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B.J.Green (23/4/14)

1. # Greenland ice sheet now ‘unstable’

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http://www.theaustralian.com.au/news/world/greenland-ice-sheet-now-unstable/story-e6frg6so-1226857333947

HE last edge of the Greenland ice sheet to have resisted global warming has now become unstable, adding billions of tonnes of meltwater to rising seas, scientists say.

In a study published in the journal Nature Climate Change, they say a surge in temperature from 2003 has eased the brakes on a long “river” of ice that flows to the coast in northeastern Greenland.

Known as an ice stream, the “river” takes ice from a vast basin and slowly shifts it to the sea — in the same way a river drains water.

In the past, the flow from this ice stream was constrained by massive build-ups of ice debris choking its mouth. But a three-year spell of exceptionally high temperatures had removed this blockage, the study said.

The ice stream, called Zachariae, is the largest drain from an ice basin that covers 16 per cent of the Greenland ice sheet.

From 2003 to 2012, northeastern Greenland disgorged

10 billion tonnes of ice annually into the ocean, the study found.

“Northeast Greenland is very cold. It used to be considered the last stable part of the Greenland ice sheet,” said Michael Bevis, an Earth sciences professor at Ohio State University, who led the study.

“This study shows that ice loss in the northeast is now accelerating. So, now it seems that all the margins of the Greenland ice sheet are unstable.”

Greenland is estimated to contribute 0.5mm to the 3.2 mm annual rise in global sea levels.

The main tool in the study was data from a network of 50 GPS sensors along the coast.

Ice is heavy, so when it melts in massive quantities the land rebounds and the position of the sensors changes slightly.

2. 25 years ago a dream caught fire — and died

By John Hollenhorst

March 23rd, 2014 @ 10:55p

http://www.ksl.com/?nid=1012&sid=29184874#drLaRhs2IjOiMmgh.99

SALT LAKE CITY — Twenty five years ago, University of Utah scientists announced a discovery that touched off a worldwide sensation.

"Basically, we've established a sustained nuclear fusion reaction by means which are considerably simpler than conventional techniques," said Professor Stanley Pons on March 23, 1989. He was describing an experiment on the Utah campus that sent waves of optimism around the globe. Some thought so-called "cold fusion" would solve the world's energy problems and lead to widespread peace and prosperity.

But it wasn't long before those hopes crumbled. At least one prominent scientist later denounced it as "the scientific fiasco of the century."

A few scientists around the world are still committed to "cold fusion" research. But the Utah episode a quarter-century ago is now viewed by many as a classic case of "pathological science" in which the hopes and biases of researchers lure them into a misinterpretation of data.

On that spring day 25 years ago, Pons and fellow chemist Martin Fleischmann became instant science celebrities. "We have tried very hard to prove ourselves wrong, all the way down the line," Fleischmann said that day. "We have to now wait and see."

From the beginning, it did seem too good to be true. The table-top apparatus of Pons and Fleischmann took common elements found in seawater and used an electric current to squeeze them into a crystal lattice. Astonishingly, it seemed to produce excess heat by triggering nuclear fusion, the same process that's kept the sun burning for billions of years.

Scientists immediately predicted far-reaching results if Pons and Fleischmann turned out to be right.

"The significance of energy production from this technology is mind-boggling," said Dr. Philip Ross, then a chemist at the University of California, Berkeley. "It would be the most significant technological discovery since man discovered fire."

Pundits dreamed about unlimited, cheap, clean energy as well as economic prosperity and the end of international tensions over oil supplies.

But sitting in the audience at the news conference that day, young physicist David Kieda spotted a red flag. In a recent interview, Kieda, who is now dean of the University of Utah Graduate School, said: "Well it sounded rather fantastic and I reserved my judgment."

If nuclear fusion was going on, he thought, why didn't Pons and Fleischmann detect bursts of neutrons or gamma rays?

"I did the back-of-the envelope calculation later on that night," Kieda recalled, "and realized they would have received a fairly heavy dose of neutrons. They could have been killed by it. So at that point I wondered whether this was real or not, that something else could have been going on."

As researchers around the world tried to duplicate the excess-heat experiment of Pons and Fleischmann, they ran into frustration and mixed results.

"Now and then they'd see some heat," Kieda said. "Now and then they wouldn't."

