

Energy Security *and* Carbon Sequestration



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Energy Consumption



**World Primary energy
consumption**

1.7 EJ Exajoules (10¹⁸) **per day**
(624 EJ per Year)

~100,000 Rounds



Of Boeing 747 travels around the earth

Or **~5,000 Rounds**



from Earth to the Moon

Source: IEA Energy Outlook 2022

Boeing 747 burns 675,000 Btu per Mile, Earth's circumference 24,901 Miles, Earth to Moon 238,855 Miles

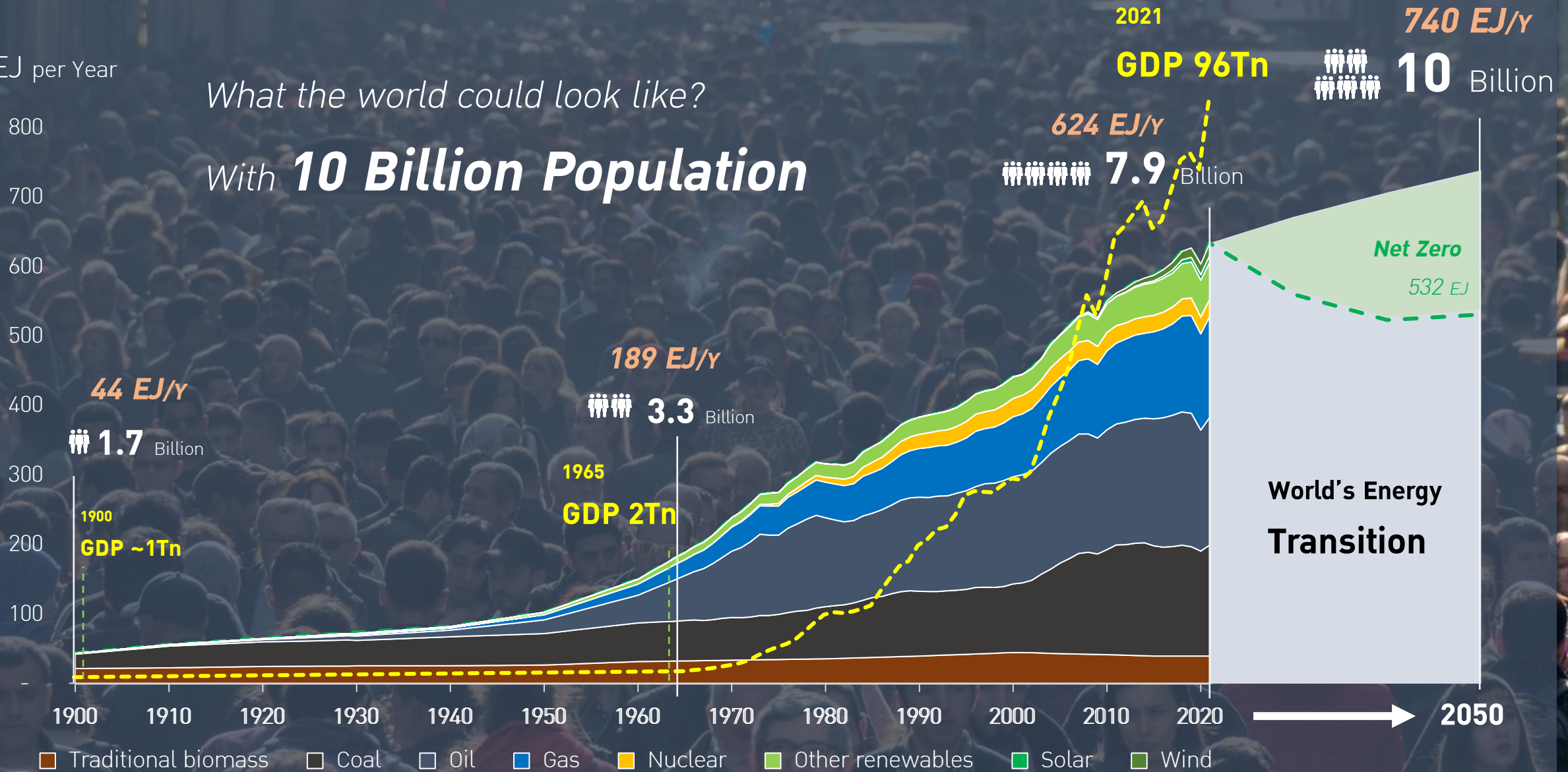
Global GDP Vis a Vis Energy Demand



EJ per Year

What the world could look like?

