The Basic Facts On Global Warming –

And What We Have To Do About It

Global warming is an existential threat to humanity.

But **many people have no clear information on global warming whatsoever or have doubts** on the information they receive.

We include this overview over the fundamental data on global warming as well as some thoughts and suggestions on how to deal with the problem in this website www.optimizingdemocracy.org, since the problem highlights our urgent need for national and international leadership and democratic policy making systems of the highest quality. Never in its history has mankind as a whole been facing an existential joint threat as climate change poses it[1].

If you have any comments and suggestions on the following overview and the data included, please contact us at opt_democracy@btinternet.com.

I. Our personal obligation to verify the information

- Many people have doubts on the information they receive on global warming.
- But if the perhaps largest joined research endeavour which the world has ever undertaken suggests

  that we,

  human beings, are destroying the world of our children and grand-children, of future generations with man-made global warming,

  we, personally, have to verify in detail, whether this is the case.

- Each of us, personally is responsible for this world.
- We are responsible to our children and grandchildren and to future generations to protect it (rather than to create life threatening danger for them).

- Having children or looking forward for grandchildren does not make sense, if we accept the risk for climate change to destroy their world.

- Relying on random newspaper information on global warming is not enough, even negligent.

- We must verify ourselves exactly, whether the statement that the world is at stake is true.

- We must ask our governments to arrange for a detailed and completely open public assessment of the data and of the consequences of global warming, an assessment in which all positions on global warming must be heard and included.

- Our governments appear responsible to ensure that all citizens understand the fundamental facts to ensure effective action against climate change, just as our governments request that drivers understand the traffic rules.

II. Our obligation to discuss and clarify what to do

- We also have to have a detailed public discussion on what to do about the threat of global warming.

- We have to jointly decide whether to save the earth or not.

- And if yes, how to do this.

- We must demand such an effective discussion from our governments.

III. Potential or probable consequences of global warming

- **More frequent extreme weather around the world**: hurricanes, rain, floods, and heat waves. Desertification.

- **Constantly increasing sea levels**, up to 0.8 meters possibly this century (some scientists predict substantially higher levels) and possibly up to 15-25 meters over the next centuries or millennia.

- **Draught and desertification destroy crops.**

- **Pests, more insects.**

- **Extinction of up to 50% of all species by the end of this century** (due to interdependence of all life also affecting human life on earth substantially).

- **Destruction of food chains and food shortages.**

- **Increasing hunger, poverty, migration for millions.**

- **Increasing global insecurity, conflicts over resources, terrorism.**

- Sea levels rises of 20 meters over the coming centuries or millennia would mean flooding of large share of earth, especially low lying coastal land and river valleys, agricultural land and many, if not most, large global urban agglomerations in the world.

- This would affect the lives of billions and basically **destroy much of human civilisation on earth** (cf. also the documentary movie "The Age of Stupid").

IV. Suggestion that global warming would be a normal development in terms of earth history not acceptable

- One thing would be the destruction of the earth (or life on earth) by natural developments.

- Another matter is the destruction of the earth by human actions.

- Man-made destruction of earth for future generations appears not to be acceptable. (We would jointly have to confirm this understanding.)

- Man-made global warming is also a much faster development than any previous known natural process of global warming (for example after the Ice Age).[2] This speed makes adaptation processes even more difficult, perhaps impossible.

V. Evidence and present assessment of global climate change

- The global climate system is a gigantic system including radiation by the sun, global wind patterns, polar ice caps, ocean temperatures and streams etc.

- Assessing the behaviour of the global climate system is a matter of the highest complexity.

- **Even if much of the scientific understanding on man-made climate change is based on probabilities, partly on probabilities close to absolute certainty, we have to take the threats from global warming as real, because of their existential relevance for us and the lives of future generations.**

- **The basic interdependencies of processes appear obvious**, such as more heat causing the desertification of land, or more heat causing more vapour over oceans and more precipitation in certain parts of the world.

