

## Re-Conceptualizing Energy Systems

### Cities are moving together towards whole energy system transformation.

*Since 2013, the USDN Family of Funds has supported nine different instances of peer exchange, learning, and collaboration around tools to allow cities to be successful in their energy system overhauls. Find out how the concept has spanned member cities and funds in just a few short years.*

The urban sustainability field cut its teeth on the concepts of energy efficiency and renewable energy implementation. However, cities face numerous obstacles when attempting to make operations more energy efficient and derive more and more of their power from renewable energy sources. These obstacles vary by locale, based on factors such as climate, existing infrastructure, and political will.

Energy system transformation is something that cities need to achieve to reach their ambitious carbon reduction goals. Sustainability directors are often tasked with coordinating these efforts. Because of this responsibility, the USDN Innovation Fund, Carbon Neutral Cities Alliance (CNCA) Innovation Fund, and the USDN Peer Learning Exchange have supported phased work to spur learning and action around the transformation of community-wide energy systems. This body of work has researched barriers, developed tools, and enabled knowledge-sharing across departments, sectors, and geographic regions, driving the field of energy transformation forward.

#### Conceptualizing Energy System Transformation

In January of 2015, the USDN Innovation Fund awarded a grant to allow five member cities - Boulder CO; Boston MA; Minneapolis MN; Portland OR; San Francisco CA; and Seattle WA. The intent was for these cities to collaboratively develop a [framework for urban energy system transformation](#). The team worked to develop a shared vocabulary, and to envision how municipalities can develop a community-wide energy planning and management system that supports a transformation of their energy systems from a fossil fuel base to 100% renewable energy.

This project was an important first step in the development of a more comprehensive approach to whole energy systems change, laying the foundation for both city organization and community understanding of the larger energy systems change (electricity, natural gas, and petroleum) necessary to achieve deep emissions reduction. Because of the work done in this project, CNCA funded the Integrated Whole Energy System Decarbonization Strategy project led by Boulder, CO in the fund's inaugural grant round.

What is Urban Energy System Transformation?  
 “Urban Energy System Transformation is the process of restructuring energy demand and supply in a municipality to radically reduce the amount of energy consumed, transition energy supply to fossil fuel-free sources, and make the system resilient to future risks.”  
 Source: [Energy Systems Transformation Framework](#)

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*Figure 1. Map of Lower North Loop neighborhood in Minneapolis, MN, where the CNCA Energy System Transformation project developed an action plan focused on transitioning the neighborhood towards zero carbon. Source: [CNCA Energy System Transformation Playbook Report](#)*

## Creating Energy Transformation Tools

In 2016, three Carbon Neutral Cities Alliance (CNCA) member cities joined together to commission the creation of a tool to assist local governments in eliminating greenhouse gas (GHG) emissions from their energy systems. This project developed a guide to help municipal governments understand and foster

energy system transformations in their city. The work included both city specific energy district assessments and a generic “playbook”, suitable for any city to use in developing energy system transition strategies. CNCA members noted that this project created a process that more actively engaged comprehensive planners around energy transition strategies.

## Continuing the Conversation

In late 2016, the USDN Peer Learning Exchange funded a peer exchange between Boulder CO; Burlington VT; San Francisco, CA; Boston MA; New York City NY, and Washington D.C. This convening explored municipal decarbonization efforts of thermal energy within the residential sector. Representatives were invited from nine major renewable heating and cooling manufacturers to discuss the development of a public-private partnership. One team member noted that *“the NYC convening provided important insight into how other cities are approaching renewable heating and cooling action, and how heat-pump manufacturers perceive technical, regulatory, and marketing obstacles to greater adoption of that technology.”* This collaborative approach between cities and private manufacturers created a dialogue intended to help rapidly scale the transition to these low-emissions alternatives in cities across the U.S.

USDN has supported concept development, refining, and early scaling phases of urban energy transformation efforts. By creating a place to test ideas and learn from the successes and struggles of member cities, the USDN Family of Funds hopes to further the work of sustainability directors and continue to support the advancement of the field energy transformation. In fact, in September 2017, CNCA funded New York City’s proposal to implement the “Thermal Decarbonization Initiative for Cities”. This phase 2 project will focus on designing and testing pilot programs to scale-up demand for heat pumps, while strengthening local supply chains - specifically in the small residential sector.