

# 1. California-solar plant frying birds in the sky

RHYS BLAKELY  
THE TIMES  
AUGUST 21, 2014 12:00AM

<http://www.theaustralian.com.au/news/world/california-solar-plant-frying-birds-in-the-sky/story-fnb64oi6-1227031193301>

**PLANS to duplicate the world's largest solar thermal energy plant at sites across the US are being -opposed because thousands of birds are bursting into flames in the sky.**

The \$US2.2 billion (\$2.3bn) Ivanpah plant, in California's -Mojave desert, uses more than 300,000 mirrors, each the size of a garage door, to reflect solar rays on to three towers, each up to 40 storeys high. Water in the towers is heated to produce steam, powering turbines that generate electricity for 140,000 homes.

However, the mirrors produce a glare that is bright enough to distract airline pilots as they descend into Los Angeles and Las Vegas, and a government report suggests this effect has turned the plant into an enormous trap for wildlife. Insects are lured en masse by the light, and the birds follow them — only to be incinerated as they glide into a solar-flux field of heat that reaches 420C. Workers at the plant refer to the stricken birds as “streamers” because of the smoke

they emit as they plummet.

Federal wildlife investigators who visited the plant last year saw one streamer every two minutes, and vast numbers of dead insects. The avian death toll will reach an estimated 28,000 birds a year.

The California Energy Commission is being urged to deny permission to build a larger solar plant of the same type near the Joshua Tree National Park in California. The plant would include a “power tower” 75 storeys high, -located on a migratory flight path between the Colorado River and the Salton Sea; an area rich in bird life such as golden eagles and peregrine falcons.

Officials of the US Fish and Wildlife Service have said the proposal holds “the highest lethality potential” of the many variants of solar power being tested in the -deserts of California.

Green energy has unleashed unintended consequences before: since the 1980s, solar farms have been blamed for killing desert tortoises by fencing off territory and encouraging invasive plants, which increase wildfires.

Wind turbines have been accused of swatting birds from the sky.

The companies behind the Ivanpah plant argue that every source of energy comes with pros and cons. Others add that the bird deaths should be put into context: between 365 million and 988 million birds are estimated to die from crashing into windows in the

US each year.

BrightSource, one of the companies involved, has proposed that it pay \$US1.8 million towards programs that neuter domestic cats, which are estimated to kill more than 1.4 billion birds a year.

Ivanpah's victims include hummingbirds and pelicans. -“Severe singeing of flight feathers caused catastrophic loss of flying ability, leading to death by impact with the ground or other objects,” a report says. “Less severe singeing led to impairment of flight capability, reducing ability to -forage and evade predators.”

The Ivanpah plant opened in February, and its managers say that the saving in carbon emissions is the equivalent of removing 72,000 cars from the road.

THE TIMES

## 2. **Bureau of Meteorology 'altering climate figures'**

THE AUSTRALIAN  
AUGUST 23, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/bureau-of-meteorology-altering-climate-figures/story-e6frg6xf-1227033735740>

Researcher Jennifer Marohasy claims the adjusted records resemble “propaganda” rather than science.

Dr Marohasy has analysed the raw data from dozens

of locations across Australia and matched it against the new data used by BOM showing that temperatures were progressively warming.

In many cases, Dr Marohasy said, temperature trends had changed from slight cooling to dramatic warming over 100 years.

BOM has rejected Dr Marohasy's claims and said the agency had used world's best practice and a peer reviewed process to modify the physical temperature records that had been recorded at weather stations across the country.

It said data from a selection of weather stations underwent a process known as "homogenisation" to correct for anomalies. It was "very unlikely" that data homogenisation impacted on the empirical outlooks.

In a statement to *The Weekend Australian* BOM said the bulk of the scientific literature did not support the view that data homogenisation resulted in "diminished physical veracity in any particular climate data set".

Historical data was homogenised to account for a wide range of non-climate related influences such as the type of instrument used, choice of calibration or enclosure and where it was located.

"All of these elements are subject to change over a period of 100 years, and such non-climate -related changes need to be -accounted for in the data for -reliable analysis and monitoring of trends," BOM said.

Account is also taken of temperature recordings from nearby stations. It took “a great deal of care with the climate record, and understands the importance of scientific integrity”.

Dr Marohasy said she had found examples where there had been no change in instrumentation or siting and no inconsistency with nearby stations but there had been a dramatic change in temperature trend towards warming after homogenisation.

She said that at Amberley in Queensland, homogenisation had resulted in a change in the temperature trend from one of cooling to dramatic warming.

She calculated homogenisation had changed a cooling trend in the minimum temperature of 1C per century at Amberley into a warming trend of 2.5C. This was despite there being no change in location or instrumentation.

BOM said the adjustment to the minimums at Amberley was identified through “neighbour comparisons”. It said the level of confidence was very high because of the large number of stations in the region. There were examples where homogenisation had resulted in a weaker warming trend.

### **3. Heat is on over weather bureau 'homogenising**

# temperature records'

by Jennifer on August 23, 2014 in Information

<http://jennifermarohasy.com/2014/08/heat-is-on-over-weather-bureau-homogenising-temperature-records/>

EARLIER this year Tim Flannery said “the pause” in global warming was a myth, leading medical scientists called for stronger action on climate change, and the Australian Bureau of Meteorology declared 2013 the hottest year on record. All of this was reported without any discussion of the actual temperature data. It has been assumed that there is basically one temperature series and that it' s genuine.

But I' m hoping that after today, with both [a feature](#) (page 20) and a [news piece](#) (page 9) in The Weekend Australia things have changed forever.

I' m hoping that next time Professor Flannery is interviewed he will be asked by journalists which data series he is relying on: the actual recorded temperatures or the homogenized remodeled series. Because as many skeptics have known for a long time, and as Graham Lloyd reports today for News Ltd, for any one site across this wide-brown land Australia, while the raw data may show a pause, or even cooling, the truncated and

homogenized data often shows dramatic warming.

When I first sent Graham Lloyd some examples of the remodeling of the temperature series I think he may have been somewhat skeptical. I know he on-forwarded this information to the Bureau for comment, including three charts showing the homogenization of the minimum temperature series for Amberley.

Mr Lloyd is the Environment Editor for The Australian newspaper and he may have been concerned I got the numbers wrong. He sought comment and clarification from the Bureau, not just for Amberley but also for my numbers pertaining to Rutherglen and Bourke.

I understand that by way of response to Mr Lloyd, the Bureau has *not* disputed these calculations.

This is significant. The Bureau now admits that it changes the temperature series and quite dramatically through the process of homogenisation.

I repeat the Bureau has *not* disputed the figures. The Bureau admits that the data is remodelled.

What the Bureau has done, however, is try and justify the changes. In particular, for Amberley the Bureau is claiming to Mr Lloyd that there is very little available

documentation for Amberley before 1990 and that information before this time may be “classified” : as in top secret. That’ s right, there is apparently a reason for jumping-up the minimum temperatures for Amberley but it just can’ t provide Mr Lloyd with the supporting meta-data at this point in time.

## 4. Fusion Strategic Plan Released

Announced: Thursday 10 July 2014

<http://h1nf.anu.edu.au/news/fusion-strategic-plan-released/>

A five year plan was released today identifying how Australia could engage with ITER, the next step fusion experiment. ITER, under construction in France, is the world's largest science experiment, and designed to demonstrate the feasibility of fusion power. The plan outlines participation with the ITER research community, strengthening Australian capability and infrastructure in fusion science, and development of a diagnostic for ITER.

A/Prof. James writes

"The urgent need to develop clean base-load power systems has sparked a global renaissance in fusion power research.

The next step ITER tokamak, now under construction in France, is designed to demonstrate the technical feasibility of fusion power generation. Supported by governments representing more than half the population of the planet, the ITER experiment will now commence operation in 2020. The slightly delayed starting date delivers a window of opportunity for Australia to make important research contributions to this largest of global scientific endeavours. It is expected that ITER will pave the way for a demonstration power plant, leading to commercial fusion power in the second half of this century. A strong Australian engagement with the international fusion program, including ITER, will see Australia well prepared for the coming fusion age.

