Multisolving Resiliency: Case Studies Prioritizing Climate, Equity, and Collaborative Benefits

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CLIMATE INTERACTIVE

Carolinas Climate Resilience Conference

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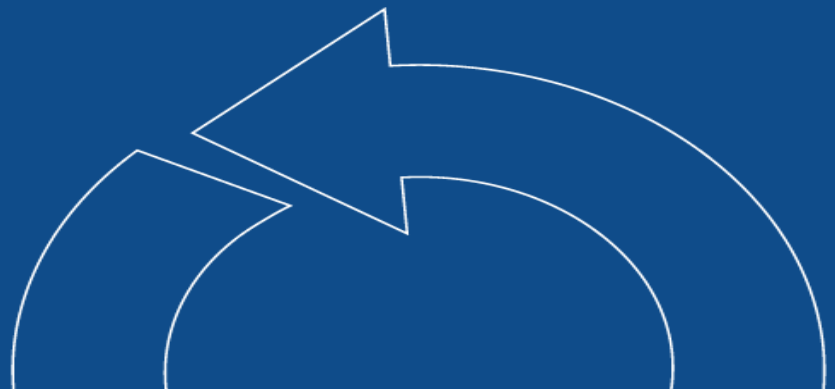
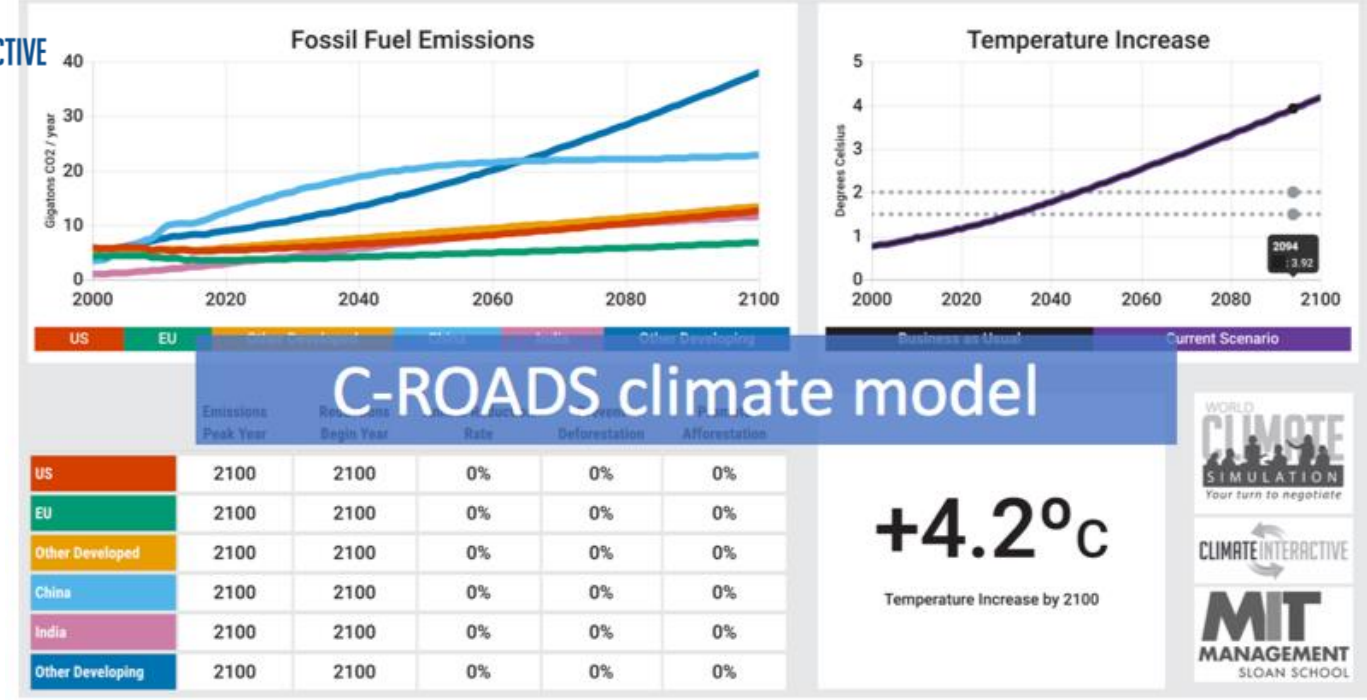
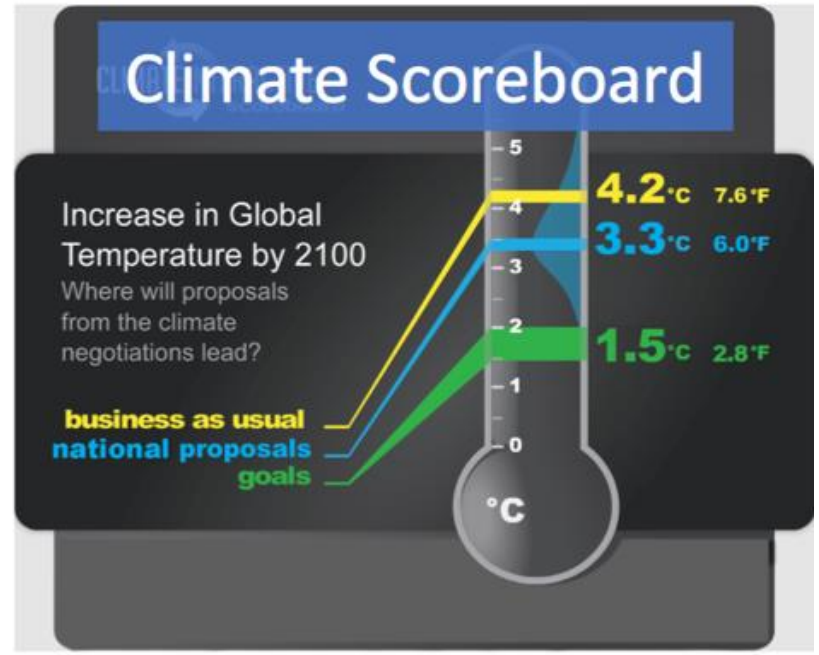
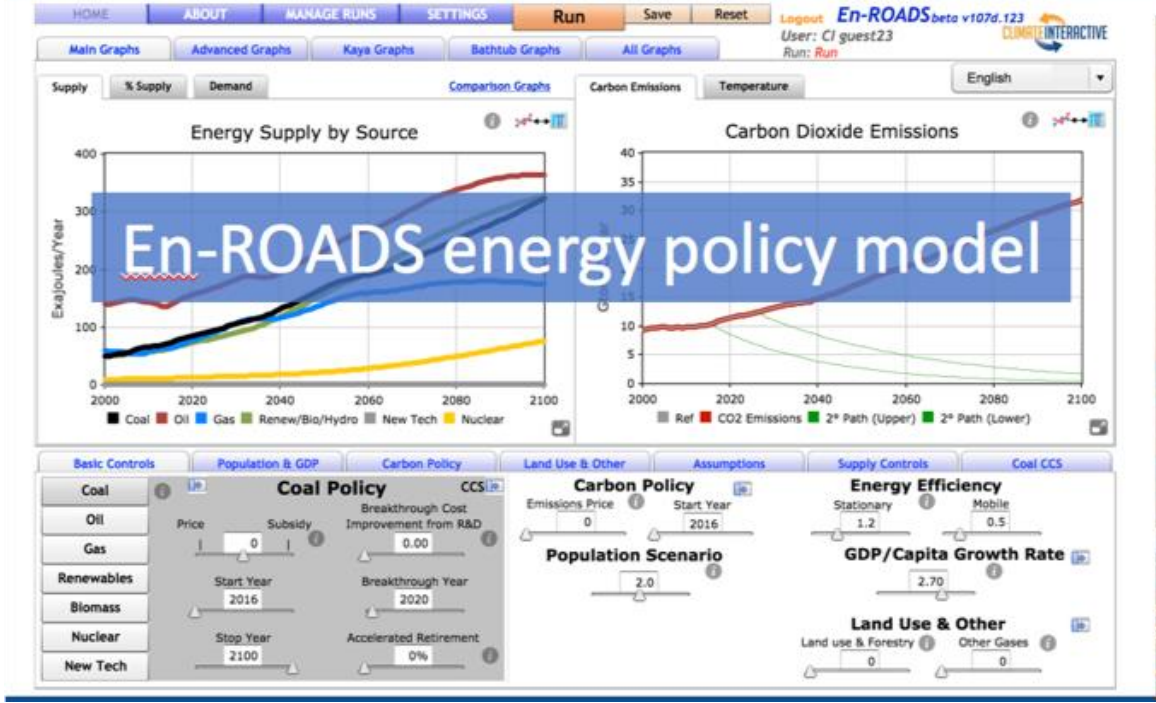
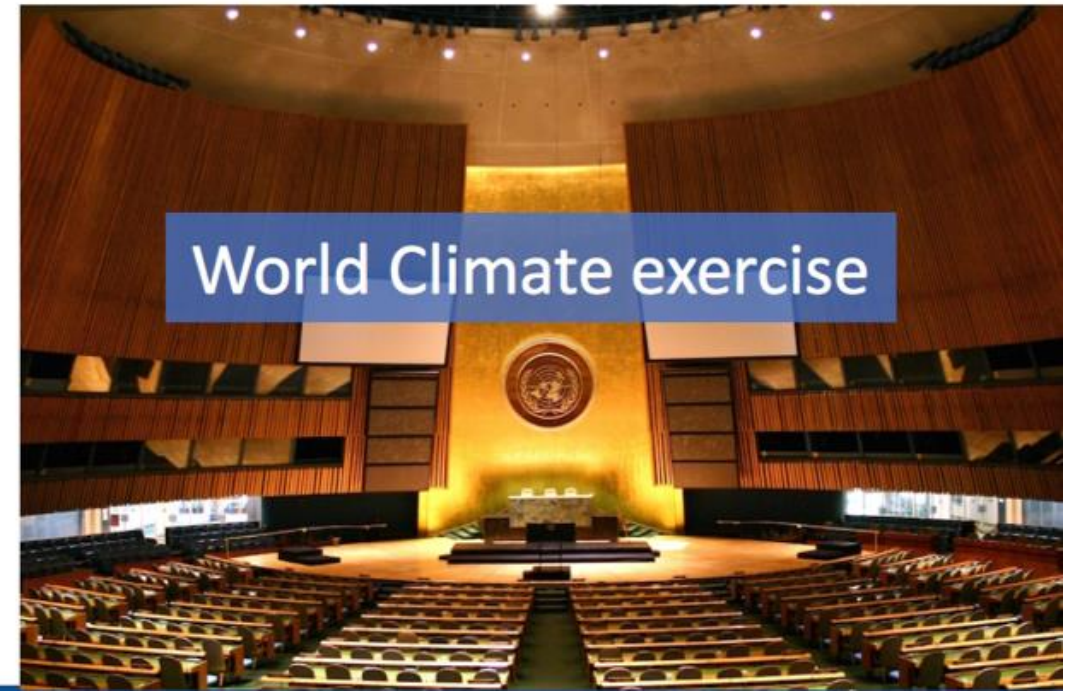
Our interactive tools help people **see** **what works** to address climate change and related issues like energy, water, and resilience.

