McKinsey & Company

Solving the net-zero equation

Session #1 of a five-step program
“From awareness to action”

April 29, 2024

A five-step program “From awareness to action” by McKinsey

Session 1

Solving the net-zero equation

Explore the **requirements for achieving net-zero** emissions and understand the **implications for companies**

Session 2

Managing strategies in an uncertain world

Learn how to develop **strategic options for a low-carbon future**, set **baselines**, and choose the right **strategic posture** for your company

Session 3

Developing high-quality climate action plans

Discover how to create high-quality **climate action roadmaps** and drive change in value-focused boardrooms through **levers for decarbonization**

Session 4

Motivating leadership teams and organizations

Uncover the **capabilities and motivation** organizations need to navigate technological advancements, policy shifts, and investor expectations

Session 5

Mapping the road ahead

Understand the importance of essential **efforts and collaboration** between public and private sectors in achieving global economic transformation

Today's agenda

Net zero fundamentals

What it will take

Implications for companies

Net zero fundamentals

There has been meaningful momentum toward net zero

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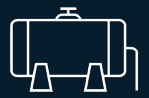
There has been meaningful momentum toward net zero

Net-zero commitments made by more than 8,000 companies and by countries representing 90 percent of global GDP



150 countries have pledged to **reduce methane emissions**

Electric vehicles (EVs) make up about **15% of new vehicle sales**

Solar power and wind power account for more than 10 percent of electricity generation and over 80% of new electricity-generating capacity

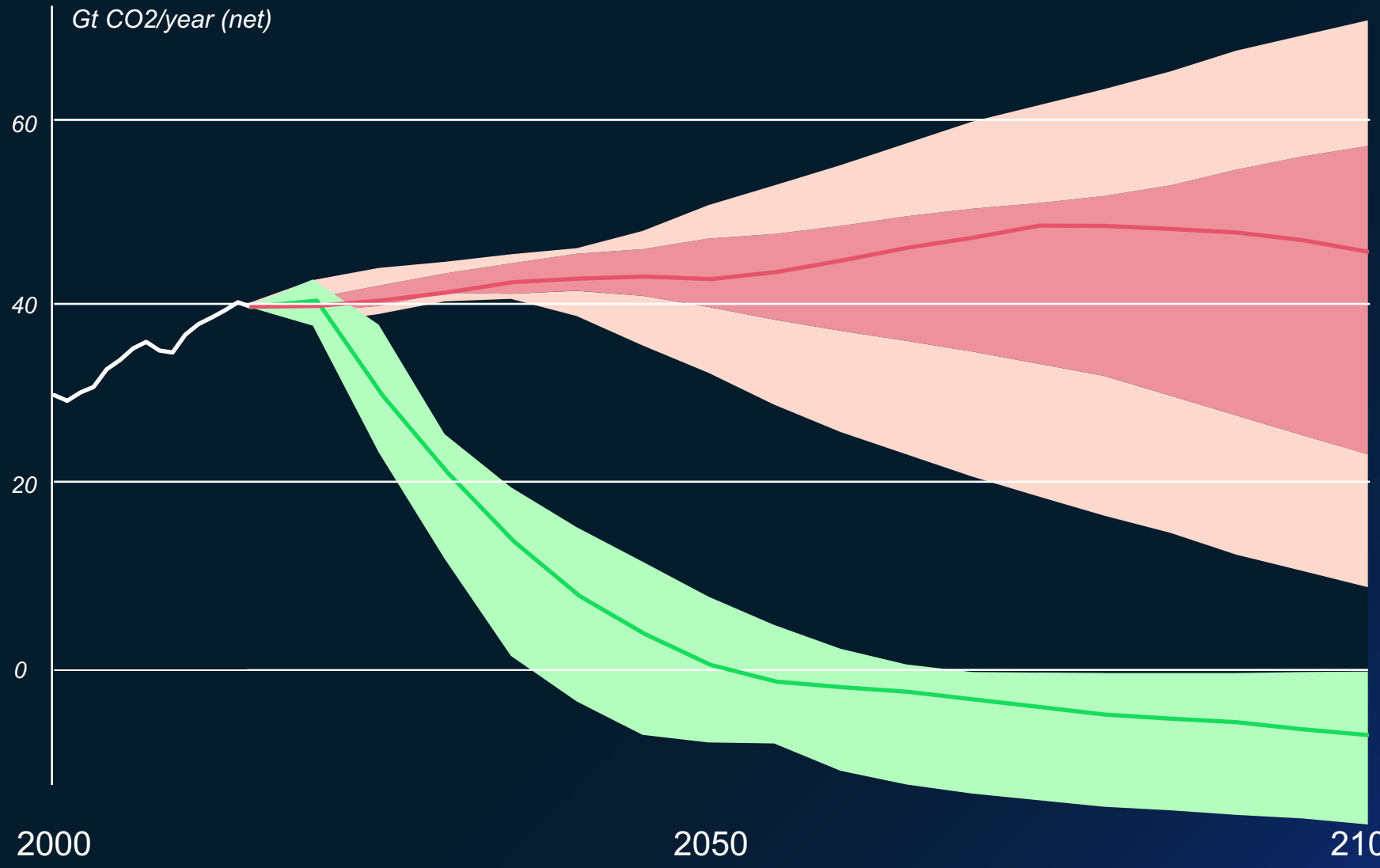
New market instruments, such as **advance market commitments**, spur innovation

