ALLIANCE TO SAVE ENERGY
using less. doing more.

U.S. GREEN BUILDING COUNCIL
USGBC

The Business Council for Sustainable Energy®

CRA
CORN REFINERS ASSOCIATION

Powering Ambition: Energy & Technology Solutions to Build Low Carbon Economies

COP24 · KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE

Lisa Jacobson

Business Council for Sustainable Energy

Bertrand Piccard

Solar Impulse


MoëtHennessy
by Solvay
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BERTRAND PICCARD
ANDRÉ BORSCHBERG
SOLARIMPULSE
AROUND THE WORLD
Solvay
Schindler

SOLAR**IMPULSE**
FOUNDATION

Our Challenge

#1000SOLUTIONS

CLEAN EFFICIENT PROFITABLE

Laura Van Wie McGrory

Alliance to Save Energy

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Building Low-Carbon Economies: The Power of Energy Efficiency

Laura Van Wie McGrory
Vice President, Strategic Initiatives

December 2018

Alliance to Save Energy

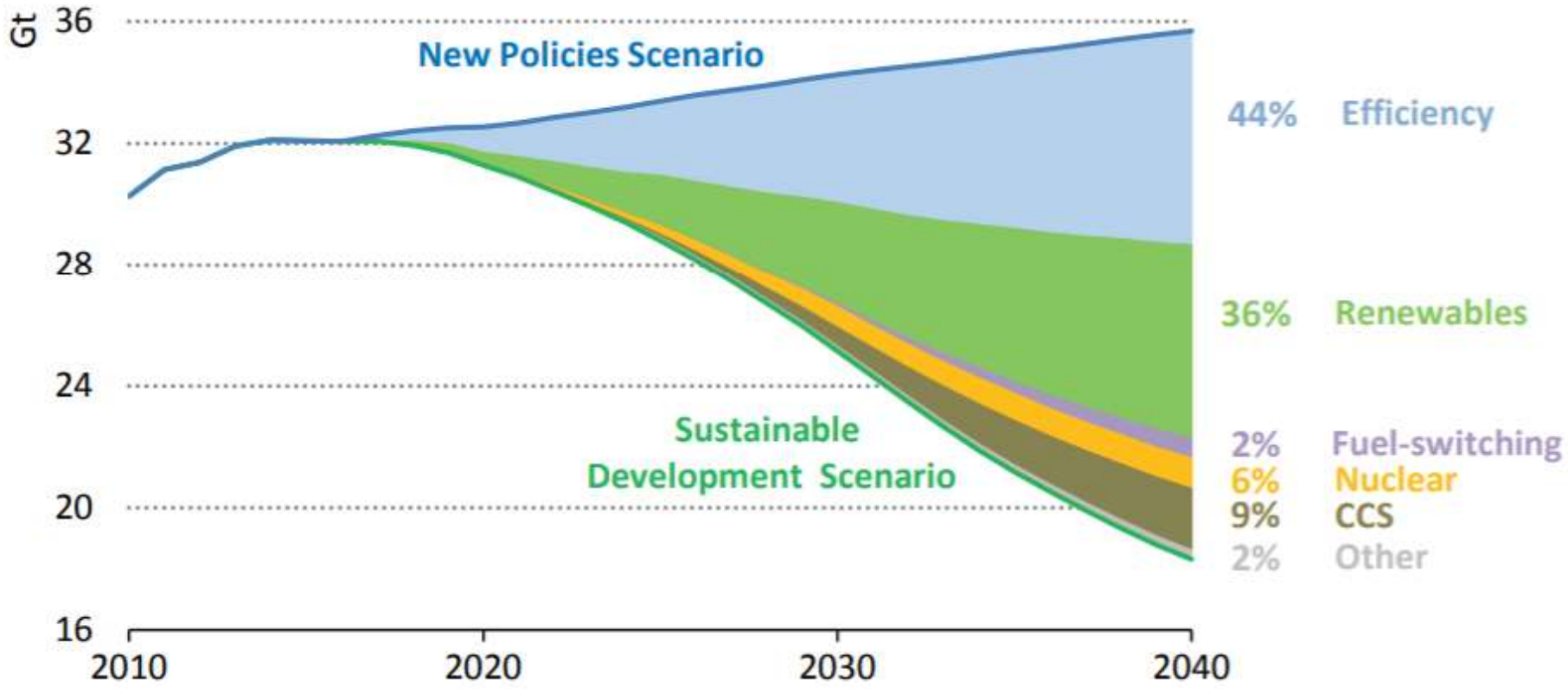
- **Non-profit, bipartisan alliance of business, government, environmental, and consumer leaders** advocating for enhanced energy productivity to achieve economic growth, a clean environment, and greater energy security, affordability and reliability.

- **25+** staff
- **41** years of experience
- **12** Bipartisan Honorary Board of Advisors
- **120+** business interests represented

POLICY LEADERS + ENVIRONMENTAL GROUPS + ACADEMIA + BUSINESS LEADERS

Energy Efficiency is a Key Opportunity

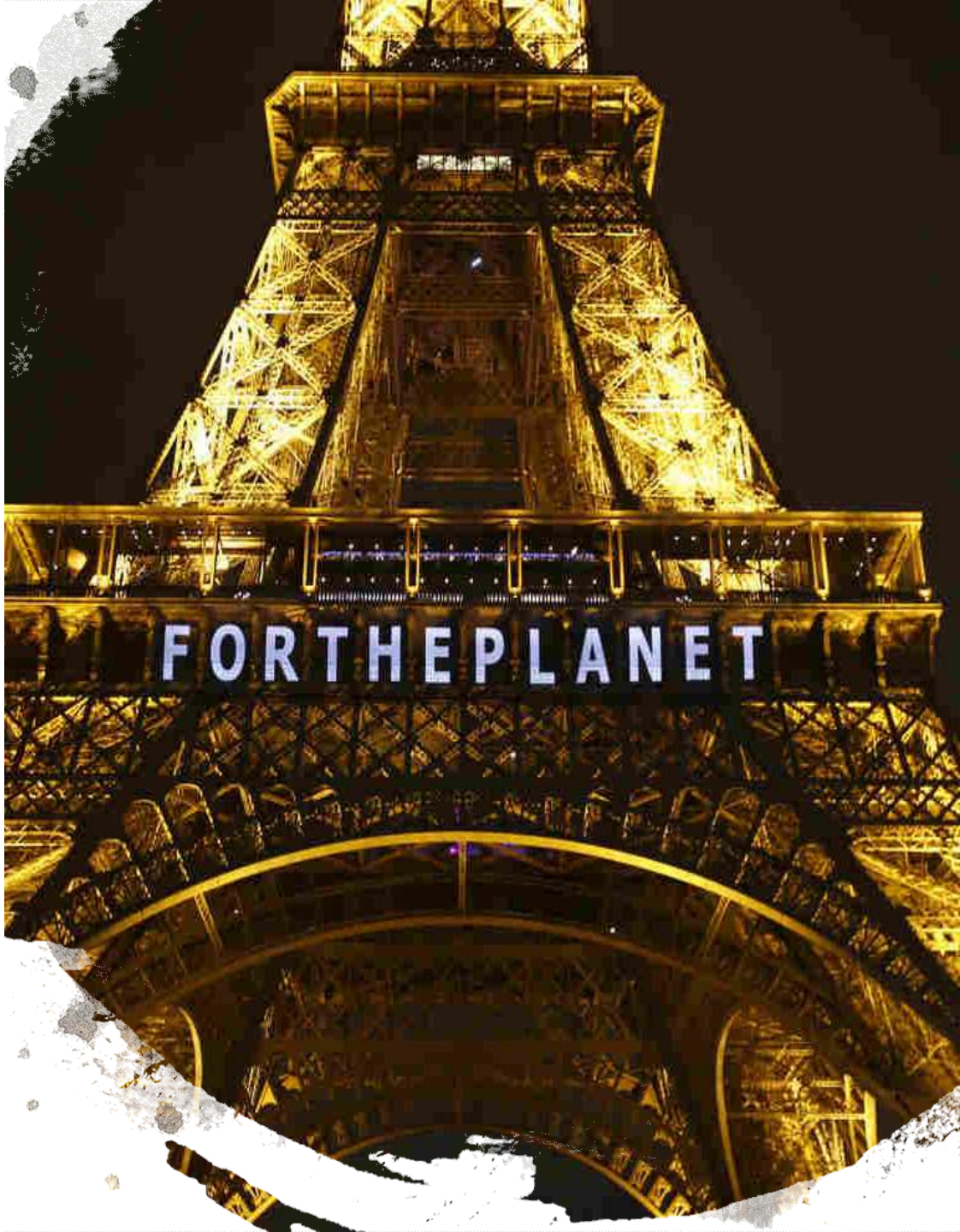
Figure 1.8 Global carbon dioxide (CO_2) emissions reductions in the WEO 2017 New Policies and Sustainable Development Scenarios



