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BROADLY BENEFICIAL CLEAN ENERGY PLANNING

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

Session 2: Defining and modeling scenarios

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Engagement partner: CUSP canadian urban sustainability practitioners

Introductions – training team

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Overall outline of training series

	Session 1: Stage-setting and baseline data	Session 2: Defining and modeling scenarios	Session 3: Turning scenarios into policies
	• Concepts and methods for equity-focused planning • Overview of scenario-based planning • Choosing indicators • Obtaining data to measure indicators	• Interpreting and communicating baseline data • Defining and modeling scenarios • Evaluating scenarios	• Understanding scenario outcomes • Identifying and prioritizing and policies and programs • Preparing for implementation
Scenario Planning "test exercise" (Level 1 cities)	• Select indicators	• Review baseline • Select scenarios	• Review scenario outcomes

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

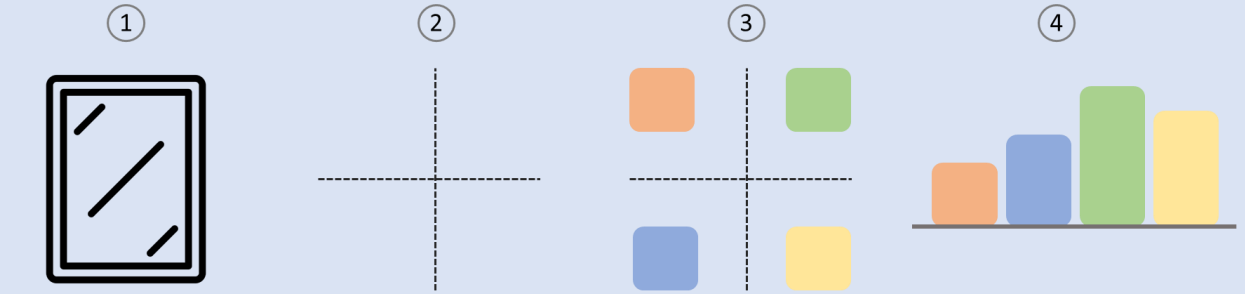
equity focus

- 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

Recap of Session 1

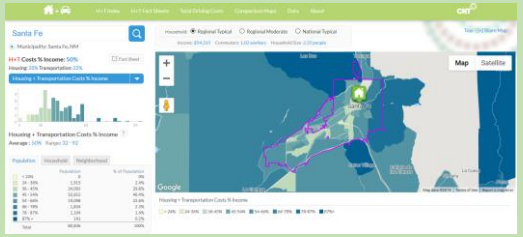
Equity and inclusive stakeholder engagement

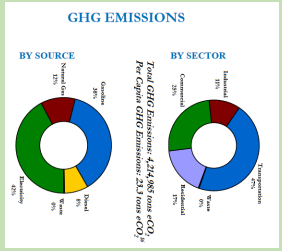
Scenario planning



1. Assess the current situation
2. Choose variables for defining scenarios
3. Choose scenarios by exploring plausible combinations of the variables
4. Examine and evaluate scenarios

Selecting indicators and baseline data





Components of Equitable Clean Energy Scenario Planning

Planning component	Questions
Goals	What are your government's and/or community's goals?
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? • 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?

Objectives for today

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

- Feel comfortable interpreting and communicating your baseline indicator data
- Understand the process of defining energy-policy scenarios through an inclusive stakeholder-driven process
- Be familiar with scenario modeling methods
- Be ready to develop scenarios for your community

Agenda

Core session – 1.5 hours

1. Communicating baseline data
2. Interpreting your baseline - discussion
3. Developing scenarios
4. Modeling scenarios
5. Case study: using scenarios for stakeholder engagement – District of Columbia
6. Using the Scenario Calculator
7. Wrap-up & homework

Optional Q & A and discussion – 30 minutes

Communicating baseline data

Example indicators that might be used in a baseline

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

The baseline's role includes information *and* communication

Illuminate assets, opportunities, and current status of stakeholder-relevant indicators

Validate and/or challenge stakeholders' perceptions of community inequity

Establish common reference points for discussion

Facilitate agreement on shared goals

Tips for turning data into discussion

Goal is to move from specific (e.g., indicators) to general (e.g., scenarios)

Make things vivid

- Use many types of data visualization
- Use narratives
- Invite stakeholders to share their personal perspectives

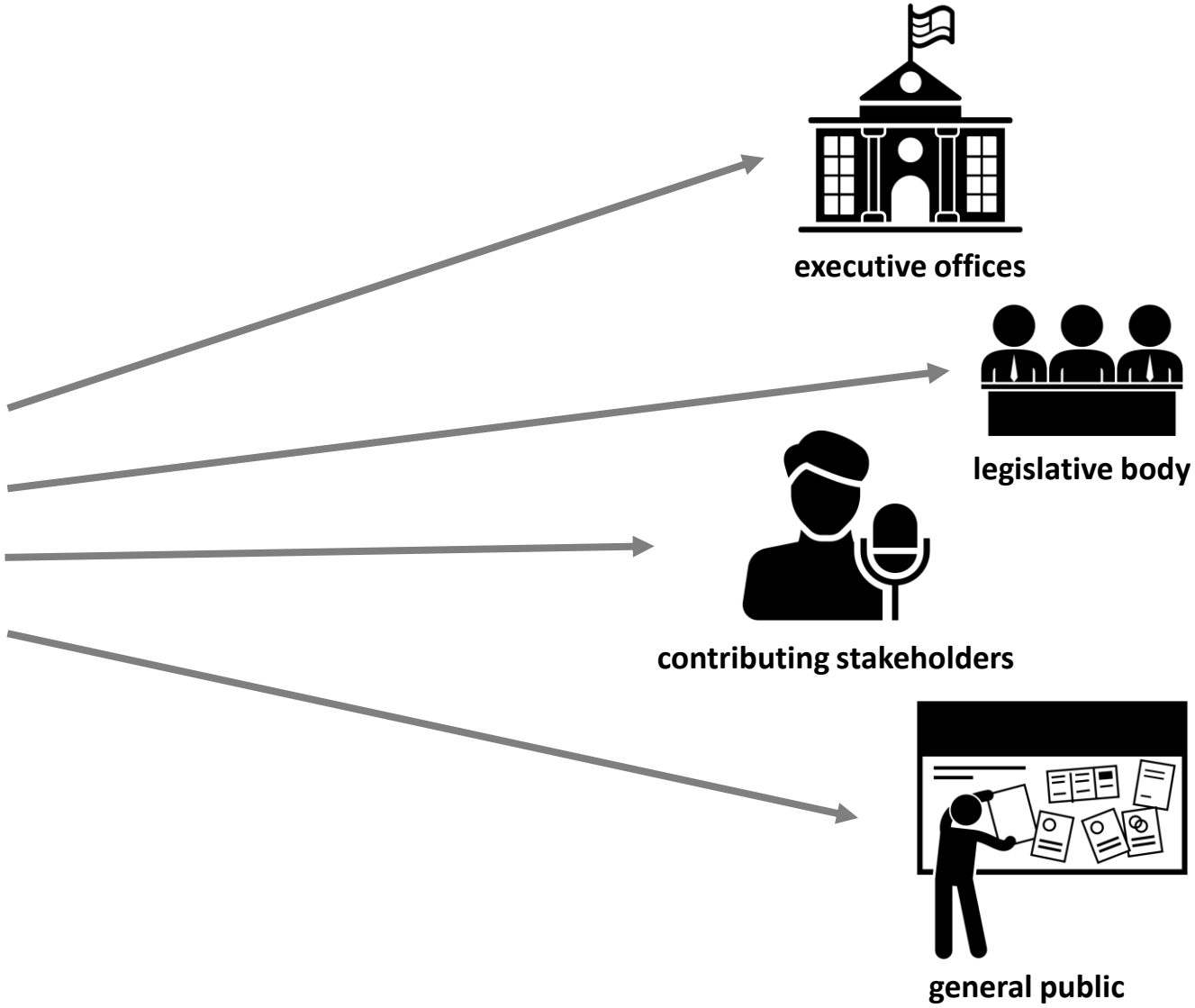
Start with unstructured discussion of the baseline indicators

- Start with one indicator at a time
- Do they make sense?
- Which indicators look good/bad?
- What would be the ideal situation?
- Which indicators are more/less important?

Baseline report: key content and audiences

Energy profile report

- Executive summary
- Stakeholder engagement process
- Energy vision
- Energy profile
  - Key facts
  - Current energy use and cost
  - Projected future energy use and cost
  - Related efforts underway in the community
- Gaps and challenges
- Next process steps

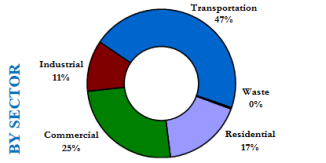


Source: U.S. Dept of Energy, *Guide to Community Energy Strategic Planning*

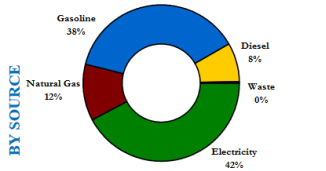
Communicating numerical info is all about converting numbers into familiar things

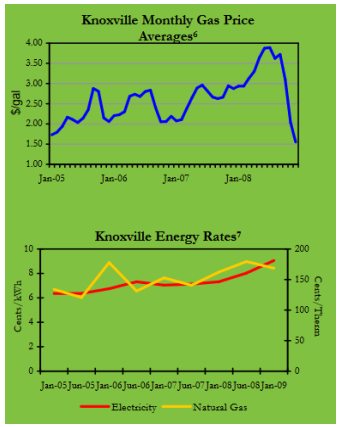
Portions and trends

GHG EMISSIONS

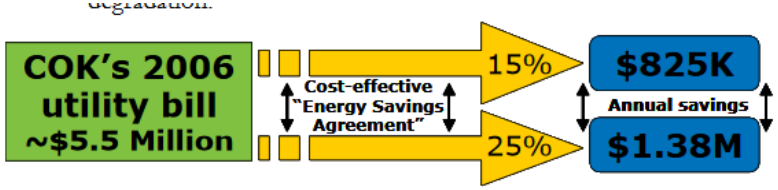


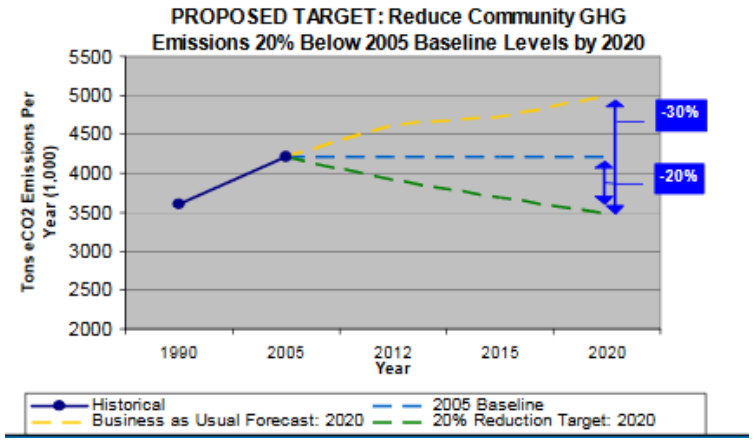
Total GHG Emissions: 4,214,985 tons eCO_2
Per Capita GHG Emissions: 23.3 tons eCO_2[16]





Gaps





Meaningful units

TRANSPORTATION

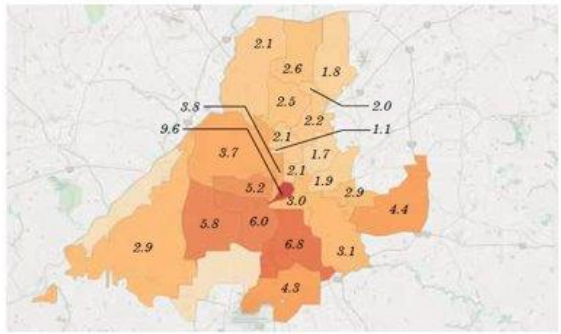
In 2005, over 2.9 billion miles were traveled on Knoxville's roads. Although nearly 222 million of these miles were clocked as pass-through interstate traffic, total miles traveled resulted in the emission of nearly 2 million tons of eCO_2 in the Knoxville area.