Annual global **investment in transition technologies has doubled from 2015 to today**

Large-scale plants are being built for **low-emissions steel production and carbon capture, utilization**, and storage

Climate-related venture capital investments **reached $70 billion in 2022, almost double the 2021 amount**

Nevertheless, the world is not on track to reach net zero by 2050



IPCC trends from implemented policies suggest we are not on track

~2.2°C – 3.5°C

~1.5°C

Source: IPCC (solid lines represent medians across stated scenarios, shaded areas represent 5th - 95th percentiles for both scenarios; darker shading of 'Implemented policies' scenario represents 25th - 75th percentiles; temperatures refer to estimated warming by 2100 above preindustrial levels)

A successful net-zero transition will require achieving not one objective but four

Interactions exist across objectives

Emissions reduction

Reducing net-zero emissions of greenhouse gases

Affordability

Ensuring that energy, materials, and other products remain affordable and cost-competitive with traditional alternatives

Industrial Competitiveness

Ensuring that individual countries, regions, and companies remain competitive and benefit from opportunities during the transition

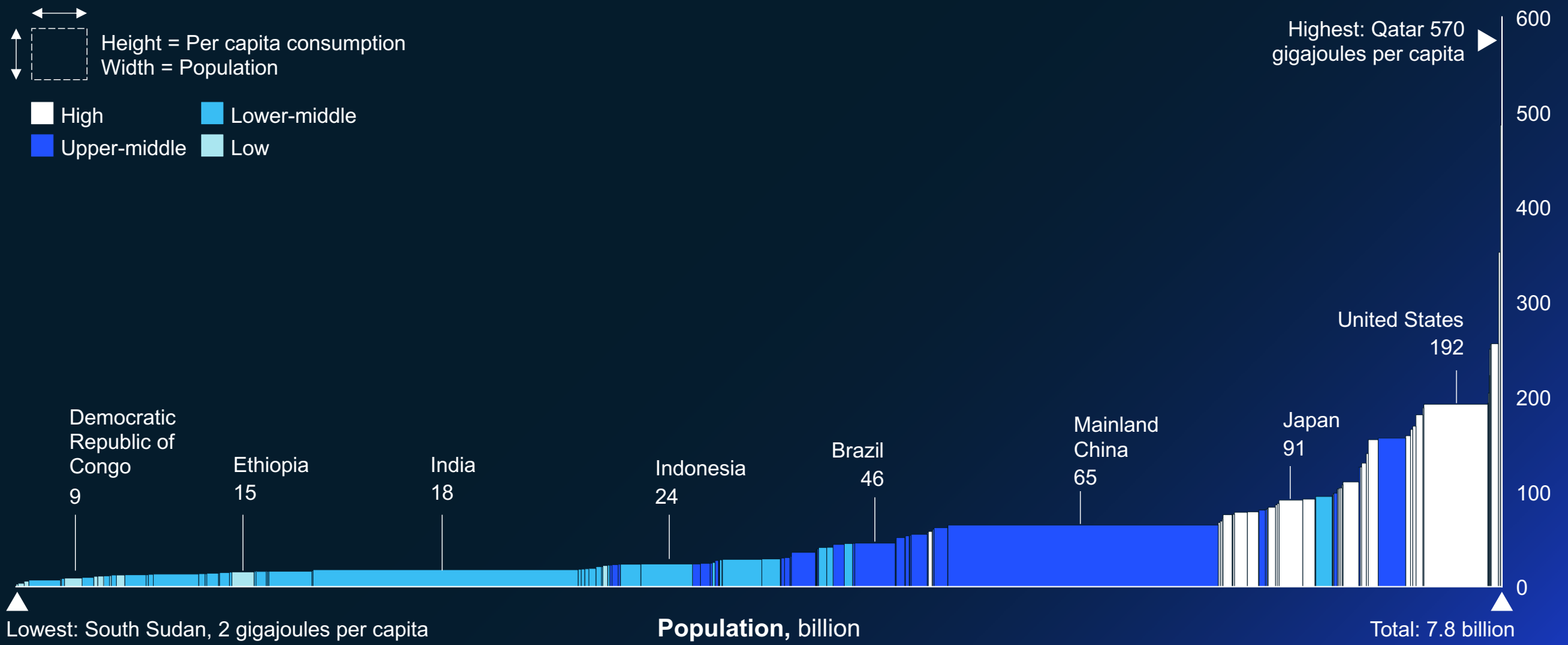
Reliability

Ensuring that energy, materials, and other products are supplied securely during the transition and that energy systems are resilient

Source: McKinsey analysis

Energy use in much of the world remains low

Final energy consumption per person, by economy's income level, 2020,[1] gigajoules

