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BROADLY BENEFICIAL CLEAN ENERGY PLANNING

Developing Processes, Indicators, Scenarios and Policies
for Equitable And Inclusive Decarbonization

Session 1: Stage-setting and baseline data



THE SUMMIT
FOUNDATION

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Engagement
partner:



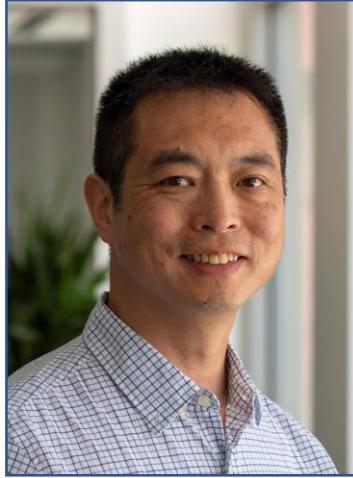
CUSP

canadian urban
sustainability practitioners

Introductions – training team



Eric Mackres
WRI



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Lacey Shaver
WRI



Yeou-Rong Jih
*Greenlink
Analytics*



Jon Crowe
USDN



Introductions – Who are you?

Using Mentimeter

1. Point a web-browser to **<http://menti.com>**
2. Enter this code: **29 59 81**
3. Answer the question
4. (When you've submitted your answer, please keep that browser window open. We'll be using it throughout the session.)

Note on data-use: we might use some of the information you enter for our own project-evaluation purposes, but all data are anonymous. Any data we use cannot be attributed to you or your employer.



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Poll: Who are you?

Mentimeter poll – word cloud:

Enter three words that describe *your personal values*

Mentimeter poll – word cloud:

Enter three words that describe *your community's values*

Discussion:

Reflections on differences/similarities

Overall outline of training series

Session 1: Stage-setting and baseline data

- Concepts and methods for equity-focused planning
- Overview of scenario-based planning
- Choosing indicators
- Obtaining data to measure indicators

Session 2: Defining and testing scenarios

- Interpreting and communicating baseline data
- Defining and modeling scenarios
- Evaluating scenarios

Session 3: Turning scenarios into policies

- Understanding scenario outcomes
- Identifying and prioritizing and policies and programs
- Preparing for implementation

Scenario Planning “test exercise” (Level 1 cities only)

- Select indicators

- Review baseline
- Select scenarios

- Review scenario outcomes



A few definitions

Clean energy

renewable energy + energy efficiency

Scenario planning

planning by comparing alternative plausible futures

Equity

fairness in procedures, the distribution of benefits and burdens, structural accountability, and generational impact

Objectives for today

By the end of today's session, you should...

- Understand concepts and methods for equity-focused planning
- Understand the broad outlines of the scenario-based energy-planning process
- Understand the role of indicators in scenario planning and in supporting a stakeholder-driven, equitable planning process
- Feel ready to work with stakeholders in choosing meaningful indicators

Poll: Overall pre-quiz

Mentimeter poll –word cloud:

In single words or short phrases, what are some of your professional goals for your clean energy planning process?

Mentimeter poll – Numerical score 0-10:

How confident are you about your ability to guide an equitable scenario planning process?

Why "Broadly Beneficial"?

Most ambitious, long-term plans fail. *Why?*

Mayors' Climate Protection Agreement

- Launched 2005
- 1,000+ U.S. mayors pledged to 7% GHG reduction from 1990 levels by 2012
- Near 0% success rate
- Top down, executive driven, visible, PR win. Limited community support. Uneven commitment and capacity to build support and implement.

The Greening of Detroit free trees program

- Small program since 1989; expanded tree planting budget and geographic reach in 2014
- Unexpectedly high “no” rate for free trees
- Historical distrust of city government on trees; outsider-driven program outreach
- Cautionary tale on the “arrogance” of white environmentalists. History and representation matter.

Why "Broadly Beneficial"?

Plans that succeed with implementation ***build a broadly shared agenda and a broad, sustained base of support.***

This requires:

1. Meaningful participation of a diversity of communities and institutions in shaping the future
2. Recognition of differentials in power, needs and perspectives
3. Seeking creative solutions to create new value, focused on what matters to people, not just rearranging business as usual
4. Equitable distribution of costs and benefits

Similar findings from management research:

- Diverse teams *solve problems more effectively and faster*
- The most successful organizations *prioritize inclusivity to create Generative Teams*
- Generative Teams are *cognitively diverse and psychologically safe*

Our theory of change



Information is power

scenario planning

- Partially frees process from biases & blindspots
- Promotes foresight, not forecasting
- Encourages cross-sector communication
- Structures iterative solution development

Values and voice provide direction

equity lens

- Diversity of voices produces larger solution-space
- Identifying and measuring what matters
- Broader inclusion and more equitable distribution of benefits
- More durable public and political support



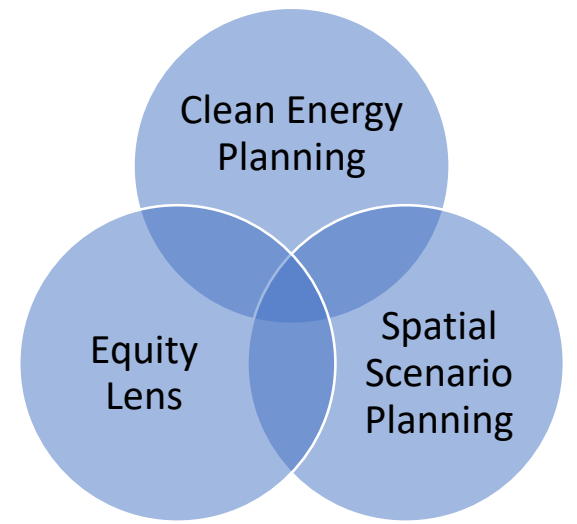
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A training series about intersections

- Unique content on
 - Quantitative data and future scenarios for stakeholder engagement
 - Spatial data for energy planning
 - Infusing equity-centered indicators/actions into energy planning
- But, because this is an “advanced course,” a lot of foundational material is left out
 - Deep dive on equity – wrestling with justice and injustice in energy and climate
 - History of exclusion and contested values in city and energy planning
 - Data options and sources
 - Modeling options and tools
- Annotated list with additional resources forthcoming



Components of Equitable Clean Energy Scenario Planning

Planning component	Questions
Goals	What are your government's and/or community's goals?
Structure	Who are your stakeholders? What is their formal role?
Process	How do you assure stakeholders are listened to?
Indicators	What are stakeholders' values and concerns?
Baseline	Where are you now?
Scenarios	What are your possible pathways? <ul style="list-style-type: none">• What actions do you want to consider?• How do you design them equitably?
Impacts	What are the likely outcomes?
Policies and programs	How do you design and implement the actions?
Distributional design	Who benefits? Who pays?

Equity-focused clean energy planning

Why equity matters in energy planning

Economic, social and environmental costs of energy services have greater impact on frontline, marginalized and vulnerable communities

INCOME

Low-income urban households have more than 2x the energy burden of the average urban household: 7.2% vs 3.5% of income¹

RACE

Neighborhoods With More People of Color Pay Higher Energy Bills²

NEIGHBORHOOD

Frontline residents live in neighborhoods with highest environmental health hazards³

HOUSING

Frontline residents live in homes that are older, less efficient and less healthy

1. <https://www.aceee.org/research-report/u1602>

2. <https://www.citylab.com/equity/2019/11/minority-utility-costs-burden-energy-discrimination-research/602452/>

3. <https://iopscience.iop.org/article/10.1088/1748-9326/ab3b99> & <https://www.mdpi.com/2225-1154/8/1/12/html>