- **We have to avoid any existential risks for the entire world and future generations by "living carefully" and stopping CO^2 emissions.**

- The **main international body** for the assessment of international climate change is the **Intergovernmental Panel on Climate Change (IPCC)**, the United Nations agency to assess climate change, established in 1988.

- The agency presently is in the process of publishing its 5th Assessment Report (AR5) on global climate change.

- Section one of the report "*The physical science basis",* has been published in September 2013 (other sections on impacts of global warming and policy options to follow).

- **The preparation of this section by Working Group 1 (WG1 AR5) involved:**

    - **209 Lead Authors and 50 Review Editors from 39 countries**

    - More than 600 additional experts as Contributing Authors and to provide additional specific knowledge or expertise in a given area.

    - Total reviews of drafts included 54,677 comments by 1089 Expert Reviewers from 55 countries and 38 Governments.

- For further information on the preparation of the report see: WG1AR5_FactSheet.pdf at www.climatechange2013.org

- Given the size of the endeavours involved in the preparation of the report, it must be taken seriously.

- **To assess the endeavour which has gone into assessing global climate by yourself** you may want to simply leaf through the report at http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf

- If doubts in the findings exist, they should be put forward to governments for clarification.

- International scientists offer more information on critical questions about climate change at http://www.skepticalscience.com/argument.php (Site maintained by John Cook, Climate Communication Fellow for the Global Change Institute at the University of Queensland, Australia).

- A climate rapid response team presently comprising 160 scientists from established research institutions are furthermore prepared to answer any critical questions media and government institutions may have on global warming http://www.climaterapidresponse.org/

VI. The fundamental data on climate change

- **Global warming is happening and is manmade.** This is now "extremely likely", which means: **more than 95% certain**. (IPCC Working Group 1/ Assessment Report 5/Summary for Policy Makers p.12; for a classification of the probabilities used in the report cf. Table 1.2, p. 18 of the main report)

- **The recent slowdown in warming is found not to be representative of overall developments.** (cf. WG1 AR5, SPM p.10)

- **Global temperatures have already risen already by 0.85°C between 1880 and 2012.** (WG1 AR5 SPM. P. 3)

- **About three quarters of this rise (0.6°C) has occurred since the 1970s.** (Cf. James Hansen et alii., 2013[3])

- Not only the temperature of the atmosphere, but **also the temperature of the oceans is increasing**. (The oceans have actually absorbed 90% of the added energy. - cf. WG1 AR5 SPM, p.5)

- As a consequence the **humidity content in the troposphere, the lowest part of the atmosphere, has increased by 3.5%-4%[4]**

- This is an explanation for **more frequent, stronger precipitation** in some parts of the world (cf. WG1 AR5, SPM p. 16).

- Of interest for people in the northern hemisphere will be that global warming also explains **the observed reduction in spring snow cover** (probability "likely", i.e. 66 -100% probability, cf. SMP p 13).

- The **oceans are not only warming, but also acidifying** due to CO^2 in the air, the increase in acidity together with the warming affecting conditions for life in the oceans including microorganisms at the bottom of the food chain like zooplankton.

- **If we continue burning fossil fuels as we do, temperatures could rise up to around 5°C by the end of this century!** (Cf. UK Government, IPCC report, Key points and questions[5] and summary of IPCC report by German Government, p. 3[6])

- **Warming will continue beyond 2100 under all scenarios except one.** (WG1 AR5 SPM p. 15)

- **Most aspects of climate change will persist for many centuries, even if emissions are stopped.** (WG1 AR5 SPM p. 19.)

VII. Present proposals for policy action

- Our governments are suggesting we need to stop global warming at 2°C. (So far they cannot, however, agree on a strategy how to achieve this goal.[7])

- A number of scientists around the reputable U.S. climatologist James Hansen suggest this goal is far too dangerous ("highly deleterious" in their terms)[8].

