



A Realistic Path to a Bright Future

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James Hansen

Why is nobody telling young people the truth? “We preserved the chance at COP26 to keep global warming below 1.5°C.” What bullshit! “Solar panels are now cheaper than fossil fuels, so all we are missing is political will.” What horse manure! “If we would just agree to consume less, the climate problem could be solved.” More nonsense!

Young people, I am sorry to say that – although the path to a bright future exists and is straightforward – it will not happen without your understanding and involvement in the political process. Ever since 2008 I have been amazed by your acumen and your ability to affect national elections and appreciate global issues. With appropriate focus, you can alter the course of our world in a good way. I hope that you find something in my experiences that helps you in your pursuit of a bright future.

Do not feel sorry for yourself or get discouraged. Yours is not the first generation to be dealt a bad hand. Some were born into great depressions. Some were sent to fight in world wars or senseless conflagrations in far away places such as Viet Nam or Iraq. Your battle will cover more years. Nature has a long time scale in its response to human-caused forces, and it takes time to alter human-made energy systems. But your cause is noble – your challenge is nothing short of guiding humanity and other life on our planet to a bright future.

The long time scales should not dishearten you. The slow response of nature provides the time that is needed to alter the infrastructure of our energy systems and improve land use practices. However, your task is now urgent. The next 10 years – the fourth decade since the adoption of the Framework Convention on Climate Change in 1992 – must be the decade in which young people take charge of their own destiny.

On the scientific front, several colleagues and I assert that IPCC (Intergovernmental Panel on Climate Change) has underestimated the sensitivity of climate to growing freshwater injection from melting ice. One potential consequence – if we continue with business-as-usual emissions – is shutdown of the overturning North Atlantic and Southern Ocean overturning ocean circulations by midcentury, each of which will contribute to acceleration of mass loss from the Antarctic ice sheet, with the likelihood of sea level rise of several meters within the lifetime of children born today.

Existential climate threat arises from the combination of sea level rise, the increasing difficulty of life in the tropics and the subtropics in the summer as temperatures rise, and the increase of climate extremes as higher temperatures drive droughts, heat waves and fires, on one hand, but also heavier rains, greater floods and stronger storms on the other hand. These effects will increase emigration pressures from low latitudes and coastal cities, thus potentially creating a planet that is practically ungovernable.

Climate science reveals that we have overshoot sensible targets not only for atmospheric carbon dioxide, but also for global temperature. We will need to return to a global climate no warmer than the middle of the 20th century, and likely somewhat cooler, for the sake of maintaining global shorelines. That task is made more difficult by our Faustian bargain with particulate air pollution, which has tended to diminish global warming by reflecting sunlight to space. Our Faustian payment is coming due as health-damaging particulate pollution is being reduced, Earth's energy imbalance is increasing, and the rate of global warming is accelerating.

The good news is that the aerosol and climate research reveal a pathway by which the present extreme human-made interference with Earth's energy balance can be diminished as fossil fuel emissions decline and greenhouse gas levels diminish. Don't worry – it does not require Frankenstein geoengineering of our home planet. Instead, we should reduce our present human interference with nature as promptly as practicable. An early requirement is that global greenhouse gas emissions begin to decline during this 4th decade of the Framework Convention. That does not imply that we must reduce global energy use – on the contrary, more energy will be needed to reduce poverty and raise global living standards – rather it implies that we need a realistic clean-energy plan and that we carry out the R&D to support it.

China and the United States – as the largest current and historical sources of emissions – should cooperate to achieve the most rapid transition to clean energies. De facto cooperation of the West and China helped drive down the cost of renewable energies, but more extensive cooperation will be needed to apply the brakes to accelerating climate change. As the largest economies in the world, the two nations have the ability to alter the global energy pathway via agreement on simple, honest carbon pricing, but adequate pricing becomes practicable only in concert with advances in carbon-free energy technologies including modern nuclear power. To achieve the cooperation that will speed these advances, scientists in the West and East can help lay the groundwork by continuing and expanding their mutual research to promote common understanding.

Young people in the United States have the most urgent and crucial task: to fix the broken two-party political system. You have the power and the means to achieve the political transformation that is required to break the grip that special interests have on Washington, our energy systems, and your future, but the transformation requires that you understand the underlying problem and organize accordingly. The urgency has more to do with the boiling frustrations of the public as they witness the endemic graft and incompetence of our elitist government. Young people must learn not to follow the siren of old orators from the broken system. You must take charge of your future. You have the incentives and the abilities to achieve the changes that are needed for the sake of both your nation and the world.

As for climate science, we have our own challenges. The forces that humanity is exerting on the climate system are unprecedented. The great inertias of the massive ocean and ice sheets are the cause of the greatest threat – because future change builds up without the warnings that public response requires – but these inertias also provide us opportunity to achieve a soft landing for humanity and nature, provided that we have adequate understanding of the system. As with your politics, our science must advance this decade so as to be in position to provide the guidance required to achieve that soft landing. Global climate models are a useful tool for that purpose, but they must be matched by comparable focus on paleoclimate – especially the Eemian period, which appears to have been as warm as today – and on ongoing physical processes, especially in the ocean and the periphery of Antarctic ice.

I am sorry that we are leaving you – young people – with such a burden, but I know that you will accept it as a challenge. You have a magnificent opportunity to change the course of history this decade, to move the world onto a realistic path to a bright future for your own sake and for that of your children, grandchildren and future generations.