Source: *Energy Efficiency 2018*, IEA

Luckily, Energy Efficiency Works

- **Cheapest, fastest, and most effective way of reaching our climate goals.**
  - Since 2000, improvements in energy efficiency in the world's major economies offset **more than one-third** of the increase in energy-intensive activities.
  - Global efficiency gains since 2000 prevented 12% more energy use in 2017.



ENERGY SYSTEMS ARE EVOLVING

Distributed generation & two-way power flows
Falling cost of renewables
Innovation and falling costs of efficient devices
Electrification
Storage
Microgrids
Smart Metering

Information, Communication Technologies
Big Data
Cloud
Grid Edge
Artificial Intelligence
Internet of Things

ENERGY EFFICIENCY IS EVOLVING

- “Energy efficiency is using technology that requires less energy to perform the same function.” (EIA)
- A holistic approach to getting the maximum impact from energy?
- Energy Productivity: maximize economic output per energy used

EE is the financing mech we use to finance upgrades.

Customers are asking for more control, and we get EE as a bonus…

Many of the best opportunities are the system level…

Our energy systems are in complete upheaval. We have to think about how and when we use energy, not just how much.

ENERGY EFFICIENCY IS EVOLVING

Economic Growth & Jobs
Health
Safety
Equity
Affordability
Resilience
Climate Change

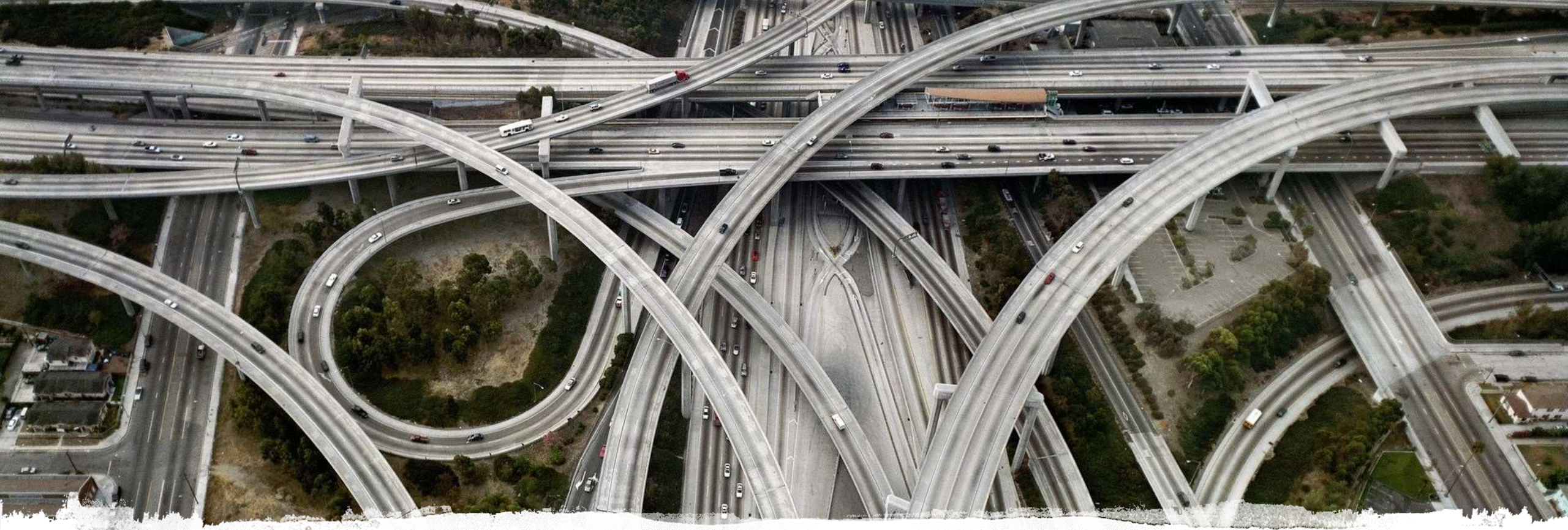
BUILDINGS

Global building electricity demand will rise by 69% by 2040. Focusing on *building systems* is necessary to achieve future **meaningful** and **cost-effective** energy savings.

Systems Efficiency Initiative

- Multiyear collaboration among more than 100 entities
- Members focus on moving the market toward a systems approach to efficient buildings
- 84 action-oriented recommendations

WWW.ASE.ORG/SEI



TRANSPORTATION

The transportation sector accounted for the largest portion (28%) of GHG emissions in the United States in 2016. It's also the sector with the **largest savings potential**.

Source: US EPA, 2018

50x50 Commission

Transform

- Address opportunities for transformational change (systems-level approaches)

Innovate

- Solutions to existing and future challenges

Invest

- In the foundation to get us there

CUT ENERGY USE IN THE TRANSPORTATION SECTOR BY 50% BY 2050

ALLIANCE TO SAVE ENERGY
using less. doing more.

Thank You!

