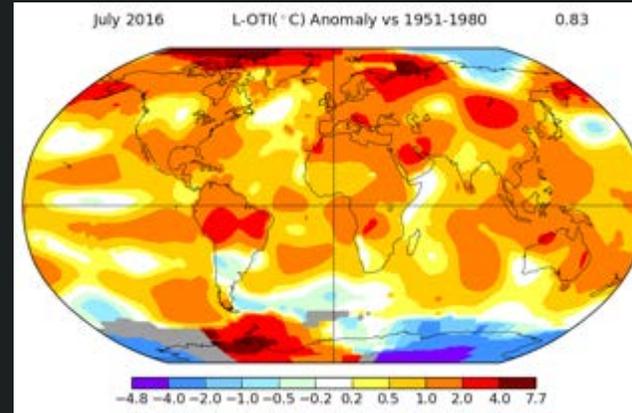


SFU

ACT

Adaptation
to Climate
Change Team



Clean Technology for Resilient Communities

Deborah Harford, Executive Director, ACT, SFU

CEC: June 26, 2020

SFU, CEC and ECCC

- SFU's Pacific Water Research Centre is collaborating with CEC on flood damage costing
- ACT, SFU is collaborating with ECCC on research into clean, resilient flood technology (report release early July)



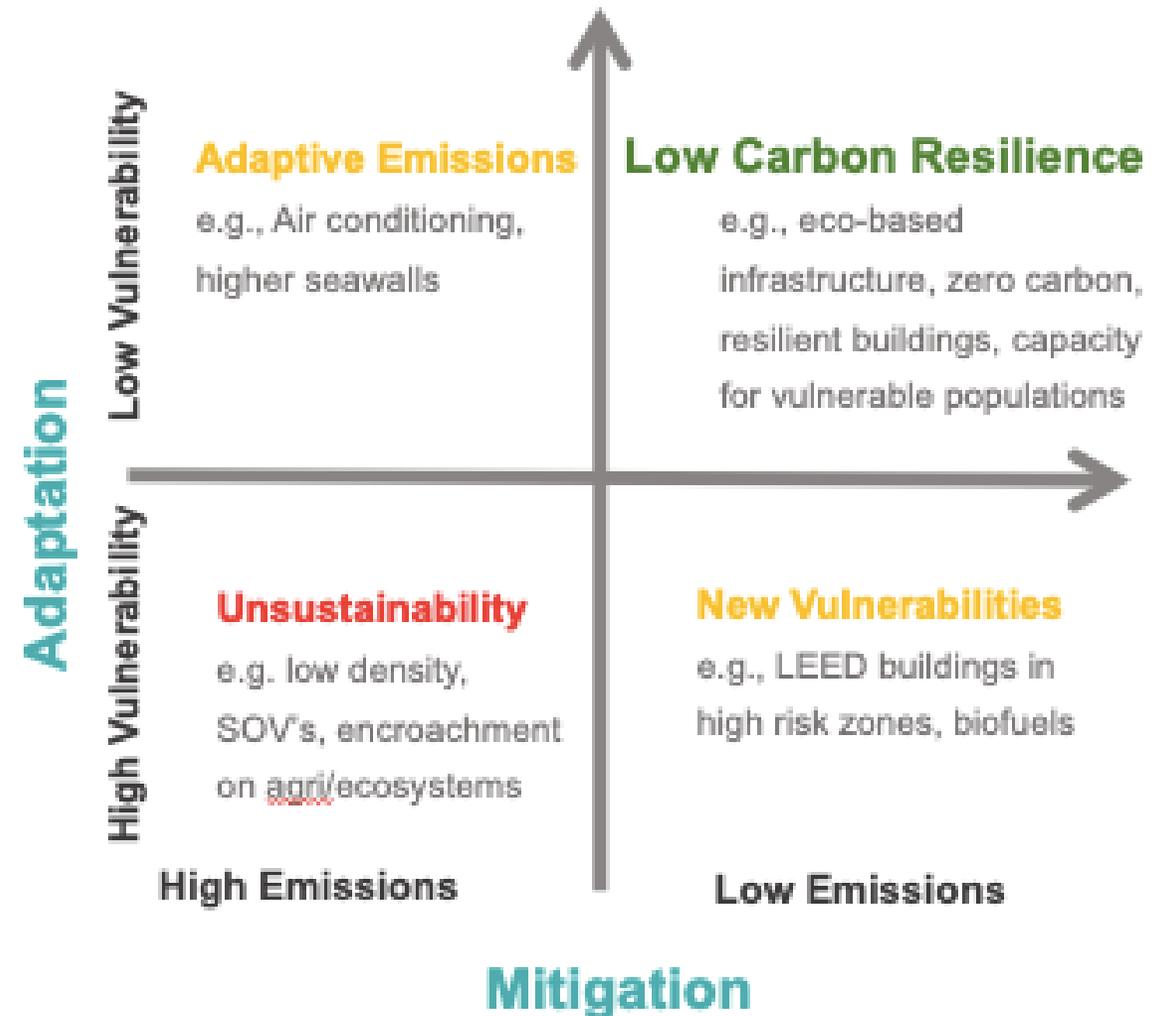
Climate Action Urgency for Communities

- **Urgency on Emissions:** 10 years to reduce emissions, stay within 2°C (or 1.5!) of warming.
- **Increasing Climate Risks and Damages:** Heat, drought, wildfire; new health risks, ecosystem impacts; water and food security issues.
- **Intersectionality:** Vulnerable populations, health, social justice and equity; sixth mass extinction; plus converging/cascading impacts increasing.
- **Need for Climate Action Planning:** Adaptation and emissions reduction still siloed. Climate action still seen as an “add on”, discarded when other issues arise. Uncertainty requires phasing/modularity.
- **Communities are on the front lines with limited capacity and disproportionate responsibility!**



Low Carbon Resilience (LCR)

Low carbon resilience (LCR): a climate action approach that coordinates and mainstreams mitigation, adaptation, and co-benefit strategies into all planning and decision processes, aligning with priorities such as equity, health, economic development, and thriving biodiversity.



