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EFFICIENCY: A CRITICAL TOOL FOR CLIMATE ACTION

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IMAGE: FLICKR/HAROLD HEINDELL TEJADA

Halving carbon emissions by 2040 is within our reach if we act now to implement 4 interdependent transition strategies

Annual carbon emissions from the energy system by 2040

Gt CO_{2e}

Business as usual



48%

Power decarbonization + Electrification



30%

Energy productivity improvement



15%

Decarbonization of "hard-to-abate" sectors



7%

Upstream emissions + Coal-to-gas switch

2°C trajectory





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WHY BUILDINGS?

HOW IMPORTANT ARE BUILDINGS?

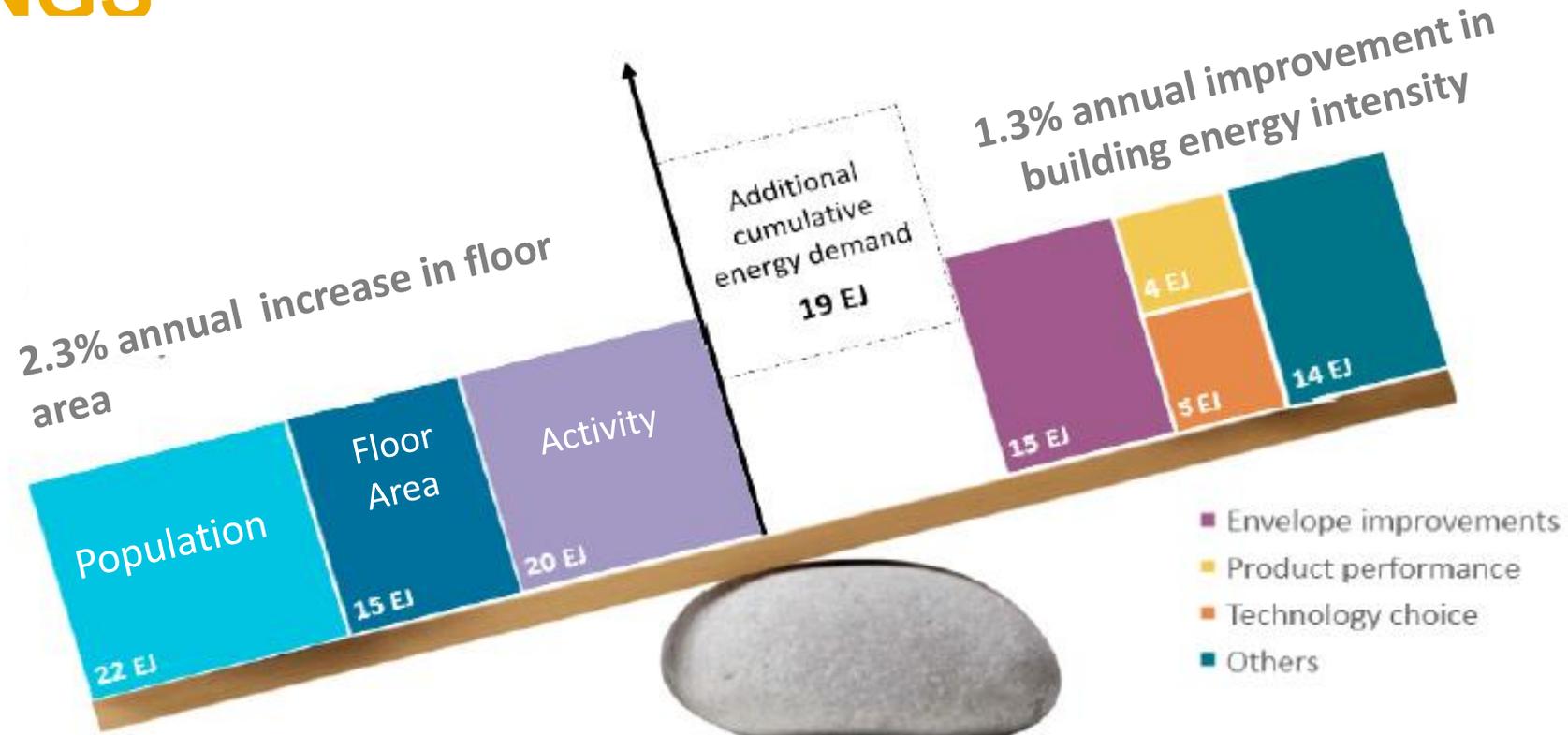
1/3

**Of global energy
demand**

1/4

**Of global GHG
emissions**

RISING ENERGY USE AND EMISSIONS FROM BUILDINGS



Composition of final building energy consumption by key contributions, 2010-2016 (GABC 2017)

1%/year increase in CO₂ emissions

60% of building stock in 2060 being built in countries with no mandatory building codes

