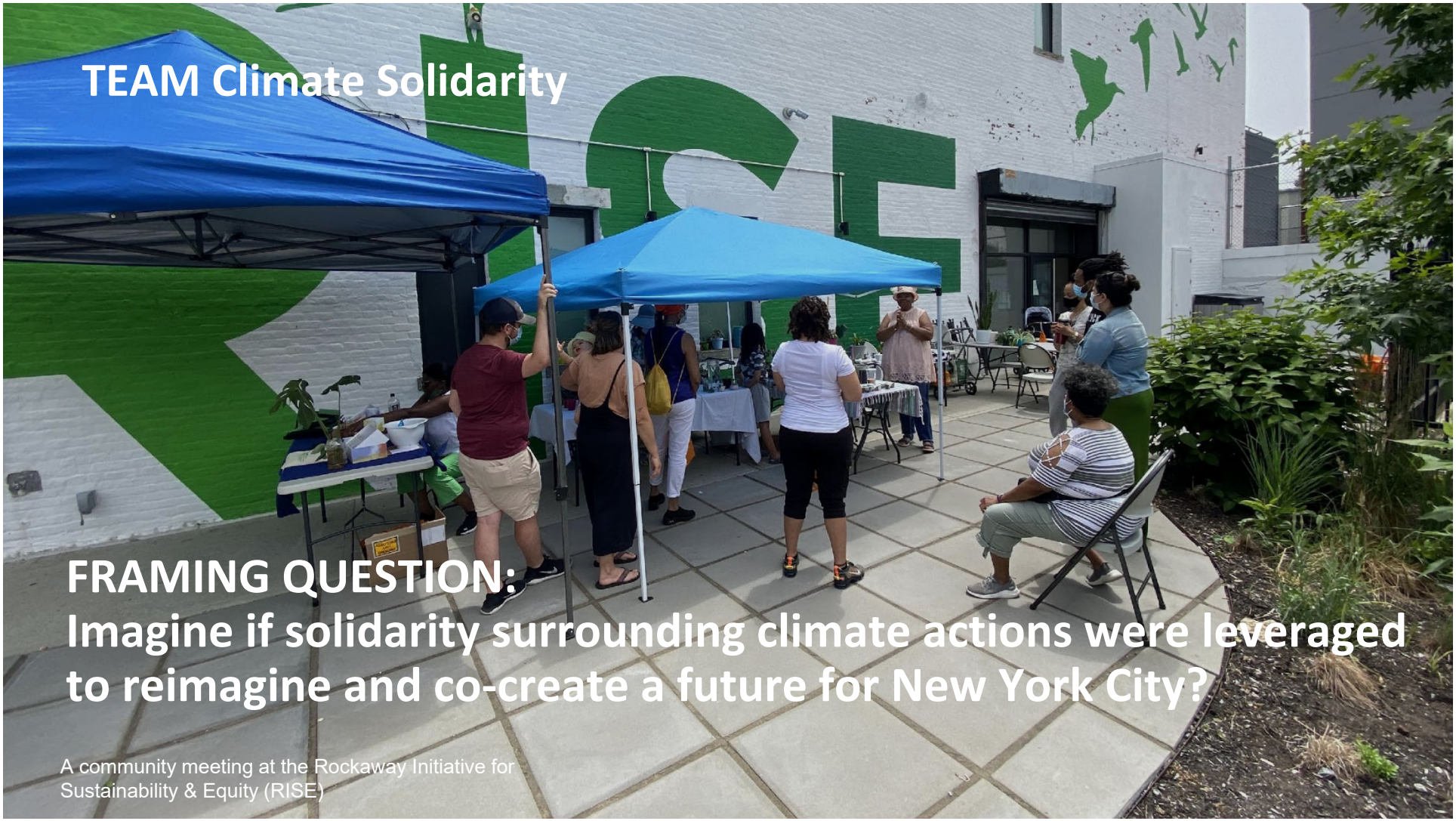
Faculty Members

TEAM Climate Solidarity

Faculty Name	Expertise Critical in Project (up to 2)
Yana Kucheva (Team Lead)	A. Housing Policy; B. Demographic Projections
Ahmed Mohamed (Co-Lead)	A. Power systems; B. Renewable energy
Zihao Zhang (Co-Lead)	A. Urban ecology; B. Smart city/urban technology
Michael Bobker	A. Energy engineering; B. Building electrical systems
Katherine Chen	A. Transformative organizations; B. Participatory research/pedagogy
Prathap Ramamurthy	A. Urban climate; B. Environmental sensing technology
Shawn Rickenbacker	A. Urban climate resilience; B. Urban justice and community engagement
Catherine Seavitt Nordenson	A. Coastal resilience and adaptation; B. Landscape restoration
Huy T. Vo	A. Urban computing; B. Data visualization
Zhigang Zhu	A. AI/machine learning; B. Multimodal sensing and modeling


