C40CITIES

CLIMATE LEADERSHIP GROUP

Early Adopters of Efficient Energy in Cities
Mexico City, June 2014

Manuel Olivera
Regional Director for Latin America

Agenda

1. A brief background of C40
2. City Powers
3. On Energy Efficiency
4. On Energy Supply
5. Some success stories
6. On Barriers and Levers

Megacities and climate change

C40 Cities Climate Leadership Group

The C40 Cities

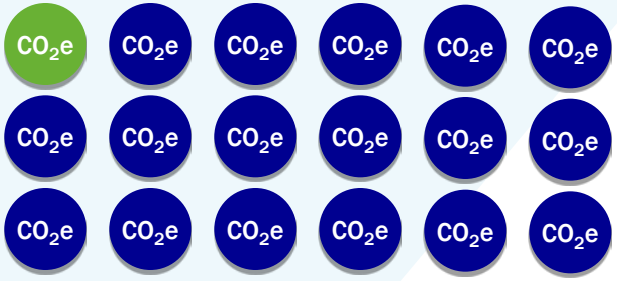
Seven regions

Africa	7
East Asia	8
Europe	19
Latin America	9
North America	14
South & West Asia	4
Southeast Asia	7
TOTAL	**68**

The Power of the C40

8%
of all humans

5%
of global GHG emissions



21%
of global GDP

$$$$$$

The Power of the C40

ONE BILLION TONS IN POTENTIAL REDUCTIONS TO 2030

The Power of the C40

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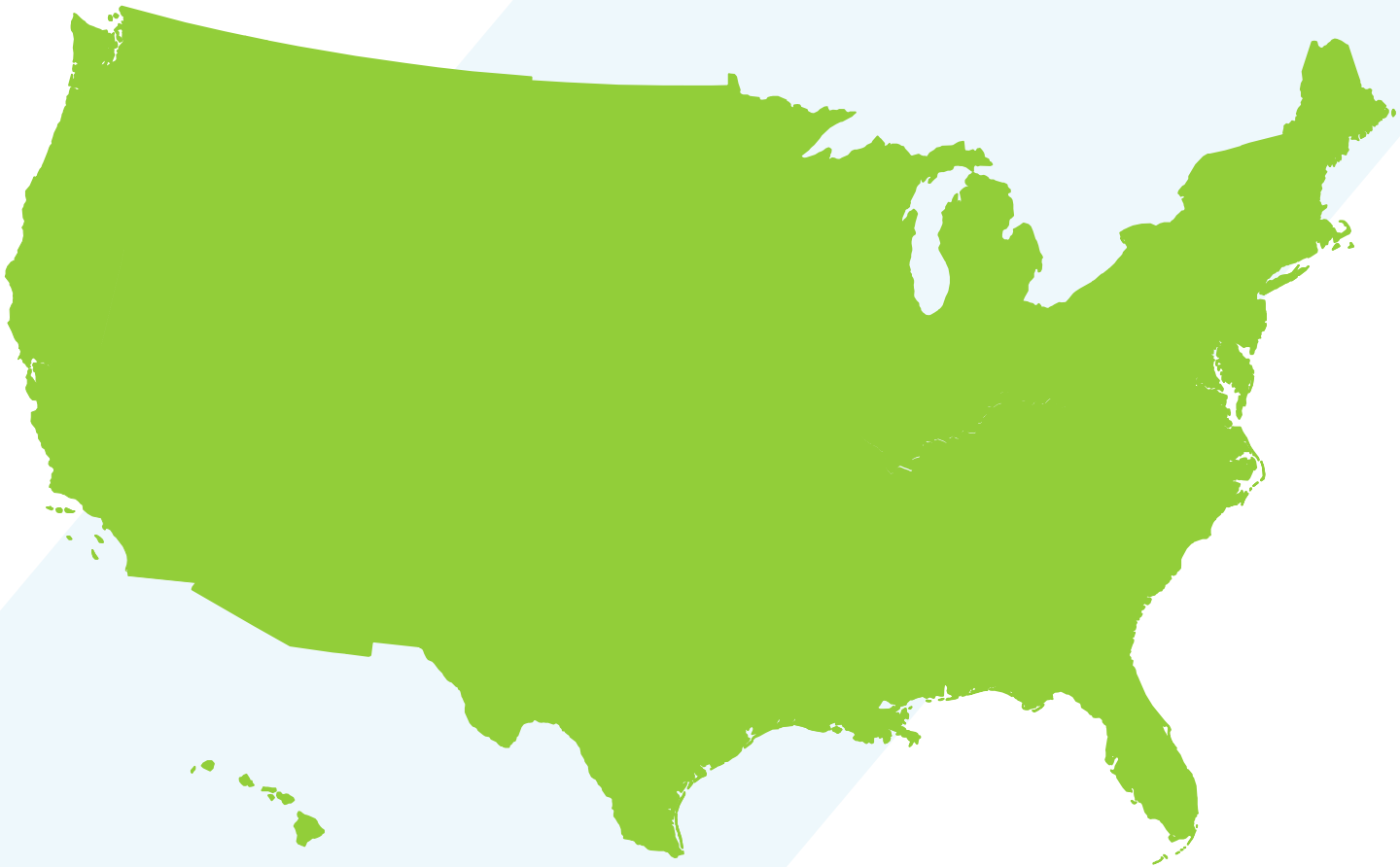
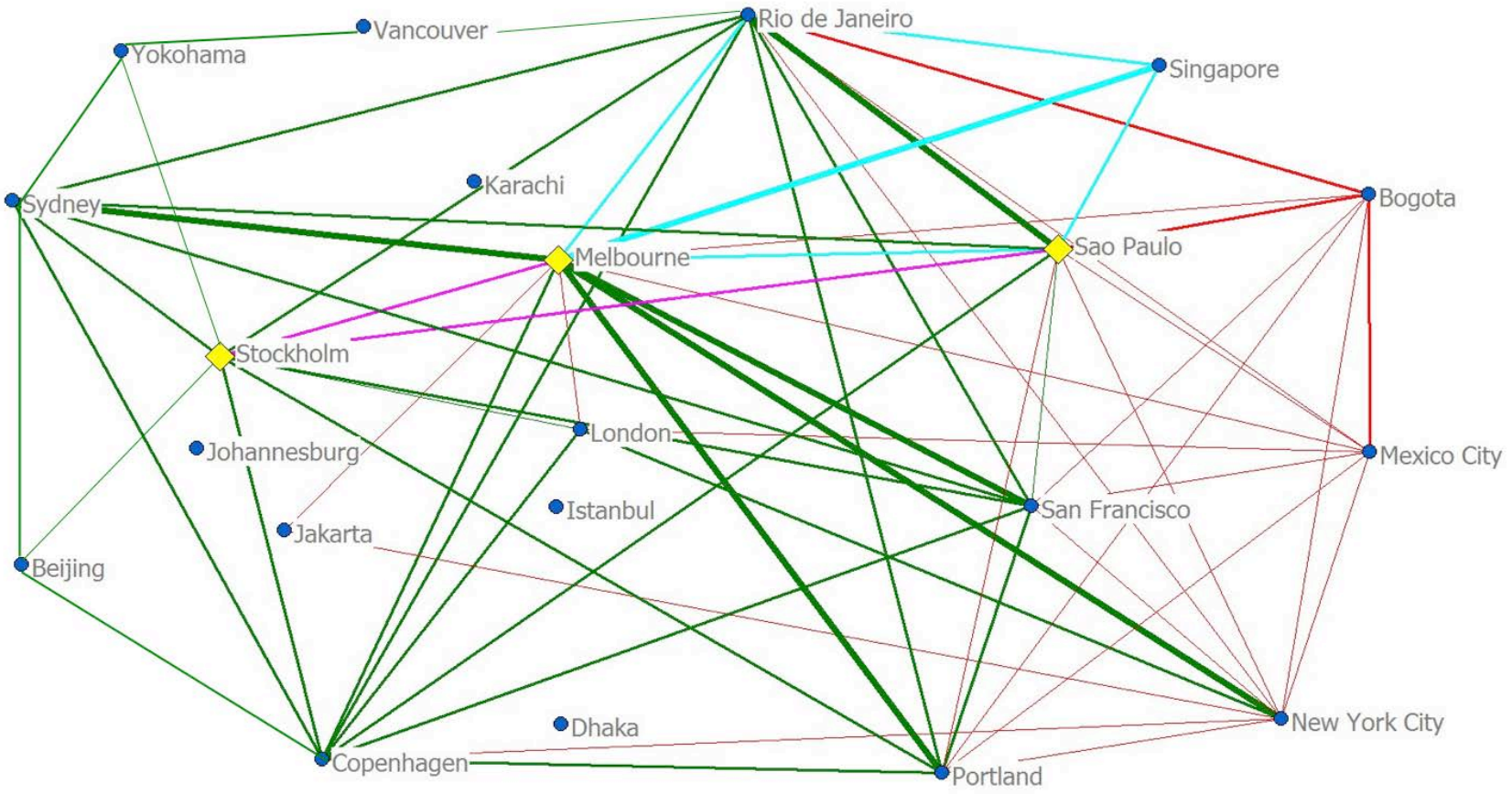
The Power of the C40