It wasn't long before mainstream science turned a cold shoulder to cold fusion.

"Eventually it corrected itself," Kieda said recently. "There was a cold fusion institute that was founded. They did work on it for about four or five years. They concluded the result is not as strong, if at all, (or) does not exist. If it exists, it's at a much smaller level and it's probably not viable for an energy source."

Almost from day one, scientists criticized University of Utah officials for allegedly pushing Pons and

Fleischmann into a news conference. Some say the scientific peer review was rushed because of worries about patent rights and fears that a BYU scientist would publish something similar first.

A few weeks after the 1989 announcement, Nobel Prize winning chemist Dr. Glenn Seaborg said, "It would have been better, of course, if the Utah work could have undergone that (peer review) process before it was revealed."

Twenty-five years later, there's a strong scientific consensus that Pons and Flesichmann added too much hope to their table-top recipe.

"I believe they really wanted it to be true," Kieda said. "It would have been fantastic if it was. But the universe is what it is. You have to bend to the rules of the universe. And just because you want something to happen doesn't mean it's going to happen."

3. Warmists pull their heads in on big calls

MATT RIDLEY
THE WALL STREET JOURNAL
MARCH 31, 2014 12:00AM
http://www.theaustralian.com.au/business/wall-street-journal/warmists-pull-their-heads-in-on-big-calls/story-fnay3ubk-1226869129259#

THE UN's Intergovernmental Panel on Climate Change will shortly publish the second part of its latest report, on the likely impact of climate change.

Government representatives are meeting scientists in Japan to sex up — sorry, rewrite — a summary of the scientists' accounts of storms, droughts and diseases to come. But the report, known as AR5-WGII, is less frightening than its 2007 predecessor.

The 2007 report was riddled with errors about Himalayan glaciers, the Amazon rainforest, -water shortages and other matters, all of which erred in the -direction of alarm. This led to a critical -appraisal of

the report-writing process from a council of national science academies.

Others, however, hit home. According to leaks, this time the full report is much more cautious and vague about worsening -cyclones, changes in rainfall, climate change refugees, and the overall cost of global warming.

It puts the overall cost at less than 2 per cent of GDP for a 2.5C temperature increase during this century. This is vastly less than the prediction of Nicholas Stern, who said climate change would cost 5 per cent to 20 per cent of world GDP in his 2006 report for the British government.

The forthcoming report apparently admits that climate change has extinguished no species so far and expresses “very little confidence” that it will do so. There is new emphasis that climate change is not the only environmental problem that matters and on adapting to it rather than preventing it. Yet the report still assumes 70 per cent more warming by the last decades of this century than the best science now suggests. This is because of an overreliance on models rather than on data in the first section of the IPCC report — on physical science — that was published in September last year.

On December 19, 2012, I forecast that the IPCC was going to have to lower its estimates of -future warming because of new sensitivity results. (Sensitivity is the amount of warming due to a

doubling of atmospheric carbon dioxide.) I was called “anti--science”, a “denier” and worse.

The IPCC’s September report abandoned any attempt to estimate the most likely “sensitivity” of the climate to a doubling of -atmospheric carbon dioxide. The explanation, buried in a technical summary not published until January, is that “estimates derived from observed climate change tend to best fit the observed surface and ocean warming for (sensitivity) values in the lower part of the likely range”. Translation: The data suggest we probably face less warming than the models indicate, but we would rather not say so.

The Global Warming Policy Foundation, a London think tank, on March 5 published a careful survey of all the reliable studies of sensitivity. The authors are British climate scientist Nic Lewis (who has no academic -affiliation but a growing reputation since he discovered a statistical distortion that had exaggerated climate sensitivity in the previous IPCC report) and Dutch science writer Marcel Crok. They say the IPCC’s September report “buried good news about global warming”, and that “the best observational evidence indicates our climate is considerably less sensitive to greenhouse gases than climate scientists had previously thought”.

They argue the -average of the best observationally based studies shows the amount of immediate warming to be expected if CO2 levels double after 70 years is “likely” to be between 1C and 2C, with a best

estimate of 1.35C. That’s much lower than the IPCC assumes in its coming report.

In short, the warming we experienced over the past 35 years — about 0.4C if you average the measurements made by satellites and ground -stations — is likely to continue at about the same rate: a little over a degree a century.