TEAM Climate Solidarity
FRAMING QUESTION:
Imagine if solidarity surrounding climate actions were leveraged to reimagine and co-create a future for New York City?
A community meeting at the Rockaway Initiative for Sustainability & Equity (RISE)

Energizing Equity:
Co-creating Scalable Urban Resilience via Climate Solidarity

Problem Statement:

The ***climate crisis*** is an opportunity to ***reimagine urban futures.*** Growing ***climate injustices*** coupled with pre-existing urban inequities can foster mass ***displacement*** of vulnerable populations and catastrophic failure of critical urban infrastructures. While existing technologies could mitigate these, ***gaps*** between ***data*** and ***design***, ***analysis*** and ***action***, ***top-down*** visions and ***bottom-up*** efforts hamper contemporary communities' efforts to establish ***actionable plans*** to adapt to the changing climate.


Imagine if solidarity around climate actions was leveraged to reimagine the future of New York City via co-created scalable urban resilience projects.

Objectives

All objectives involve stakeholders documenting current conditions and visualizing possibilities so that people know how to focus organizational and community efforts.

1. **Web-based urban climate service platform** with consolidated data, visualizations and simulations for on-going public dialogue, program evaluation, and decision-making

2. **AI-enabled physics-based models** of climate change at micro scales, coupled with demographic projections of population displacement and infrastructural vulnerabilities

3. **Pathway for low-energy, grid-interactive affordable housing** through deep retrofits and subsidized financing mechanisms (NYC Local Law 97)

4. **Community-based energy infrastructure project in Harlem**: “energy cell”/microgrid model with community participation, public agency, and utility recognition

5. **Launch a citizen science initiative** for knowledge co-creation

6. **Standing institution located at CCNY** with joint community-public sector governance for ongoing work and training of the next generation of climate leaders

Intellectual Merits and Broader Impacts

Intellectual Merits

1. Combine urban design, engineering, computer science, and sociology frameworks to co-create a socio-eco-technical framework that addresses present climate change issues
2. Pioneer an interdisciplinary approach to convergent science where technological solutions in electricity and building efficiency and AI tools with multimodal data visualization and analytics are built into policy scenarios that place housing and energy justice at the forefront of a transition to a decarbonized future
3. Develop microgrid renewable energy models and identify actionable climate solutions with community leadership and input

Broader Impacts

1. Enable community voices
2. Promote student engagement and leadership
3. Break silos across public agencies, community organizations, and academia

Technical Approach

Work Package 1

Online platform “Climate Solidarity” for convergence research around climate actions

Work Package 2

Data Science for modeling and visualization of impacts and risk assessment

Work Package 3

AI-Enabled Community Energy Cells: a transformative approach to decarbonize the grid and achieve energy justice