*With **10 Billion Population***





World is Moving To Cleaner Technologies

However, Time is Needed

1866

1st Automobile
Introduced by Benz



1897

Electrical Cab Introduced in London



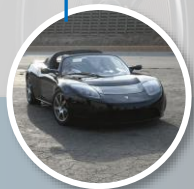
1913

Henry Ford
Mass Production



2012

120,000 EV Stock



>90 Years
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2021

1,450 Mn ICE+EV
Total Global Vehicle Car Stock



2030

200 Mn EV
10% of total Global Vehicle Car Stock



Next?

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FCEV



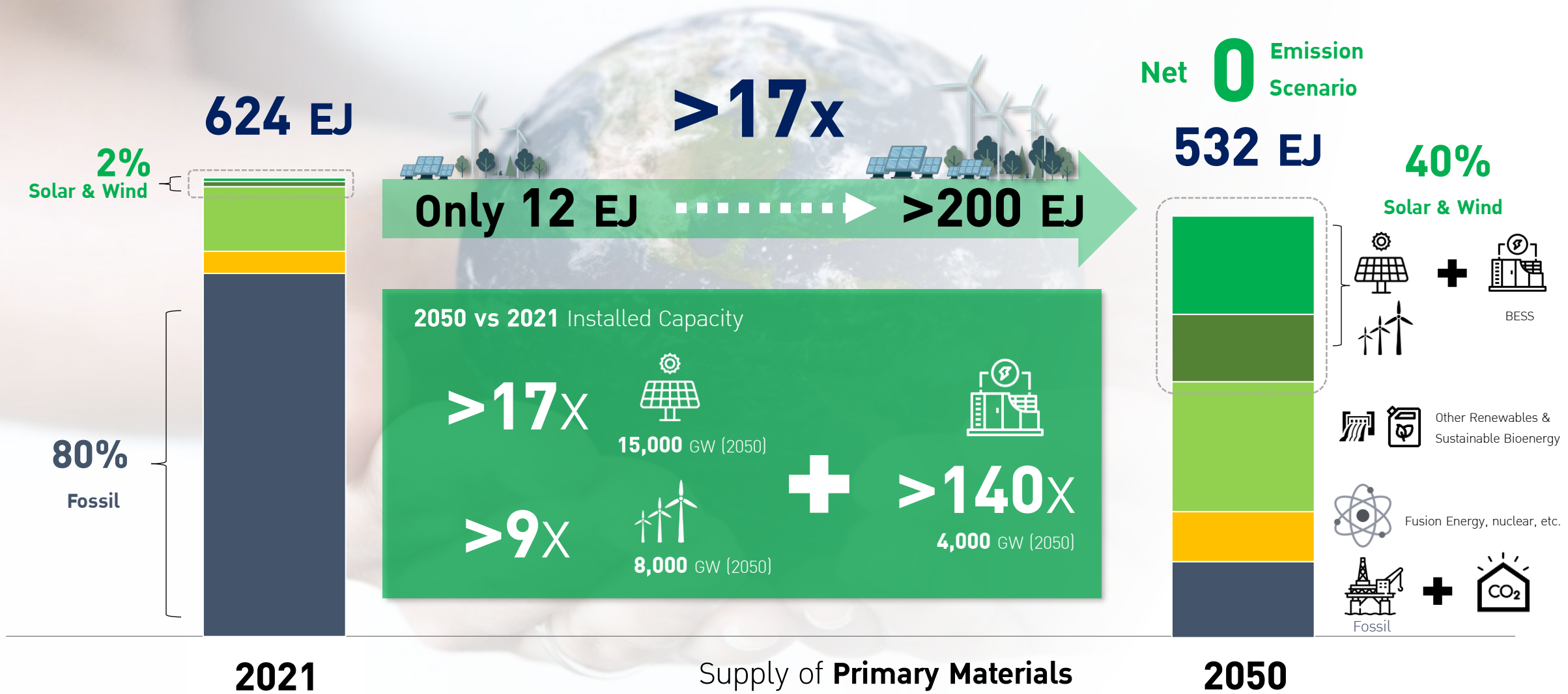
Hydrogen Car?