Laura Van Wie McGrory
lvanwie@ase.org
@ToSaveEnergy

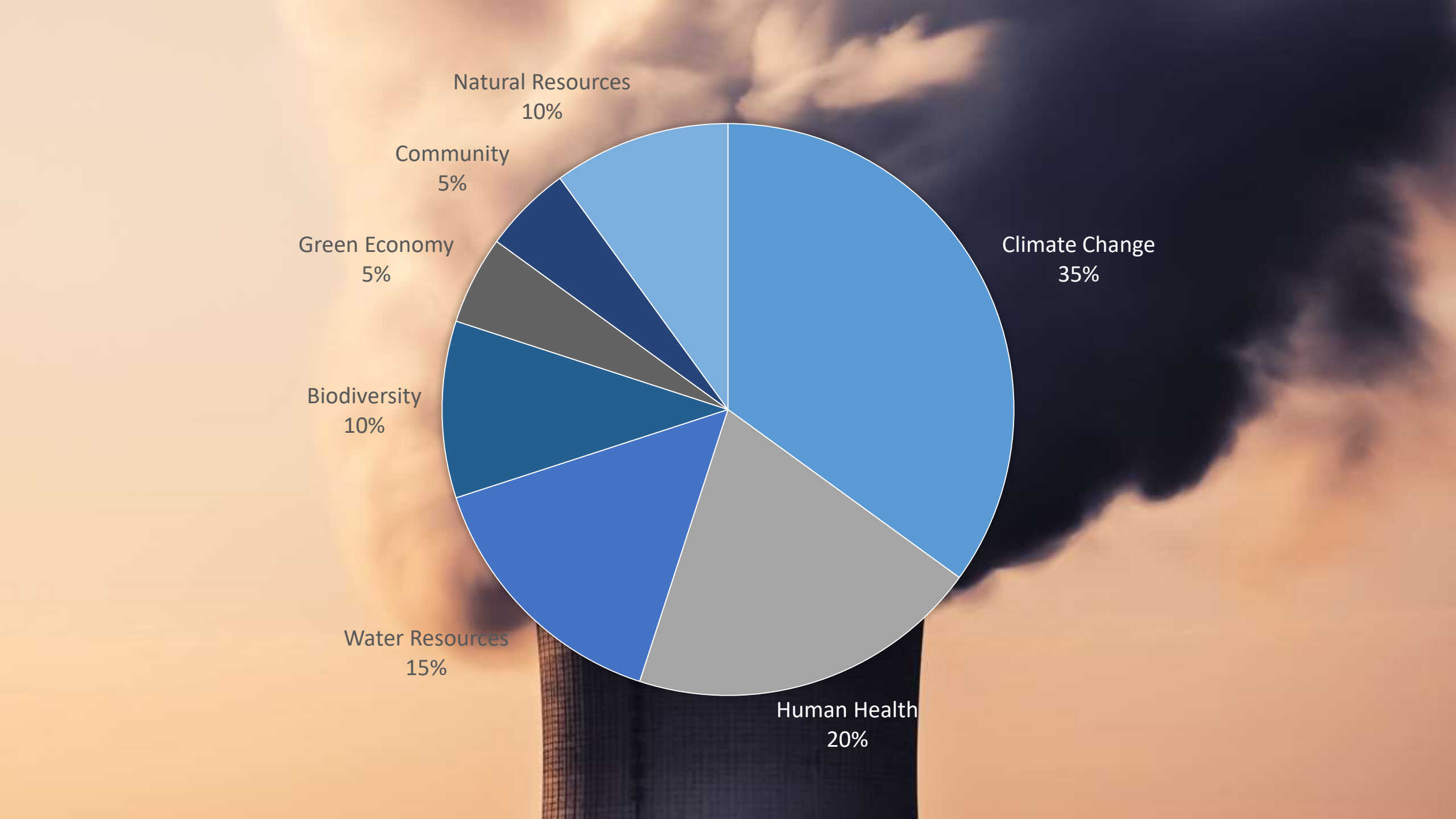
Elizabeth Beardsley

U.S. Green Building Council

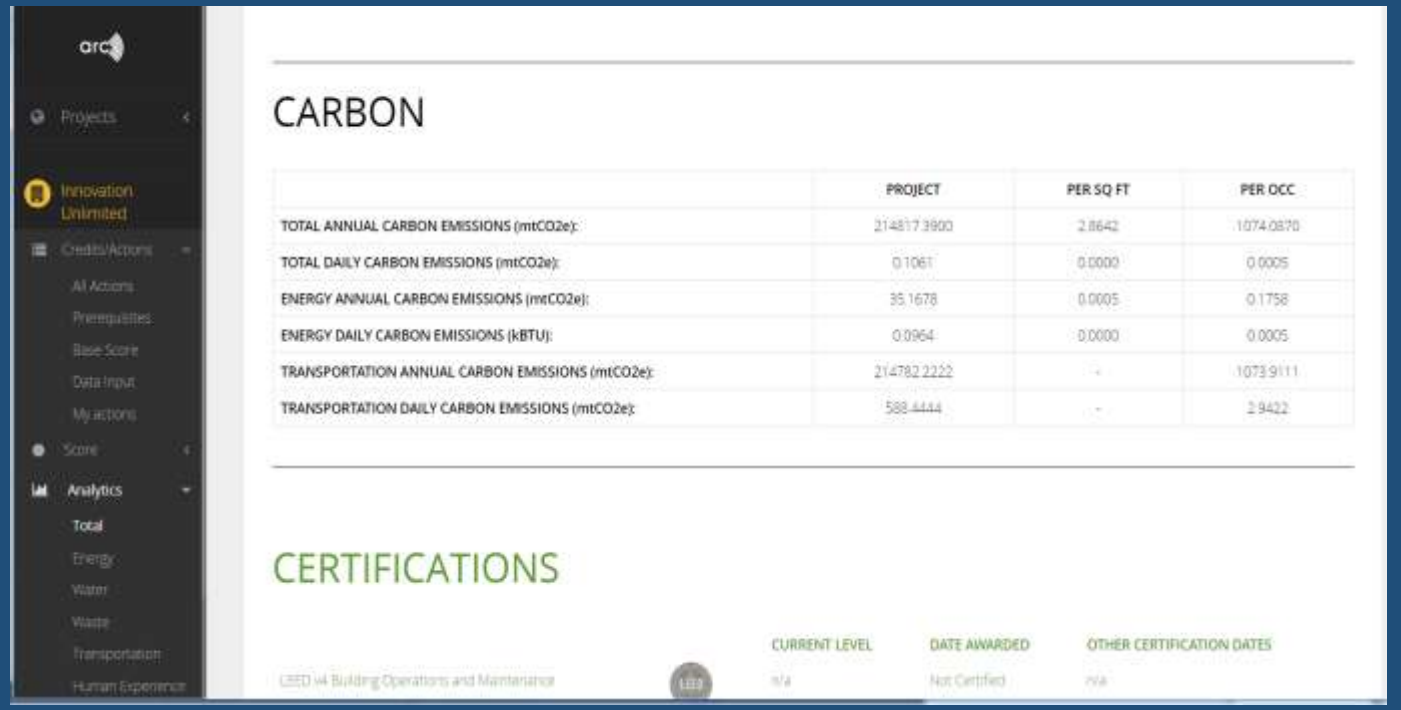
NATIONAL RENEWABLE ENERGY LAB (Colorado, U.S.)