- They suggest we must keep global temperatures at the present level (already 0.85°C warmer than one hundred years ago). Higher temperature increases might cause "self-heating action" and spiral the global climate out of control.[9]

- According to Hansen we need to reduce global CO^2 emissions by at least 6% annually beginning in 2013 and capture a major share of CO^2 also by a significant global re-forestation effort (if we were to begin with CO^2 reductions only in 2020 the reduction rate would have to be 15% per year.[10]

- Reducing CO^2 by 6% per annum might be feasible. Reducing CO^2 by 15% per year will be much more difficult.

- We must initiate and demand a quick clarification from our governments on which precise strategy is necessary.

- All in all, stopping global climate change will require a unique, mutually supportive, collaborative effort not only by governments, but by global

society as a whole, comparable to the “war efforts” of the societies of the Allied Powers during WWII.

VIII. Required personal measures to combat climate change

- Even if our governments cannot agree on required strategies and measures, we as citizens of the globe are personally responsible for this world.

- We should already adopt a personal strategy on how to reduce our personal CO^2 emissions step-by-step independently of government action.

- A non-profit organization (**“10:10”**) suggests that we personally commit to reducing our personal CO^2 emissions by 10% per year. This is roughly in line with the suggestions made by Hansen for joint global efforts.
  Cf.: http://www.1010global.org/uk

- The more people take this action in a country and around the globe the more people will be encouraged to join.

- We can insulate our homes, drive smaller cars, plant trees. We can build more cycle tracks and cycle more. We can use human creativity to invent new technical solutions for our needs in order to combat climate change.

- An illustration for possible personal action and necessary changes in the way we live can also be found in **“How to save the climate”** by Greenpeace at http://www.greenpeace.org/international/Global/international/planet-2/report/2007/4/how-to-save-the-climate-pers.pdf (Information valuable, even if Greenpeace in the document still subscribes to the 2°C warming limit, which may have to be adapted.)

- We also must request from our governments that they submit a comprehensive strategy to stop global warming involving all sectors of society (the strategy must assess and comment on the proposal by James Hansen on the necessary CO^2 reductions and take any other policy proposals into account).

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[1] Other extraordinary challenges certainly were the Black Death or the nuclear threats of the Cold War.

[2] James Hansen, Pushker Kharecha, Makiko Sato, Valerie Masson-Delmotte, Frank Ackerman, David J. Beerling, Paul J. Hearty, Ove Hoegh-Guldberg, Shi-Ling Hsu, Camille Parmesan, Johan Rockstrom, Eelco J. Rohling, Jeffrey Sachs, Pete Smith, Konrad Steffen, Lise Van Susteren, Karina von Schuckmann, James C. Zachos*, Assessing ‘‘Dangerous Climate Change’’: Required Reduction*

of Carbon Emissions to Protect Young People, Future Generations and Nature, PLOS ONE | www.plosone.org 1 December 2013 | Volume 8 | Issue 12 | e81648, p. 14. Hansen et alii write: *"…there is no known case of a positive (warming) climate forcing as rapid as the anthropogenic change."*

[3] Ibid. p. 8

[4] Increase of 3.5% over the last 40 years consistent with 0.5°C temperature increase, medium confidence concerning human influence. Data from IPCC, WG1 AR4, Chapter 3.4.2.1 and WG1 AR5 Technical Summary p.42.

[5] https://www.gov.uk/government/publications/ipcc-report-key-points-and-questions/ipcc-report-key-points-and-questions

[6] http://www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/ipcc_sachstandsbericht_5_teil_1_bf.pdf

[7] Christina Figueres, Head of the IPCC, formulated at the end of the international Climate Conference in Warsaw in November 2013: *"The conference has brought us closer …to an agreement in 2015. It does not put us on track for a 2 degree world."* cf. UNFCCC closing press briefing Saturday 23 November at http://unfccc.int/meetings/warsaw_nov_2013/meeting/7649.php.

[8] Hansen et alii, p.9

[9] Ibid., p.13

[10] Ibid. p. 10