2.9 Billion Miles = Distance To the Moon and Back X 6,150

Assuming average US fuel economy and prices, this number of vehicle miles traveled indicates:

Consumption of approximately:	…and fuel costs of approximately:[15]
148.5 million gallons of Gasoline	$ 337 million for Gasoline
31.5 million gallons of Diesel	$ 75.7 million for Diesel

Places



Atlanta Residential Electricity Burden By ZIP Code

Sources: City of Knoxville, 2007. *Knoxville's Energy Inventory: Government and Community Analysis and Strategic Plans.* Greenlink and City of Atlanta.

Interpreting your baseline

Which indicators are most important to your community? (Check the two you most wanted to see mapped)

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
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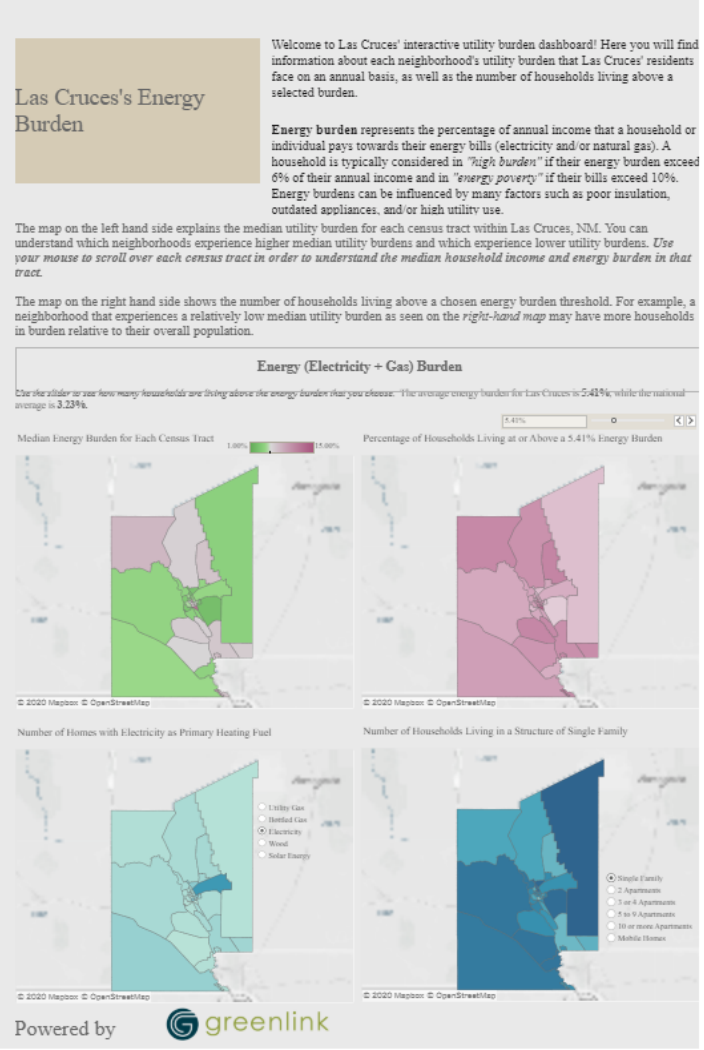
Prevalence of smoking
Prevalence of stroke
Prevalence of taking medication for high blood pressure
Prevalence of visits to the dentist
Prevalence of visits to doctors for routine checkups within the past year

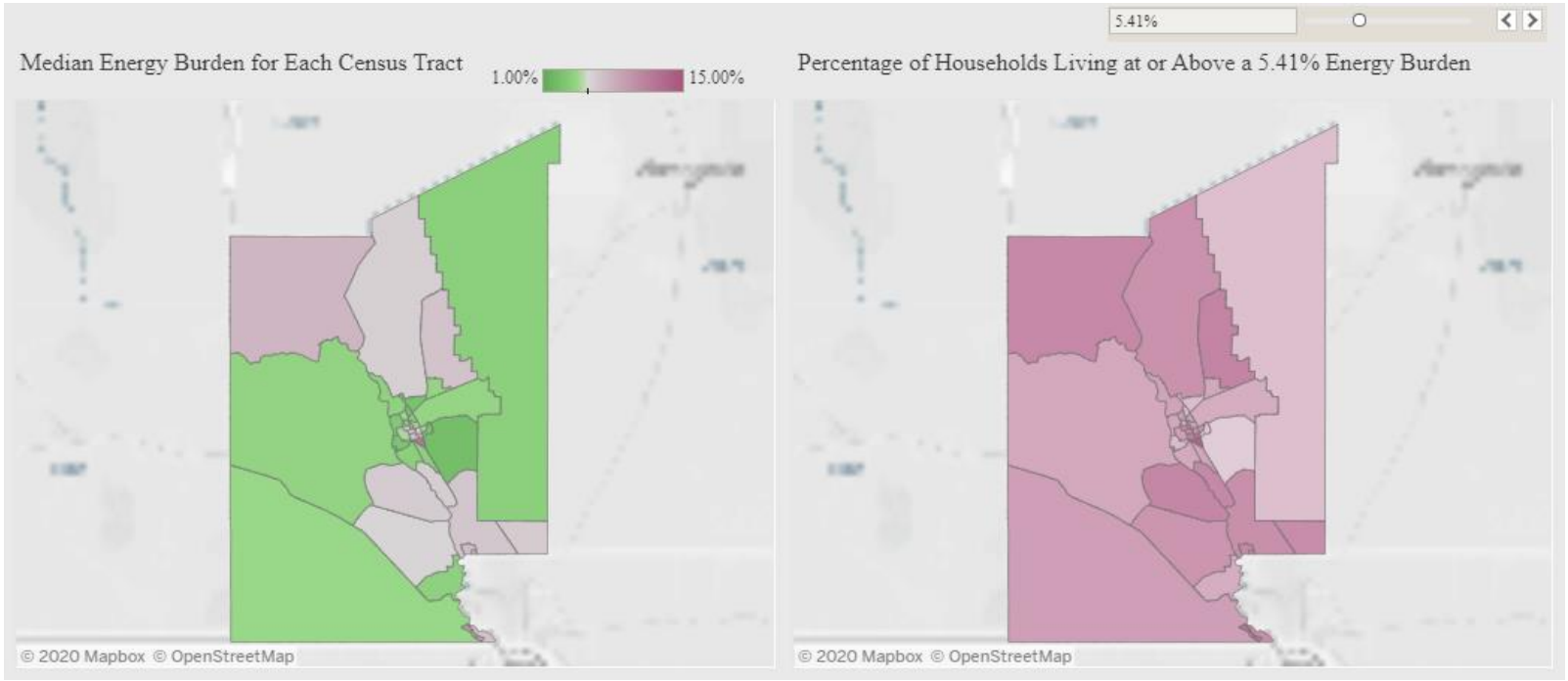
Discussion: Indicator selection

Why did you choose the indicators you did?

Are there any that you would have chosen, but they weren't on the list?

Baseline energy equity indicator maps -
Example: Las Cruces' energy burden, heating fuel, housing structure





Source: Greenlink Analytics, published on Tableau. Plus maps for all 12 Level 1 cities.

Discussion: Baseline results

What did you learn from your baseline indicators and maps?

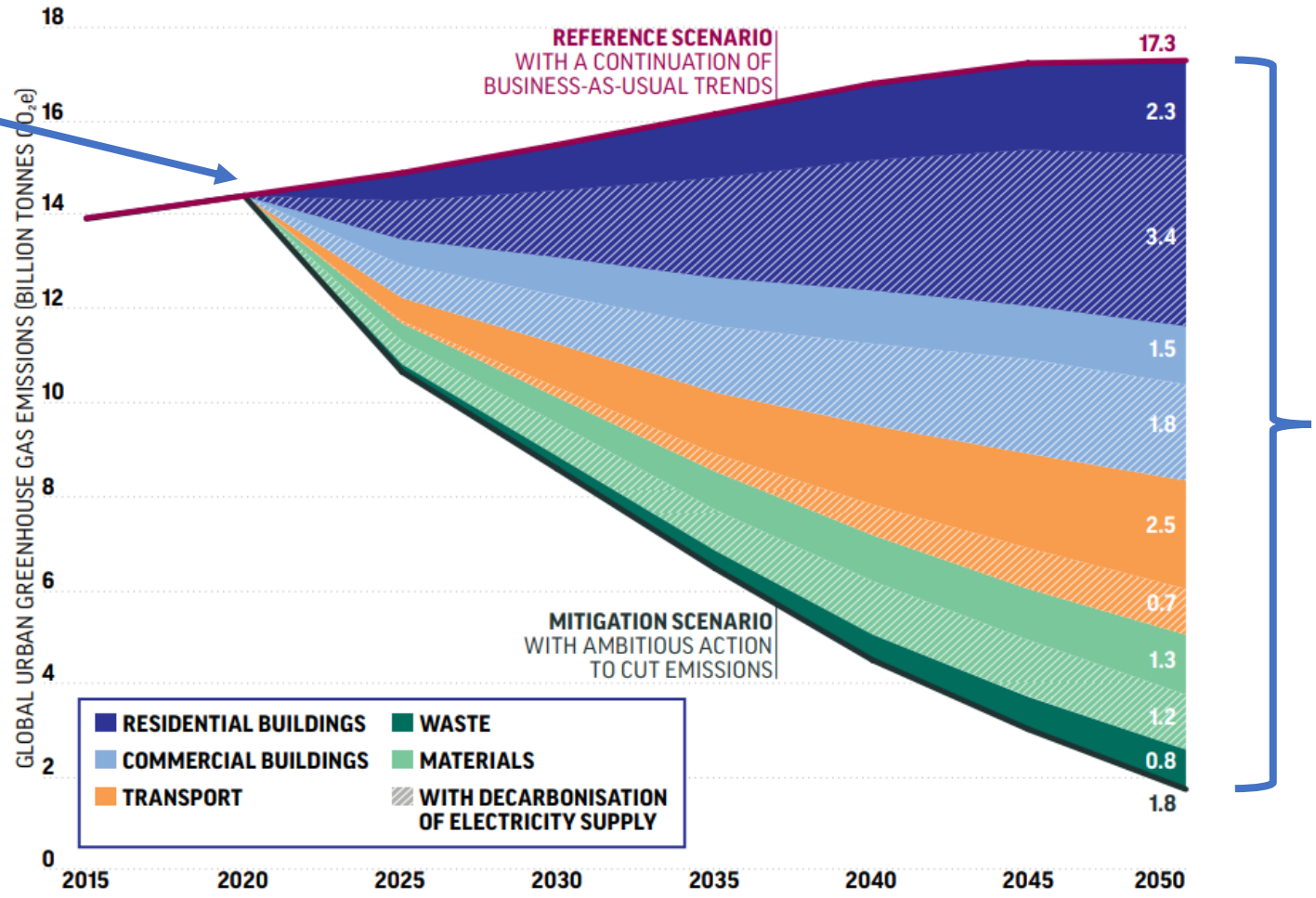
What might you do differently as a result of this information?

How might you use this information to engage and communicate with stakeholders?