Credit: Adapted from Cohen & Waddell, 2009

(Adapted from: *Cohen and Waddell, 2009*)

Key Hazards and Risks

Key climate hazards:

- Flooding
- Heatwaves
- Drought
- Wildfire smoke

Key climate risks:

- Infrastructure damage
- Health impacts
- Loss of water, food and energy security
- Ecosystem and biodiversity impacts
- Economic losses
- Disproportionate impact on vulnerable



ACT/ECCC: Resilient, Clean Flood Technology

Key Criteria:

Does it reduce risk?

Does it reduce emissions?

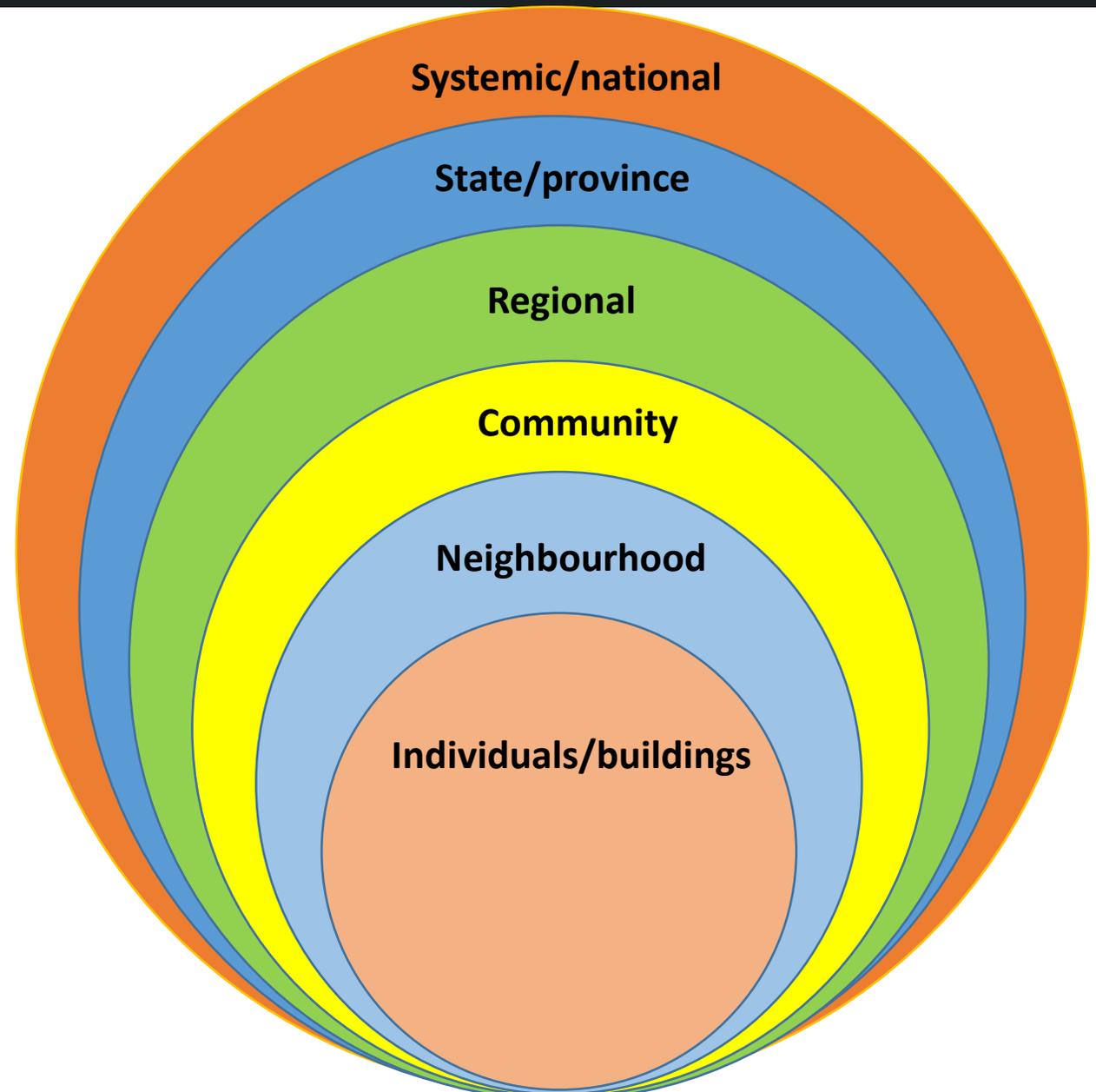
Does it provide co-benefits?



Nested Levels of Action for a Resilient Ecosystem

Priorities:

Early Warning Systems
Emergency Responses
Decision making/Planning
Essential Services



Clean Tech for Climate Resilience: Examples

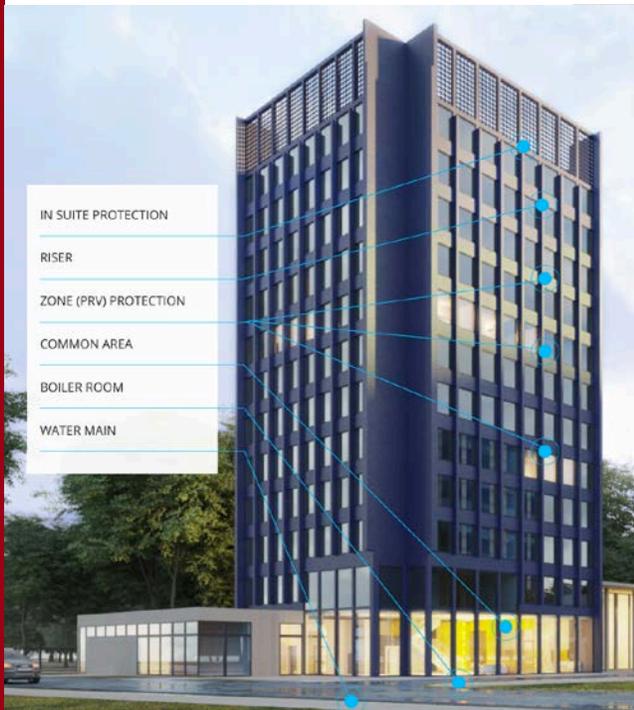
Sensors/Early Warning Systems (community/individual)

Data/Mapping (national/community)

Smart/Micro Grids (national/state/community)