In recent years, the Australian fusion science community, largely through the Australian ITER Forum, has worked hard to increase government and public awareness of the potential of fusion and to enhance the visibility of fusion science across the Australian scientific community. In 2007 the Forum released a strategic plan “A strategy for Australian Fusion Science and Engineering: Through ITER and into the Future”. Many elements of the plan have been realized, including Super-Science infrastructure upgrade for the Australian Plasma Fusion Research Facility (APFRF), and support for a fellowship scheme that is similar to the ARC Future Fellowships program.

There has also been growth in fusion plasma and materials science across the wider university research community. A new “Extreme Materials for Fusion” program embracing collaborations in the field of nuclear science was commenced in 2012 under the 2010 Memorandum of Understanding between the Australian Nuclear Science and Technology Organisation (ANSTO) and the Australian National University (ANU). The University of Newcastle has expanded its international collaborations in fusion related materials through its formal involvement in the CERAMAX consortium (which involves mainly European researchers).

In December 2012, it was agreed at a meeting of senior ANSTO representatives and the Australian fusion science community, including the Australian ITER Forum, that as Australia’s premier nuclear organisation, ANSTO would in future represent the formal interests of the Australian fusion community with the ITER organisation (see Appendix 2). In early 2013, ANSTO CEO Dr Adi Paterson met with ITER Director General, Dr Osamu Motojima, to identify pathways for future linkages between Australian science and ITER.

In concert with these developments, the ANU, ANSTO and Australian ITER Forum, on behalf of the Australian fusion community, have commissioned this new plan, with the goal of securing an Australian capability and preparedness for fusion power. Building on the work of the first plan, this will be achieved by expanding domestic research, maintaining world class facilities and infrastructure, and by broadening collaboration and engagement with international programs."

## 5. Sun, wind and drain

**Wind and solar power are even more expensive than is commonly thought**

Jul 26th 2014 | From the print edition

<http://www.economist.com/news/finance-and-economics/21608646-wind-and-solar-power-are-even-more-expensive-commonly-thought-sun-wind-and>

SUBSIDIES for renewable energy are one of the most contested areas of public policy. Billions are spent nursing the infant solar- and wind-power industries in the hope that they will one day undercut fossil fuels and drastically reduce the amount of carbon dioxide being put into the atmosphere. The idea seems to be working. Photovoltaic panels have halved in price since 2008 and the capital cost of a solar-power plant—of which panels account for slightly under half—fell by 22% in 2010-13. In a few sunny places, solar power is providing electricity to the grid as cheaply as conventional coal- or gas-fired power plants.

But whereas the cost of a solar panel is easy to calculate, the cost of electricity is harder to assess. It depends not only on the fuel used, but also on the cost of capital (power plants take years to build and last for decades), how much of the time a plant operates, and whether it generates power at times of peak demand. To take account of all this, economists use “levelised costs”—the net present value of all costs (capital and operating) of a generating unit over its life cycle, divided by the number of megawatt-hours of electricity it is expected to supply.

The trouble, as Paul Joskow of the Massachusetts Institute of Technology has pointed out, is that levelised costs do not take account of the costs of intermittency.\* Wind power is not generated on a calm day, nor solar power at night, so conventional power plants must be kept on standby—but are not included in the levelised cost of renewables. Electricity demand also varies during the day in ways that the supply from wind and solar generation may not match, so even if renewable forms of energy have the same levelised cost as conventional ones, the value of the power they produce may be lower. In short, levelised costs are poor at comparing different forms of power generation.

To get around that problem Charles Frank of the Brookings Institution, a think-tank, uses a cost-benefit analysis to rank various forms of energy. The costs include those of building and running power plants, and those associated with particular technologies, such as balancing the electricity system when wind or solar plants go offline or disposing of spent nuclear-fuel rods. The benefits of renewable energy include the value of the fuel that would have been used if coal- or gas-fired plants had produced the same amount of electricity and the amount of carbon-dioxide emissions that they avoid. The table summarises these costs and benefits. It makes wind and solar power look far more expensive than they appear on the basis of levelised costs.

Mr Frank took four sorts of zero-carbon energy (solar, wind, hydroelectric and nuclear), plus a low-carbon sort (an especially efficient type of gas-burning plant), and compared them with various sorts of conventional power. Obviously, low- and no-carbon power plants do not avoid emissions when they are not working, though they do incur some costs. So nuclear-power plants, which run at about 90% of capacity, avoid almost four times as much CO<sub>2</sub> per unit of capacity as do wind turbines, which run at about 25%; they avoid six times as much as solar arrays do. If you assume a carbon price of \$50 a tonne—way over most actual prices—nuclear energy avoids over \$400,000-worth of carbon emissions per megawatt (MW) of capacity, compared with only \$69,500 for solar and \$107,000 for wind.

Nuclear power plants, however, are vastly expensive. A new plant at Hinkley Point, in south-west England, for example, is likely to cost at least \$27 billion. They are also uninsurable commercially. Yet the fact that they run around the clock makes them only 75% more expensive to build and run per MW of capacity than a solar-power plant, Mr Frank reckons.

To determine the overall cost or benefit, though, the cost of the fossil-fuel plants that have to be kept hanging around for the times when solar and wind plants stand idle must also be factored in. Mr Frank calls these “avoided capacity costs”—

costs that would not have been incurred had the green-energy plants not been built. Thus a 1MW wind farm running at about 25% of capacity can replace only about 0.23MW of a coal plant running at 90% of capacity. Solar farms run at only about 15% of capacity, so they can replace even less. Seven solar plants or four wind farms would thus be needed to produce the same amount of electricity over time as a similar-sized coal-fired plant. And all that extra solar and wind capacity is expensive.

### **A levelised playing field**

If all the costs and benefits are totted up using Mr Frank's calculation, solar power is by far the most expensive way of reducing carbon emissions. It costs \$189,000 to replace 1MW per year of power from coal. Wind is the next most expensive. Hydropower provides a modest net benefit. But the most cost-effective zero-emission technology is nuclear power. The pattern is similar if 1MW of gas-fired capacity is displaced instead of coal. And all this assumes a carbon price of \$50 a tonne. Using actual carbon prices (below \$10 in Europe) makes solar and wind look even worse. The carbon price would have to rise to \$185 a tonne before solar power shows a net benefit.

There are, of course, all sorts of reasons to choose one form of energy over another, including emissions of pollutants other than CO<sub>2</sub> and fear of nuclear accidents. Mr Frank does not look at these. Still, his findings have profound policy implications. At the moment, most rich countries and China subsidise solar and wind power to help stem climate change. Yet this is the most expensive way of reducing greenhouse-gas emissions. Meanwhile Germany and Japan, among others, are mothballing nuclear plants, which (in terms of carbon abatement) are cheaper. The implication of Mr Frank's research is clear: governments should target emissions reductions from any source rather than focus on boosting certain kinds of renewable energy.

- ["The Net Benefits of Low and No-carbon Electricity Technologies"](#), by Charles Frank, Brookings Institution,

# 6. ‘Amateurs’ challenging Bureau of Meteorology climate figures

THE AUSTRALIAN  
AUGUST 26, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/amateurs-challenging-bureau-of-meteorology-climate-figures/story-e6frg6xf-1227036441118>

Graham Lloyd

Environment Editor  
Sydney

**CONCERNS about the accuracy of the Bureau of Meteorology’s historical data are being raised by “poorly informed amateurs”, one of Australia’s leading climate -scientists has said.**

David Karoly of Melbourne University’s School of Earth Sciences, said claims BOM had introduced a warming trend by homogenising historical temperature data should be submitted for peer review.

BOM has confirmed analysis that homogenisation had introduced or dramatically increased a warming trend, but said the process used was common internationally. However, concerns about homogenisation have been raised with climate agencies in the US and Europe.

“The ACORN-SAT network of high-quality station data for Australia from the Bureau of Meteorology has been published after peer-review by international experts,” Professor Karoly said.

Jennifer Marohasy, who in *The Weekend Australian* raised concerns about the quality of the historical BOM data, has been published in the peer-reviewed climate science literature.

Her paper in *Advances in -Atmospheric Sciences and Atmospheric Research* included detail of the methodology used to construct the temperature series for locations in Queensland.

