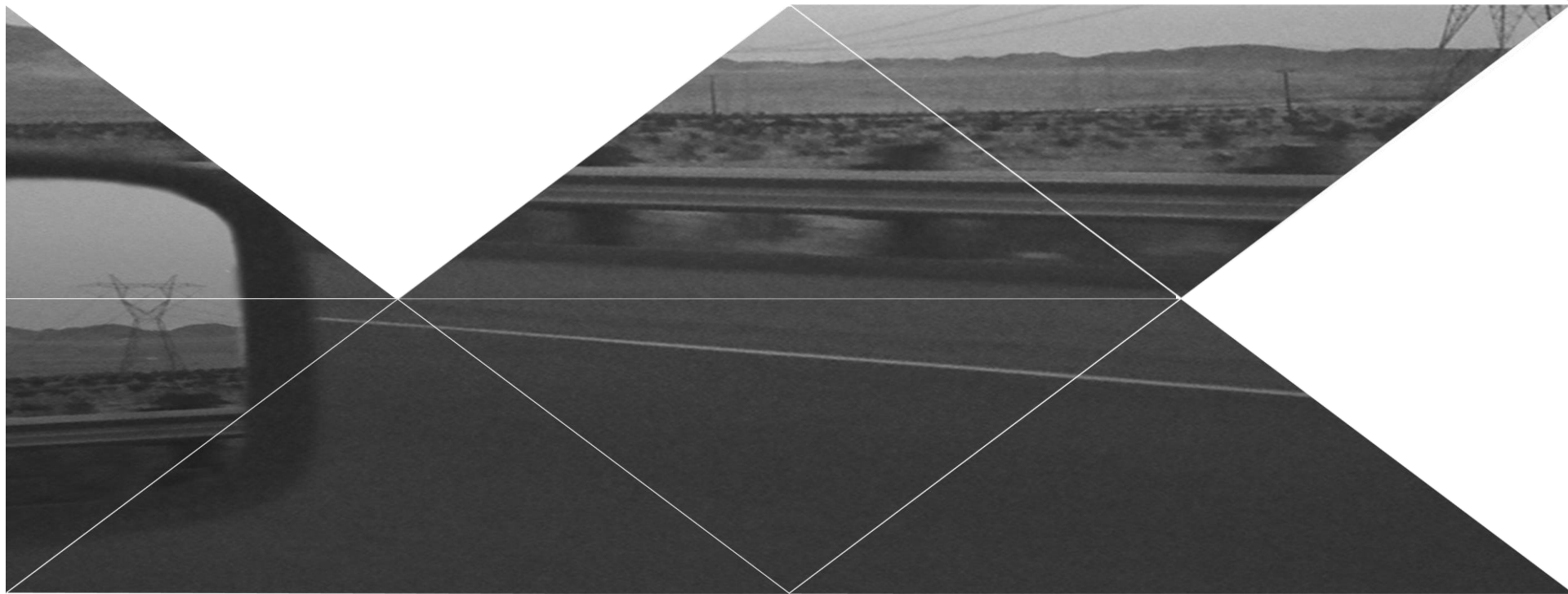


ROADMAP TO ZERO

Edward Mazria, AIA, FRAIC
Architecture 2030







60%

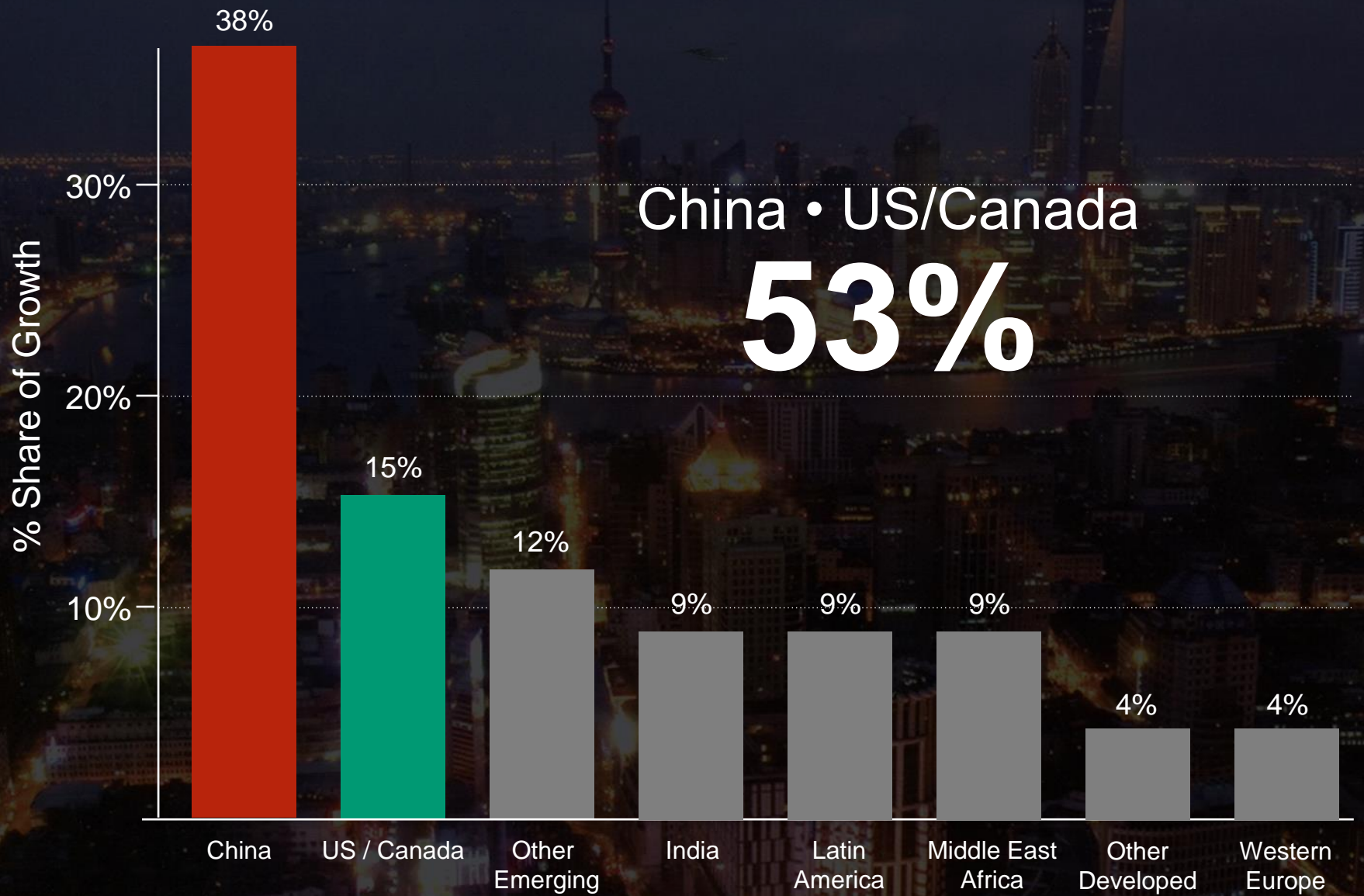
An area equal to 60% of the entire building stock of the world,

By 2030, even
with energy and emissions patterns
locked in for 80 years (120 years)
80 billion m² (900 billion ft²)

of new and rebuilt buildings
will be constructed in cities worldwide.

Sources:
UN Habitat, *State of the World's Cities 2010/2011*; McKinsey Global Institute.





Global Urban Floor Space Growth (2012 – 2030)

Source:
McKinsey Global Institute, *Urban World: Cities and the rise of the consuming class*, 2012.



ROADMAP 2050

A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. New Buildings
2. Existing Buildings (renovations)
3. Building Products

