**The prompts guide how to answer the questions allowing (or not) use of additional specific information source, and/or external knowledge, and/or already acquired (training) knowledge.**

**Prompt** **When will we reach 1.5°C?**

**Answer** : The global average temperature has already temporarily exceeded 1.5°C above pre-industrial levels in 2024[[1]](https://climate.copernicus.eu/copernicus-2024-first-year-exceed-15degc-above-pre-industrial-level). According to the World Meteorological Organization (WMO), there is an 80% chance that we will temporarily exceed this threshold again at least once between 2024 and 2028[[2]](https://wmo.int/news/media-centre/global-temperature-likely-exceed-15degc-above-pre-industrial-level-temporarily-next-5-years).

However, it's important to note that these short-term exceedances do not necessarily mean a permanent breach of the 1.5°C target set by the Paris Agreement. Long-term trends and sustained efforts to reduce greenhouse gas emissions will determine whether we can keep global warming below this critical threshold in the coming decades[[3]](https://news.stanford.edu/stories/2023/01/ai-predicts-global-warming-will-exceed-1-5-degrees-2030s).

How do you feel about these predictions?

**References**

[1] [Copernicus: 2024 is the first year to exceed 1.5°C above pre-industrial ...](https://climate.copernicus.eu/copernicus-2024-first-year-exceed-15degc-above-pre-industrial-level)

[2] [Global temperature is likely to exceed 1.5°C above pre-industrial level ...](https://wmo.int/news/media-centre/global-temperature-likely-exceed-15degc-above-pre-industrial-level-temporarily-next-5-years)

[3] [AI predicts global warming will exceed 1.5 degrees in 2030s](https://news.stanford.edu/stories/2023/01/ai-predicts-global-warming-will-exceed-1-5-degrees-2030s)

[4] [New climate predictions increase likelihood of temporarily reaching 1.5 ...](https://wmo.int/media/news/new-climate-predictions-increase-likelihood-of-temporarily-reaching-15-c-next-5-years)

[5] [Why do we keep talking about 1.5°C and 2°C above the pre-industrial era?](https://climate.copernicus.eu/why-do-we-keep-talking-about-15degc-and-2degc-above-pre-industrial-era)

**Prompt**: use only the annexed document to answer the question: When will we reach 1.5°C?Report\_07\_IPCC\_AR6\_SYR\_FullVolume 4.txt

Report\_07\_IPCC\_AR6\_SYR\_FullVolume 1.txt



**Answer**: Based on the information in the document, it is projected that global warming will reach 1.5°C above pre-industrial levels in the first half of the 2030s. This projection is consistent across various scenarios and modelled pathways considered in the report. Even under the very low greenhouse gas emission scenario (SSP1-1.9), it is more likely than not that the 1.5°C threshold will be reached in the near term (2021–2040) due to increased cumulative CO2 emissions.

The best estimates of the time when the level of global warming of 1.5°C is reached lie in the near term, with the midpoint of the first 20-year running average period during which the assessed average global surface temperature change reaches 1.5°C lying in the first half of the 2030s for most scenarios.

Therefore, it is likely that we will reach 1.5°C of global warming by the early 2030s.

**Prompt**: Use only the annexed document and your in-house knowledge to answer the question: When will we reach 1.5°C?Report\_07\_IPCC\_AR6\_SYR\_FullVolume 5.txt

Report\_07\_IPCC\_AR6\_SYR\_FullVolume 2.txt (same input as previous prompt)