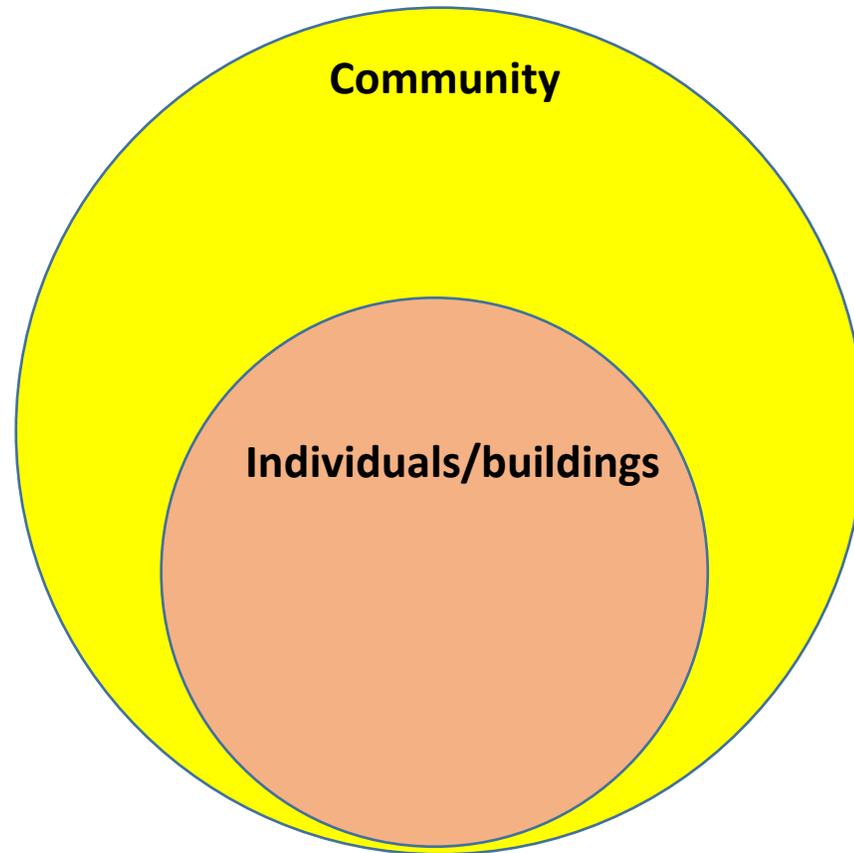
Modular Infrastructure/Adapted Buildings (neighbourhood/individual)

Water Treatment/Cogeneration Plants (state/regional/community)