“I’ve looked in the peer--reviewed literature for justification for the methodology that the bureau uses and I can’t find it,” she said. “Sure, there are lots of technical reports and reports from committee meetings and audits by committees but there are no peer-reviewed publications that outline and justify the methodology currently used.”

Dr Marohasy has analysed the raw data from dozens of locations across Australia and matched it against the new data used by BOM showing that temperatures are progressively warming. In many cases, she said, trends had changed from slight cooling to dramatic warming over 100 years.

Professor Karoly said a recent independent analysis by him of the temperature data for southeast Australia from 1860 to 2010 had been published in the *Australian Meteorological and Oceanographic Journal* after anonymous peer-review.

He said his paper had shown good agreement with the BOM temperatures, after homogenisation. It

confirmed that a 1.1C increase in maximum temperature and 0.9C increase in minimum temperature since 1960 were the largest and most significant trends in southeastern Australian temperatures in the past 152 years.

It said “detailed homogenisation” was undertaken using metadata collected from station history files and a two-step process that involved individual station adjustments and comparison with neighbouring reference sites.

“I am aware of some poorly informed amateurs who have made unsupported claims that are not based on modern scientific methods,” Professor Karoly said.

“Those claims do not constitute a debate. Those claims should be submitted for publication in scientific journals and peer-reviewed by experts, to assess the validity of their claims.”

## 7. **Bureau of Meteorology told to be more transparent**

THE AUSTRALIAN  
AUGUST 29, 2014 12:00AM

<http://www.theaustralian.com.au/news/health-science/bureau-of-meteorology-told-to-be-more-transparent/story-e6frg8y6-1227040620469>

Graham Lloyd  
Environment Editor  
Sydney

**THE Bureau of Meteorology was told to be more transparent and make public all details of the computer models used to adjust historic temperature records by the peer review panel that cleared its work as world best practice.**

The 2011 independent panel told BOM to clearly explain any changes that were made between raw and “homogenised” data.

BOM yesterday rejected claims it was altering climate records to exaggerate estimates of global warming, but it has not disputed that temperature trends at some sites had changed from slight cooling to warming after homogenisation.

Critics have said BOM’s exact methodology and reasons for any changes had not been properly explained publicly.

“Homogenisation is carried out by meteorological authorities around the world as best practice, to ensure that climate data is consistent through time,” BOM said.

It said both raw and adjusted national temperature data and the larger unadjusted national data set all indicate that Australian air temperatures had warmed over the past century.

“These findings are also consistent with those of other leading international meteorological authorities, such as NOAA and NASA in the US and the UK Met-Office,” BOM said.

The bureau has been under fire for not making publicly available the methodology used for homogenisation. Michael Asten from the School of Earth Atmosphere and Environment at Monash University said confidence in BOM's data would increase "if and when BOM publishes or supplies its homogenisation algorithms, a step which would be quite consistent with existing requirements of the better peer-reviewed journals."

BOM said its methods had been published in peer-reviewed scientific journals but did not say where or in what form.

Independent scientist Jennifer Marohasy, who has questioned the change in temperature trend towards greater warming at a number of sites she has studied said BOM's response had been riddled with "half truths and untruths".

"The bureau claims it makes a raw data comparison but it does not," Dr Marohasy said. "At least there is no report or published paper that shows the raw un-homogenised and untruncated values," she said.

Dr Marohasy said it was not disputed that NOAA, NASA and the UK Met Office get the same result as BOM because they used the same homogenisation techniques.

BOM's 2011 independent panel said it was "satisfied overall" with the bureau's methodology but it "encouraged" the bureau to improve the public

transparency of the process used.

The panel recommended a list of adjustments be made publicly available along with the adjusted temperature series including the rationale for each adjustment. It said the computer codes underpinning the national ACORNSAT data-set, including the algorithms and protocols used by BOM for data quality control, should be made publicly available.

8.

## **Groupthink reigns in climate change research**

MAURICE NEWMAN  
THE AUSTRALIAN  
AUGUST 29, 2014 12:00AM

<http://www.theaustralian.com.au/opinion/groupthink-reigns-in-climate-change-research/story-e6frg6zo-1227040582622>

**PRECIOUS little in the world inspires such intense hostility and personal vilification as commentary that runs counter to global warming orthodoxy.**

“We’re ill-prepared if the iceman cometh” (*The Australian*, Aug-ust 14) evoked an extraordinary reaction, considering the views expressed were those of eminent scientists who believe the world may face -cooling.

Like ants swarming to repair a disturbed nest, the defenders of the faith used every opportunity to reject the contrary science and to discredit the author. We are reminded there is only one truth. When 97 per

cent of scientists agree that climate change is an -urgent man-made problem, how can a non-scientist challenge this?

Joseph Bast and Roy Spencer, writing in *The Wall Street Journal* on May 26, maintained that this so-called consensus “is a fiction” that came from “a handful of surveys and abstract counting exercises that have been contradicted by more reliable research”. But they are heretics and, no matter how compelling their evidence, must be ignored.

Richard Tol’s resignation last May from the Intergovernmental Panel on Climate Change is harder to dismiss.

As the 20th most-cited climate scholar in the world, he was part of the team that prepared the draft of the Summary for Policy Makers to the Fifth Assessment Report (AR5) Working Group 1.1. He claims: “The panel is directed from within the environmental lobby and not from within the science.” He says that “after the debacle of AR4 — where the Himalayan glacier melt really was the least of the errors”, he had criticised the IPCC for “faulty quality control”.

He believes that “many of the more worrying impacts of climate change really are symptoms of mismanagement and under-development”. This message, he says, does not support the political agenda for greenhouse gas emission reduction.

Tol says: “The IPCC does not guard itself against

selection bias and group think.” Tol’s frank insider assessment of the IPCC suggests that rather than accept its authority we should apply caution and curiosity.

This notion of groupthink in the scientific profession is reinforced by Anne Glover, appointed in 2011 to give the European Commission with independent scientific advice. She found “countless examples” of confirmatory bias driving policy and that there was “little incentive to produce evidence that contradicts the commission’s political agenda”.

British science writer Nigel Calder alerted us to this when the director-general of CERN, a Geneva-based European collaboration, apparently worried by the clear inferences to be drawn from a “CLOUD” cosmic ray experiment, warned that interpretations should be politically correct about climate change. Calder observed: “The implication was that they should on no account address Danish heresy — Henrik Svensmark’s hypothesis that most of the global warming of the 20th century can be explained by the reduction in cosmic rays due to livelier solar activity.” If people this close to the epicentre are questioning climate research, should we too not be curious?

Tampering with temperature records has become topical. Jennifer Marohasy followed up an independent audit by Ken Stewart and accused the Australian Bureau of Meteorology of manipulating historical records to fit a predetermined view of global warming. She alleges in many cases temperature

trends over 100 years were changed from slight cooling to dramatic warming. The BoM rejects her claims and says the data was “homogenised” in line with “world’s best practice”.

This would be comforting except that questions are being asked about similar adjustments made by NASA and the National Oceanic and Atmospheric Administration in the US. For example, in 1999, NOAA maintained 1934 was 1.1F warmer than 1998, but it has quietly turned a steady temperature decline into a warming. Now, 1998 is the hottest on record in the US.

While homogenisation may be legitimate, it invariably results in warming and so undermines trust.

Australia’s temperature records remain suspect. Conversion from fahrenheit to celsius involved unscientific rounding with a warming bias. *The Australian’s* environment editor Graham Lloyd (August 27) disclosed that the official catalogue of weather station locations contradicts the BoM’s explanation. Its homogenisation of 100 years of raw data at one station turned 0.35C of cooling into a warming of 1.73C.

With evidence of data manipulation, organised resistance to disclosure, the admission of flaws in public claims, collusion and group think, no one should be surprised doubters are on the rise. If the science is so sound, why there is such reluctance to entertain alternative views on the nearly 18-year

pause, the absence of significant ocean warming, the increase in Antarctic sea ice and the lack of predicted extreme weather events?

*Maurice Newman is chairman of the Prime Minister's Business Advisory Council. The views expressed here are his own.*

## 9. News articles describe heightened IPCC urgency

A leaked Intergovernmental Panel on Climate Change report is said to use the word *irreversible* 48 times.