Developing scenarios

Scenarios as possible futures

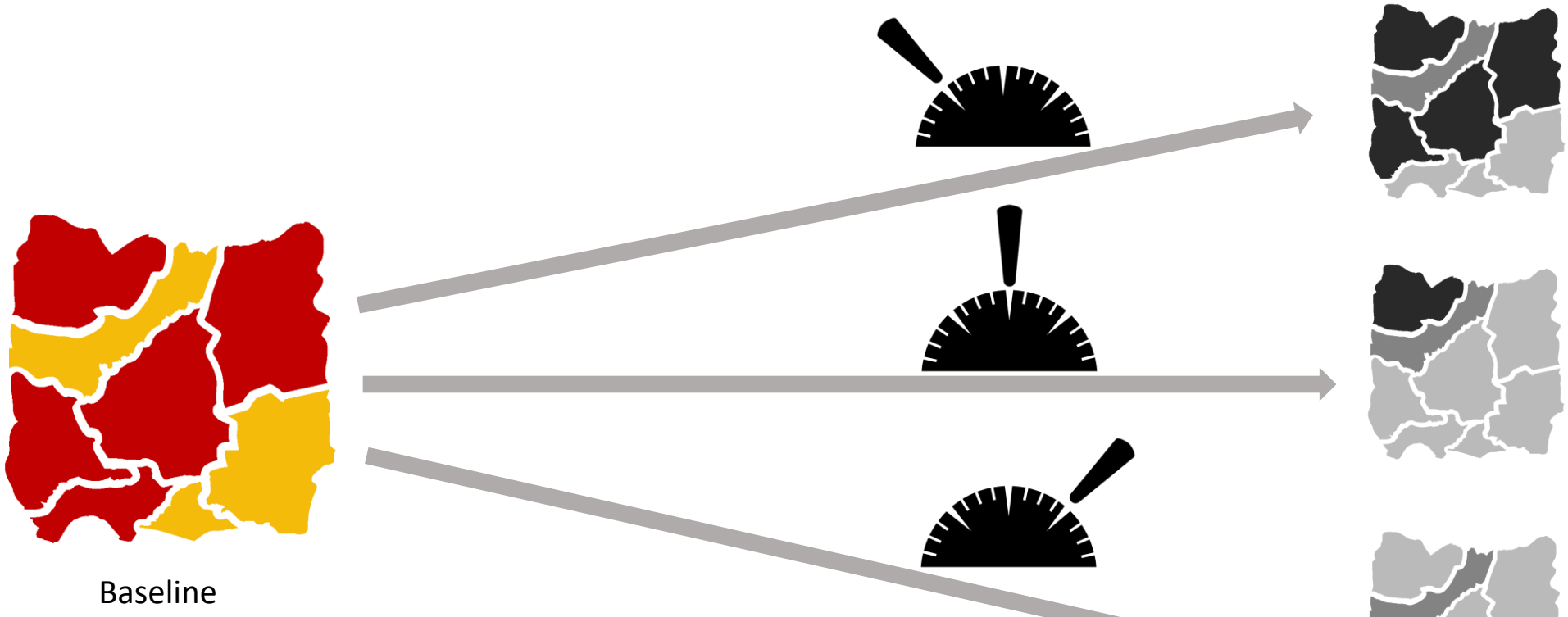
Baseline



Range of numerous possible futures

Source: Coalition for Urban Transitions, Climate Emergency, Urban Opportunity, 2019

Scenarios are a combination of actions

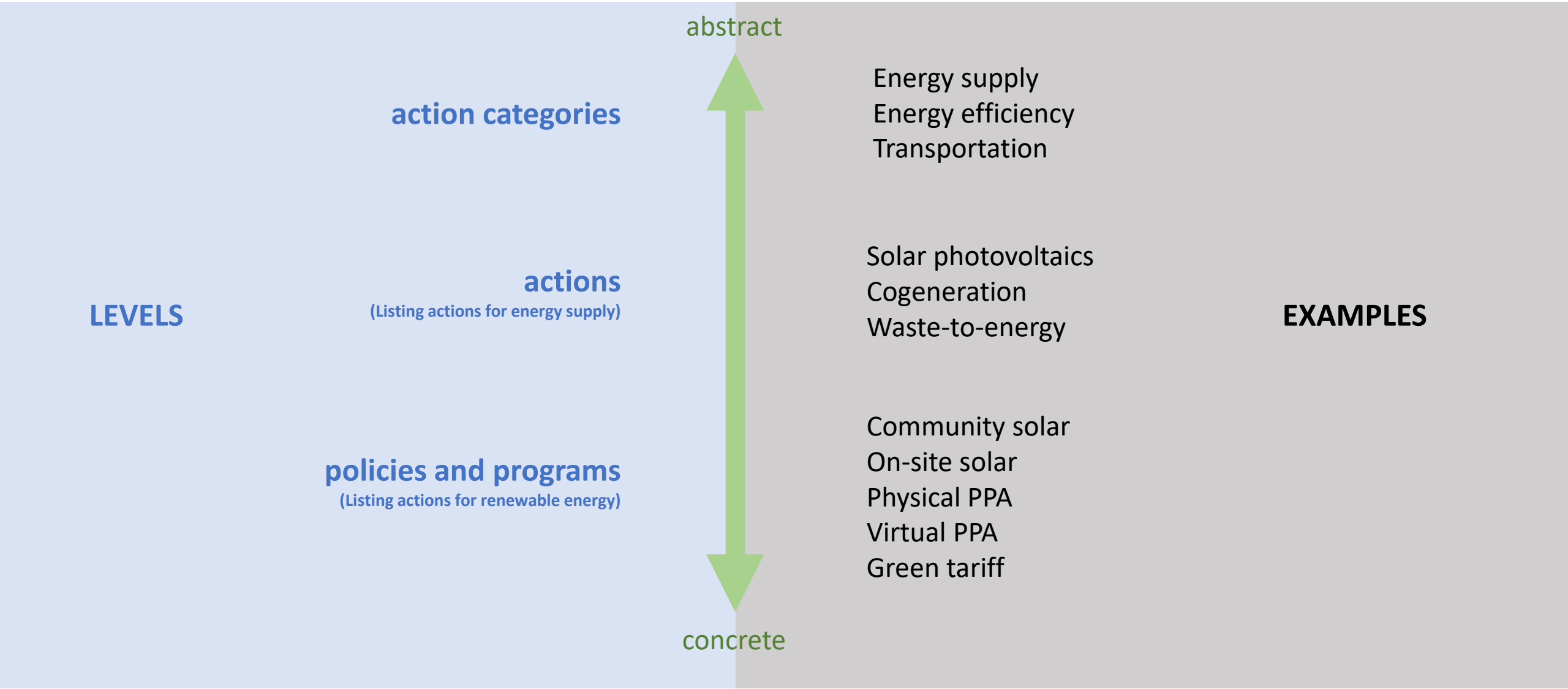


Baseline

Possible mixes of action options

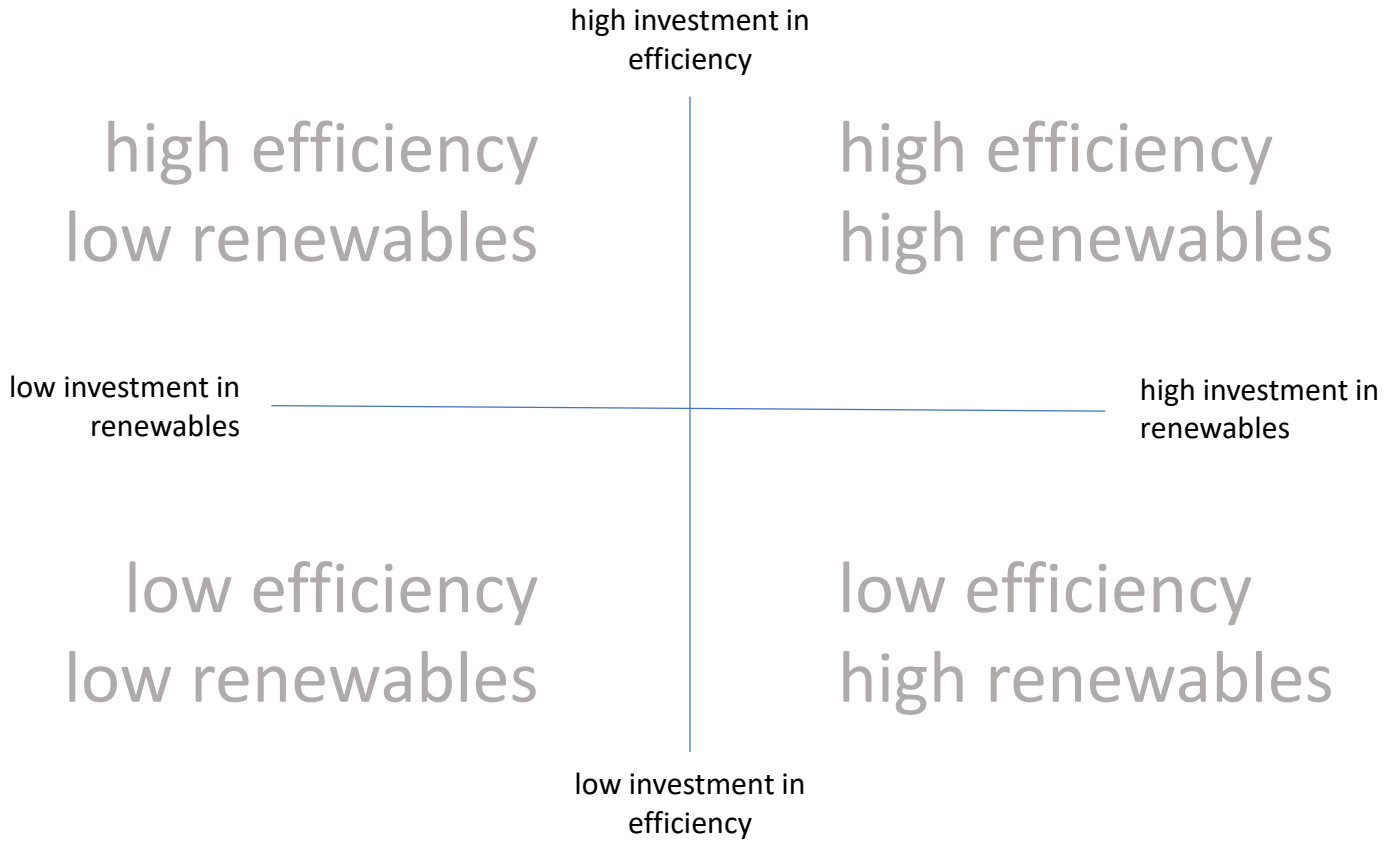
Possible future outcomes

What level of detail? Identifying available *actions*



Renewable energy policies and programs from C40, https://www.c40.org/researches/c40-cities-the-power-to-act

Scenario development: action-spaces

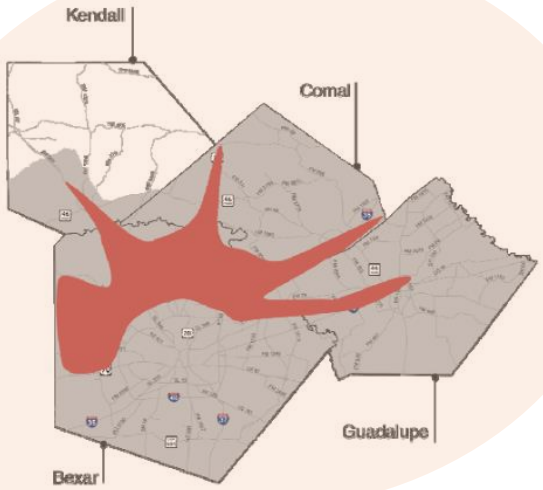


- Good if you have 1-2 actions
- Good if you have many actions, but they cluster in their societal effects

- Easy to think about
- Easy to communicate

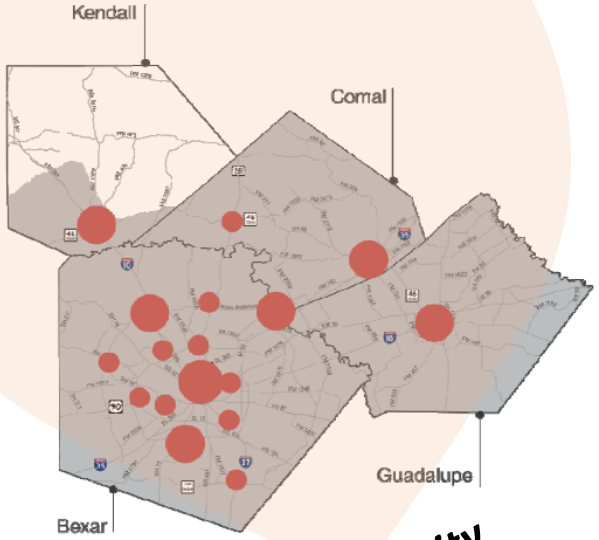
Scenario 1 (15 year trend)

