

# Tools for Building Energy Efficiency: Resources for Policy Development

*Clean Energy Solutions Center webinar; November 24, 2015*

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# Today's Webinar

1. Introduction - Maryke van Staden, ICLEI
  2. Mapping of building efficiency tools - Nate Aden, WRI  
Ksenia Petrichenko, C2E2
  3. Tools application case studies - Peter Graham, GBPN  
Christian Daniel Mahler, World Bank
  4. Conclusion - Jennifer Layke, WRI
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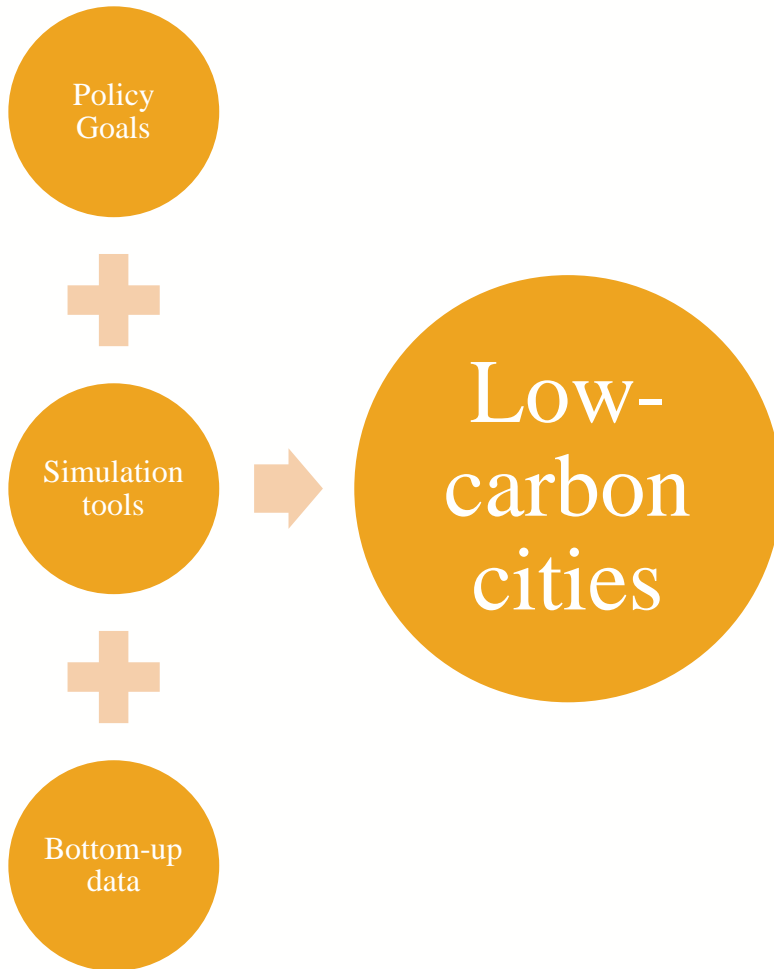


# Introduction



© copyright: sino-singapore tianjin eco-city development and investment

# The Opportunity: tools to link new data, technology, and policy goals



Options for summary tracking metrics:

- Total city-wide energy use or emissions
- Aggregate building intensity (energy or emissions/m<sup>2</sup>)
- Number of certified buildings/projects
- CDM methods
- Number of net-zero buildings
- Policy demonstration projects

# There are numerous building- and city-



Building Energy Software Tools  
Formerly hosted by US Dept. of Energy

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### CITY-LEVEL TOOLS BY SECTOR

- Residential
- Commercial
- Industrial
- Generation
- Transportation
- Land Use

- Plenario
- Zoning Check
- Climate Explorer
- Smart Location Database
- Coastal Resilience Mappin
- National Climate Change
- Open Street Map
- Alternative Fueling Station
- US DOT Infrastructure Car
- Long Range Energy Altern
- SLED
- Better Buildings Toolkit
- Regional Indicators Initi
- TRACE
- BEPTC
- The Energy & Emissions R
- I-Places
- Envision Tomorrow
- Trip Generation Tool for M
- BITES
- Community Solar Scenario
- Cost of renewable energy
- JEDI
- Open PV Database
- OpenEI Datasets
- BEDES
- CommunityVis
- Plug-in Electric Vehicle Ac
- PVWatts Calc.
- ReOpt
- RET Finance
- SAM
- ENE-MCA
- Open Studio
- EnergyPlus Energy Simula
- e-Quest
- Driving Transformation to
- Policy tool for New Buildin
- Home Energy Saver Calcul
- Clean Air and Climate Prot
- SEED
- Energy Star Portfolio Man.
- Green Button