Steven T. Corneliusen

August 2014

[http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.8066?utm\\_medium=email&utm\\_source=American+Institute+of+Physics&utm\\_campaign=4637620\\_Physics+Today%3a+The+week+in+Physics+25-29+August&dm\\_i=1Y69,2REES,E1OV2B,A1TB4,1](http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.8066?utm_medium=email&utm_source=American+Institute+of+Physics&utm_campaign=4637620_Physics+Today%3a+The+week+in+Physics+25-29+August&dm_i=1Y69,2REES,E1OV2B,A1TB4,1)

At mid-day on 26 August, the *New York Times* posted online Justin Gillis's [article](#) "Greenhouse gas emissions are growing, and growing more dangerous, draft of UN report says." The leaked draft comes from the UN's Intergovernmental Panel on Climate Change (IPCC). Gillis begins by emphasizing the panel's contention that emissions growth "is swamping all political efforts to deal with the problem, raising the risk of 'severe, pervasive and irreversible impacts.'"

Bloomberg.com, working from its own leaked copy of the 127-page report, posted an [article](#) at about the same time. Early articles also appeared on the [website](#) of ABC News, which said it worked from a copy obtained by the Associated Press, and at *The Hill*, which [reported derivatively](#) from the *Times* piece. By late afternoon, news articles were proliferating.

Early paragraphs in Gillis's piece summarize:

Global warming is already cutting grain production by several percentage points, the report found, and that could grow much worse if emissions continue unchecked. Higher seas, devastating heat waves, torrential rain and other climate extremes are also being felt around the world as a result of human-produced emissions, the draft report said, and those problems are likely to intensify unless the gases are brought under control.

The world may already be nearing a temperature at which the loss of the vast ice sheet covering Greenland would become inevitable, the report said. The actual melting would then take centuries, but it would be unstoppable and could result in a sea level rise of 23 feet, with additional increases from other sources like melting Antarctic ice, potentially flooding the world's major cities. Gillis stipulates that the draft only restates, albeit with "blunter, more forceful

language,” what recent IPCC reports have already said, and that it will evolve between now and “early November, after an intensive editing session in Copenhagen.”

Bloomberg.com contacted an IPCC spokesman:

Jonathan Lynn, a spokesman for the IPCC, declined to comment on the contents of the report. The draft “is still a work in progress, which will certainly change--indeed that is the point of the review--and so it would be premature to discuss its contents at this stage,” Lynn said.

Bloomberg apparently also conducted a quick linguistic-statistical analysis, revealing that the draft report mentions the word *risk* more than 350 times, versions of the word *vulnerable* 61 times, and the word *irreversible* 48 times. Gillis observes that political efforts worldwide, according to the leaked draft, are “being overwhelmed by construction of facilities like new coal-burning power plants that will lock in high emissions for decades.” He notes that the report warns that although emissions are declining in the West, the declines don’t compensate for rising emissions elsewhere.

He sums up:

The draft report found that past emissions, and the failure to heed scientific warnings about the risks, have made large-scale climatic shifts inevitable. But lowering emissions would still slow the expected pace of change, the report said, providing critical decades for human society and the natural world to adapt.

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*Steven T. Corneliussen, a media analyst for the American Institute of Physics, monitors three national newspapers, the weeklies Nature and Science, and occasionally other publications. He has published op-eds in the Washington Post and other newspapers, has written for NASA's history program, and is a science writer at a particle-accelerator laboratory.*

## 10. **Weatherman’s records detail heat that ‘didn’t happen’**

THE AUSTRALIAN  
AUGUST 30, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/weathermans-records-detail-heat-that-didnt-happen/story-e6frg6xf-1227041833824>

**AS a child, Ian Cole would watch his father Neville take meticulous readings from the Bureau of Meteorology thermometer at the old post office in**

**the western NSW town of Bourke and send the results through by teleprinter.**

The temperature was recorded every three hours, including at night when the mercury sometimes plunged to freezing, and the data was logged in handwritten journals that included special notes to help explain the results.

That all changed in 1996 when the Stevenson Screen, the official measuring equipment, was replaced with an automatic station and moved to an airport site.

The Stevenson Screen went to the dump and, but for fate, the handwritten notes could have gone there too. But without instruction, the records were kept and are now under lock and key, held as physical evidence of what the weather was really doing in the mid-20th century.

These Bourke records have -assumed a new significance in light of concerns about how historic data is being treated at many sites around the country. The records are also important in an ongoing row that frustrates Mr Cole.

The Bourke cotton farmer may be managing director of the local radio station 2WEB but Mr Cole can only broadcast temperature records that date back to 2000 because the Bureau of Meteorology won't supply historic records to service provider Weatherzone.

As a result "hottest day on record" doesn't really mean what it seems. "We keep on being told about

records that are not actually records and averages that are not quite right,” Mr Cole said.

Worse still there are concerns about what has happened to the precision of those handwritten records in the earlier years. Bourke now forms part of a network of weather stations used to make up the national record known as ACORN-SAT. The raw temperature records are “homogenised”, a method BOM says has been peer-reviewed as world’s best practice and is used by equivalent meteorological organisations across the world.

Independent research, the -results of which have not been disputed by BOM, has shown that, after homogenisation, a 0.53C warming in the minimum temperature trend has been increased to a 1.64C warming trend. A 1.7C cooling trend in the maximum temperature series in the raw data for Bourke has been changed to a slight warming.

BOM has rejected any suggestion that it has tampered inappropriately with the numbers. It says the major adjustment to Bourke temperatures relate to “site moves in 1994, 1999 and 1938 as well as 1950s in homogeneities that were detected by neighbour comparison which, based on station photos before and after, may relate to changes in vegetation around the site”.

Queensland researcher Jennifer Marohasy, who has analysed the Bourke records, says BOM’s analysis is all very well but the largest adjustments, both to

maximum temperature series, -occurred in the period 1911 and 1915 with a stepdown of about 0.7C, followed by a step-up between 1951 and 1953 of about 0.45C. Of greater concern to Dr Marohasy is that historic high temperatures, such as the record 51.7C recorded on January 3, 1909, were removed from the record on the assumption it was a clerical error. In fact, all the data for Bourke for 40 years before 1910 has been discarded from the official record. If it were there, says Dr Marohasy, the record would show that temperatures were particularly hot during that period.

For Mr Cole it is a simple matter of trusting the care and attention of his father. “Why should you change manually created records?” Mr Cole said. “At the moment they (BOM) are saying we have a warming climate but if the old figures are used we have a cooling climate.”

## 11. The 10 million-piece nuclear puzzle

26 August 2014

<http://www.neimagazine.com/features/featurethe-10-million-piece-nuclear-puzzle-4354055/>

*The project to build a demonstration fusion power reactor relies on hundreds of individual suppliers. It is the ITER Organization's job to coordinate all of their contributions.*

The seven members of the ITER project share the responsibility of building the ITER machine and facilities. It is the largest global research

effort on nuclear fusion ever undertaken.

Ninety percent of contributions will be delivered in-kind. Members (China, EU, India, Japan, Russia, South Korea and the USA) will deliver components for the Tokamak and plant systems directly to the ITER Organization in France. Designing, manufacturing, transporting and assembling the 10 million components of the project, many of which are of exceptional size and weight, pose logistics and managerial challenges of colossal proportions.

ITER sought an off-the-shelf solution to manage the supply chain for components that are being manufactured and procured all over the world.

ITER also wanted cost-effective software that could bring in industry standards and best practices. Intergraph, engineering enterprise software provider for the power and nuclear sectors, among others, was awarded the contract to provide the software and services supporting the Assembly and Operation division of the ITER project. ITER contracted Intergraph to supply and implement off-the-shelf solutions to help manage construction, materials management, commissioning/testing, technical document and data management, as well as to bring industry best practice for these systems to ITER. These products also had to integrate seamlessly with existing ITER software, such as ITER Document Management, Engineering Data Base (EDB, including ITER's engineering tools) and SAP.

SmartPlant® Materials (SPMat) is able to track, trace and manage all components and parts of the ITER site in compliance with nuclear safety regulation. The tool will link on-site inventory management with construction planning to maximize cost-efficiency and avoid construction disruption.

