CNCA
CARBON NEUTRAL CITIES ALLIANCE

Carbon Neutral Cities Alliance (CNCA)
Innovation Fund
2017 Annual Report

Document Purpose

This document describes the Carbon Neutral Cities Alliance (CNCA) and details the progress and impacts of the CNCA Innovation Fund through the end of 2017.

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CNCA Overview

Created in 2015, the Carbon Neutral Cities Alliance (CNCA) is a collaboration of leading global cities working to cut greenhouse gas (GHG) emissions by 80% or more by 2050 or sooner ("80x50") — the most aggressive GHG reduction targets undertaken by any cities across the globe. The Alliance aims to address what it will take for leading international cities to achieve these deep emissions reductions and how they can work together to meet their respective goals more efficiently and effectively. These cities collaborate to share lessons in planning for and implementing deep carbon reductions and agreed upon opportunities to accelerate best practices in deep decarbonization by:

- Advancing "transformative change" in key urban sectors
- Creating a CNCA "Innovation Fund" to invest in high-potential, city-led projects that develop, test, implement, and amplify deep decarbonization strategies and practices
- Speaking with a common voice to demonstrate global thought leadership on the need for carbon neutrality
- Developing common approaches, analysis, and tools to support urban carbon neutrality and measurement and verification methodologies for tracking progress
- Creating key partnerships with external stakeholders in sectors not directly controlled by cities to more quickly and effectively advance cities' success
- Fostering a "next wave" of carbon neutral city leaders by facilitating the sharing of lessons learned between CNCA members and other leading and "next wave" cities around the world to foster a broader global movement toward urban carbon neutrality.

CNCA is staffed by the Urban Sustainability Directors Network (USDN), in partnership with the C40 Cities Climate Leadership Group (C40), Innovation Network for Communities (INC), and others. CNCA is supported by The Kresge Foundation, Barr Foundation, MacArthur Foundation, McKnight Foundation, Rockefeller Brothers Fund, Summit Foundation, and Bullitt Foundation.

CNCA Member Cities

Current CNCA members include:

Adelaide, Australia	London, UK	Portland (OR), USA	Sydney, Australia
Berlin, Germany	Melbourne, Australia	Rio de Janeiro, Brazil	Toronto, Canada
Boston, USA	Minneapolis, USA	San Francisco, USA	Vancouver, Canada
Boulder, USA	New York City, USA	Seattle, USA	Washington DC, USA
Copenhagen, Denmark	Oslo, Norway	Stockholm, Sweden	Yokohama, Japan

2017 CNCA Innovation Fund Awards

The CNCA Innovation Fund was created in 2015 to invest in high-potential, city-led projects that develop, test, implement, and amplify deep urban decarbonization strategies and practices. Projects are selected by the CNCA Innovation Fund Selection Committee. This committee is composed of CNCA member cities. Their award decisions are approved by CNCA's Steering Committee.

To date, the Alliance has invested $2.4 million in 27 innovation projects. CNCA Innovation Fund Round 3 (2017) awards are listed in Table 1. Table 2 shows 2017 Technical Assistance (TA) and Quick Turnaround Grants. The library of completed projects and products is available here.

The CNCA Innovation Fund offers three types of grants:

- **Innovation Grants** – Support city projects that define the most effective pathways for significant urban GHG reduction, and help CNCA and other cities consider, communicate and advance potential pathways that will achieve their aggressive GHG reduction goals. Typical grant amounts: $60,000-$100,000 USD over one year; in 2017, began to fund larger projects up to $250,000 USD over two years.
- **Technical Assistance (TA) Mini-Grants** – Grants of up to $5,000 USD that enable the development of strong projects and proposals.
- **Quick Turnaround Grants** – In 2017 the CNCA Steering Committee decided to set aside a small pool of funding to test "Quick Turnaround" grants—"quick funds" up to $2,500 USD to support short-term projects that are ready to go and/or have a compelling opportunity in the off-season of the general CNCA Innovation Fund Request for Proposals (RFP).