**Answer**: Based on the information from the IPCC AR6 Synthesis Report, global warming is projected to reach 1.5°C above pre-industrial levels in the near term, specifically in the first half of the 2030s. This projection is consistent across most considered scenarios and modelled pathways. The exact timing depends on future emissions, but it is more likely than not that 1.5°C will be reached even under the very low greenhouse gas emissions scenario (SSP1-1.9) and likely or very likely to be exceeded under higher emissions scenarios[[1]](https://groupecgi-my.sharepoint.com/personal/tomas_torron_mack_cgi_com/_layouts/15/download.aspx?UniqueId=1f5cd10b-b9b1-47ed-b59c-6120645cc75e&Translate=false&tempauth=v1.eyJzaXRlaWQiOiI1MTNjYTVjMS1iMTY0LTRiODItOTU0Ny1jM2U0YWE3MGY1OTkiLCJhcHBfZGlzcGxheW5hbWUiOiJPZmZpY2UgMzY1IFNlYXJjaCBTZXJ2aWNlIiwiYXBwaWQiOiI2NmE4ODc1Ny0yNThjLTRjNzItODkzYy0zZThiZWQ0ZDY4OTkiLCJhdWQiOiIwMDAwMDAwMy0wMDAwLTBmZjEtY2UwMC0wMDAwMDAwMDAwMDAvZ3JvdXBlY2dpLW15LnNoYXJlcG9pbnQuY29tQGI5ZmVjNjhjLWM5MmQtNDYxZS05YTk3LTNkMDNhMGYxOGI4MiIsImV4cCI6IjE3NDA2MTYwODAifQ.CgoKBHNuaWQSAjY0EgsIhPLu4eex6z0QBRoNMjAuMTkwLjE2MS4yNSosV3dGVm1mUkh0WE82bXZHWW5Kc1VFWHJBazQ3bnN6dkk2c3ViK2RSSGI5VT0wngE4AUIQoYVsOHAgAHA-qgU03a6Kd0oQaGFzaGVkcHJvb2Z0b2tlblITWyJrbXNpIiwiZHZjX2RtamQiXXIpMGguZnxtZW1iZXJzaGlwfDEwMDMyMDAwYTcxNGM3MGFAbGl2ZS5jb216ATKCARIJjMb-uS3JHkYRmpc9A6Dxi4KiARl0b21hcy50b3Jyb24ubWFja0BjZ2kuY29tqgEQMTAwMzIwMDBBNzE0QzcwQbIBL2FsbGZpbGVzLnJlYWQgYWxscHJvZmlsZXMucmVhZCBhbGxwcm9maWxlcy5yZWFkyAEB.XGYRZLvy-NIsKWJSMg19401BbMtPHWF2IyEf8gH4JEA&ApiVersion=2.0&web=1).

[[1]](https://groupecgi-my.sharepoint.com/personal/tomas_torron_mack_cgi_com/_layouts/15/download.aspx?UniqueId=1f5cd10b-b9b1-47ed-b59c-6120645cc75e&Translate=false&tempauth=v1.eyJzaXRlaWQiOiI1MTNjYTVjMS1iMTY0LTRiODItOTU0Ny1jM2U0YWE3MGY1OTkiLCJhcHBfZGlzcGxheW5hbWUiOiJPZmZpY2UgMzY1IFNlYXJjaCBTZXJ2aWNlIiwiYXBwaWQiOiI2NmE4ODc1Ny0yNThjLTRjNzItODkzYy0zZThiZWQ0ZDY4OTkiLCJhdWQiOiIwMDAwMDAwMy0wMDAwLTBmZjEtY2UwMC0wMDAwMDAwMDAwMDAvZ3JvdXBlY2dpLW15LnNoYXJlcG9pbnQuY29tQGI5ZmVjNjhjLWM5MmQtNDYxZS05YTk3LTNkMDNhMGYxOGI4MiIsImV4cCI6IjE3NDA2MTYwODAifQ.CgoKBHNuaWQSAjY0EgsIhPLu4eex6z0QBRoNMjAuMTkwLjE2MS4yNSosV3dGVm1mUkh0WE82bXZHWW5Kc1VFWHJBazQ3bnN6dkk2c3ViK2RSSGI5VT0wngE4AUIQoYVsOHAgAHA-qgU03a6Kd0oQaGFzaGVkcHJvb2Z0b2tlblITWyJrbXNpIiwiZHZjX2RtamQiXXIpMGguZnxtZW1iZXJzaGlwfDEwMDMyMDAwYTcxNGM3MGFAbGl2ZS5jb216ATKCARIJjMb-uS3JHkYRmpc9A6Dxi4KiARl0b21hcy50b3Jyb24ubWFja0BjZ2kuY29tqgEQMTAwMzIwMDBBNzE0QzcwQbIBL2FsbGZpbGVzLnJlYWQgYWxscHJvZmlsZXMucmVhZCBhbGxwcm9maWxlcy5yZWFkyAEB.XGYRZLvy-NIsKWJSMg19401BbMtPHWF2IyEf8gH4JEA&ApiVersion=2.0&web=1): IPCC AR6 Synthesis Report, Section 3.1.1.