Source: IEA Global EV Outlook 2022

Scaling-Up Renewable and Sustainable Energies are Required in Decades



How Can We Secure Energy Supply?

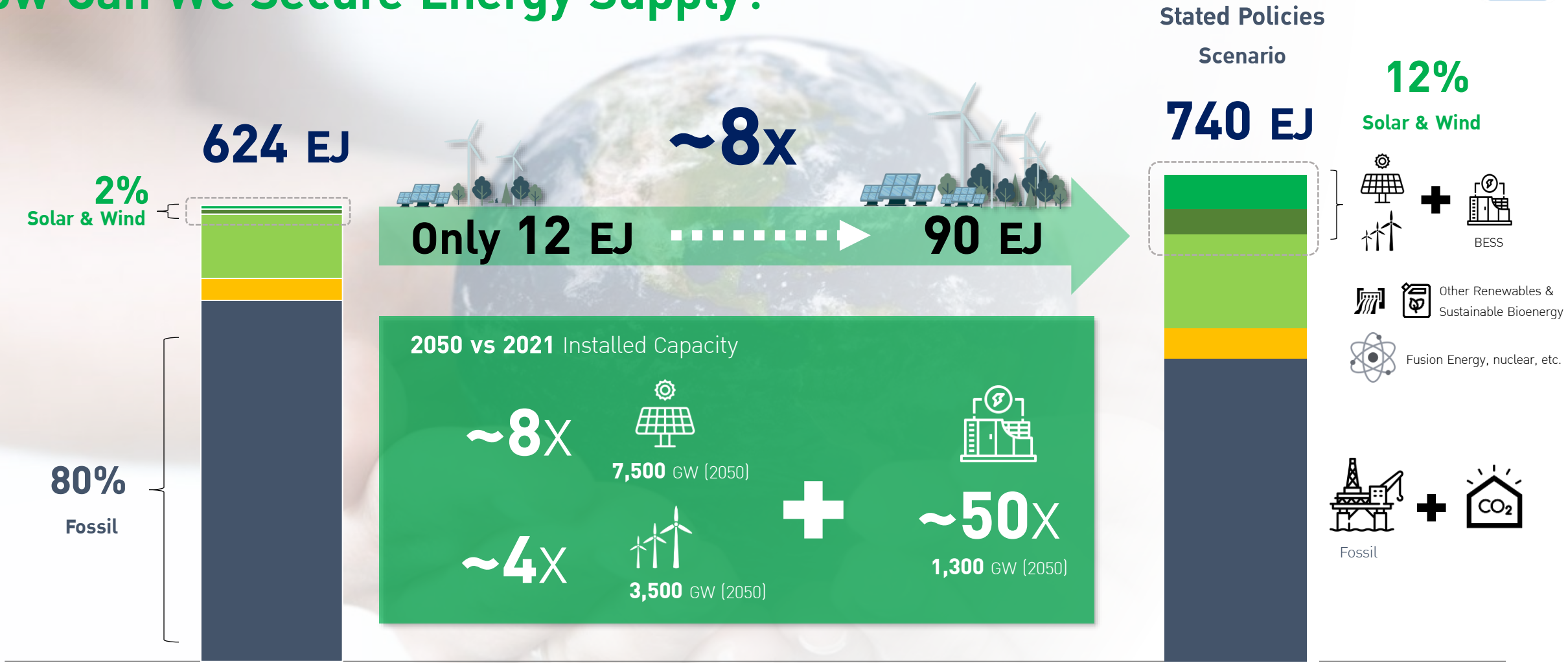


“will be critical in the decades to come”

Scaling-Up Renewable and Sustainable Energies are Required in Decades



How Can We Secure Energy Supply?