Table 1. CNCA Innovation Fund Round 3 (2017) Innovation Projects

CNCA Round 3 – 2017 Innovation Fund Awards				
Title	**Lead City**	**Amount**	**Other Participating Cities**	**Project Description**
Consumption and Urban De-carbonization: New Tools and Approaches	Portland	$100,000	Primary: Vancouver; San Francisco. Observing: Ft. Collins; Stockholm; Oslo; Paris; Toronto	Harmonizing approaches for creating consumption-based emissions inventories (CBEI) and bringing their use into the mainstream, to develop and prioritize GHG reduction activities.
Thermal Decarbonization Initiative for Cities – Phase 2	New York	$200,000	Primary: Boulder; Burlington; Washington, DC. Observing: Berkeley; Boston; Minneapolis; Northampton; Oakland; Portland; Providence; Salt Lake City; San Francisco; Seattle; Somerville; Sydney; Vancouver	Phasing the Thermal Decarbonization Initiative for Cities for local supply chain development and contractor training. This is part of a multi-year effort to scale up the market for cold-climate electric air source heat pumps (ASHPs)—a critical component of each city's climate goals.

Total System Performance Ratio Transforming Real-world HVAC Performance in North America	Seattle	$150,000	Primary: Boulder; New York City. Observing: Copenhagen; Oakland; San Francisco; Vancouver	Developing model code language (with an associated digital compliance tool) that creates a single minimum efficiency standard for each building's entire HVAC system.
Yokohama Blue Carbon	Yokohama	$100,000	Primary: Vancouver. Observing: Melbourne; San Francisco	Researching how to increase carbon sequestration through the conservation and rejuvenation of seagrasses, such as kelp.
Capitalizing Carbon to Accelerate Electric Vehicle Charging Investments – Phase 2: Prototype Project Implementation	San Francisco	$25,000	Primary: Boulder; Palo Alto; Portland; New York City; Vancouver. Observing: Seattle; Adelaide; Paris; Sydney	Building on 2016 USDN Innovation Fund work and pioneering access to carbon market funding for city EV charging projects to address the problem that no profitable business model has yet emerged to scale-up infrastructure installs.
Human Centered Design (HCD)	Seattle	$25,000	Primary: New York; Sydney; Vancouver; Portland; Melbourne; San Francisco; Auckland. Observing: Toronto	Changing the way cities approach climate issues by working with teams to cultivate a human-centered design mindset and equipping them with human-centered design tools.
Zero Emissions Building Centre of Excellence	Vancouver	$25,000	Primary: New York City; Washington, DC Observing: Yokohama; Sydney; Copenhagen; Brussels; Vienna	Creating the Zero Emissions Building (ZEB) Centre of Excellence as a hub to showcase leaders in ZEBs, sharing learnings, and offering training, resources, and support – with the goal of building a ZEB community of practice.
Net-Zero Program Excellence - A Community of Practice	Sydney	$25,000	Primary: Adelaide; Melbourne. Observing: Perth	Enabling market transformation for net-zero emissions by mobilizing business and residential communities consistently and at scale.

Table 2. CNCA Innovation Fund Round 3 (2017) TA Mini-Grants and Quick Turnaround Grants

	2017 Technical Assistance Grants			
Title	**Grantee**	**Amount**	**Other Cities**	**Outputs / Outcomes**
Yokohama Blue Carbon	Yokohama	$5,000	None	Providing funds for a Round 3 proposal to be developed. Final proposal funded.
Waste Prevention / Electric Vehicles (workforce education)	San Francisco	$7,500	None	Providing funds for two Round 3 proposals to be developed. No funding provided for either proposal.
Urban Planning / Net-Zero Heroes	Sydney	$7,200	None	Providing funds for two Round 3 proposals to be developed. One proposal funded, one not funded.

Thermal Decarbonization / High Performance Hub	New York City	$7,500	None	Providing funds for two Round 3 proposals to be developed. One proposal funded, one not funded.
Human Centered Design	Seattle	$2,500	None	Providing funds for a Round 3 proposal developed. Final proposal funded.
2017 Quick Turnaround Grant				
Travel for Renewable Cities Dialogue	Vancouver	$2,500	None	Enabling Vancouver city team members to attend the 2nd Annual Renewable Cities Dialogue

CNCA Innovation Fund Award Impacts

The following are outputs and known impacts to-date from the grants that closed in 2017.