The Power of the C40



Cities act

What C40 does?



C40 creates **NETWORKS**

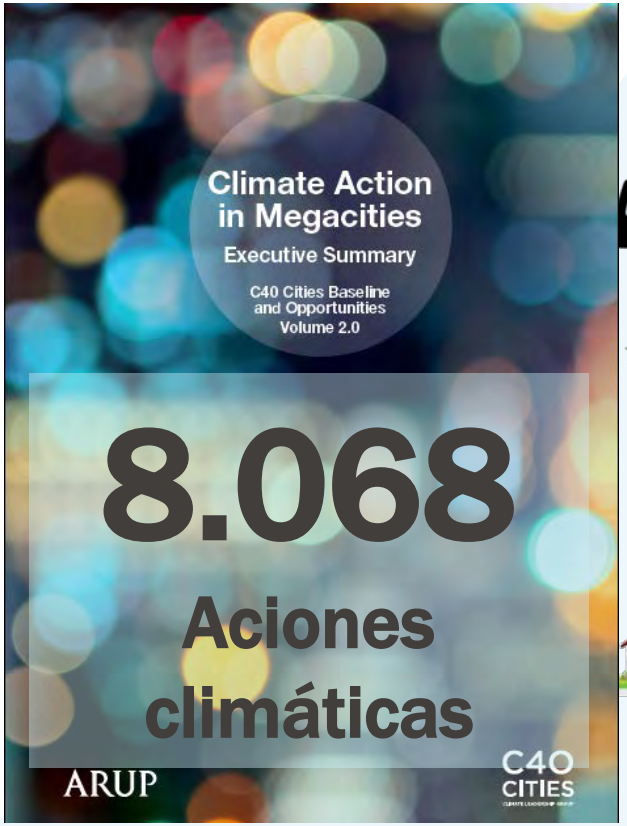
PEER-TO-PEER EXCHANGE

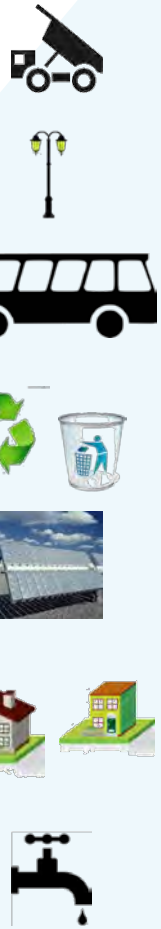
ON-THE-GROUND CITY SUPPORT

RESEARCH & KNOWLEDGE MANAGEMENT

C40 EXCHANGE

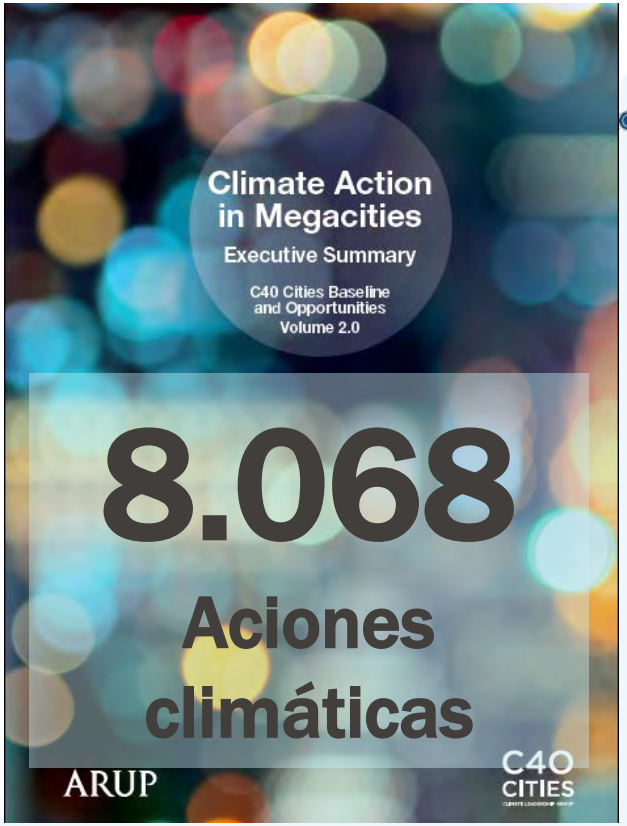
Cities decide so take actions





Adaptation	1024
Public lighting	114
Transport	1534
Waste and landfills	1039
Energy supply	370
Buildings	1667
Water supply	590