47% of of buildings-related CO₂ emissions covered by policies

PERCENTAGE OF ENERGY CONSUMPTION BY THE BUILDING SECTOR

USA: 31%

Mexico: 18%

**Brazil:
15%**

EU: 39%

**Turkey:
36%**

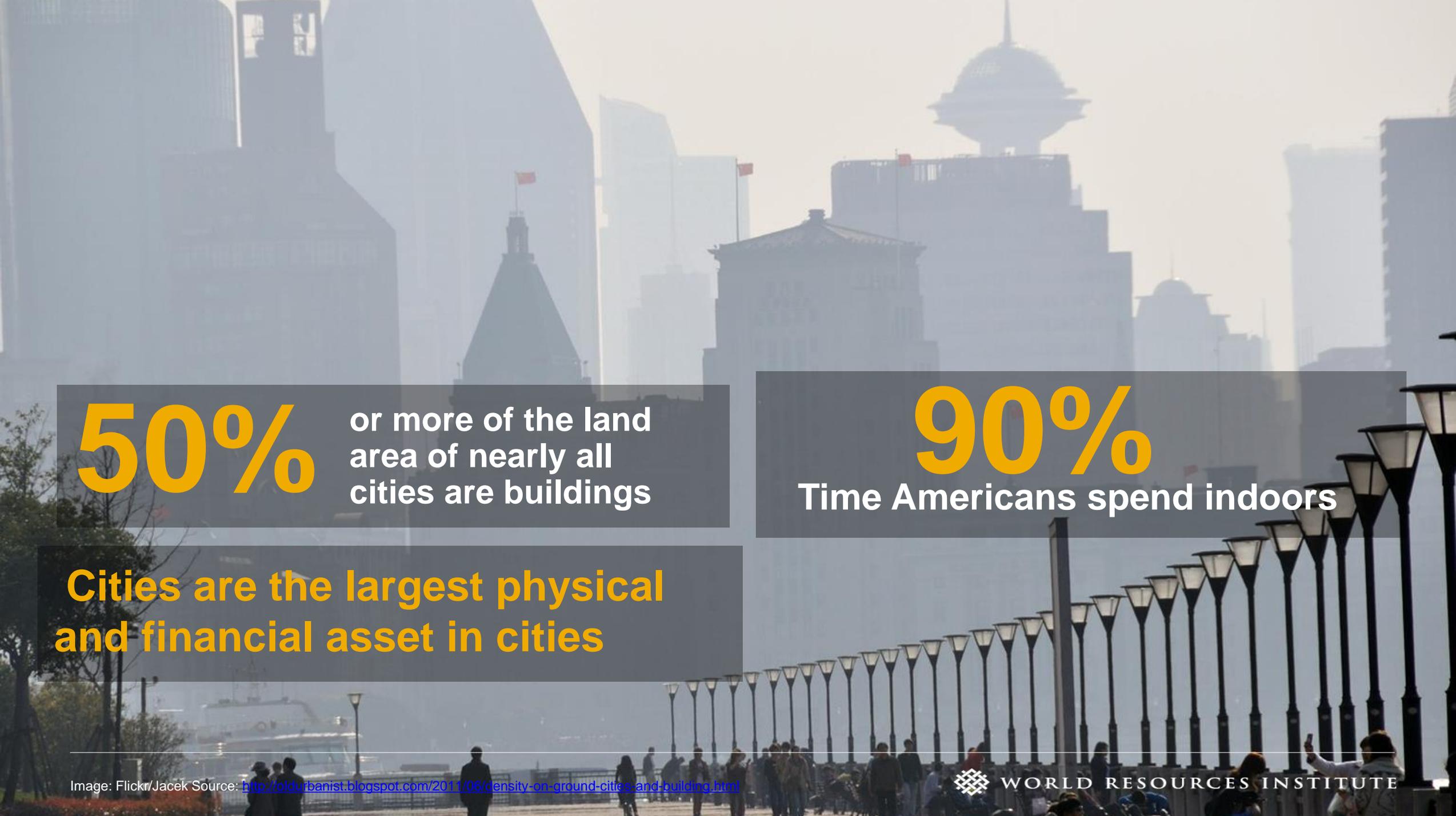
**Ethiopia:
92%**

South Africa: 29%

**India:
39%**