Integrated Whole Energy System Decarbonization Strategy *(City lead: Boulder, CO)*

Outputs:

- An in-depth energy transition assessment on three sites, one in each of the three cities: Boulder, Minneapolis, and Seattle.
- A comprehensive energy system transition guide "Playbook" that can be utilized by any city interested in developing an energy transition strategy.
- An in-depth case study of a city application of the playbook on a neighborhood - the Chautauqua case study.

Known impacts to date:

- For Boulder, the project created a process to more actively engage the comprehensive planning work group in energy transition planning. The selection of a deep-dive pilot project has also resulted in a cultural heritage site, the Chautauqua, actively pursuing the development of a deep emissions reduction strategy.
- Minneapolis found it useful to connect with staff in their Planning Department on the selection of the location and their initial draft strategies. It grounded the strategies in some market reality and resulted in some modifications. Findings are now integrated into

the Clean Energy Partnership work, and built into the bones of the City's Comprehensive Plan.

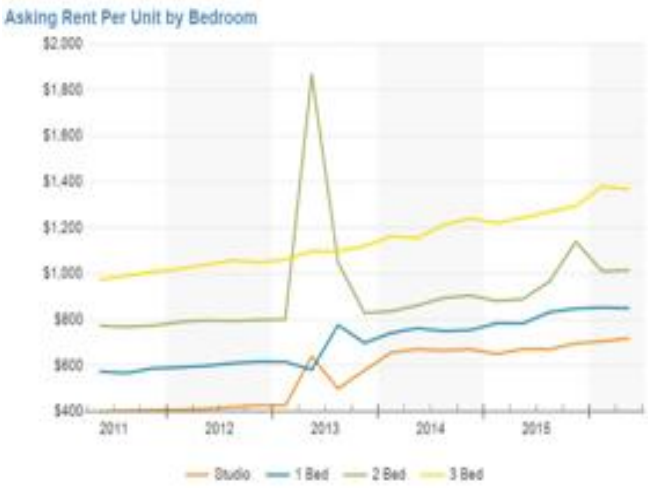
- Seattle integrated findings from the project into the 2017 work plan.

Deep Carbon Reductions in the Transport Sector: Impacts on Affordability and Displacement *(City lead: Portland, OR with special funding from the Bullitt Foundation)*

Multifamily buildings sold 2011-2016 in corridor

Outputs:

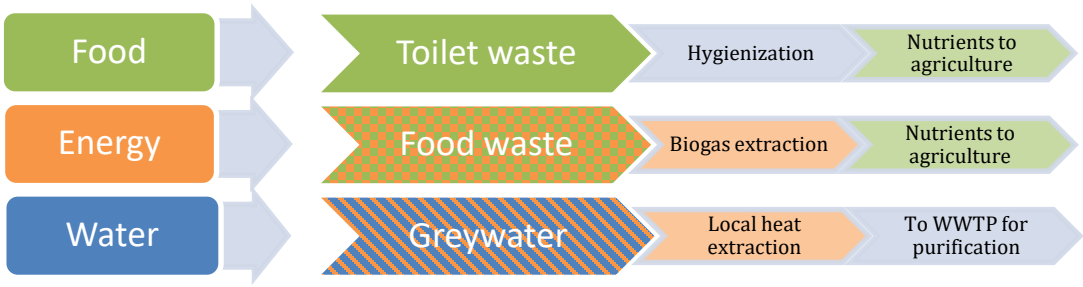
- A summary of household and property research
- A Bus-Rapid Transit (BRT) literature review
- A rental ownership typology report
- A population change (movement of vulnerable households) methodology memo
- A GHG modeling summary



Known impacts to date:

- This project had many unforeseen obstacles during the grant period. The anticipated outcome of identifying a correlation between transportation, carbon reduction and low-income household displacement was not achieved, but there was valuable learning that came from the project.
- The main issues faced by the grant team were data reconciliation problems between the Transportation and Household Displacement models created by Metro and Portland State University, respectively.
- Lessons from this project have been shared with involved/interested Northwestern cities.