Cities decide so take actions



plan

Sustainable communities & urban planning **1387**

Food and urban agriculture **176**

$€

Finance and economic development **167**

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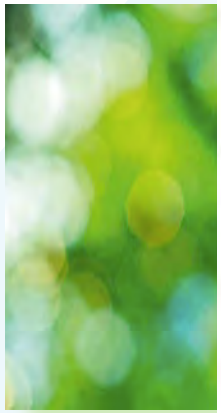
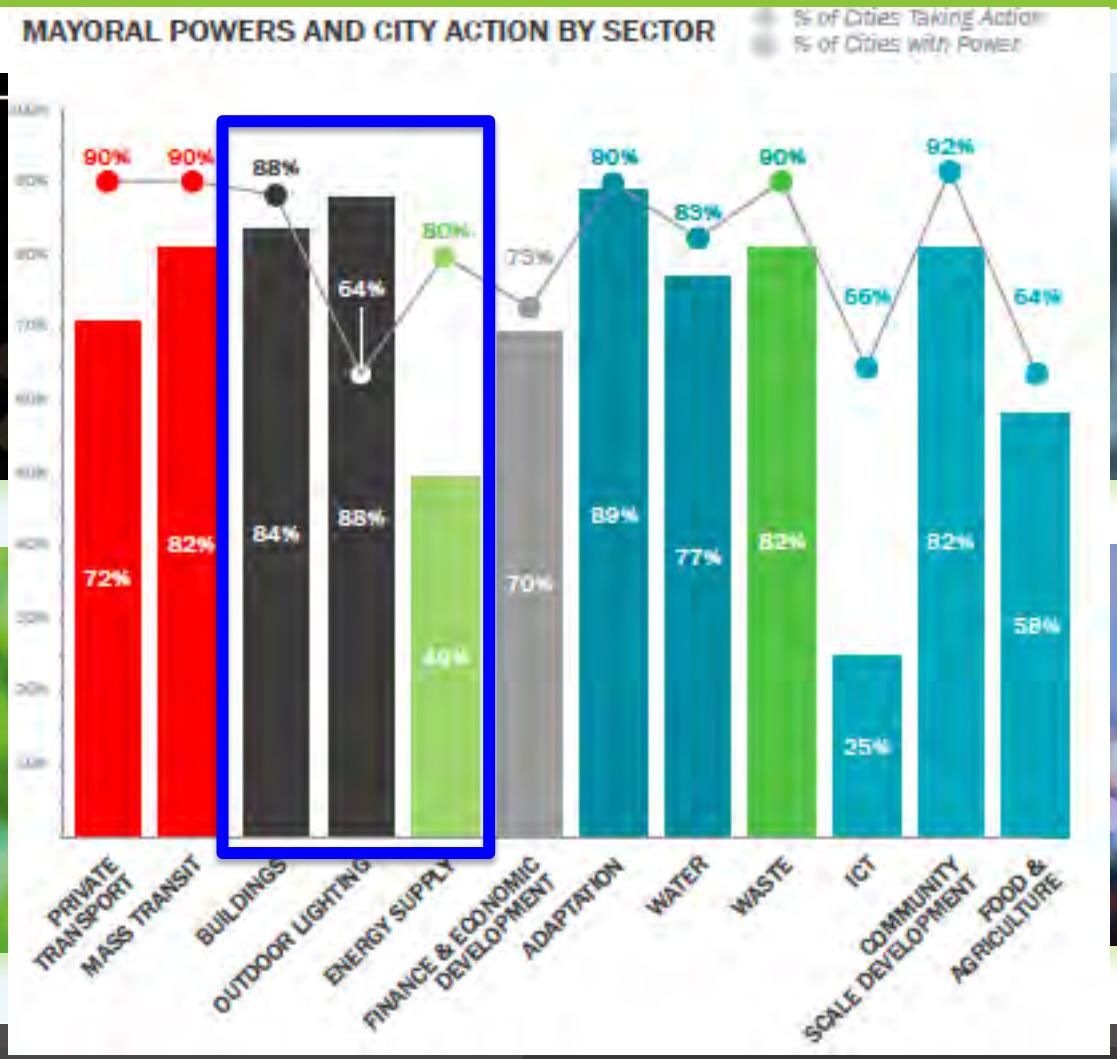
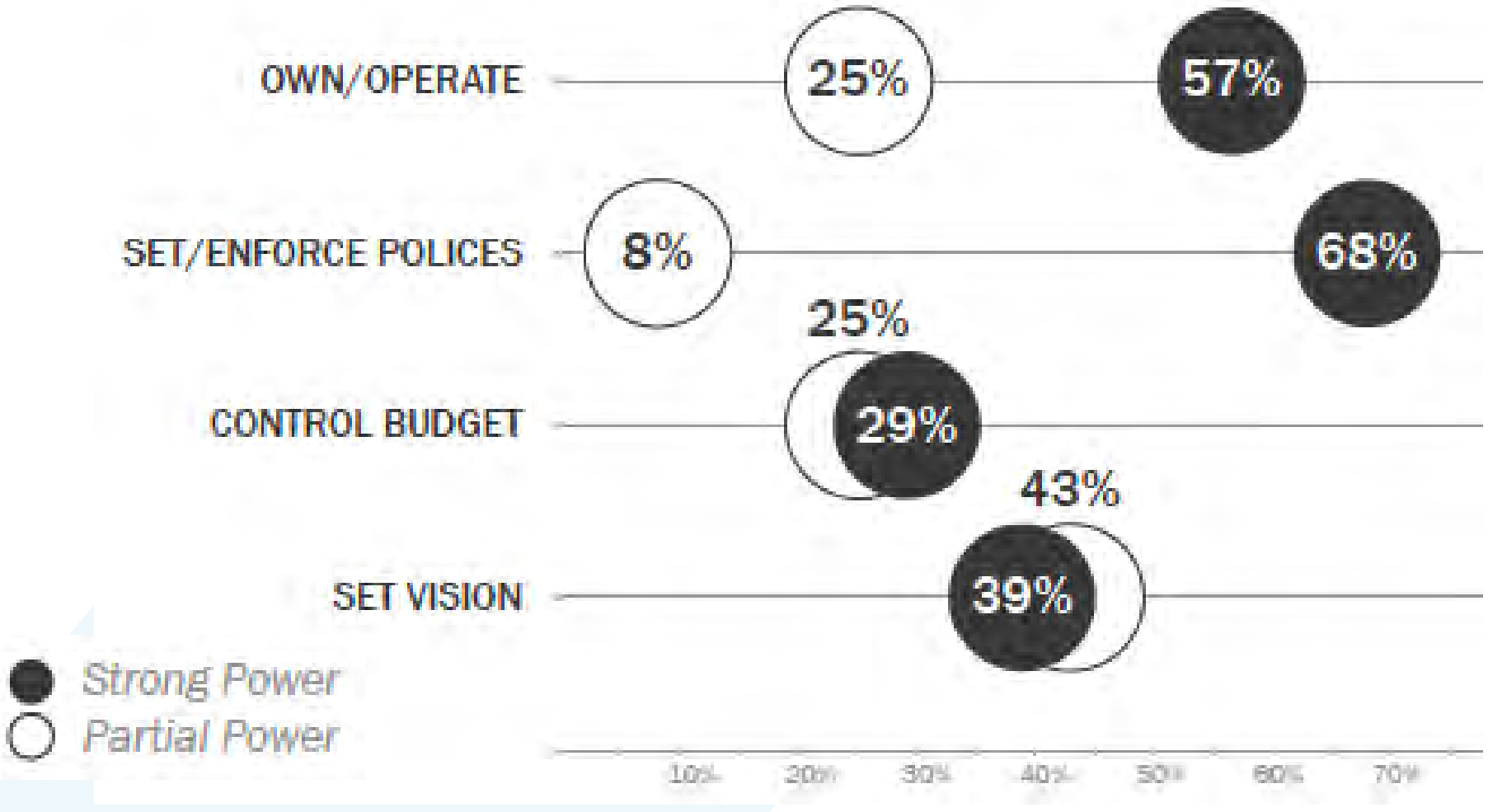
Actions are based in reliable & disclosed data