Clean Tech for Climate Resilience: Examples

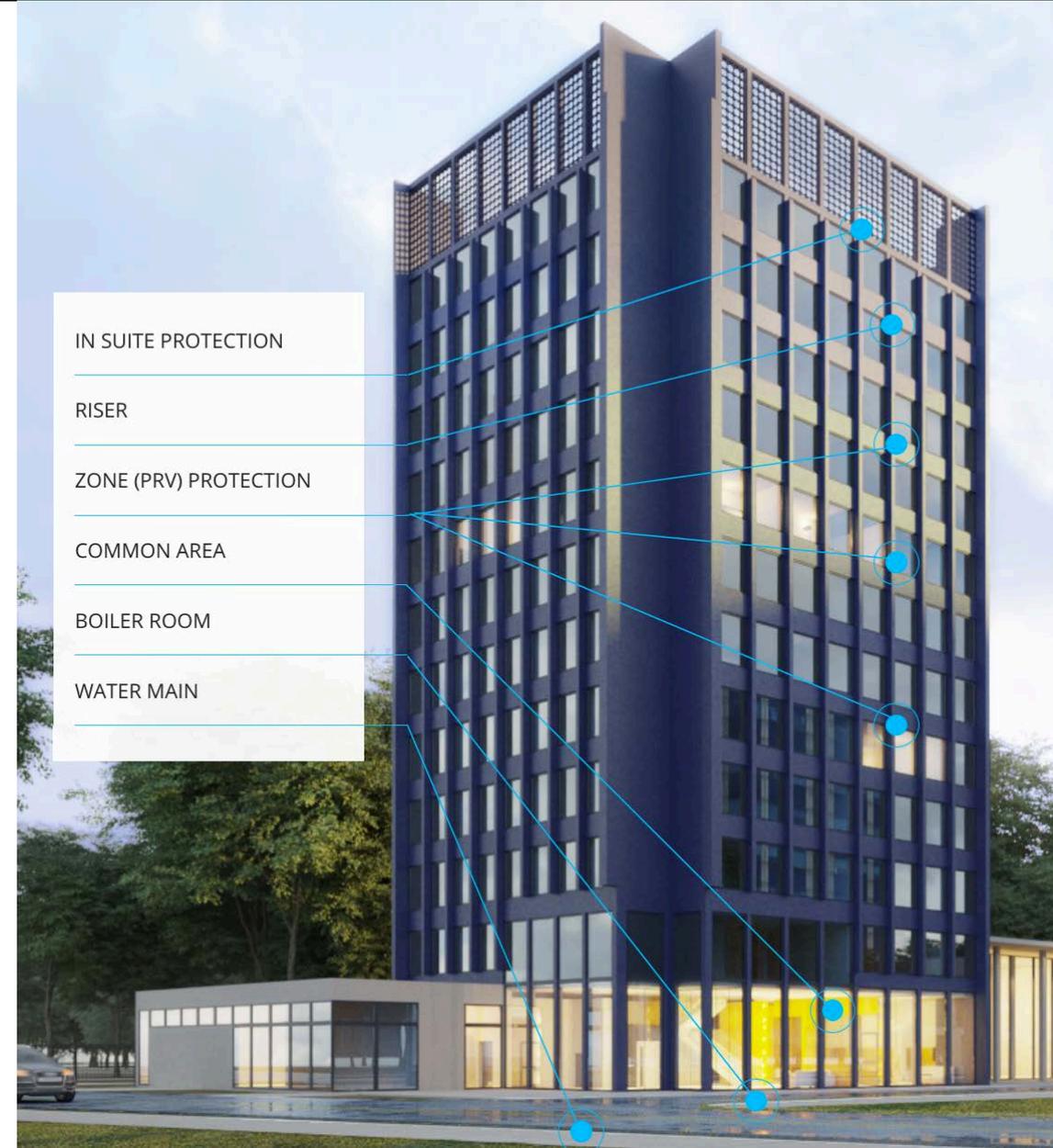
Sensors/Early Warning Systems



Eddy Solutions: Toronto, Canada

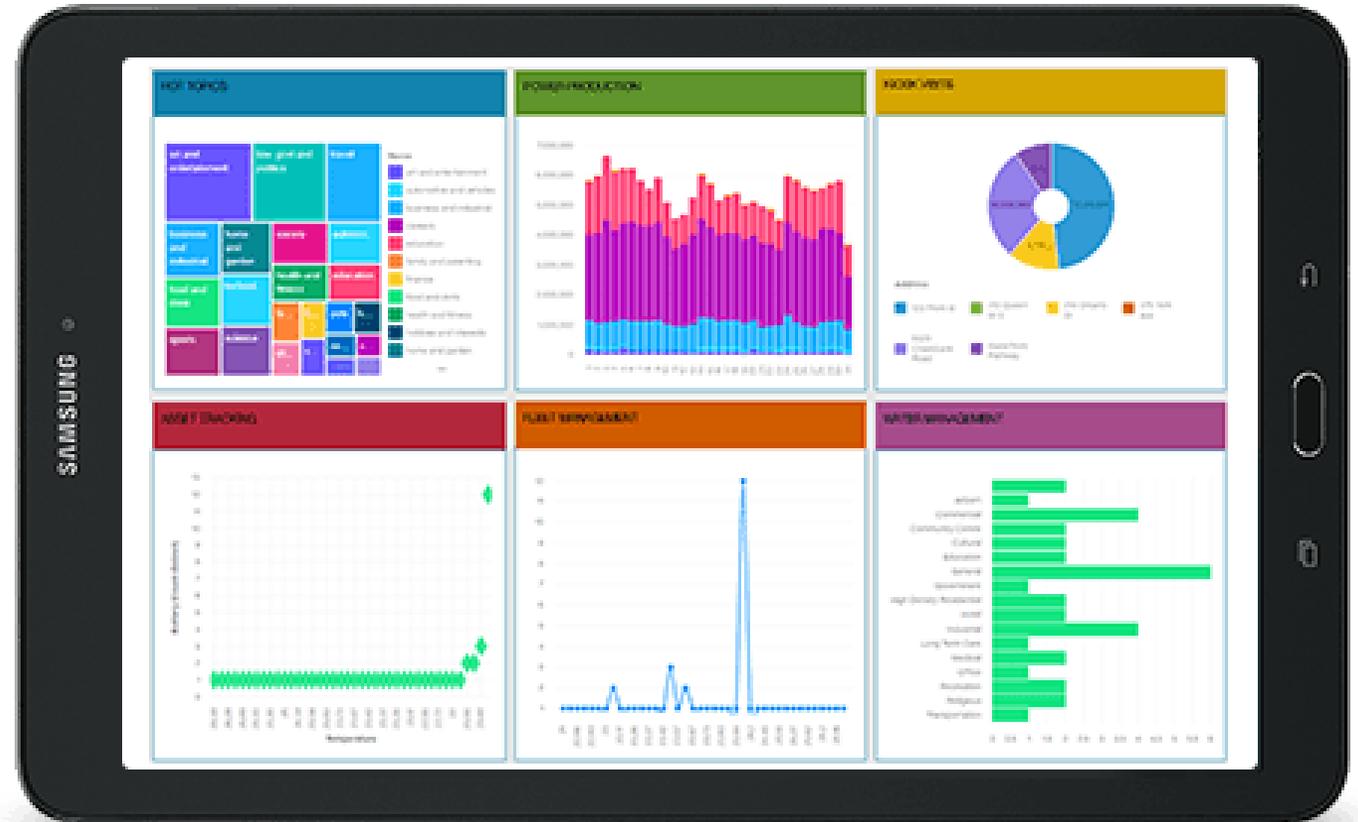
Eddy's H2O sensors monitor the presence of water, as well as temperature and humidity.

The system operates on a LoRaWAN platform, and integrates with immediate notifications for shutoff.