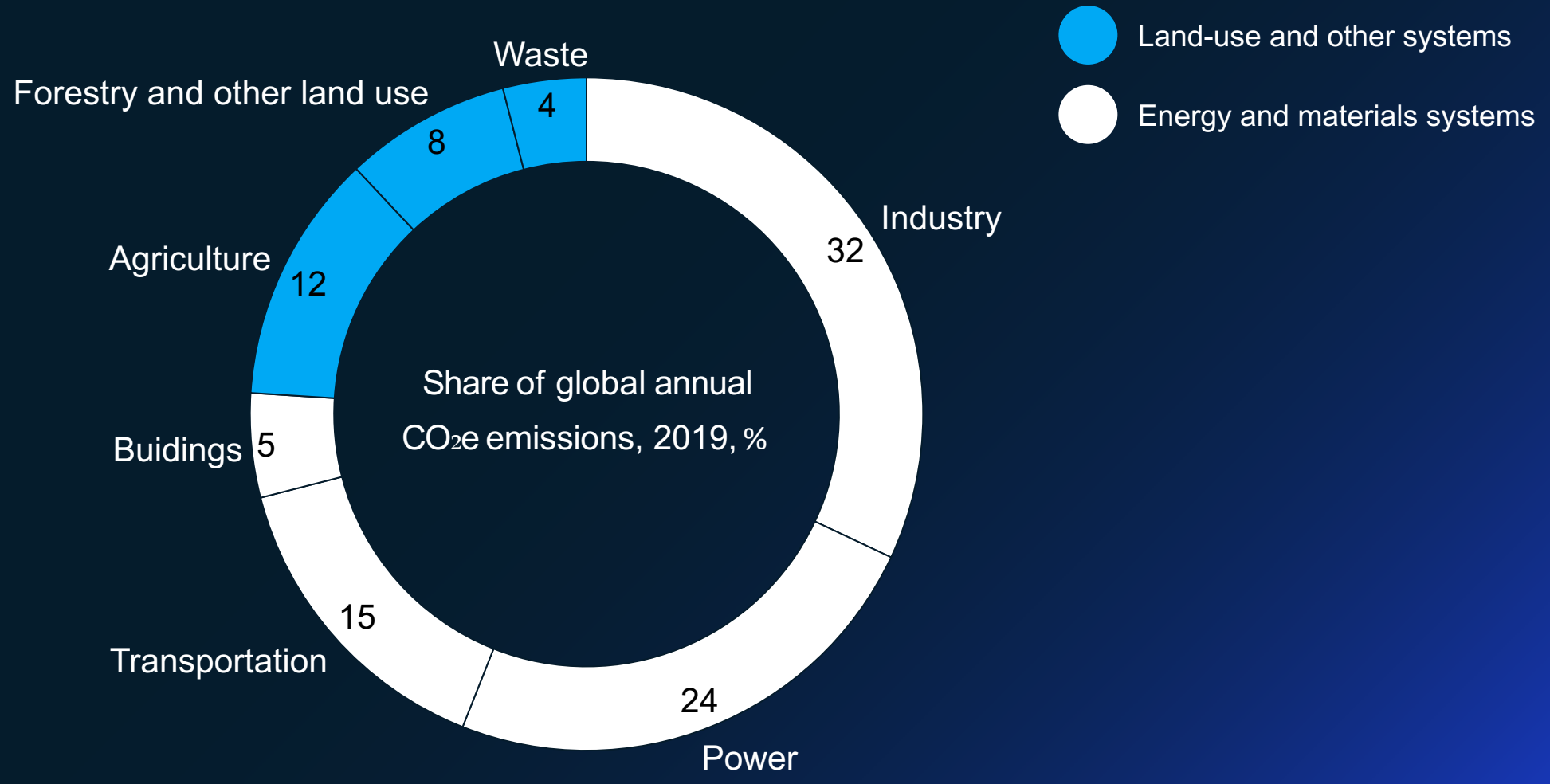


1. Country groupings by income level are from the World Bank's classifications for fiscal year 2019. See "New country classifications by income level: 2018–2019," Data Blog, World Bank, July 1, 2018. Consumption estimates are those published in Global Energy Perspective 2023, McKinsey & Company, October 2023.

Source: World Bank; McKinsey analysis

What it will take

This is an integrated challenge – across energy, materials, land-use, and other systems that emit greenhouse gases



Note: CO2e, or carbon dioxide equivalent, includes not only carbon dioxide but also other greenhouse gases. Those gases are converted into CO2e according to their potential to increase global warming over a given period—in this case, 100 years.

Source: United Nations, McKinsey EMIT

The solutions to reach net zero are known, and all are needed

Reduce demand

Reduce demand via efficiency gains, process optimization, the circular economy, and shifts in consumption patterns

Change how we power and fuel our lives

Electrify transport, buildings, and industrial processes

Rapidly deploy **renewables** at scale

Expand the role of **hydrogen** in the energy mix

Increase the use of **bioenergy**

Scale up carbon management industries

Scale **carbon capture**, utilization, and storage (CCUS)

Curb deforestation

Remove carbon dioxide from the atmosphere

Tackle methane and nitrous oxide

Reform agriculture and food systems

Eliminate **fugitive methane** emissions

Source: McKinsey 1.5C Scenario Analysis

Solving the net-zero equation requires a complex set of interdependent elements

Progress to date

Low High

Physical building blocks

1. Technological innovation
2. Ability to create at-scale supply chains and support infrastructure
3. Availability of necessary natural resources

Economic & societal adjustments

4. Effective capital reallocation and financing structures
5. Management of demand shifts and near-term unit cost increases
6. Compensating mechanisms to address socio-economic impacts