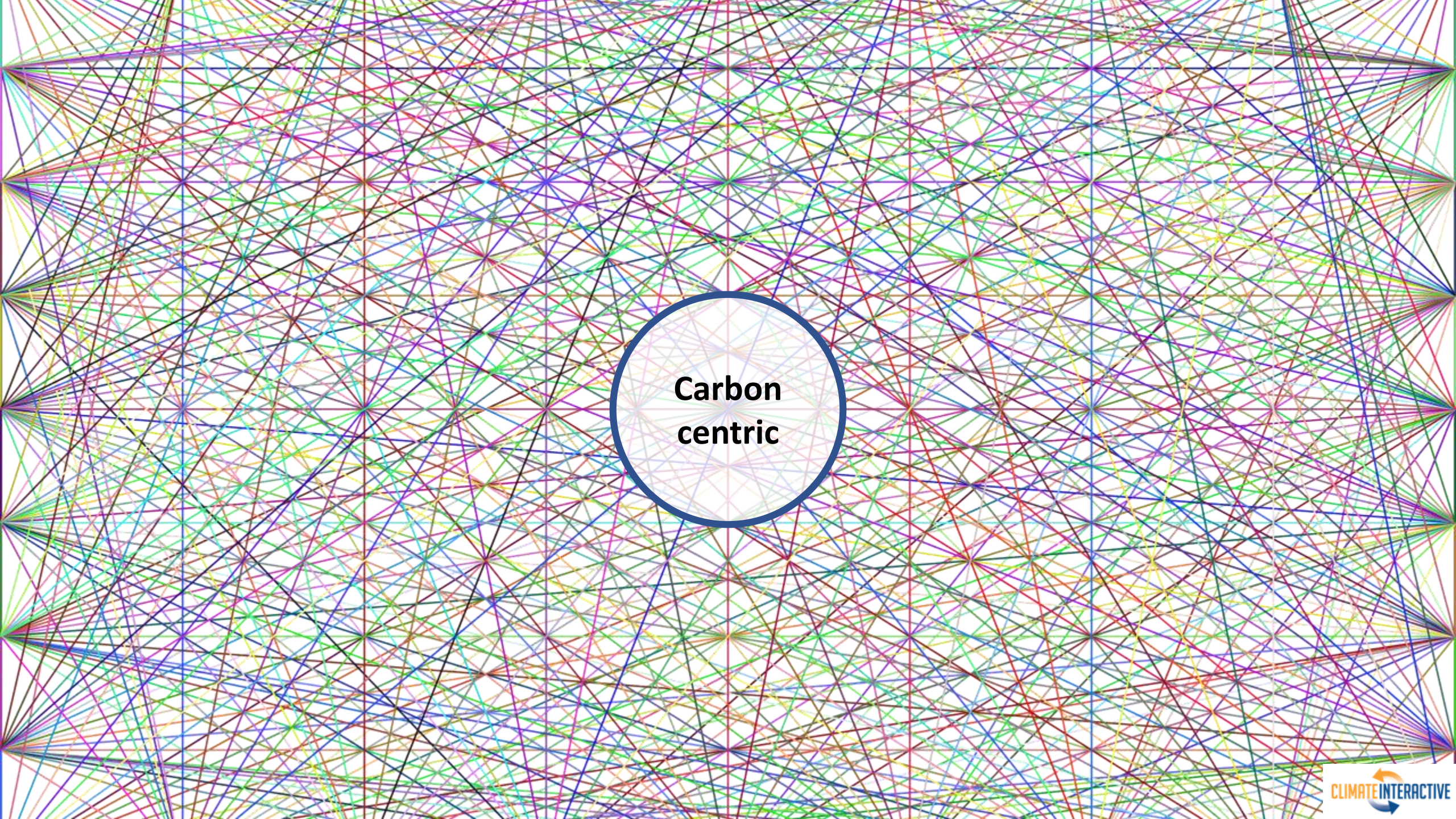


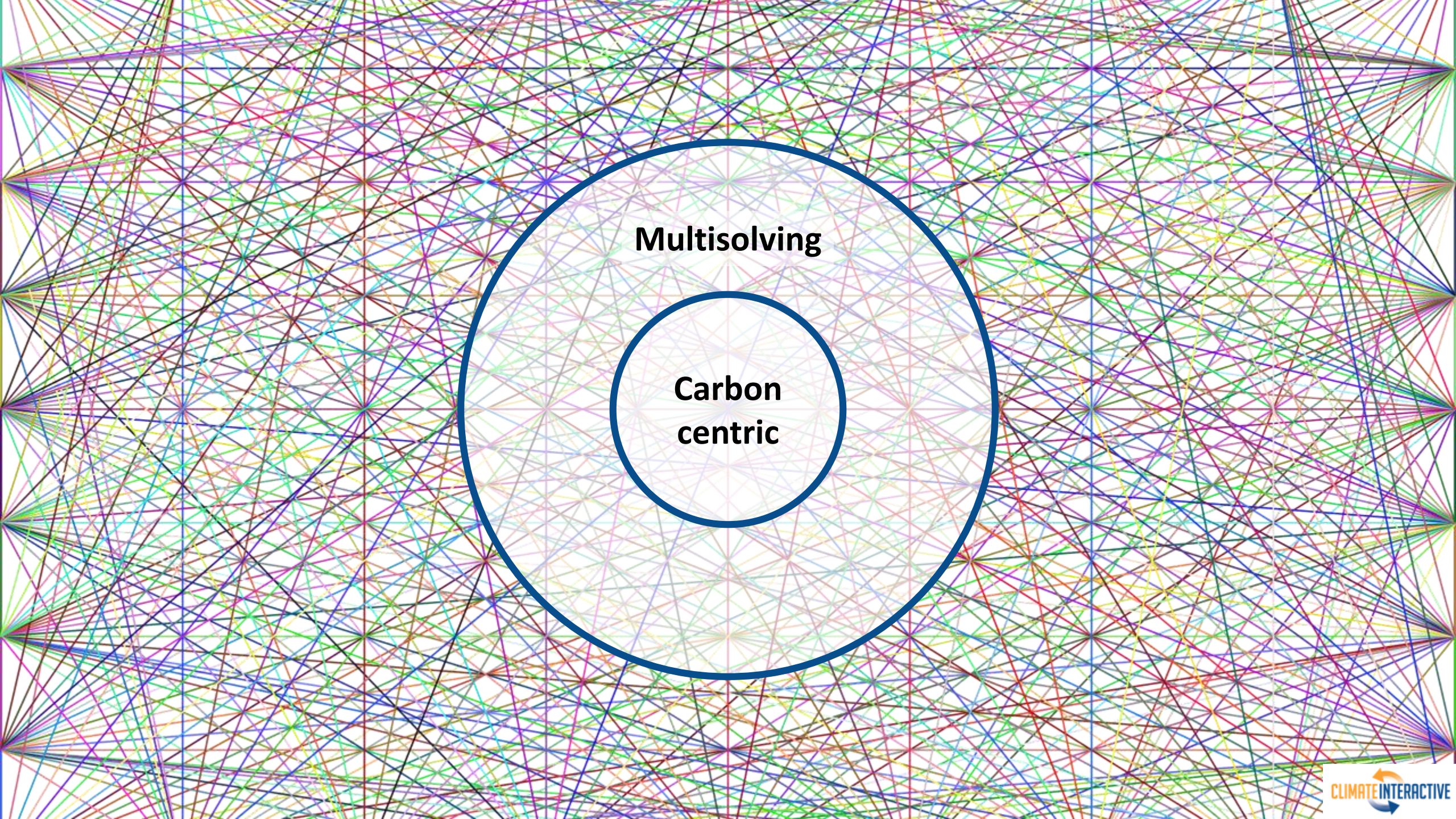

Fossil Fuel Emissions
Gigatons CO2 / year
Temperature Increase
Degrees Celsius
US
EU
Business as Usual
Current Scenario
C-ROADS climate model
+4.2°C
Temperature Increase by 2100


Climate Scoreboard
Increase in Global Temperature by 2100
Where will proposals from the climate negotiations lead?
business as usual
national proposals
goals
4.2°C 7.6°F
3.3°C 6.0°F
1.5°C 2.8°F
°C


En-ROADS energy policy model
Energy Supply by Source
Carbon Dioxide Emissions
Exajoules/Year


