Evaluating the Quickly Evolving Landscape, Climate

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Abstract

Achieving net zero emissions has evolved into a defining goal for climate action in the five years since the Paris Agreement. We examine more than 4000 nations, businesses, and local government units, which collectively account for the majority of world emissions. We discover that 769 of these businesses have net zero aims, but only 152 of them meet the minimal standards for robustness in terms of governance, timing, status, and coverage. Although the idea of net zero is now widely accepted, its operationalization is still in its early stages. To execute Paris-consistent action and secure more ambitious targets, authorities should prioritize making net zero targets resilient. Target status including enacting targets into law), coverage of activities, restrictions on and transparency surrounding the use of offsets, and disclosure of plans and progress reports are the areas that need strengthening the most. By establishing criteria for strong net zero targets and empowering organizations, especially those in the global South, to meet the technical and resource demands necessary to successfully operationalize net zero emission targets, policymakers should work to strengthen net-zero targets. While robust net zero aims only cover around 5% of the global economy, net-zero targets currently encompass 2/3 of it.

Keywords: Climate • Nations • Global emissions • Rainfall and geographical information system

Introduction

The idea of "net zero emissions" has transformed from a subject of scientific debate to the organizing principle for global, national, subnational, and business initiatives to combat climate change in a startlingly short amount of time. But as doubts about the legitimacy of net zero targets have grown, so have they. In this paper, we give a comprehensive evaluation of the net zero targets to date, demonstrating that despite the concept's wide adoption, the targets' timing, bindingness, coverage, use of offsets, governance structures, and other requirements remain very variable. The net-zero idea is still in its infancy as a tool for policy.

As scientists began to pay more attention to the almost linear relationship, discussions about net zero in science began to take place in the late 2000s. between total human CO_2 emissions and the rise in global temperatures. This conclusion was highlighted by the Intergovernmental Panel on Climate Change (IPCC) in 2014, along with the implication that to restrict global temperature change to a specific level, a point at which net additions of CO_2 to the atmosphere reach zero is necessary The 2015 Paris Agreement's long-term objective was to "achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century." This served as the basis for that objective. Notably, the Paris Agreement objective broadens the net zero ideas to include greenhouse gases rather than just $CO_{2'}$ which was the IPCC's primary argument. 1 Notably, the IPCC stated in 2018 that limiting temperature rise to 1.5°C necessitates achie--ving net zero CO_2 emissions by the middle of the century in addition to significant reductions in non CO_2 emissions.

Given that it gives an entity a specific deadline for ceasing greenhouse gas emissions, the politically appealing nature of net zero as a framework for target-setting is enhanced by its conceptual simplicity, 2017. The idea is inextricably linked to strategies that prioritize temperature targets before global net zero resulting in less warming) or carbon budgets which outline the total amount of emissions to be produced before net zero). In recent years, and continues to do so, an increasing number of national governments, subnational authorities, and private sector organizations have expressed a commitment to net zero. The Race to Zero Campaign of the United Nations seeks to mobilize more commitments (UNFCCC, 2021a).

Activists like Greta Thunberg have called for "real zero" instead of net zero, and many others are doubting the validity and rigor of net zero aims. These criticisms often concentrate on two topics. First, detractors worry that by allowing a heavy reliance on carbon offset credits and/or carbon removal, the "net" portion of net zero may divert effort away from emission reductions. While carbon removal is commonly assumed in global pathways to achieve the Paris Agreement but is still unproven at scale, offset credit markets are criticized for their lack of additional and strong governance. Second, detractors are concerned that long-term net zero targets could create the appearance of alignment with the Paris Agreement's objectives.

Since the idea of net-zero has gained so much traction, it is imperative to keep track of how frequently objectives are used as well as to evaluate them. One early study discovered a lack of transparency and a wide range of interpretations among net zero targets established by cities, regions, and businesses. Here, we thoroughly evaluate all the components of the designated populations responsible for the majority of global emissions. 2 In particular, we examine all 1170 cities with populations over 500,000, 203 nations including some self-governing territories), 806 states, and areas of the world's 25 top emitters, and the 2000 largest publicly-traded firms by sales. Our strategy is based on a group of 53 trained. Our method classifies net zero targets according to a predetermined set of criteria using publically accessible sources in different languages that are found through methodical internet searches and a staff of 53 trained data collectors.