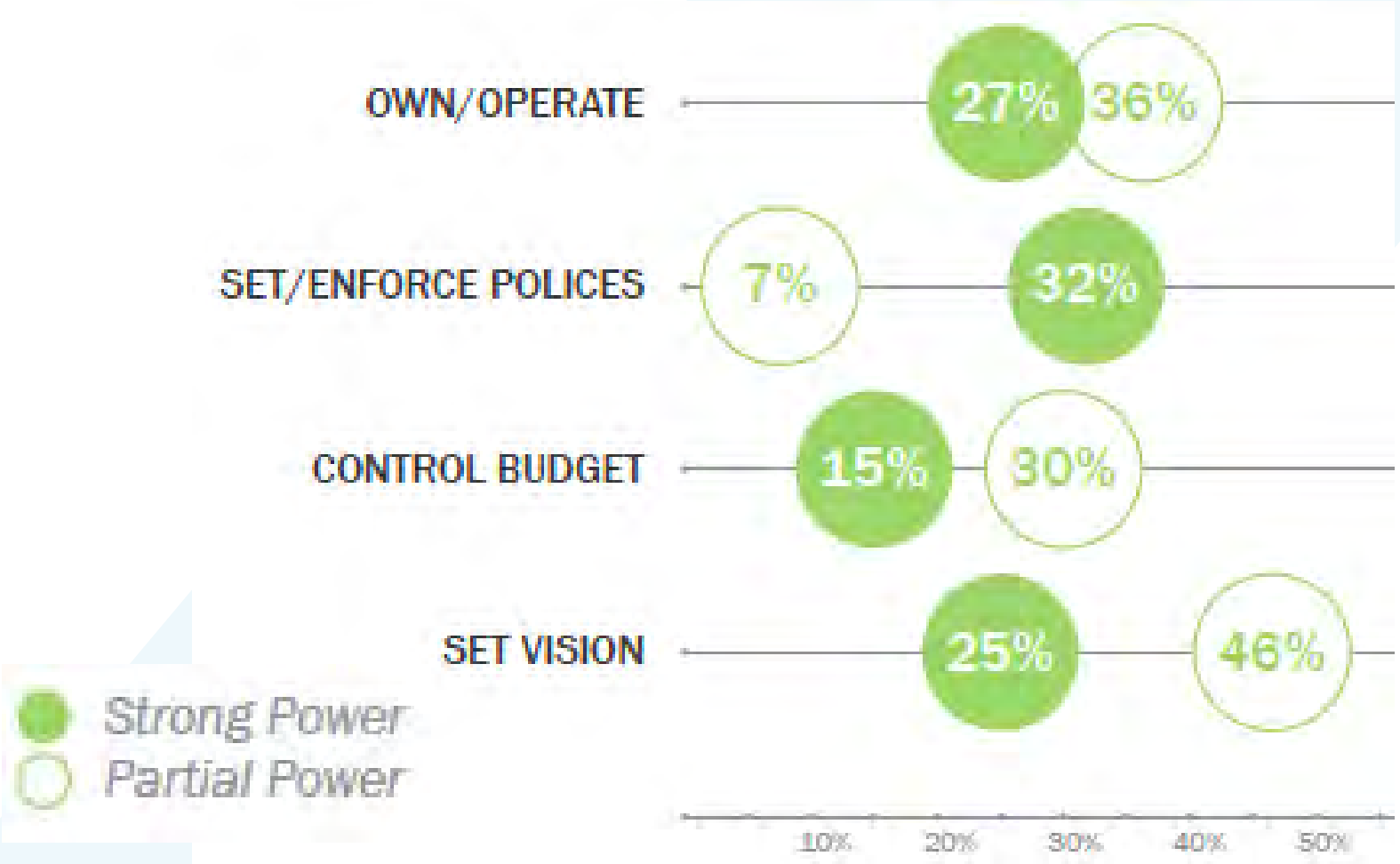




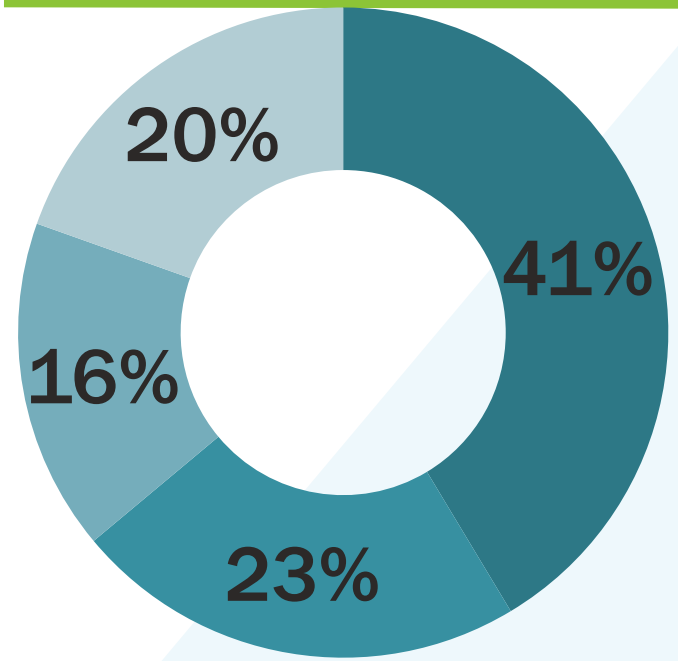
Mayoral powers: % of assets/functions related to **buildings and street lights**



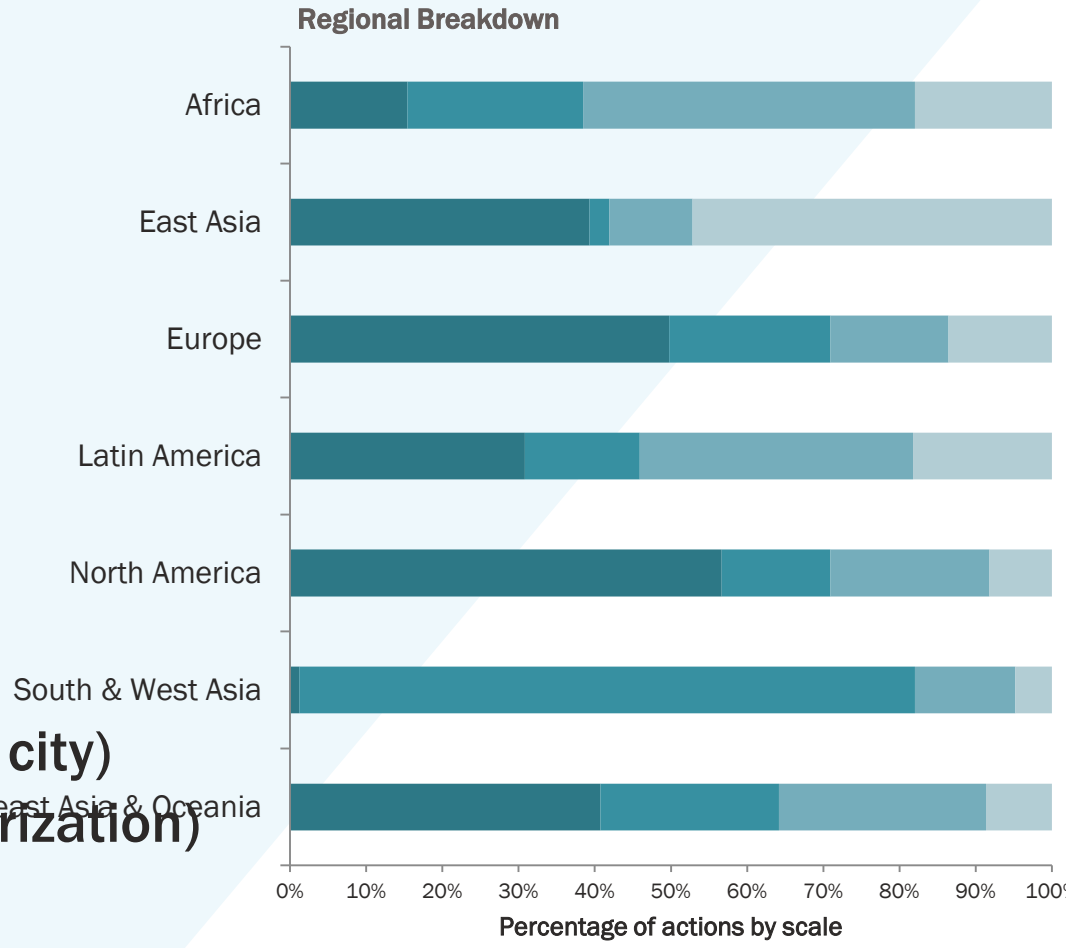
Mayoral powers: % of assets/functions related to energy supply