- Population and employment follow a trend seen over the past 15 years
- Primarily low density development
- People live in the suburbs and work in the central city
- Consistent with current land use plans and policies



Scenario 3 (Activity Centers/Corridors)

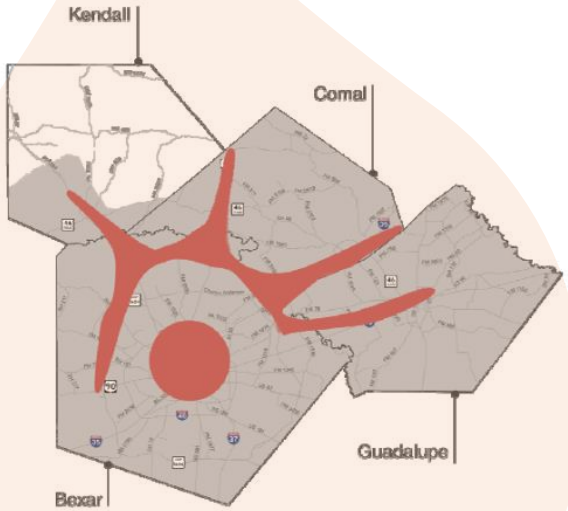
- Population and employment growth occurs at activity centers and key transportation corridors
- Produces highest density of the three scenarios
- Results in people living closer to where they work
- Increases active transportation modes and transit use



Low-density Mid-density High-density

Scenario 2 (5 year trend)

- Follows recent (past 5 years) trend
- For Bexar County this is infill development that is primarily medium- to higher-density and supports increased use of alternative modes of transportation
- For Comal, Guadalupe and Kendall counties this shows development patterns similar to the 15 year trend



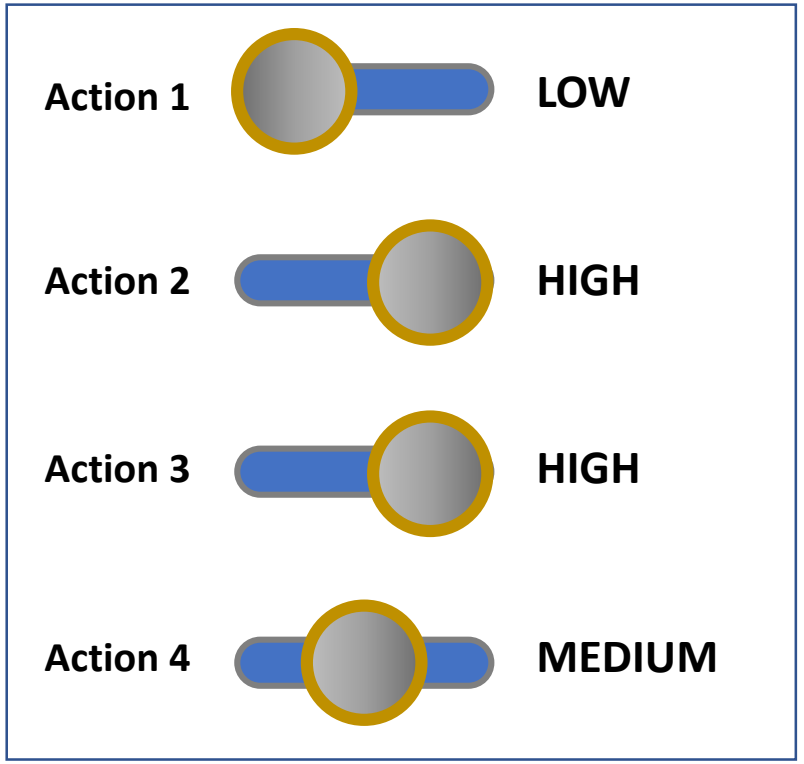
Source: Alamo Area Metropolitan Planning Organization, 2014. MOBILITY 2040 Report.

Scenario development: action combinations

If you have more than two actions, use check-box matrices or slider panels.

The idea is to keep things visual.

	Scenario A	Scenario B	Scenario C
Action 1	✓		
Action 2	✓	✓	
Action 3			✓
Action 4	✓	✓	✓
Action 5		✓	



	Scenarios			
	A	B	C	D
Existing buildings renovated for efficiency	✓	✓	✓	✓
New buildings more efficient	✓	✓	✓	✓
District heat in high-density areas, powered by 70 MW CCGT	✓	✓		
District heat in industrial park, powered by30 MW CHP	✓	✓	✓	✓
Increased vehicle efficiency; 7% EV	✓	✓	✓	✓
24 MW photovoltaic installation		✓	✓	
20 MW biomass facility, partially replacing coal		✓		
10% biogas blend for CHP and (if used) CCGT		✓	✓	✓
37 MW wind		✓	✓	
70 MW biomass/coal facility			✓	✓

Source: City of Holland, Michigan, 2011. Holland Community Energy Efficiency and Conservation Strategy.

How many scenarios?

Have a business-as-usual (BAU) scenario and at least two that reflect active changes. More is OK, but try to use as few as possible.

The scenarios should be different enough from each other that the public can easily differentiate them

All active-change scenarios should be improvements over BAU

How far will our money take us?

- Your goals should drive your scenarios, not costs
  - Scenario outcomes will help you shape the conversation on costs and benefits next, and budget and finance later
- More equitable scenarios may require more upfront investment, because more people receiving more kinds of benefits.
- “Cost-effectiveness” – aim for more inclusive definitions
  - Financial return on investment
  - Monetized externalities (social cost of carbon) integrated into cost test – “societal benefit”
  - [Metric] / $ invested – GHG emissions reduction, % income saved through reduced energy burden

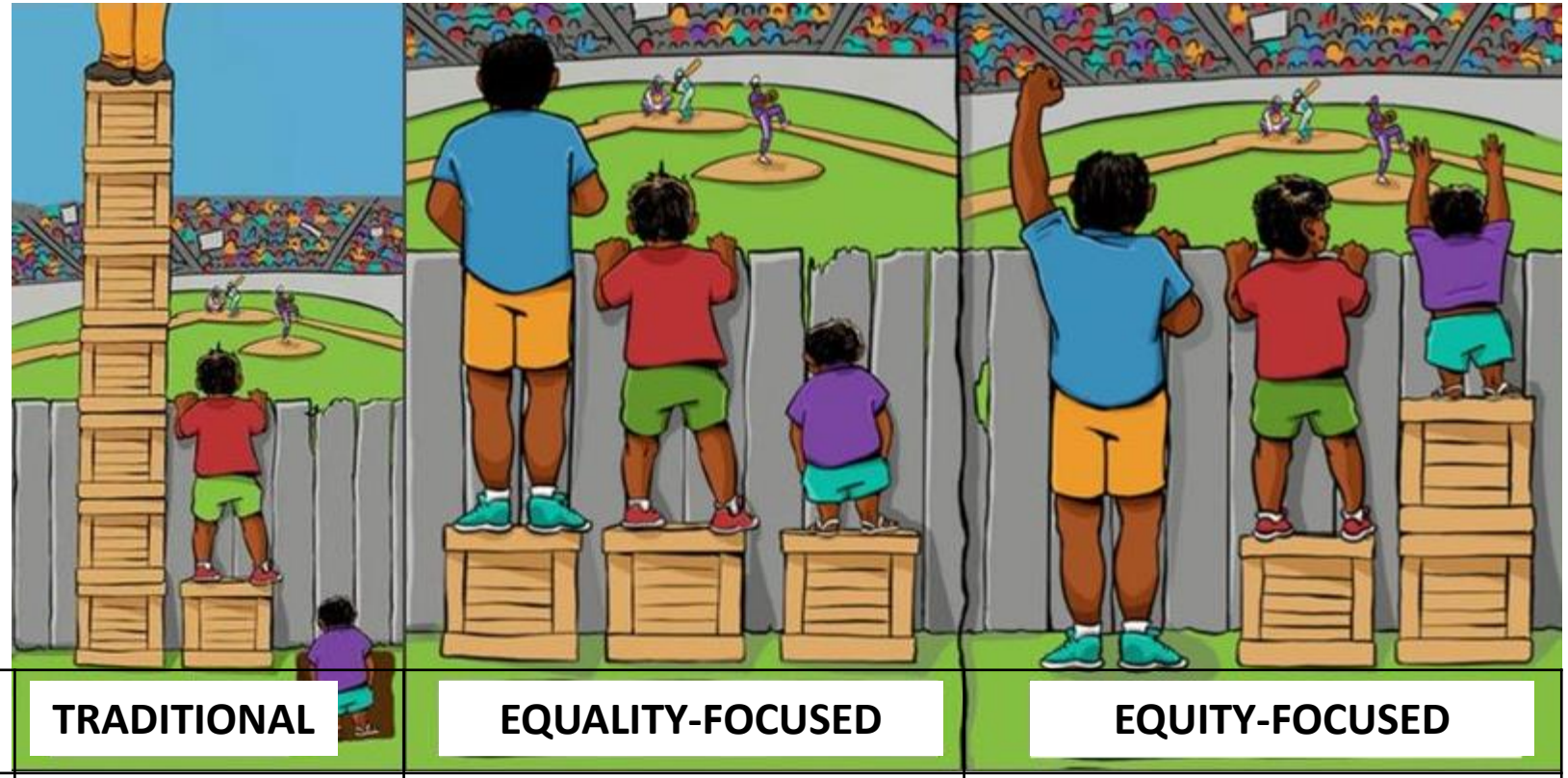
Who is impacted? Distributional parameters

- *Who* is impacted by actions is just as important as the kinds of actions selected.
  - Costs – who pays?
  - Direct benefits – who sees financial (e.g. bill savings) and non-financial benefits (e.g. home comfort and indoor health) from action
  - Indirect benefits – jobs created, increased local investment, outdoor air quality, etc.