**China:
23%**

Indonesia: 23%



50%

or more of the land
area of nearly all
cities are buildings

90%

Time Americans spend indoors

**Cities are the largest physical
and financial asset in cities**

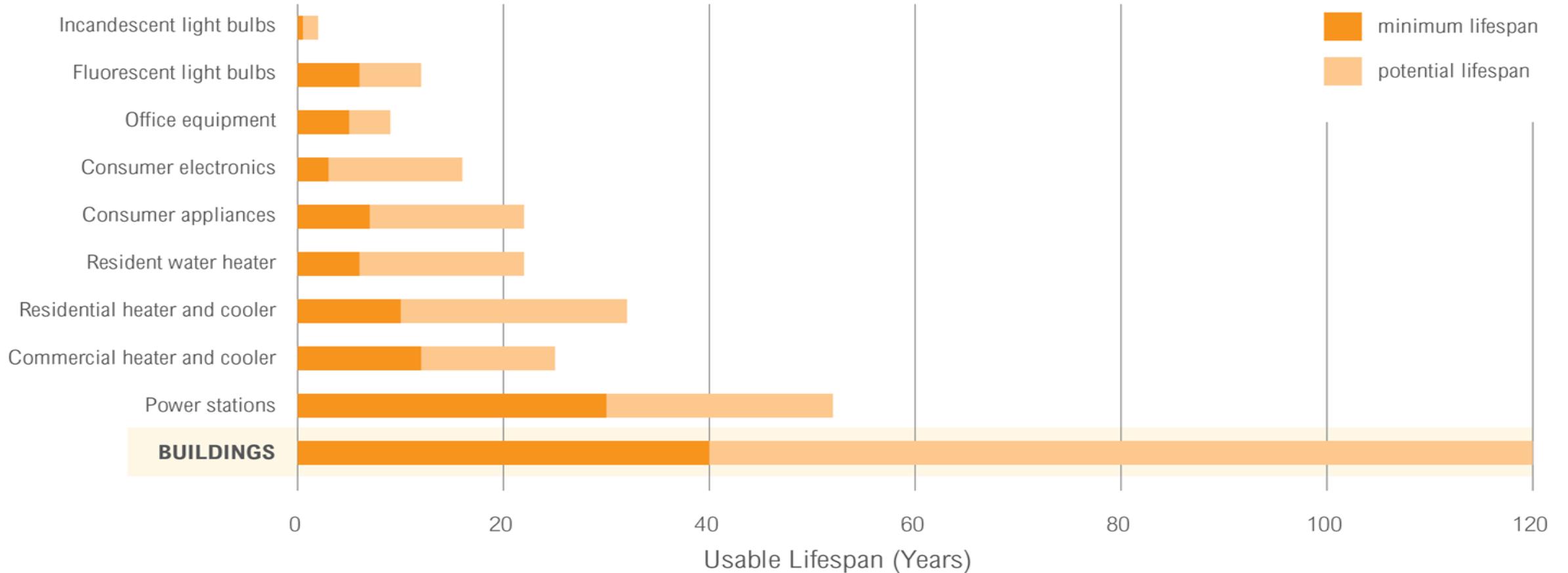
HOW IMPORTANT ARE BUILDINGS?