Work Package 4

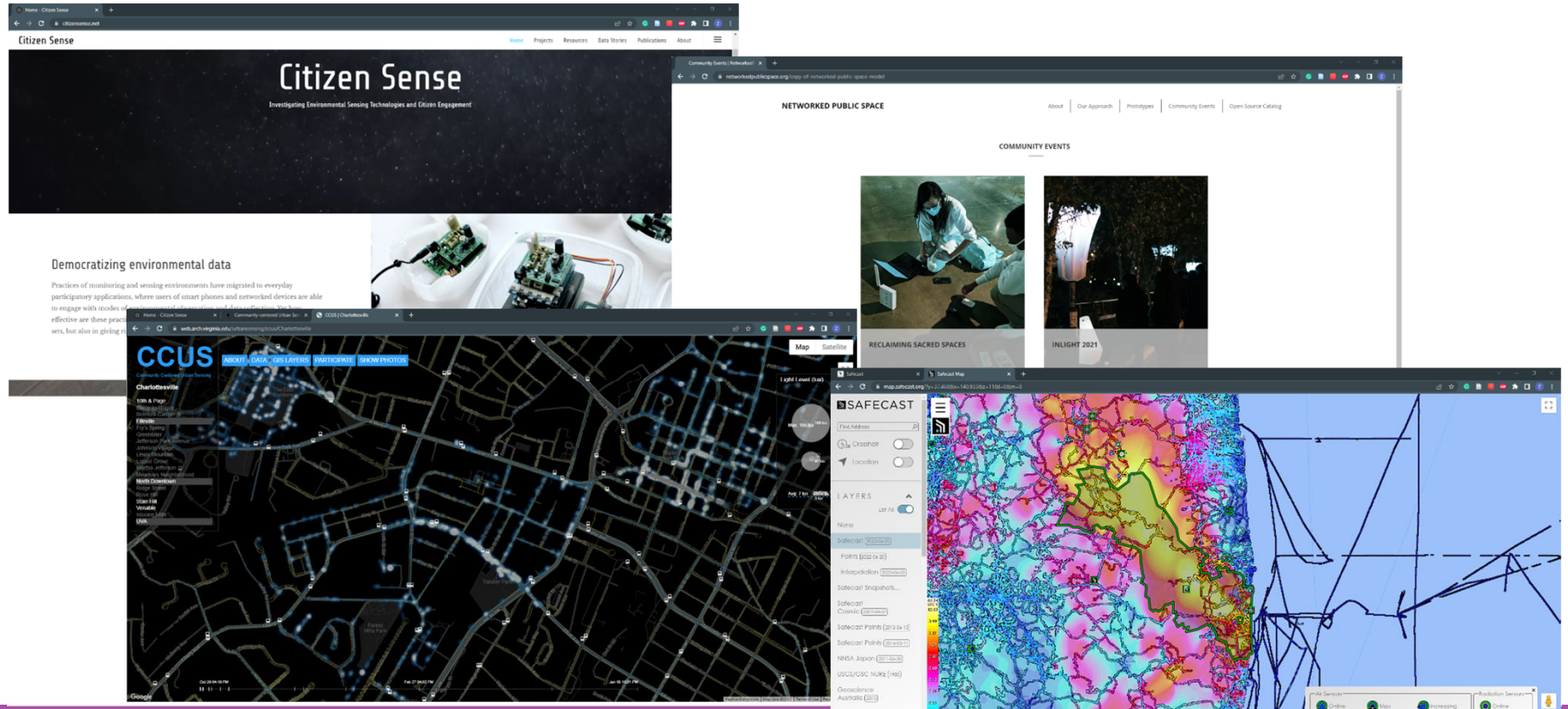
Community Climate Response Index (CCRI) by evaluating current NYC climate resilience efforts

Work Package 5

Participatory Research and Community Engagement for Public Policy Development

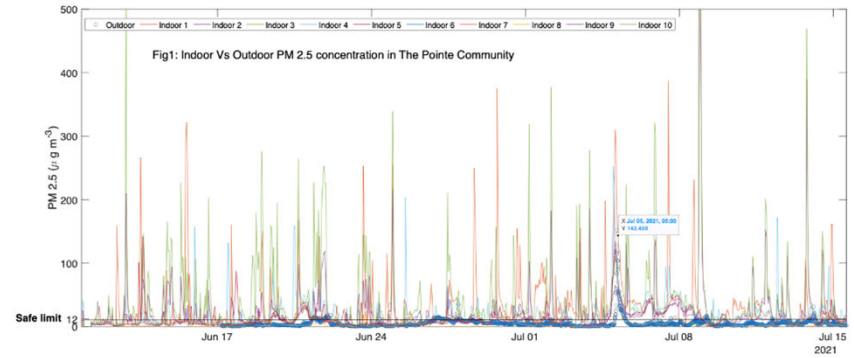
Work Package 1:

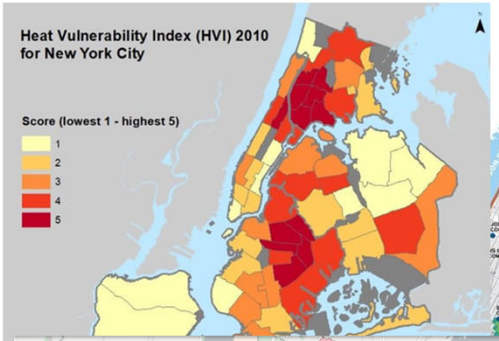
Web-based urban climate service platform with consolidated data, visualizations and simulations for on-going public dialogue, program evaluation, and decision-making

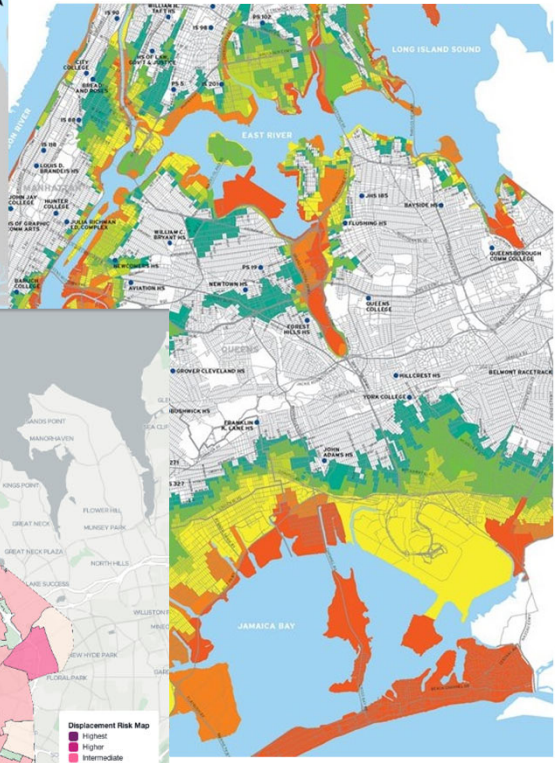


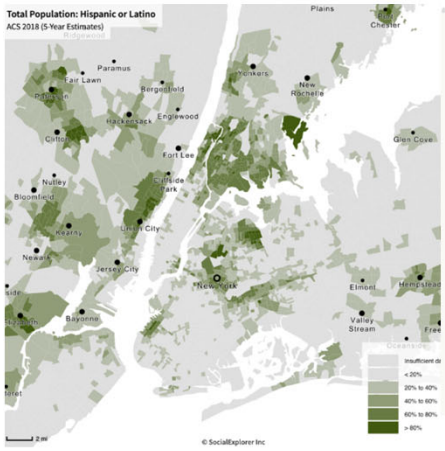
Work Package 2:

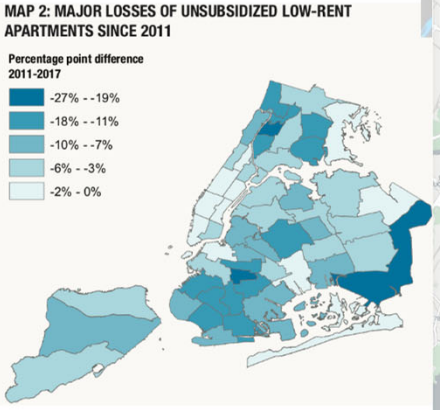
Data Science for modeling and visualization of impacts and risk assessment

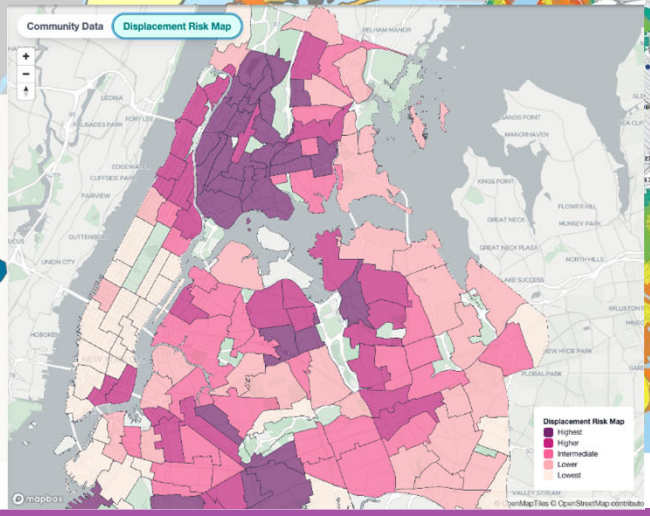












Work Package 3

AI-Enabled Community Energy Cells: a transformative approach to decarbonize the grid and achieve energy justice