Briefly during the 1990s there did seem to be warming that went as fast as the models wanted. But for the past 15 to 17 years there has been essentially no net warming (a “hiatus” conceded by the IPCC), a fact that the models did not predict and struggle to explain. The favourite post-hoc explanation is that because of natural variability in ocean currents, more heat has been slipping into the ocean since 2000 — although the evidence for this is far from conclusive.

None of this contradicts basic physics. Doubling CO_2 cannot on its own generate more than about 1.1C of warming, however long it takes. All the putative warming above that level would come from amplifying factors, chiefly related to water vapour and clouds. The net effect of these factors is the subject of debate.

In climate science, the real debate has never been between “deniers” and the rest, but between “lukewarmers”. who think man-made climate change is real but fairly harmless, and those who think the future is alarming.

There remains a risk the latest science is wrong and rapid warming will occur with disastrous consequences. If renewable energy had proved to be cheap, clean and thrifty in its use of land, we would be right to address that small risk of a large catastrophe by rushing to replace fossil fuels with first-generation wind, solar and bio-energy. Since these have proved expensive, environmentally damaging and land-hungry, it appears that in our efforts to combat warming we may have been taking the economic equivalent of chemotherapy for a cold.

Almost every environmental scare of the past half-century proved exaggerated, including the population "bomb", pesticides, acid rain, the ozone hole, falling sperm counts, GM crops and killer bees. In every case, institutional scientists gained a lot of funding from the scare and then quietly converged on the view the problem was much more moderate than the extreme voices had argued. Global warming is no different.

Matt Ridley is the author of The Rational Optimist and a member of the British House of Lords

4. Eureka! How a magic doughnut that fakes the sun could save our planet: But the Chinese will get it first thanks to the billions we spend on the 'eco-power' gravy train

Mail One News

http://www.dailymail.co.uk/news/article-2587072/Eureka-How-magic-doughnut-fakes-sun-save-planet-But-Chinese-thanks-billions-spend-eco-power-gravy-train.html

Nuclear fusion could stop man-made global warming once and for all
The technology could give the world limitless clean energy
But fusion is being starved of funds as Britain, the U.S. and EU spend billions on subsidies for wind farms, solar

panels and power stations

The job of developing the technology - pioneered by scientists in the U.S. - has fallen to China and South Korea

Expert says a large-scale demonstration of nuclear fusion could happen in around a decade

Construction of the International Thermonuclear Experimental Reactor is now underway at Cadarache in France

By DAVID ROSE

It could stop man-made global warming once and for all – and give the world limitless, clean energy for as long as humanity lasts.
Nuclear fusion – zerocarbon electric power produced from sea water in a doughnut-shaped reactor that imitates the sun – is also far closer to a reality than most people think.
But while Britain, the United States and the European Union spend hundreds of billions on subsidies for wind farms, solar panels and power stations fuelled by wood pellets, fusion is being starved of funds.
As a result, the ultimate prize of developing this revolutionary technology now looks certain to be claimed by China and South Korea – despite the fact that the science behind it was pioneered here and in the U.S.

he challenge posed by fusion has always been daunting.
A conventional fission reactor, of the type developed to build the atom bomb by the Manhattan Project during the Second World War, harnesses the energy produced when atoms of uranium split.
This can be dangerous, but it isn't difficult, once you obtain a critical mass of enriched, radioactive uranium – when the chain reaction develops of its own accord, and continues unless you stop it.
But it also has a nasty by-product – nuclear waste – that has to be buried in sealed containers.
By contrast, a fusion machine taps the much greater amount of energy unleashed by fusing atoms of hydrogen.
This has advantages. A fusion reactor's fuel is heavy hydrogen – atoms that contain one proton and one or two neutrons – and can be refined from sea water.
The helium gas created when the atoms fuse is not radioactive and is harmless.
But to get the reaction going requires the gas to be heated by giant magnets to temperatures of up to 200 million degrees Celsius, so that it becomes a plasma – the fourth state of matter, where the electrons that normally orbit the proton and neutron nuclei become detached.