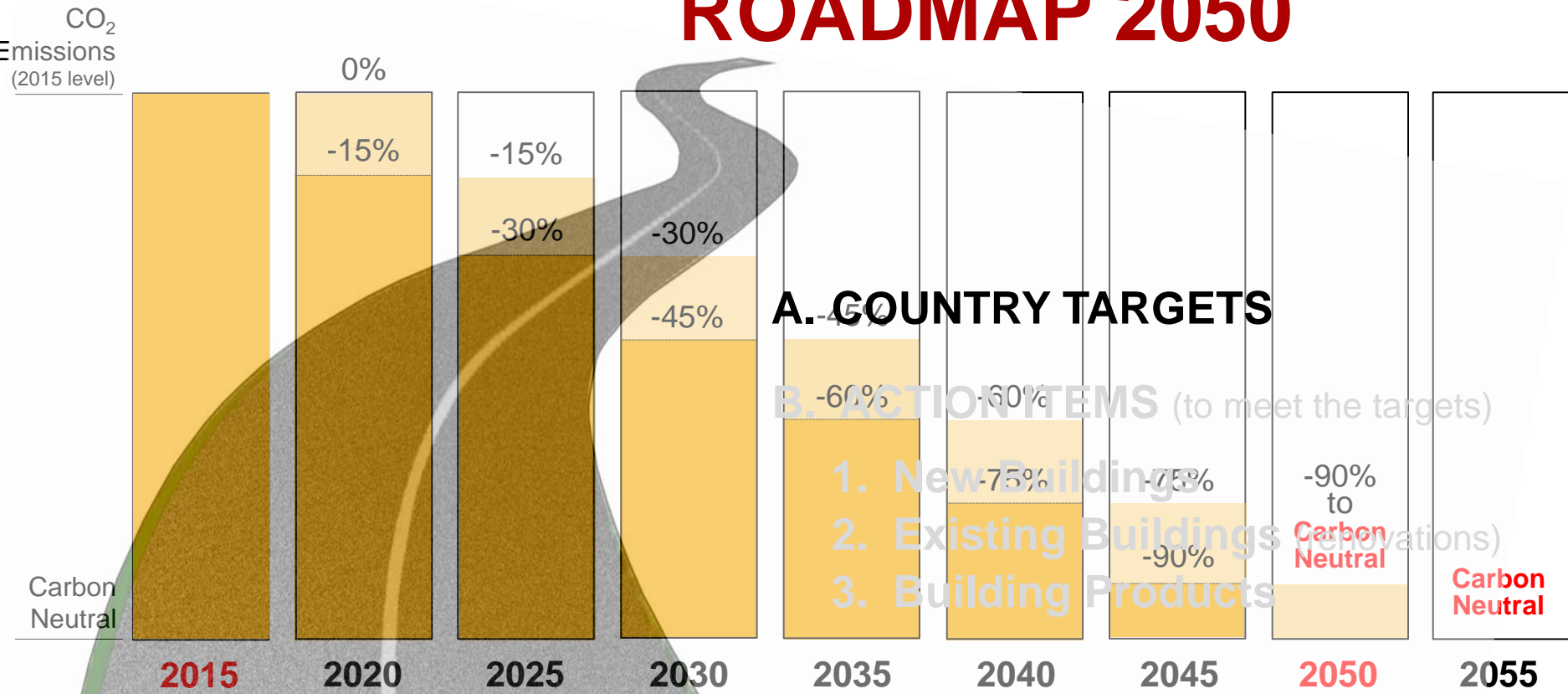
BUILDING SECTOR



COP 21, PARIS 2015



ROADMAP 2050



A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. New Buildings
2. Existing Buildings (Renovations)
3. Building Products

Roadmap 2050
 Total Building Sector CO₂ Emissions Targets 2015 - 2050
BUILDING SECTOR
 COP 21, PARIS 2015

Source: Architecture 2030



ROADMAP 2050

A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. New Buildings
2. Existing Buildings (renovations)
3. Building Products

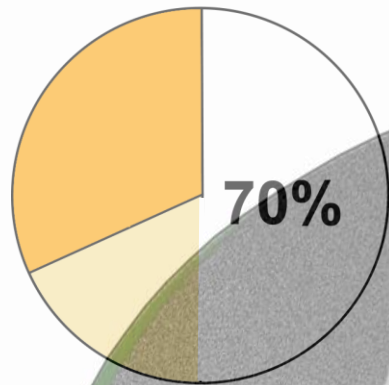
BUILDING SECTOR



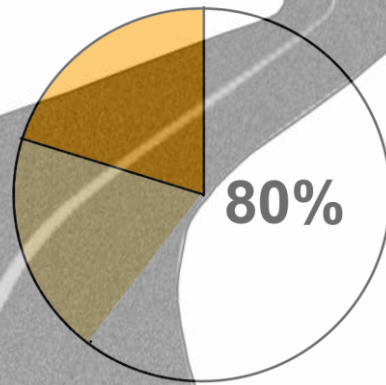
COP 21, PARIS 2015



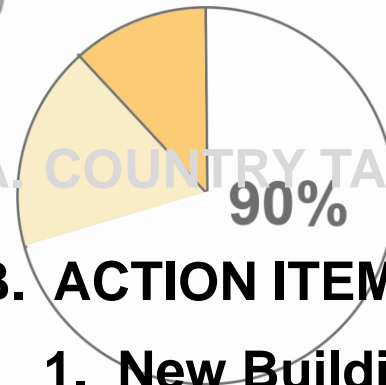
ROADMAP 2050



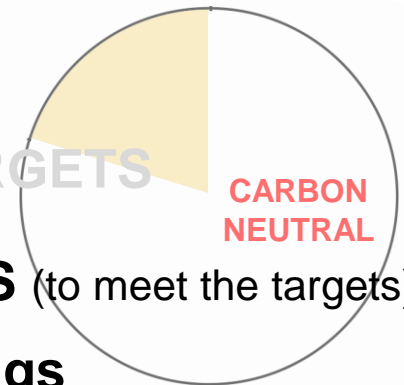
2015



2020



2025



2030

CARBON NEUTRAL

A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. New Buildings
2. Existing Buildings (renovations)
3. Building Products

Fossil Fuel CO2 Reduction
 Renewable Energy
 Fossil Fuel Consumption

2030 Challenge

Roadmap 2050



1. New Buildings Fossil Fuel CO₂ reduction Targets
BUILDING SECTOR COP 21, PARIS 2015

Source: Architecture 2030

"New Buildings" include major renovations; EUI = building operation Site Energy Use Intensity



ROADMAP 2050

A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. **New Buildings**
2. **Existing Buildings** (renovations)
3. **Building Products**