- If you have equity indicators and objectives, select scenario parameters and modeling tools that can influence and assess distributional impacts:
  - Geography
  - Race
  - Income
  - Other frontline or vulnerability categories

- Include explicit distributional parameters in action design:
  - First-come-first-served
  - Geographic targeting
  - Means-tested
  - Performance/outcome-based – GHG reduction, energy cost burden reduction

Distributional design of scenarios – metrics matter

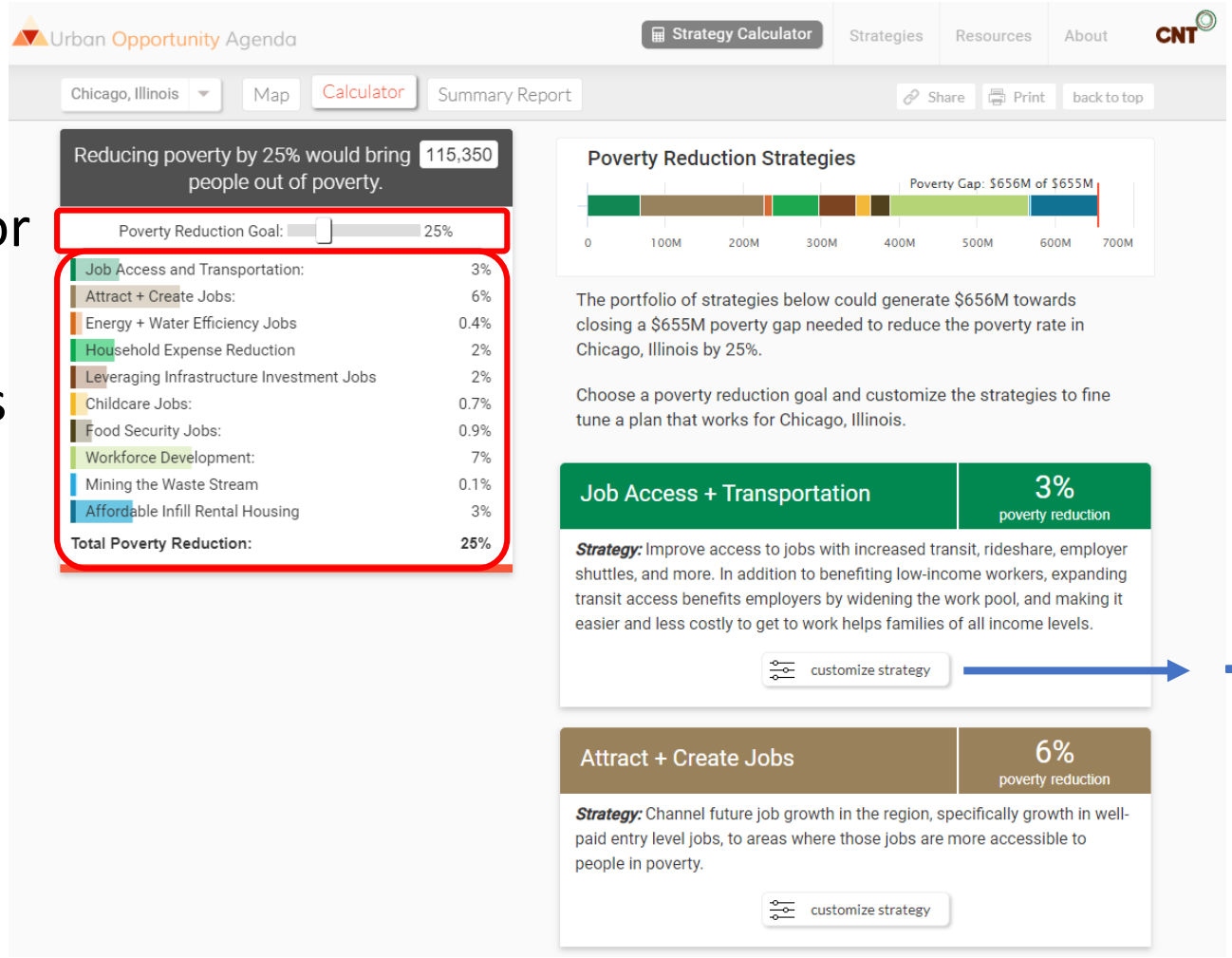


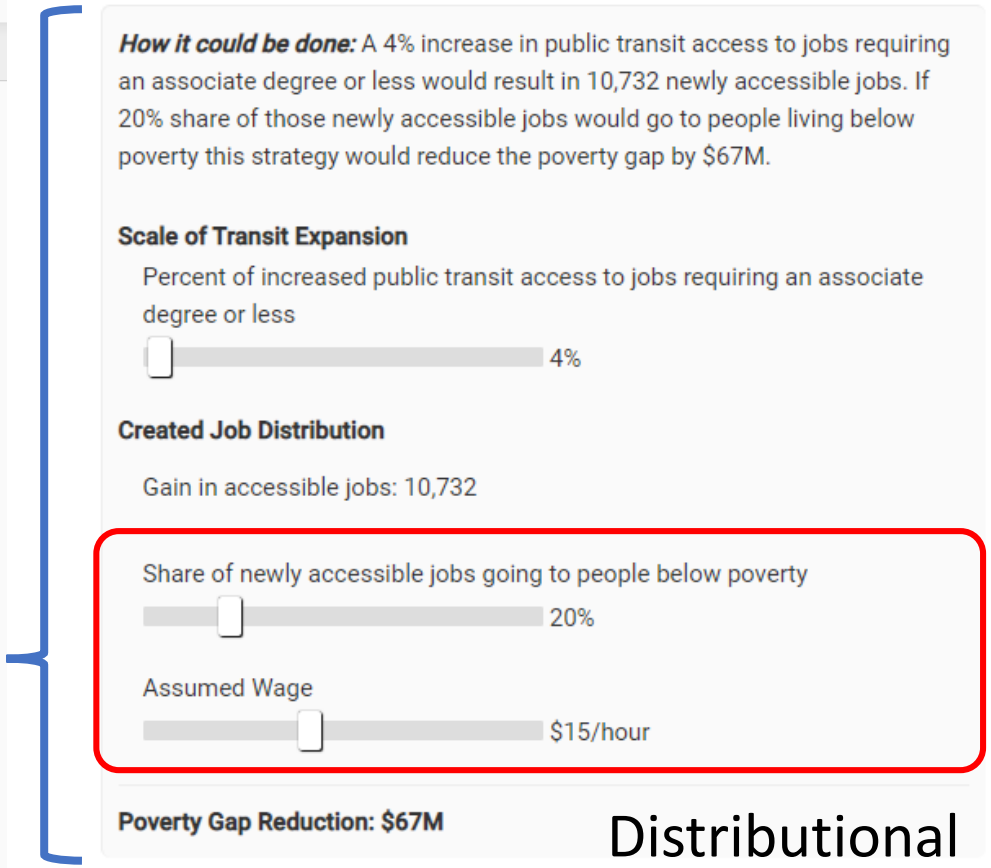
Action design type	TRADITIONAL	EQUALITY-FOCUSED	EQUITY-FOCUSED
Example metrics used to prioritize action delivery	High energy *consumption*	*Population* distribution	High energy *burden*
Example programs	Utility appliance rebates	Programs with equal budget per city ward	Weatherization Assistance Program

Example: poverty reduction in Chicago

Indicator

Actions



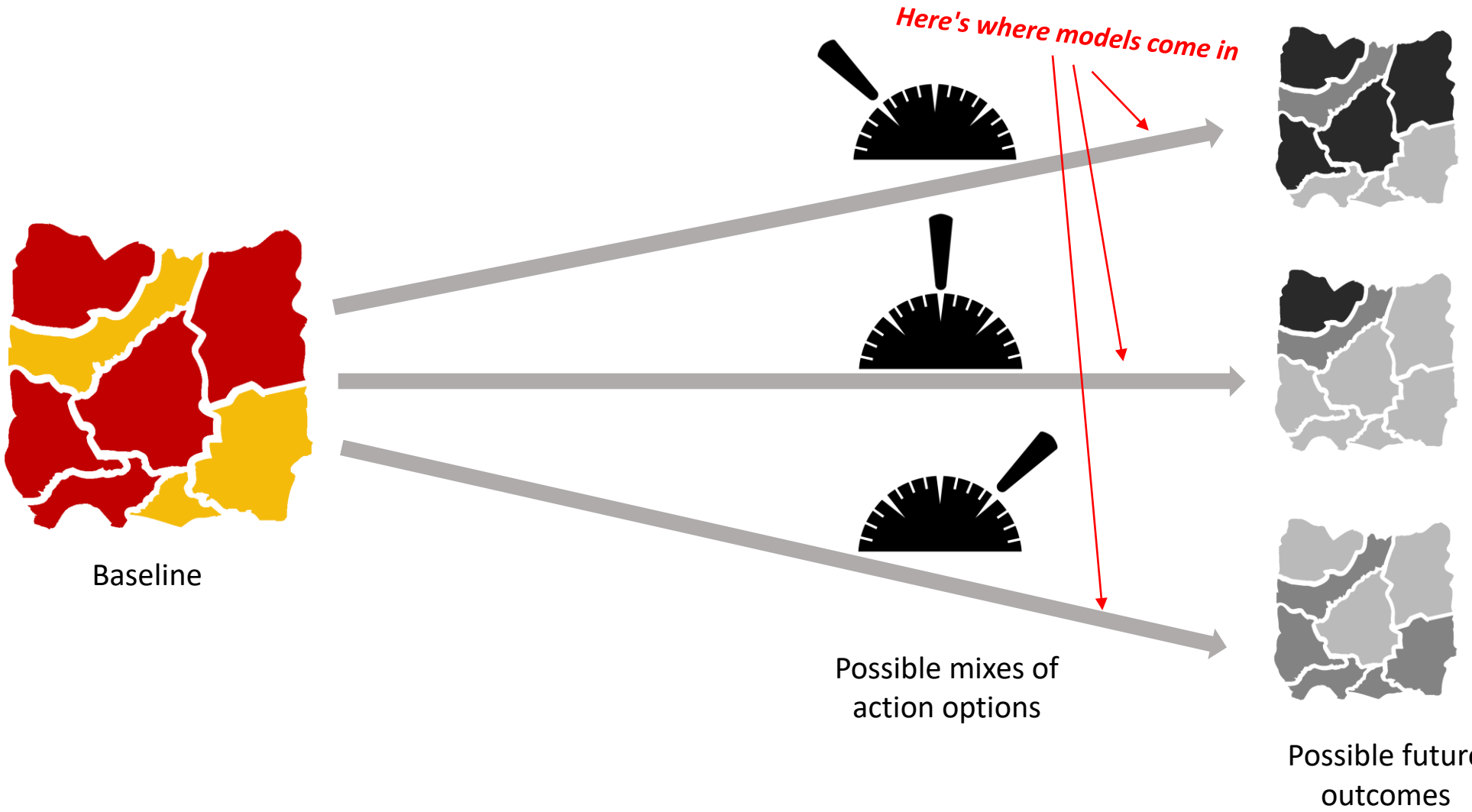


Distributional design

Source: CNT, Urban Opportunity Agenda calculator https://uoa.cnt.org/

Modeling scenarios

Models take you from baseline to potential futures



Some free modeling tools

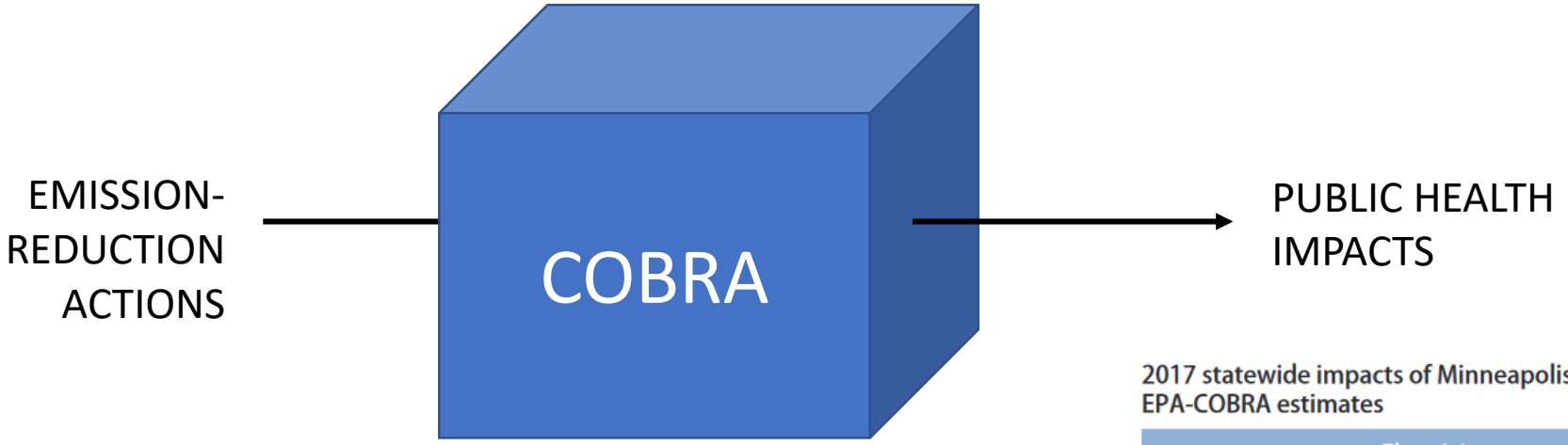
Tool	Provider	Function
Avoided Emissions and Generation Tool (AVERT)	EPA	Estimates pollution and GHG impacts of energy-efficiency and renewable-energy policies. State, city, or zip-code level.
Benefits Mapping and Analysis Program (BenMAP)	EPA	Estimates pollution-related deaths and illness, and associated economic costs, from air-quality data. Resolution same as CMAQ data, but can be aggregated to larger units.
Co-benefits Risk Assessment Health Impacts Screening and Mapping (COBRA)	EPA	Estimates pollution-related deaths and illness, and associated economic costs, avoided for energy-efficiency and renewable-energy policies. County, state, regional, or national.
Climate Action for Urban Sustainability (CURB)	C40, World Bank	Estimates GHG emissions from energy-consumption and waste-production data. (Downscaled default inputs are provided.) Estimates emission reduction from selected policies. City level.
Grid Project Impact Quantification Screening Tool (GridPIQ)	Pacific Northwest National Laboratory	Projects impacts of grid projects that change load profile. Impacts include emissions, and peak characteristics and other changes to load dynamics.
Economic Tool for Rapid Assessment of City Energy (TRACE)	World Bank	Estimate cost and energy savings and avoided emissions from a variety of GHG emission-reduction actions.