BRIGHT POWER

HOME SOLUTIONS MARKETS SUCCESS STORIES ABOUT US CONTACT US CAREERS

NEWS

NYCHA Announces Completion of Solar Installations at Queensbridge Houses

NYCHA

APRIL 22, 2021

Largest community solar project in New York City completes installation of 1.8 megawatts of solar arrays across 27 rooftops, with NYCHA residents helping to power the solar team

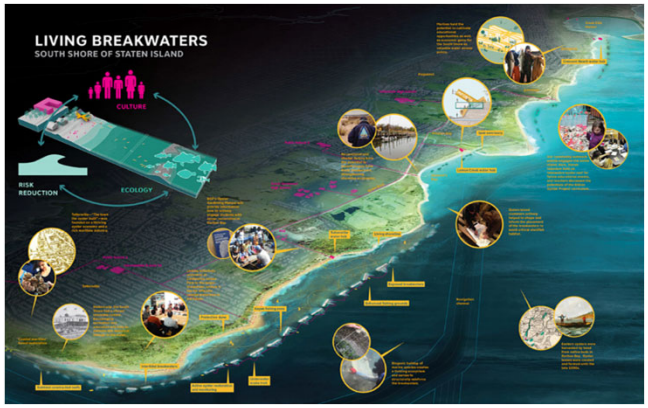
NEW YORK – Today, the New York City Housing Authority (NYCHA) announced substantial completion of 1.8 megawatts of rooftop solar arrays on 27 buildings across Queensbridge North and Queensbridge South Houses, the largest public housing project in the country. This solar installation is the first to reach completion as part of NYCHA's solar program, and is a key component of the **NYCHA Sustainability Agenda** commitment to host 25 megawatts of solar power by 2025, which will make it the largest community shared solar project in New York City.

A solar developer team led by **Bright Power**, **Sol Purpose**, and **Sunwealth Power** worked with the Authority to design, install, and maintain the solar systems. NYCHA will receive $1.3 million in lease revenue over the next 20 years. As a part of this project, a cohort of NYCHA residents have been trained in solar installation and have received their OSHA certification. The project team has hired 13 NYCHA residents and community members as full-time installation employees for this project, with opportunities for advancement and permanent employment.

"NYCHA roofs are a valuable asset to drive equitable access to solar energy, raise much-needed revenue and provide inspiring workforce development opportunities for our residents to join the green jobs economy," said **NYCHA Chair & CEO Gregory Russ**. "This project is one of many that speak to the Authority's necessary work around climate resiliency and sustainability."

Work Package 4:

Community Climate Response Index (CCRI) by evaluating current NYC climate resilience efforts



Work Package 5:

Participatory Research and Community Engagement for Public Policy Development

Team Milestones

5/31/2023

Complete data collection and AI-assisted modeling
Produce a publicly available dataset of NYC housing and infrastructure vulnerabilities at the micro level

Develop visualization and risk assessment approaches
An AI-enabled climate visualization and modeling methodology coupled with demographic projections

8/31/2023

Launch online platform
Interactive "Climate Solidarity" platform for climate futuring scenarios with inputs from Milestones 1 and 2

Develop microgrid model
White Paper for a pathway for low-energy, grid interactive affordable housing

Develop CCRI of local climate resilience strategies
Co-created CCRI through community engagement and local knowledge

Develop citizen science collection tools
Develop research protocols and user-friendly sensors

8/31/2024

Further development of interactive platform and climate models
Integrate CCRI and community engagement knowledge into "Climate Solidarity" platform and AI-enabled models

8/31/2025

Launch "Energy Cell" community demonstration project
Demonstrate a community-based energy infrastructure project in Harlem

Integrate in CCNY curriculum
CCNY Standing institution with joint community-public sector governance

20XX

CCNY Institution + yearly symposiums + long-term impact on NYC

Team Qualifications

Critical Expertise to Accomplish the Proposed Work

1. **Interactive Visualization and Scenario Building**

   Urban computing; Visualization; Interactive online maps; and Design

1. **Data science for modeling and visualization**

   Demographic modeling; AI / Machine Learning for data analytics; Urban climate modeling; Data visualization