The challenge facing scientists developing fusion is containing a plasma and keeping it stable.
Sceptics often sneer that fusion energy has been said to be '50 years away' for decades, and that however hard scientists try, it always will be.
But according to Professor Steve Cowley, director of the UK's Centre for

Fusion Energy at Culham, near Oxford, huge technological milestones have already been passed in the quest to develop fusion on a large scale.
These have been largely ignored by the media.
The design of a fusion reactor as settled long ago: a hollow doughnut known as a 'tokamak' or 'torus', ringed by powerful magnets.
These keep the plasma in place. At JET, the Joint European Torus at Culham, nuclear fusion first generated an output of 16 megawatts (MW) back in 1997.
'People just didn't seem to realise how significant that was,' said Prof Cowley.
'I'm always being asked, how can we get the sun in a bottle?

'But we've already done that at JET, and we've done it predictably. So far, the scale has been small.
'But would you have told the Wright brothers that their first flight didn't count because they'd only flown 100ft?'
Dave Rasmussen, leader of the fusion energy group at the US National Laboratory at Oak Ridge, Tennessee, which was once the Manhattan Project's home, describes other advances.
For example, the discovery that plasmas are prone to disruption – shockwaves that can cause them to lose heat and damage the reactor – presented a major hurdle.
But an extraordinary solution has been found: firing into the plasma pellets of solid gas, cooled to minus 263C. Thanks to this breakthrough, plasmas have been kept going for many hours at JET.
Prof Cowley and Mr Rasmussen are both playing key roles in the International ThermonuclearExperimental Reactor (ITER), whose construction is now under way at Cadarache in France.
This will be five times bigger than JET, and its goal is ambitious: to achieve, some time in the mid- 2020s, an output of 500MW – as much as a fair-sized commercial power station – far exceeding the power it takes to start the fusion reaction. This would be a gamechanging event.
Debate about climate and energy policy would start to end right then, as people and governments realised that a safe and infinite low-carbon energy source was within reach.
The scientists are confident.

'We've solved more or less all of the physics problems, and most of the engineering issues,' Mr Rasmussen said.
Prof Cowley added: 'A large-scale demonstration of nuclear fusion isn't five decades away, but a little more than one.'
However, enormous obstacles remain – not least those imposed by humans.
At about £17 billion, building ITER isn't cheap, but this compares to the £46 billion the UK will have spent on subsidies for wind, biomass and other types of renewable energy by 2020, plus many billions more on connecting installations to the grid.
The taxpayer-funded Engineering and Physical Science Research Council budget for fusion costs just £40 million a year, but research into renewables is more than three times as much at £130 million.

As for Europe, by 2011 the total EU investment in renewables was running at £67 billion a year – a figure which, thanks to colossal subsidies, has continued to rise.

Yet though the EU is one of the main international sponsors for ITER, its total contribution is just £400 million a year.
The reluctance to spend big money means ITER has had to be funded by an unwieldy coalition, including the US, China, India, Japan, the EU and South Korea.
Insiders say the project is bogged down by bureaucracy, and sometimes those involved are forced to make decisions that make no scientific sense.
For example, its tokamak will be assembled from nine identical segments.
Because each ITER partner wants to stimulate their own hitech industries, it has been agreed that seven segments will be made in Europe, and the other two in South Korea.
What will happen if they don't quite fit together? 'It will be a disaster', Prof Cowley admitted.
And while funding shortages have delayed ITER's construction, they are already holding up the next stage of delivering commercial fusion power.

The next big technological hurdle – and, perhaps, the last – is the development of tiles for the tokamak's lining. These will have to be tough enough to withstand the highenergy bombardment of neutrons produced by fusion.
It is not that these tiles must be made before ITER will work, but for a fusion reactor to be commercial, they need to last a long time. Scientists– led by a team from Oxford University – have many theoretical ideas about how to do this.
But, to be sure, said Mr Rasmussen, they need a 'neutron factory' in order to test new alloys under the conditions they will meet inside a tokamak.
He and Prof Cowley agreed that this could be done now, so that the tiles were ready at the same time as ITER – if the total budget were roughly doubled.
Instead, said Prof Cowley, 'we'll have to wait until the world sees that ITER works. Then we'll have to spend another decade or more on the materials. This delay could simply be eliminated'.
While Europe and America hang back on the sidelines, South Korea and China are already planning 'son of ITER' reactors and investing billions in the technology.
'The Chinese have decided that the pace of fusion development is too slow, and that they'll take the risk,' said Prof Cowley.
'They're assuming that ITER will work, and they are pouring money into the next step.'