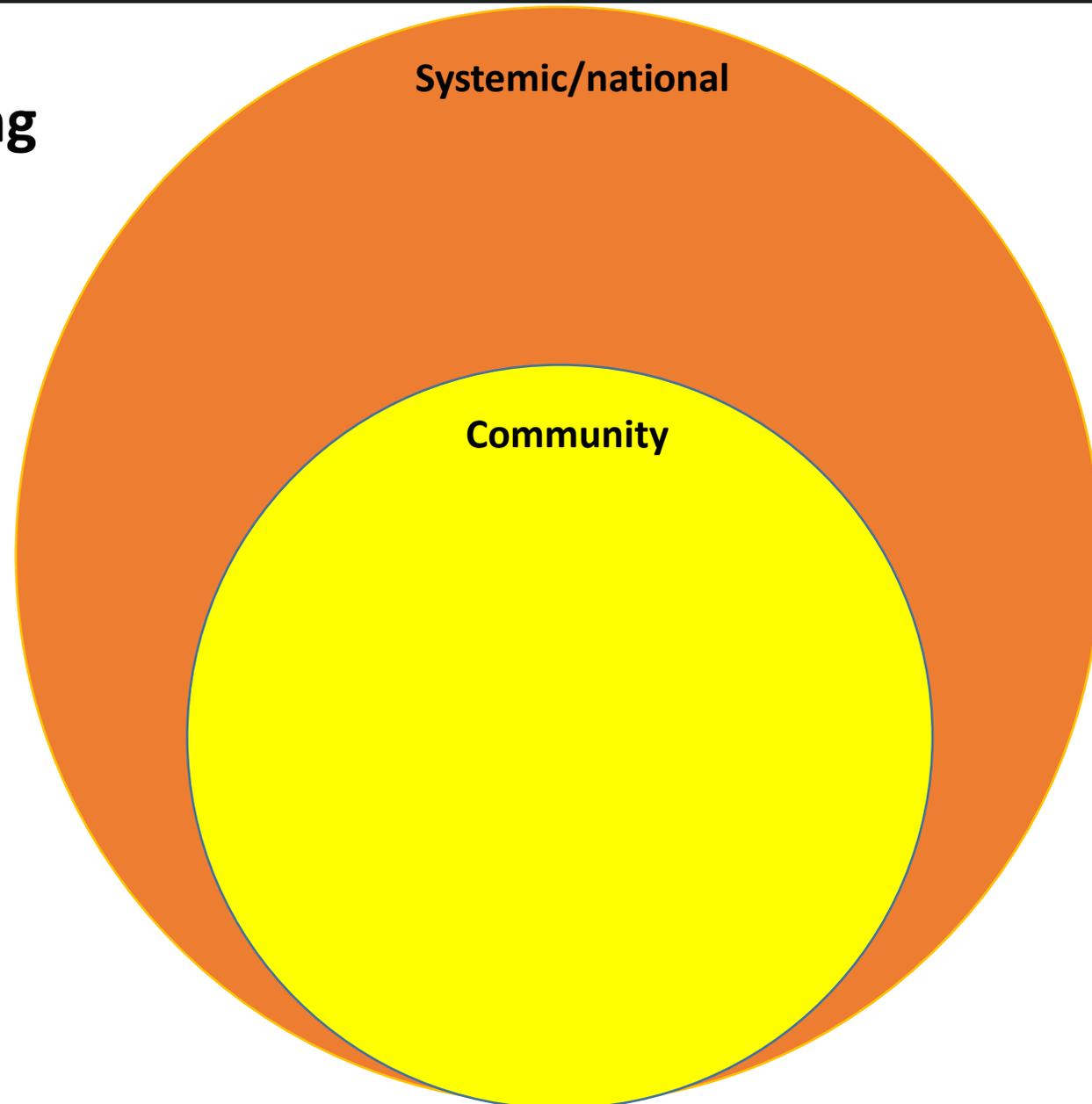
Smart City Initiative: Markham, Ontario

Smart city initiative to improve city operations and sustainability public-private partnership implementing solutions for asset monitoring, flood and water leak detection and energy management.



Clean Tech for Climate Resilience: Examples

Data/Mapping



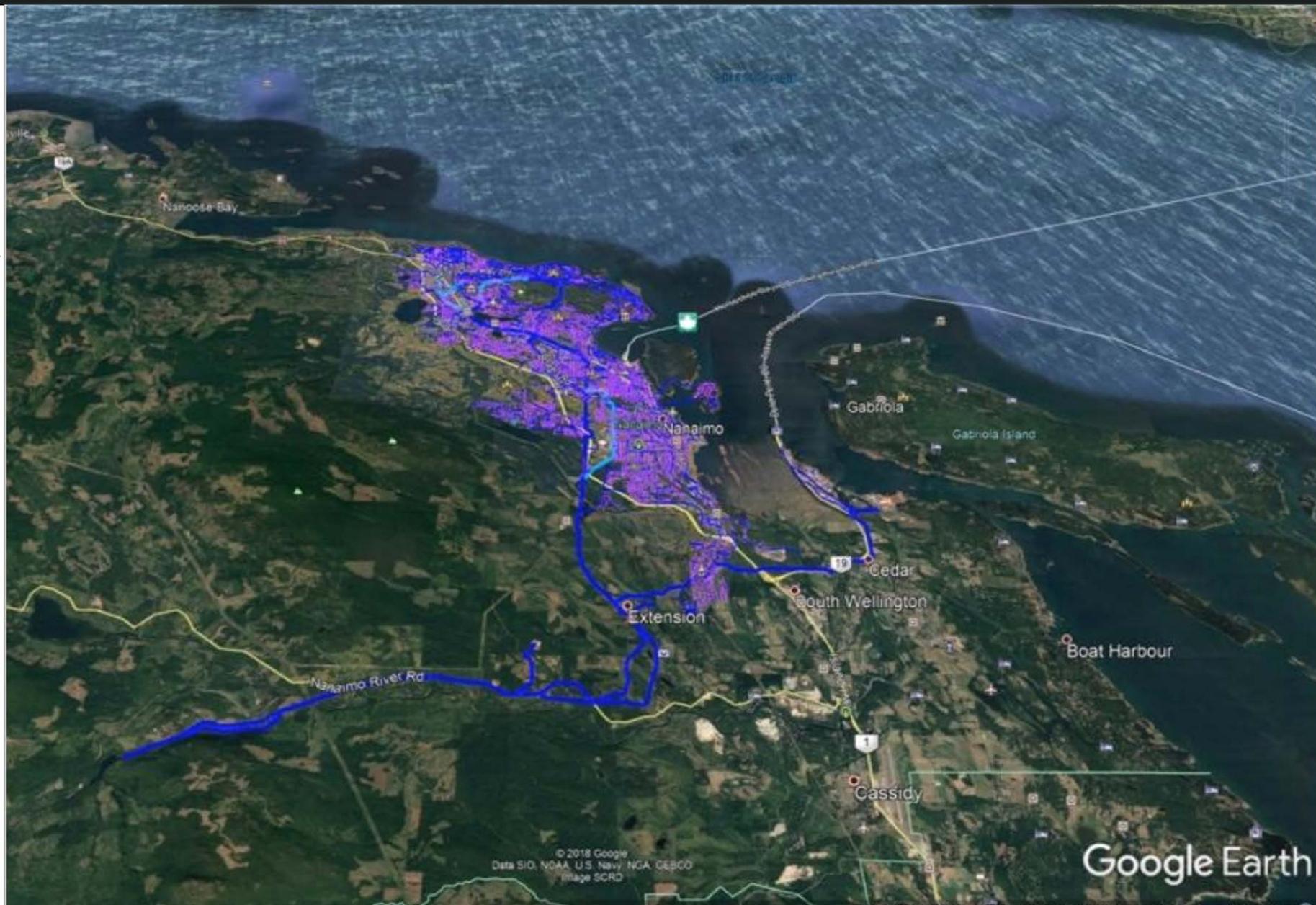
Sea Level Rise Forecasting: ISEECI, California

Using data to test the feasibility of ecosystem-wide responses to climate change, including projections of coastal impacts of climate change.