SPMat will provide ITER Organization with central storage of logistics information and make possible effective management of logistics activities. The material catalogue specifications, bill of materials (BOM) and material take-off (MTO) requisitions, and procurement, tracing, warehousing and inspections information will all be centralized in SP Materials. This will enable each department or function to access whatever materials logistics data is needed for a task in the format most appropriate to that task. SP Materials configuration was delivered in May and is expected to continue acceptance testing until October, although in the meantime it is being used in a production environment for activities such as materials receiving. All material deliveries to the ITER site will be loaded into SPMat. It will manage all materials for both domestic agency in-kind contracts and ITER Organization in-cash contracts with suppliers (see figures).

To help with these materials management processes in SPMat, interfaces have already been developed and tested between SPMat and EDB, SPMat and SAP as well as SPMat and the shipping data that will be provided by logistics provider Daher.

The data for all material deliverables that will arrive at the ITER site in Cadarache, France needs to be captured at the source (the supplier) and tracked through data received from Daher. When the delivery trucks arrive at site, the data in SPMat should match the delivery details and allow planning for final inspections and warehousing. A big focus of SPMat is on tracking and tracing of all materials from the source supplier to the ITER site.

This materials management process means that the materials in the SPMat warehouses are ready to interface with the next Intergraph product being implemented, SmartPlant Construction (SPC). SPC manages workface planning and interfaces to the project-assembly schedule in Primavera project management software. The Field Installation Work Packs in SPC (downloaded from Primavera) will interface with SPMat to determine the status of required materials and, when available, will automatically reserve the material, ready for automatic issuing to construction.

The main challenges for this part of the project were different states of design maturity in the components and an adequate 3D model for construction. Component and part numbering, BOM definition at each lifecycle stage, a central and common catalogue and specification are currently being defined and created. The tool will also be integrated with numerous other applications, including SAP.

As of April 2014, most of the project design and detailed design is ready and the first components are being manufactured. Component arrival will slowly ramp up during 2014 and 2015 and reach full speed from 2016. Initially, only two or three people will be trained to use SPMat, although technical staff, domestic agencies and IO suppliers will be able to access the information via a portal and by running specific reports in SPMat. As the shipping volume grows, new users will be properly trained by the core team as needed.

The next step is to proceed with the implementation of SmartPlant Construction and to integrate the systems.

Inventory management will be integrated with the construction planning before the first on-site installation and assembly start in 2015.

SmartPlant Construction will be used to schedule, organize, track and report on assembly activities on-site (machine and systems) by browsing through the 3D model. The technical information and documentation will be centralized and managed using Intergraph product SmartPlant for Owner Operators.

Accurate and effective materials management and construction will pave the way for assembly activities, which have been carefully planned in a schedule that contains 40,000 lines for machine assembly alone. Assembly operations will require 1.5 million man hours extending over a period of four years, before arriving to the crucial point of testing the facilities and the Tokamak. !

## 12. **Foundation in place for Iter Tokamak**

28 August 2014

<http://www.world-nuclear-news.org/NN-Foundation-in-place-for-Iter-Tokamak-2808144.html>

**The concrete basemat has been completed for the Tokamak complex of the Iter fusion reactor project at Cadarache in southern France.**

The 12-hour operation to pour concrete for the last of the 15 segments that make up the Tokamak complex basemat (the B2 slab) was completed at 6.00pm on 27 August. The pouring of concrete for the basemat started last December.

The B2 slab covers an area of 9600 square metres and comprises 14,000 cubic metres of concrete, 3600 tonnes of rebar and 2500 embedded plates. It will support some 400,000 tonnes of building and equipment, including the 23,000-tonne Iter Tokamak.

The slab is a 'floating' foundation: installed on seismic columns, it has a capacity for lateral movement of up to 10cm in any direction. A gap of some 1.5 metres separates the B2 slab from the surrounding retaining walls. The 1.5-metre thick slab will serve as the first basement level of the diagnostic, Tokamak and tritium buildings. Five large drain tanks, supports for the base of the cryostat, and the building walls will be positioned directly on it. Completion of the Tokamak slab marks the conclusion of the preparatory phase of the construction site which started in August 2010 and represents an investment of some €100 million (\$132 million).

Speaking to workers at the construction site, Iter director general Osamu Motojima said, "With the completion of the B2 slab, a new chapter opens in the history of our project. In September, construction of the Tokamak complex will begin in earnest. You have built the floor, now come the walls, then the roof, and after that the machine itself."

The Iter project is meant to take nuclear fusion research to a new level with the largest ever Tokamak unit, which should be capable of sustaining plasmas that produce 500 MWt for as long as seven minutes. The EU is funding half of the cost while the remainder comes in equal parts from six other partners: China, Japan, India, Russia, South Korea and the USA. The facility is expected to reach full operation in 2027.

*Researched and written by World Nuclear News* The 12-hour operation to pour concrete for the last of the 15 segments that make up the Tokamak complex basemat (the B2 slab) was completed at 6.00pm

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*Researched and written by World Nuclear News*

## 13. **UK government paves way for Chinese nuclear plant**

18 June 2014

**The UK and China signed two agreements 17 June enabling Chinese companies not only to invest in nuclear power plant projects but also to build Chinese-design nuclear reactors in the UK, the Department of Energy and Climate Change (DECC) said.**

<http://www.world-nuclear-news.org/NP-UK-government-paves-way-for-Chinese-nuclear-plant-18061401.html>

Li and British Prime Minister David Cameron signed a civil nuclear agreement, which DECC said "paves the way" for Chinese

companies to invest in Hinkley Point C - EDF Energy's project to build two 1.6 GW EPR at Hinkley Point on the northern Somerset coast.

In a joint statement, Li and Cameron said China and the UK "stand ready to work together to ensure the success of Hinkley Point as soon as possible."

DECC and EDF Group, EDF Energy's parent company, announced last October they had agreed the main commercial terms of an investment contract for Hinkley Point C, allowing the state-owned French company to secure partners to finance the project. The share of equity is expected to be divided between EDF with 45-50%, China General Nuclear (CGN) and China National Nuclear Corporation (CNNC) with 30-40%, Areva with 10%, and "interested parties" with up to 15%.

DECC said the joint civil nuclear agreement signed yesterday also aims at "better cooperation in the wider nuclear fuel supply chain cycle by working together to develop and export innovative solutions in areas such as waste treatment and decommissioning which could be worth hundreds of millions of pounds to British companies over several years."

The agreement builds on a memorandum of understanding the UK signed with China last October, which set out a framework of cooperation in civil nuclear energy, DECC said.

The second and separate agreement is a four-way memorandum of understanding between DECC, CNNC, China Atomic Energy Authority, and International Nuclear Services - the commercial arm of the UK's Nuclear Decommissioning Authority. DECC said this "landmark agreement" would enable Chinese companies to own and operate a Chinese-designed nuclear power plant in the UK, provided they meet UK regulatory requirements.

Rolls-Royce, the British engineering company, announced separately that it had signed identical memoranda of understanding with Chinese nuclear reactor vendors State Nuclear Power Technology Corporation and China General Nuclear Power Co. The memoranda will "explore possible collaboration in areas such as engineering support, provision of components and systems, supply chain management and instrumentation & control technology," Rolls-Royce said.

*Researched and written by World Nuclear News*

## 14. **New French energy policy to limit nuclear**

18 June 2014

**France's nuclear generating capacity will be capped at its**

## **current level under a long-awaited draft energy policy announced today by energy minister Ségolène Royal.**

<http://www.world-nuclear-news.org/NP-New-French-energy-policy-to-limit-nuclear-1806144.html>

French president Francois Hollande's 2012 election pledge was to limit nuclear's share of French generation at 50% by 2025, and the closure of France's oldest nuclear power plant, Fessenheim, by the end of 2016. Now, following a national energy debate, his government has announced that the country's nuclear generating capacity will indeed be capped at the current level of 63.2 GWe. It will also be limited to 50% of France's total output by 2025. Nuclear currently accounts for almost 75% of the country's electricity production, making closures of power reactors appear inevitable. While not calling for the closure of any currently operating power reactors, the new policy will mean that EDF would have to close older reactors in order to bring new ones online. The utility is currently constructing an EPR unit at Flamanville which is expected to be completed in late 2016. EDF would therefore be forced to shut one of its reactors - most likely Fessenheim - by that time in order to begin operating the Flamanville unit.