- Largest net zero energy building in North America
- 33,445 m2
- LEED Platinum certified


LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN
LEED
MetLife
U.S. GREEN BUILDING COUNCIL


Natural Resources
10%
Community
5%
Green Economy
5%
Biodiversity
10%
Water Resources
15%
Human Health
20%
Climate Change
35%

LEED® Zero

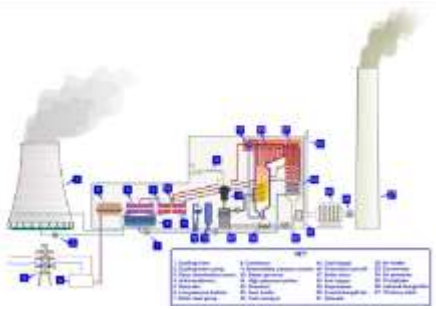


Carbon Analytics for All Buildings

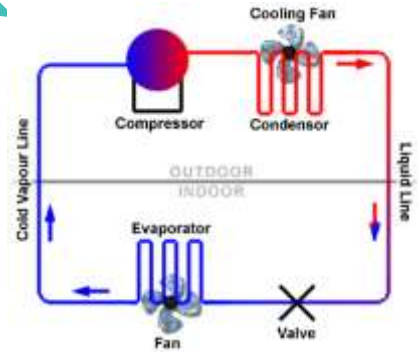
Whole Building Carbon Accounting

Embodied Carbon in Buildings (MR Credits)

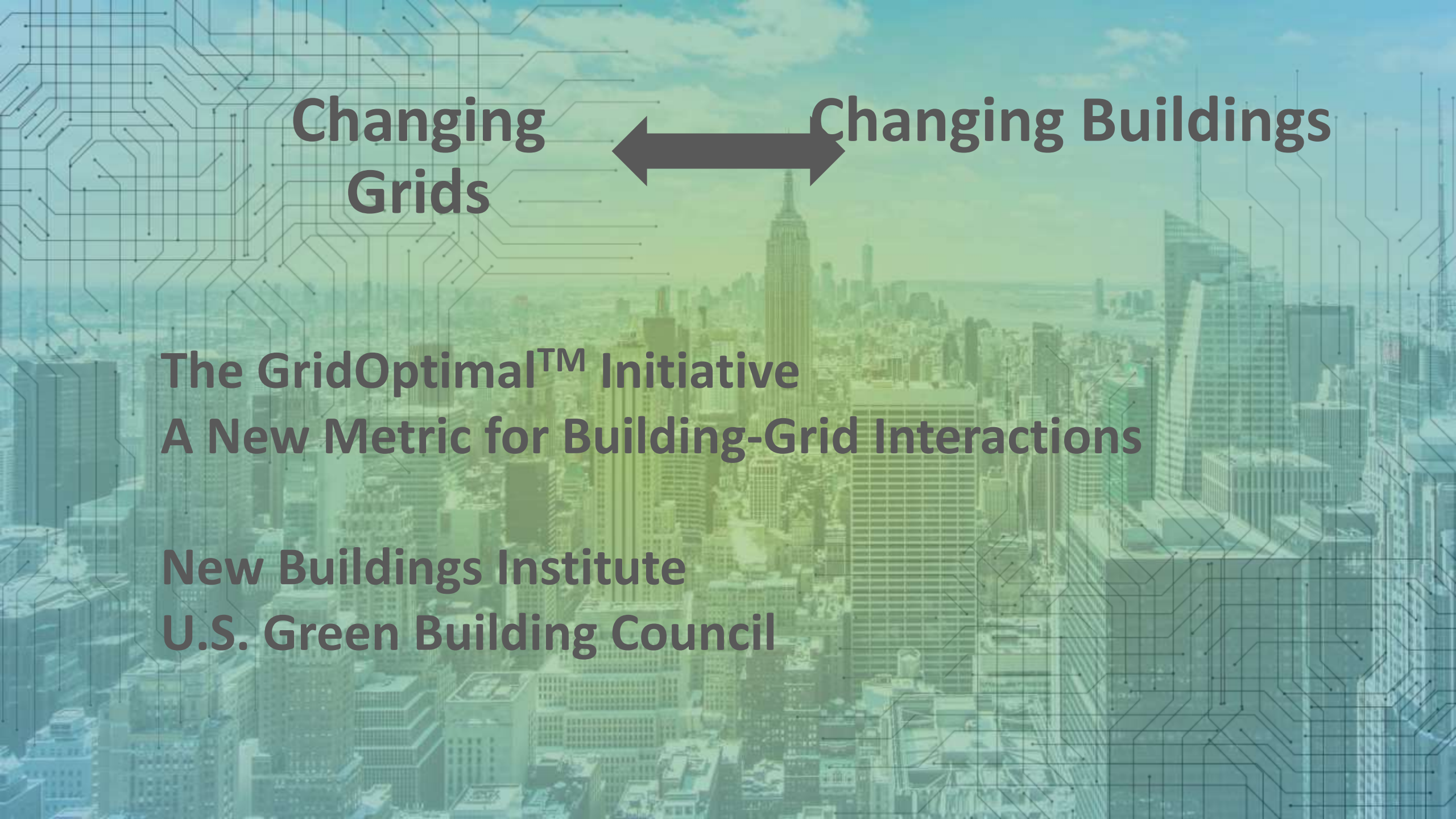
Operational Carbon (EA Credits)



GWP of Refrigerants & Gasses (EA Credits)



Water & Transportation Emissions (LT & SS Credits)



The GridOptimal™ Initiative
A New Metric for Building-Grid Interactions

New Buildings Institute
U.S. Green Building Council

Thank You

Elizabeth Beardsley

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Ben Gruitt

Corn Refiners Association

CRA
CORN REFINERS ASSOCIATION

Advanced Bioproducts

Ben Gruitt, Director of Sustainability & Advanced Bioproducts

Plant-Based Product Advocacy

Our Objectives

- Enhance public awareness of the vast economic, environmental, and social benefits of plant-based products.
- Encourage collaboration between business, government, and non-profits to incorporate principles of a circular bioeconomy into consumer products and industrials.
- Advocate policy that encourages the transition to renewable products.
- Provide a platform for stakeholders throughout the plant-based product value chain to connect and collaborate.