5. Endless energy? Fusion science is one step closer to building a star on earth

1 April 2014 Adam Leach

Scientists in California have reached an important milestone in nuclear fusion research; generating more energy from a fusion reaction than transferred to the nuclear fuel. The holy grail of ignition remains elusive, but each step brings the world closer to a virtually limitless nuclear energy source with no emissions and negligible waste.

http://www.power-technology.com/features/featureendless-energy-fusion-scientists-one-step-closer-to-building-a-star-on-earth-4207104/

Clean, safe and in infinite supply. In terms of answering the modern energy needs, nuclear fusion ticks all the boxes. The problem is that while the concept goes back all the way back to Einstein's E=MC2 equation and research has been conducted for more than six decades, with the forever promise of success being 30 years away attached, it is not a feasible option.
Whether pinched or punched, the process of fusion, the same process that powers the Sun and many other stars in the galaxy, provides hope, at arm's length.
Earlier this month, that hope moved a little closer when it was revealed that Alpha heating of a hydrogen isotope fuel source had been achieved by the Lawrence Livermore National Laboratory (LLNL). Within the 10-storey Nuclear Ignition Facility in California, a team of scientists from LLNL turned on the world's most powerful laser, split the beam into 192 separate beams and aimed each one at a target that shared both the size and shape of a pencil rubber that contains light-massed hydrogen isotopes deuterium and tritium, which when fused, produce helium and energy.
While the experiment might sound like the most elaborate and expensive physics lesson prank in history, its purpose was entirely practical; to prove that the nuclear fusion process can put out more energy than is put into it.

Getting more from less

And it did just that. In a paper published earlier this month in the peer-reviewed journal Nature, the team led by Omar Hurricane announced that the billionth-of-a-second assault had resulted in the fuel pellet producing roughly double the amount of energy that it had absorbed. The success of the experiment is an exciting step forward in the research arena as it marks the first time that such a feat, making more energy out of less, has been achieved. But that success does not come caveat-free. In terms of the overall energy that was expended in the experiment, a large amount of the laser beams missed the target; the amount generated was equivalent to just 1 per cent of all the energy expended.

But Hurricane is not dismayed: "We're closer than anyone's gotten before. It does show that there's promise. This isn't like building a bridge. This is an exceedingly hard problem. You're basically trying to produce a star, on a small scale, here on Earth."
He analogised the challenge with another human endeavour: "Picture yourself halfway up a mountain, but the mountain is covered in clouds and then someone calls you on your satellite phone and asks you, 'How long is it going to take you to climb to the top of the mountain?' You just don't know."
Since it was published, the paper detailing the experiment within the NIF has received huge praise from the scientific community and been heralded as a significant milestone in the pursuit of turning nuclear fusion into a viable energy source. At the same time, it has also been put into context, with scientists calculating that it still has to improve by a factor of 100 before it can start to be considered viable.

A significant step forward

Stewart Prager, director of the Princeton Plasma Physics Laboratory, is certain that fusion will emerge from the lab to the grid, but less sure about the economics that will underpin it.
He said: "In 30 years, we'll have electricity on the grid produced by fusion energy, absolutely. I think the open questions now are how complicated a system it will be, how expensive it will be, how economically attractive it will be."Mark Herrmann, a fusion researcher at Sandia National Laboratories in New Mexico, said: "These results are still a long way from ignition, but they represent a significant step forward in fusion research."

Professor Steve Cowley, head of Culham Centre for Fusion Energy, praised the results of the experiment: "This is a truly excellent paper that begins to get at the core problems that NIF has - instability of the capsule containing the fusion fuel as it is compressed by lasers."
Explaining where it might lead, he said: "At the moment the situation is that if they push the laser hard enough to get ignition the capsule will become unstable so the best energy yield is from pushing less. There are two possible solutions, a bigger laser pushing slowly, or an innovative capsule that can be pushed hard and still remain roughly stable.
At the same time as researchers at the Nuclear Ignition Facility are trying to make fusion a reality with a well-aimed punch, Cowley and his team are taking a different approach at the Joint European Torus (JET). Using a powerful arrangement of magnets around a doughnut-shaped container called a Tomakak, the magnetic-confinement method of fusion involves fusing hydrogen into helium by pinching them together.
Cowley explained that while the methods of fusion at both facilities differ, progress in either one is good for fusion research as a whole:

"We have waited 60 years to get close to controlled fusion, we are now close in both magnetic and inertial confinement research."