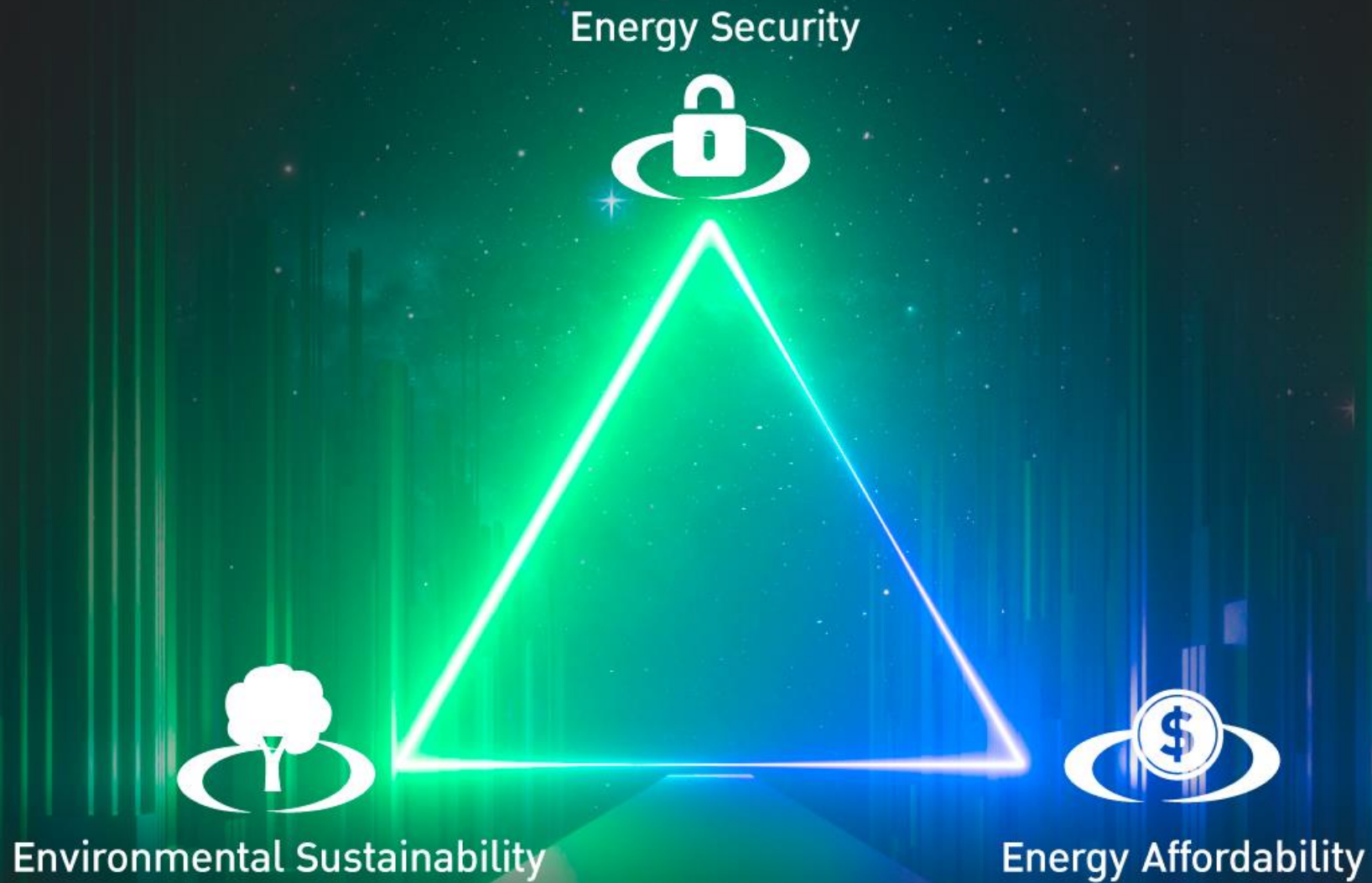


Supply of **Primary Materials**

“will be critical in the decades to come”

Likely?