Royal said that the draft policy also reinforces nuclear safety by giving the French nuclear safety regulator - the *Autorité de Sûreté Nucléaire* (ASN) - the power to impose higher penalties for safety breaches or delays in implementing requested safety measures. The policy, however, notes that safety standards have changed significantly since the construction of the first plant and have been particularly strengthened since the March 2011 accident at Japan's Fukushima Daiichi plant.

The draft policy also sets the goal of a 40% reduction in carbon dioxide emissions, compared with 1990's level of 565 million tonnes, by 2030. By that time, renewable energy sources should account for 40% of electricity consumption and 32% of total energy use. The policy sets the objective of halving total energy consumption by 2050. It also sets ambitious targets for expanding the use of electric vehicles with the number of charging points increasing from the current 10,000 to 7 million by 2030. Financial incentives of up to €10,000 (\$13,500) will be offered to encourage people to scrap diesel cars and to replace them with electric ones. Royal said that regular reviews would be made of France's energy situation and progress on meeting its longer-term "energy transition" objectives. These reviews, the first covering the period 2015-2018 and then every five years, would lead to "multi-year energy plans."

"We will not exit nuclear energy - that is not the decision we are making," Royal said. "It is thanks to nuclear energy that we can

make this energy transition in an unperturbed way."

*Researched and written by World Nuclear News*

15.

# **Bureau of Meteorology defended over temperature records by climate scientists**

THE AUSTRALIAN  
SEPTEMBER 02, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/bureau-of-meteorology-defended-over-temperature-records-by-climate-scientists/story-e6frg6xf-1227044313807>

**THE Bureau of Meteorology’s rewriting of historic temperature records has been defended by leading climate scientists from the ARC Centre of Excellence for Climate Systems Science at the University of NSW.**

In an online article, centre director Andy Pitman and chief investigator Lisa Alexander said homogenisation of raw temperature data was an “essential process in improving weather data by spotting where temperature records need to be corrected, in -either direction”.

They said data homogenisation was used to varying degrees by many weather agencies and climate researchers worldwide.

“Although the World Meteorological Organisation

has guidelines for data homogenisation, the methods used vary from country to country, and in some cases no data homogenisation is applied,” Dr Pitman and Dr Alexander said.

They said Australian Research Council Centre data on extreme temperature trends showed the warming trend across Australia looked bigger without homogenisation. Adjusted data showed a cooling trend over parts of northwest Australia, which wasn't seen in the raw data.

“Far from being a fudge to make warming look more severe than it is, most of the bureau's data manipulation has in fact had the effect of reducing the apparent extreme temperature trends across Australia,” the two said.

BOM's homogenisation process has been queried following examples of long-term cooling or neutral trends being turned into a strong warming trend.

Analysis of the 100-year record at Rutherglen in Victoria showed that a cooling trend of 0.35C in the raw data had become a 1.73C warming after homogenisation.

BOM said the discrepancy was consistent with the thermometer site moving from a farm building on a small hill outside the town to low-lying flat ground.

However, the official catalogue says “there have been no site moves during the site's history”. Former Rutherglen workers said the site had not been moved.

Asked further about Rutherglen, BOM said “statistical analysis of minimum temperatures at Rutherglen indicated jumps in the data in 1966 and 1974”.

“These changes were determined through comparison with 17 nearby sites,” it said. “The biases detected in the temperature data for Rutherglen were deemed large enough to require adjustment, based on the statistical tests alone.

“The site records indicate that at least one site move took place between 1958 and 1975. It is likely but not confirmed that this move took place in 1966. The site records also indicate that the weather station was substantially upgraded around the time of the 1974 break in the temperature record.”

The bureau did not provide a copy of the Rutherglen site record.

BOM has yet to provide a full list of peer-reviewed publications regarding its homogenisation process, but in an article in the *International Journal of Climatology*, BOM climate researcher Blair Trewin said the bureau’s homogenised data set included 112 sites across Australia and extended from 1910 to the present, with 60 sites having data for the full period.

The data set was developed using a technique, the percentile-matching algorithm, that applies differing adjustments to daily data depending on their position in the frequency distribution.

“This method is intended to produce data sets that are

homogeneous for higher-order statistical properties, such as variance and the frequency of extremes, as well as for mean values,” the paper said.

“The PM algorithm is evaluated and found to have clear advantages over adjustments based on monthly means, particularly in the homogenisation of temperature extremes.”

## 16. Nuclear Regulatory Commission decision is seen as a “game-changer”

At the *New York Times*, a headline reported, “Nuclear waste is allowed above ground indefinitely.”

Steven T. Corneliussen

September 2014

[http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.8068?utm\\_medium=email&utm\\_source=American+Institute+of+Physics&utm\\_campaign=4671012\\_Physics+Today%3a+The+week+in+Physics+1-5+September&dm\\_i=1Y69,2S46C,E1OV2B,A469P,1](http://scitation.aip.org/content/aip/magazine/physicstoday/news/10.1063/PT.5.8068?utm_medium=email&utm_source=American+Institute+of+Physics&utm_campaign=4671012_Physics+Today%3a+The+week+in+Physics+1-5+September&dm_i=1Y69,2S46C,E1OV2B,A469P,1)

At the business-news website Forbes.com, contributor James Conca identifies himself as “a scientist in the field of the earth and environmental sciences for 33 years, specializing in geologic disposal of nuclear waste.” He praises the Nuclear Regulatory Commission for what he calls a recent “small but incredibly important decision about nuclear waste that could finally get nuclear energy moving forward again.” If that assessment is even partly valid, it’s surprising that very little media coverage has ensued.

Bloomberg.com covered the news, however, and so did Matthew Wald at the *New York Times*. Wald’s opening paragraphs summarize:

As the country struggles to find a place to bury spent nuclear fuel, the Nuclear Regulatory Commission has decided that nuclear waste from power plants can be stored above ground in containers that can be maintained and guarded indefinitely.

The decision, in a unanimous vote of the commission on [26 August], means that new nuclear plants can be built and old ones can expand their operations despite the lack of a long-term plan for disposing of the waste.

Wald mentions a few immediately affected nuclear plants. He also notes that in a statement, the Natural Resources Defense Council’s Geoffrey H. Fettus charged that the NRC “failed to analyze the long-term environmental consequences of indefinite storage of highly toxic and radioactive nuclear waste, the risks of which are apparent to any observer of history over the past 50 years.”

Conca sees it quite differently. The “game-changer of this ruling is it recognizes storing spent fuel for long periods in dry casks is incredibly safe and cheap.” He adds:

[O]ne of the best things you can do with spent nuclear fuel is let it sit for a hundred years. A hundred years is a few half-lives of the two bad players—the uranium fission products cesium-137 and strontium-90. Each of these nuclides has a 30-year half-life, so after 100 years, 90% of each will have decayed away, and the waste will be much, much cooler and easier to handle, no matter what you end up doing with it.

He cites a Nuclear Regulatory Commission [fact sheet](#) that says:

Dry cask storage is safe and environmentally sound. Cask systems are designed to contain radiation, manage heat and prevent nuclear fission. They must resist earthquakes, projectiles, tornadoes, floods, temperature extremes and other scenarios. The heat generated by a loaded spent fuel cask is typically less than is given off by a home-heating system. The heat and radioactivity decrease over time without the need for fans or pumps. The casks are under constant monitoring and surveillance.

In the days leading up to the decision, the Sierra Club and others expressed worries, as reported in a *Washington Post* [blog](#) (“Groups try to block nuclear regulator’s vote, citing conflict of interest”) and in an [article](#) at a magazine well known for taking pride in being [named](#) for a “radical reformer,” *Mother Jones* (“Ruling on nuclear waste storage could create a ‘catastrophic risk’”).

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*Steven T. Corneliussen, a media analyst for the American Institute of Physics, monitors three national newspapers, the weeklies Nature and Science, and occasionally other publications. He has published op-eds in the Washington Post and other newspapers, has written for NASA’s history program, and is a science writer at a particle-accelerator laboratory.*

## 17. ITER receives first plant components

05 September 2014

**The first plant system components were delivered yesterday to the ITER construction site in Saint Paul-lez-Durance, France.**

<http://www.world-nuclear-news.org/NN-ITER-receives-first-plant-components-0509201401.html>

This first delivery provided a “concrete opportunity” to test the administrative, technical, industrial and regulatory procedures that will accompany the procurement of plant and machine components by the ITER members, ITER said.

