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Article

The Heat Goes On and On. Where Do We Stand in 2026?

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Abstract: Globally, the year 2025 was not as warm as the record year 2024, but it still belongs to the three warmest years ever observed. The global warming goes on and on. We illustrate the link between global temperature variability and ocean-atmosphere oscillations and present the prospects for 2026–2027. We update the information on international climate policy path, emphasizing its so-far successes and failures. Growing confusion can be noted, sparked by some recent policy developments.

Keywords: climate change; global temperature; climate variability; climate policy

1. Introduction

Most databases show that, globally and regionally, the year 2025 was not as warm as the record year 2024. In many regions, cold spells have occurred. For instance, in contrast to several recent snow-less winters in Poland, frost spells and snow occurred in much of the country. This sparked naïve speculations between laymen—can it be a sign of a "hiatus", or the beginning of cooling, long awaited by climate change negationists and contrarians? The answer is clearly negative. Indeed, global warming is not monotonous—there has been a significant temperature variability between consecutive years superimposed on a clear warming trend. A recent study [1] convincingly demonstrated a statistically significant acceleration of global warming. The warming trend corresponds to the anthropogenic amplification of the greenhouse effect. Greenhouse gas (GHG) emissions have been increasing, while emissions of cooling aerosols have been decreasing, strengthening the greenhouse effect [2]. The climate variability is linked to such factors as volcanic eruptions, solar activity and oscillations in the global ocean-atmosphere system. In this paper, we interpret the situation, noting that the year 2025 still belongs to the three warmest years ever observed. The value of ENSO (El Niño—Southern Oscillation) index illustrating the primary factor of recent climate variability clearly shows that La Niña year 2025 (following La Niña phase of ENSO over much of 2024) should be expected to be cooler than 2024. Based on available data, we illustrate the link between global temperature variability and ocean-atmosphere oscillations (ENSO).

Further, we update the information on international climate policy path, emphasizing its so-far successes and failures. The confusion about the warming has grown worldwide in 2025 and part of the spectators were puzzled by the stance of the administration of the most powerful country in the world that announced firm return to fossil fuels. Again, many a layman asked the four old questions [3,4]:

(1) Has the global climate been really warming?
(2) Do disadvantages of global warming prevail over advantages (now and in the future)?
(3) Has the human kind substantially contributed to the global warming?
(4) Is it possible to mitigate the global warming?

Even if the mainstream reply to each of these questions is positive, there are many people who are still reluctant to agree.

2. Materials and Methods

In this paper we use data related to global atmospheric temperature and to ENSO variability that are available in public domain. The temperature data stem from nine global databases, namely: Berkeley Earth (1850–2025); CMA-GMST (1850–2025); CMST v3 (1850–2025); DCENT-I (1850–2025); ERA5 (1940–2025); GISTEMP v4 (1880–2025); HadCRUT5 (1850–2025); JRA-3Q (1947–2025); and NOAAGlobalTemp v6 (1850–2025). To align all nine datasets to the common 1850–1900 baseline, monthly anomalies, relative to 1981–2010 monthly means for each dataset, were computed and averaged to annual anomalies. A uniform +0.69 °C offset (IPCC AR6 estimate for 1850–1900 to 1981–2010 warming) was then added to all series. The ensemble mean is the arithmetic average of the nine adjusted series. The time series of global temperature of 1850–2025 reconstructed using these databases was provided in [5], while the numerical data for all nine databases were sourced from the online dashboard accompanying the WMO State of the Global Climate reports (https://www.jkclimate.fr (accessed on 16 June 2026)). We used the annual mean Niño 3.4 index illustrating the El Niño—Southern Oscillation (ENSO) variability. It was calculated from monthly sea surface temperature anomalies over the Niño 3.4 region (5° S–5° N, 170° W–120° W). We selected the Niño 3.4 index because Niño 3.4 data are available over a long time span. We used the values of the Niño 3.4 index from Hadley Centre Sea Surface Temperature data (Hadley Centre, UK), downloaded from [6].

Historical CO_2 emission data (2000–2024) were obtained from the Global Carbon Budget dataset released by the Global Carbon Project [7]. Future projections adopt the SSP2-com (Shared Socioeconomic Pathway 2-combination) scenario, which is a policy-grounded pathway within the SSP framework that explicitly incorporates China's 2030 carbon-peaking and 2060 carbon-neutrality targets and updated emission inventories. It projects a sharp post-2030 emission decline, reaching global net-zero by 2070–2075 and limiting warming to ~2 °C by 2100 without major overshoot, offering a realistic baseline aligned with current mitigation efforts [8,9].