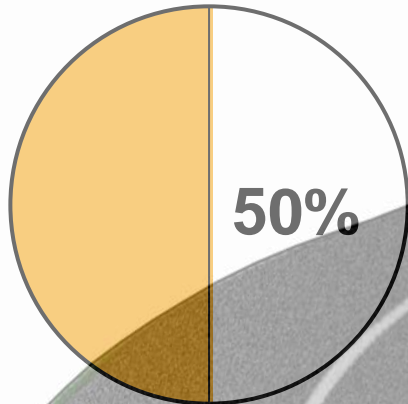
BUILDING SECTOR



COP 21, PARIS 2015



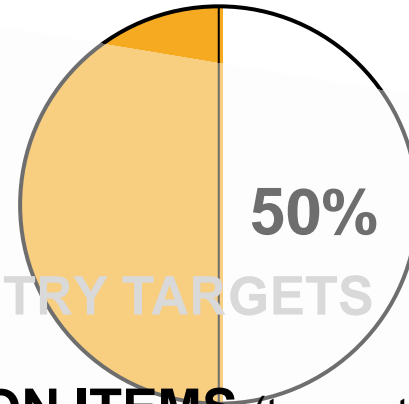
ROADMAP 2050



2% to 3%
(annual building stock renovation)

Developed Countries

Renovate a *minimum* of 2% to 3% of the total existing building stock each year to a 50% fossil fuel operating energy consumption reduction.



A. COUNTRY TARGETS

B. ACTION ITEMS (to meet the targets)

1. New Buildings **1.5% to 2%**
(annual building stock renovation)
2. **Existing Buildings** (renovations)
3. **Developing Countries**

Renovate a *minimum* of 1.5% to 2% of the total existing building stock each year to a 50% fossil fuel operating energy consumption reduction.