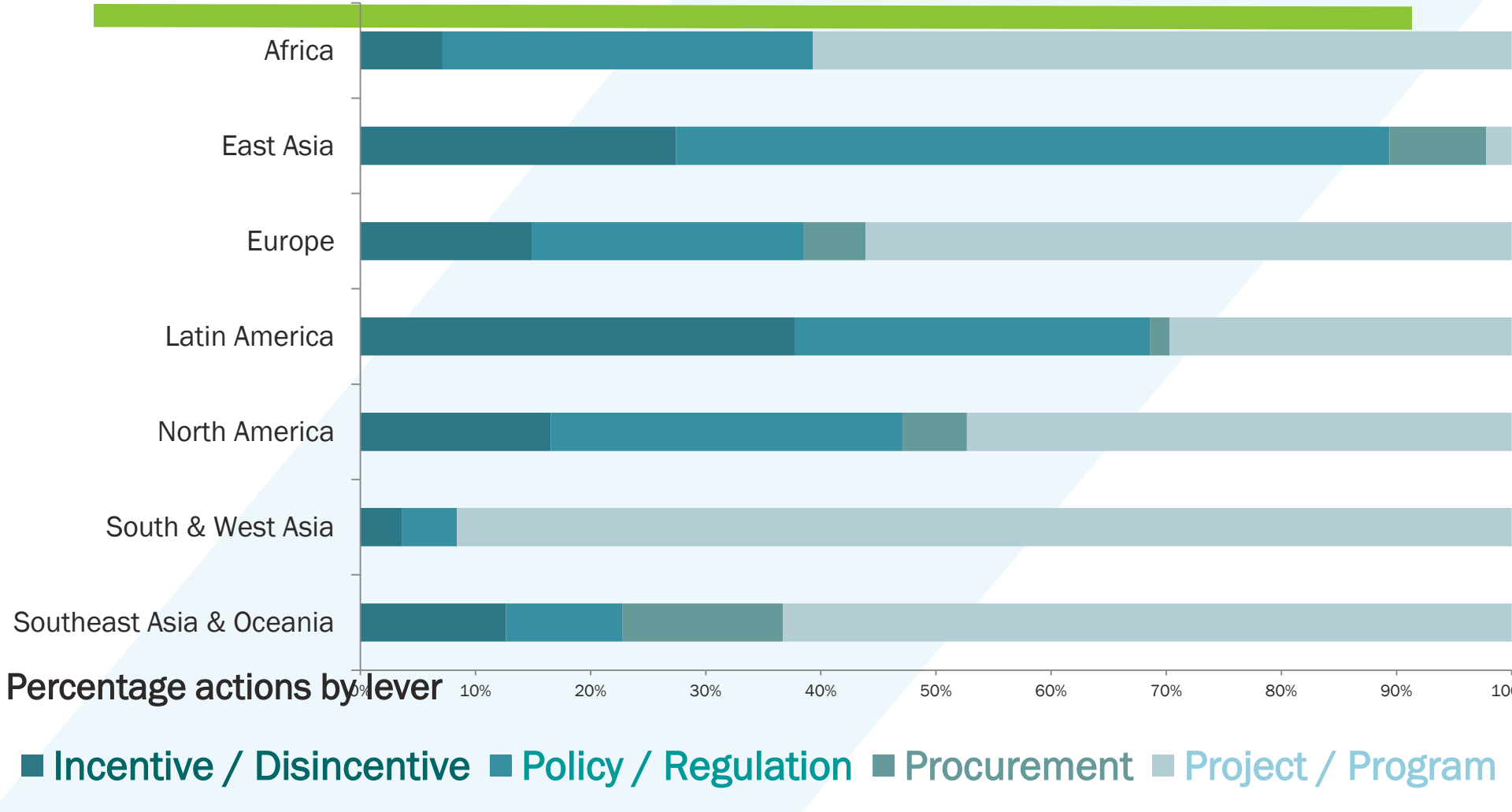
Cities are Taking Buildings Actions to Scale



- Transformative (city wide)
- Significant (across most of the city)
- Proposed (awaiting final authorization)
- Pilot (being tested)



Cities Tailor Solutions to Local Circumstance



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Energy Efficiency

- Heating, building energy and public lighting are key action areas in C40 cities.

- Efforts are attractive because they yield financial returns on investment through energy cost savings.

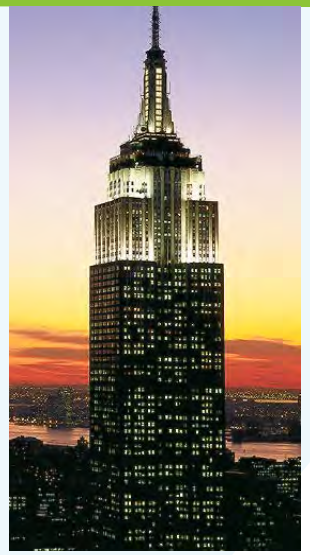
Actions in C40 cities during 2013:

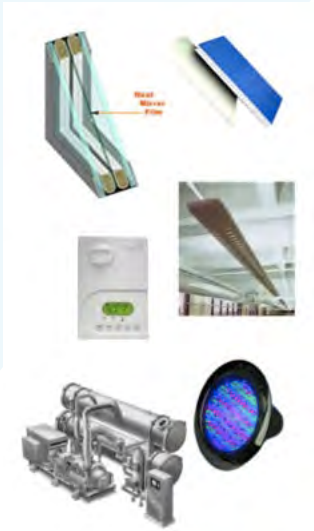
- **1668** actions taken
- **90%** of the cities act on public lighting
- **69%** are focused towards demand reduction

Energy Efficiency: top 5 actions

In Buildings:

1. Insulation
2. Audits and advice
3. Energy performance certification
4. Benchmarking
5. Heating and cooling efficiency





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Energy Efficiency: top 5 actions

In outdoor lighting :

1. More efficient luminaires (e.g. LED)
2. Timed lighting
3. Computerized lighting
4. Solar-powered streetlights
5. Sensor-based lighting

Energy Supply

- A stable & sustainable energy supply is necessary for the lighting, heating, cooling and transport functions
- Much of that energy is provided by electricity.
- Its source is a significant driver of the GHG footprint of C40 cities.