International powers join forces

As for where the big breakthrough will occur, Cowley is confident that it will be at the successor to JET. The International Thermonuclear Experimental Reactor or ITER is currently being built in the south of France with funding provided by the EU, Russia, China, India, South Korea, Japan and the United States.

While a fixed timeline on the viability of fusion should be treated with caution, ITER has set a fixed target of 2027 to achieve full nuclear fusion. Expressing his confidence in the project, Cowley said: "We must keep at it. The engineering milestone is when the whole plant produces more energy than it consumes, ITER, the successor to JET, will be the first experiment to do this. ITER is going slowly but progress is happening."

Ever since it was first touted as a revolutionary energy source, nuclear fusion has been surrounded with an air of scepticism, exemplified by the joke, "nuclear fusion is 30 years away and always will be". While that legacy is likely to endure until a more substantial breakthrough is achieved, the team in California have drawn strength from their finding, or in Hurricane's words: "A lot of people are jazzed".

6. Fusion power could end fossil fuel use

By Robert S. Ball

POSTED: 04/02/14, 4:50 PM EDT | UPDATED: 4 DAYS AGO

http://www.theoaklandpress.com/opinion/20140402/fusion-power-could-end-fossil-fuel-use

Despite not nearly enough support from our leaders in Washington, the nation's making some major strides toward development of renewable energy.

Even Michigan, according to a recent report from the state's Public Service Commission, is closing in on a requirement that utilities secure 10 percent of their electrical energy from wind and solar sources within a couple of years.

But without leadership at the federal level, it isn't enough. Too many fossil fuel power plants remain in operation. Nuclear power plants can be built quite safely, but can't get online fast enough.

At a time when virtually all of the world's climate scientists believe the world as we know it is heading off the rails, the halls of Congress are still inhabited by elected officials in denial.

A game-changer would help.

A potential game-changer's in the works, but whether it ever comes to pass is iffy. And lack of support from Washington is just one of its problem

The game changer is fusion power, using powerful magnetic fields to fuse atoms together amid the temperatures and pressures found in stars. Those temperatures and pressure are found in the midst of atomic bombs, and the hydrogen bombs in modern nuclear But controlling such a chaotic environment? Not yet.

Fusion power has been several decades in the future. It's been there for several decades now. Scientists since the 1950s have said it might be commercially feasible in another 30 or 40 years.

The potential? Fuel from sea water. Little waste, compared with fission power. A downside? Some equipment housing the reaction becomes radioactive.

The timetable might be foreshortened if nations contributing to an international demonstration project in France could get their act together and open their pursestrings, the U.S. included.

Especially the U.S.

Developed nations have coordinated efforts to plan, design, finance and build the International Thermonuclear Experimental Reactor, ITER, a device intended to demonstrate feasibility.

An article in a recent edition of New Yorker magazine described the efforts to build a device which produces more power than is applied to produce the controlled fusion reaction, and does so in a sustainable way.

ITER is truly an international project, proposed nearly 30 years ago in talks between the U.S. and Soviet Union, but expanded since to include the European Union, Japan, South Korea, India and China.

Each participant wants a role in the planning, engineering and

construction of parts, and that's led to a kind of fragmenting of authority, with a team of engineers tasked solely with attempting to ensure that everything will fit.

Money is an issue. According to the article, a conservative estimate of the cost is $20 billion. The U.S. has been a contributor, but not always willingly. When funding for a smaller domestic research version of ITER was yanked to make good on this nation's contribution to the international project, members of Congress were miffed.

That's amazingly short-sighted. The history of fusion power research has been one of building increasingly larger devices, each raising the temperature and pressure needed to sustain a controlled fusion reaction for a longer time. A success at ITER could lead quickly to a commercial application of power using seawater.

Wind turbines and thermal and photovoltaic solar installations aren't likely to make our coal- and gas-powered generating stations obsolete anytime soon. Plants powered by nuclear fission, our traditional ones, can be built safely, but not safely enough to ease the minds of those nearby, and the issue of disposal of radioactive waste will remain.