No.	Name of the tool	Type of usage		Scope		Stage of the policy development cycle					City focus	
		Passive	Interactive	Project	Policy	Scoping	Identification	Design	Implementation	Tracking	Targeting	Supporting
1	<a href="#">Local Energy Efficiency Policy Calculator (LEEP-C)</a>		x		x					x	x	
2	<a href="#">Energy Forecasting Framework and Emissions Consensus Tool (EFFECT)</a>		x		x					x	x	
3	<a href="#">Global Protocol for Community Scale GHG Emissions (GPC)</a>	x			x					x	x	
4	<a href="#">IEA Indicators</a>	x			x					x		x
5	<a href="#">ACEEE City EE Scorecard</a>	x			x					x	x	
6	<a href="#">Building Efficiency Policy Assessment Tool</a>		x		x		x					x
7	<a href="#">Tool for Rapid Assessment of City Energy (TRACE)</a>		x		x	x	x			x	x	
8	<a href="#">Solutions gateway</a>	x			x			x			x	
9	<a href="#">Building Energy Efficiency Policies (BEEP)</a>	x			x			x				x
10	<a href="#">BioEE Policy Guide</a>	x			x			x				x
11	<a href="#">Policy Tool for New Buildings</a>		x		x			x				x
12	<a href="#">Policy Tool for Renovation</a>		x		x			x				x
13	<a href="#">IPCC AR4 Chapter 6</a>	x			x	x		x				x
14	<a href="#">IPCC AR5 Chapter 9</a>	x			x			x				x
15	<a href="#">Handbook of Sustainable Building Policies</a>	x			x			x	x			x
16	<a href="#">Energy Model Input Translator (EMIT)</a>		x	x	x				x			x
17	<a href="#">Green Resources &amp; Energy Analysis Tool (GREAT)</a>		x		x	x				x	x	
18	<a href="#">Common Carbon Metric (CCM)</a>		x		x	x				x		x
19	<a href="#">The Co-benefits Evaluation Tool for the Urban Energy Benchmarking and Energy Saving Tool for Low Carbon Cities (Urban)</a>		x		x			x			x	x
20	<a href="#">Saving Tool for Low Carbon Cities (Urban)</a>		x		x		x			x	x	
21	<a href="#">IEA EE Governance Handbook</a>	x			x		x	x		x		x
22	<a href="#">Co-Benefits Risk Assessment (COBRA)</a>		x		x			x			x	x
23	<a href="#">ENERGYSTAR Portfolio Manager</a>		x		x					x		x
24	<a href="#">ENERGYSTAR Energy Treasure Hunt Guide</a>	x			x		x	x				x
25	<a href="#">Excellence in Design for Greater Efficiencies (EDGE)</a>		x		x				x	x		x
26	<a href="#">RETScreen</a>		x	x	x				x			x
27	<a href="#">Building Energy Optimization (BEopt)</a>		x		x				x	x		x
28	<a href="#">EnergyPlus and eQUEST</a>		x		x				x			x
29	<a href="#">Building Upgrade Value Calculator</a>		x		x				x			x
30	<a href="#">Commercial Building Analysis Tool for Energy-Efficiency Retrofit (COMBAT)</a>		x		x				x	x		x

Search

Capabilities

- Whole-building Energy Simulation
- Load Calculations
- HVAC System Selection and Sizing
- Parameters & Optimization
- Model Input Calibration
- Energy Conservation Measures
- Code Compliance
- Ratings and Certificates
- Utility Bill & Meter Data Analysis
- Weather Data & Climate Analysis
- Building Energy Auditing
- Building Energy Benchmarking
- Lighting Simulation
- Indoor Air Quality Simulation
- Life-cycle Analysis
- Detailed Envelope Simulation
- Detailed Component Simulation
- Other