World Climate exercise


Carbon
centric


Multisolving
Carbon centric

Multisolving improves lives, health, & equity while protecting the climate

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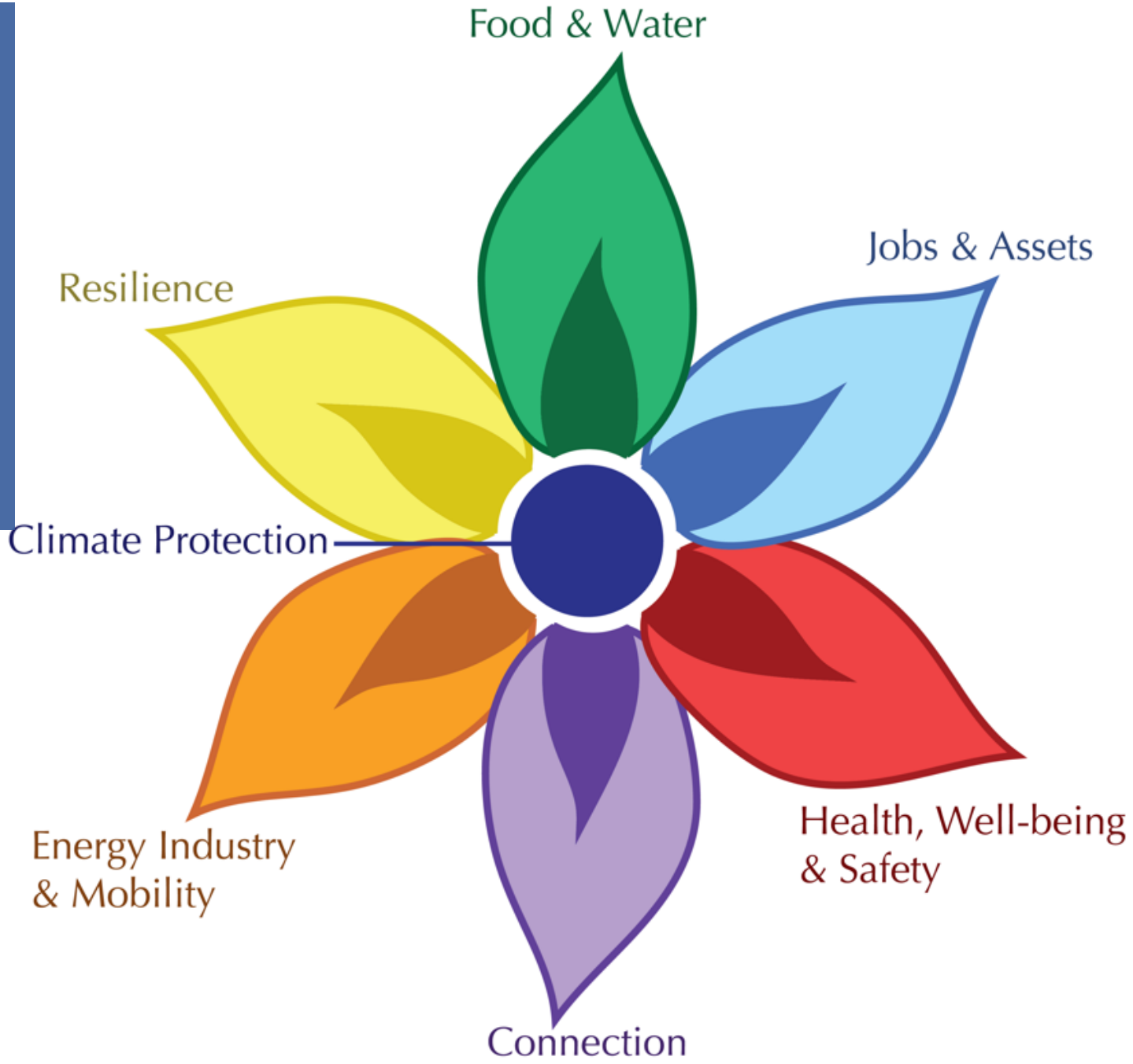
Framework for
Long-term,
Whole-system,
Equity-based
Reflection



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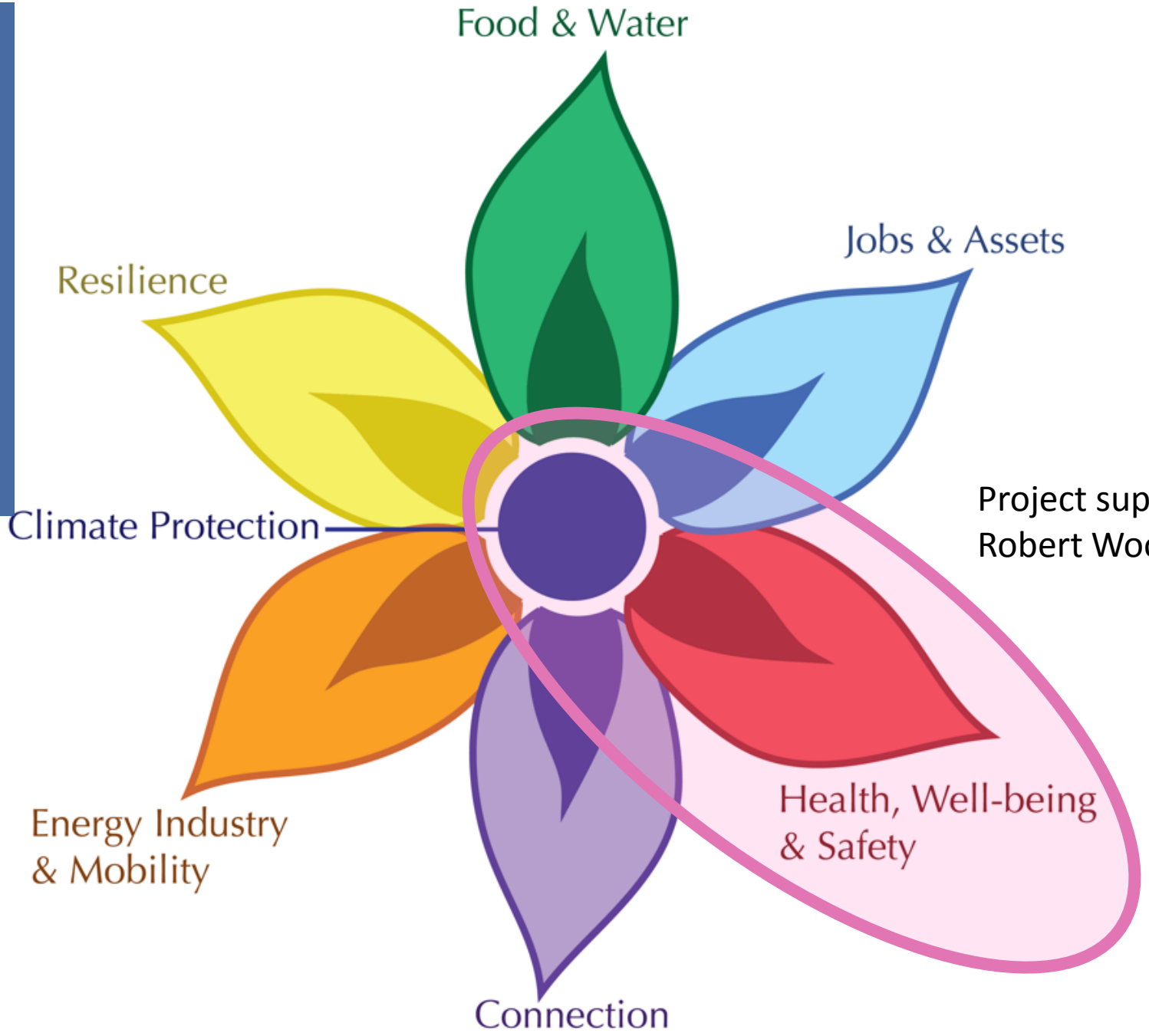