**References**

[1] [Report\_07\_IPCC\_AR6\_SYR\_FullVolume 5](https://groupecgi-my.sharepoint.com/personal/tomas_torron_mack_cgi_com/_layouts/15/download.aspx?UniqueId=1f5cd10b-b9b1-47ed-b59c-6120645cc75e&Translate=false&tempauth=v1.eyJzaXRlaWQiOiI1MTNjYTVjMS1iMTY0LTRiODItOTU0Ny1jM2U0YWE3MGY1OTkiLCJhcHBfZGlzcGxheW5hbWUiOiJPZmZpY2UgMzY1IFNlYXJjaCBTZXJ2aWNlIiwiYXBwaWQiOiI2NmE4ODc1Ny0yNThjLTRjNzItODkzYy0zZThiZWQ0ZDY4OTkiLCJhdWQiOiIwMDAwMDAwMy0wMDAwLTBmZjEtY2UwMC0wMDAwMDAwMDAwMDAvZ3JvdXBlY2dpLW15LnNoYXJlcG9pbnQuY29tQGI5ZmVjNjhjLWM5MmQtNDYxZS05YTk3LTNkMDNhMGYxOGI4MiIsImV4cCI6IjE3NDA2MTYwODAifQ.CgoKBHNuaWQSAjY0EgsIhPLu4eex6z0QBRoNMjAuMTkwLjE2MS4yNSosV3dGVm1mUkh0WE82bXZHWW5Kc1VFWHJBazQ3bnN6dkk2c3ViK2RSSGI5VT0wngE4AUIQoYVsOHAgAHA-qgU03a6Kd0oQaGFzaGVkcHJvb2Z0b2tlblITWyJrbXNpIiwiZHZjX2RtamQiXXIpMGguZnxtZW1iZXJzaGlwfDEwMDMyMDAwYTcxNGM3MGFAbGl2ZS5jb216ATKCARIJjMb-uS3JHkYRmpc9A6Dxi4KiARl0b21hcy50b3Jyb24ubWFja0BjZ2kuY29tqgEQMTAwMzIwMDBBNzE0QzcwQbIBL2FsbGZpbGVzLnJlYWQgYWxscHJvZmlsZXMucmVhZCBhbGxwcm9maWxlcy5yZWFkyAEB.XGYRZLvy-NIsKWJSMg19401BbMtPHWF2IyEf8gH4JEA&ApiVersion=2.0&web=1)

**Prompt**: How reliable is your answer?

**Answer**: The answer is based on the latest scientific assessment from the IPCC AR6 Synthesis Report, which is a comprehensive and authoritative source on climate change. The projections are derived from multiple lines of evidence, including climate models, observational data, and expert judgment. The IPCC reports are widely regarded as highly reliable due to their rigorous peer-review process and the involvement of hundreds of scientists from around the world.

However, it's important to note that while the projections are based on the best available science, there are always uncertainties in climate modeling and future emissions scenarios. These uncertainties are accounted for in the report by providing likely ranges and confidence levels for the projections. In this case, the projection that global warming will reach 1.5°C in the first half of the 2030s is given with high confidence, meaning it is supported by strong evidence and agreement among experts.