Fusion power, brought to commercial application, could virtually end the use of fossil fuels.

This isn't the time to be stingy with its development.

Ball is a former reporter, editor and editorial writer at Journal Register newspapers.weapons use such an explosion as a trigger.

7. No sure bets in the climate debate

CHERYL JONES
THE AUSTRALIAN
APRIL 23, 2014 12:00AM

http://www.theaustralian.com.au/news/features/no-sure-bets-in-the-climate-debate/story-e6frg6z6-1226892682728#

LAST summer, Nobel laureate Brian Schmidt

challenged Tony Abbott's chief business adviser Maurice Newman to bet $10,000 that the Earth's average surface temperature would be lower in 20 years than now.

The exchange, on these pages, started with an article by Newman in which he said that the "scientific delusion, the religion behind the climate crusade, is crumbling".

At the centre of the exchange between Schmidt and Newman is the latest battle in the climate wars – over a slowdown in the past 15 years in the increase of the global mean surface temperature despite rising atmospheric greenhouse gas concentrations.

Most of the climate models underpinning the Intergovernmental Panel on Climate Change's latest global warming projections failed to simulate the slowdown, often loosely called a "hiatus" or "pause", which followed a rapid rise in warming.

And there is a big spread in the value calculated by the models for a parameter called "climate sensitivity" – the increase in global mean surface temperature caused by a doubling of the carbon dioxide concentration relative to pre-industrial levels.

The models' spread in the value, put by the IPCC at between 2.1C and 4.7C, hampers the prediction of greenhouse impacts. The threshold to dangerous climate change has been put at 2C over pre-industrial levels but some scientists say it is lower.

While acknowledging that the models are imperfect, climate scientists say the sophisticated computer programs have performed well in projections covering longer timescales.

They say there is strong evidence, including ever-rising sea levels, that the planet continued to warm this century. Global mean surface temperature – the air temperature measured by convention 1.5 metres above the ground – is only one of many measures of climate change. But it is a major one used in international negotiations on limiting climate change, according Britain's Met Office Hadley Centre.

Meanwhile, a big palaeoclimatological study assessing environmental records of climate change in the deep past supports the models' climate sensitivity values.

But greenhouse sceptics, and those who reject that label but oppose the scientific consensus on global warming, have claimed that the deceleration in surface warming is evidence that the IPCC and wider climate science community have exaggerated the risks of climate change.

They have attempted to use the discrepancy between simulations and observations to discredit the models' projections.

The debate in the learned journals (the traditional ground for the formalised sparring of science), the media and the blogosphere has also entered the

political realm.

“Global temperatures have gone nowhere for 17 years,” wrote Newman, chairman of the Prime Minister’s Business Advisory Council and former chairman of the Australian Securities Exchange and the ABC.

He continued with a quotation from a blog posted by climate scientist Roy Spencer, of the University of Alabama in Huntsville, a sceptic and strong critic of the models.

Although a blogger, Spencer does publish research in the scientific journals. He was not surprised that Newman had invoked his name. “I’ve testified in the United States Congress probably half a dozen times,” he tells The Australian. “My name is out there.”

The IPCC addressed questions surrounding the models’ predictive accuracy in its report, “Climate Change 2013: the Physical Science Basis”. The UN agency released the full report in January after issuing a summary for policy makers last year. The report says warming of the climate system is “unequivocal” and human influence on the climate system is clear. It forms part of the IPCC’s Fifth Assessment Report, sections of which have been released progressively.

And the questions are the subject of a big research effort. Scientists have proposed mechanisms including unusually strong Pacific trade winds and unanticipated amounts of aerosols formed after

volcanic eruptions as possible explanations for the attenuation of the surface temperature rise.

Climate change is driven by a multitude of forces acting at differing intensities and interacting on different timescales and over different regions, with complex feedbacks, some amplifying warming and others counteracting it. The most sophisticated computer models representing the system are run on supercomputers. Coupled climate models combine atmosphere and ocean models that exchange information during simulations.

The models differ in their resolution and treatment of feedbacks, such as clouds.

The IPCC report drew on simulations run on scores of climate models by groups around the world under a big program, the Coupled Model Intercomparison Project phase 5, or CMIP5.