Actions in C40 cities during 2013

- **293 actions taken**
- 1/3 of future actions are focused on energy generation from waste
- 30% of actual actions involve solar energy

Energy Supply: top 5 actions

Low-carbon and renewable energy generation actions:

1. Solar electricity
2. Solar heat
3. Biofuels
4. Anaerobic digestion
5. Community renewable energy projects

Photo: water heaters in Joburg

Energy Supply: top 5 actions

Improving efficiency of conventional energy generation

1. Fuel switching
2. Increase capture of waste heat
3. Provision/encouragement for new power project sites
4. Re-powering/power station replacement
5. Heat generation asset replacement

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London's RE:FIT

BUILDING ENERGY EFFICIENCY FOR TOMORROW

Details:

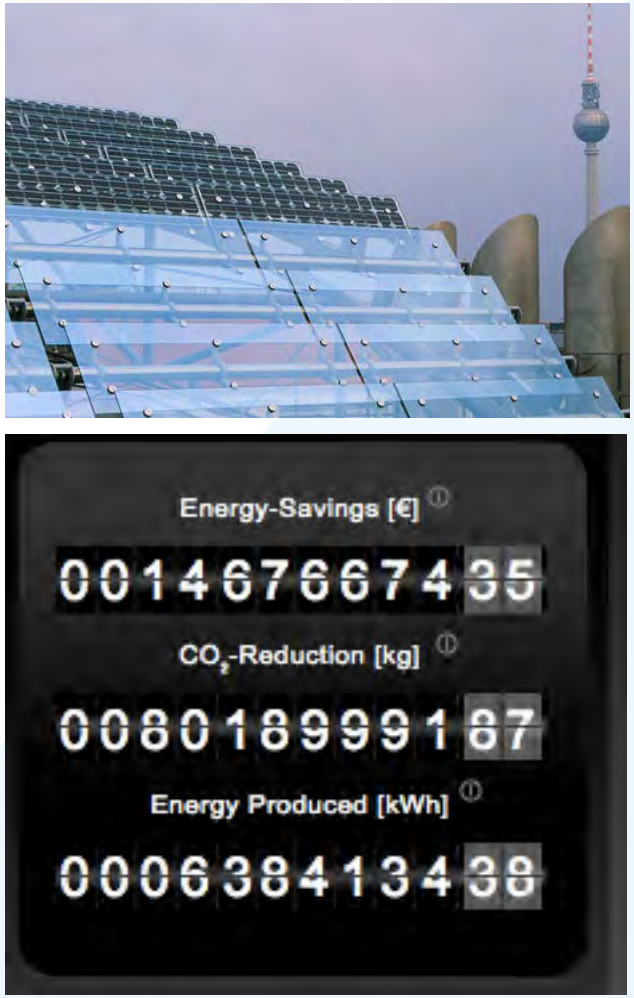
- Open to all public sector organizations
- Pre-approved panel of ESCOs
- Guaranteed savings contracts
- Includes a EU-funded "program delivery unit"

Results:

- 235 buildings retrofitted
- £31.7m invested
- 24,000 t/y CO_2e saved
- £3.5M/y fuel bill savings

In 2007, President Clinton challenged C40 cities to commit to retrofitting public sector buildings. London led - and developed RE:FIT

Berlin Energy Agency



- "Energy Savings Partnership"
- For public and private buildings
- Pools buildings (average 20) to a minimum energy bill of €200,000 to ensure scale
- 1,400 buildings
- 64,000 t CO_2e annually saved
- Average energy savings of 26% per building pool

NYC: Greener, Greater Buildings

- 75% of Citywide GHGs
- 4 local laws impose…
  - Benchmarking (>50,000 sq ft)
  - Energy code compliance
  - Auditing and retro-commissioning
  - Lighting upgrade, sub-metering
- 30% GHG reduction over 10 years
  - 17 universities, 11 hospitals
  - Expanding to commercial offices, multi-family residences, theatres

Tokyo: Cap and Trade

CITY CLIMATE LEADERSHIP AWARDS

- Instead of restraining urban business and development promotes the shift toward greener, low carbon buildings
- Target 1,300 Buildings

- Compliance periods 1) 2010-14: 6% reduction 2) 2015-19 : 17%
- More than 60% of targeted facilities are ahead the 2014 goal
- More than 20% of targeted facilities have already succeeded in meeting 17% reduction target
- Mandatory reporting

Melbourne: retrofitting 1200 Buildings

- Innovative financing effort for commercial building retrofits

- 70% of commercial building: **improve EE by 38%** and reduce **GHG emissions: 383,000** t/y
- Environmental upgrade finance gives owners **access to competitive capital** & help owners **sharing costs** of retrofits with tenants

- Financiers have a **strong incentive to advance funds** for retrofit works as they can recover loans as a statutory charge which provides certainty.

Cities share experience on how to use biogas from landfills: Bogota CDM project

Biogas extracted (av.)	14.000 m^3/h
Power generation	70.000 Kw/h
Biogas methane content (%CH_4)	50-55%
Av. Emission reduction / year	700.000 Ton CO_2eq
Overall investment:	USD$ 18.6 M

Mexico´s Bordo Poniente project: under construction

Electric taxi pilot in Bogota: a successful business model shared

Fr. Mayor Bloomberg launching Nissan Leaf test

Fr. Mayor Petro & President Clinton for a test drive, BYD cab

	5 years	6 years
	Gasoline	**Electric**
Income		
Long shift	56,842	95,495
Expenditure		
Total expenditure	**49,970**	**52,482**
Balance	**6,872**	**43,013**

Bogota: initial results, 25 cabs

- **Mean driving and energy performance is 3,11 km/kWh**
- **Mean autonomy 213 km/charge**
- **128 ton/CO_2 avoided in 513.807 km run**

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http://www.nydailynews.com/autos/electric-cabs-hit-nyc-article-1.1324046, OE TABACCA FOR NEW YORK DAILY NEWS

Sharing the experience of the Hybrid Electric Bus Test Program: 31-77% eq fuel savings