Integrated Solutions are Vital

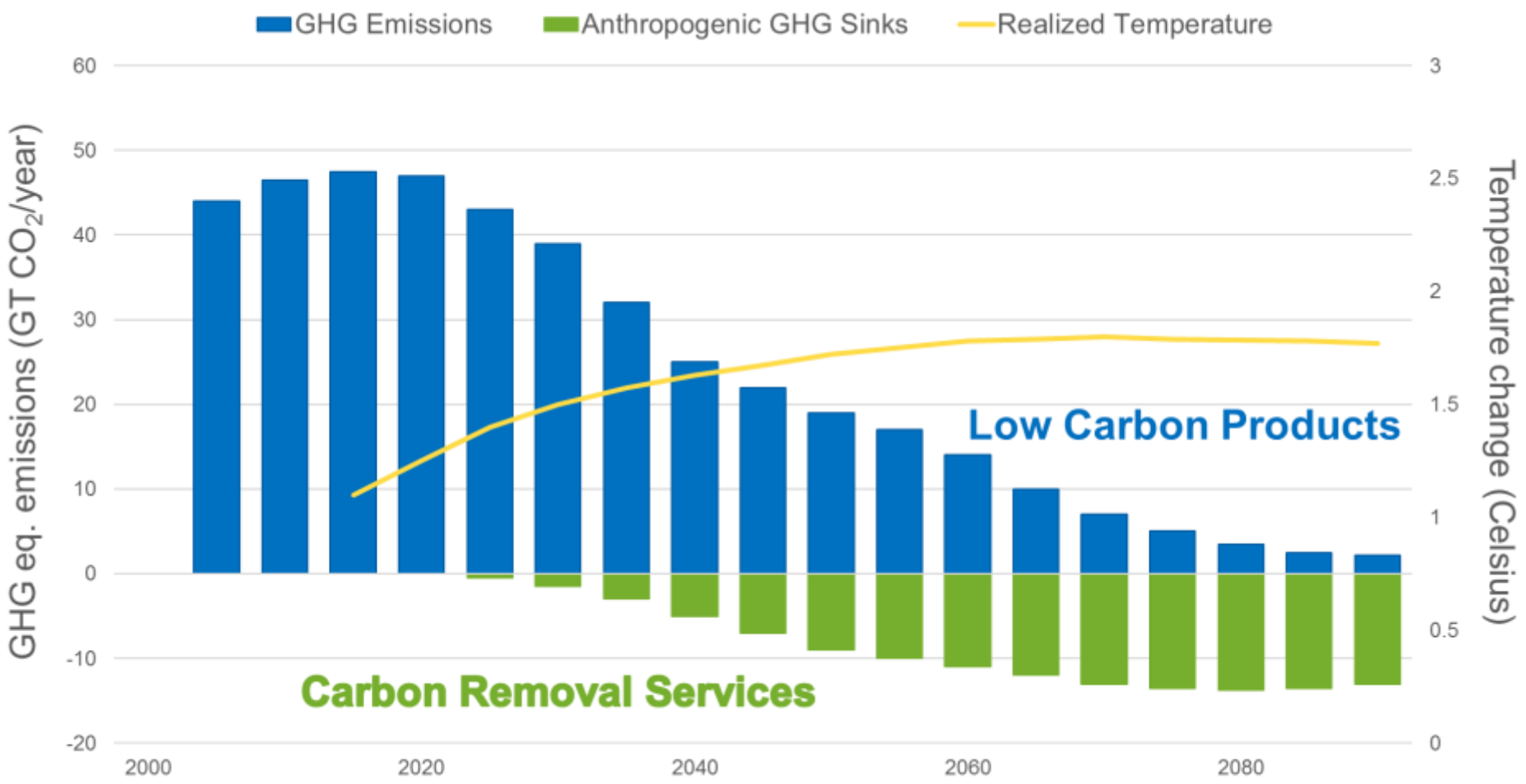
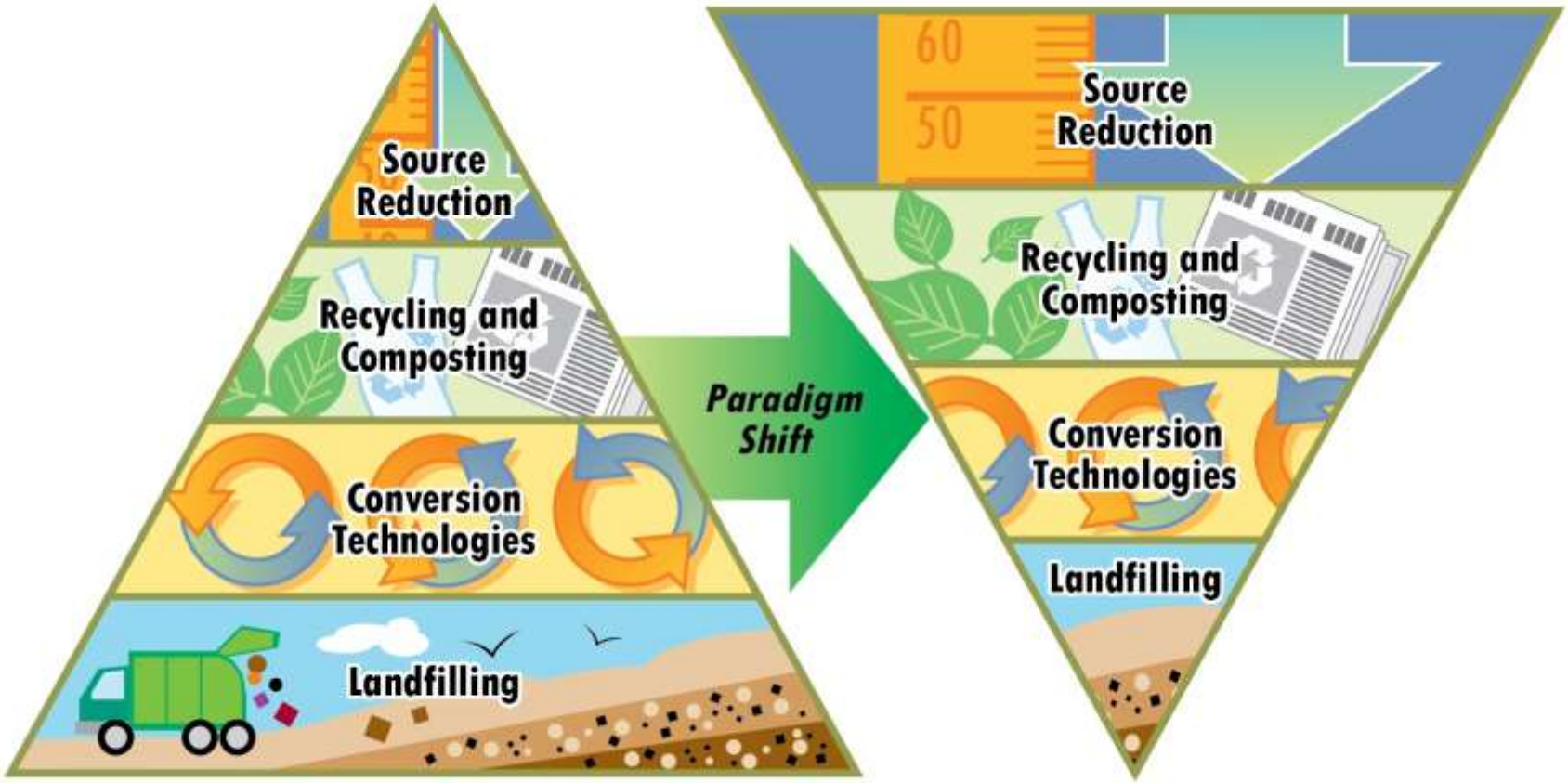