**Under current patterns, by 2050
carbon emissions from
buildings will**

Double

TODAY'S CHOICES ARE LOCKING US IN

Choices about long-lived capital investments like buildings have long-lasting implications for carbon emissions and urban services

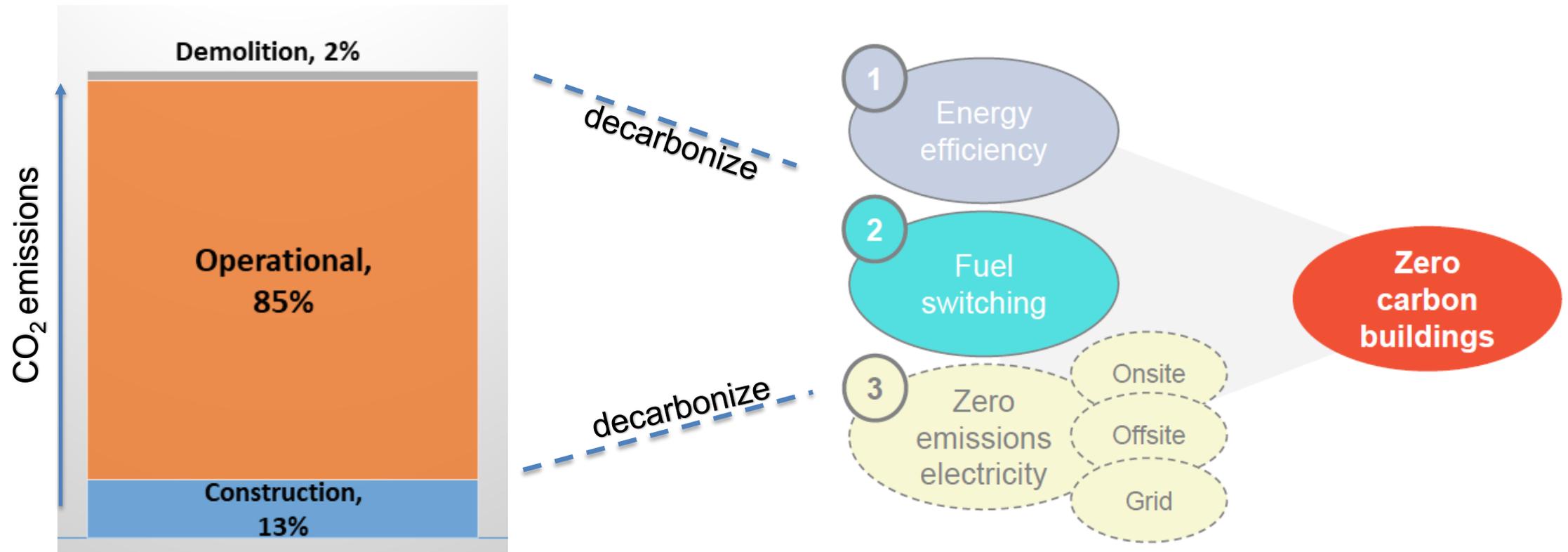


HUGE OPPORTUNITIES EXIST

1/3

The reduction in global building energy demand possible by 2050 if existing best practices are implemented at scale

DECARBONISATION OF BUILDINGS SECTOR



EXAMPLES OF BUILDINGS ACTIONS IN CLIMATE COMMITMENTS

China:

- Integrate **low-carbon development** concept throughout the entire process of planning, construction, and management of new facilities
- NDC goal: **green buildings account for 50% of all new construction by 2020**

India:

- National Mission for Enhanced Energy Efficiency aims to strengthen the market for energy efficiency by creating a **navigable regulatory and policy regime**.
- **Standards and Labeling Program** enables consumers to make informed appliance purchasing decisions
- Financing mechanisms like the Partial Risk Guarantee Fund for Energy Efficiency and Venture Capital Fund for Energy Efficiency helps to **provide equity for efficiency projects**

Japan:

- Promote **compliance of existing energy efficiency standards** for newly constructed buildings
- Develop a program for **energy efficiency** in existing buildings through **retrofits**
- Employ efficient equipment, lighting, water heaters; implement building energy management systems and energy efficiency diagnosis; efficiency and conservation of buildings in remodeling

Canada:

- Developing “**net zero energy ready**” **building codes** to be adopted by 2030 for new buildings
- Retrofitting existing buildings based on new **retrofit codes**
- Providing businesses and consumers with **information on energy performance**
- Improving energy efficiency of **appliances and equipment**

2050 VISION FOR EFFICIENT AND PRODUCTIVE BUILDINGS

“To meet the Paris Agreement, all new buildings must operate at **net zero carbon** from 2030 and 100% of buildings must operate at net zero carbon by 2050.”

World Green Building Council (WorldGBC), 2017,
*From Thousands To Billions: Coordinated Action
towards 100% Net Zero Carbon Buildings By 2050*



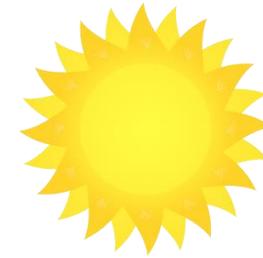
A net zero carbon building is “a **highly energy-efficient** building with all remaining operational energy use from **renewable energy**, preferably **on-site** but also off-site production, to achieve **net zero carbon emissions annually in operation.**”