Platform

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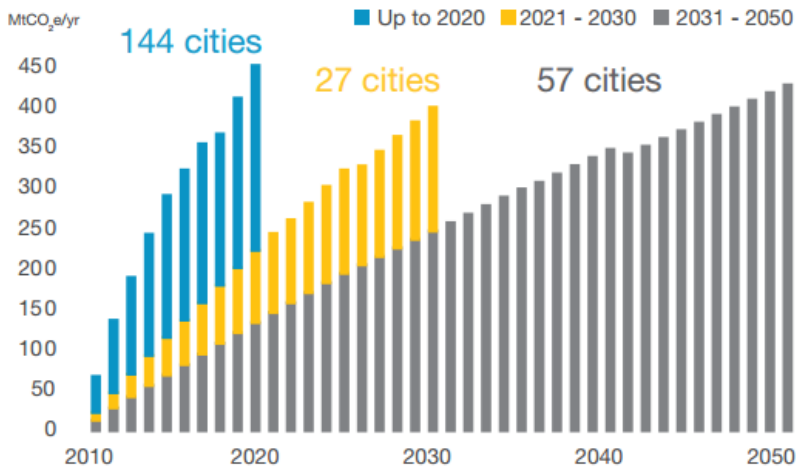
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# The challenge is to harmonize existing tools to connect building stakeholders with outcomes