The share of electricity from renewable sources is derived from the Our World in Data platform. The underlying data is compiled from Ember's "Yearly Electricity Data" (2026) and the Energy Institute's "Statistical Review of World Energy" (2025), with major processing by Our World in Data [10].

In order to analyze the global data, we followed the Exploratory Data Analysis approach. We also plotted the detrended global temperature anomaly versus Niño 3.4 index. The temperature anomaly was detrended by removing a linear trend over the full 1870–2025 period. The Pearson correlation coefficient between the detrended temperature anomaly and the Niño 3.4 index was then calculated. Statistical significance was tested using a two-tailed Student's t-test at the 95% confidence level. The sample size is $n = 156$, corresponding to the annual Niño 3.4 index data from 1870 to 2025.

Further, we used the information from reports on the state of climate, published in [5] for the globe and in [11] for Europe. We went beyond observations towards outlooks for the future. We provided own interpretation of data and data products by co-authors: an experienced senior researcher and a young talent.

We analyzed recent climate policy relevant documents. We drew from the contents of President Trump's executive orders related to climate (Putting America First in International Environmental Agreements, [12]) and energy (Unleashing American Energy, [13]) as well as to President Trump's address to UN General Assembly ([14,15]).

3. Results

3.1. Three Globally Warmest Years on Record—2024, 2023 and 2025

The last three years, 2023, 2024 and 2025, were globally the three warmest years on record, by large margin (Table 1). All nine global datasets agree that the year 2024 was, by far, the warmest ever observed. If ensemble mean of nine global datasets is concerned, in 2023, the mean global temperature exceeded the former record of 2016 by 0.17 °C. In 2024, the record established just a year before was exceeded by another 0.09 °C. This means that the two globally warmest years, 2023 and 2024, lifted the former global temperature record by unprecedented increment of 0.26 °C. The ensemble mean ranking was rounded to the nearest integer.

Figure 1a illustrates a time series of global average temperature for 1850–2025, calculated for each of nine databases. Values for each year from 2015–2025, according to different databases, are specified in Table 1. Figure 1b shows an example of ENSO index (Niño 3.4). Gradually increasing atmospheric CO_2 concentration [5] explains the long-term increasing trend in the last six decades, while global temperature variability can be explained to considerable extent by ocean-atmosphere oscillations, such as ENSO [16]. It is a well established finding that, typically, there is a considerable correlation between ENSO indices and detrended global temperature anomaly (Figure 2). The temperature record of 2023 coincided with a strong El Niño, warm phase of ENSO. However, high global average temperature of 2025 could have been a surprise, because it was accompanied by La Niña, a cold phase of ENSO over 11 months of the year.

Table 1. Global temperature anomaly (°C) with reference to 1850–1900 (Source: [5]).

Year	Temperature Anomaly										Ranking									
	EM	B	C	Z	D	E	G	H	J	N	EM	B	C	Z	D	E	G	H	J	N
2025	1.43	1.44	1.41	1.42	1.44	1.47	1.45	1.39	1.46	1.42	3	3	3	3	2	3	2	3	3	3
2024	1.55	1.54	1.51	1.55	1.54	1.60	1.55	1.51	1.57	1.54	1	1	1	1	1	1	1	1	1	1
2023	1.46	1.47	1.43	1.48	1.43	1.48	1.44	1.46	1.47	1.44	2	2	2	2	3	2	3	2	2	2
2022	1.16	1.16	1.12	1.19	1.15	1.18	1.16	1.15	1.15	1.15	9	8	9	9	8	8	9	9	9	9
2021	1.12	1.11	1.12	1.17	1.12	1.16	1.12	1.11	1.08	1.12	10	10	10	10	10	9	11	10	11	11
2020	1.28	1.26	1.25	1.31	1.26	1.32	1.28	1.26	1.27	1.27	5	5	5	4	5	5	5	5	5	5
2019	1.25	1.23	1.21	1.28	1.24	1.28	1.25	1.23	1.25	1.24	6	6	6	6	6	6	6	6	6	6
2018	1.12	1.11	1.09	1.14	1.11	1.15	1.12	1.10	1.11	1.12	11	11	11	11	11	10	10	11	10	10
2017	1.19	1.19	1.16	1.23	1.18	1.23	1.19	1.18	1.20	1.19	7	7	8	7	7	7	7	7	7	7
2016	1.29	1.29	1.27	1.31	1.27	1.32	1.28	1.27	1.32	1.28	4	4	4	5	4	4	4	4	4	4
2015	1.16	1.15	1.17	1.20	1.14	1.14	1.17	1.16	1.15	1.16	8	9	7	8	9	11	8	8	8	8

Notation: EM—ensemble mean; B—Berkeley Earth; C—CMA-GMST; Z—CMST v3; D—DCENT-I; E—ERA5; G—GISTEMP v4; H—HadCRUT5; J—JRA-3Q; N—NOAAGlobalTemp v6.

