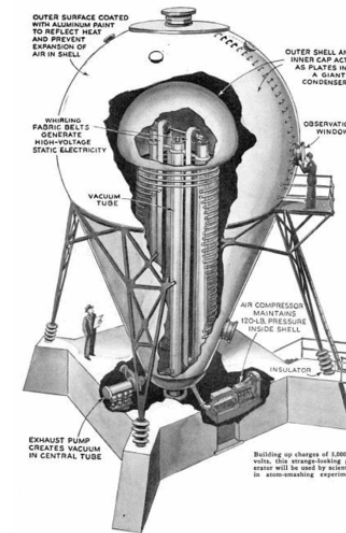
‘Massive change is not about the world of design but the design of the world.’ *Bruce Mau*



Background

After two centuries of dependence on fossil fuels and “solidified sunshine,” there is broad convergence that we are on the cusp of an energy transition to carbon-free fuels. Energy transition and the adoption of new technologies will require new spatial patterns and practices, all of which are design opportunities. Carbon-free transition needs to occur globally to shift the trajectory of climate change. It will start at the scale of the site and the city where technical challenges and cultural practices will create alternative landscapes of energy generation.

HELIOStudio will examine how the pivot between energy technologies will reshape our use space and will test how our landscape and urban form determine how we deploy technologies. HELIOStudio will examine the neighborhoods of Pittsburgh through the lens of solar power generation to find new spatial qualities, ways of using space, and ways we can use energy technologies to experience familiar spaces in new ways. The studio will explore the experiential and cultural connections to energy technologies to uncover the meanings behind what we make and how it shapes our understanding of the world.



Left. *Solar Hourglass*, 1st Place Winner LAGI 2014 Copenhagen
Santiago Muros Cortés
Energy Technologies: concentrated solar power (thermal beam-down tower with heliostats). Annual Capacity: 7,500 MWh

Above. *The Westinghouse Atom Smasher*, nuclear accelerator was instrumental in the development in practical applications of nuclear science for energy production and was developed only a few miles from CMU's campus.

Context

Western Pennsylvania is a place of energy firsts. Some of the nation's earliest coal mines were found in Pittsburgh's hillsides and the black rock heated homes, powered steamships, and anchored early industries, enabling the city to grow. Western PA was also home to the first commercial oil wells, the nation's first nuclear power plant, and now the nation's newest methane cracker plant that will process natural gas from the Marcellus Shale gas fields. This studio will speculate how Pittsburgh might continue the energy innovation and acquire the mantle of the first equitably integrated solar city.

Care In the broadest sense, the transition to carbon-free energies is an act of planetary self-care that attempts to heal the tragedy of the commons. As a studio we will explore how designers can integrate new infrastructure and technologies into communities and the daily experience of individuals. We will explore direct benefits, such as energy performance, and we will identify issues of equity and how people may gain or lose in the transition to a new energy regime.

Program

Each successive energy technology has reshaped our culture and sense of place and has resonated with design opportunity. HELIOStudio will use design to explore the next transition through two reciprocal scales—a site scale design problem to introduce us to carbon-free technologies in an urban context and a city-wide examination of the potential for energy generation and exploration of public realm design. Our work will hybridize architecture and infrastructure through critical engagement of technology, culture, and urban systems, with a goal of identification of 30MW of generation.

Our studio will collaborate with Elizabeth Mononian (Art '00) and Robert Ferry (Arch '98), who founded the nonprofit **Land Art Generator Initiative** to create art installations that could inspire others to collective action on issues of climate change. Through a series of international competitions, LAGI has proposed “land art generators” that showcase renewable technologies. We will learn from them and add a new dimension by exploring how such projects can be implemented at a city-wide scale using Pittsburgh as a test case. We will explore energy performance and place while examining the cultural and economic systems that will enable or inhibit solarization. Our work will inform their next round of competitions that is aimed at actual implementation and we will develop on-the-ground strategies for working with neighborhoods.



Above. *Beyond the Wave*, a submission to LAGI 2014 Copenhagen, Jaesik Lim, Ahyoung Lee, Sunpil Choi, Dohyoung Kim, Hoeyoung Jung, Jaeyeol Kim, Hansaem Kim (Heerim Architects & Planners) *Energy Technologies: organic thin film. Annual Capacity: 4,229 MWh*