Choosing modeling tools is all about inputs and outputs

The big-picture goal is to show how each set of actions leads to a different future—*but all the modeling options can be confusing*.

The trick is to look at one tool at a time, and to think of each in terms of its inputs and outputs...

Think of models as inputs becoming outputs



- Electricity-efficiency goal
- Natural gas-efficiency goal
- VMT goal

2017 statewide impacts of Minneapolis Climate Action Plan goals: EPA-COBRA estimates

	Electricity efficiency goal	Natural gas efficiency goal	Vehicle miles traveled goal
Adult mortality	0.4 - 1	0	0.2 - 0.4
Infant mortality	0	0	0
Non-fatal heart attacks	0.04 - 0.4	0	0.02 - 0.2
Asthma E.R. visits	0.17	0	0.08
Work loss days	63	.01	31
Asthma exacerbations	14	.002	6.3
Total savings	$3.5 - $8.9 million	$509 - $1,299	$1.0 - $3.7 million

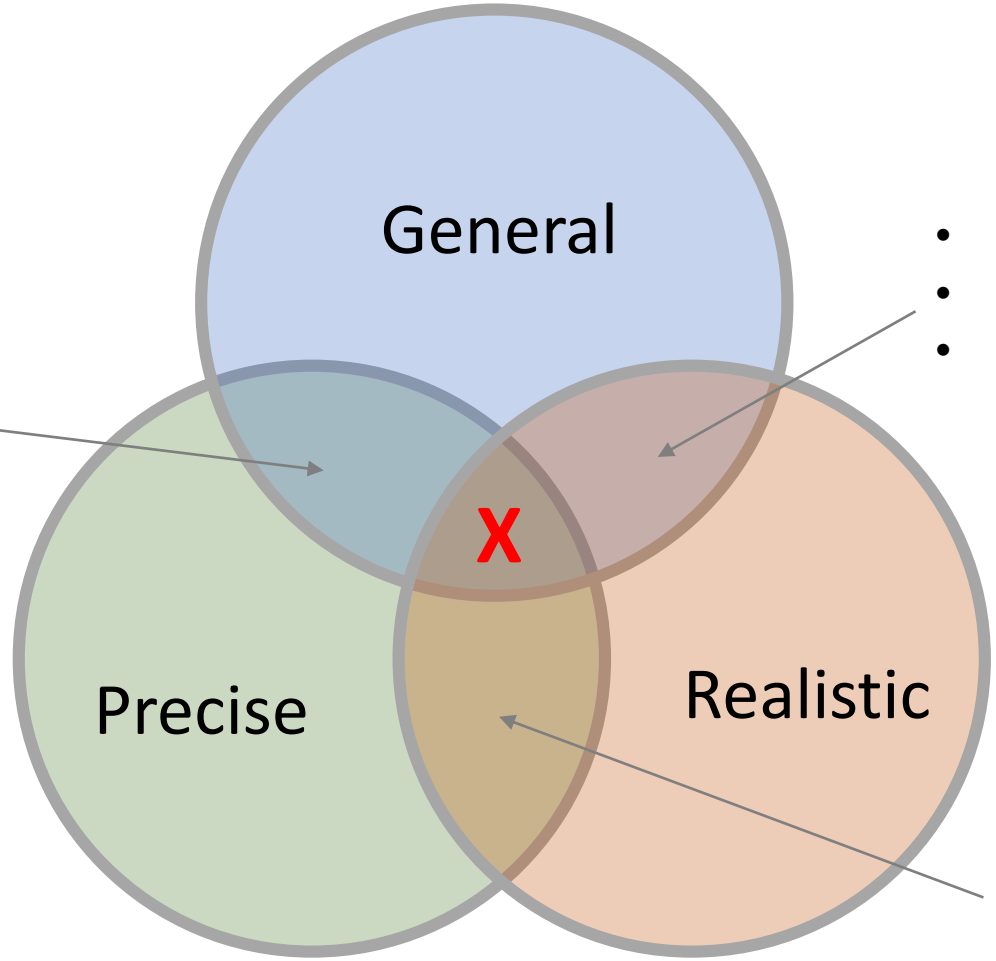
Source: Minneapolis Climate Action Plan

Models have different strengths and requirements

	What it is	*What it requires*
General	Underlying logic applies in many places and situations	Willingness to make assumptions and interpretations
Realistic	Underlying logic reflects actual causes and effects driving the modeled phenomenon	Contextual info regarding local dynamics and interactions
Precise	Model makes specific, numerical predictions	Precise, accurate baseline data

Models can be two but not all three

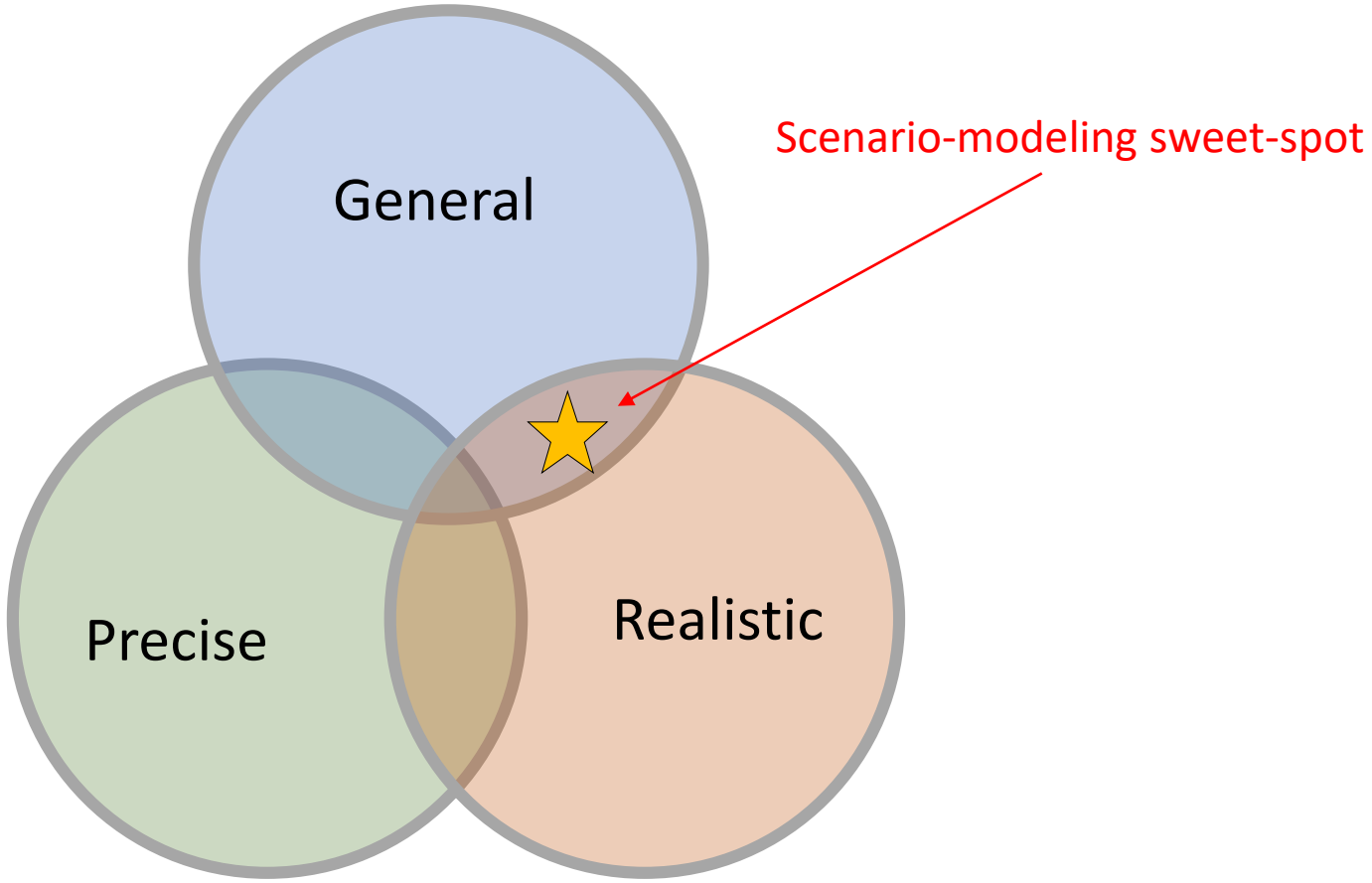
- Demographic models
- Machine-learning models
- IMHE COVID-19 model (a curve-fitting model)



- Economic models
- Climate-vulnerability models
- Imperial College COVID-19 model (an agent-based simulation)

- Local weather models
- Regional climate models
- Hydrological models

Generalism and realism are most useful for scenario planning



Precise is nice, but…

- Hard to get good input data
- The future is unpredictable
- Direction and rough magnitude of change is often sufficient

Predicting direction and rough magnitude of change can be sufficient

Health Outcome/ Determinant	Impact (Direction and Extent)	Likelihood	Distribution	Quality of Evidence
Buildings and Energy				
▪ Obesity, diabetes and other chronic diseases	▼	Possible	▪ Low-income residents impacted more	*
▪ Respiratory and cardiovascular diseases and hospitalizations	▼▼▼	Likely	▪ Residents living in the pathway of power plants impacted more	***
▪ Negative health outcomes of contaminated surface water and drinking water	▼▼	Possible	▪ Residents living near power plants impacted more	**
▪ Mental health	▲	Possible	▪ Low-income residents impacted more	**
Transportation and Land Use				
▪ Respiratory and cardiovascular diseases and hospitalizations	▼▼▼▼	Likely	▪ Residents located near major roads impacted more	***
▪ Obesity, diabetes and other chronic diseases	▼▼▼	Likely	▪ Residents using non-auto mode share impacted more	***
▪ Mental health	▲▲	Possible	▪ Residents using non-auto mode share impacted more	**
▪ Neighborhood safety	▲▲	Possible	▪ Residents of livable, walkable neighborhood impacted more	**
Waste and Recycling				
▪ Respiratory and cardiovascular diseases and hospitalizations	▼▼	Possible	▪ Residents living in the pathway of landfills or power plants impacted more	**
▪ Waterborne disease outbreaks and health outcomes of contaminated surface and drinking water	▼▼	Possible	▪ Residents living near landfills impacted more	**

Source: Minneapolis Climate Action Plan

Generality and realism both require stakeholder participation

General models ← Willingness to make assumptions and interpretations ← Stakeholders' comfort with simplifications and inferences

Realistic models ← Contextual info regarding local dynamics and interactions ← Stakeholders' perspectives and expertise

Some questions to ask when evaluating modeling tools

Can I get the inputs? Can I use the outputs?

Does it provide default data? Is it easy to customize?