Roadmap 2050

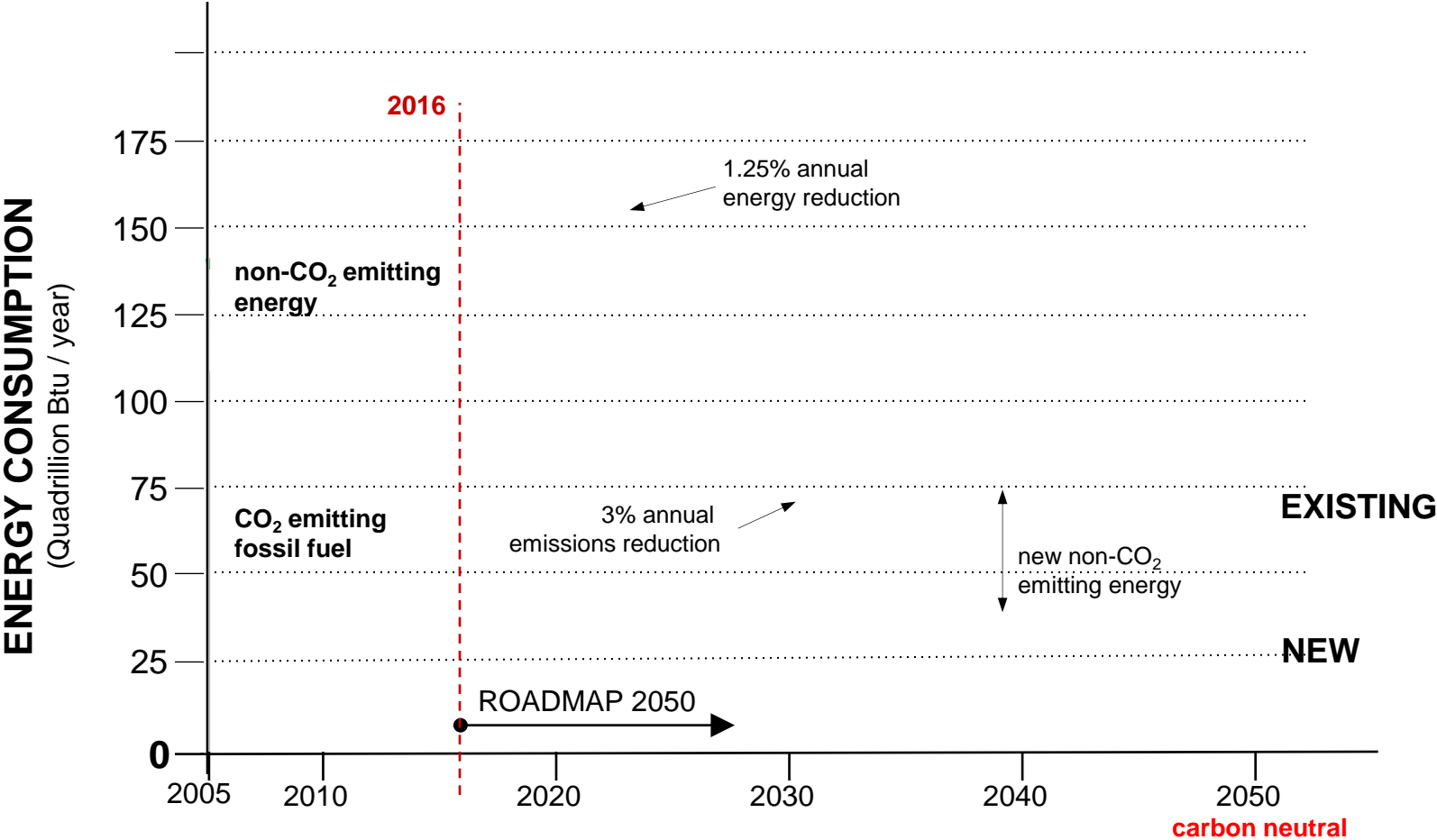


2. Existing Buildings Fossil Fuel CO₂ Reduction Targets
BUILDING SECTOR

Source: Architecture 2030

COP 21, PARIS 2015





Roadmap 2050

Global Building Sector Targets 2016 - 2050

Source: Architecture 2030; Data adapted from the EIA International Energy Outlook 2013.

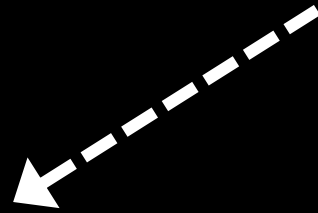


PROGRESS?



2030 TARGETS

(carbon neutral by 2030)



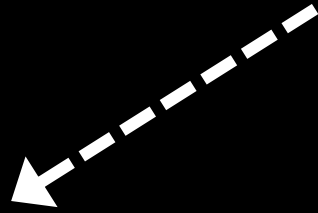
Practice





2030 TARGETS

(carbon neutral by 2030)



Practice