Consideration of equity in clean energy policies is growing in some cities

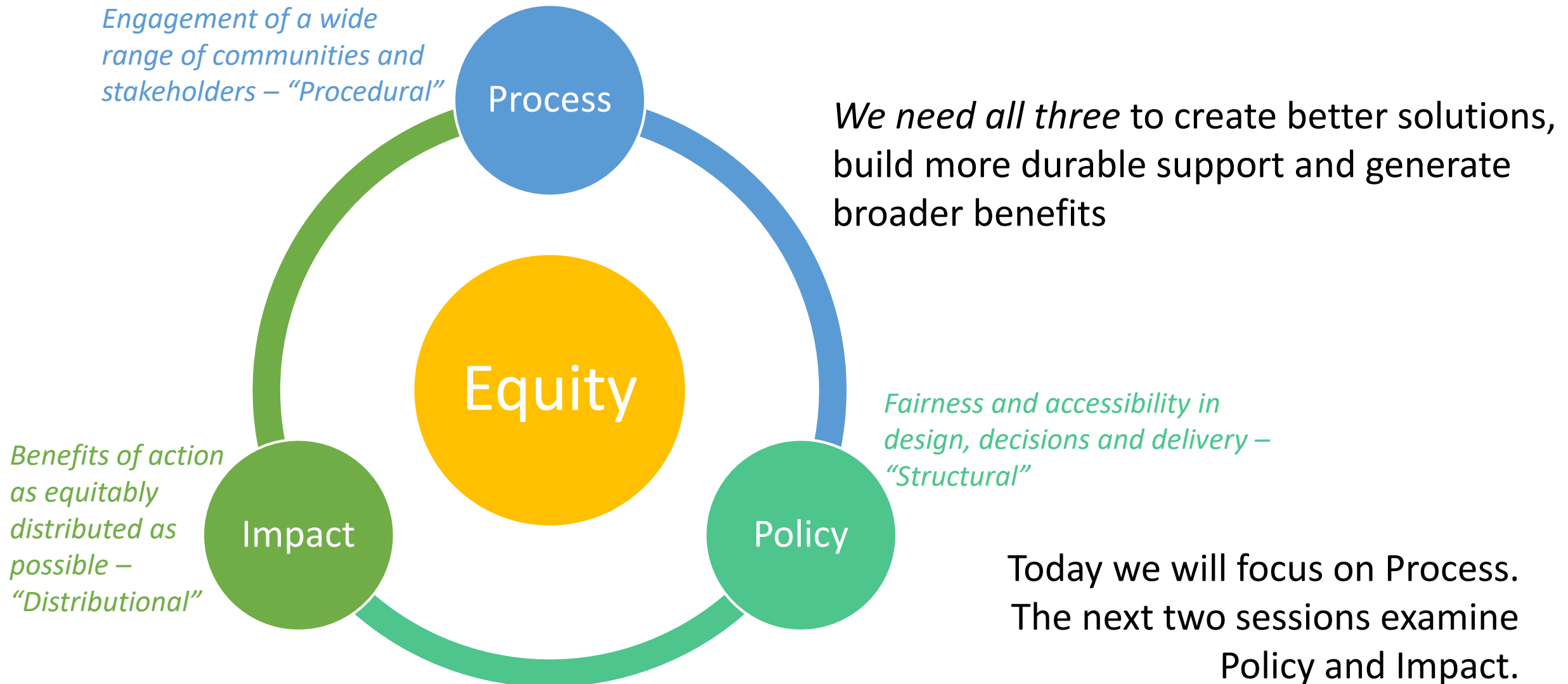
Equity-driven actions in *City Clean Energy Scorecard*

- Equity-driven planning
 - Community engagement
 - Decision making
 - Accountability
- Buildings
 - Incentives and financing for efficient buildings and solar
 - Energy efficiency workforce development
 - Renewable energy workforce development
- Utilities
 - Low-income energy efficiency programs
 - Multifamily energy efficiency programs
- Transportation
 - Low income housing around transit
 - Low income access to high quality transit
 - Subsidized access to efficient transportation options

TABLE D3. CITIES BY EQUITY-DRIVEN CLEAN ENERGY PLANNING AND POLICIES TOTAL SCORE

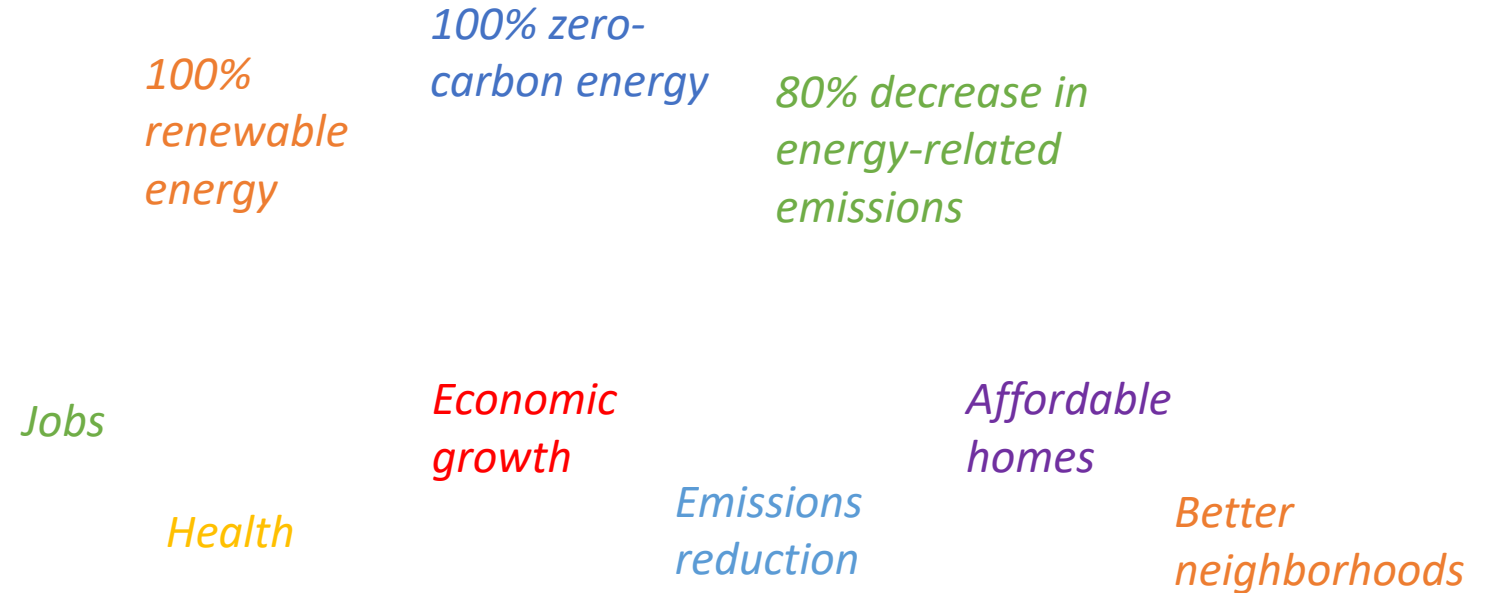
CITY	TOTAL EQUITY SCORE (12 PTS)	CITY	TOTAL EQUITY SCORE (12 PTS)	CITY	TOTAL EQUITY SCORE (12 PTS)
MINNEAPOLIS	8.5	CHULA VISTA	4.5	BAKERSFIELD	2
SEATTLE	8	KANSAS CITY	4.5	CHARLOTTE	2
BOSTON	7.5	LONG BEACH	4.5	JACKSONVILLE	2
PHILADELPHIA	7.5	NEW ORLEANS	4.5	LOUISVILLE	2
PROVIDENCE	7.5	ROCHESTER	4.5	NEW HAVEN	2
WASHINGTON	7.5	SAN DIEGO	4.5	TULSA	2
AUSTIN	7	AURORA	4	BIRMINGHAM	1.5
CHICAGO	7	BRIDGEPORT	4	LAS VEGAS	1.5
LOS ANGELES	7	CINCINNATI	4	MESA	1.5
BALTIMORE	6.5	COLUMBUS	4	MIAMI	1.5
NEW YORK	6.5	DALLAS	3.5	NASHVILLE	1.5
ORLANDO	6.5	DETROIT	3.5	SALT LAKE CITY	1.5
PORTLAND	6.5	GRAND RAPIDS	3.5	OKLAHOMA CITY	1
HARTFORD	6	HOUSTON	3.5	ST. PETERSBURG	1
MILWAUKEE	6	KNOXVILLE	3.5	VIRGINIA BEACH	1
OAKLAND	6	MEMPHIS	3.5	MCALLEN	0.5
PHOENIX	6	NEWARK	3.5	OMAHA	0.5
ST. PAUL	6	ST. LOUIS	3.5	HENDERSON	0
DENVER	5.5	TUCSON	3.5	RENO	0
HONOLULU	5.5	WORCESTER	3.5		
RALEIGH	5.5	FORT WORTH	3		
SAN JOSÉ	5.5	SACRAMENTO	3		
BUFFALO	5	SAN ANTONIO	3		
CLEVELAND	5	TAMPA	3		
PITTSBURGH	5	EL PASO	2.5		
RIVERSIDE	5	INDIANAPOLIS	2.5		
SAN FRANCISCO	5	RICHMOND	2.5		
ATLANTA	4.5	ALBUQUERQUE	2		

Three kinds of equity & inclusion



Integrating Clean Energy Goals with an Equity Vision

- Clean energy goals are defined differently in different cities
- Stakeholders have their own primary interests
- Planning processes with ***clean energy as the “what”*** can be designed with ***equity lens as the “how”***



Example vision and priorities:

Priorities

100% of Atlantans have a right to 100% clean energy

- 01** Energy equity must be a priority
- 02** Investments in energy efficiency must be increased
- 03** Local investments in renewable energy must be prioritized over investments outside of the Atlanta Metro

Poll: What are your residents' priorities?