Bogota starts with 200 hybrids, moves to 790 H/E

Shenzhen shares experience of 1000 electric battery buses

London shares results of+350 hybrid buses & starts testing electrics

Curitiba has 30 hybrid buses running

Mexico has 8 hybrid buses running

Sao Paulo starts with 10 electric and foreseen 1000

The HEBTP was funded by IDB

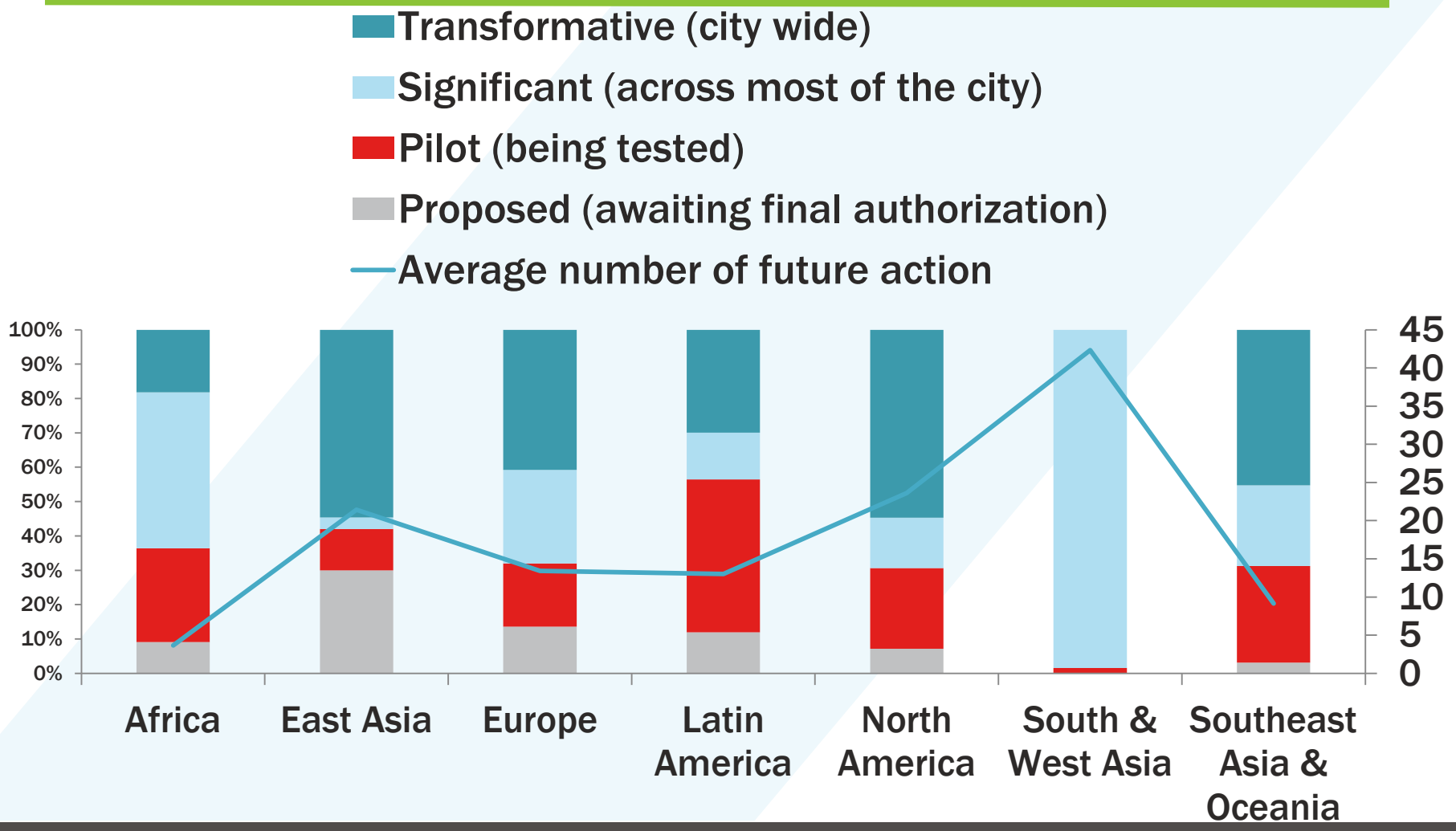
Micro-hydro: local power generation in Bogota

Power Plant Characteristics

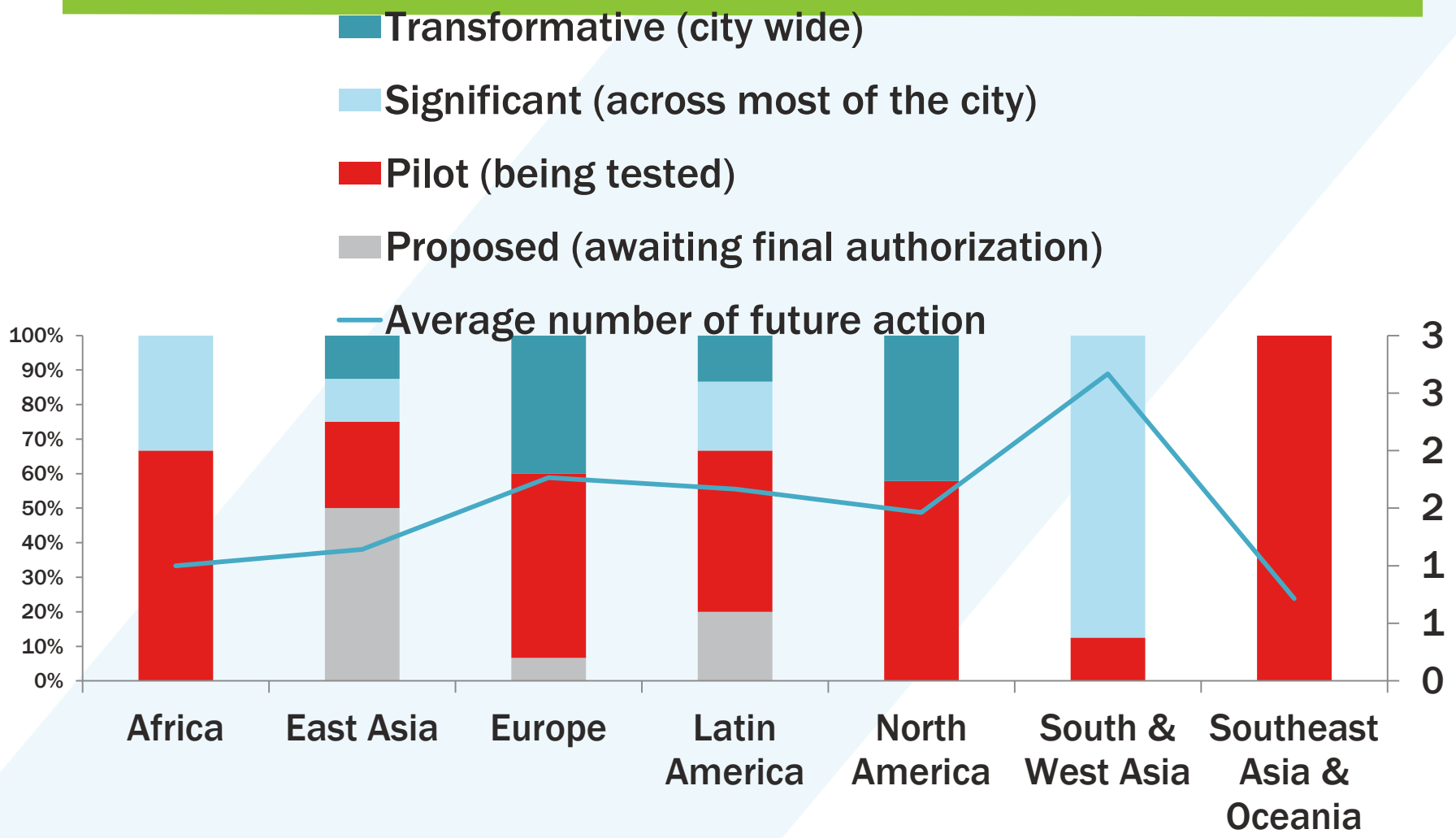
- Installed Capacity (design):
  - 12 MW
- Installed Capacity Flow:
  - Design 13.43 m3/s
  - Mean 7.2 m3/s
- Electricity Generation:
  - 47 GWh/year
- Mean ton/year of CO2 reductions:
  - 23,800 (CDM)