Shipped from the USA in four crates, the 12 high-voltage surge arrestors that arrived at the site by truck are part of the US

contribution to the installation's steady state electrical system, ITER said.

The surge arresters belong to a large system that will be installed between the 400 kV switchyard and the transformers that feed power to the ITER plant systems and components. As their name suggests, they are designed to protect the transformers from a major voltage surge that can be caused by lightning, ITER said.

"These are the first of many thousands of components to be delivered to ITER by the project's members," said Ken Blackler, head of ITER's assembly and operations division, as the crates were being unloaded. "In this historic and meaningful moment, I wish to thank the US Domestic Agency for procuring the components, the logistics service provider DAHER for handling the shipment all the way from New York, and the European Domestic Agency for providing temporary storage on the ITER site," he said.

Sergio Orlandi, ITER's head of plant system engineering, said "the timely delivery of these first plant components - in conformity with the schedule proposed in 2010 - is an example to be followed."

The remaining components needed to connect the ITER installation to the dedicated 400 kV switchyard are expected before the end of the month on site. Their installation should begin early 2015, ITER said.

ITER is a global collaboration to build the largest experimental fusion facility. Europe will contribute almost half of the costs of its construction, while the other six members - China, India, Japan, Korea, Russia and the USA - will contribute equally to the rest.

### **Superconducting lengths for PF1 coil**

D. V. Efremov Scientific Research Institute of Electrophysical Apparatus has completed the joint manufacture with Russia's European ITER partners of the first two unit lengths of the superconductor for ITER's magnet system, for the PF1 coil, Russia's Rosatom said today.

The ITER magnet system comprises 18 superconducting toroidal field and six poloidal field coils, a central solenoid, and a set of correction coils that magnetically confine, shape and control the plasma inside the vacuum vessel. The poloidal field (PF) magnets pinch the plasma away from the walls and contribute in this way to maintaining the plasma's shape and stability. The PF is induced both by the magnets and by the current drive in the plasma itself.

Russia is responsible for manufacturing two copper dummies, one superconducting dummy, nine superconducting unit lengths for the PF6 coil, and 17 unit superconducting lengths for the PF1 coil.

Early in 2013, the Italian company Criotec completed the manufacture of the first copper dummy conductor for the PF1 poloidal field coil using cable that had been manufactured in Russia. The cable is composed of superconducting niobium-titanium strands

produced by the Chepetsky Mechanical Plant in Udmurtia, Russia.  
*Researched and written by World Nuclear News*

# 18. **Editorial: PPPL fusion work will focus on the future of energy**

By **Times of Trenton Editorial Board**

on September 09, 2014 at 6:48 AM, updated September 09, 2014 at 7:40 AM

[http://www.nj.com/opinion/index.ssf/2014/09/editorial\\_pppl\\_fusion\\_work\\_will\\_focus\\_on\\_the\\_future\\_of\\_energy.html](http://www.nj.com/opinion/index.ssf/2014/09/editorial_pppl_fusion_work_will_focus_on_the_future_of_energy.html)

The future of energy has an address.

You can find it at the Princeton Plasma Physics Laboratory (PPPL), where a nuclear fusion reactor is about to resume operation as early as this winter, bringing with it the very real possibility that data it produces may lead scientists to a clean and sustainable energy source.

We're not talking about tomorrow or the next day, or even the next few years. But engineers at the lab say they hope to be working on a conceptual design for a reactor that can harness fusion energy in the next decade, with commercial application somewhat further in the future – but still possibly within our children's lifetimes.

We don't pretend to understand the physics behind the Princeton facility – we'll leave that to rocket scientists like U.S. Rep. Rush Holt (D-12th Dist.), a former assistant director of the lab. But we do appreciate the need for an

energy source that comes minus the headaches of hazardous waste storage and disposal, a la nuclear fission.

The PPPL is one of several initiatives nationwide known as GoCos – government owned, contractor operated – that represent a mutually beneficial collaboration between the public and private sectors. New Jersey’s world-class fusion energy research lab, owned by the U.S. Department of Energy and managed by Princeton, sits on 88 acres of the university’s James Forrestal Campus, about three miles from the main campus.

There, more than 450 employees as well as graduate students and subcontractors are working to further the country’s knowledge in such diverse fields as vacuum technology, mechanics, materials science, electronics, computer technology and high-voltage power systems.

For the past two years, the reactor that serves as the lab’s heart has been sidelined as it undergoes a \$94 million upgrade officials hope will make PPPL the most powerful fusion facility of its kind in the world.

In the works since 2012, the revamping will essentially double the power of the reactor. Physicists working on the project hope the results will serve as a prototype for bigger, more powerful machines capable of producing commercial fusion power.

PPPL’s mission is as simple as it is profound: to enable a world powered by safe, clean and plentiful fusion energy while promoting discoveries in plasma science and technology.

It’s an exciting concept, and it’s equally exciting that such progress is taking place just down the road – literally and figuratively. We join scientists and officials in welcoming the changes, and the potential they hold.

# 19. CO<sub>2</sub> levels in record increase: WMO

STAFF REPORTER  
SEPTEMBER 12, 2014 12:30PM

<http://www.theaustralian.com.au/business/latest/co2-levels-in-record-increase-wmo/story-e6frg90f-1227056457984>

The amount of greenhouse gases in the atmosphere reached a new record high in 2013, propelled by a surge in levels of carbon dioxide, according to the World Meteorological Organization's latest *Greenhouse Gas Bulletin*.

In the release of the annual update, the WMO calls for even greater urgency into the need for concerted international action against accelerating and potentially devastating climate change.

The *Greenhouse Gas Bulletin* showed that between 1990 and 2013 there was a 34% increase in radiative forcing – the warming effect on our climate – because of long-lived greenhouse gases such as carbon dioxide (CO<sub>2</sub>), methane and nitrous oxide.

In 2013, concentration of CO<sub>2</sub> in the atmosphere was 142% of the pre-industrial era (1750), and of methane and nitrous oxide 253% and 121% respectively.

The observations from WMO's Global Atmosphere Watch (GAW) network showed that CO<sub>2</sub> levels increased more between 2012 and 2013 than during

any other year since 1984. Preliminary data indicated that this was possibly related to reduced CO<sub>2</sub> uptake by the earth's biosphere in addition to the steadily increasing CO<sub>2</sub> emissions.

The WMO *Greenhouse Gas Bulletin* reports on atmospheric concentrations – and not emissions – of greenhouse gases. Emissions represent what goes into the atmosphere. Concentrations represent what remains in the atmosphere after the complex system of interactions between the atmosphere, biosphere and the oceans. About a quarter of the total emissions are taken up by the oceans and another quarter by the biosphere, reducing in this way the amount of CO<sub>2</sub> in the atmosphere.

The ocean cushions the increase in CO<sub>2</sub> that would otherwise occur in the atmosphere, but with far-reaching impacts. The current rate of ocean acidification appears unprecedented at least over the last 300 million years, according to an analysis in the report.

“We know without any doubt that our climate is changing and our weather is becoming more extreme due to human activities such as the burning of fossil fuels,” said WMO Secretary-General Michel Jarraud.

“The *Greenhouse Gas Bulletin* shows that, far from falling, the concentration of carbon dioxide in the atmosphere actually increased last year at the fastest rate for nearly 30 years. We must reverse this trend by cutting emissions of CO<sub>2</sub> and other greenhouse gases

across the board,” he said. “We are running out of time.”

“Carbon dioxide remains in the atmosphere for many hundreds of years and in the ocean for even longer. Past, present and future CO<sub>2</sub> emissions will have a cumulative impact on both global warming and ocean acidification. The laws of physics are non-negotiable,” said Mr Jarraud.

“The *Greenhouse Gas Bulletin* provides a scientific base for decision-making. We have the knowledge and we have the tools for action to try keep temperature increases within 2°C to give our planet a chance and to give our children and grandchildren a future. Pleading ignorance can no longer be an excuse for not acting,” said Mr Jarraud.