Commitment and enabling mechanisms

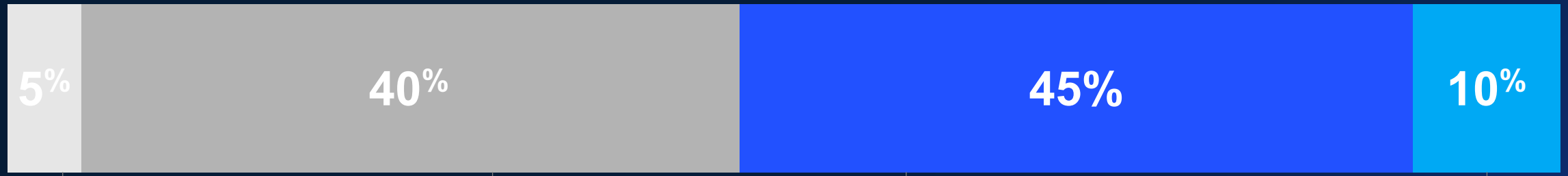
7. Governing standards, tracking and market mechanisms, and effective institutions
8. Commitment by, and collaboration among, public and private sector leaders globally
9. Support from citizens and consumers

Source: Solving the net-zero equation: Nine requirements for a more orderly transition, McKinsey & Company, 2021

Today's deployed technologies are not enough

Only 10% of abatement will come from technologies deployed at-scale today

Share of long-term abatement potential by 2050 technology maturity, %



Concept	Early innovation	Commercialization	Global deployment
Proof of concept in laboratories	Proven in large-scale demonstrations	Scaling-up, but support for competitiveness needed	At-scale deployment, competitive in certain settings
Nuclear fusion	SMR nuclear	Offshore wind	Solar PV
Li-Air batteries	DAC	Passenger BEVs	Large nuclear
Lab-grown meat	Plant-based beef		

Source: McKinsey Platform for Climate Technologies, McKinsey GEP, IEA

During the transition, annual spending on physical assets would rise to about $9.2 trillion

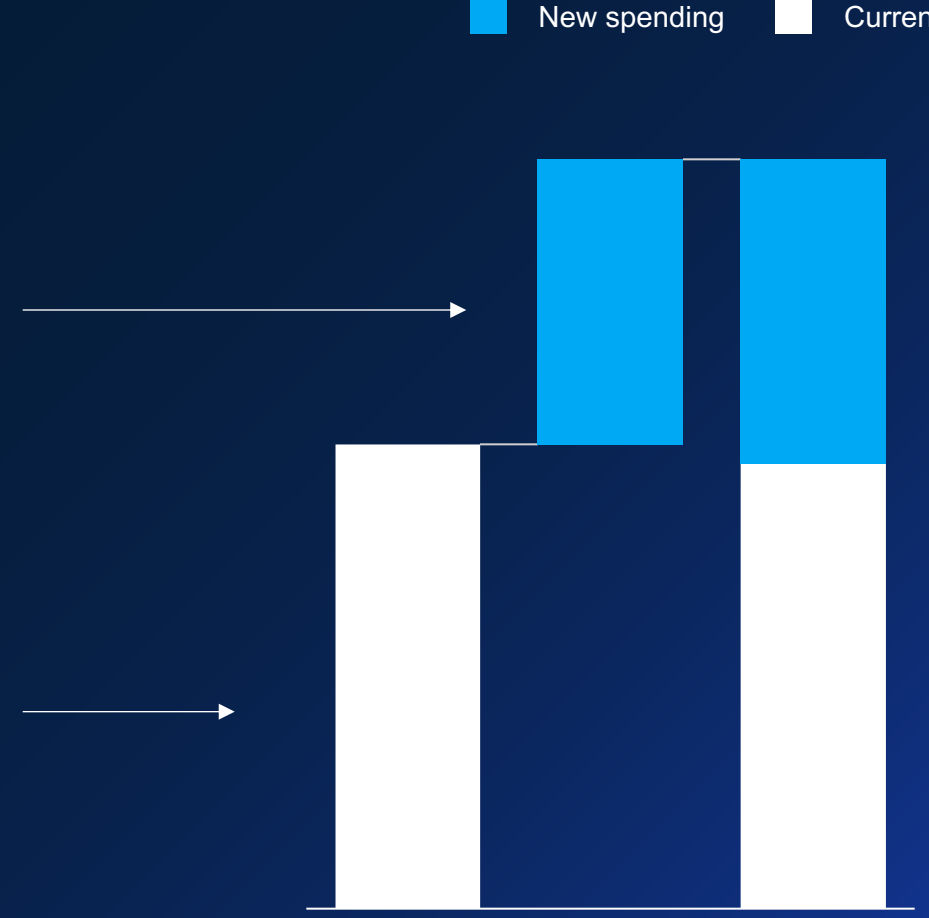
Annual investment expected to reach Net Zero (climate change mitigation)