The Energy Trilemma



With Carbon Sequestration & Climate Technologies

Fossil Fuels will Bring Balance to the World's Energy Transition



CURRENT

ECOSYSTEM

Crude Oil / Gas



Nature Based Sequestration



Refined Products



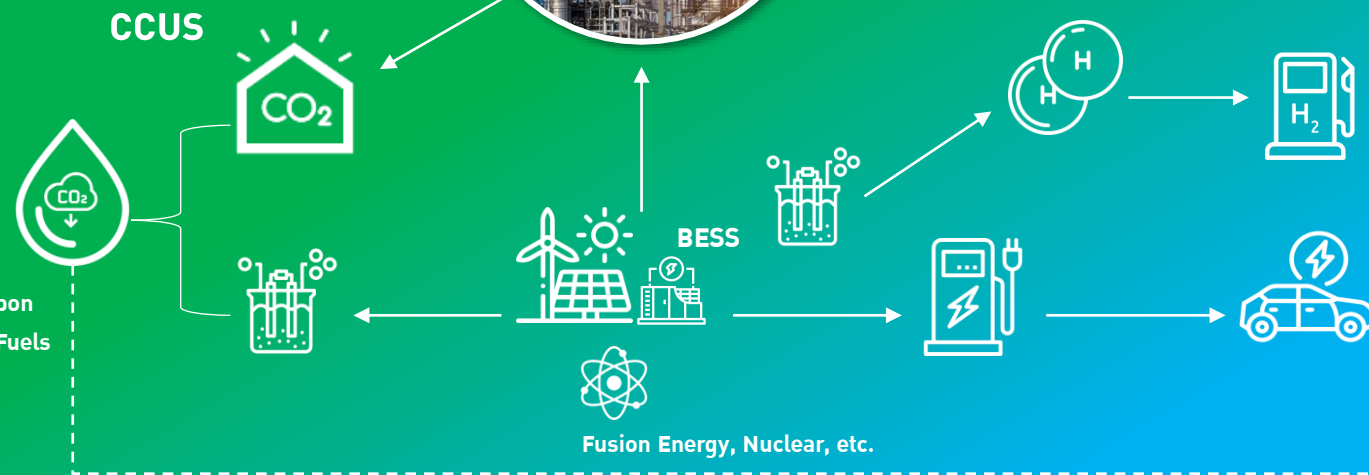
Taxonomy and Carbon Markets

ARE REQUIRED to expedite the TRANSITION

FUTURE

ECOSYSTEM

Low Carbon Synthetic Fuels



01

Nature-based solutions



Co-existence
with fossil fuel:
**Carbon
Sequestration**

Science-based solutions

02



01

Nature-based solutions

Forestry practices



01

Nature-based solutions

Wetland-related practices



01

Nature-based solutions

Restorative agriculture



01

Nature-based solutions

Ocean-based practices





02

Science-based solutions