Top 30 A/E Firms

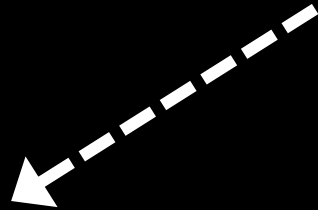
52% of all U.S. architecture firms





2030 TARGETS

(carbon neutral by 2030)



Practice

- SEATTLE
- CLEVELAND
- PITTSBURGH
- LOS ANGELES
- DENVER
- TORONTO
- DALLAS
- SAN FRANCISCO
- WASHINGTON
- SYRACUSE
- ANN ARBOR
- ATLANTA
- DETROIT
- THICHA
- FT. WORTH
- ALBUQUERQUE
- STAMFORD
- PHOENIX
- SAN ANTONIO

2030
DISTRICTS[®]

Unique private/public partnerships

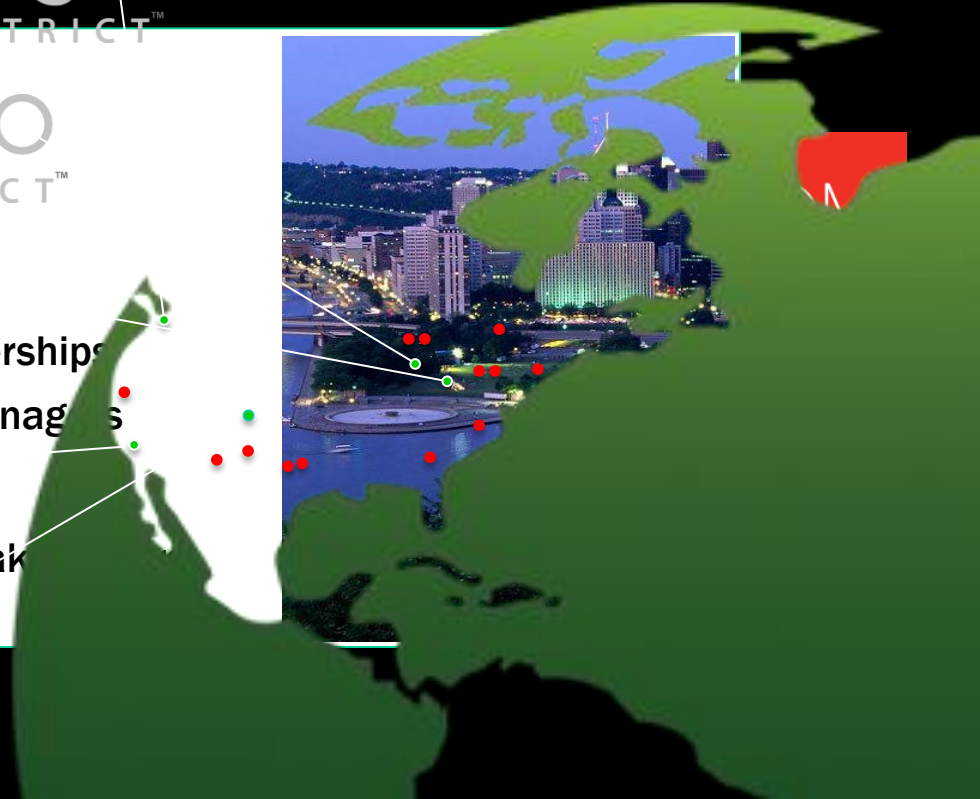
- Property owners and managers
- Local governments
- Business/community stakeholders