$9.2tn

Total **global** annual spending in the net-zero scenario

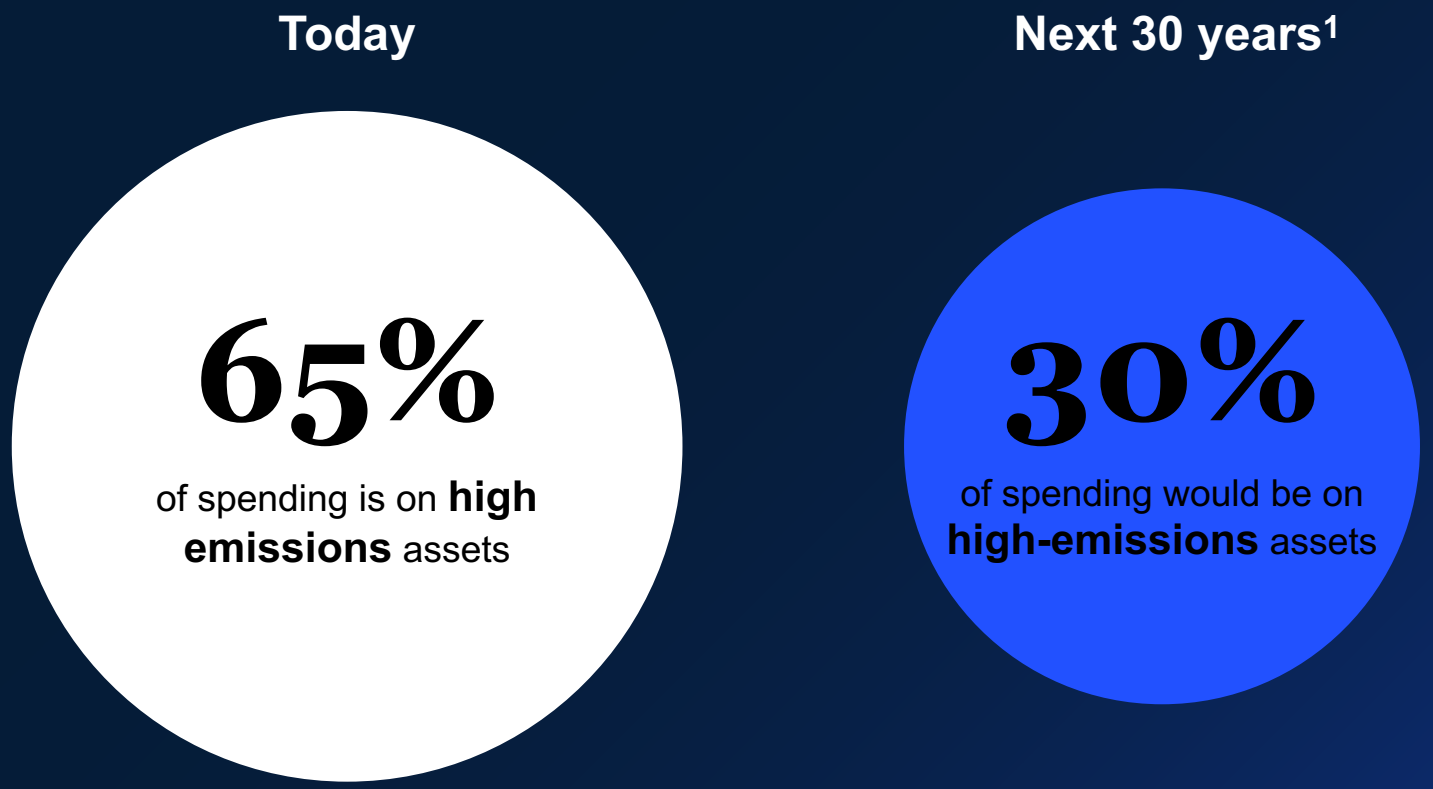
$3.5 New spending on low-emissions assets and enabling infrastructure