Carbon capture and storage



02

Science-based solutions

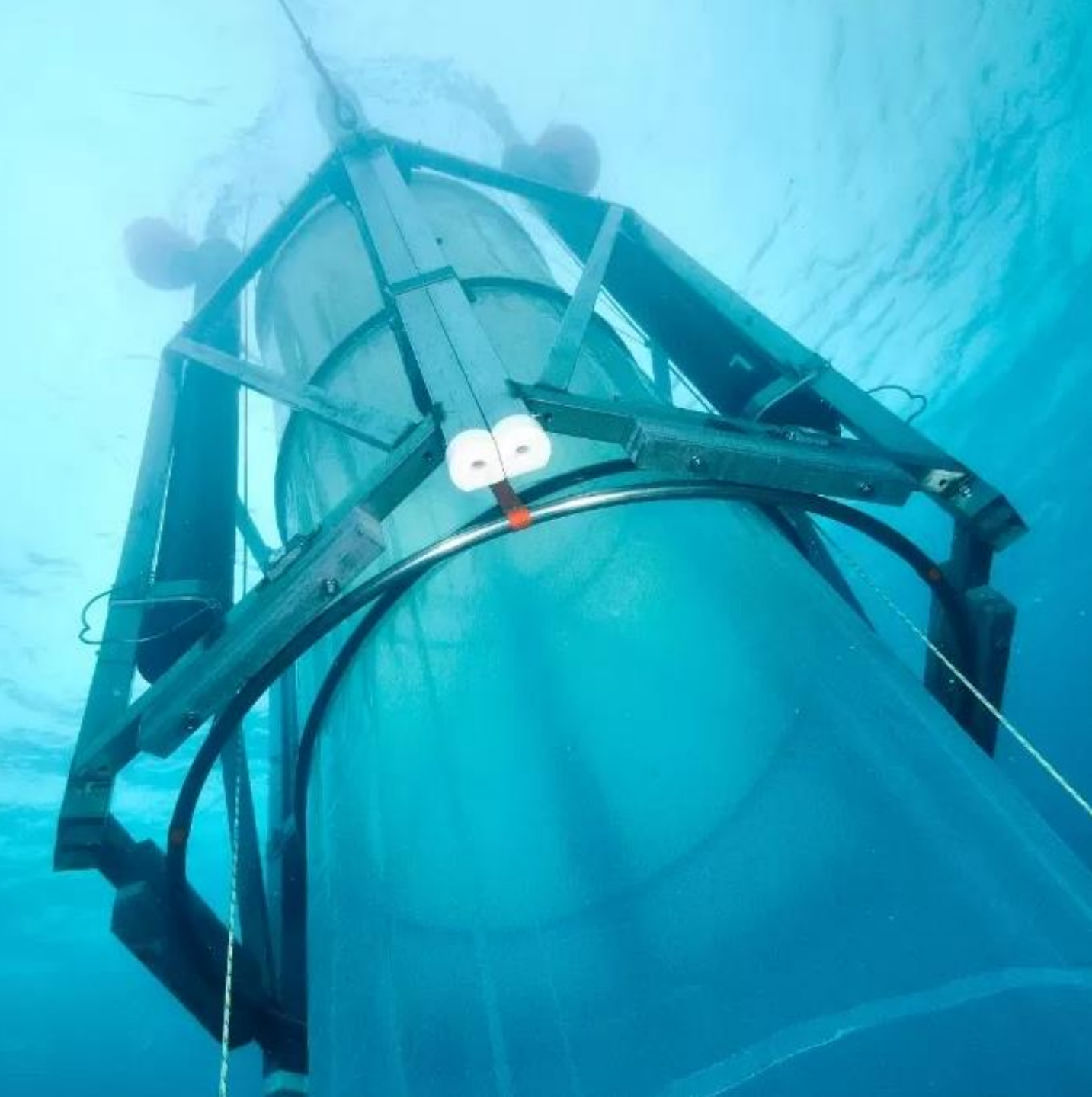
Direct air capture with carbon storage



02

Science-based solutions

Enhanced weathering



02

Science-based solutions

Ocean alkalization



TAXONOMY is needed.

Incentive

- Emission Trading System (ETS)*
- Voluntary Emission Reduction Program (VER)*
- Renewable Energy Certificate (REC)*
- Green Bond*
- Sustainability-Linked Bond (SLB)*

Law & Regulation

- Carbon Tax Penalty*
- Carbon Tax Incentive*



Profit, IRR



Facilitate and Expedite the Transition

TAXONOMY: A Navigator for Sustainable Finance



In Place:

China
EU
Malaysia
Russia
South Korea
Columbia
Indonesia
Mongolia
Singapore



In Draft:

South Africa
UK
Vietnam



Under Development:

Thailand

Brazil
Canada
India
Japan
Kazakhstan
New Zealand
Philippines
Sri Lanka

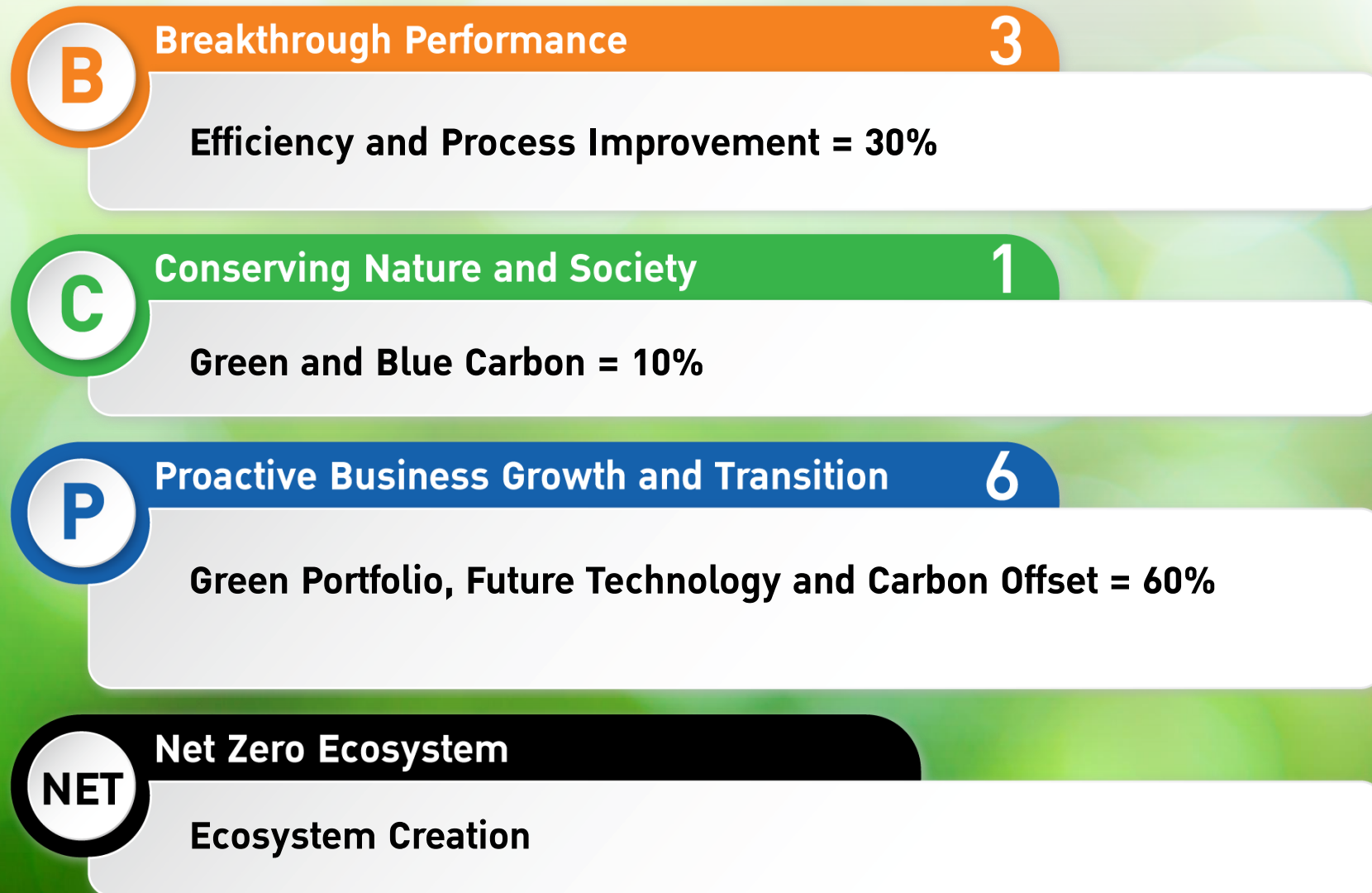
Pathway to NET ZERO 2050



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Energy in Harmony with Nature