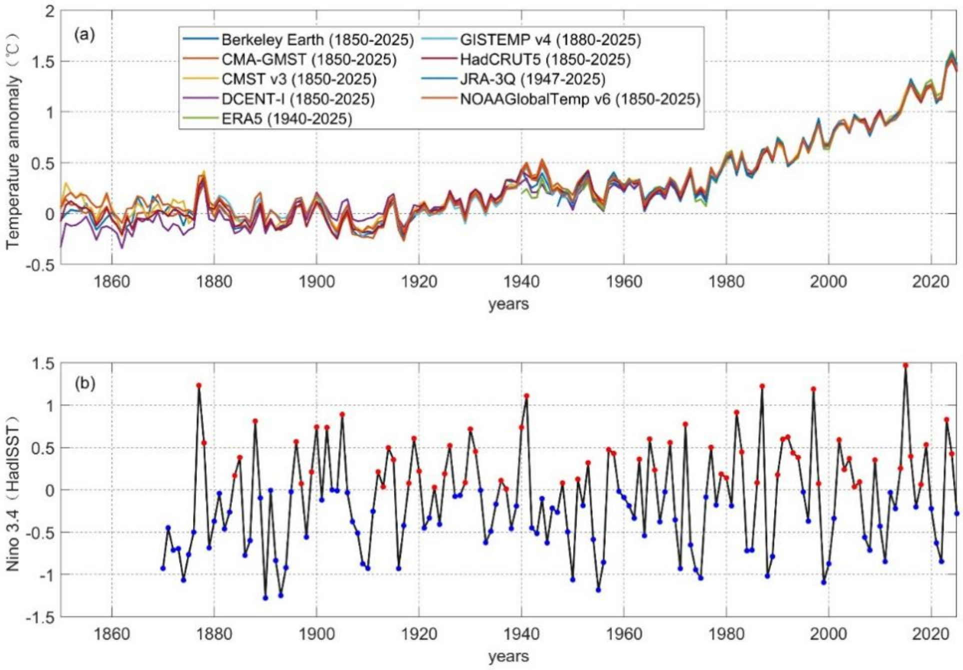

Figure 1. Juxtaposition of (**a**) annual global mean temperature anomalies for 1850–2025, relative to a pre-industrial (1850–1900) baseline (Data Source: [5]) and (**b**) Niño 3.4 index (Data Source: [6]).

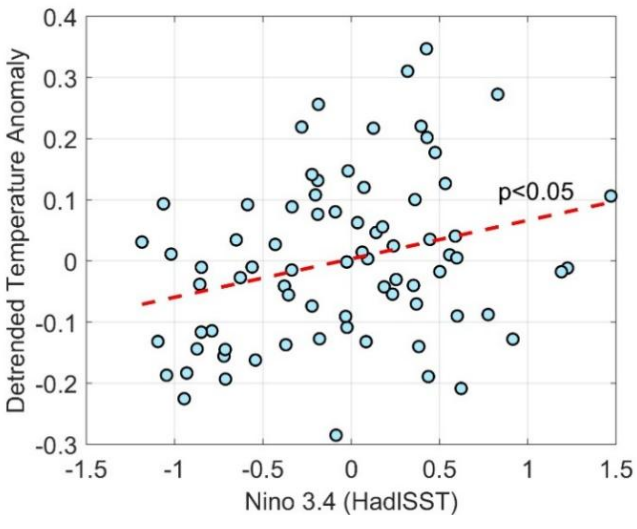

Figure 2. Scatter plot of detrended temperature anomaly versus same-year Niño 3.4 index (HadISST) during the period 1950–2025.