Mentimeter poll – word cloud:

Please enter three words describing your perception of residents' top priorities for your city's energy policy. (One word per priority.)

Discussion:

Why did you submit the answers that you did?

Importance of deliberate stakeholder engagement

Minneapolis's NRP and the importance of stakeholder-engagement design

Minneapolis's Neighborhood Revitalization Program (1990-2008)



Mechanism: neighborhood organizations, with support from NRP staff...

- Created organizational structure
- Elicited priorities from neighbors
- Developed grant proposals
- Implemented plans



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NRP: contrasting neighborhood profiles

Neighborhood Name	Neighborhood Type	Median Household Income 1990	Percent Persons in Poverty 1990	African American 1990	African American 2000	Caucasian 1990	Caucasian 2000	Hispanic 1990	Hispanic 2000	Native American 1990	Native American 2000	Asian 1990	Asian 2000	Number Housing Units 1990	% Owner Occ. 1990	% Renter Occ. 1990
Linden Hills	Protection	\$44,424	2%	1%	1%	96%	94%	1%	2%	0%	0%	2%	2%	3,704	63%	35%
Longfellow	Revitalization	\$28,869	9%	4%	8%	91%	80%	2%	6%	2%	3%	2%	2%	9,654	69%	27%
McKinley	Revitalization	\$24,205	14%	15%	44%	74%	30%	3%	3%	8%	3%	3%	16%	1,260	68%	27%
Phillips	Redirection	\$12,254	39%	21%	29%	46%	32%	4%	22%	23%	12%	8%	6%	7,611	16%	70%
Whittier	Redirection	\$17,325	25%	26%	20%	63%	54%	2%	22%	5%	2%	3%	6%	7,628	9%	79%

Source: E. Fagatto and A. Fung (2005) The Minneapolis Neighborhood Revitalization Program: An Experiment in Empowered Participatory Governance



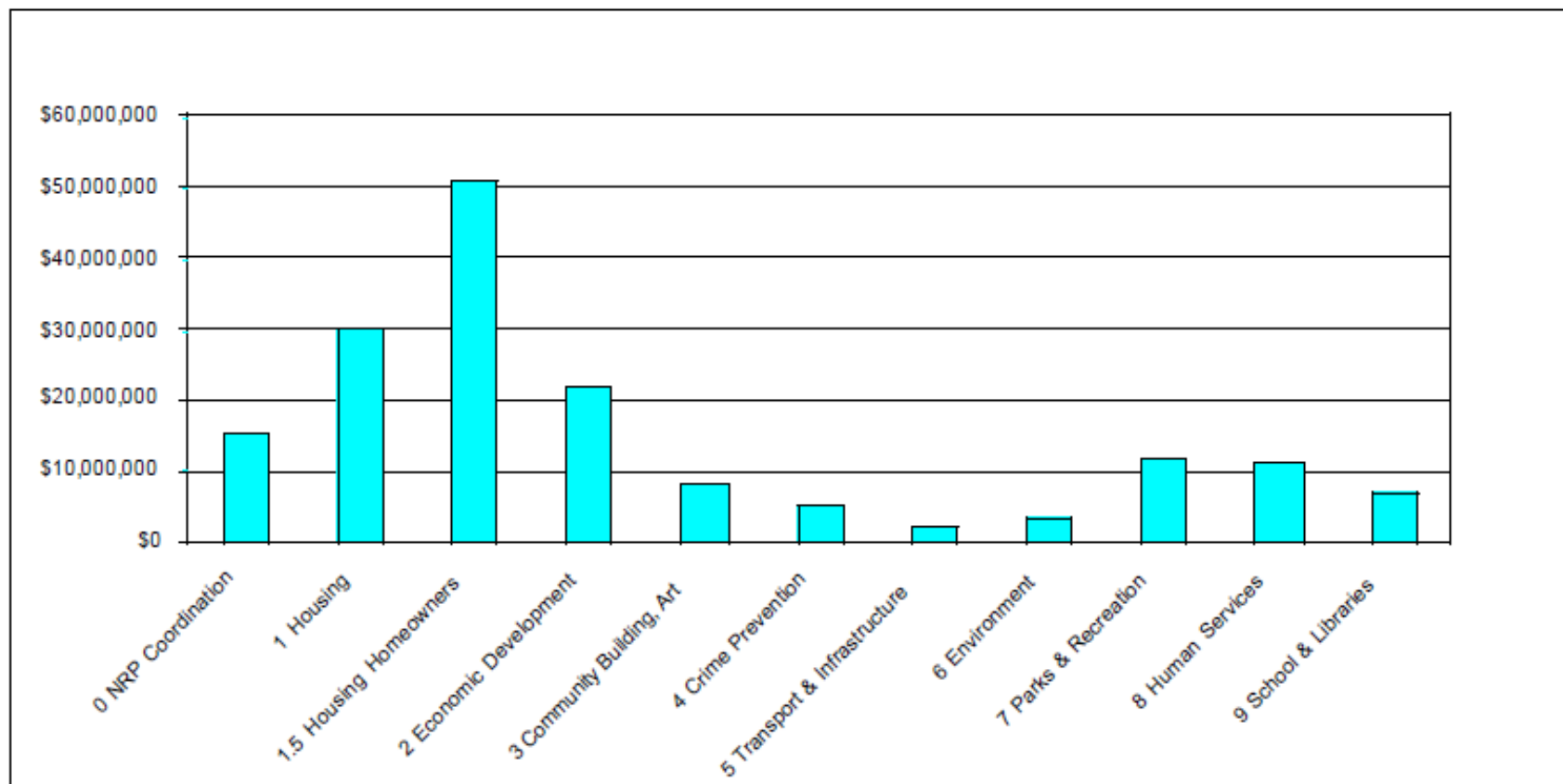
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NRP: outcomes dominated by homeowner interests

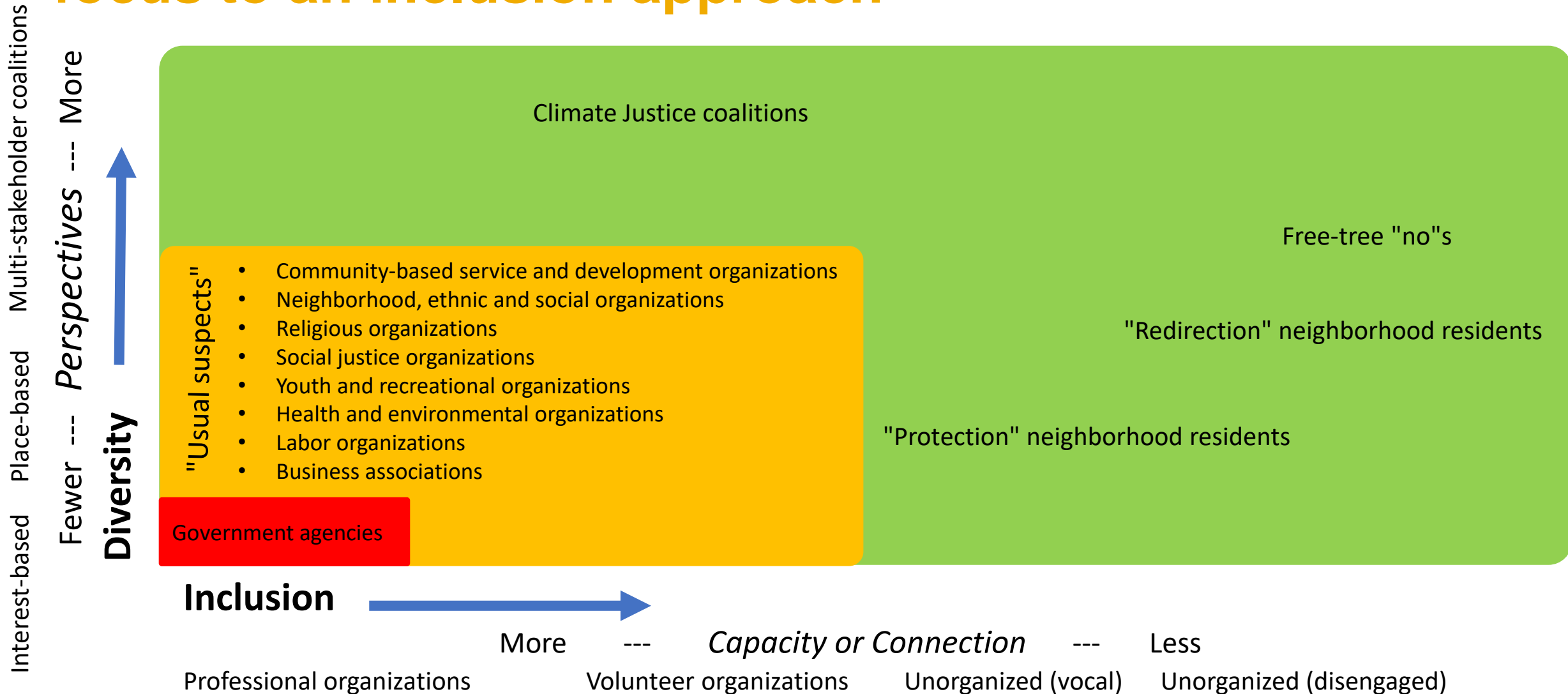


NRP and the importance of deliberate design and management of stakeholder-engagement