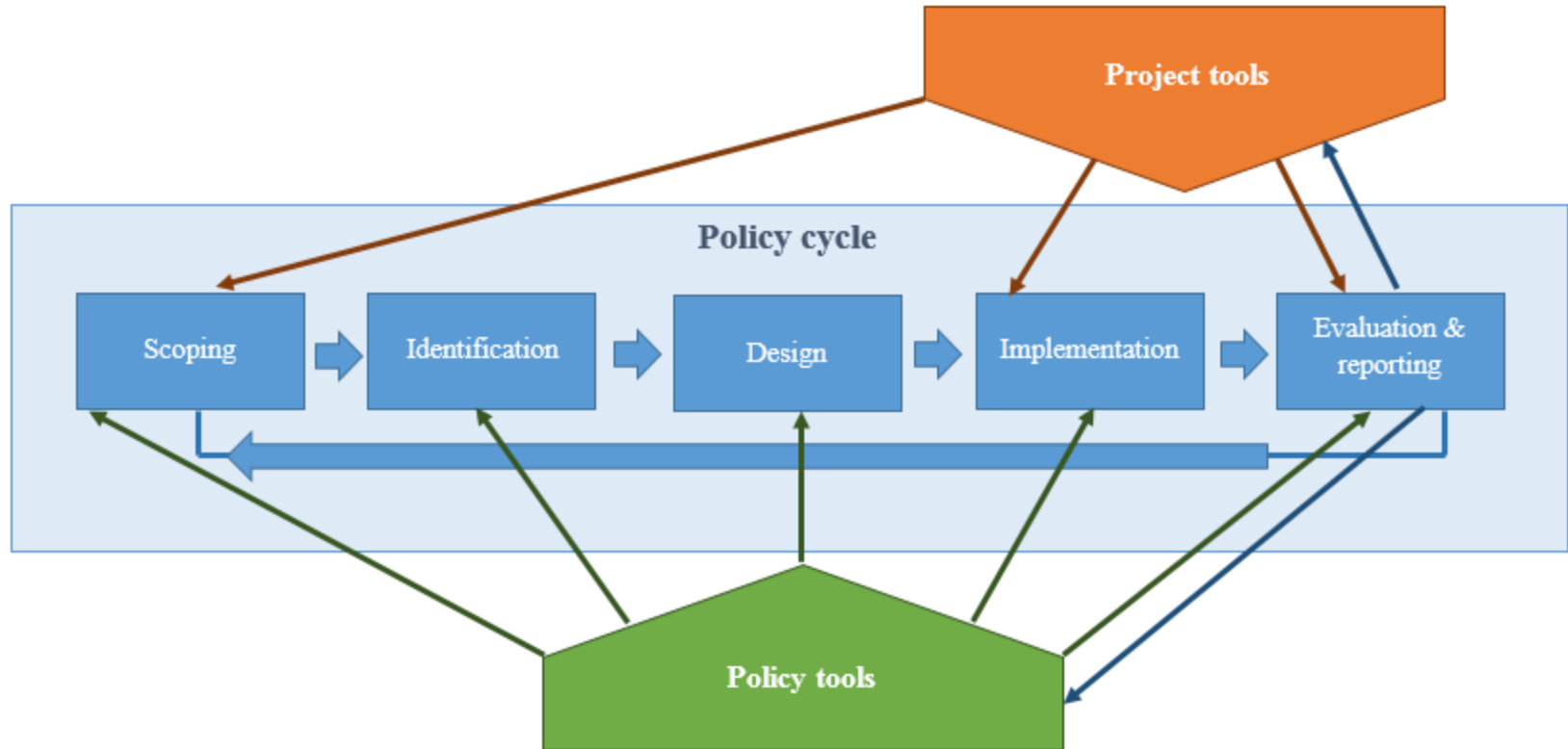


Figure 2 – Committed Annual Savings by Commitment End Date

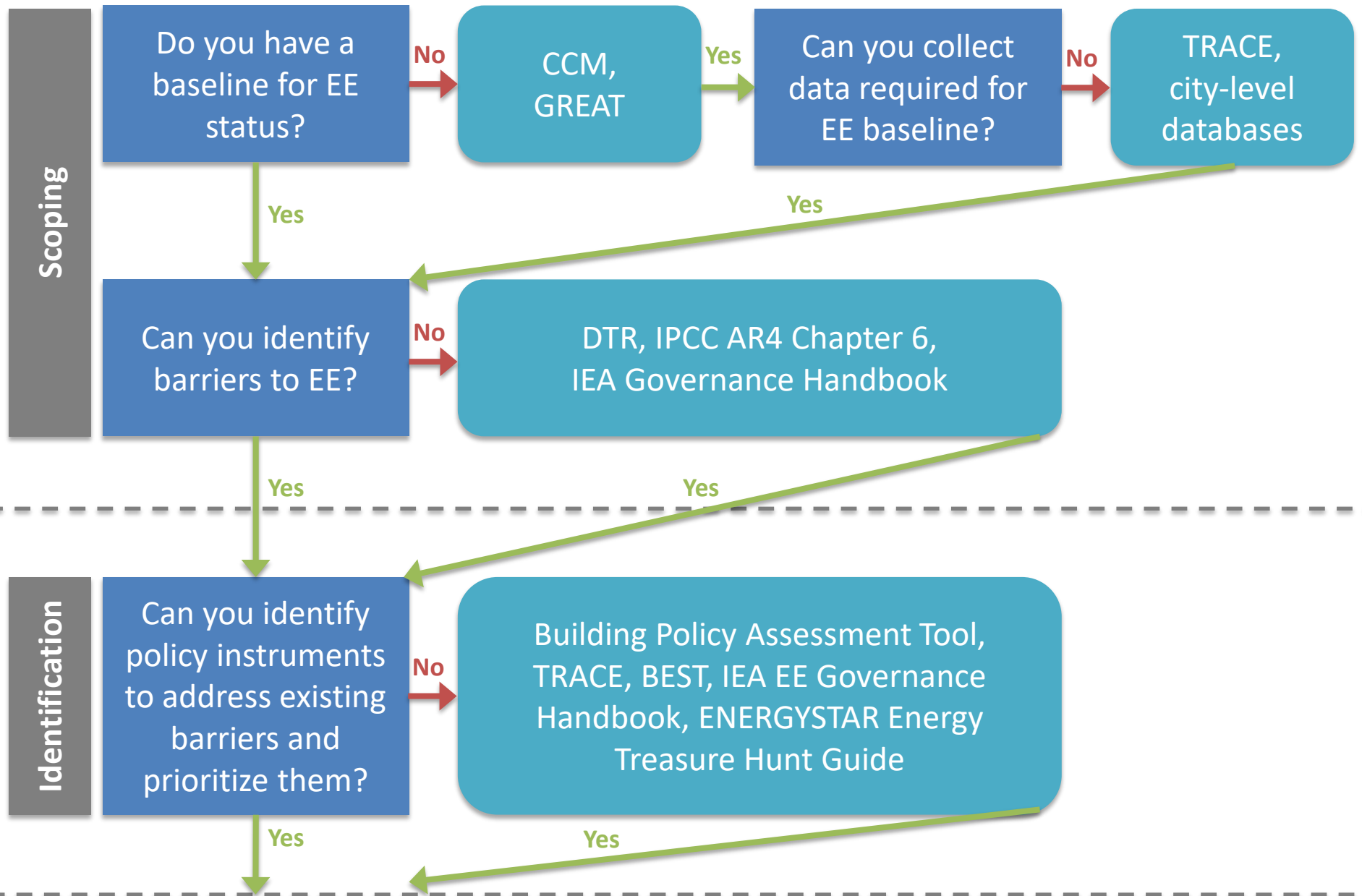


228 global cities, representing 436 million people, have already set GHG reduction goals and targets

# Project and policy-level tools inform various stages of cities' policy cycles









Scoping

Identification of options

Policy design

Implementation

Evaluation & Reporting

Policy design

Do you have policy design guidelines and/or information on existing policy practices?

Yes

Yes

No

Guidelines: Handbook of Sustainable Building Policies, IPCC AR5 Chapter 9, IEA EE Governance Handbook, DTR  
Existing policy practices: BEEP, GBPN Tool for new buildings, GBPN Tool for renovation, BigEE, Solutions gateway, DTR

Yes

Yes

Will your policy actions track/include EE co-benefits?

No

Guidebook 'The co-benefits evaluation tool for the urban energy systems', COBRA

Yes

Yes



**Implementation**

Do you have tools for implementation of building EE policies and related projects?

Yes

No

Scope	New buildings	Retrofit buildings
Projects	EMIT, RETScreen, EDGE, BEopt, EnergyPlus, BEopt	COMBAT, eQuest, EnergyPlus, Building Upgrade Value Calc.
Policies	Solutions gateway, Handbook of Sustainable Building Policies, IEA EE Governance Handbook, DTR	

**Evaluation & Reporting**

Do you know how to evaluate the impact of policies or projects you are planning?

Yes

No

Policies	Projects
EMIT, GREAT, LEEP-C, EFFECT, GPC, CCM, IEA indicators, ACEEE City Scorecard, TRACE, The co-benefits evaluation tool, BEST	COBRA, ENERGYSTAR Portfolio Manager, EDGE, BEopt, COMBAT

Yes