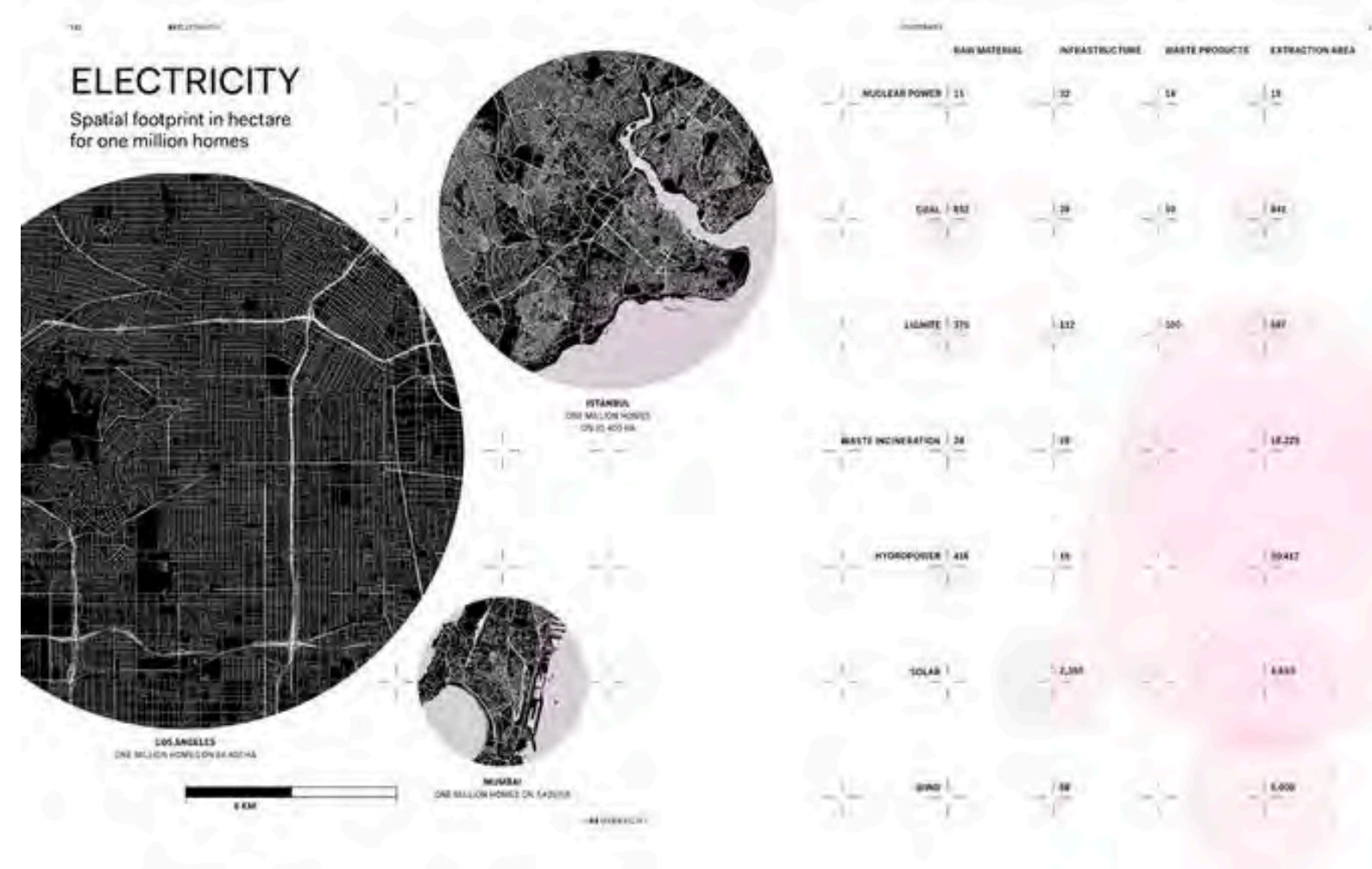
Learning Outcomes

During this studio, students will gain technical, procedural, spatial, and experiential design skills, and will be able to:

- >create provocative designs that integrate energy infrastructure and urban places
- >identify and speculate on key drivers of urban energy design, including experience, materials, context, economy, and policy
- >analyze and represent qualitative and quantitative data related to urban patterns, cultural practices, and energy infrastructure
- >understand social models of change and how design and engagement can catalyze or contribute to cultural transitions



Opposite. *Spatializing electricity*, Sijmons.



Resources:

- Sijmons, Dirk. *Landscape and Energy: Designing Transition* (cameo)
- LAGI, *Regenerative Infrastructures: Fresh Kills Park, NYC* (cameo)
- LAGI, *A Field Guide to Renewable Energy Technologies* (online)
- Kim and Carver, *The Underdome Guide to Energy Reform*. (cameo)
- Mau, *Massive Change* (cameo)

Our studio will be structured as a semester-long query that results in documents that summarize our findings. We will explore through early individual projects and later group projects. Students will be expected to produce architectural and spatial designs, to write and create narrative arcs, and to illustrate key concepts and data.

We will have visiting experts in to contribute to our understanding of concepts such as:

- energy systems and technologies
- infrastructure and history of the city
- urban computational analysis
- community dynamics and engagement
- competitions and design as a change agents

I will be traveling to Rotterdam, NL the week of 26 September to present at the **EcoCities conference**. The Dutch have been leaders in designing energy transition and I would welcome any fellow travelers. Please contact me if you might be interested.