Table 2 lists the fifteen strongest El Niño and La Niña events (measured by annual mean Niño 3.4 index) in 1950–2025, along with the global mean surface temperature anomalies in the peak year (T_0) and the following two years (T_1 and T_2). Notably, for the six strongest El Niño events, the warmest year occurs consistently at T_1 in all cases, demonstrating a remarkably robust one-year lag for the most intense warm-phase events. When extending to all 15 El Niño events, the T_1 peak is observed in nine out of 15 cases, yielding a 60% occurrence rate. This suggests that the one-year lag is highly robust for strong El Niño events but becomes less deterministic for weaker ones. For La Niña, the cooling response is considerably more variable even among the strongest events: among the top five La Niña events, the coldest year appears at T_1 in three cases (1955, 1975, 1988), with one tie between T_0 and T_1 (1999) and one case where T_0 is the coldest (1950). Across all fifteen La Niña events, the coldest year occurs at T_0 in 10 cases, at T_1 in five cases, and at T_2 in one case, with one T_0-T_1 tie. This marked asymmetry between the two ENSO phases suggests that the lagged global temperature response is substantially stronger and more phase-locked for El Niño than for La Niña, likely due to the asymmetric ocean heat uptake and release dynamics between the warm and cold phases.

Table 2. Top fifteen strongest El Niño and La Niña events for the 1950–2025 period and their neighboring years of global mean temperature.

El Niño					La Niña				
Rank	**|Niño 3.4| Peak Year (Value)**	**T_0 (°C)**	**T_1 (°C)**	**T_2 (°C)**	**Rank**	**|Niño 3.4| Peak Year (Value)**	**T_0 (°C)**	**T_1 (°C)**	**T_2 (°C)**
1	2015 (1.47)	1.16	**1.29**	1.19	1	1955 (−1.18)	0.12	**0.07**	0.30
2	1987 (1.22)	0.59	**0.63**	0.52	2	1999 (−1.09)	**0.67**	**0.67**	0.81
3	1997 (1.19)	0.74	**0.90**	0.67	3	1950 (−1.06)	**0.10**	0.24	0.30
4	1982 (0.92)	0.40	**0.58**	0.40	4	1975 (−1.04)	0.22	**0.14**	0.43
5	2023 (0.83)	1.46	**1.55**	1.43	5	1988 (−1.02)	0.63	**0.52**	0.71
6	1972 (0.78)	0.28	**0.41**	0.17	6	1974 (−0.95)	0.17	0.22	**0.14**
7	1992 (0.62)	0.48	0.51	**0.58**	7	1971 (−0.93)	**0.16**	0.28	0.41
8	1965 (0.60)	0.16	0.21	**0.24**	8	2000 (−0.87)	**0.67**	0.81	0.89
9	1991 (0.60)	0.67	0.47	**0.51**	9	1956 (−0.86)	**0.07**	0.30	0.34
10	2002 (0.59)	**0.89**	**0.89**	0.81	10	2011 (−0.85)	**0.87**	0.92	0.95
11	1969 (0.56)	**0.32**	0.28	0.16	11	2022 (−0.85)	**1.16**	1.46	1.55
12	2019 (0.53)	1.24	**1.27**	1.12	12	1989 (−0.79)	**0.52**	0.71	0.67
13	1977 (0.50)	0.42	0.33	**0.43**	13	1984 (−0.72)	0.40	**0.38**	0.46
14	1957 (0.48)	0.30	**0.34**	0.30	14	2008 (−0.71)	**0.80**	0.92	1.00
15	1983 (0.44)	**0.58**	0.40	0.39	15	1985 (−0.71)	**0.38**	0.46	0.59

Notation: T_0, T_1, and T_2 denote the global mean surface temperature (GMST) anomalies in the Niño 3.4 peak year, one year later, and two years later, respectively. Temperature anomalies are ensemble means of nine global datasets and are expressed relative to the 1850–1900 pre-industrial baseline. Bold values indicate the highest GMST among T_0, T_1, T_2 for each El Niño event, and the lowest GMST among T_0, T_1, T_2 for each La Niña event.

3.2. Update on International Climate Policy—Successes and Failures

The first tangible milestone of the formalized international climate policy dates back to the 1992 Earth Summit in Rio de Janeiro, where the United Nations Framework Convention on Climate Change (UNFCCC) was signed [17]. Article 2 of the Framework Convention states that the "ultimate objective of this Convention…is to achieve…stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".