Food and Energy in a Circular Economy *(City lead: Stockholm, Sweden)*



Outputs:

- A baseline report that maps and compiles a flowchart for energy (heat and biogas) and nutrients for the "business as usual" scenario
- A scenario report that outlines stakeholder scenarios and scenario assessments:
    - Preconditions for a source-separated wastewater system and implications
    - The potential to optimize and tier energy and nutrient recovery from wastewater
- A final report that costs the work based on the City's preliminary design

Known impacts to date:

- At the water utility, the study tour contributed to an increased understanding of the fact that other European cities have embraced the concept and are now implementing larger urban pilot projects. This understanding has been game-changing for the Stockholm Water Company, who now has a renewed interest in participating in the development of an urban pilot project at Stockholm Royal Seaport. The utility has suggested including blackwater treatment in the pilot, which, if implemented, will be reaching further in terms of resource recovery and reuse than any of the other cities piloting this work.
- The potentials study has also contributed to a better understanding of the technical impacts and costs/benefits motivating testing of the source separated system at the individual property level. For developers who have signed off on meeting stringent energy use criteria, it will be necessary to work with heat recovery from separated greywater on property level. A discussion with the energy utility has been initiated, identifying synergies and potentials for an R&D project, combining an energy project with nutrient recovery using bio-char as the common denominator. This project is engaging the water utility, the energy utility, and the city.
- Because the show and tell element spurs cooperation between the city and the utility, it is possible that there will be a second study tour.

RealIZE: Bringing the clean industrial revolution to existing residential buildings *(City lead: San Francisco, CA)*

Outputs:

- An aggregate supply workshop summary (manufacturers)
- An aggregate demand workshop summary (housing portfolio owners)
- A housing stock analysis summarizing topological and market findings (SF, CA and partners and observers), and featuring data and analytic files for continued use by San Francisco
- A San Francisco go-to-market strategy

Known impacts to date:

- The final deliverable, the San Francisco Bay Area Program Strategy, outlines the expected scope, staffing, work areas, budget required, and targeted budget sources to operationalize the RealIZE program, starting with the San Francisco Bay Area. San Francisco intends to acquire these resources and launch the program.
- The City of New York, as well as the NYC Department of Housing Preservation and Development (which is the largest municipal housing agency in the nation) both participated in the convening in New York, alongside the New York State Energy Research and Development Authority (NYSERDA), and a representative from the Office of the Governor of New York. Subsequently, New York State officials committed to investing $30 million in refurbishing homes and apartment buildings. They created an Energiesprong market development team, RetrofitNY.
- NYSERDA also continued to pursue the development of specific market enabling tools that were identified as critical strategic next steps at our first convening. Specifically, NYSERDA is establishing a deep energy retrofit comparable database that can be used to demonstrate building performance and subsequent improvements in equity value to the financial services industry.

- In Canada, through connection to the City of Vancouver and the Pembina Institute, continued expansion of various programs is emerging. Pembina Institute is using the technical analysis methodology to inform the development of these programs at an October 2017 convening. Pembina and REALIZE continue to actively collaborate and share learnings. Additionally, Natural Resources Canada is conducting an envelope retrofit pilot in British Columbia. NRCan's findings will not only inform the development of technical solutions in Canada, but also a US Department of Energy funded envelope retrofit pilot RealIZE is undertaking starting in 2018.
- As a direct result of the San Francisco convening, the California Housing Partnership Corporation (CHPC) proposed a collaboration to develop one of the most critical pieces of the RealIZE offering: an energy services plan. After doing extensive research on the Energiesprong model, as well as identifying top market barriers in the Bay Area, this work stream was identified as a key strategic next step and will be our next phase of work in the Bay Area market.

Fostering a "Next Wave" of Carbon Neutral City Leaders

CNCA cities are working to completely decarbonize community-wide. However, dozens of additional cities around the world have adopted similar targets and are actively working to achieve them. To accelerate deep carbon reductions in a wider set of cities, CNCA fosters sharing between CNCA members and other cities around the world, by:

- Inviting other leading and "next wave" cities to participate in CNCA Innovation Fund projects:
    - Any city in the world can receive funding, if a CNCA member city leads the project team.
    - Scalability is part of the criteria CNCA Innovation Fund proposals are evaluated against.
    - Projects share methodologies, so other cities can locally apply concepts.
    - City grant leads collaborate with CNCA cities as well as "next wave" cities.
- Producing a Deep Carbon Reduction Planning Framework and accompanying 80x50 plan outline.
- Inviting other leading and "next wave" cities to participate in CNCA webinars.
- Holding "Getting to Carbon Neutrality" workshops for "next wave" cities.
- Posting products, such as infographics and current events on CNCA's website.