

Preface

Global net zero emissions describes the state where emissions of carbon dioxide due to human activities and removals of these gases are in balance over a given period. It is often called simply net zero. In some cases, "emissions" refers to emissions of all greenhouse gases, and in others it refers only to emissions of carbon dioxide (CO₂).

To reach net zero targets requires actions to reduce emissions. One example would be by shifting from fossil fuel energy to sustainable energy sources. Organizations often offset their residual emissions by buying carbon credits. People often switch between the terms net zero emissions, carbon neutrality, and climate neutrality with the same meaning. However in some cases, these terms have different meanings from each other. Some standards for carbon neutral certification allow heavy carbon offsetting, however net zero standards require reducing emissions to >90% and then only offsetting the remaining <10% to fall in line with 1.5 °C targets.

In the last few years, net zero has become the main framework for climate ambition. Both countries and organizations are setting net zero targets. Today more than 140 countries have a net zero emissions target. They include some countries that were resistant to climate action in previous decades. Country-level net zero targets now cover 92% of global GDP, 88% of emissions and 89% of the world population. 65% of the largest 2,000 publicly traded companies by annual revenue have net zero targets. Among Fortune 500 companies the percentage is 63%. Company targets can result from both voluntary action and government regulation.

Net zero claims vary enormously in how credible they are. Most have low credibility. This is despite the increasing number of commitments and targets. While 61% of global carbon dioxide emissions are covered by some sort of net zero target, credible targets cover only 7% of emissions. This low credibility reflects a lack of binding regulation. It is also due to the need for continued innovation and investment to make decarbonization possible.

To date, 27 countries have enacted domestic net zero legislation. These are laws that legislatures have passed which contain net zero targets or equivalent. There is currently no national regulation in place that legally requires companies based in that country to achieve net zero. Several countries including Switzerland are developing such legislation.¹

In the present book, fourteen typical literatures about the carbon neutrality published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on the carbon neutrality. We hope this book can demonstrate advances in the orca as well as give references to the researchers, students and other related people.

¹ https://en.wikipedia.org/wiki/Net_zero_emissions