It has taken many years for the international community to agree on the interpretation of the term "dangerous anthropogenic interference with the climate system". The path to the interpretation was formed at successive yearly Conferences of Parties (COPs) of UNFCCC, first of which (COP-1) was held in Berlin, Germany in 1995, and the last so far (COP-30) was held in Belém, Brazil in 2025. Substantial assistance to UNFCCC in interpretation of the global climate system was provided in assessments carried out by the Intergovernmental Panel on Climate Change (IPCC). The most essential, all-time, milestone success of the climate policy was the Paris Agreement [18], adopted at the COP-21 of UNFCCC, held in Paris in December 2015. The Paris Climate Agreement set the specific, concrete, and ambitious, long-term goals of the global climate policy "to reduce effective GHG [Greenhouse Gas] emissions so that global temperature increase in the present century is constrained to at most 2 °C (preferably 1.5 °C) above the pre-industrial" [18]. Subsequent COPs revealed persistent gaps between ambition and action. The COP-28 in Dubai underscored the immense challenge of coping with the climate crisis [19], while COP-29 in Baku called for new global climate actions, albeit with limited binding commitments [20].

Unfortunately, the implementation of the Paris Agreement has not been satisfactory so far. The global GHG emissions, that should be reduced, keep growing [21,22], hence reaching both Paris Agreement guardrails (not only the more ambitious 1.5 °C but even the less ambitious 2 °C) is in jeopardy. As evaluated in [21], global CO_2 emissions in 2025 may have reached a marginal drop. However, due to large uncertainty involved it is safer to write about reaching a plateau, caused by a large drop in Land-Use Change (LUC)-related emissions that more than compensates a slight increase of emissions due to fossil fuel burning. Yet, atmospheric CO_2 concentration keeps growing [5,22]. While a clear pandemic lockdown-related drop in 2020 was visible in emissions, it did not show in concentrations. Now, the remaining CO_2 budget for a 50% probability to restrict warming to 1.5 °C is nearly exhausted. It is estimated that only 170 $GtCO_2$ of the remaining budget is left, equivalent to around four years at the level of 2025 emissions [22]. This means that exceeding the 1.5 °C level on a regular basis is virtually certain to happen within the next few years. The COP-30 demonstrated that global joint climate action is indispensable, but the time is running out [23].

Since 2025, international climate policy is subject to a blow due to the development of situation in the most powerful country of the world. The US engagement with the Paris Agreement has traced a zig-zag path in the last ten years. The country joined the Paris Agreement in 2016 under the 44th President Barack Obama, withdrew in 2017 under the 45th President, Donald Trump, re-entered in 2021 under the 46th President Joe Biden, and exited again under the 47th President, Donald Trump on the first day of his second term, 20 January 2025 [12]. In 2017, when explaining the rationale of exiting the Paris Agreement, President Trump stated "I happen to love the coal miners", and further, "I was elected to represent the citizens of Pittsburgh, not Paris" (https://trumpwhitehouse.archives.gov/briefings-statements/statement-president-trump-paris-climate-accord/ (accessed on 16 June 2026)). In fact, Paris Agreement was indeed coined and signed in Paris, but it has been serving not only the inhabitants of Paris and Pittsburgh, but also of Poland and China, and of the whole Planet Earth. The entire United States too.

In 2025, for the first time ever, the USA did not send an official delegation to the Conference of Parties of the United Nations Framework Convention on Climate Change, UNFCCC (COP 30), held in Belém, Brazil.

On 20 January 2025, President Trump also signed an executive order 'Unleashing American Energy', indicating re-orientation of US policy towards "maximizing the use of domestic energy resources, with priority given to oil, natural gas, coal, hydropower, biofuels, critical minerals and nuclear energy" [13]. He labelled the new US priority as "Drill, baby, drill!". Renewable energies like photovoltaics and wind energy were downplayed. Thorp [24] called the situation "The US marches boldly backward toward the past."

4. Discussion

4.1. Global Temperature

According to seven global datasets, the year 2025 ranks third (after 2024 and 2023) and according to two datasets it ranks second (after 2024) on record [5], see Table 1. All the years 2015–2025 were among 11 globally warmest years ever recorded (Table 1), for each of nine datasets considered. It is worthy of noting that the last three-year average (2023–2025) of global temperature anomaly attained a record high level, 1.48 °C (ensemble mean), and this also holds for each of nine datasets considered. For one individual dataset, the three-year average for 2023–2025 was equal to 1.5 °C and for another one, even greater than 1.5 °C (1.52 °C).

The fact that there are nine global databases that may show slightly different results (embracing various datasets) is a surprise to many an observer who would like to see an aggregated single database (that may come some time in the future) and agreed single ranking. Only for 2024 and 2019, all the nine databases show the same ranking (the warmest year and the sixth warmest year, respectively). For 2015, the ranking largely varies, ranging from rank seven after one database to rank eleven after another database. Entries in Table 1 show only three most meaningful digits, but since further digits are available, ordering was possible without ties.