$5.7 Spending today on physical assets



Source: The net-zero transition: What it would cost, what it could bring. McKinsey Global Institute, 2022. Based on the NGFS Net Zero 2050 scenario, a hypothetical scenario and not a projection

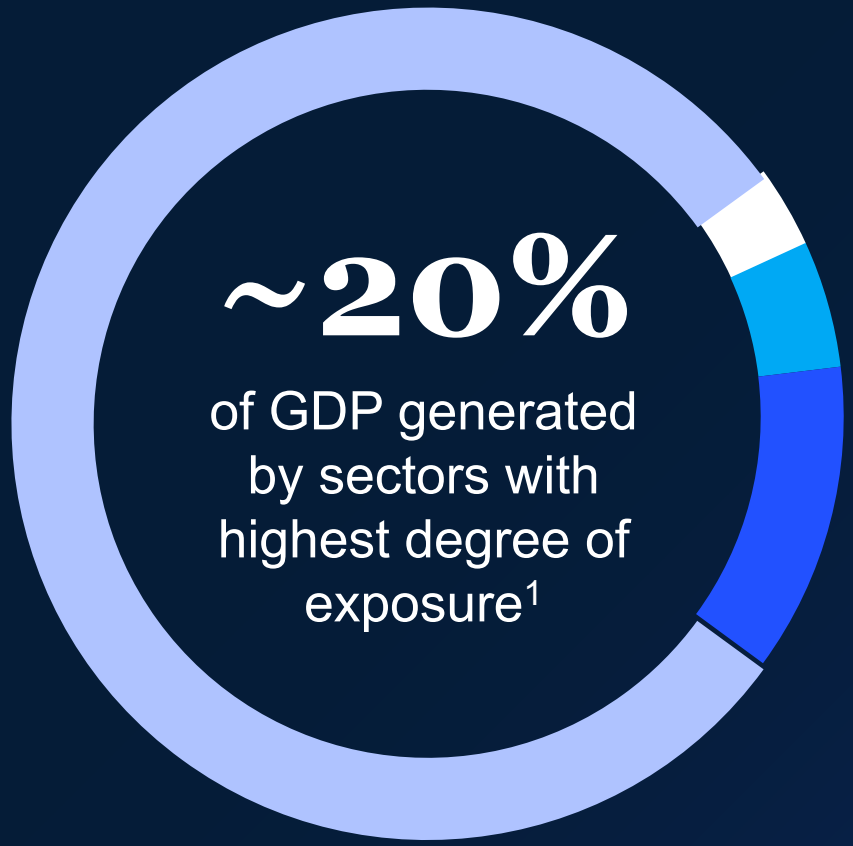
The transition would also require a major shift in the nature of capital spending



1. Average for 2021 - 2050

Source: The net-zero transition: What it would cost, what it could bring, McKinsey Global Institute, February 2022. Based on the NGFS Net Zero 2050 scenario, a hypothetical scenario and not a projection.