Project supported by the
Robert Wood Johnson Foundation

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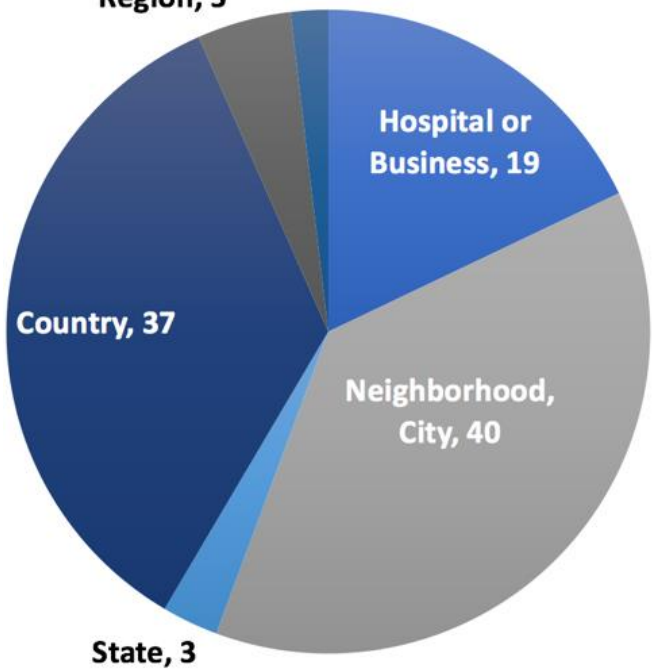
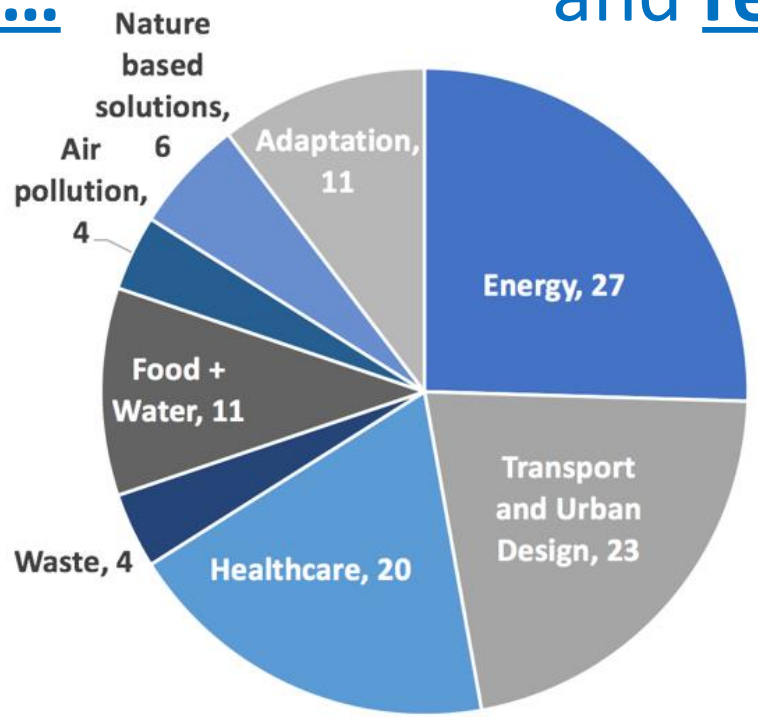
What can we learn from ‘bright spots’ where policies are tackling health and climate change together?

We found **106 global examples** across:

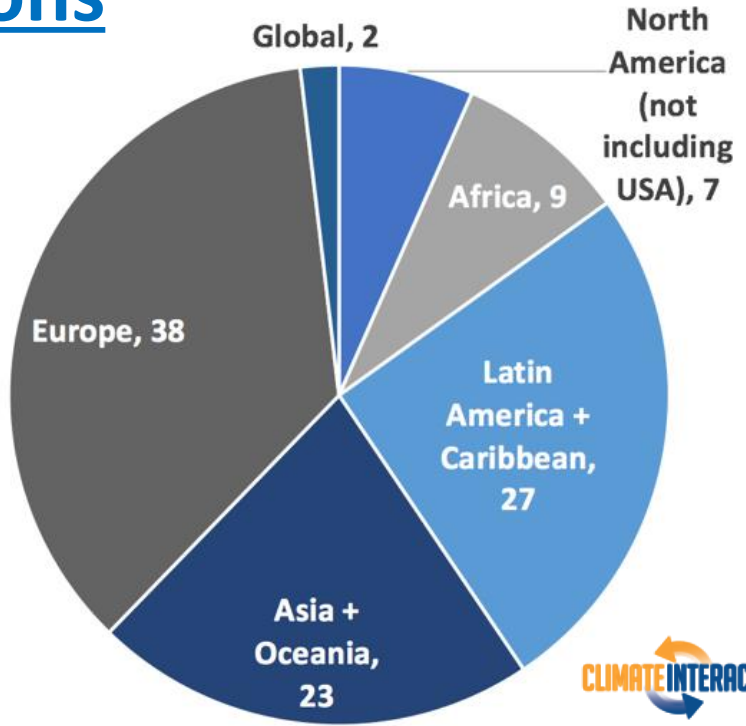
scales…

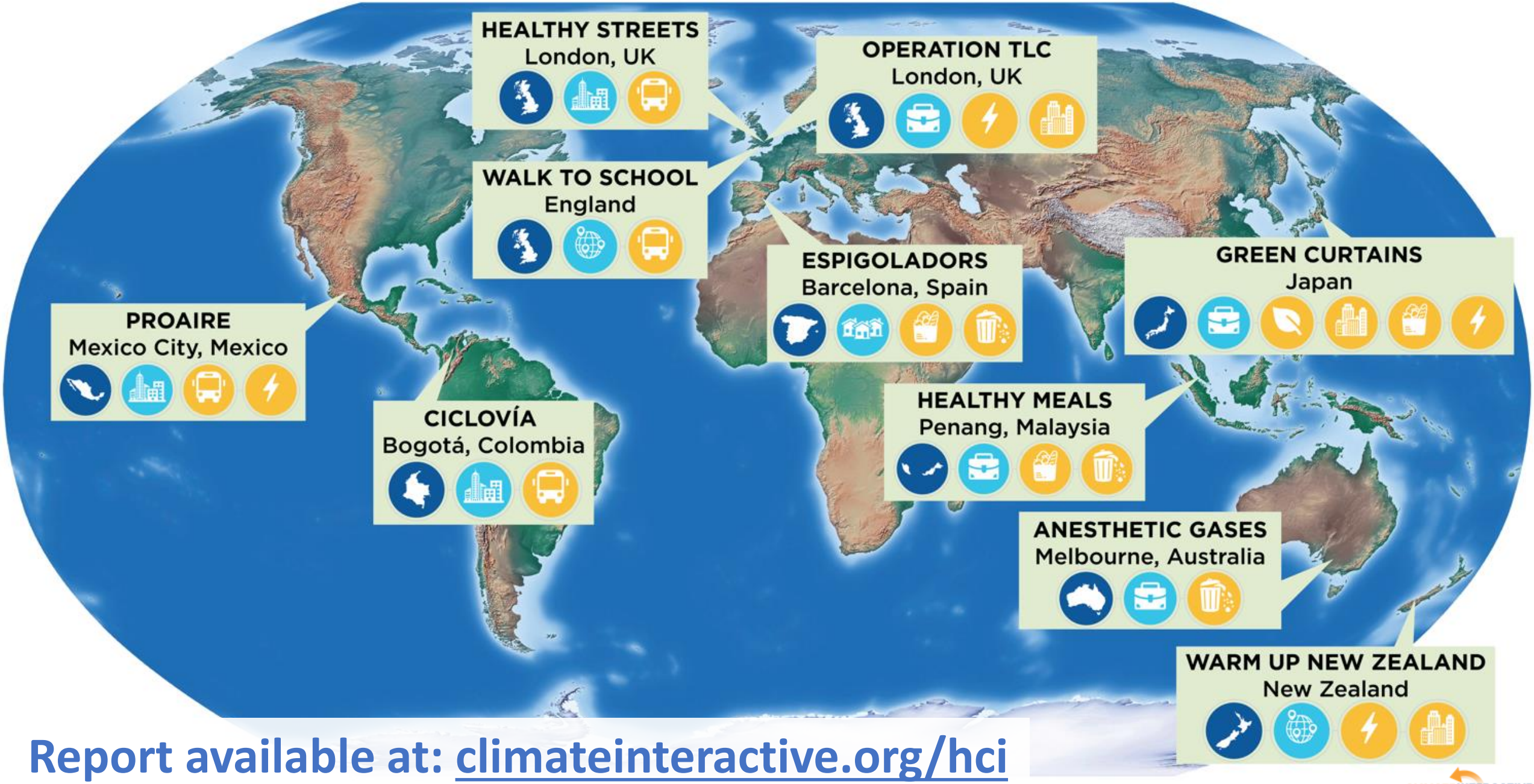


sectors…



and **regions**





Report available at: climateinteractive.org/hci

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Warm Up New Zealand

Residential energy program providing grants for insulation or clean heating costs for low-income or residents with health needs

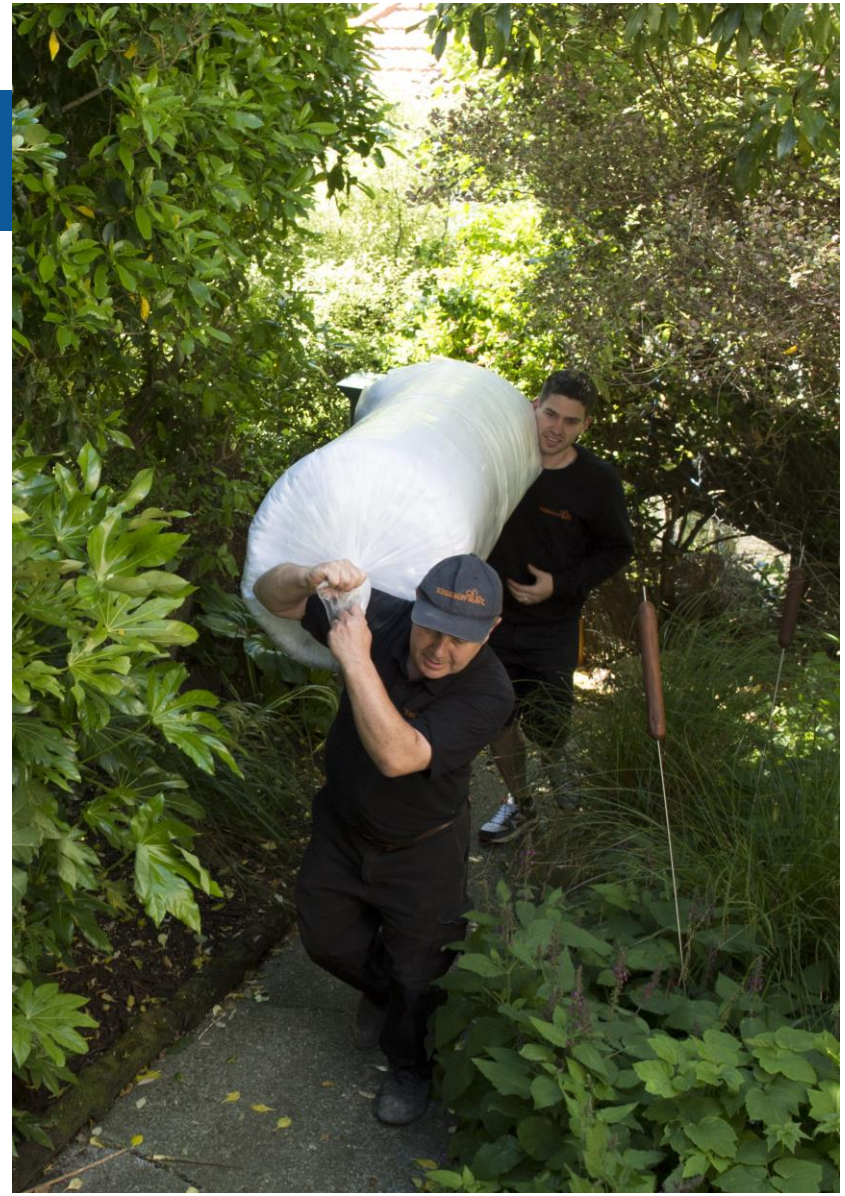
Goals

- Increase job opportunities
- Warmer, drier, healthier homes
- Improve energy efficiency
- Reduce CO_2 emissions