*In Minneapolis, planning department **staff tended to play a passive role, inhibited by their belief that democratic planning precluded their taking initiatives and shaping people's opinions.** ...The tension between democracy as practiced and equitable outcomes arises because citizen participants usually prefer policies that benefit owners more than renters. In general, **middle-class homeowners are more likely to participate than lower-income renters and are more effective in doing so.***

Susan Fainstein, *The Just City*

Who is the community? Expanding from a diversity focus to an inclusion approach



Stakeholder engagement at every stage



Indicators
& baseline



Scenario
development



Scenario
selection



Action design &
implementation



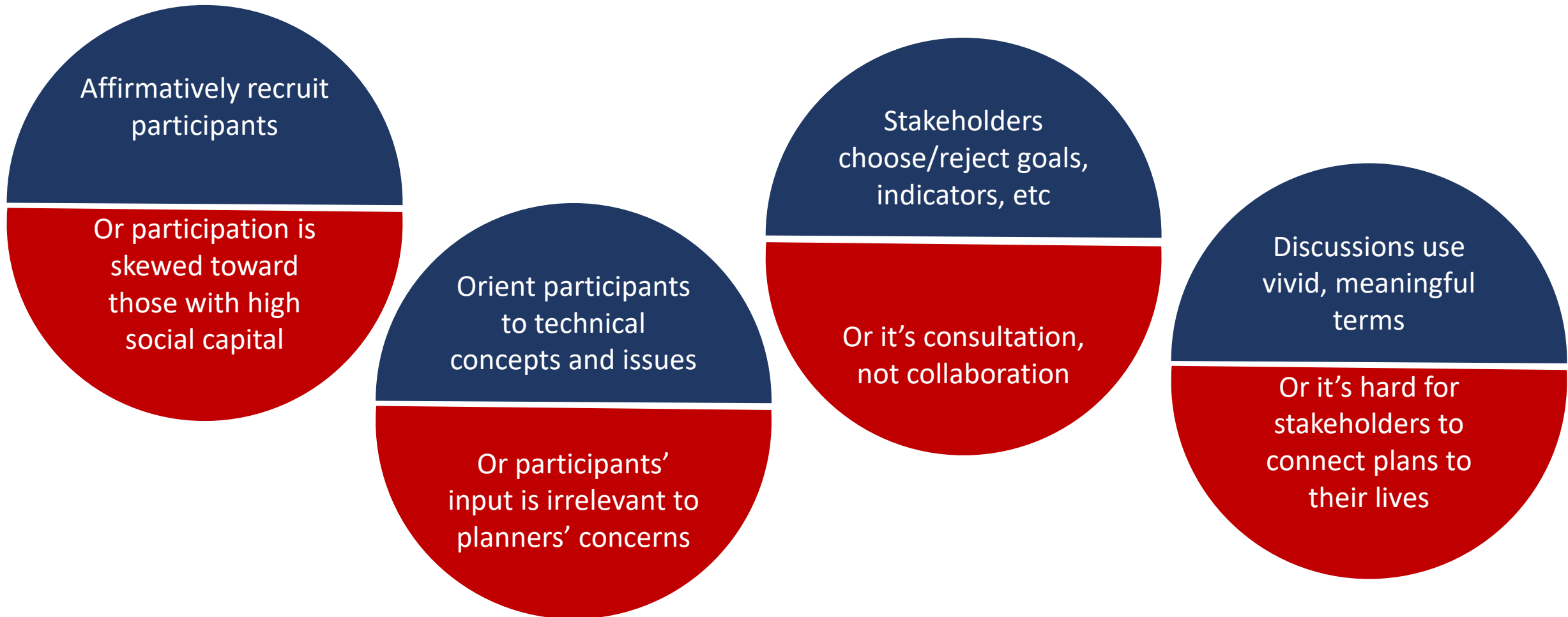
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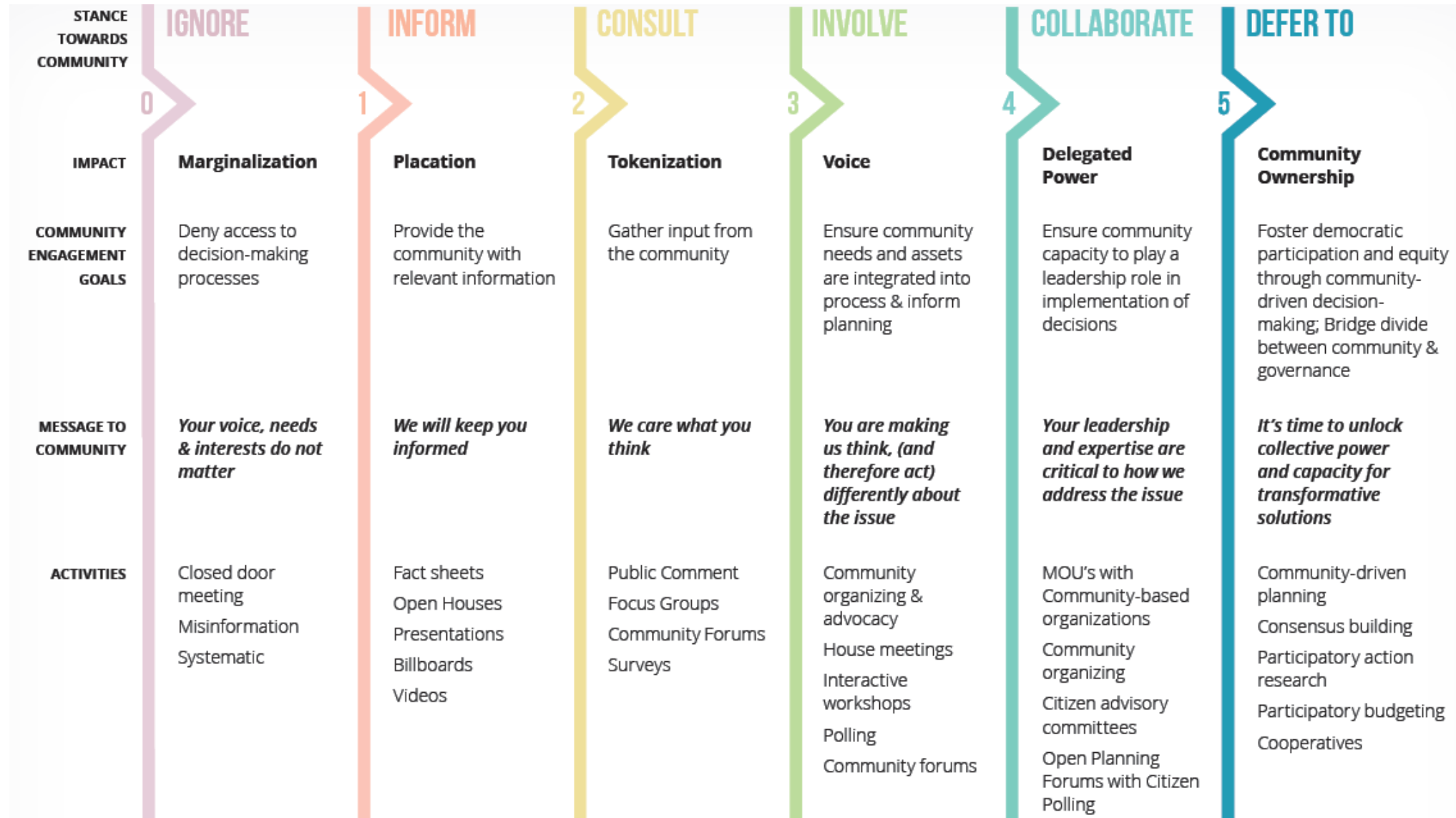
Good practices for stakeholder engagement



Who to affirmatively recruit?