After carefully examining each of these more than 4,000 entities, we compute the percentage of emissions, population, and economic value that targets cover, and we evaluate how reliable these targets are. We use the criteria established for the UN's Race to Zero Campaign, a global initiative to encourage sub and non-state actors to set net-zero targets, to operationalize "robustness" (UNFCCC, 2021b). These criteria were created in consultation with industry professionals and share themes with many other widely-used best practice guides for establishing emission reduction objectives. Natural Capital Partners, 2020; Overall, this research offers a global assessment of both the quality of operationalizing net zero aims as well as the adoption of net zero targets among the most significant sources of global emissions. A total of 203 entities, including all UN-recognized nations, independent territories, and dependencies, are analyzed. The EU is not treated separately by us. The International Organization for Standardization (ISO) 3166-1 Alpha standard was used to determine country codes and names. Country populations for 2019 were gathered from the United Nations (UN DESA, 2019a), the World Bank's Gross Domestic Product (GDP), which was calculated using constant 2017 US dollars and purchasing power parity terms, and CAIT's greenhouse gas emissions (WRI, 2018). We were unable to collect comparable GHG data for all sub- or non-state entities, nor comparable GDP statistics for states, regions, or cities. The analysis of GDP and GHG coverage is thus limited to country states. regions and states. The top 25 emitting nations, which collectively account for more than 80% of global greenhouse gas emissions, are examined in terms of their states, regions, and provinces (or other comparable entities). There are 806 states and regions in this group, specifically from the following countries: The United States, Australia, Canada, India, Russia, Japan, Germany, Iran, Saudi Arabia, South Korea, Mexico, Indonesia, Brazil, South Africa, France, Turkey, Italy, Thailand,

Poland, Kazakhstan, the United Kingdom, Spain, Taiwan, China, and Malaysia. We assemble names and population datasets from a variety of governmental and open-source repositories because there are no global datasets for these topics. Cities. All cities with a population greater than 500,000 are examined, totaling 1170 cities. Population statistics and city names for 2018 were taken from the UN (UN DESA, 2019b). Companies. We review we examine each of the 2000 publicly traded businesses on the Forbes Global 2000 list (Forbes, 2020). Forbes is the source for company sales, names, industries, and headquarters locations. A group of trained student data collectors, under the direction of the authors of the research, systematically examined each of these entities to determine whether it had a net zero target and, if so, what features that target exhibited. We rely on publicly accessible sources such as websites, published material, news articles, press releases, or press releases from entities. The following procedure was used to conduct information searches to complete the pertinent template for each entity.

Cross-referencing the entity name with the Race to Zero-member master list (to which the UNFCCC Secretariat has access) and thee The Net Zero Tracker master list maintained by the Energy & Climate Intelligence Unit (ECIU) (ECIU provides access to the data. After all entities' data had been collected, 10% of all entities in each category were chosen at random for "double coding" to check the accuracy of the data. In other words, ten entities were chosen at random from an alphabetical list. For these entities, the aforementioned data collecting procedure was repeated with different coders from those who had carried it out the first time, and the outcomes of the two acquisitions were compared. In 94% of the cases, we discovered identical data collecting outcomes using this technique. This high intercoder reliability rate increases trust in the coding process' correctness. Additionally, spot checks were conducted to confirm the accuracy of data entries for particular significant entities, such as "Amazon" or "Los Angeles" (in cities) (in companies). Spot-checking was done to ensure that any upcoming, significant revisions relating to net zero aims had been taken into consideration as well as to triple-check any entities that could have a significant impact on our final results. In addition, until the data collecting procedure was finished, Google News searches for fresh net zero announcements were made to make sure any new announcements from businesses that had been coded earlier in the data acquisition period were recorded. The findings should be regarded as accurate as of 23 November 2020 since the acquisition was finished at that time.

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