BUILDING EFFICIENCY AS A SOLUTION

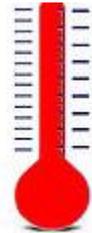


WORKER PRODUCTIVITY INCREASES FROM GREEN BUILDING IMPROVEMENTS

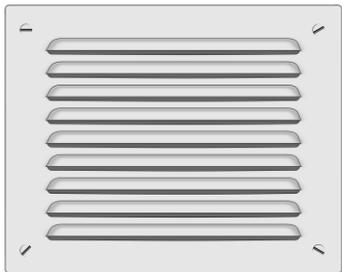
Lighting
23%



Access to
daylight
18%



Individual
temperature
control
3%



Better
ventilation
11%



Better mental
function and memory
from outside views
10-25%

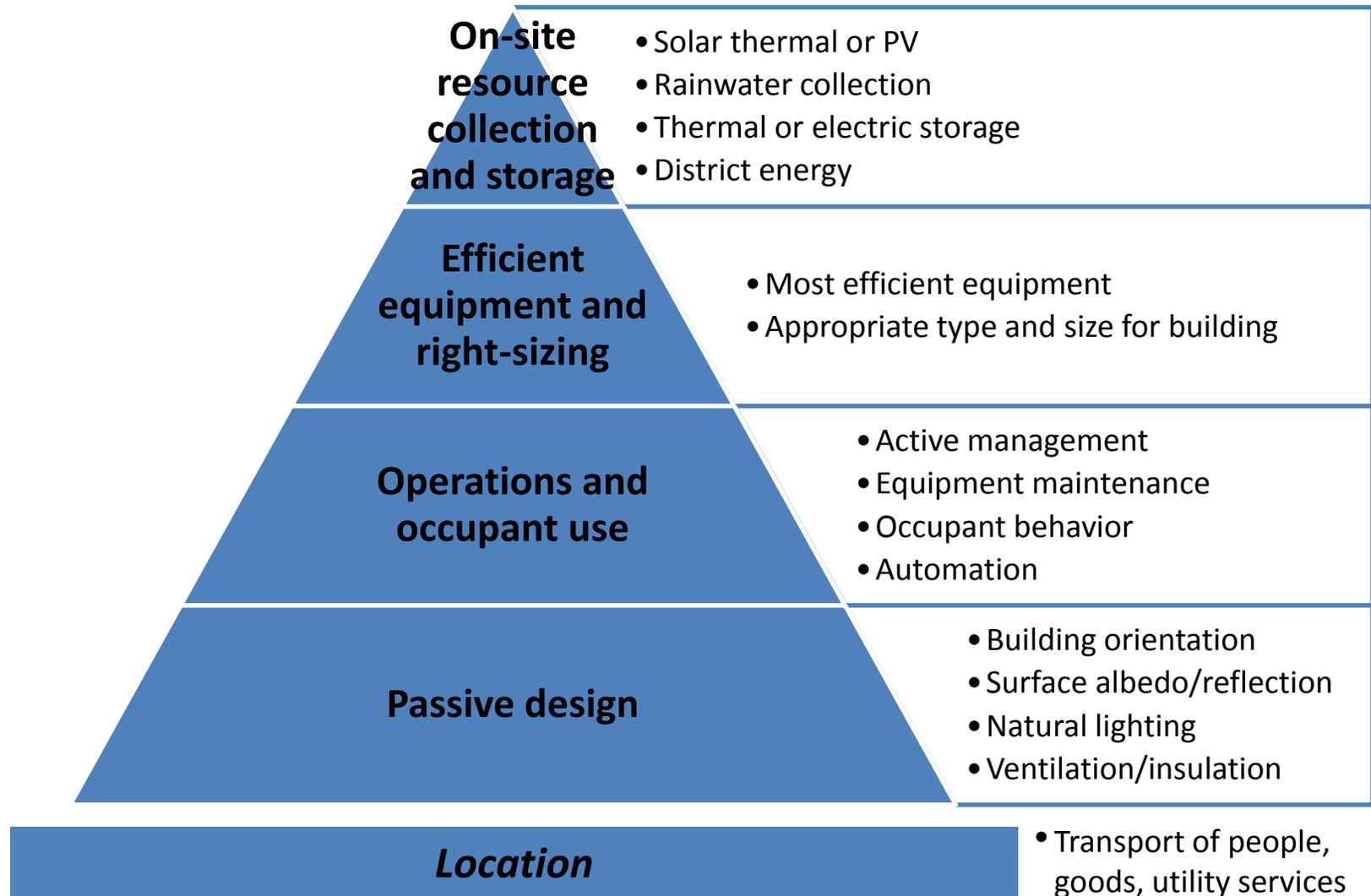
EFFICIENCY IS BIG BUSINESS AND A GOOD INVESTMENT

USD16 trillion investment potential for sustainable buildings – largest by far of any sector

SHADES OF GREEN: INVESTMENT POTENTIAL BY REGION AND SECTOR (\$ BILLION)

	Wind	Solar	Biomass	Small Hydro	Geothermal	All Renewables	Electric Transmission & Distribution	Industrial Energy Efficiency	Buildings	Transport	Waste	
East Asia Pacific	231	537	48	34	16	866	392	143	13,235	1,316	53	>1000
Latin America and Caribbean	118	44	45	11	14	232	0	21	901	1,461	26	>500<1000
South Asia	111	211	16	0	0	337	0	85	1,542	255	13	>250<500
Eastern and Central Asia	51	39	6	7	6	110	0	57	410	78	11	>100<250
Sub-Saharan Africa	27	63	4	3	27	123	0	0	153	499	8	>50<100
Middle East and North Africa	50	45	0	1	0	97	21	1	92	50	4	>25<50
Total Climate-Smart Investment Potential by Sector (\$ billion)	589	939	118	56	63	1,765	413	308	16,332	3,659	115	<25

BUILDING BLOCKS OF SUSTAINABLE BUILDINGS



One Goal:

Achieving Sustainable Energy for All by 2030



Three Objectives:



ENSURING
universal access
TO MODERN ENERGY SERVICES.



DOUBLING THE GLOBAL RATE OF IMPROVEMENT IN
energy efficiency.



DOUBLING THE SHARE OF
renewable energy
IN THE GLOBAL ENERGY MIX.