Santana micro-hydroelectric plant

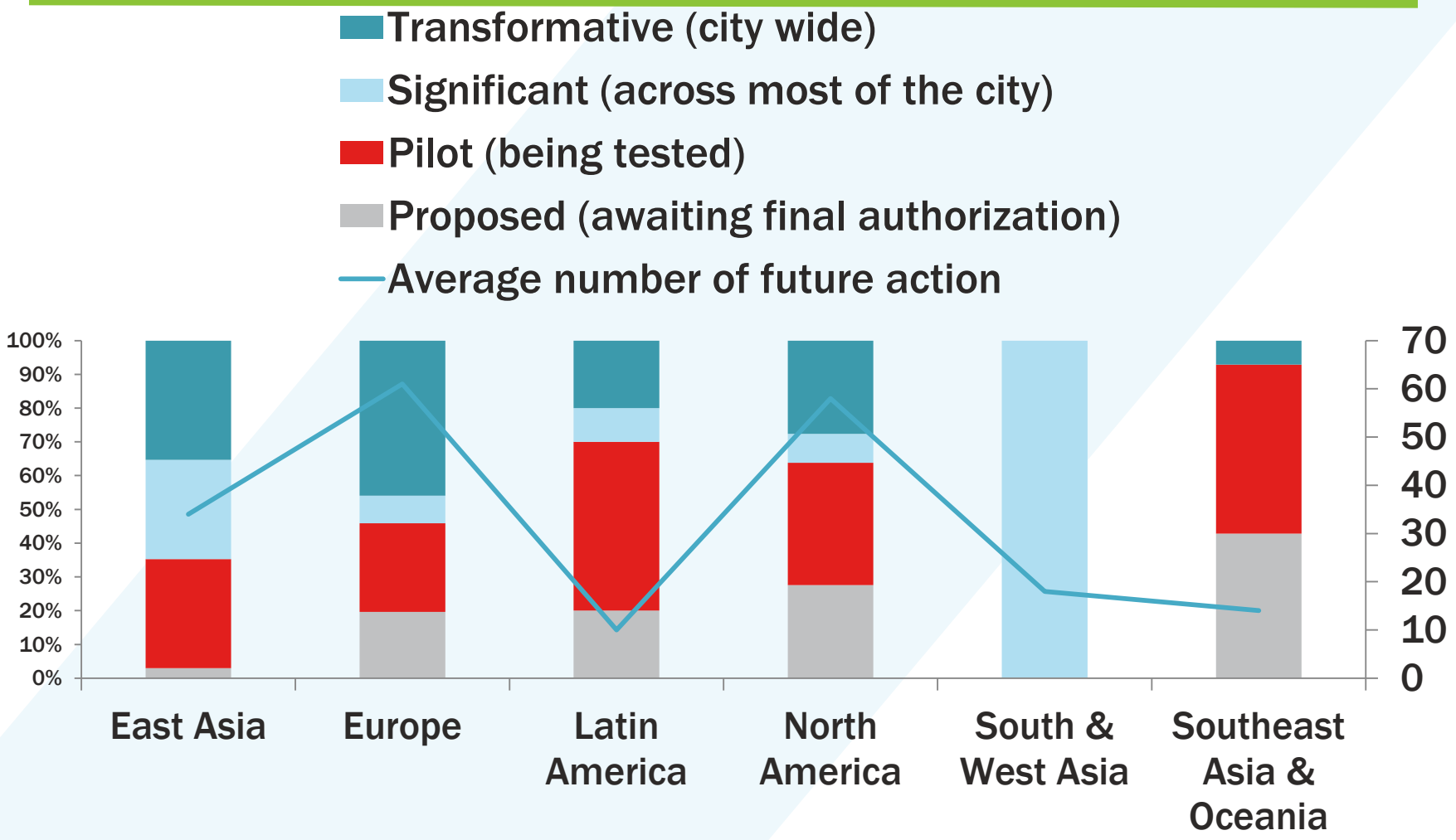
Future Actions – Buildings



Future Action – Outdoor Lighting



Future Action – Energy Supply



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Some barriers to make buildings energy efficient

- Low tax management capacity in cities since some are nationally governed
- Lack of financial trust from banks
- Very few long term credit lines
- Guaranties for projects: hard to accept performance
- No experience or legal support for performance contracts
- Low ESCO experience

Some examples of actions to foster building energy efficiency

Regulations

- Audit Program: Victoria EPA, EU
- On Site Renewables: Merton, London
- Energy Efficiency Requirements: Austin, Berkeley, San Francisco
- Product Requirements: Incandescent Lighting Ban - Australia, Bogota
- Local Carbon Tax: Boulder, Colorado
- 3rd Party Green Building Requirements: Boston, New York, DC, Portland, San Francisco
- Building Codes

Some examples of actions to foster building energy efficiency

Financial Incentives

- On Bill Financing: Nova Scotia Power, San Diego Gas and Electric
- Tax Credits: State of NY, Oregon, etc.
- Utility Rebates & Loans: Toronto Atmospheric Fund Revolving Loan
- Fee Waivers: City of Calgary, Pasadena

Some examples of actions to foster building energy efficiency

Structural Incentives

- Performance Contracting Facilitation: Toronto, Berlin
- Expedited Permitting: City of Chicago
- Energy Efficiency Density Bonuses: Minneapolis
- Green Building Density Bonus: Seattle, Arlington County, Nashville
- Local Improvement Districts: Berkeley Solar Initiative

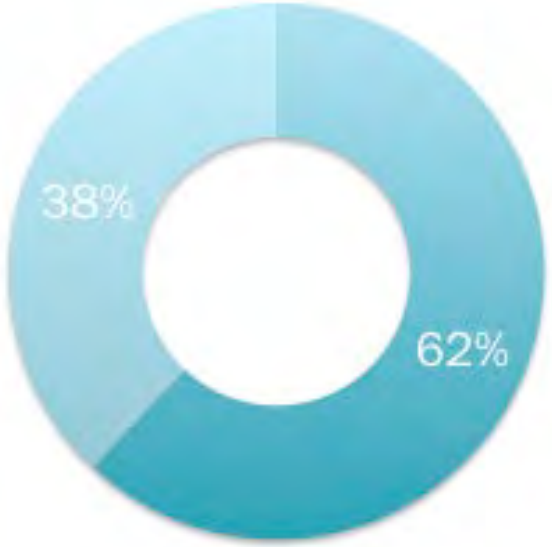
Some barriers to make energy generation cleaner

Besides low level of mayoral powers:

- Control by national or federal governments
- Political conflicts that block cities access to credit
- Difficult access to long term credit lines
- Blocking entering electricity to regional or national grids and markets
- Subsidies in fossil fuel energy generation

Some ideas to foster building clean energy supply

- Preferential market for clean electricity
- Regulations to foster district generation
- Taxes on kw from fossil fuel
- Revolving funds to finance hous and local generation
- City creditworthiness for cities to facilitate access to credit
- New rules for access to direct credit for cities



Has the city established a fund to invest in energy efficiency, renewable energy or carbon reduction projects?

C40 is LOOKING AHEAD

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