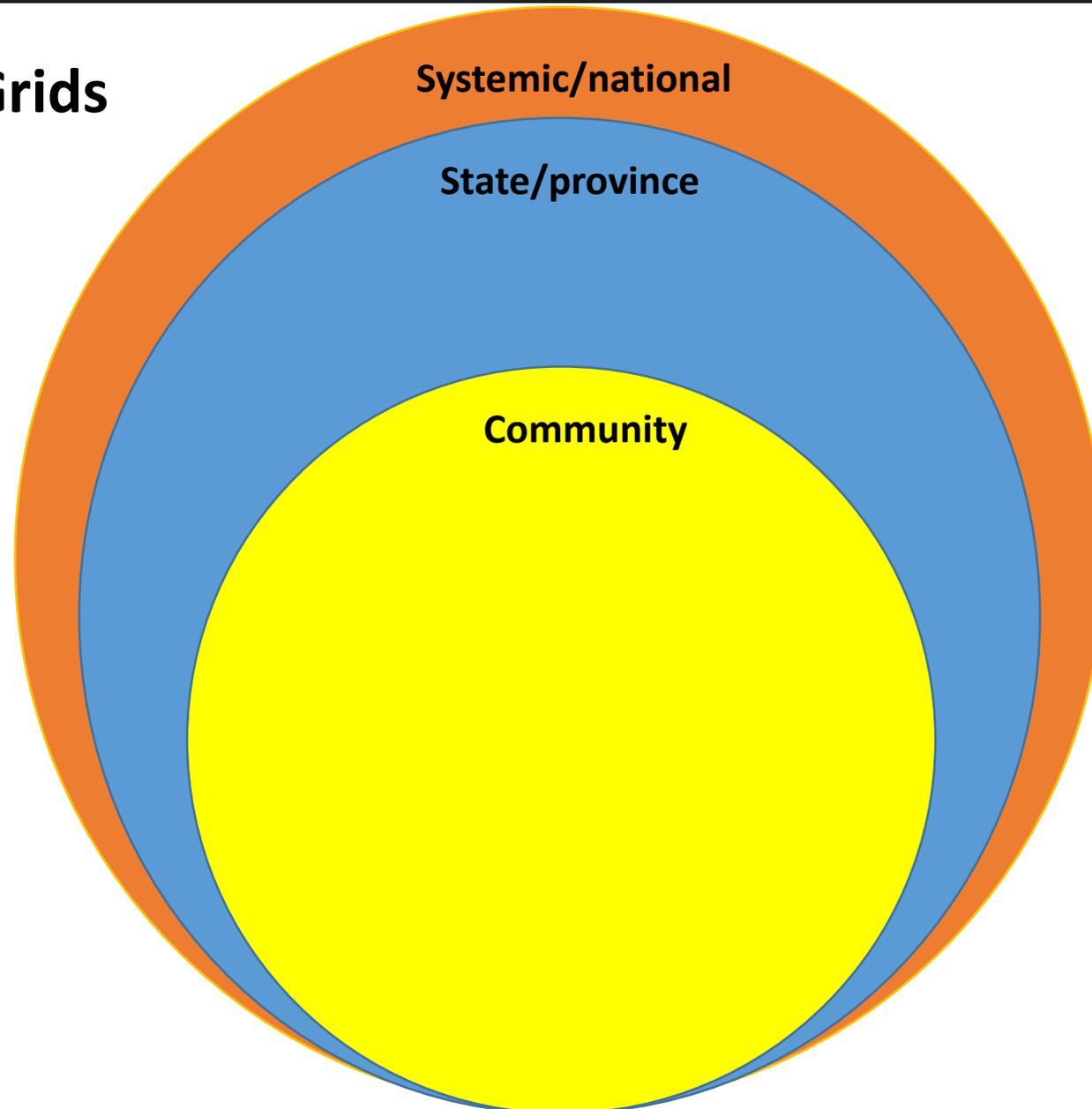
Systemic Interdependency Maps: Nanaimo, Canada

Critical systems interdependency mapping and hazard analysis for regional general hospital resilience planning.



Clean Tech for Climate Resilience: Examples

Smart/Micro Grids



Smart Grid: Mexico

\$6.3 billion invested in smart grid infrastructure plus \$2.1 billion in LED and smart street lighting by 2027. Includes smart metering, distribution automation, battery storage, home energy management, information technology and wide area measurement.



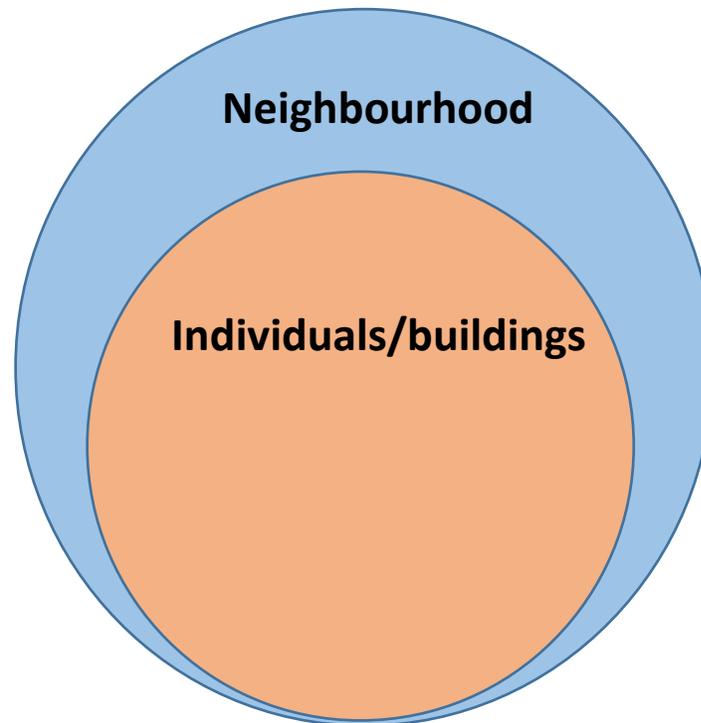
Micro Grid: Green Lake, Saskatchewan

“This initiative takes advantage of the substantial opportunity of using Nature to produce electricity, to reduce energy costs and our carbon footprint, while aligning with Cultural considerations of our predominantly Aboriginal population.”