Collaborators

- NZ government, insulation companies, energy trusts, physicians

JOBS & ASSETS
HEALTH & WELL-BEING
CONNECTION
ENERGY & MOBILITY
RESILIENCE



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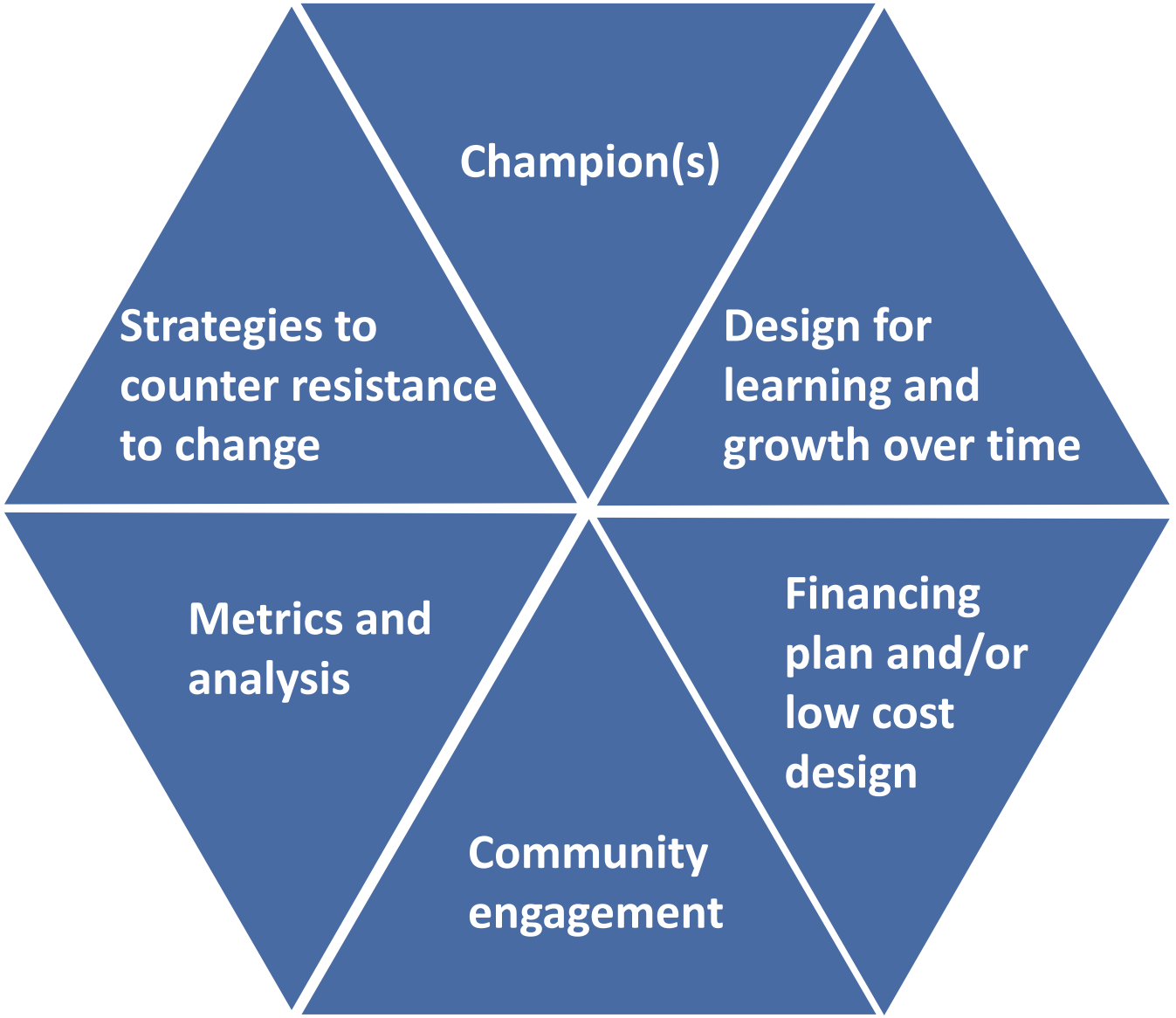
Common Elements



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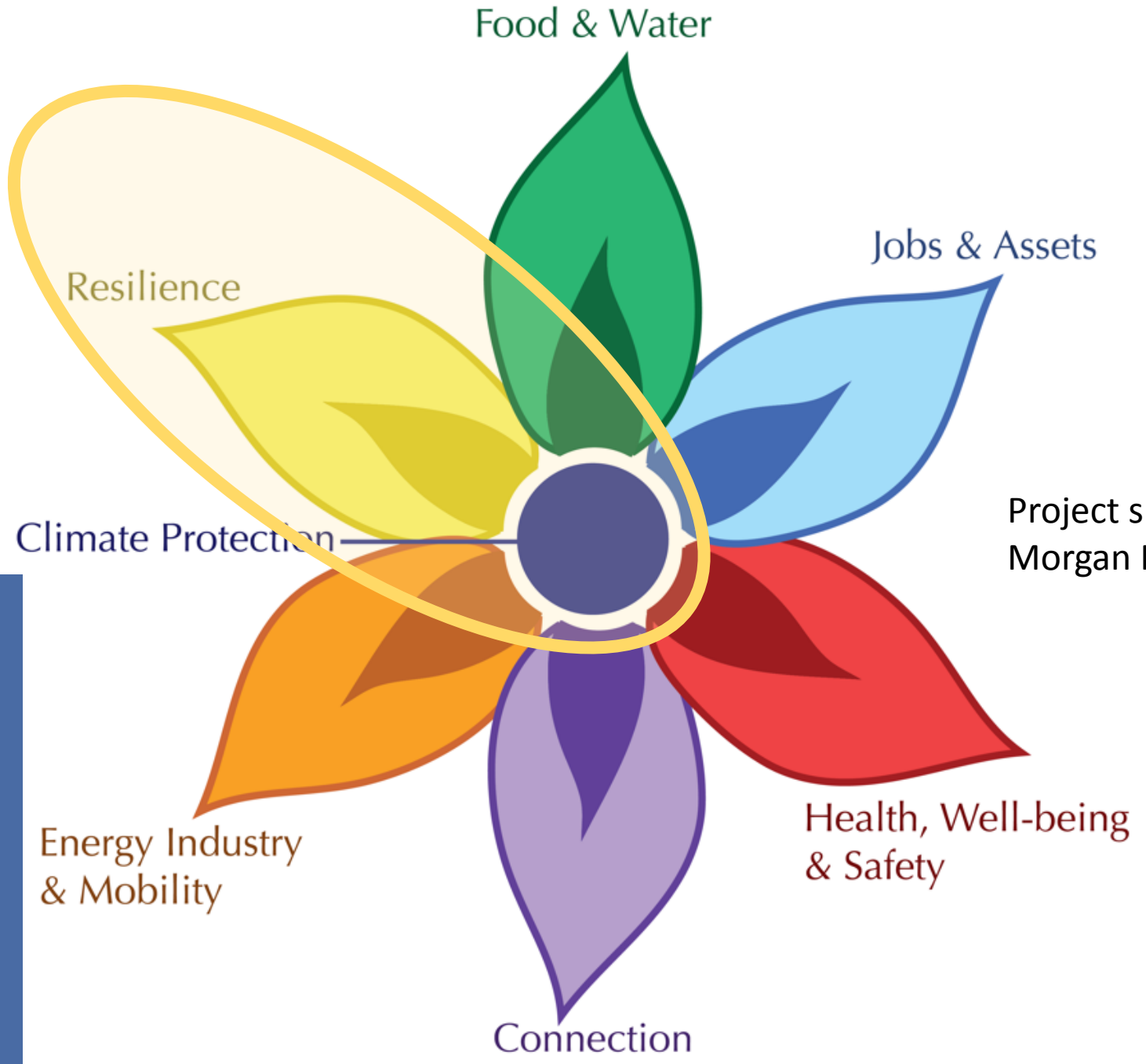
Framework for Long-term, Whole-system, Equity-based Reflection



