March 8, 2018 Fusion development’s time has run out.

It is time to massively deploy fission.

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The time for the research and development of fusion to solve the energy crisis of global warming has run out and it is time to turn to nuclear fission deployment on a scale appropriate to mitigate the climatologists’ dire predictions of warming, ocean acidification and level rising. During the next one hundred years a significant fraction of the world’s population will be dislocated or expire owing to mankind’s overuse of fossil fuels leading to 3.5 to 4.5 °C temperature rise.[[1]](#footnote-1) A 1 °C temperature increase in the US is predicted to reduce the annual GDP by 1.2%.[[2]](#footnote-2) Fusion development that was meant to mitigate these predictions has not yet even proven its feasibility, and economical competitiveness is surely many decades in the future if then.[[3]](#footnote-3) Fission, however, has been proven feasible and economical over half a century ago. We need to get on with deploying fission in one or more of its most promising variants along with other mitigating measures at a rate and schedule sufficient to mitigate the global warming, ocean level rising and acidification disasters.[[4]](#footnote-4)

By the 1960s fission power plants were pushing submarines around routinely, and in early fission plants electricity production economically outcompeted coal power plants in many places. Many fission plant variants proved feasible.[[5]](#footnote-5) At the same time research and development of fusion was vigorously underway. Now over half a century later fission electrical plants have gotten over 10% market share; however, fusion has far to go to make more electricity than consumed and still further to prove economic feasibility. To be fair, in the 1980s fusion demonstrations made more fusion energy than the input to the fusion reaction; however, this is far from making economical electrical energy for sale. Planned research and development of fusion for the 2020-2030s has the goal of electrical energy breakeven equivalent at a cost of several tens of billions of dollars. Apparently, decades later actual net electrical energy from fusion energy might be achieved but at a predicted cost substantially exceeding today’s power plant costs.

It is this person’s opinion that fusion’s R&D should continue vigorously because its promise and sapien’s future might depend on it eventually. However, time has run out on fusion to mitigate the climatologists’ predictions. We can and should turn to massive fission energy deployment. This is not to diminish the issue of proliferation of nuclear weapons nor the issue of nuclear wastes associated with fission and its safety. These issues with fission must be addressed increasingly while deploying tens of thousands of plants worldwide in the next 100 years from today’s approximately 400 plants in order to avoid the climatologists’ dire predictions.

1. . Intergovernmental Panel on Climate Change 2014: <http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf>. Figure 5. [↑](#footnote-ref-1)
2. . S. Hsiang, R. Kopp, A. Jina et al., “Estimating economic damage from climate change in the United States,” *Science*, **356** Issue 6345, pp 1362-1369 (2017). [↑](#footnote-ref-2)
3. . While this author advocates continuing to pursue vigorous fusion development, we can no longer delay alternative energy developments just as predicted in 1983 by L. M. Lidsky “The Trouble with Fusion,” Technology Review, Oct 1983 but now 35 more years have passed. [↑](#footnote-ref-3)
4. . For a further discussion of vigorous deployment of fission see: Ralph W. Moir, “The Nuclear Middle Way,” draft. <http://www.ralphmoir.com/wp-content/uploads/2017/08/The-Nuclear-Middle-Way8-7-17.pdf> [↑](#footnote-ref-4)
5. . Light water, heavy water, gas, molten salt and liquid metal variants have been demonstrated. [↑](#footnote-ref-5)