"The inclusion of a section on ocean acidification in this issue of WMO's *Greenhouse Gas Bulletin* is appropriate and needed. It is high time the ocean, as the primary driver of the planet's climate and attenuator of climate change, becomes a central part of climate change discussions,” said Wendy Watson-Wright, Executive Secretary of the Intergovernmental Oceanographic Commission of UNESCO.

“If global warming is not a strong enough reason to cut CO<sub>2</sub> emissions, ocean acidification should be, since its effects are already being felt and will increase for many decades to come. I echo WMO Secretary General Jarraud's concern – we ARE running out of time,” she said.

## Atmospheric Concentrations

Carbon dioxide accounted for 80% of the 34% increase in radiative forcing by long-lived greenhouse gases from 1990 to 2013, according to the U.S. National Oceanic and Atmospheric Administration (NOAA) Annual Greenhouse Gas Index.

On the global scale, the amount of CO<sub>2</sub> in the atmosphere reached 396.0 parts per million in 2013. The atmospheric increase of CO<sub>2</sub> from 2012 to 2013 was 2.9 parts per million, which is the largest annual increase for the period 1984-2013. Concentrations of CO<sub>2</sub> are subject to seasonal and regional fluctuations. At the current rate of increase, the global annual average CO<sub>2</sub> concentration is set to cross the symbolic [400 parts per million threshold in 2015 or 2016](#).

Methane is the second most important long-lived greenhouse gas. Approximately 40% of methane is emitted into the atmosphere by natural sources (e.g., wetlands and termites), and about 60 % comes from human activities like cattle breeding, rice agriculture, fossil fuel exploitation, landfills and biomass burning. Atmospheric methane reached a new high of about 1824 parts per billion (ppb) in 2013, due to increased emissions from anthropogenic sources. Since 2007, atmospheric methane has been increasing again after a temporary period of leveling-off.

## Nitrous oxide (N<sub>2</sub>O)

Nitrous oxide is emitted into the atmosphere from both natural (about 60%) and anthropogenic sources (approximately 40%), including oceans, soil, biomass burning, fertilizer use, and various industrial processes. Its atmospheric concentration in 2013 was about 325.9 parts per billion. Its impact on climate, over a 100-year period, is 298 times greater than equal emissions of carbon dioxide. It also plays an important role in the destruction of the stratospheric ozone layer which protects us from the harmful ultraviolet rays of the sun.

### Ocean acidification:

For the first time, this *Bulletin* contains a section on ocean acidification prepared in collaboration with the International Ocean Carbon Coordination Project (IOCCP) of the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), the Scientific Committee on Oceanic Research (SCOR), and the Ocean Acidification International Coordination Centre (OA-ICC) of the International Atomic Energy Agency (IAEA).

The ocean currently absorbs one-fourth of anthropogenic CO<sub>2</sub> emissions, reducing the increase in atmospheric CO<sub>2</sub> that would otherwise occur because of fossil fuel combustion. Enhanced ocean CO<sub>2</sub> uptake alters the marine carbonate system and lead to increasing acidity. The ocean's acidity increase is already measurable as oceans take up about 4 kilogrammes of CO<sub>2</sub> per day per person.

The current rate of ocean acidification appears unprecedented at least over the last 300 million years, based on proxy-data from paleo archives. In the future, acidification will continue to accelerate at least until mid-century, based on projections from Earth system models.

The potential consequences of ocean acidification on marine organisms are complex. A major concern is the response of calcifying organisms, such as corals, algae, mollusks and some plankton, because their ability to build shell or skeletal material (via calcification) depends on the abundance of carbonate ion. For many organisms, calcification declines with increased acidification. Other impacts of acidification include reduced survival, development, and growth rates as well as changes in physiological functions and reduced biodiversity.

## 20. **Bureau of Meteorology warms to transparency over adjusted records**

THE AUSTRALIAN  
SEPTEMBER 11, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/bureau-of-meteorology-warms-to-transparency-over-adjusted-records/story-e6frg6xf-1227054494820>

**THE Bureau of Meteorology has been forced to publish details of all changes made to historic**

**temperature records as part of its homogenisation process to establish the nation’s climate change trend.**

Publication of the reasons for all data adjustments was a key recommendation of the bureau’s independent peer review panel which approved the bureau’s ACORN SAT methodology.

BoM posted a new site on its ACORN SAT website on Monday, two weeks after being questioned by *The Australian* about the transparency of its homogenisation process.

Independent researchers had been calling for publication of BoM’s methodology for more than two years.

They described publication of the data as a “big win”.

A spokesman for BoM said “publication of this table meets the Bureau of Meteorology response to the recommendations of the Independent Peer Review Panel”.

The peer review panel commended BoM’s homogenisation process but said the bureau should be more open and transparent.

It said “a list of adjustments made as a result of the process of homogenisation should be assembled and maintained and made publicly available, along with the adjusted temperature series”.

“Such a list will include the rationale for each adjustment,” the peer review panel said.

BoM has been under fire over changes to individual temperature records where cooling trends had been changed to warming trends.

The bureau has said changes were necessary to compensate for non-climatic factors such as a site move or change in measuring equipment or in comparison with nearby sites.

Defenders of BoM have accused detractors of cherrypicking examples to question the bureau’s methodology and concentrating on “a few potential errors in the data”.

BoM was unable to provide *The Australian* with details to substantiate their claim of a site move at Rutherglen in Victoria where the minimum temperature trend had been changed from a cooling trend of 0.35C in the raw data to 1.73C warming after homogenisation. The official station record said there had been no site move at Rutherglen.

## 21. **Record expansion sees Antarctic sea ice confound climate scientists**

THE AUSTRALIAN  
SEPTEMBER 15, 2014 12:00AM

<http://www.theaustralian.com.au/national-affairs/climate/record-expansion-sees-antarctic-sea-ice-confound-climate-scientists/story-e6frg6xf-1227058298989>

**ANTARCTIC sea ice has expanded to its greatest coverage since records began in 1978, continuing to confound climate scientists and proving even more hazardous than usual for shipping in the Southern Ocean.**

The three-year, record-breaking run continued as the sea ice cover in the region hit 19.619 million square kilometres on Friday, more than two weeks ahead of last year's October 1 record of 19.607 million. The coverage is roughly 2½ times the size of the Australian continent.

The data, which is kept by the US National Snow and Ice Data Centre and analysed by the Antarctic Climate and Ecosystems Co-operative Research Centre in Hobart, shows the ice has been growing at an average of 1.5 per cent each decade.

“It is telling us we need to know much more about sea ice than we think we know already,” Hobart research centre marine glaciologist Jan Lieser told *The Australian*.

“I suspect the record reached on Friday will not even be the record for 2014, it has some growing to do in the next couple of weeks.”

Dr Lieser said the “growth and decay” of the Antarctic was one of the biggest, potentially the biggest, naturally occurring events in the world. It has long been considered a climate paradox because, as it grows, sea ice in the Arctic has been shrinking.

The prevailing hypothesis is that winds in the Antarctic have strengthened as a result of global temperature gradients changing. Winds play a major role in the formation of sea ice.

“Sea ice is very much a product of its local environment and is not just driven by temperature but (also) ocean currents and winds,” Dr Lieser said. “We know the wind speed and storminess of the Antarctic has increased as a result of a changing climate.

“Crucially, while sea ice is -expanding in the Southern Ocean we know the Antarctic continent itself is losing ice mass at a rapid pace. Whether that loss is contributing to the extra sea ice we do not know but it is something we must look at.”

Although submarines were able during the Cold War to collect useful surveys of the thickness of Arctic ice, no such record of volume exists for Antarctic sea ice. The coverage may have spread but it may also be thinning.

*The Australian* understands the growing ice mass will pose a significant challenge to shipping in the coming Antarctic summer, even to resupply missions conducted by the Aurora Australia.

Last year, scientists were trapped in sea ice for more than a week aboard Russian research vessel Akademik Shokalskiy. They were finally helicoptered to safety aboard the Aurora Australis, which was unable to break through the ice to reach the boat.

The Aurora Australis is due to leave Hobart on October 22 to resupply scientists at the Davis research station. A spokeswoman for the Australian Antarctic Division said the season was yet to begin and she did not have any comment about “potential impacts on the Aurora resupply”.