Income level		Low-income communities	Grouping or thresholds connected to earnings of labor and/or capital. Categories typically are defined related to the local/national economy.
Migrant status		Migrants	Refers to the legal and immigration status of a person who changes their place of residence. Categories include locals, expatriates, documented or undocumented migrants, refugees and asylum seekers.
Gender		e.g. Women	The socially constructed characteristics of women and men – such as norms, roles and relationships of and between groups of women and men. Categories typically include lesbian, gay, bisexual, transsexual and intersex, and traditional biological sex categories of male and female.
Race and ethnicity		Racial and ethnic minorities	Race is defined as a category of humankind that shares certain distinctive physical traits. The term ethnicity is more broadly defined as large groups of people classed according to common racial, national, tribal, religious, linguistic, or cultural origin or background.
Religion		Religious minorities	Religious or spiritual belief of preference, regardless of whether or not this belief is represented by an organized group, or affiliation with an organized group having specific religious or spiritual tenets.
Informality status		Informal communities (e.g. residents, workers)	Relationship of individuals, households, activities or firms to the formal or informal economy, typically with respect to production, employment, consumption, housing and/or land.
Disability		People with disabilities	Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective access to and participation in society on an equal basis with others.
Age		Elderly, Youth, Children	Chronological grouping based on years lived
Working conditions		Outdoor workers, temporary workers, workers in transitioning industries	Working conditions cover a broad range of topics and issues, from working time (hours of work, rest periods, and work schedules) to remuneration, as well as the physical conditions and mental demands that exist in the workplace and job stress for workers in transitioning industries (e.g. fossil fuels)

Levels of public engagement



Inclusive governance – low cost, high return

Who is represented in the decision-making bodies for your planning process?

HousingNOLA

- 10-year community-driven housing plan, convened and staffed by non-profit housing coalition, funded by community foundation
- Executive committee: local foundation, community development NGO, city agency, private bank

King County Mobility Framework Equity Cabinet

- Government convened advisory committee of 23 citizens and equity-focused community orgs
- Developed recommendations on principles and policies and will continue to advise as policymaking progresses

- Include citizens or community organization representatives in Executive Board / Steering Committee
- Create a Citizen Advisory Committee with defined and substantial role
- Provide compensation for community time and focused input, pilots

Poll: Stakeholder engagement

Menti-meter poll – multiple short answers :

What stakeholder engagement methods have you or your office used in your community?

Discussion:

What stakeholder engagement methods have worked well?

What methods have not worked well, and why?

Scenario-based energy planning

Scenario planning: definition

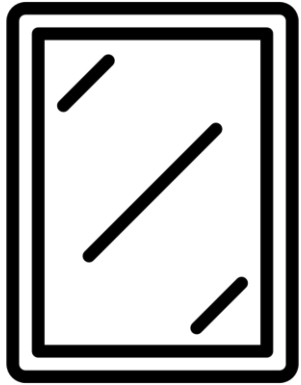
Strategic planning through the systematic generation of—
and evaluation of—scenarios



Alternative plausible futures defined by imagining or modeling effects of a predefined set of variables

Scenario planning: general process

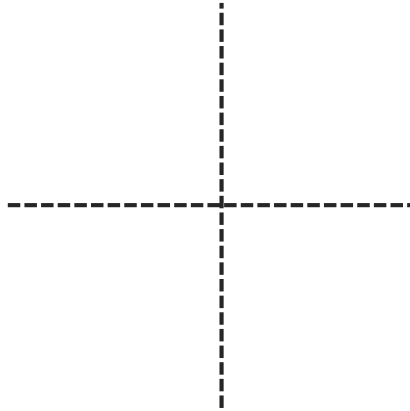
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Assess the current situation

Select indicators that matter. Collect data.

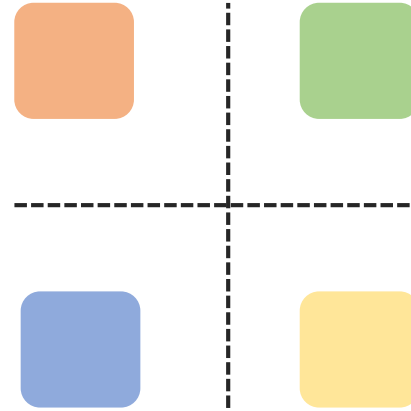
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Choose variables for defining scenarios

Identify what can be changed

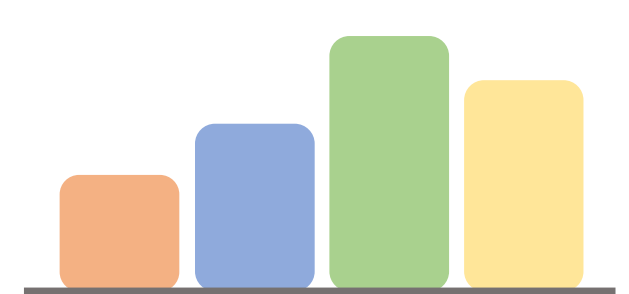
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Choose scenarios by exploring plausible combinations of the variables

Select changes to test

4



Examine and evaluate scenarios

Identify combination of changes that most improve indicators

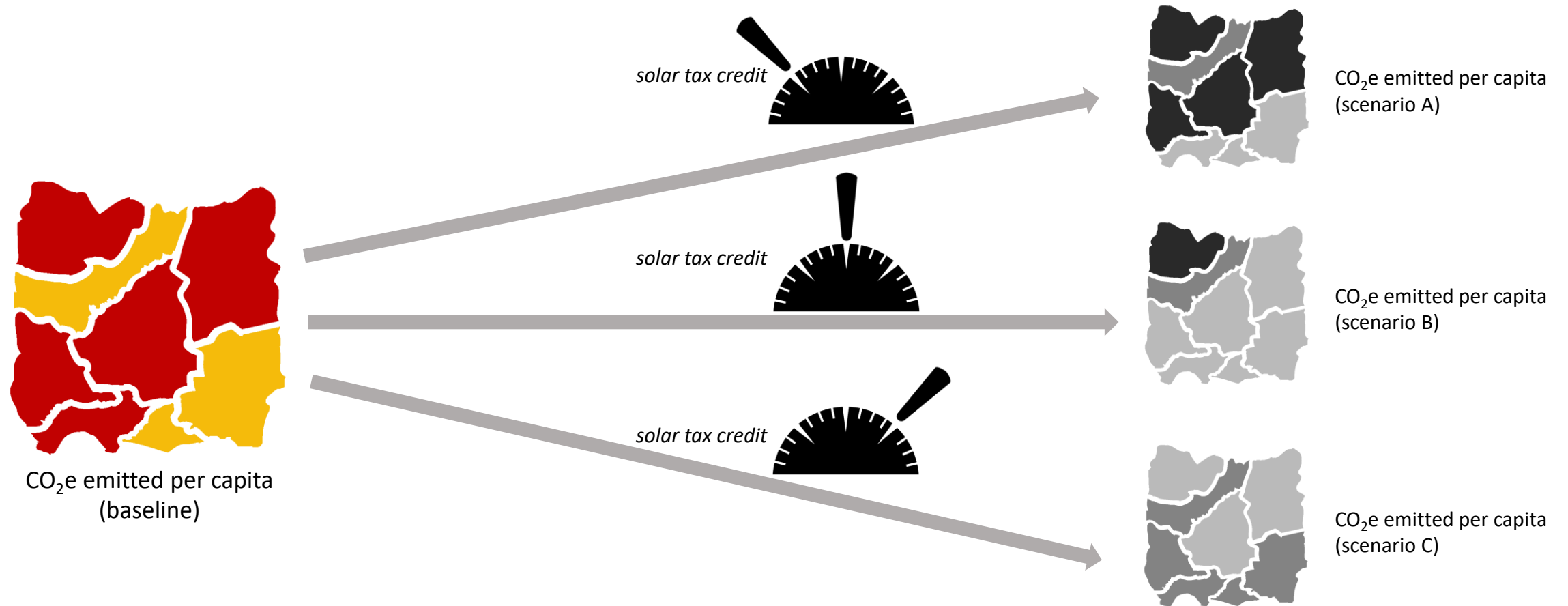


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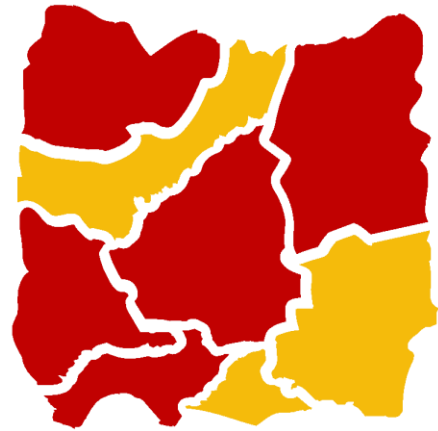
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Different actions result in different changes