Several recent publications heralded the advent of the breach of the 1.5 °C threshold stated in Paris Agreement, on a regular basis. Twelve consecutive months, from July 2023 to June 2024, with global temperature greater than or equal to 1.5 °C above the pre-industrial level were found to signal earlier than expected breach of Paris Agreement threshold [25]. A year above 1.5 °C (2024) was interpreted as a signal that Earth is most probably already within the 20-year period with global warming in excess of 1.5 °C above the pre-industrial [26].

In 2025, a La Niña year, ocean heat content was found to reach the record highest level in the whole observation period of 66 years [5]. Interestingly, each of the past nine years, 2017–2025, set a new record for ocean heat content [2]. The number of days with marine heatwaves has more than trebled in 1991–2025 [2]. The Earth is getting increasingly remote from the balance state. The year 2025 marked peak Earth's energy imbalance—a crucial integrative measure of the warming of the Earth [5] and the Earth energy imbalance has doubled in relation to 1976–1995 [2].

The recent C3S/ECMWF and WMO report on state of the climate in Europe [11] summarizes the temperature anomalies observed throughout Europe until 2025, inclusive. Almost the entire continent of Europe showed above-average mean annual temperature in 2025. In some areas, local records were spotted. For instance, in July 2025, sub-Arctic Fennoscandia experienced a heat wave lasting for 21 days (with anomaly of +10.2 °C), devastating the former record of consecutive 11 days (with anomaly of +10.8 °C).

Each month of the first half of 2026 has been by over 0.5 °C warmer than the 1991–2020 average and by almost 1.5 °C warmer than pre-industrial (1850–1900). May 2026 was declared by Copernicus Centre as, globally, the second warmest May ever [27] and June 2026—the warmest June ever. An unusually early and intense heat wave affected western Europe in May 2026, with daily average temperatures exceeding 10 °C above the long term mean.

In this paper, we only examine temperature, the most obvious attribute of global warming. However, climate change impacts embrace a broad range of issues, some of which are related to growing average temperature. Heat waves are getting more intense and more frequent in the warming world and affecting an increasing number of vulnerable older people. Sea level rise accelerates due to melting of glaciers (mountain glaciers, and—more pronounced—the Arctic and the Antarctic) and thermal expansion of sea water in the warmer world. Compound dry-hot extremes (favored by persistent high-pressure conditions and extreme temperatures) and wildfire incidents are on the rise. Also hot and humid spells can be a severe issue, because they impair human thermoregulation capacity—the human body cannot adapt through sweating and evaporative cooling if the air is saturated with moisture. There is more room for water vapor in the warmer atmosphere, hence there is an increasing potential for intense precipitation that can cause flash and urban flooding (the latter is amplified by urbanization). In the second half of June of 2026, a major heat wave hit the European continent—first Western and then Central and Eastern Europe and many temperature records of all times were established. We have no right to state that a particular heat wave was a result of climate change but we can say that the probability of exceedance of a high temperature threshold increases in the warmer climate. On 27 June 2026, the temperature record ever observed on Polish lands (40.2 °C) was exceeded at two stations, 40.3 °C in Torun and 40.5 °C in Slubice. Apart from direct health issues (morbidity and mortality) caused by heat waves themselves, there have been multiple secondary losses during the 2026 heat wave in Poland, such as drownings of people trying to cool down in surface waters during the scorching heat. Many elderly people intended to escape the heat travelling by rail to cooler regions, but trains were largely delayed, and some stopped for hours in the middle of nowhere under a cloudless sky with air conditioning system not operating properly because conditions were significantly more severe than the design assumptions. The heat wave and in particular its tail end, when strong gradients appeared, was accompanied by violent phenomena, such as heavy rainfall, thunderstorm, hail, and strong wind. These phenomena caused material and human losses, such as ripped-off roofs, broken or uprooted trees, hail damage to agriculture and horticulture, and a range of damages related to flash and urban floods.

Most forecast models suggest that in 2026/2027 El Niño will be at least moderate—and possibly strong. The summer of 2026 is heralded as hotter than normal across nearly all part of the globe [28]. It is a general observation that the warm ENSO phase, El Niño, begins developing between March and June and may reach its peak intensity between November and February (hence the name—El Niño, referring to Christmas as indication of the date of occurrence of maximum). Impacts of El Niño on global temperatures are typically most pronounced in the next year after development [28]. In June 2026, El Niño started to develop and is very likely to last at least until the winter of 2026/2027, with expected consequences to global temperature. If a moderate-to-strong El Niño develops in 2026 and no major volcanic eruption occurs, the probability of another near-record or record-warm year in 2027 may increase. “It will pour fuel on the fire of a warming world”—said UN Secretary-General António Guterres, in his video statement [29]. Nevertheless, such a projection remains conditional and should be interpreted with caution, given the inherent limitations in long-lead ENSO forecasting and the influence of unpredictable external forcings.