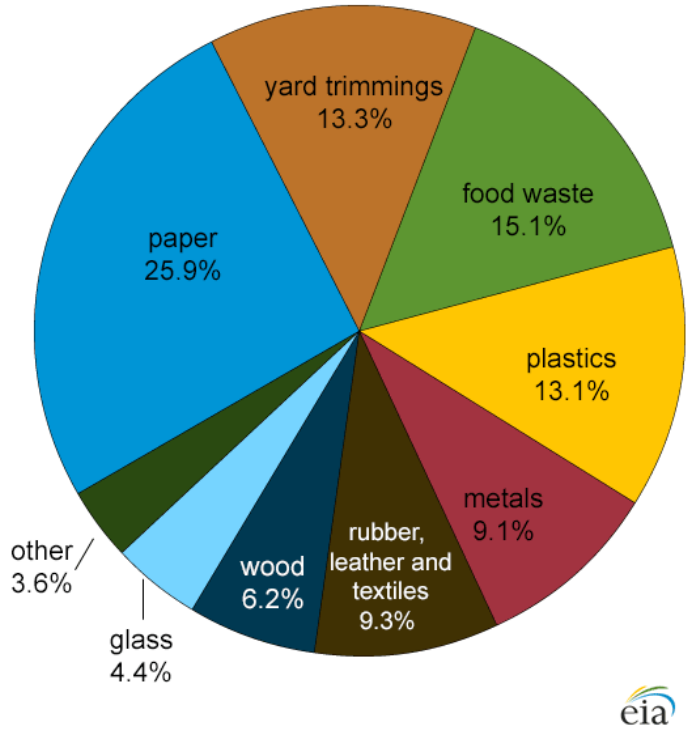
Chart adapted from Professor Piers Forster. Emissions and temperature change are taken from the IMAGE SSP1-2.6 model in the Shared Socioeconomic Pathway (SSP) version 1.0 database.

Shifting the Waste Paradigm



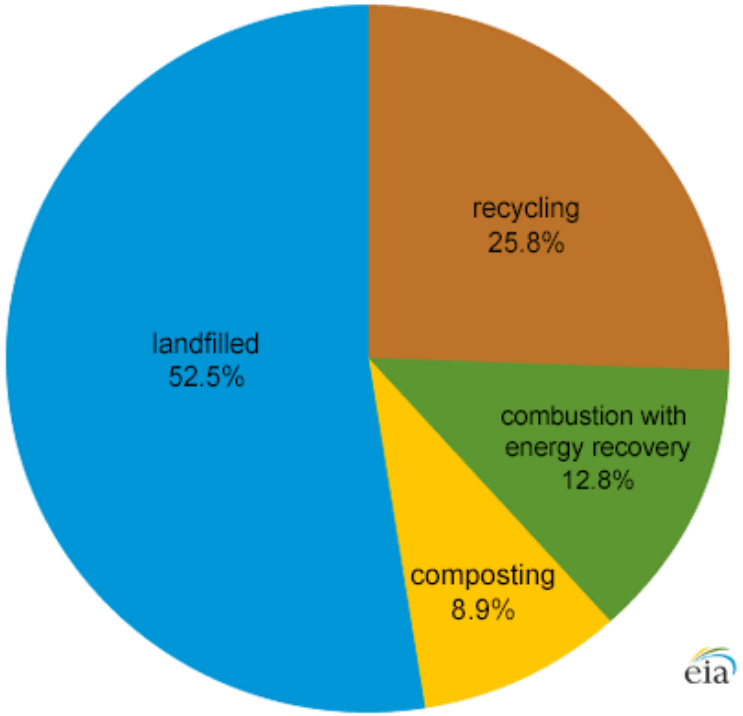
Waste Generation and Management in the U.S.

Total MSW generation in the United States by type of waste, 2015
Total = 262 million tons



Source: U.S. Environmental Protection Agency, Advancing Sustainable Materials Management: 2015 Fact Sheet, July 2018

Management of MSW in the United States, 2015
Total = 262 million tons



Source: U.S. Environmental Protection Agency, *Advancing Sustainable Materials Management: 2015 Fact Sheet*, July 2018

A Dirty Challenge for Waste Management

Global Consumption of Disposable Serviceware

- 500 Billion Disposable Cups
- 183 Million Disposable Straws
- 4 Trillion Plastic Bags

U.S. Consumption of Disposable Serviceware

- 40 Billion Pieces of Plastic Cutlery
- 113 Billion Disposable Cups
- 29 Billion Disposable Plates

32% of the 78 million tones of plastic packaging produced annually ends up in the oceans.

Shifting Waste Streams into Feedstocks

Industrial Scale Composting

The Benefit?

Estimated Soil Carbon Stocks Lost in Cultivated Soils:

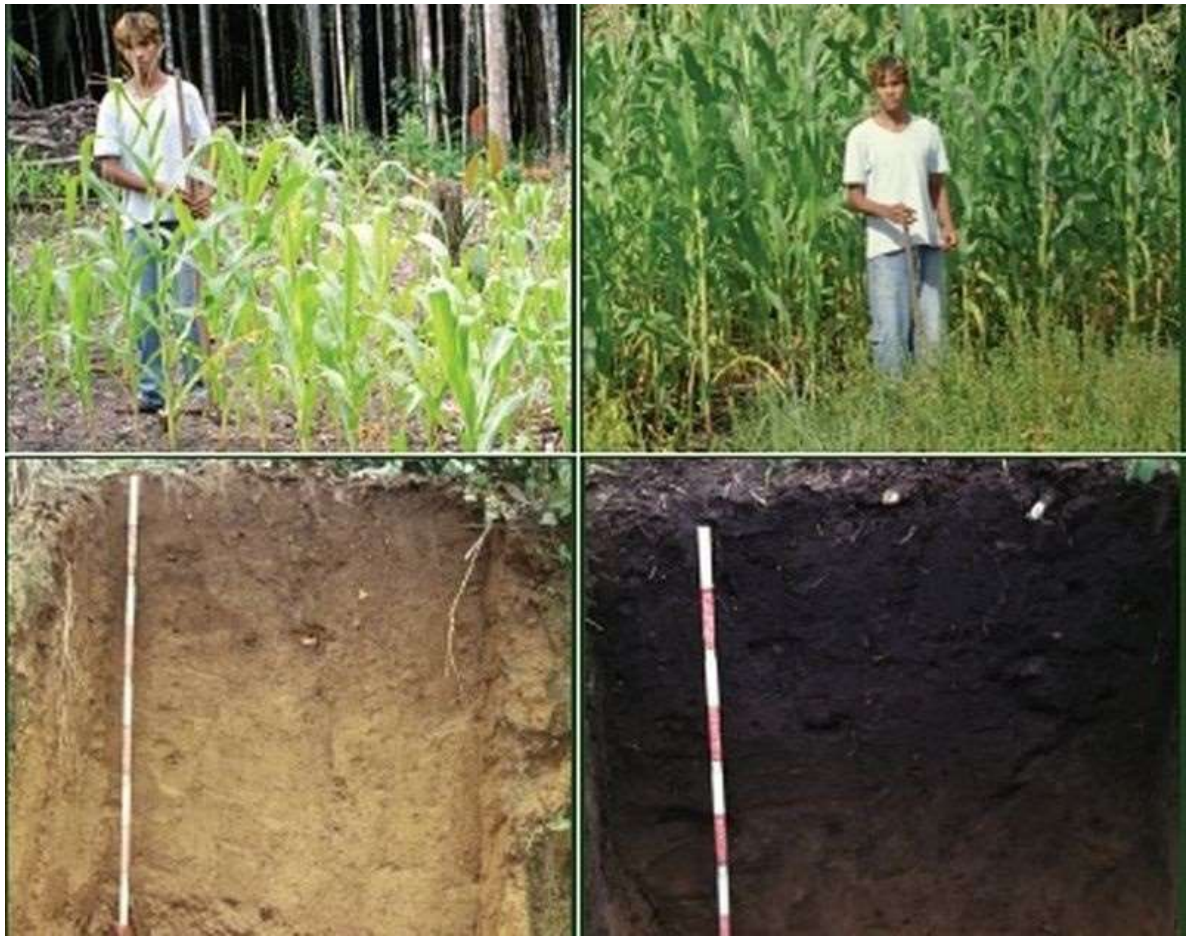
50-70%

Estimated Annual Carbon Storage Potential of World's Soils:

1-3 Billion MT of carbon
(equivalent to 3.5-11 billion MT CO_2e emissions)

Total Global GHG Emissions (2016):

49.3 Billion MT CO_2e



Thank You

www.corn.org

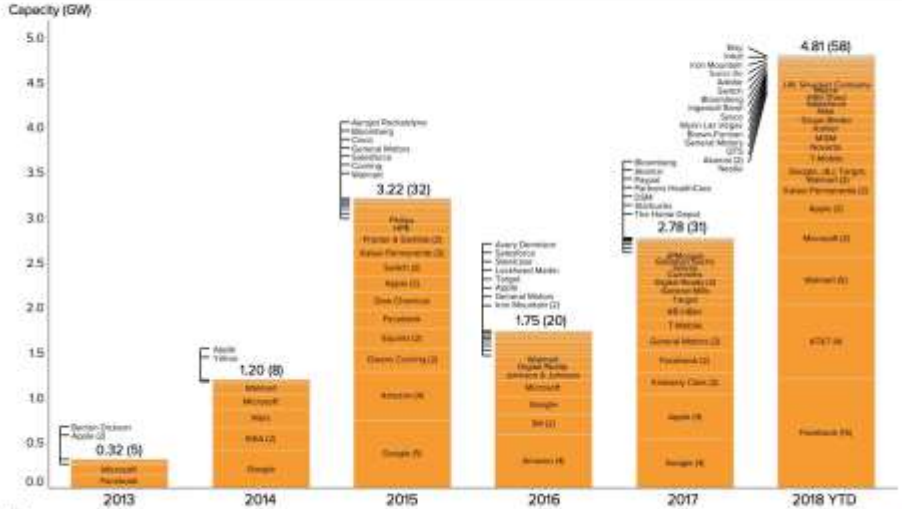
@CornRefiners

CornRefiners

Kevin Rabinovitch

Mars, Inc.

2018 YTD Deal Tracker



REBA

#REBA18

RENEWABLE THERMAL COLLABORATIVE

?

James Wolf

Jupiter Oxygen Corporation

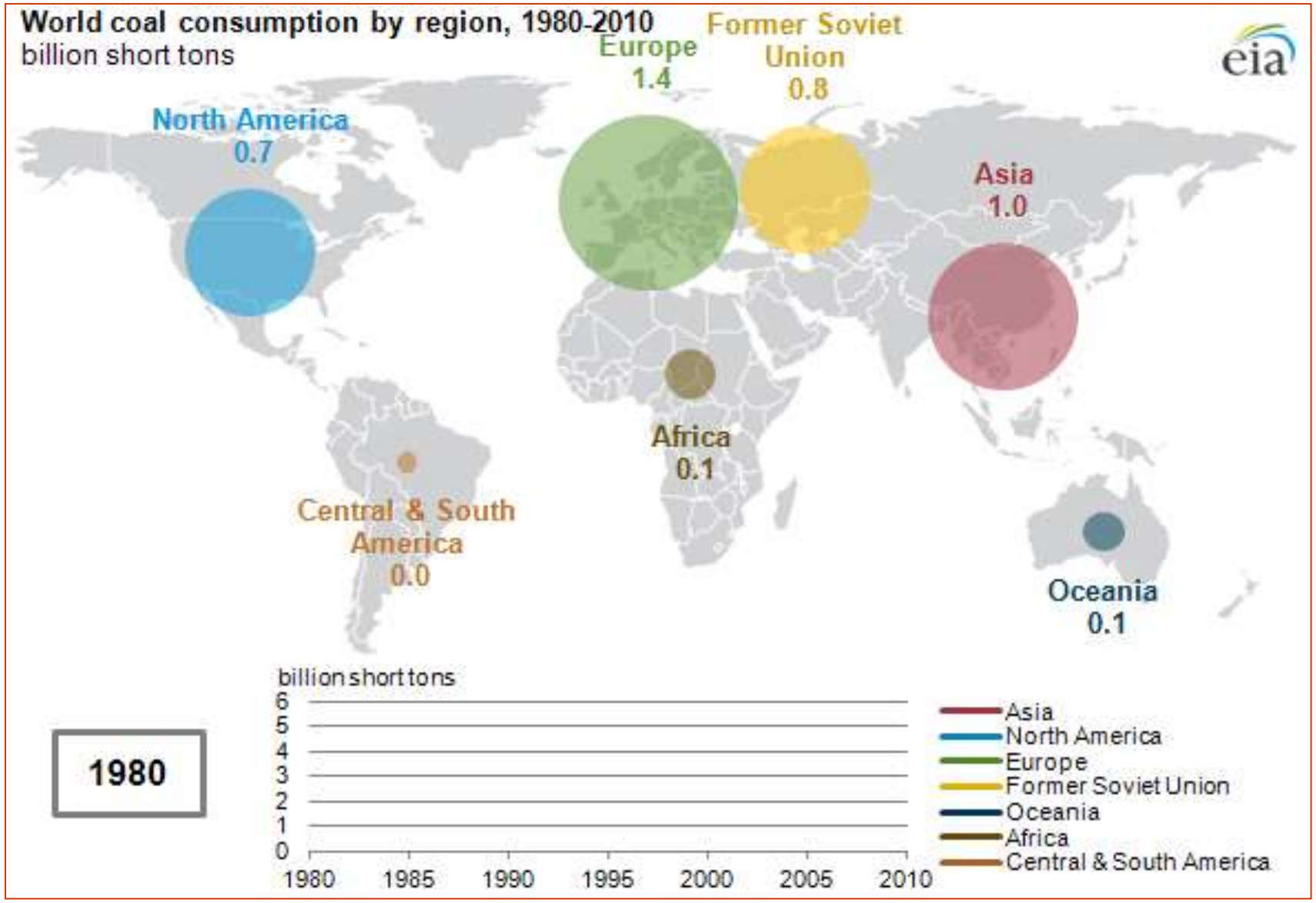
JUPITER OXYGEN CORPORATION

STORING CO2 TO MEET THE PARIS AGREEMENT
Synergies from Oxy-combustion, Carbon Capture & Enhanced Coal Bed Methane Recovery