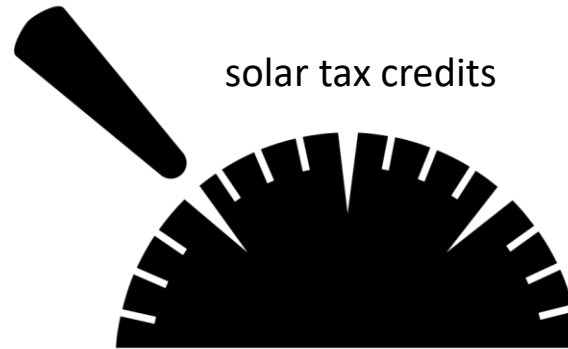


Scenario-based planning: define different scenarios by varying actions, and evaluate those scenarios (and therefore the actions) by the outcomes

Multiple variables—necessary but complicating



CO₂e emitted per capita



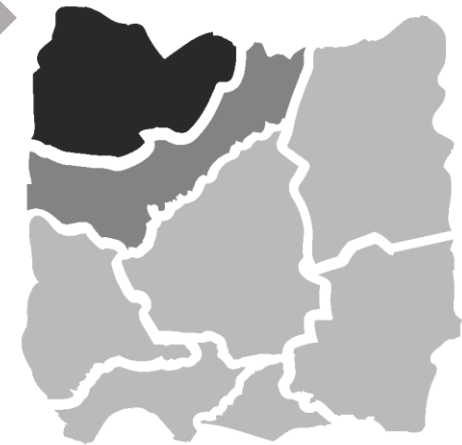
CO₂e emitted per capita



Household energy burden



Using multiple indicators is important to assess outcomes. There can be trade-offs between indicators, with some improving while others worsen.



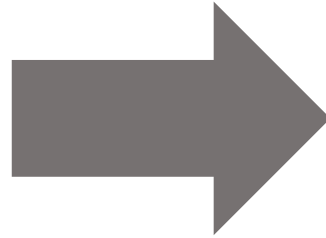
Household energy burden

Choosing equity-centered indicators

Indicators should reflect values and goals

Traditional energy planning

- GWh demand
- GWh generated
- GWh saved
- Rates and tariffs
- Energy reliability
- Utility rate of return
- Territory scale



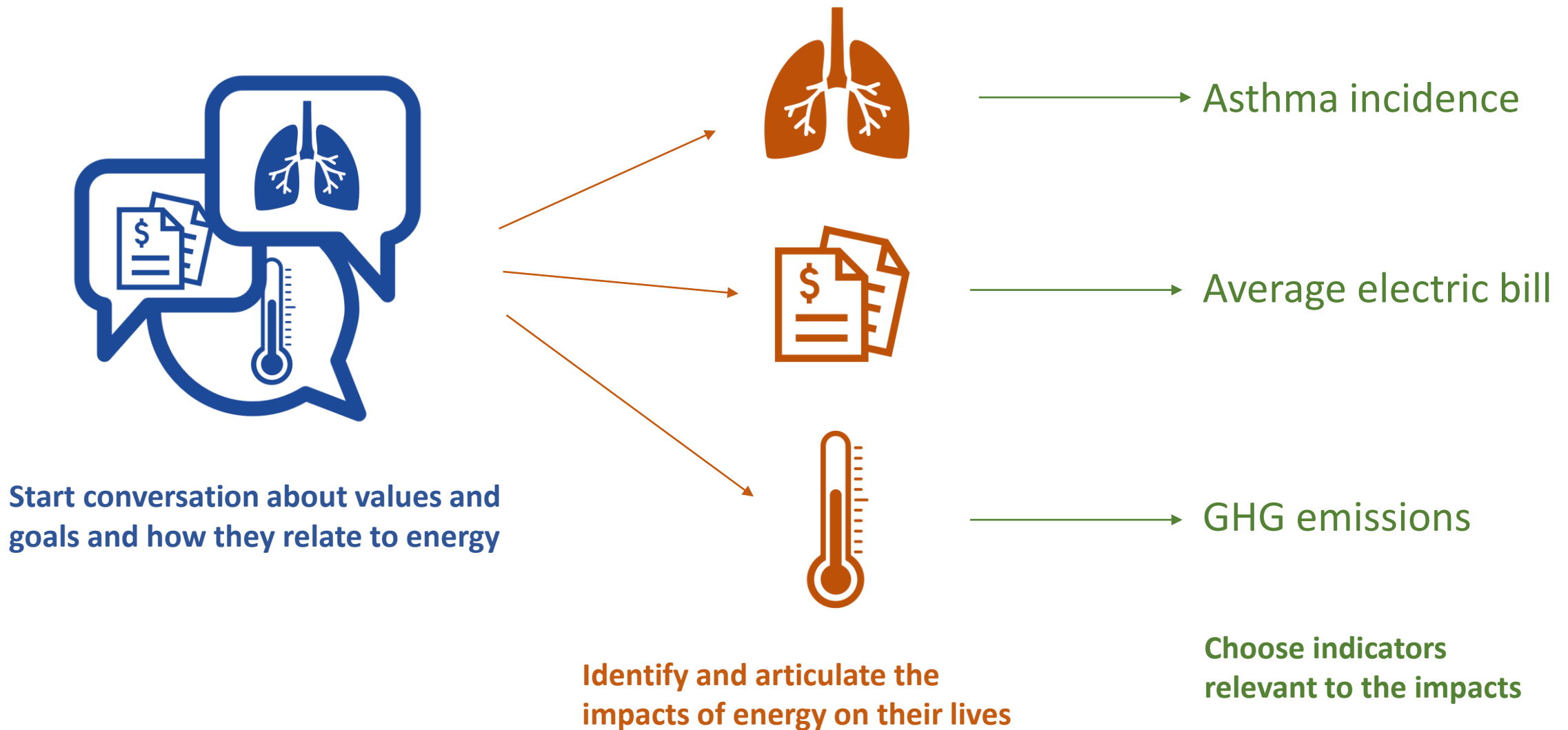
Equity-focused energy planning

- Energy bills
- Energy burden reduction
- CO2 reduction
- Air pollution reduction
- Spatial & demographic distribution
- Others?

Using data in stakeholder-responsive planning processes

- Data serves the process, not the other way around
 - Data does not define the community or its residents
 - Data does not define options
 - Data does not determine which solutions are best
- Community members do all of these things
- For data to serve the process, they should be
 - Accompanied by info on sources and methods
 - Expressed in meaningful terms and units
 - Subject to examination and acceptance by the stakeholders

How to choose good indicators with stakeholders



Criteria for choosing good indicators

Criterion	Explanation	Weak examples	Strong examples
Measurable	Reflected in attainable, credible, timely data	<ul style="list-style-type: none"> Public health Equity 	<ul style="list-style-type: none"> Asthma incidence Spatial correlation of energy-burden and poverty
Sensitive	Changes measurably in response to city energy-related action	<ul style="list-style-type: none"> Heat-wave frequency Interest rate 	<ul style="list-style-type: none"> GHG emissions Payback period
Relevant	Identified by stakeholders as impacting their lives in important ways	<ul style="list-style-type: none"> Progress toward city pledge 	<ul style="list-style-type: none"> Avg electricity bill Program costs
Distinctive	Does not cover information addressed by the other indicators	<ul style="list-style-type: none"> % homes using NG heat/stoves % homes using electric heat/stoves 	<ul style="list-style-type: none"> % homes using electric % commercial buildings using electric

Obtaining data

Baseline data: energy indicators and sources

Energy profile	Energy consumption data broken down by end-use sector (transportation, residential and commercial buildings, city and public sector, industry, electricity generation, heating, water, and waste)
	Load profiles for residential and commercial buildings
	Industrial-load data for major, local, industrial energy users
	Local transportation-fleet characteristics (vintage, efficiency, and vehicle type)
	GHG emissions
Energy cost	Average electricity rates (residential, commercial, and industrial)
	Utility tariff structure
	Average prevailing heating costs (residential, commercial, and industrial)
Efficiency, renewables	Efficiency opportunity estimates
	Wind and solar resource potential
	Potential for converting waste to energy
	Potential for using biomass
Utility info	Existing grid-mix by generation type (coal, natural gas, hydro, and non-hydro renewables)
	Utility type (publicly owned [muni/co-op] vs. investor-owned utility)
	Current policies and rates applicable to renewable energy or distributed energy resources (e.g., net energy metering, capacity-based incentives, performance based incentives, local tax incentives)

