

# Principal ESG Academy - What are Carbon Neutrality and Net Zero Emissions?



## What are Carbon Neutrality and Net Zero Emissions?

As global warming intensifies, scientists have long warned of its disastrous consequences, such as extreme weather, rising sea levels, evaporation increases, glaciers melting, etc. In order to tackle the problem at its roots, the world needs to act in a speedy manner to reverse the trend of excessive greenhouse gas emissions.

“Carbon Neutrality” and “Net Zero Emissions” both target the reduction in greenhouse gas emissions, with the first one solely targeting net-zero carbon dioxide (CO<sub>2</sub>) emissions and the latter on cutting down all greenhouse gas emissions to as close to zero as possible with any remaining emissions reabsorbed from the atmosphere, according to the United Nations.<sup>1</sup>

Comparatively, carbon neutrality is balancing the carbon emissions released by a company or country through an offset that absorbs or removes carbon from the atmosphere. As such, carbon neutrality is not necessarily contributing to the global goal of reducing carbon emissions from the atmosphere.

## How can we achieve carbon neutrality?

The first and primary approach is to cut down the CO<sub>2</sub> emissions from human activities. It may include moving away from fossil fuels by replacing with renewable energy, utilizing energy more efficiently by enhancing technologies, and adopting more sustainable ways for production, consumption, and living. Examples of carbon offsetting projects include tree planting to neutralize a certain amount of greenhouse gas emissions, as well as the development of carbon sequestration techniques that aim to capture and reduce CO<sub>2</sub> in the atmosphere artificially.

After all, carbon dioxide represents just a portion of greenhouse gas emissions, with methane (CH<sub>4</sub>), ozone (O<sub>3</sub>), nitrous oxide (N<sub>2</sub>O), and so forth also contributing to the worsening trend of global warming. As a result, a more comprehensive target to reduce all sorts of greenhouse gases comes to the stage, which is “Net Zero Emissions.”

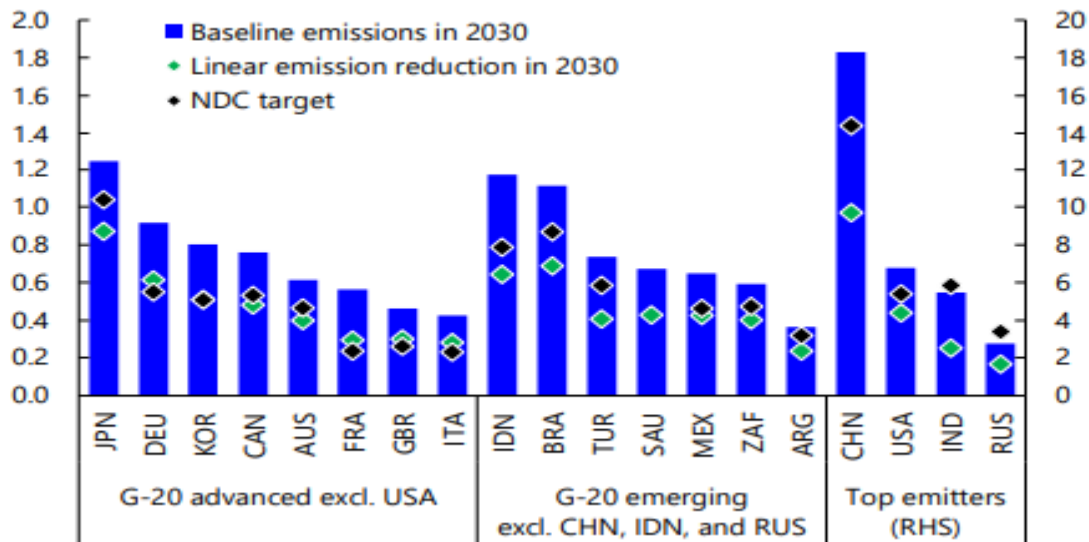
## Why is Net Zero Emissions important?

According to the United Nations, the key to avoiding the worst impacts of climate change lies in the world’s collective effort to prevent the global temperature from rising by higher than 1.5 degrees Celsius compared to the pre-industrial level. The fact that the earth is already 1.1 degrees Celsius warmer than in the 1800s has set the alarm bells ringing.

The Paris Agreement calls for greenhouse gas emissions to be reduced by 45% by 2030 and reach net zero by 2050. This Agreement was adopted in 2015, where 196 countries agreed to reduce global warming and help tackle the problem of climate change. Some countries began to submit climate action plans known as nationally determined contributions (NDCs) in the following years. However, the reduction targets are still deemed to be far from enough even if they are fully implemented.