Project supported by the Morgan Family Foundation

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Search for cases addressing both resilience and climate in the Southeast

Search for programs that:

- Reduce emissions
- Build resilience to climate shocks
- Increase equity
- Have cost and benefit data available

Initial scans found:

- Programs just getting started
- Programs abandoned
- Many policies without mention of climate ambitions
- Health resonates more than resilience

Resilience in the Southeast

Lowcountry GO
Lowcountry, SC

- Launched early 2018
- COGs, employers, SCDOT, Fed Hwy Admin
- Reduce traffic and improve quality of life
- Connect car/van pools, public transit, walking, biking, emergency rides
- Flextime and commuter incentives

Savannah FEMA lot nurseries
Savannah, GA

- Planting Jan 2019
- City of Savannah, UGA, Ga Sea Grant
- Green Infrastructure to Green Jobs initiative
- Creates tree nurseries on flood-prone FEMA lots

Green Heart Project
Louisville, KY

- Planting fall 2018
- TNC, Univ of Louisville, NIH, EPA, nonprofits, faith groups
- Originally working to fight UHI with faith groups
- Now looking at health outcomes from pollution reduction

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Resilience in the Southeast

Initial Conclusions:

- We are in the early stages of combining resilience and mitigation.
- There may be missed opportunities in resilience planning by avoiding the topic of mitigation.
- Reframing and the inclusion of all potential sectors, partners, funding sources can be especially helpful.
- We can learn from places further along in the process.

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BORREGO SPRINGS MICROGRID

2009—2016
BORREGO SPRINGS, CA
SAN DIEGO GAS & ELECTRIC

Borrego Springs is a remote desert town whose electricity is generated dozens of miles away and transported over a single transmission line. Power outages caused by thunderstorms, flash floods, wind, wildfires, and planned maintenance used to occur several times per year.[1] During powerful storms, all of the roads into and out of Borrego Springs can close, trapping residents.

Throughout the year, average high temperatures range from 90-100 degrees Fahrenheit or above.[2] Between the high temperatures, high elderly population, and fragile connection to the main grid, there is a significant public health risk whenever the power goes out.

A crisis in 2007 left Borrego Springs without power when a wildfire took down the town's only transmission line. Spurred by the crisis, the local utility, San Diego Gas & Electric (SDG&E), won a grant to build a demonstration microgrid, which was completed in 2012. The microgrid brought power to the most critical sites in Borrego Springs whenever the connection to the main grid went down.

The microgrid was put to the test in 2013, when a thunderstorm knocked down the same transmission line. SDG&E disconnected the microgrid from the main grid and used it to direct power to the critical zones: a gas station, a library that was a designated cool zone, and an elderly community. These areas had power until the connection to the main grid was restored. Since then, the microgrid has kept electricity flowing to these and other critical zones, such as grocery stores, during several power outages and planned maintenance periods.[3,4]

In 2015, SDG&E won a grant to expand the microgrid and connect it with a nearby solar farm. The expansion and connection project enabled the microgrid to bring power to all of Borrego Springs.[5] The microgrid has also added technology such as automated switching, allowing it to operate independently and automatically in case of emergency.

Overall the microgrid has fixed the utility's poor reliability and preserves the health and comfort of Borrego Springs residents.[6]

PROJECT GOALS

- Prevent power outages
- Reduce the use of diesel generators
- Protect the health of the city's elderly residents

POWER OUTAGE COSTS[7]

Power outages in the US cost over $18 billion per year - up to $75 billion in years with major storms.

- Food spoilage
- Slower emergency response
- Infrastructure damage
- Threats to health
- Lost productivity & need for overtime
- Missed school days

References and photo credits available at climateinteractive.org/resilience

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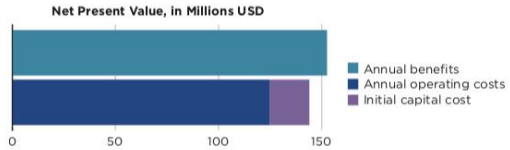
MICROGRID COSTS AND BENEFITS[8]



LEADERSHIP AND COLLABORATION[9]

ACADEMIA
University of San Diego, University of California, San Diego (I)

BUSINESS
SDG&E (C, D, E, F, I)
Energy, engineering, and technology companies (I)

GOVERNMENT
US Department of Energy, California Energy Commission (F, I)
Pacific Northwest National Laboratory (I)

SOCIAL MISSION
Anza Borrego Desert Natural History Association, Borrego Springs Chamber of Commerce (A, I)

A: Advocacy, C: Champion
D: Design, E: Evaluation,
F: Funding, I: Implementation

SDG&E designed and implemented the project with the help and advocacy of public and private sector partners, universities, and nonprofits. Several energy, engineering, and technology companies aided implementation, and the US Department of Energy, the California Energy Commission, and the Pacific Northwest National Laboratory provided technical expertise. The Anza Borrego Desert Natural History Association partnered with SDG&E to create an energy education program to go along with the project.

CLIMATE AND RESILIENCE BENEFITS

REPLICATION[10]

The Borrego Springs microgrid is the first large, utility-scale microgrid in the US. A year after its completion, the California Energy Commission issued a $45 million request for proposals for microgrids to help the state of California transition to more distributed energy sources. Winning bids must demonstrate 20 percent or greater reductions in greenhouse gas emissions.

OTHER BENEFITS

FOOD & WATER
JOBS & ASSETS
HEALTH, WELL-BEING, & SAFETY
CONNECTION
ENERGY & MOBILITY
RESILIENCE

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Support More Multisolving

- Name multisolving as a field of practice
- Support opportunities for learning together, reflection, capacity building across different types of multisolving
- Support more research – documenting benefits and success factors in a deeper way

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Connect With Other Multisolvers


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Thank You!
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