2030 DISTRICT™

2030 DISTRICT™

2030 DISTRICT™

2030 DISTRICT™



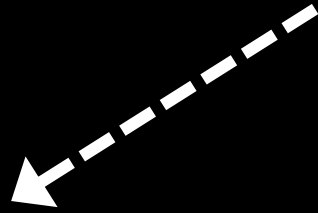
Top 3
52% of all U.S. architecture firms



architecture
2030

TARGETS

(carbon neutral by 2030)



Practice

Net-Zero
NORTH AMERICAN
LEADERSHIP SUMMIT

NZB
NET ZERO BUILDINGS

March 2013 • Volume 1, Number 1

DAYLIGHTING: A BALANCING ACT ☉
POWER: BUYING LOCAL ⚡
ENVELOPE: WITHIN THESE WALLS 🏠

KILOWATTHOURS

THE FUTURE OF THE BUILT ENVIRONMENT
SUSTAINABILITY, CARBON NEUTRALITY AND BEYOND

SUSTAINABLE URBANISM
URBAN DESIGN WITH NATURE

DOUGLAS FARR

Two Degrees
The Built Environment and Our Changing Climate

Aislinn McGregor, Fiona Cousins, and Cole Roberts

urbanism
in the age of
climate change

peter calthorpe

urbanism in the age of climate change

THE
INSTITUTE
OF ARCHITECTS

LIVING BUILDING CHALLENGE™

getting to zero national forum
2013 NASEO Annual Meeting
Framing the policies, programs and projects that will drive zero net energy buildings

WE ARE... GREENBUILD NAT
PHILADELPHIA NOV. 20-22
PRESENTED BY THE U.S. GREEN BUILDING COUNCIL

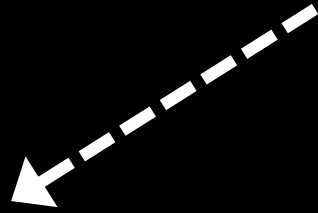
U.S. GREEN BUILDING COUNCIL



2030 TARGETS

(carbon neutral by 2030)

Practice



Net-Zero
NORTH AMERICAN
LEADERSHIP SUMMIT

**LIVING
BUILDING
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GREENBUILD NAT**
PHILADELPHIA NOV. 20-22
PRESENTED BY THE U.S. GREEN BUILDING COUNCIL



TARGETS

(carbon neutral by 2030)

Practice

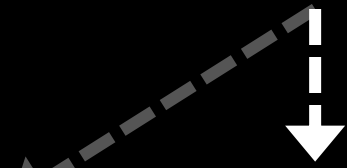
Policy





2030 TARGETS

(carbon neutral by 2030)



Practice

Policy



Executive Order

Energy Independence and Security Act

Counties Care for America

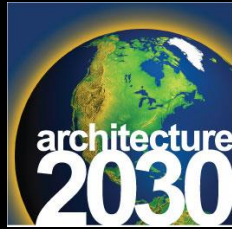
Possible Fuel Reduction

55%	- 2010
55%	- 2015
80%	- 2020
90%	- 2025
100%	- 2030

Beginning in 2020 and thereafter, ensure that all new Federal buildings that enter the planning process are designed to achieve **zero-net-energy by 2030.**

Energy Independence

Sec. 433



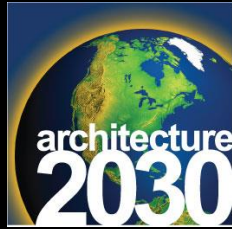
2030 TARGETS

(carbon neutral by 2030)



Practice

Policy



TARGETS

(carbon neutral by 2030)

Practice

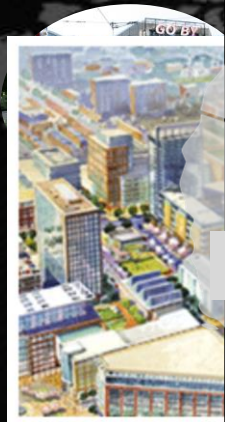
Policy

Information

DISTRICT

SITE

REGION



INFORMATION GAP



Professional Markets in U.S. and Canada
Professional Education Series
CITY / TOWN



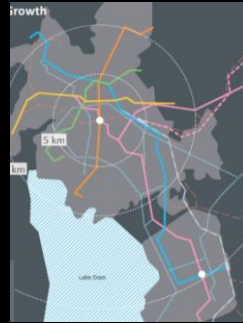
GETTING TO ZERO CARBON

Step 1.