1. **AI-enabled electric grid models**

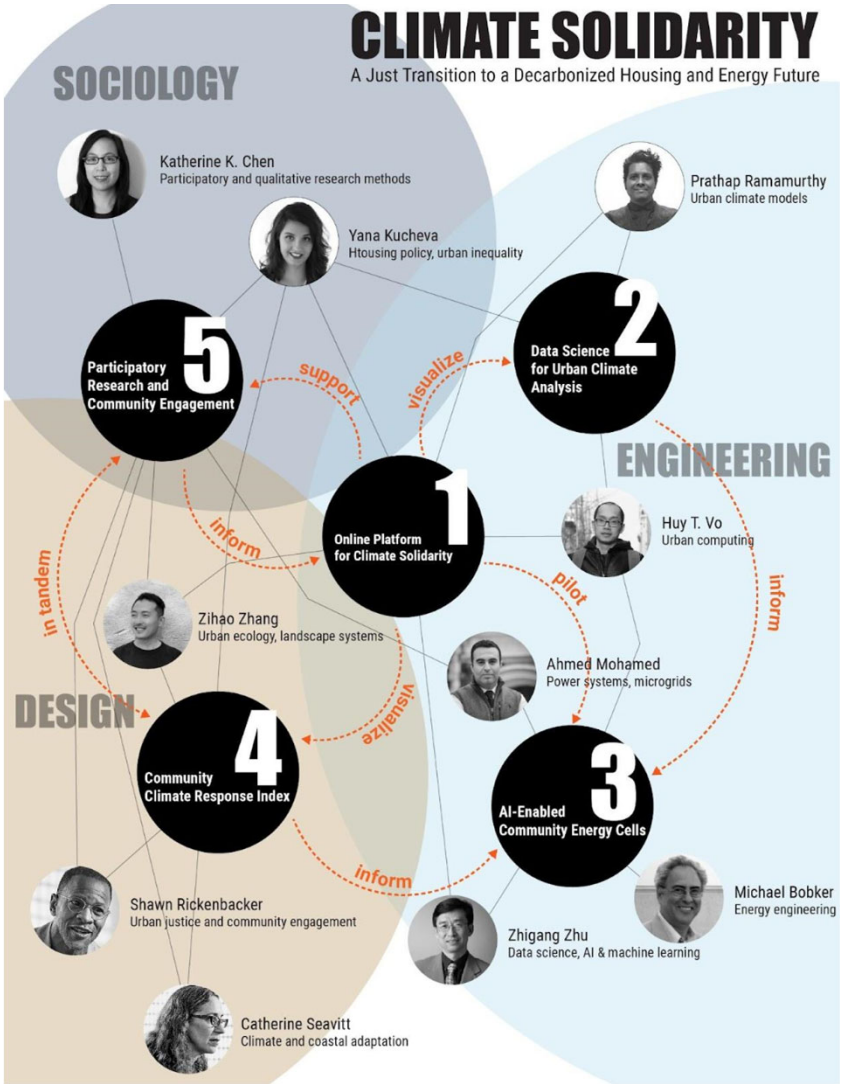
   AI-based algorithms; Microgrids; Electrification; Energy engineering; Building systems

1. **Program evaluation through community engagement**

   Direct work with communities, organizations, and city agencies; Urban climate resilience programs

1. **Citizen science for policy development**

   Ethnography; Organizational sociology; Community engagement; Citizen sensing; Climate justice



Management Plan

- Team co-leads: Drs. Kucheva (Sociology), Zhang (Design) and Mohamed (Engineering)
- Postdoctoral scholar as project manager
- Monthly collaborative meetings
- Yearly symposium and workshop with community partners

Future Funding Prospects and Self-Sustaining Plan

Funding sources

- **Government Sources**: NSF (Smart and Connected Communities; Coastlines and People Hubs for Research and Broadening Participation); Department of Energy, Building Technologies Office (BTO)
- **Private Foundations**: New America Public Interest Technology
- **Public and Private Partners**: NYSERDA Clean Energy programming; NYC Mayor's Office; NYC Housing Authority; Con Edison; NGO partnerships
- **Curriculum Development**: CCNY Cengage

Book series tied to annual interdisciplinary conferences

Standing institution at CCNY with joint community-public sector governance for community dialogue and student leadership training