

Editorial

On Energy Resources, Climate Change, Fossil Fuels, and Drilling. Challenges in Tackling Problems by Governments in Europe and USA

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Received: 30 March 2016; Accepted: 30 March 2016; Published: 1 April 2016

This month in Italy a public consultation will decide (by majority, in case 50% of voters will participate) whether to renew the ongoing concessions between Italian government and drilling companies at the end of their contracts, even if the fossil fuels have not been extracted completely. The journal *Challenges* has invited scientists to express their opinion in favor or against the consultation, and we expect that the argument will touch the major debated topics such as climate change, renewable energies, and strategic use of fossil fuels. Drilling offshore has recently been the object of new legislation by the Italian government; however, the consultation deals only with existing drilling concessions within a 12 miles (22 km) sea area.

It is also a topic in the attention of the media. In fact, in USA, President Obama has halted Atlantic drilling, while keeping the Arctic and Gulf open for business [1]. The Obama administration declared Atlantic waters off limits for oil and gas leasing for the next five years.

The decision is a reversal of a prior draft that would have opened up wide swaths of the southeast Atlantic to drilling, which was strongly opposed by hundreds of coastal communities as well as environmental groups. The decision to pull Atlantic leases came despite the governors of North Carolina, South Carolina and Virginia expressing support for offshore drilling as a source of jobs and revenue. The Interior Department estimated in 2014 that 4.7 billion barrels of recoverable oil and 37.5 trillion cubic feet of natural gas lie below the Atlantic's outer continental shelf.

This is a balanced proposal that protects sensitive resources and supports safe and responsible development of the nation's domestic energy resources to create jobs and reduce our dependence on foreign oil. The proposal kept open the possibility of drilling in Arctic waters off Alaska and allowed continued leasing in the Gulf of Mexico.

Many opponents to the extraction of fossil fuels justify their renounced use with the COP21 statements, signed by all the participants to implement the production of renewable energies and reduce the use of fossil fuels. In particular, the containment of release of greenhouse gasses, and a more favorable GHG emission balance are the major points to be considered.

Nicholas Stern, chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science (LSE), and president of the British Academy, has published in *Nature* a critical review on current climate models, pointing to the need to set up new models taking in consideration economic losses [2]. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), published in 2013 and 2014, provided a comprehensive overview of the literature on the costs of action and inaction. However, the assessment understated the limitations of the research done so far. Many estimates of economic losses are based on the outputs of integrated assessment models (IAMs). These models attempt to combine the key elements of biophysical and economic systems. There is evidence that temperature increases of 1.5 °C and 2 °C would lead to differing extents of sea-level rise and extreme weather events.

In 2015, James Hansen, a pioneer of climate science, delivered a research-based finding: a little-known feedback cycle between the oceans and massive ice sheets in Antarctica and Greenland

might have already jump-started an exponential surge of sea levels. That would mean huge levels of sea level rise will happen quite soon. Hansen's best estimate was 2 to 5 meters between 2050 and 2100: this is five to 10 times faster than mainstream science has predicted. Now, after intense scrutiny by the scientific community, the findings have passed formal peer review and were published by Atmospheric Chemistry and Physics [3]. Hansen and his coauthors describe a world that may quickly start to spin out of control if humans keep burning fossil fuels at close to the current rate. Moreover, given the assumed accelerated pace of melting, all this could happen just decades from now, not centuries. The biggest scientific contribution that Hansen and his colleagues make is an attempt to nail down a Moore's law (which models nonlinear rates of growth in computer chips) to ice sheets. Assuming non-linear processes have already begun, how fast will Greenland and Antarctica melt? Through scrutiny of climate models, evidence of ancient sharp shifts in climate, and observations of rapid change over the past few decades, Hansen lays out possible futures that put us past the point of no return. The paper's conclusions on sea level rise go far beyond current scientific consensus. Hansen suggests "several meters" of sea level rise over the next 50 to 150 years given a continued high rate of fossil fuel emissions, well above the accepted 1 meter or so by the end of the century [4].