Clean Tech for Climate Resilience: Examples

Modular Infrastructure/Adapted Buildings



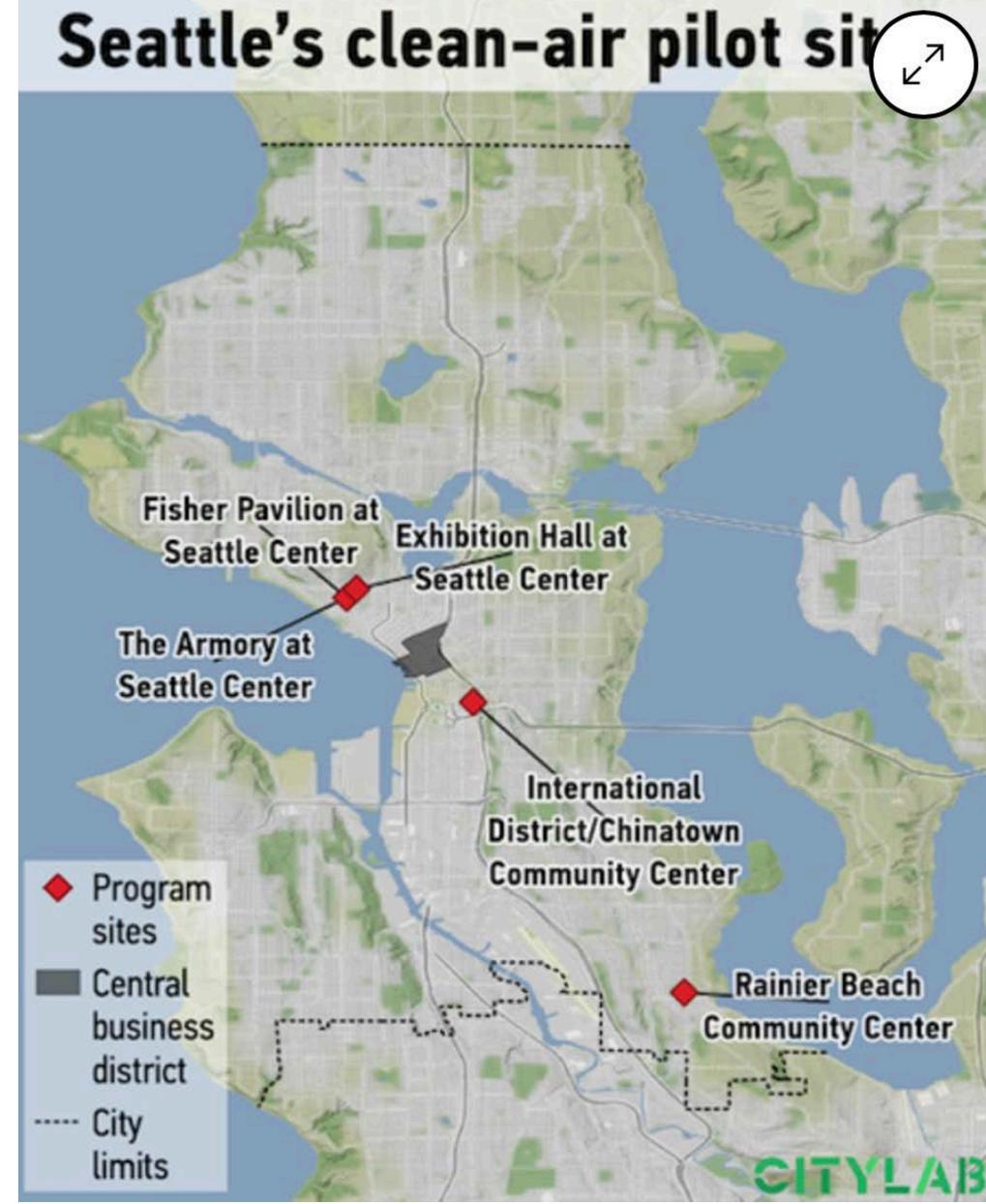
Modular Flood Barriers: Kitchener, Canada

Water-Gate flood protection dam uses incoming floodwater to deploy. Light weight design allows timely intervention in remote/hard-to-access environments.