Additional information on tools & decision tree is available in forthcoming 3<sup>rd</sup> edition of Driving Transformation report

# Tool application case studies

**GBPN** | Building Policies for a Better World  
Global Buildings Performance Network

**CCM 2.0** COMMON CARBON METRIC

REGISTER LOGIN

HOME ABOUT METHODOLOGY THE TOOL CAPACITY BUILDING ASSESSMENT DIRECTORY PARTNERS

*MRV Tools for Building Energy Policy Action Plans*

COMMISSIONED BY: **Dr. Peter Graham**  
Executive Director - GBPN

IMPLEMENTED BY: **GBPN** SEMANTIC WEB COMPANY



CHRISTIAN MAHLER (WORLD BANK)

## Tool for Rapid Assessment of City Energy (TRACE)

Supporting cities in tapping their energy efficiency potentials





# Discussion of Building Efficiency Accelerator



ENERGY EFFICIENCY  
ACCELERATOR

## BUILDING EFFICIENCY

The buildings sector accounts for about one-third of global energy use and energy-related GHG emissions. Widespread implementation of progressive policies that encourage the use of best available technologies, low-energy building design and energy efficiency renovation can deliver 25-50% reductions in energy demand from new and existing buildings. Achieving such savings would not only significantly reduce GHG emissions, but also reduce costs, create jobs, provide cost-effective energy capacity and improve the comfort, health and environment in communities. Through public-private collaboration, governments can establish effective policies and businesses can deliver current technologies to accelerate investment in energy efficiency and the achievement of benefits.



Thanks!

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