Figure 1: Baseline Emissions and NDC Target<sup>2</sup>

*(GHG emissions in GtCO<sub>2</sub>e)*



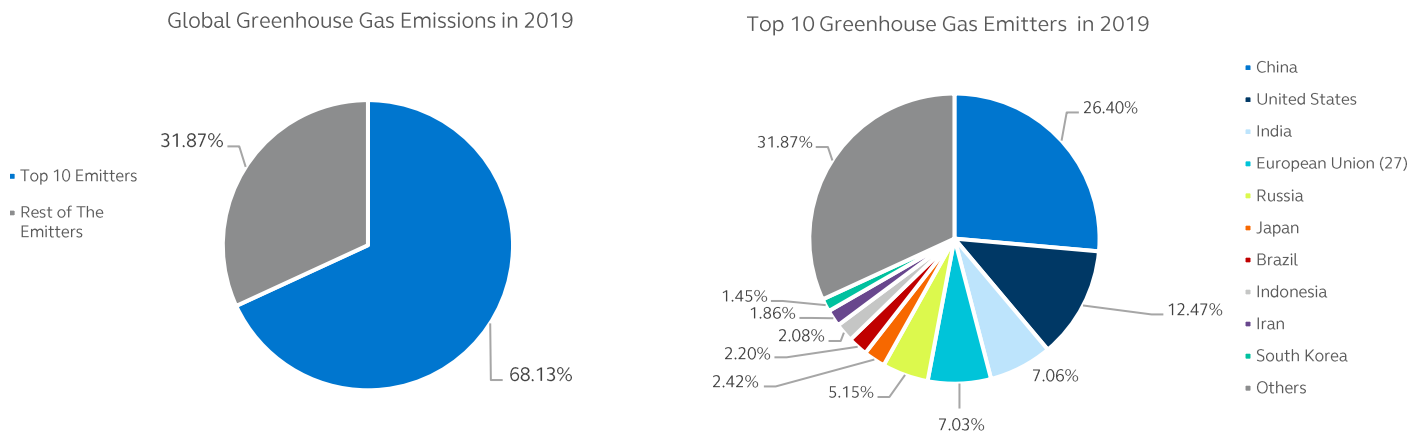
Source: International Monetary Fund

Notes: Linear emissions are calculated from baseline emissions in 2021 to net zero emissions in 2050. NDC targets are the unconditional target or, where available, the average of the conditional and unconditional target. For EU countries, the EU commitment to reduce emissions by 55% is used. Saudi Arabia's NDCs could not be converted to emission reduction targets.<sup>2</sup>

According to International Monetary Fund, only a few G20 countries have endeavored to implement the net zero emissions targets by setting related policies or laws. As a result, the baseline emissions in 2030 for most countries exceed their NDC targets (figure 1). Echoing the United Nations, IMF also called for more ambitious and swift actions on carbon pricing and investment in clean technologies from current levels.<sup>2</sup>

**Where are the greenhouse gases coming from?**









Figure 2: sources of global greenhouse gas emissions



Source: CLIMATEWATCH<sup>3</sup>, PrincipalAsset Management Company (Asia) Limited

In fact, a handful of countries in the world are responsible for a significant portion of global greenhouse gas emissions. The 10 largest emitters contribute to over two-thirds of it, including China, US, India, European Union, Russia, and the other five countries, as shown in figure 2. The imbalance is even more distinct when compared to the 100 least-emitting countries which account for only 3% of total global emissions<sup>1</sup>. It should be noted that around half of the top 10 emitters are situated in Asia, indicating the region's importance in dealing with the issue of global warming. Some Asian countries have begun recognizing the problem and setting their own emissions targets for the next few decades. (Figure 3).

Figure 3: Emissions targets of selected Asian countries

Countries	Target Type	Target Year	Status
China 	Carbon neutral(ity)	2060	In policy document
India 	Net zero	2070	Declaration / pledge
Indonesia 	Net zero	2060	Proposed / in discussion
Thailand 	Net zero	2050	Declaration / pledge
Malaysia 	Carbon neutral(ity)	2050	Declaration / pledge
Vietnam 	Net zero	2050	Declaration / pledge
Philippines 	Reduction v. BAU	2030	In policy document
Singapore 	Net zero	2050	In policy document

source: Net Zero Tracker<sup>4</sup>

<sup>1</sup>Source: For a livable climate: Net-zero commitments must be backed by credible action. For details, please refer to:

<https://www.un.org/en/climatechange/net-zero-coalition>

<sup>2</sup>Source: G20: REACHING NET ZERO EMISSIONS. For details, please refer to:

<https://www.imf.org/external/np/g20/pdf/2021/062221.pdf>

<sup>3</sup>source: CLIMATEWATCH: Historical GHG Emissions. For details, please refer to:

[https://www.climatewatchdata.org/ghg-emissions?breakBy=countries&calculation=ABSOLUTE\\_VALUE&end\\_year=2019&regions=TOP&start\\_year=1990](https://www.climatewatchdata.org/ghg-emissions?breakBy=countries&calculation=ABSOLUTE_VALUE&end_year=2019&regions=TOP&start_year=1990)

<sup>4</sup>source: Emission targets of selected countries. For details, please refer to:

<https://zerotracker.net/>

#### Disclosures:

All figures shown in this document are in U.S. dollars unless otherwise noted.

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