On 12 March 2016, data released from NASA confirmed that February 2016 was not only the warmest month ever measured globally, at 1.35 °C above the long-term average [5]. It was more than 0.2 °C warmer than the previously most unusually warm month ever measured, January 2016. The new NASA data confirms unofficial data released earlier this month showing a dramatic and ongoing surge in the planet's temperature. The data, upon which the previous versions of this post were based, were an underestimate. Gavin Schmidt, director of NASA's Goddard Institute for Space Studies, which maintains the NASA temperature database, noted that February's temperature record was "special". NASA's global temperature data is measured from a 1951–1980 baseline, about 0.3 degrees warmer than pre-industrial levels. That means February 2016 was the first month in history that global average temperatures passed the 1.5 °C mark. Also, since last month's warmth was concentrated in the Northern Hemisphere (2.76 °C warmer than the 1951–1980 baseline) and the Arctic (5.36 °C warmer than the 1951–1980 baseline), these regions of our planet were also record warm, likely the warmest they have been for at least thousands of years. Even though this surge of warmth is likely only temporary, it is a major milestone moment for humanity and our relationship to our planet. A daily analysis of global temperatures shows the Northern Hemisphere likely exceeded 2 °C above "normal" around 1 March 2016, when measuring from pre-industrial levels. The heat wave has continued until now. As of 12 March 2016, it appears that average temperatures across the Northern Hemisphere have breached the 2 °C above "normal" mark for the first time in recorded history, and likely the first time since human civilization began thousands of years ago. That mark has long been held as the point above which climate change may begin to become "dangerous" to humanity. It's now arrived, much more quickly than anticipated. Parts of the Arctic were more than 16 °C warmer than "normal" for the month of February, bringing them a few degrees above freezing, on par with typical June levels, in what is typically the coldest month of the year. In the United States, the winter was record-warm in cities coast to coast. In Europe and Asia, dozens of countries set or tied their all-time temperature records for February. In the tropics, the record-warmth is prolonging the longest-lasting coral bleaching episode ever seen.

In conclusion, with this editorial we are launching a change in journal policy, with opinion articles and letters to the editor that will be open to the readers without peer-review editing. The aim is to leave the community to debate freely the topics and to increase the number of editions in order to take into account the new challenges science will face in the future.

Conflicts of Interest: The author declares no conflict of interest.

References

1. McKenna, P. Obama Halts Atlantic Drilling, but Keeps Arctic and Gulf Open for Business. Available online: <http://insideclimatenews.org/news/15032016/obama-halts-atlantic-drilling-keeps-arctic-and-gulf-open-business> (accessed on 24 March 2016).
2. Stern, N. Economics: Current climate models are grossly misleading. *Nature* **2016**, *530*, 407–409. [[CrossRef](#)] [[PubMed](#)]
3. Hansen, J.; Sato, M.; Hearty, P.; Ruedy, R.; Kelley, M.; Masson-Delmotte, V.; Russell, G.; Tselioudis, G.; Cao, J.; Rignot, E.; *et al.* Ice melt, sea level rise and superstorms: Evidence from paleoclimate data, climate modeling, and modern observations that 2 °C global warming could be dangerous. *Atmos. Chem. Phys.* **2016**, *16*, 3761–3812. [[CrossRef](#)]
4. Hansen, J. Bombshell Climate Warning Is Now Part of the Scientific Canon. Available online: http://www.slate.com/blogs/the_slatest/2016/03/22/james_hansen_sea_level_rise_climate_warning_passes_peer_review.html (accessed on 24 March 2016).
5. Holthaus, E. Our Planet's Temperature Just Reached a Terrifying Milestone. Available online: http://www.slate.com/blogs/future_tense/2016/03/01/february_2016_s_shocking_global_warming_temperature_record.html (accessed on 24 March 2016).



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