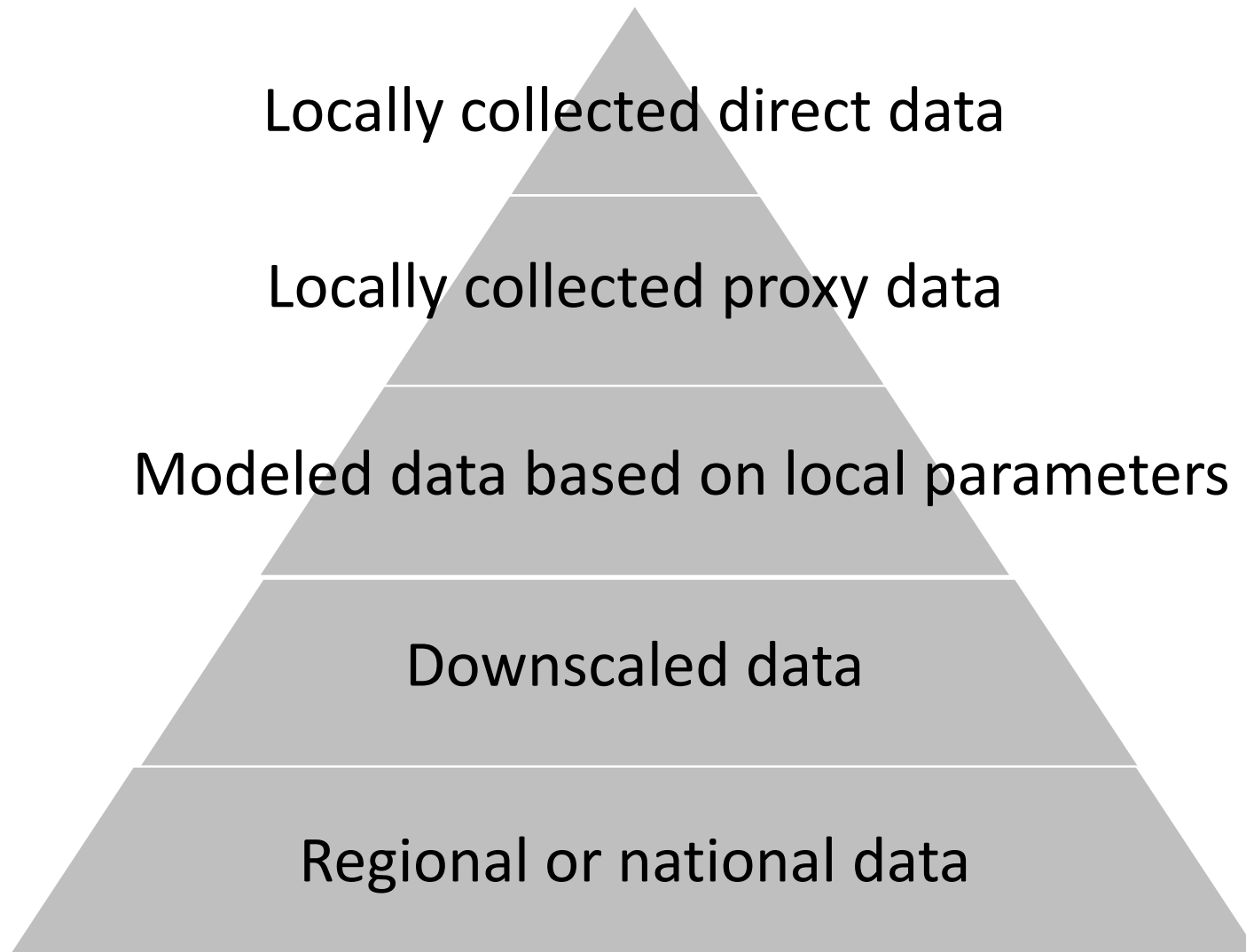
- Local government
 - Sustainability
 - Public Works
 - Finance
 - Licensing
 - Revenue
- Community organizations
 - Service provision
 - Needs
 - Incidence of problems
- State government
 - Energy
 - Transportation
 - Forestry
 - Commissions and task forces
- Utilities
 - Consumption and generation volumes
 - Annual report on source of fuel supply
- Local vendors
 - Fuels
 - Renewables
- Other data sources
 - EIA State Energy Data System (SEDS)
 - Local data as reported to CDP

Baseline data: spatial demographic indicators and sources

Demographic and social-wellbeing indicators
Population size and density, and changes
Race, age, sex profiles
Poverty rate
Housing costs
Rental rates
Transportation modes
Commute times
Health insurance rates
Educational attainment
Incidences of various diseases and disorders

- US Census Bureau
- LEAD (US Dept of Energy)
- Housing + Transportation Affordability Index (Center for Neighborhood Technology)

Hierarchy of data quality



Example: Electricity consumption data obtained from power utility

Example: Building mix from property data as proxy for stationary energy consumption

Example: VMT modeled from local street lengths, vehicle license data, and/or strip counts

Example: Gasoline consumption downscaled from state gasoline-sales data

Example: Statewide solar-installation cost data



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Poll: baseline data

Menti-meter poll – multiple short answers:

What sources of data have you found for energy and sustainability data for your community?

Discussion:

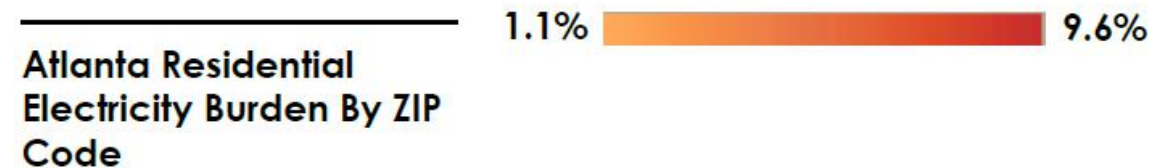
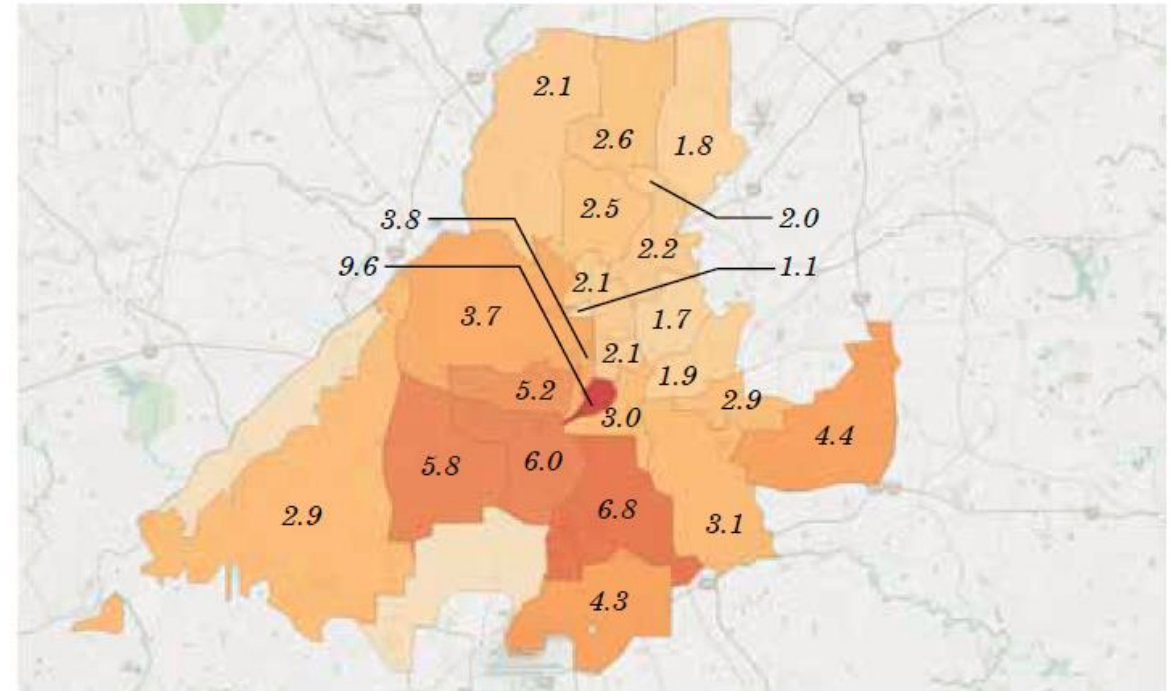
What are your primary challenges in making use of the data you have available?

Case study:
Baseline Data on Energy
Equity in Atlanta

Energy Equity



- Energy Burden
 - % of household income spent on utility
- Atlanta has 4th highest energy burden in U.S.
 - National average is 2.7% of income
 - Atlanta – up to 9.6% in some ZIP codes
- Paying utility bills is the #1 reason for taking out a payday loan.