COP 24 Katowice, Poland
December 8, 2018

ENERGY

AGAINST CLIMATE CHANGE

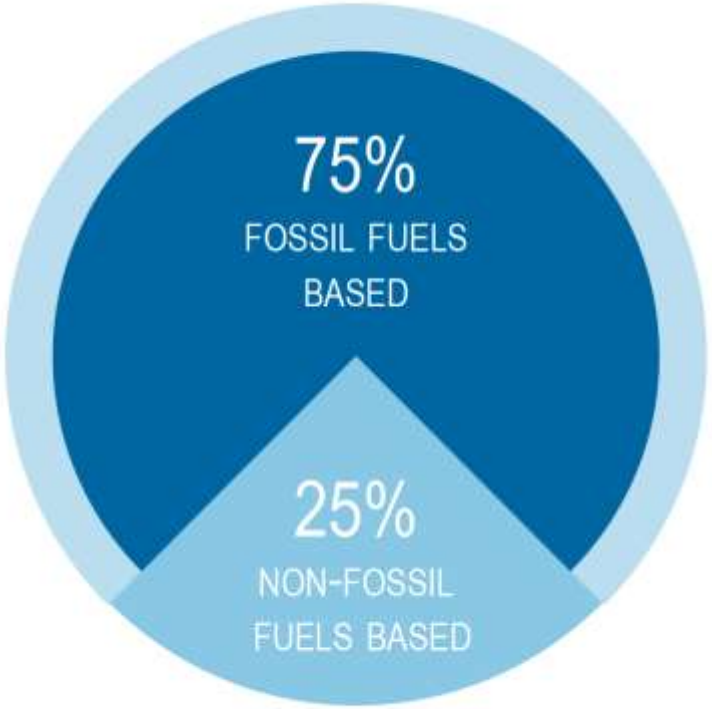


US Energy Information Administration

THE CHALLENGE

Projected Global Energy Use 2040

(IEA World Energy Outlook 2015)



THE SOLUTION

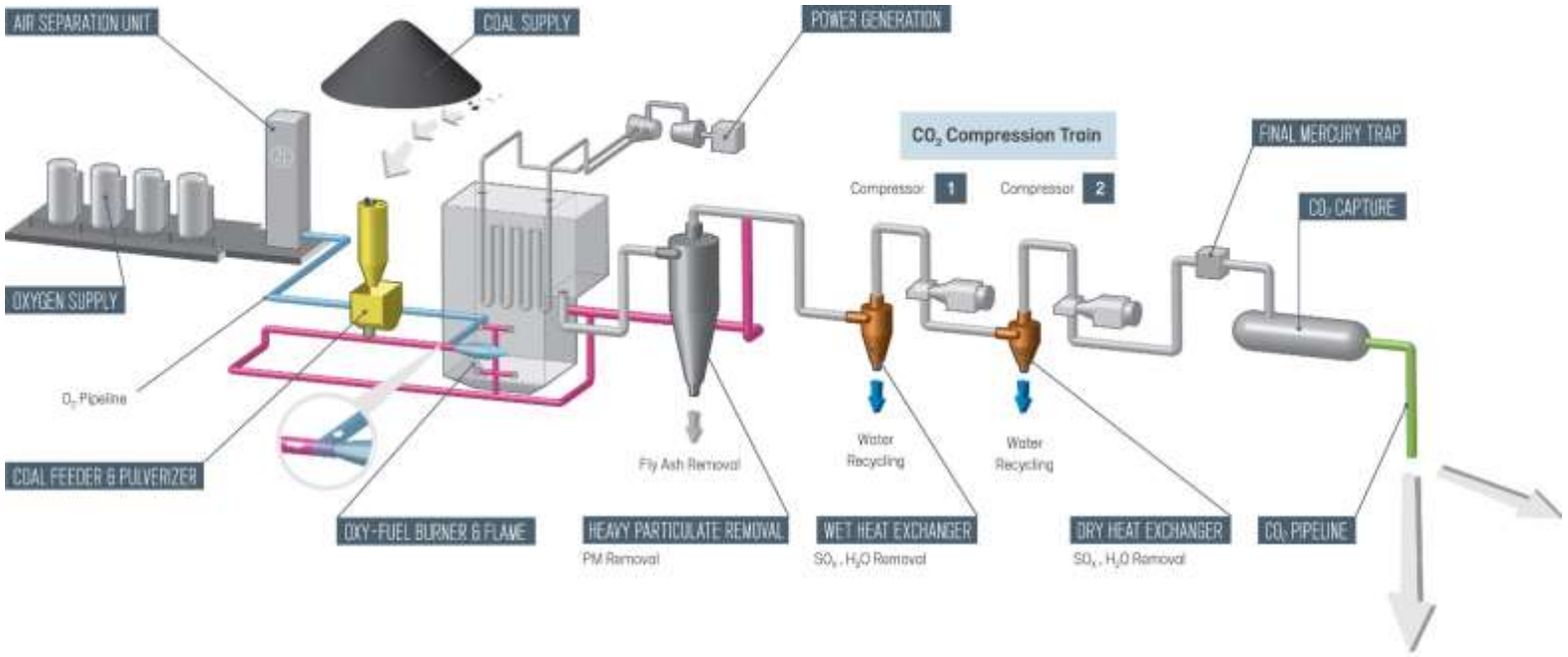
► **CARBON CAPTURE from large sources:**

- Coal, oil, and natural gas fired power plants
- Industrial plants

► **CARBON UTILIZATION options:**

- Enhanced Oil Recovery
- Enhanced Coalbed Methane Recovery
- CO2 based algal biomass industries
- Carbon reuse in building materials
- Others

JOC OXY-COMBUSTION CARBON CAPTURE



CO_2 Underground Storage and Use

- Specific Geological Formations
- Enhanced Oil / Natural Gas Recovery
- Enhanced Coal Bed Methane (ECBM) Recovery
- Algal Biomass Industry
- Submarine Extraction of Methane from Hydrate

ASSESSMENT OF ENHANCED COALBED METHANE OPPORTUNITIES IN INDIA" (ARI 2015)

2.0 to 2.6 Tcm resources of methane in India

- 25% recoverable via CBM and additional 20% via ECBM
- Will require ~10,000 MW clean-coal facilities initially, and up to ~100,000 MW to produce required CO_2 to serve the ECBM market
- Storage of several billion tons of CO_2 possible via ECBM in India
- ECBM is a multi-billion dollar domestic Natural Gas resource in India
- Revenues from carbon utilization will reduce cost of carbon capture technology implementation, enabling wider CCUS/CCU applications such as BE-CCS, carbon reuse in building materials & synthetic fuels

MORE INFORMATION AT WWW.JUPITEROXYGEN.COM

A clean energy technology company

- High flame temperature oxy-combustion process Know-How
- Patents and Licensing
- Consulting Services

tweber@jupiteroxygen.com
Thomas Weber, President
Jupiter Oxygen Corporation

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