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# China in Action: Carbon Neutral by 2050

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*An early priority for China – at least two to three decades back – was to reduce carbon dioxide (CO2) output, as well as that of other greenhouse gases, such as* ***methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs)****, to eventually reach* ***carbon neutrality,*** *meaning, eliminating as much CO2 as is produced, by 2050.*

With industrialization and excessive consumption, the output of CO2 and other greenhouse gases has increased rapidly and especially in later years. And this despite repeated pledges during numerous UN-sponsored Environmental Conferences, to reduce the world's carbon footprint.

Global carbon dioxide levels reached 419 parts per million (ppm) in May 2021, the highest since CO2 output has been measured 63 years ago. Compare this to China's CO2 output of 409 ppm by 2018.

China is often blamed as being the world's largest polluter which may be the case in absolute terms, as China also has the world's largest population. However, putting China's CO2 output in perspective, on a per capita basis, China ranks only 5$^{th}$, after Australia, the US, Russia and Germany:

- Australia: 17.27 tons per capita
- USA:  15.52 tons p/c
- Russia: 11.33 tons p/c
- Germany: 8.52 tons p/c
- China: 7.38 tons p/c (less than half the US level)
- India:  1.91 tons p/c

These are 2019 figures.

China's 14th Five Year Plan (14th FYP), published in March 2021, included 2025 energy and carbon intensity reduction targets, as well as a mid-point non-fossil share target to achieve her *nationally determined contributions*, or NDC.

At China's Leaders Climate Summit in April 2021, **President Xi Jinping** announced that China will strictly control coal generation until 2025 when she will start to gradually phase out of coal.

President Xi just announced at the UN General Assembly in NYC of 2021, that China seizes using coal powered plants as of now.

To understand the concept and the lingo of the different terms and terminologies, let's back track a bit.

It all began decades ago – with the First United Nations Conference on Environment and Development (UNCED), also known as the 'Earth Summit', held in **Rio de Janeiro, Brazil**, from 3-14 June 1992. It set the stage for the reduction of greenhouse gases, the most important of which is carbon dioxide.

CO2 emissions are toxic and harmful for the environment and life, when produced in excess.

However, let's also keep in mind – CO2 is one of the most important gases on earth, because the plants use it to produce carbohydrates in a process called photosynthesis. Since humans and animals depend on plants for food, thus, CO2 is necessary for the survival of life on earth.

In the meantime, there have been numerous climate change conferences around the world, most of them UN-sponsored, the latest one if I'm not wrong, was *the Santiago Climate Change Conference*, the 25th so-called *Conference of the Parties* (COP25) of December 2019 — meaning the 25th conference to the United Nations Framework Convention for Climate Change (UNFCCC).

The names of these conferences and their results are often confusing, at times also controversial, especially between the industrialized countries and the so-called developing countries, or the Global South.

A chief reason for potential conflicts is rapid industrialization – excessive consumption, particularly in the West, or the Global North. The output of CO2 and other greenhouse gases has increased rapidly and unequally between the Global North and the Global South. Yet, developing countries are often asked to take similar measure to reduce greenhouse gases, in particular, CO2.

A safe level of CO2 in the air, according to one of the first 21st Century UN Conferences, it may have been the 2009 Copenhagen Conference, was suggested to be 350 ppm. This figure was already exceeded in 1987, reaching, as mentioned before, 419 ppm in May 2021.

Despite COVID, the concentration has not been significantly changed for the better. In some cases, to the contrary.

Despite pledges to the contrary, the main source of energy has changed little in the last 20

years. Hydrocarbons are still king. Today's world economy still depends on some 84% of hydrocarbons (petrol, gas, coal) of all energy used, as compared to 86% at the turn of the century.