According to UK Met Office, “It is likely (86% chance) that one year between 2026 and 2030 will surpass 2024 as the warmest year on record” [30].

Over the last 30 years (1996–2025), Europe was found [11] to be the fastest-warming continent (+0.56 °C/decade) and the Arctic—the fastest-warming region (+0.75 °C/decade). The only exception to the warming pattern, a “North Atlantic cold blob”, could be observed over the ocean, south of Greenland.

4.2. Climate Policy

On 23 September 2025, at the 80th session of the UN General Assembly, President Donald J. Trump delivered a lengthy, improvised (without a teleprompter) speech [14,15], addressed towards the supreme international body. In his meandering talk, amidst many digressions, President Trump enforced a frontal attack on international energy policy, climate change policy and climate change science. He informed the world that the US is “getting rid of falsely named renewables". "They are a joke. They don't work. They are too expensive". This is in contrast with Thorp [24] who re-iterated the observation from New York Times: "Chinese solar panels are literally the cheapest form of energy we have ever had on Earth" and further noted that: "Many of the technologies that have led to this remarkable rise of renewables were developed in the United States, but advances in perfecting and manufacturing them have taken place in China. China is reaping the benefits economically, supplying 80% of the world's solar cells and 70% of its wind turbines…"

In his speech at UN General Assembly [14,15], President Trump called wind energy "most expensive energy ever conceived". He stated that China builds wind mills and sells them abroad but barely uses them. This is in sharp contrast with reality. According to World Wind Energy Association, the record-breaking wind power capacity expansion in 2025 was overwhelmingly driven by China, "which alone accounted for 77% of global additions" [31]. This means that in 2025 China installed more than three times as much wind power as the rest of the world combined. China represents an overall share of more than 50% of the world total wind power capacity. It was noted in [32] that "all of the world's six largest wind turbine manufacturers are Chinese, displacing once-dominant European firms and companies like General Electric." Indeed, China's CO_2 emissions have increased over the past two decades, rising from 3.6 billion tonnes in 2000 to 12.3 billion tonnes by 2024. However, under China's "dual carbon" policy framework—which aims to peak CO_2 emissions before 2030 and achieve carbon neutrality before 2060—the country is actively pursuing its climate goals. In line with this commitment, emissions under the SSP2-com scenario are projected to peak around 2030 and then decline steadily toward net-zero by 2060–2070 (Figure 3a). China is making tangible progress toward these targets. The share of electricity produced from renewable sources increased from 16.6% in 2000 to 37.0% in 2025 (Figure 3b), demonstrating that the country is not only the world's largest solar cell and wind turbine manufacturer but also increasingly relying on clean energy to meet its domestic electricity demand.