Wrap-up

Homework

(all participants)

1. Start stakeholder engagement on indicators
 - **What indicators for clean energy action are most important to stakeholders in your community?**
2. Share your feedback on this session (5 minutes)
 - Please respond to the poll at https://bit.ly/broadly_feedback_1

Questions? Comments? – contact Eric.Mackres@wri.org

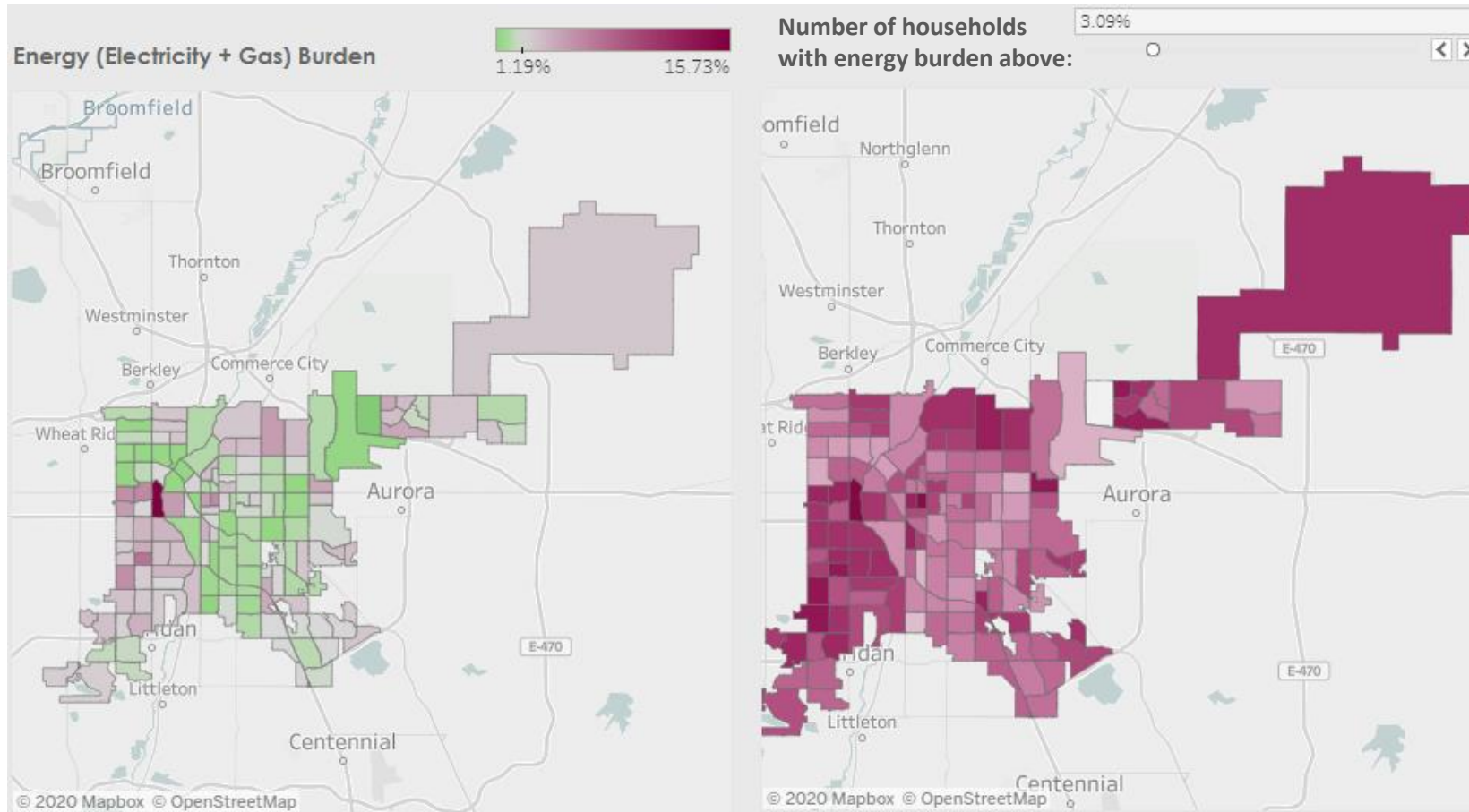
Session 2 – May 28, 3:30-5pm EST

Topics

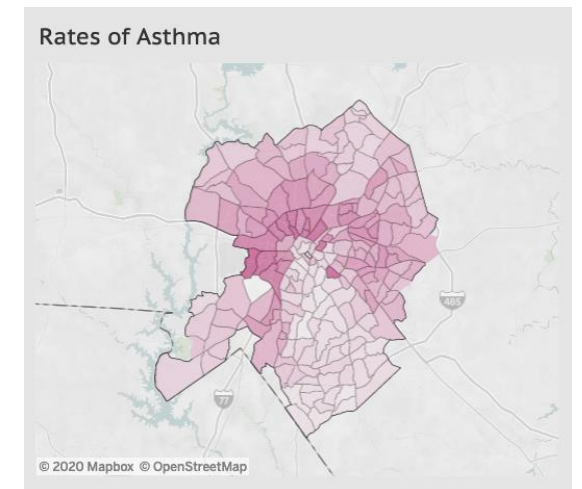
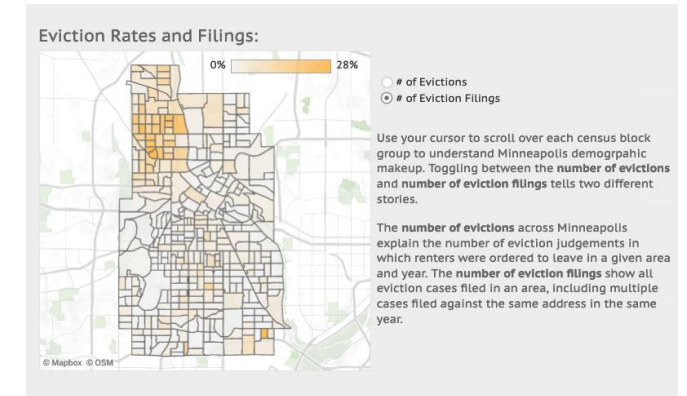
- Interpreting and communicating baseline data
 - Defining and modeling energy-policy scenarios
 - Evaluating scenario outcomes
-
- Make sure the appointment is on your calendar
 - Register in advance at
<https://wri.zoom.us/meeting/register/tJEsceyoqT4pG9bbm916sTVGxD9hBxwn2yNT>

Sneak-peak of Level 1 city custom data for Session 2: Interactive baseline energy equity maps

Utility energy burden indicators



Example optional indicators



Homework

(Level 1 participants only)

1. Before the next session, Greenlink will provide you with a baseline dataset for your city for 2018 (or the most recent year available), which will include:
 - City-wide baseline indicators: Energy consumption and CO2 emissions by sector and fuel
 - Two maps by Census tract of total utility energy burden – median burden (% income) & # households in burden
 - Two maps by Census tract of your two chosen optional indicators.
2. **Choose two optional indicators** that you would most like mapped (from the list on the next slide)
3. **By May 6, indicate your choices** in the form at http://bit.ly/broadlybeneficial_hw1.
4. In preparation for the next session, **examine the data for insights into your community**, particularly with respect to equity of utility energy burdens.



Optional indicators for mapping: Choose two

Demographics

Population
Racial composition
Educational attainment
Median age

Housing characteristics

Average household size
Households with children
Number of bedrooms
Eviction rates
House heating fuel (gas, electricity, renewables, etc.)
Mortgage status
Median property value
Percent of renters in a geography
Housing type, rented or owned (single family detached, multifamily, townhouse, etc.)

Transportation characteristics

Means of transportation
Travel time to work
Average commute to work (in minutes)

Income characteristics

Gini index of income inequality
Poverty status
Number of individuals utilizing the Supplemental Nutrition Assistance Program
Households with living costs exceeding 30% of their income

Health characteristics (for select cities)

Prevalence of arthritis
Prevalence of asthma
Prevalence of binge drinking
Prevalence of cancer (except skin cancer)
Prevalence of cholesterol screening
Prevalence of chronic obstructive pulmonary disease
Prevalence of colonoscopy and/or sigmoidoscopy
Prevalence of coronary heart disease
Prevalence of current lack of health insurance
Prevalence of diabetes
Prevalence of high blood pressure
Prevalence of high cholesterol
Prevalence of kidney disease
Prevalence of no leisure time physical activity
Prevalence of loss of teeth
Prevalence of mammography use
Prevalence of mental health of not good for equal to or greater than 14 days
Prevalence of obesity
Prevalence of PAP smear use
Prevalence of poor physical health
Prevalence of sleeping less than 7 hours
Prevalence of smoking
Prevalence of stroke
Prevalence of taking medication for high blood pressure
Prevalence of visits to the dentist
Prevalence of visits to doctors for routine checkups within the past year

See you in a few weeks!

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