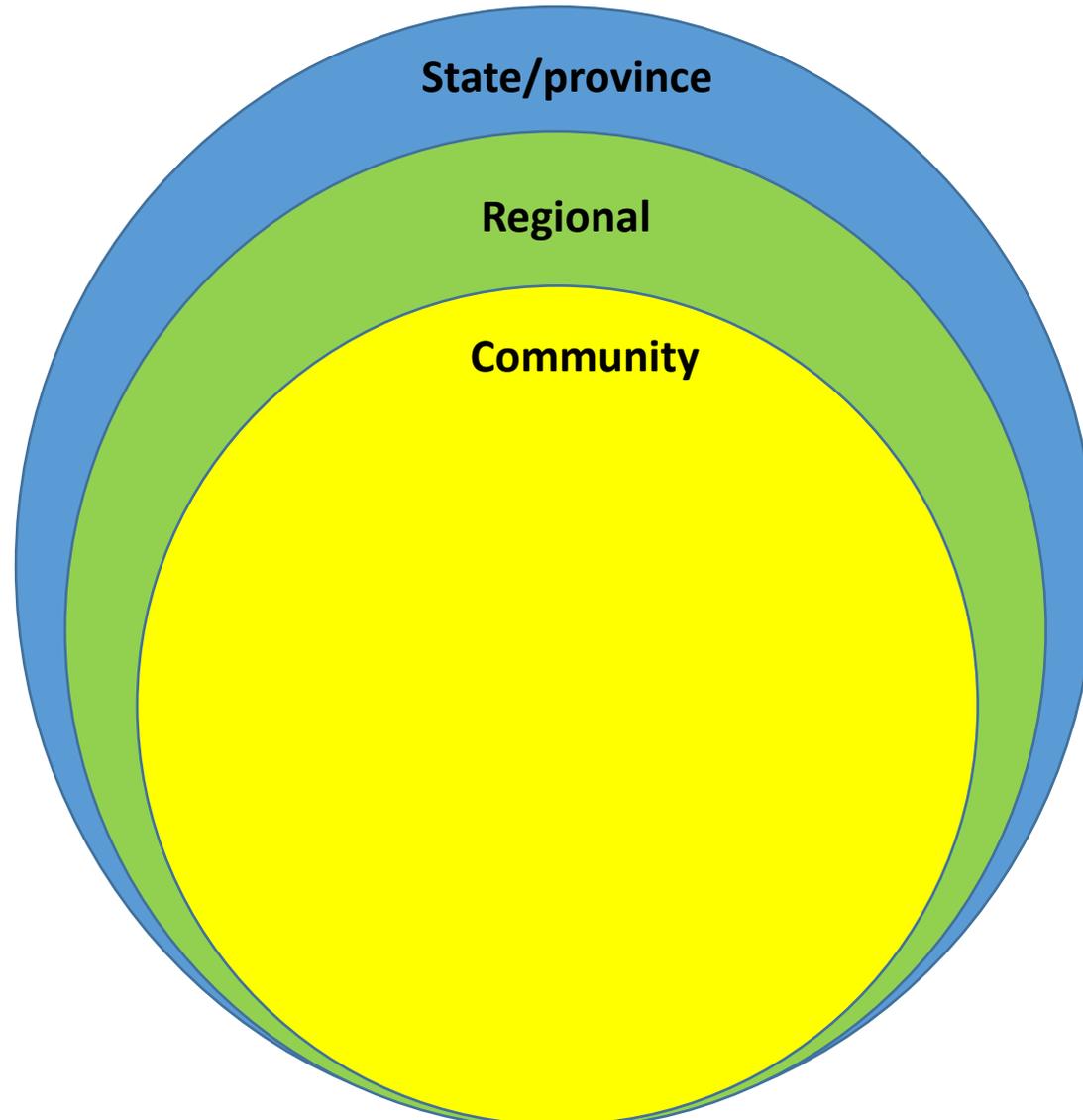
Clean Air Rooms: Seattle, USA

Advanced, energy-efficient air filtration for wildfire smoke; possibility of using “air scrubbers,” or mobile filtration units.



Clean Tech for Climate Resilience: Examples

Water Treatment/Cogeneration Plants



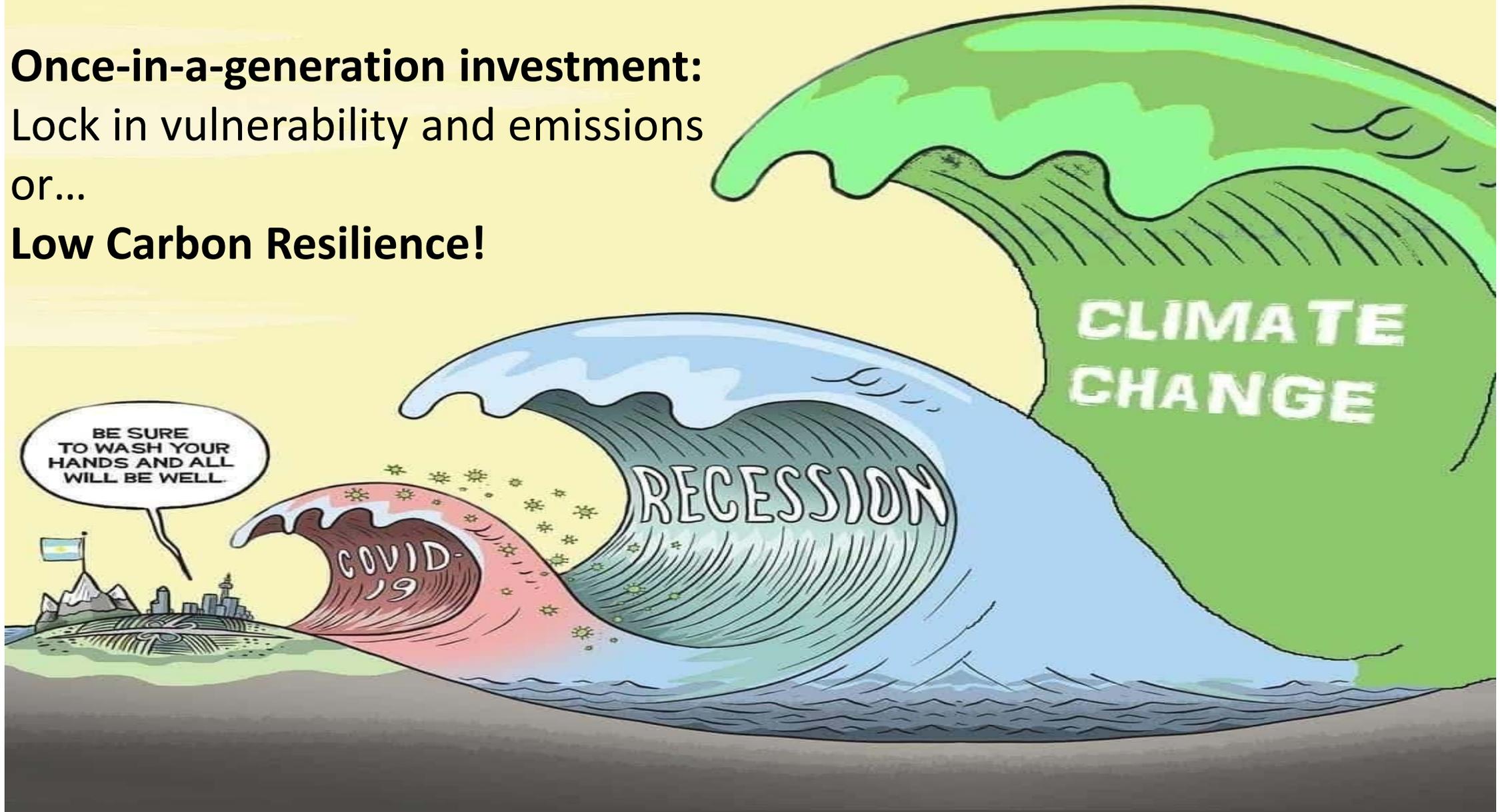
Waste Water Treatment: Atotonilco, Mexico

Wastewater treatment, irrigation water, drinking water, cogeneration of power and heat using methane gas, improving living conditions of 300,000 inhabitants in the region.



COVID-19

Once-in-a-generation investment:
Lock in vulnerability and emissions
or...
Low Carbon Resilience!



Summary Recommendations

- **Provide sustained funding** for low carbon resilience projects to support local governments and Indigenous communities
- **Support collaboration** among levels of government and the private sector
- **Tie stimulus funding to criteria** for low carbon resilience
- **Incentivize low-impact development**, nature-based solutions
- **Assist companies with scaling up** products/services
- **Identify creative financing opportunities** - stimulate green jobs (e.g. revenue-sharing, private sector/NGO partnerships)
- **Ensure diverse representation** at the decision table (public participation, vulnerable populations, Indigenous Peoples)

Questions?

Thank you!

