THE WEEK IN ENERGY CLIMATE SHOCK *

The difference between 1.5C and 2C of global warming might not sound like much, but according to the scientists who work on the reports from the Intergovernmental Panel on Climate Change, it matters a lot. A "special report" from the IPCC, published on Monday, showed some of the reasons why. At 1.5C of warming, starting from before the industrial revolution, the Arctic could be expected to be free of sea ice one time every century. With 2C of warming, that would be expected at least once a decade. At 1.5C of warming, coral reefs are projected to decline by a further 70—90 per cent, but at 2C they are expected to fall by more than 99 per cent. Climate policy has taken that difference into account: under the 2015 Paris agreement, the world's governments committed not only to holding the increase in the global average temperature to "well below" 2C, but also to "pursuing efforts" to limit it to 1.5C.

The IPCC report this week gave a sense of how colossal those efforts would have to be. Chapter 2 is devoted to "mitigation pathways compatible with 1.5C"; in other words, possible futures in which global warming stands a good chance of staying within that limit. All of those scenarios include what the report's summary for policymakers' calls "rapid and far-reaching transitions in energy" as well as in infrastructure, land and industrial systems. The details vary, but the 90 scenarios for 1.5C assessed in the report all envisage steep falls in consumption of fossil fuels, and rapid growth in renewable energy. In the median scenarios, fossil fuels drop from 84 per cent of the world's energy supply in 2020 to just 36 per cent in 2050. Renewables correspondingly rise in the median scenarios from 15 per cent of global energy supply to 61 per cent over 2020-50. Nuclear power also plays a growing role in all of these possible futures, rising from 2 per cent of global energy to 4 per cent in the median scenarios.

Even that understates the difficulty of the challenge, though, because the report notes that all the scenarios that limit warming to 1.5C project significant use of carbon dioxide removal techniques. There are plenty of those, ranging from reforestation to capturing carbon dioxide out of the air, but the IPCC warns that deploying them at a large scale "is subject to multiple feasibility and sustainability constraints". The world's present trajectory, with greenhouse gas emissions rising after a pause in 2015-16, puts us on track to overshoot even the higher of the Paris goals, delivering a 3C increase in global temperatures by the end of the century.

It was an appropriate coincidence that one of the two winners of the Sveriges Riksbank's Nobel Prize for economics, awarded by the Royal Swedish Academy of Sciences on Monday, was William Nordhaus of Yale University, whose work has been highly influential on the IPCC. He made his name working on the economics of the environment and energy and is worth reading on many subjects — he is excellent on oil markets, for

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example — but the specific work that won him the prize was his development of integrated assessment models, describing how the world economy and the climate interact. The shutdown of about 700,000 barrels a day of oil production in the Gulf of Mexico as a precaution against the storm briefly pushed oil prices higher on Tuesday, but the trend during the week has been downwards, as stock market jitters have highlighted concerns about global growth. Opec, in its latest Monthly Oil Market Report, downgraded its forecasts for demand growth for this year and next. The International Energy Agency did the same in its monthly report but suggested that the strain on crude supplies "could be with us for some time and it will probably be accompanied by higher prices".

By Friday, Brent crude was hanging on at about $80 a barrel, supported by the rebound in stock markets. One key uncertainty for the market is exactly how badly Iran's oil exports have been hurt by the reinstatement of US sanctions over its nuclear programme. Elizabeth Rosenberg, who used to work on sanctions at the US Treasury, argued in Foreign Affairs magazine that the EU would not be able to get around the revived array of restrictions. However, Iran has been looking for creative routes to ensure that its crude can still find customers somewhere. In Forbes, Ellen Wald cited information from TankerTrackers.com to make the case that Iran "has actually been exporting much more oil to many more destinations than we have been led to believe".

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