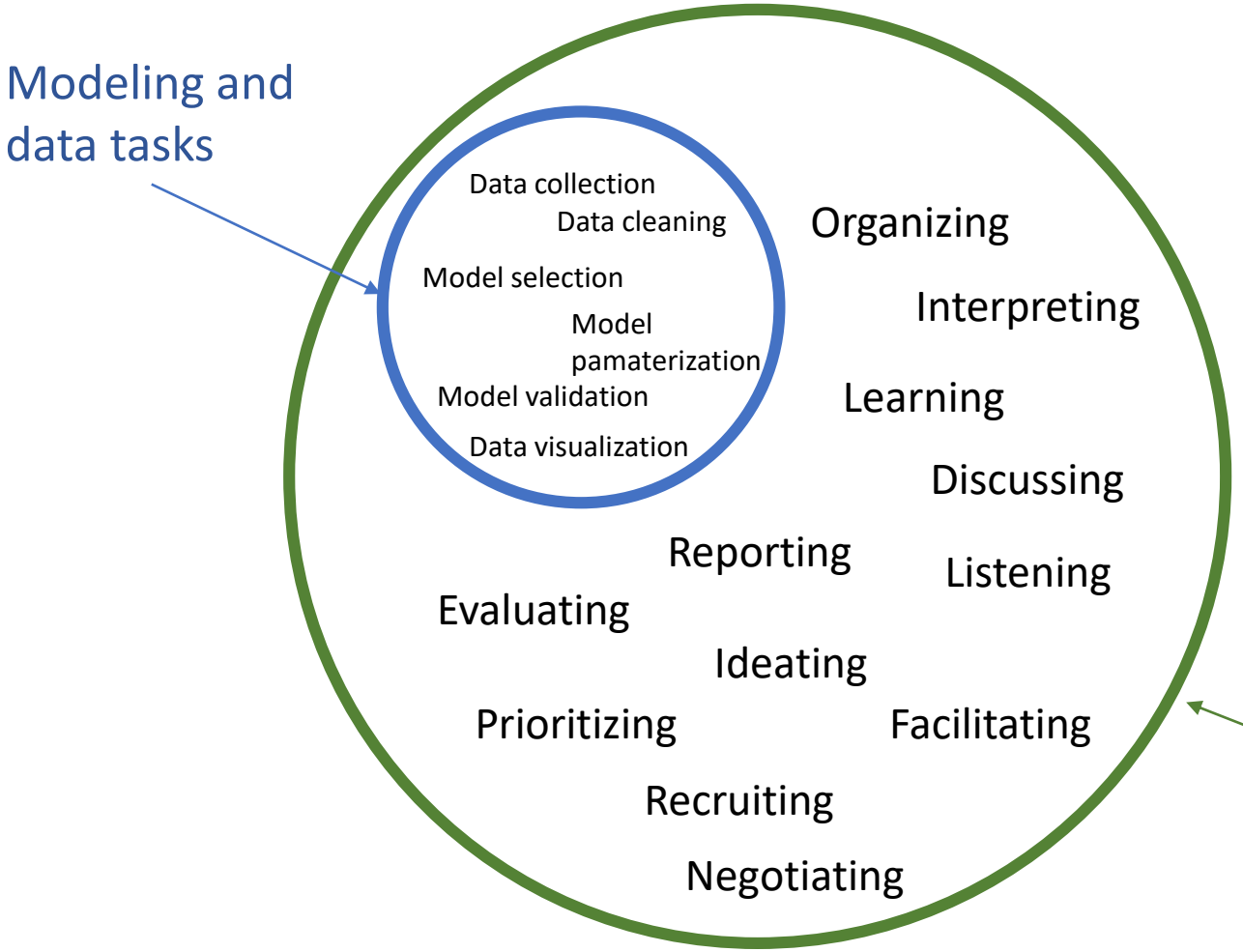
How granular is it? How granular do I really need?

Do I understand the underlying logic? Can I explain it?

How current is it? Is it on a regular update schedule? Will it be available in five years?

Does the provider provide live support?

Models are not everything



All models are wrong, but some are useful.

– George Box

Discussion: Developing & modeling scenarios

What challenges with developing or modeling scenarios have you encountered or do you anticipate encountering?

Case study – Using Scenarios for Stakeholder Engagement

Carbon Free DC 2050

Kate Johnson
Chief, Green Building & Climate Branch
Urban Sustainability Administration
Department of Energy & Environment

Pathways Toward a

Safe

Equitable

Livable

Accessible

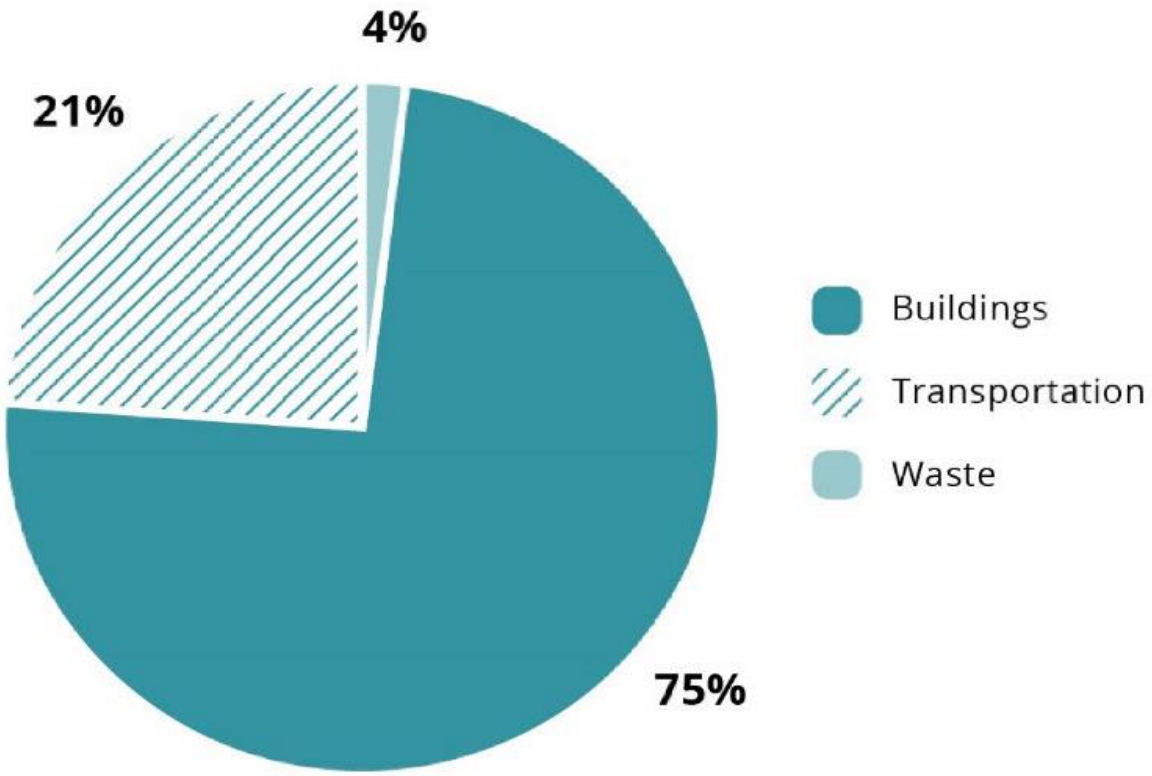
Prosperous

Healthy

Resilient

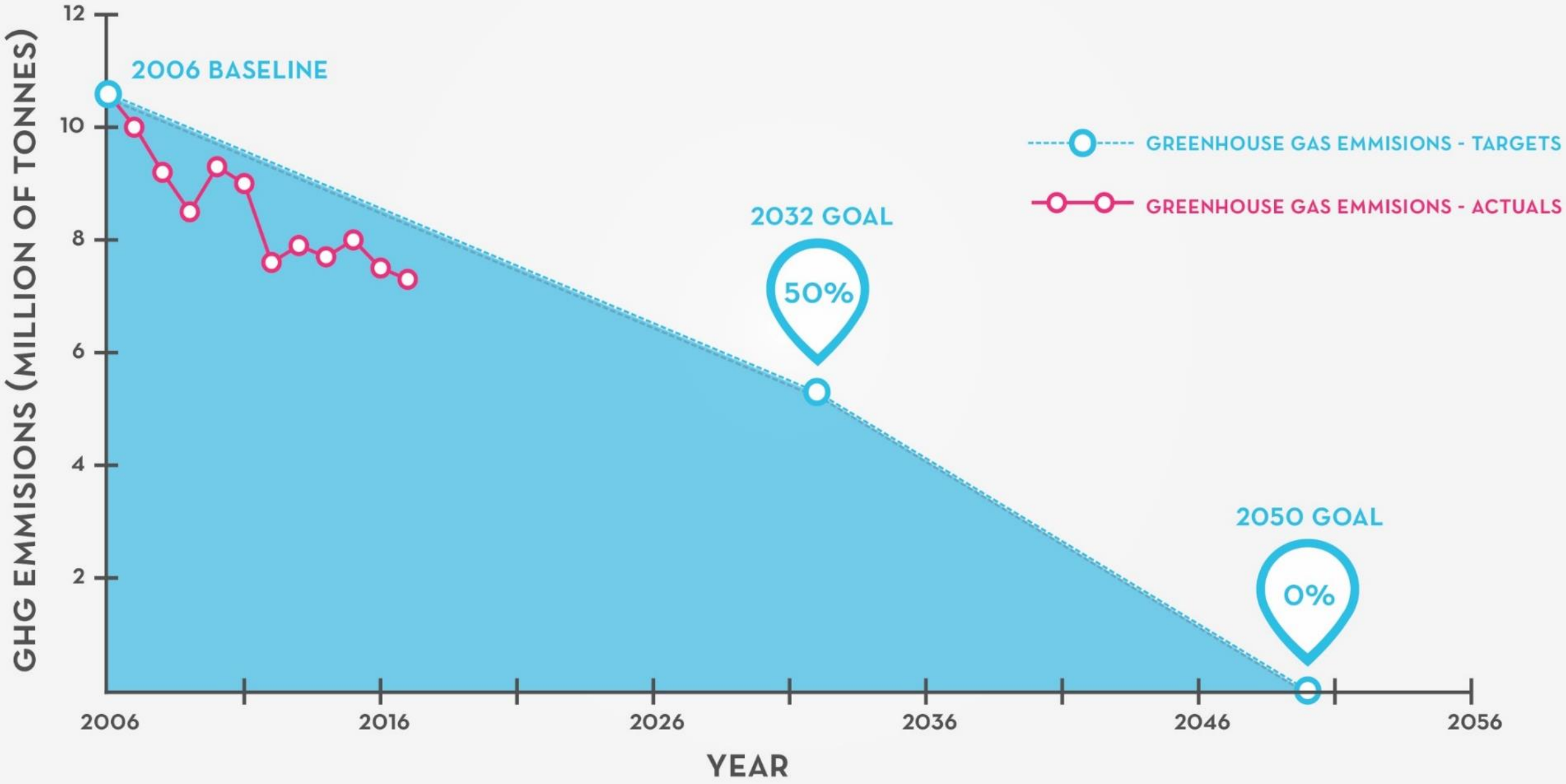
+ Zero Carbon DC

Current Emissions



7.3M tons of carbon (2017)

CITYWIDE EMISSIONS AND TARGETS

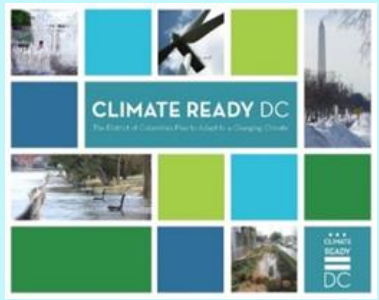


A Next Step in City Planning

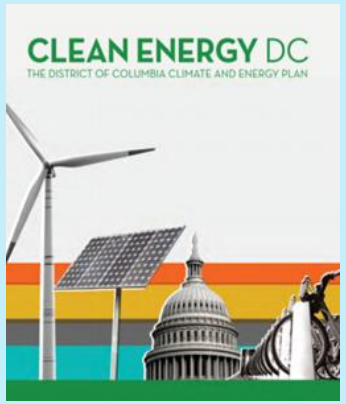
2013
Sustainable DC
Envisioned a 20 year citywide plan for sustainability

2014
moveDC
Set a 25 year vision for the District's transportation system

2016
Climate Ready DC
Identified resilience strategies to address key climate risks



2018
Clean Energy DC
Outlined a roadmap to achieve 50% GHG reduction by 2032



2019
SDC DC 2.0
Updated the 2013 plan, recommitting to innovative and inclusive ways to meet sustainability goals by 2032

2020
Net-Zero Carbon Strategy
Will chart the District's pathway to become carbon neutral by 2050

COMING SOON!