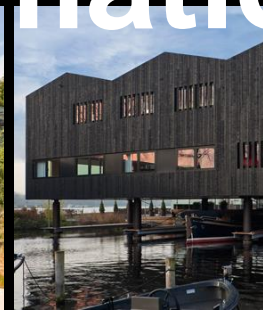
Design & Planning

- Sustainable
- Adaptable

70%-80%
(no cost / low cost)



Information



Step 2.

Technology

ZERO CARBON

GETTING TO ZERO CARBON

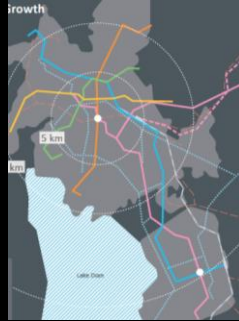
Step 1.

Design & Planning

- Sustainable
- Adaptable

70%-80%

(no cost / low cost)



Step 2.

Renewables

20%-30%

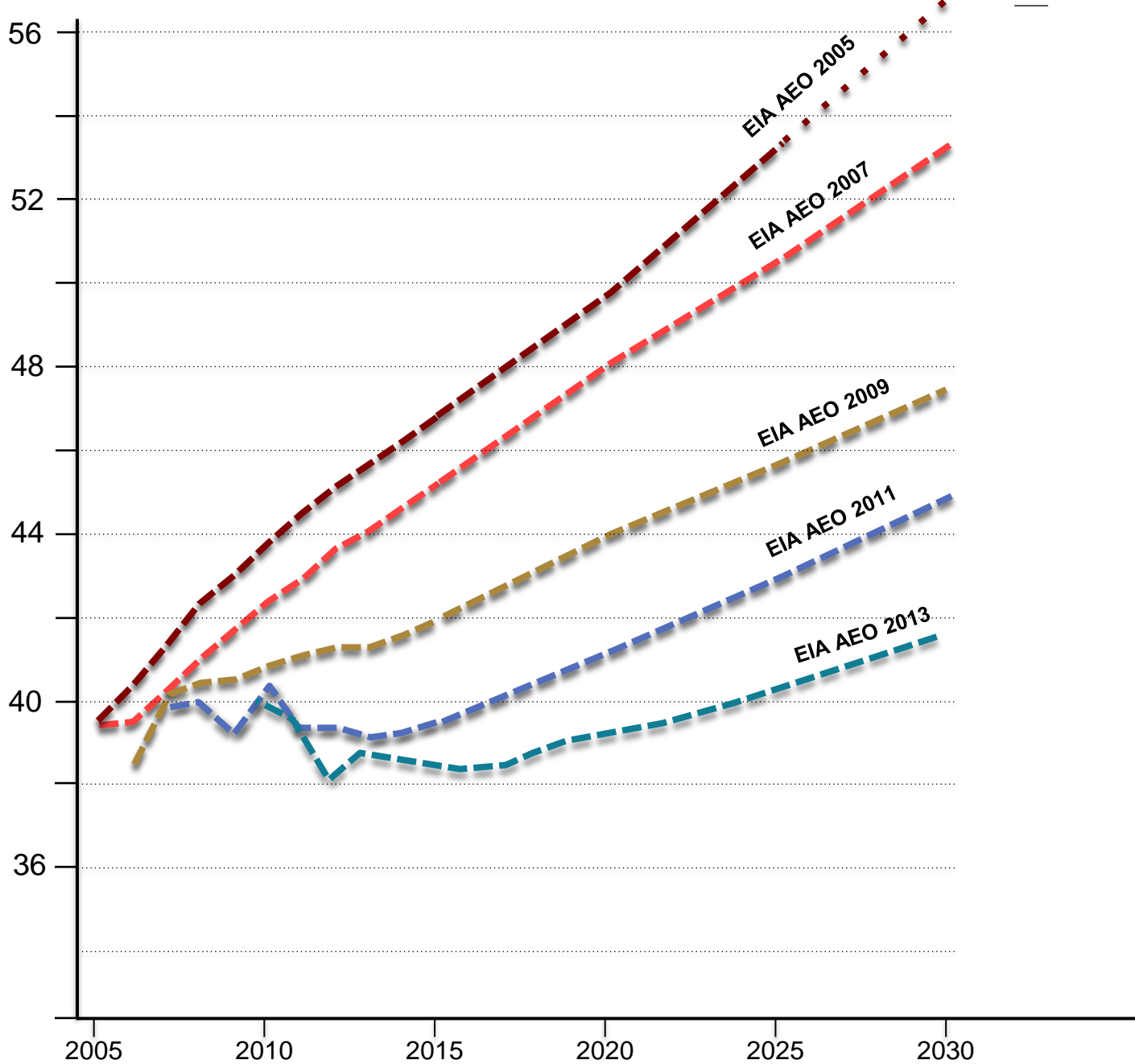


Technology

ZERO CARBON

**Case for
ACTION**

QBtu
Quadrillion Btu

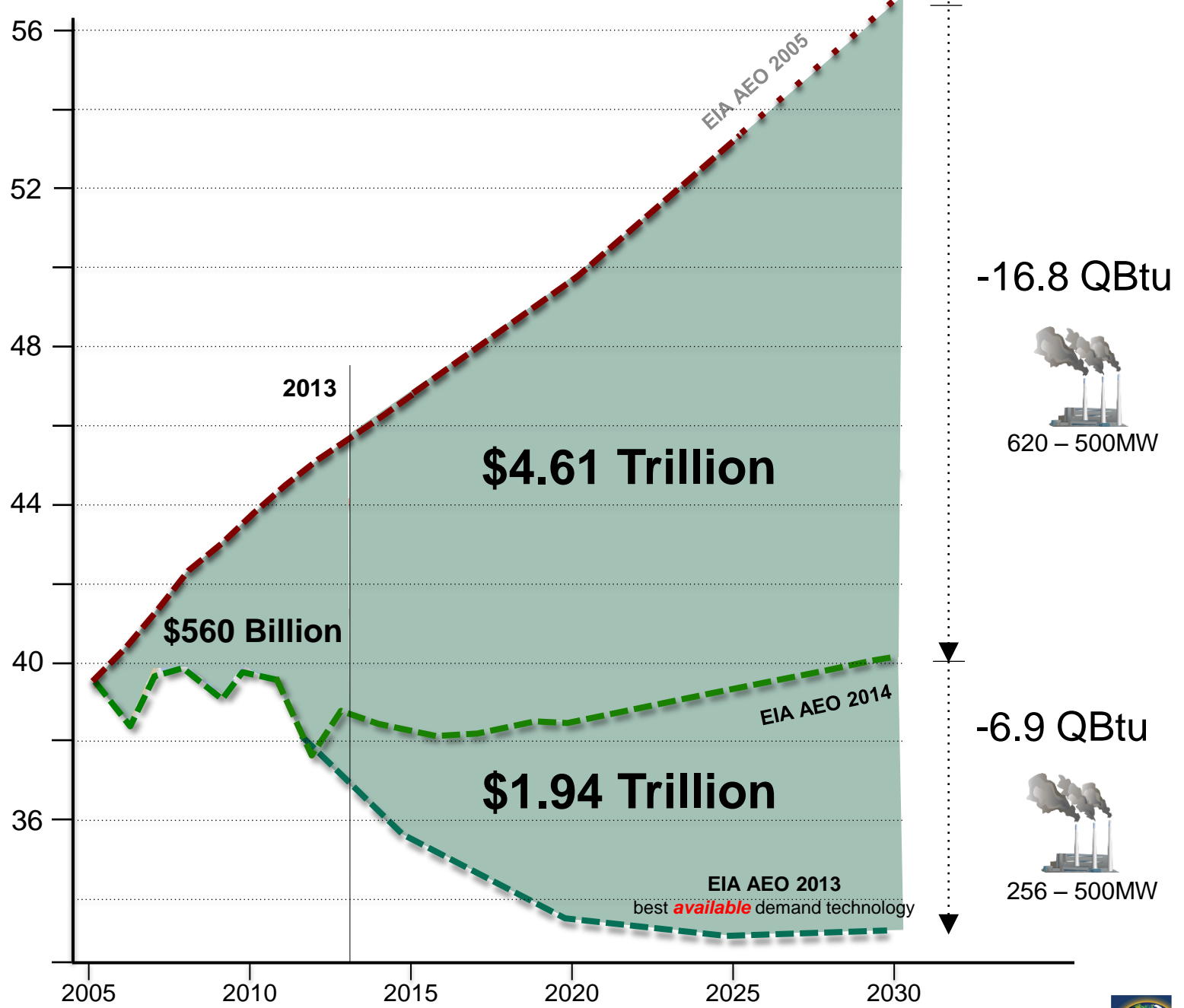


U.S. Building Operations 2005 - 2030

Source: Architecture 2030, U.S. Energy Information Administration, Annual Energy Outlook (EIA AEO)



QBtu
Quadrillion Btu



U.S. Building Operations 2005 - 2030

Source: Architecture 2030, U.S. Energy Information Administration, Annual Energy Outlook (EIA AEO)



it's all about... challenges & opportunities

Chatham House cordially invites you to join the conversation:

The Road to Zero

-- Worldwide Initiatives --

Chatham House and *Architecture 2030* invite you to join experts from countries, cities, and companies to discuss net zero initiatives and other emissions reduction strategies across the globe. Focusing on the Building Sector, participants will have a chance to hear from practitioners, researchers, and policy makers about strategies that work in the effort to reach carbon neutrality by mid-century.

- » **Thursday 12 June, 2014**
- » **Solar Room, Federal Ministry for Environment**
- » **15:00 - 16:30**



Thank You



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