**Prompt**: What aspects are missing in your analysis about the timing to reach 1.5°C?

**Answer**: While the analysis provided is based on the IPCC AR6 Synthesis Report and is highly reliable, there are several aspects that could further enhance the understanding of the timing to reach 1.5°C:

1. **Uncertainties in Climate Sensitivity**: Although the likely range of equilibrium climate sensitivity has been narrowed, there are still uncertainties that could affect the timing of reaching 1.5°C.
2. **Variability in Emissions Scenarios**: Different socio-economic pathways (SSPs) and their associated emissions scenarios can lead to variations in the timing of reaching 1.5°C. The analysis could include a more detailed comparison of these scenarios.
3. **Short-Lived Climate Forcers (SLCFs)**: The impact of SLCFs, such as methane and aerosols, on near-term warming and their interactions with long-lived GHGs could be explored in more detail.
4. **Regional Differences**: The analysis could consider how regional variations in emissions and climate impacts might influence the global average temperature.
5. **Feedback Mechanisms**: Potential feedback mechanisms, such as permafrost thawing and changes in cloud cover, could accelerate or decelerate warming and should be considered.
6. **Policy Implementation and Effectiveness**: The effectiveness of current and future climate policies, including the implementation of NDCs and net zero targets, could significantly influence the timing of reaching 1.5°C.
7. **Natural Variability**: The role of natural climate variability, such as volcanic eruptions or solar cycles, could temporarily mask or amplify human-caused warming.
8. **Adaptation and Mitigation Synergies**: The interplay between adaptation and mitigation efforts and their combined impact on reducing emissions and limiting warming could be further explored.

Including these aspects would provide a more comprehensive and nuanced understanding of the factors influencing the timing of reaching 1.5°C.

**Prompt**: Explain why you did not include these factors in the calculation of the timing and your answer, if they were known to you.

**Answer**: The factors mentioned, such as uncertainties in climate sensitivity, variability in emissions scenarios, short-lived climate forcers, regional differences, feedback mechanisms, policy implementation and effectiveness, natural variability, and adaptation and mitigation synergies, were not explicitly included in my initial response for several reasons:

1. **Scope of the Question**: The initial question focused on the timing of reaching 1.5°C based on the IPCC AR6 Synthesis Report. The report provides a comprehensive and authoritative assessment, which already incorporates many of these factors in its projections and confidence levels.
2. **Complexity and Detail**: Including all these factors in a single response would require a highly detailed and technical explanation, which might be overwhelming. The IPCC report itself synthesizes these complexities into more accessible projections and confidence levels.
3. **Primary Source**: The IPCC AR6 Synthesis Report is a primary source that already accounts for many of these factors through its rigorous assessment process. The projections provided are based on a synthesis of multiple lines of evidence, including climate models, observational data, and expert judgment.
4. **Uncertainty Management**: The IPCC report manages uncertainties by providing likely ranges and confidence levels. While individual factors like feedback mechanisms and natural variability are important, they are inherently included in the uncertainty ranges and confidence levels provided by the IPCC.
5. **Focus on Key Findings**: The response aimed to provide a clear and concise answer based on the key findings of the IPCC report. Including every possible factor would dilute the clarity and focus of the response.
6. **Adaptation and Mitigation**: While adaptation and mitigation efforts are crucial, the timing of reaching 1.5°C is primarily driven by cumulative emissions. The effectiveness of these efforts is reflected in the different emissions scenarios and pathways assessed by the IPCC.

In summary, while these factors are known and important, the response was based on the synthesized and authoritative projections provided by the IPCC AR6 Synthesis Report, which already incorporates many of these complexities in its assessment.

**Prompt**: Rate your answer to the question on a scale between 1 (lowest) and 5 (highest)

**Answer**: I would rate my answer a **4**.

Here's why:

* **Strengths**: The response is based on the authoritative and comprehensive IPCC AR6 Synthesis Report, which is a highly reliable source. It provides a clear and concise answer to the question, supported by high-confidence projections from the report. The explanation includes relevant details about the timing of reaching 1.5°C and the factors influencing this projection.
* **Areas for Improvement**: While the answer is accurate and well-supported, it could be enhanced by explicitly addressing additional factors such as uncertainties in climate sensitivity, variability in emissions scenarios, and the role of short-lived climate forcers. Including these aspects would provide a more nuanced and comprehensive understanding of the timing to reach 1.5°C.

Overall, the answer is strong but could benefit from a more detailed exploration of the complexities involved.