A Community Vision

In 2050, all District residents…

- Have a home to live in that is healthy, safe, and affordable to keep comfortable;
- Get around using convenient, reliable, safe, affordable transportation options;
- Can meet their daily needs within an easy walk/roll of their home;
- Participate in and benefit from a green economy and green jobs;
- Are prepared for the impacts of climate change and have the tools to live green

How Do We Get There?

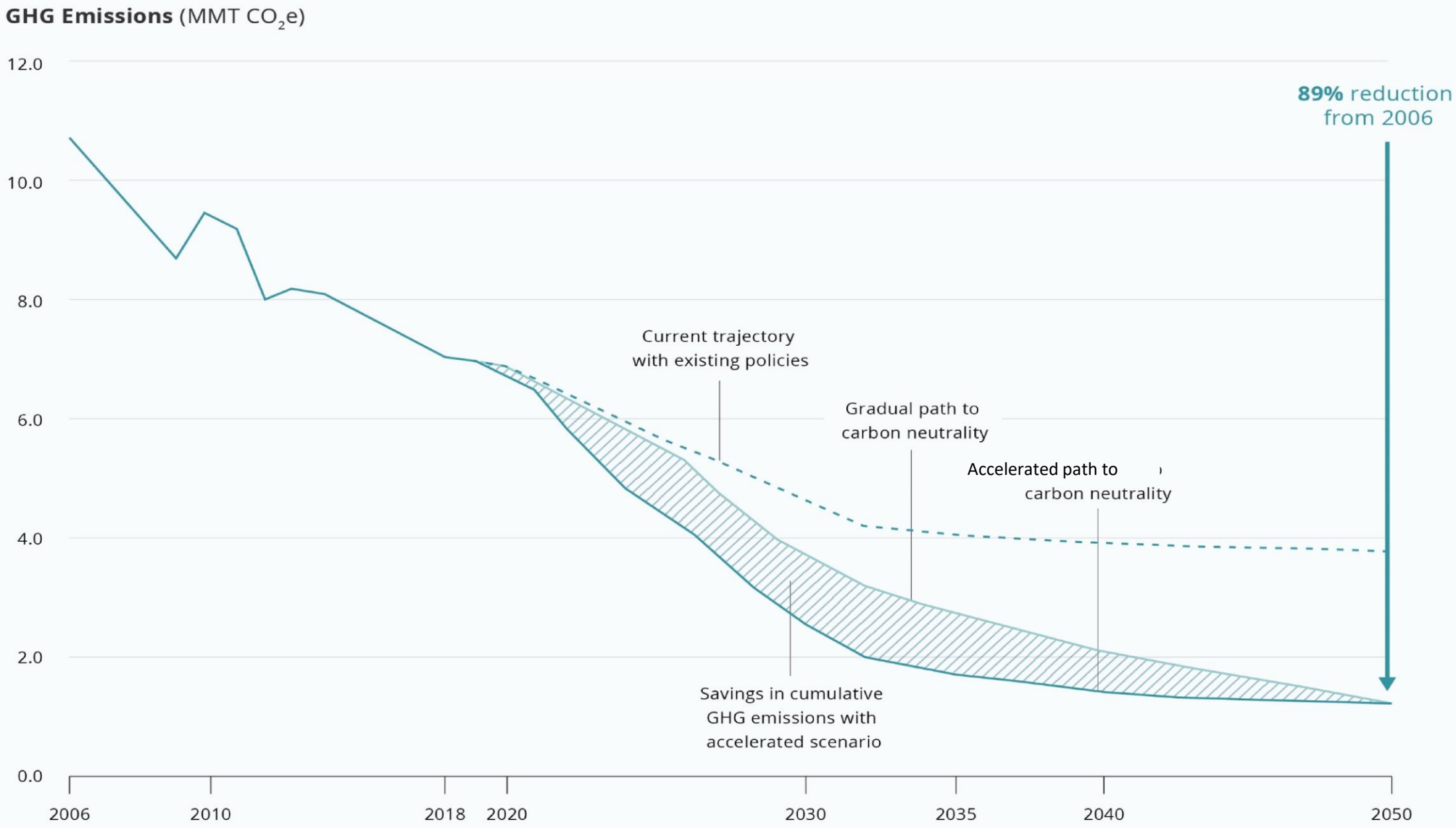
Our Approach

The community tells us what goals we're solving for.

The technical assessment tells us what systems we must change.

The community identifies what we'll need to tackle in order to meet these targets.

And the policy roadmap will identify what we need from policies to meet both our carbon and equity goals.


GHG Emissions (MMT CO_2e)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
89% reduction from 2006
Current trajectory with existing policies
Gradual path to carbon neutrality
Accelerated path to carbon neutrality
Savings in cumulative GHG emissions with accelerated scenario
2006
2010
2018
2020
2030
2035
2040
2050

Key Milestones

2026: Net-zero energy construction for new homes & buildings

2030: 70% of organic waste from homes & businesses is composted

2032: 75% of commute trips are made without a car

2035: Replacement heat & hot water systems are all electric

2040: 70% of existing homes are all-electric

2045: All new cars registered in the District are electric

Equity & Resilience Evaluation Criteria

Questions?

Using the Scenario Calculator

Our “test exercise” scenario calculator tool

Energy Pathways for Miami Florida

About the Tool This tool allows you to design energy pathways in Miami Florida. It covers outcomes of energy efficiency and solar investments within the residential and commercial sector. This tool is powered by Greenlink Analytics trusted professional knowledge, using industry wide assumptions and sample outputs created by Greenlink's ATHENIA model.

How to use You can create your own energy future by inputting the values in the 'ACTION' cells. After entering your target values, your report card will give a deeper breakdown of the impact.

	Residential	Commercial	*You can change these values to reflect your own city's energy consumption.*
Miami's Current Electricity Consumption (MWh):	17,757,284	13,707,397	
Miami's Current Natural Gas Consumption (MMBTU)	3,369,529	2,628,476	

Energy Efficiency

Direct All Energy Efficiency Investments towards Low-Income Communities? Yes

	ACTION		IMPACT	
Residential Potential Achieved	100%	*Residential Potential Achieved*	670,000	*# of homes cutting electricity in half*
Commercial Potential Achieved	100%	*Commercial Potential Achieved*	19	*kWh-saved per sqft*

Solar Power

	ACTION		IMPACT	
Residential Solar Power	100%	*Residential Solar Potential Achieved*	3,360	*Homes Adding Solar*
Commerical Solar Power	100%	*Commercial Solar Power Achieved*	6,510	*# Cars off the Road each Year*

Your 2030 Pathway Report Card

Cost Overview		2030 Clean Energy Summary	
Total Investment	$3,690,000,000	Energy Demand Met by Efficiency	28%
Net Benefits ($M)	$1,521,000,000	Residential Solar Capacity Installed (MW)	17
Benefit-Cost Ratio	0.4	Commercial Solar Capacity Installed (MW)	95
Net Jobs Created	33,100	Avoided Climate Damages ($)	$1,042,000,000
		Metric Tons CO_2 Avoided (2021-2030)	18,855,000

Source: Greenlink Analytics. Links to scenario calculators for all 12 Level 1 cities here.

Wrap-up

Homework

(all participants)

1. **Share your feedback on this session** (5 minutes) –
   - respond to the poll at https://bit.ly/broadly_feedback_2

2. We will send custom city scenario calculators this week (one for each Level 1 city). **Use one calculator (your city's, or one for a city a similar to yours) to explore different scenario options and their impacts.** Based on your explorations, choose:
   - *One distributional program design for residential efficiency* – Business-as-usual vs additional low-income investments
   - *The level of potential achieved* (0-100%) for *four intervention types*
     - Residential energy efficiency
     - Commercial energy efficiency
     - Residential solar
     - Commercial solar

Homework

(Level 1 participants only)

3. Choose an intervention scenario and indicate your chosen variables in your scenario calculator. **Email a copy of the calculator tool (with your settings saved) or a screenshot of it to Yeou Jih at yjih@greenlinkanalytics.org by June 3.**

4. Before the next session, Greenlink will provide you with projected 2030 indicators and maps for your city resulting from *two scenarios*—your selected "intervention" scenario and a "business-as-usual" scenario.

5. In preparation for the next session, **examine the scenario outcomes and think about what they would mean for your community**.

Session 3 – June 25, 3:30-5pm EST

Topics

- Interpreting scenario outcomes
- Evaluating and communicating scenarios
- Turning scenarios into equitable policies and actions

- Make sure the appointment is on your calendar
- Register in advance at https://wri.zoom.us/meeting/register/tJYtduqsqD4qHNUAEjjhukVuKfZLAGYP4WJg

Equitable Clean Energy Planning Resource List

Resource and Reading List

Broadly Beneficial Clean Energy Planning

This list compiles tools, datasets, reports, frameworks, and other resources that should be useful to city governments engaging in inclusive clean-energy planning. The list is necessarily incomplete, but the gold-highlighted items are particularly recommended.

Resource	Provider	Category	Type	Description
City and County Energy Profiles	DOE	baseline	data	Modeled state- and county-level data for electricity and natural gas consumption, vehicle use, and emissions.
Energy Poverty and Equity Explorer	CUSP	baseline	data	Income, housing, demographic, and energy-burden data at neighborhood-scale for Canadian cities. Based on data from Statistics Canada.
H+T Affordability Index	Center for Neighborhood Technology	baseline	data	Affordability of housing and transportation at a variety of spatial scales, down to US Census block. Based on census housing-cost data and modeled transportation-cost data.
Low-Income Energy Affordability Data (LEAD)	DOE	baseline	data	Income, housing, and energy-expense data at US, state, county, city, and census-tract levels. Data from US Census Bureau and Energy Information Administration.
State and Local Energy Data (SLED)	DOE	baseline	data	City-level energy use (by sector), energy expense, and demographic and income data.
State and Local Planning for Energy (SLOPE)	NREL	baseline	data	Modeled energy-efficiency potential, renewable generation potential, electricity and natural gas consumption BAU projections, levelized cost of energy (LCOE) projections, and population projections on a variety of spatial scales. Models based on numerous government-derived datasets and models.
Cities Leading through Energy Analysis and Planning (Cities-LEAP)	DOE	baseline	resource list	Guidance and modeled data supporting city adoption of clean-energy policies and programs.
Local Clean Energy Self-Scoring Tool	ACEEE	baseline	tool	Interactive tool for evaluating a community's existing energy policies against the ACEEE's 2019 City Clean Energy Scorecard.

Full list available here.

See you in a few weeks!

Thanks to our partners:

And advisors, reviewers and researchers:

- Allison Ashcroft, Canadian Urban Sustainability Practicioners
- Julie Curti, Metropolitan Area Planning Council (Boston)
- Megan Day, National Renewable Energy Laboratory
- Alex Dane, Natalie Elwell & Devashree Saha, World Resources Institute
- Denise Fairchild, Emerald Cities Collaborative
- Anthony Giancatarino, Movement Strategy Innovation Center
- Rebecca Kiernan, City of Pittsburgh
- Samantha McDonald, Greenlink Analytics

Q&A & Additional Discussion