A fifth of the economy is most exposed to the net-zero transition



3% of GDP

Producers of fossil fuel energy

5% of GDP

Producers of fossil fuel-dependent products

12% of GDP

Emitters in core operations

Source: World Input-Output Database; Emissions Database for Global Atmospheric Research; McKinsey Global Energy Perspectives; IPCC; OECD; IHS Global; Penn World Tables; The net-zero transition: What it would cost, what it could bring, McKinsey Global Institute, 2022.

Implications for companies

Seven principles can help stakeholders successfully navigate the next phase of the transition

Allocating spending effectively

1. Create incentives to deploy underused lower-cost solutions
2. Drive down costs of expensive solutions
3. Build effective financial mechanisms to drive capital where it is needed

Redesigning physical and energy systems

4. Anticipate and remove bottlenecks for materials, land, infrastructure, and labor
5. Revamp energy markets and planning approaches for an electrified world

Navigating risks and opportunities

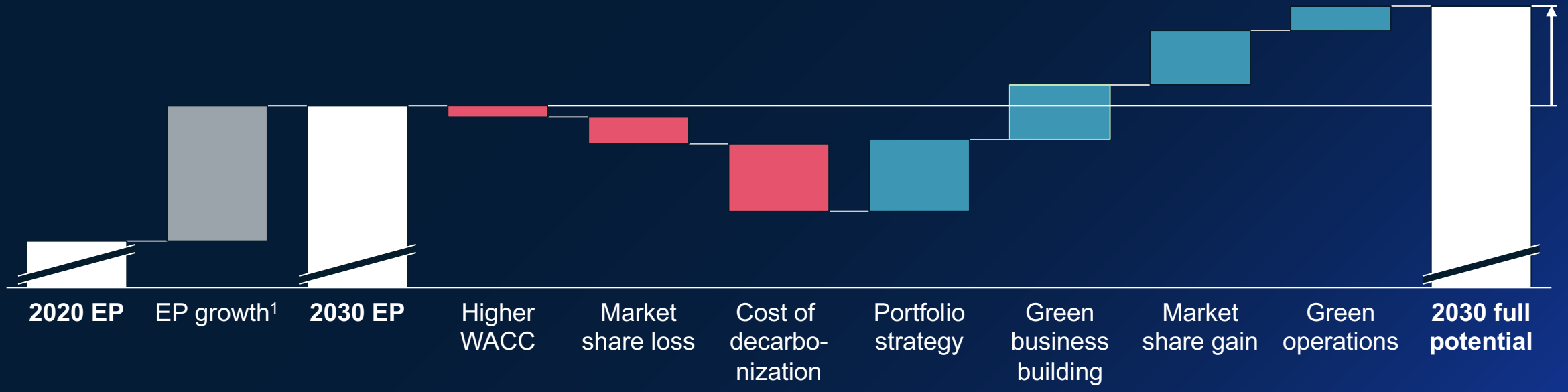
6. Manage existing and emerging energy systems in parallel
7. Compete for opportunities created by the transition, using comparative advantage as a guide

Source: McKinsey analysis

For companies – this is about value creation!

Sustainability value creation levers

Illustrative economic profit



Manage sustainability risks: WACC, market share, carbon cost

Capture sustainability value creation: Four levers could strengthen competitive position and increase economic profit

1. 1 Assuming 5% EP growth

Source: McKinsey analysis, EBA climate stress testing pilot, MSCI

CEOs must prioritize five key actions to win

Action #1

Develop a **full potential "play offense" strategy** for value creation and winning the transition

Action #2

Accelerate capital / resource deployment with a PE mindset – hyperscale green businesses AND decarbonize hard to abate assets

Action #3

Embed **Net Nature Positive** in your value creation plans

Action #4

Build a new kind of **partnership and ecosystem** muscle (private, public, philanthropy)

Action #5

Aggressively **reskill** yourself, your leadership teams, and your board

How will you navigate the net-zero transition?

Scan the QR code to access the report or visit mck.co/transition