**What does carbon neutral mean?**

***Carbon neutral*** – the amount of $CO_2$ emissions put into the atmosphere is the same as the amount of CO2 removed from the atmosphere. The impact is neutral. This is not making it actively worse, but it doesn't make it better either, especially when the average output is above 400 ppm, meaning above the considered "safe" target of 350 ppm.

***Carbon negative, or carbon net zero*** might be a step in the right direction. It means the amount of CO2 removed from the atmosphere is bigger than the $CO_2$ output. The impact is positive; something is actively done to reduce the harm to the atmosphere – and to improve the air for every breathing life.

We have the historical responsibility to urgently cleaning up the atmosphere to eventually get back to the *civilized level of 275 ppm*.

Since the beginning of human civilization, our atmosphere contained about 275 ppm of carbon dioxide. According to renowned climatologist **Dr. James Hansen**, these are the conditions under which civilization developed and to which life on earth adapted. Going beyond this indicator, risks disrupting our global climate system's 1,000,000+ years of relative stability. Beginning in the 18th century, with the age of industrialization, humans began to burn coal, gas, and oil to produce energy and goods. The carbon in the atmosphere began to rise, at first slowly and, then ever more rapidly.

Many of the activities we do every day, rely on energy sources that emit carbon dioxide and other greenhouse gases. We're redistributing millions and millions of years' worth of carbon, once stored beneath the earth as fossil fuels, and releasing it into the atmosphere.

Just a thought.

Apologies for this long background. The environmental agenda is very complex.

As to China, China's Ministry of Environment and Ecology publishes regularly CO2 concentration levels. China's greenhouse gas emission in 2018 reached 409.4 ppm with an estimated annual growth of 1.3%.

While in full action towards carbon neutrality, China was hosting the 5$^{th}$ Ministerial meeting on Climate Action in April 2021. A virtual event attended by the European Union and Canada, plus ministers and representatives from 35 governments and international organizations, from all the world's regions.

The meeting aimed at drastically reducing the carbon level in the air, through significant shifts from fossil fuel energy to alternative sources for the upcoming UN Climate Change Conference (COP26), hosted by the UK, from **31 October to 12 November 2021 in Glasgow.**

The Glasgow Conference will focus at implementation of the Paris Agreement in a comprehensive, balanced and effective manner, building a fair global climate governance system, equitable and centered on win-win cooperation – with focus on renewable energy,

the phase-out of fossil fuels, zero-emissions vehicles, resilience-building, carbon-pricing, green finance, nature-based climate solutions such as afforestation and reforestation, biodiversity conservation, and waste management.

China is already pushing ahead with this agenda.

The Ministers asked for an equitable transition throughout the implementation process. This may include financial, technological and capacity building support to developing countries, especially the poorest and most vulnerable ones. Implementation of the Paris Agreement should also reflect the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

China's ambitious agenda to reach carbon neutrality or better, by 2050, includes …

- Investing in projects of liquid hydrogen which can be used, for instance, in hydrogen fuel cell automobiles, and Hydrogen metallurgy, a technology that applies hydrogen instead of carbon.
- Third generation photovoltaic energy with efficiency above 40%, is another sector where China's world-class development and vast demands may attract global investors.
- In addition, China has ambitious research projects into generating energy from photosynthesis, the process plants use to transform carbon dioxide and sunlight into energy. It's an ecosystem's way of producing fuel at a high level of efficiency (>90%) without polluting residues.
- Green parks in urban areas and reforestation as well as improved water management, so as to reduce areas of frequent droughts and convert them into green agricultural crop lands.
- At the same time, China is seeking new alternative energy investments abroad, such as an automotive lithium-ion battery production in Germany – a planned investment of 1.8 billion euros.

And much more….

China is not only on the right track to seek environment-friendly renewable sources of energy, thus, reducing her carbon footprint – but to exceed the 2050 net zero emissions target into a carbon negative project.

China, as in other matters of importance to the world's societies, just to mention one – poverty alleviation – may be again an example on environmental progress. Towards a human society with shared benefits for all.

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