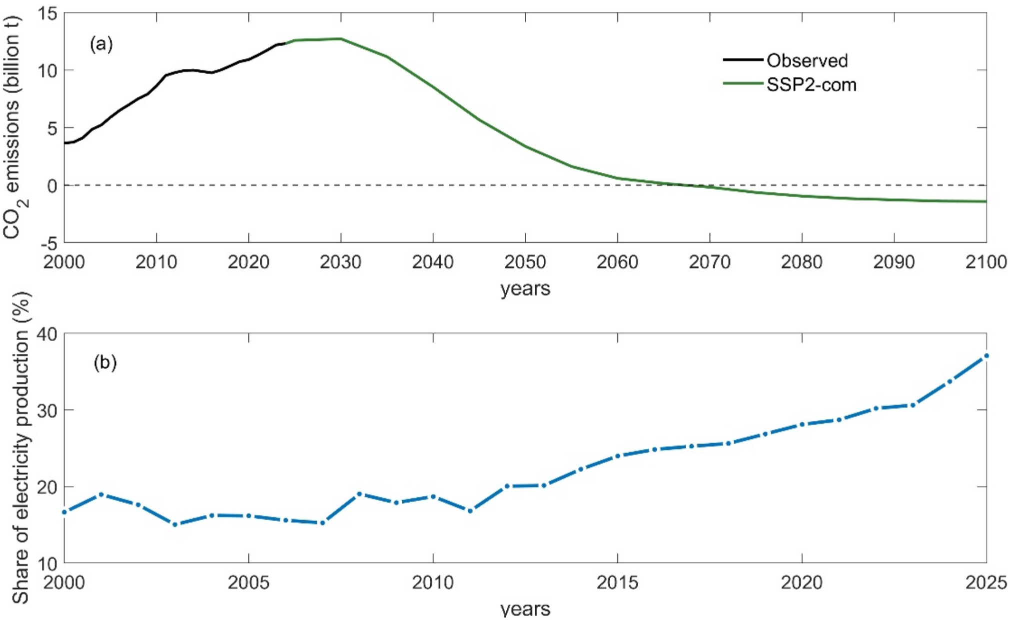

Figure 3. Changes in (**a**) CO_2 emissions from 2000 to 2024 (observations) and from 2025 to 2100 (projections) and (**b**) estimated share of electricity production from renewable sources from 2000 to 2025 in China. (Data Source: [7,10]).

In his speech at UN General Assembly [14,15], President Trump stated that climate change was "the greatest con job ever perpetrated on the world" and that "carbon footprint is a hoax". He ridiculed climate change predictions, stating arrogantly: "All of these predictions made by the United Nations and many others, often for bad reasons, were wrong… They were made by stupid people." This opinion looks rather weird in the context of the fact that it was three times when the Nobel Prize was bestowed in areas directly related to climate change—for improving understanding of the complex physical climate system, climate economy, and climate-related peace and security. In 2007, Peace Nobel Prize was awarded to IPCC (Intergovernmental Panel on Climate Change) and Al Gore. In 2018, the Nobel Prize in Economy was bestowed upon William Nordhaus, for results of his work, combining climate change and economy. In 2021, the Nobel Prize in Physics was awarded to three climate change scientists—Syukuro Manabe (pioneer in linking atmospheric CO_2 concentration and global warming that is essential in climate change projections), Klaus Hasselmann and Giorgio Parisi.

In his speech at the UN General Assembly, President Trump violently criticized the international climate and energy policies, stating "The primary effect of these brutal green energy policies has not been to help the environment but to redistribute manufacturing and industrial activity from developed countries that follow the insane rules that are put down to polluting countries that break the rules and are making a fortune." This is very far away from the UN narrative of "common but differentiated responsibility", guiding the international climate policy.

Future climate change depends on the efficiency of climate change mitigation and energy transition. The aim of the international climate policy is to build up the climate resilience, that is resilience of environmental, social, and economic systems to climate change, allowing the inhabitants of the Earth to manage the Global Commons while staying in safe operating space within Earth System Boundaries [33,34].

In 2025, S*cience* magazine declared 'Rise of the Renewables' as its 'Breakthrough of the Year'. It is estimated that in 2025 more power was generated, globally, from renewable energy sources than from coal and this can be regarded as a moderate success of international climate policy, promising some hope for the future [20]. In his closing address to COP-30 plenary, Simon Stiell, UN Climate Change Executive Secretary, noted that despite "stormy political waters, denial and division…with one country stepping back…, remaining 194 nations [signatories to UNFCCC] said in unison that the global transition to low greenhouse gas emissions and climate resilience is irreversible" [35]. Further vigorous efforts in climate change mitigation are clearly indispensable to secure this irreversible transition [36].

5. Conclusions

Globally, the year 2025 was not as warm as the record year 2024, but it still belongs to the three warmest years ever observed. We convincingly demonstrate that the heat goes on and on. The lack of global temperature record in 2025 (after record years 2023–2024) is completely understandable and, in fact, expected in the light of natural variability. There was a cold ENSO phase, La Nina, over most of 2024 and nearly complete year 2025. We illustrate the link between global temperature variability and ocean-atmosphere oscillations, announcing a good chance for a new global temperature record in 2027 if the warm phase of ENSO develops as indicated by most projections and if no major volcanic eruption occurs.

We update the information on international climate policy path, emphasizing its so-far successes and failures. Indeed, even if the year 2025 was marked with "stormy political waters", yet a moderate success in decarbonizing the energy could be spotted.

Author Contributions

Z.W.K.: conceptualization, methodology, data curation, writing—original draft preparation, reviewing and editing; J.H.: methodology, data curation, software; visualization, investigation; writing—reviewing and editing. Both authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The authors used the data that are openly available under links identified in this paper.

Conflicts of Interest

Given the roles of Z.W.K. (Deputy Editor-in-Chief) and J.H. (Editorial Board Member) at Climate Change, Risk and Resilience, they had no involvement in the peer review of this paper and had no access to information regarding its peer-review process. Full responsibility for the editorial process of this paper was delegated to another editor of the journal.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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