Launched in 2008, this set of experiments followed plausible scenarios setting out estimates for input data such as aerosol levels and the 11-year solar cycle. Aerosols reflect solar radiation back into space, cooling the planet, while the solar cycle determines the amount of solar energy striking the Earth.

Gavin Schmidt, a climate modeller at NASA’s Goddard Institute for Space Studies, in New York, tells The Australian that a lack of good observational data available when the experiments were conducted led to input values for aerosol concentrations that

were probably too low.

He says a dramatic increase in particulate pollution from India and China during the past 15 years has raised aerosol levels greatly, and the models differ widely in how they handle aerosols.

And the current solar cycle has been less active than the last one, so the models overestimated the amount of incoming solar radiation.

“There is a case to be made that the modellers were unlucky in a bunch of different things, which has meant that in the very short-term trend in the last 10 years or so they (the models) are running slightly warm,” he says.

Meanwhile, Benjamin Santer, of Lawrence Livermore National Laboratory in California, and co-workers, found that aerosols formed from gases blasted into the atmosphere in several small volcanic eruptions this century accounted for some of the temperature discrepancy between the models and observations. The scientists published their results in Nature Geoscience in February.

CSIRO oceanographer Wenju Cai says a pattern of natural climate variability called the Interdecadal Pacific Oscillation, which has cooled the planet since 1998, has generated “noise” that has drowned out the underlying surface “signal” of human-induced global warming. But the effect will be temporary, he says.

Cai is a member of a team led by Matthew England,

professor at the University of NSW's Climate Change Research Centre, that found that a pronounced strengthening of the Pacific trade winds caused by the IPO was increasing the mixing between ocean layers in the tropical Pacific, boosting the heat taken up by deeper waters.

The effect could account for much of the slowdown in the rise of the global mean air surface temperature, and was not captured by climate models.

The scientists published their findings in Nature Climate Change in February. They say the pattern could persist for the rest of the decade but they expect rapid warming to resume when the trade winds abate.

Strong support for predictions made in the virtual world of the future comes from data from the real world of the past.

An international team of scientists led by palaeoclimatologist Eelco Rohling, of the Australian National University in Canberra and the University of Southampton in Britain, came up with a way to treat results from sets of environmental records covering 65 million years.

The aim of the Palaeosens project was to calculate the planet's climate sensitivity.

The archives include bubbles of carbon dioxide in Antarctic ice cores reaching back 800,000 years and measures of the gas in the exoskeletons of single-celled marine organisms called foraminifera. The

organisms can also yield ocean temperature data.

Previously, palaeoclimatological studies had been difficult to compare because of differences in the methods used by researchers to measure and interpret parameters. The team got a climate sensitivity of a rise of 2.2C to 4.8C for a doubling of carbon dioxide, and published its results in Nature in late 2012. The result is close to the values obtained from the models. “The work was central to the validation of climate projections,” Rohling tells The Australian.

The problem of the big spread in the values remains, but it might have been solved by a group led by Steven Sherwood, also a professor at the UNSW’s Climate Change Research Centre.

The team found that the spread could be attributed largely to the various ways in which the models treated the feedback from clouds, which amplify the greenhouse effect in ways that have been poorly understood.

Sherwood’s team traced the mechanism to atmospheric convective mixing, and published its results in Nature in January.

Sherwood tells The Australian the research implies that a doubling of carbon dioxide levels would trigger a temperature rise of more than 3C – relatively severe warming – so the values at the lower end of the range should now be considered suspect.

“We should always have been planning for the

worst," Sherwood says. "I don't think our international policies have been really recognising the science anyway. No-one has really been taking the problem seriously enough but I think this result makes not doing so look even more ill-considered."

Roy Spencer is sticking to his position.

"I'm not saying that it can be proved that there's something seriously wrong with the models," he says. "They might eventually be shown to be correct in another 30 years if global warming returns with a vengeance.

"But ... the most logical conclusion from the available evidence at this point is that the climate sensitivity of those models is too high, probably by a factor of two."

Brian Schmidt says climate models are not perfect but they are "continually evolving and continually getting better".

He is yet to hear from Maurice Newman on the wager.

8. Panel in search of message to keep it in the game

GRAHAM LLOYD, COMMENT
THE AUSTRALIAN
APRIL 14, 2014 12:00AM

http://www.theaustralian.com.au/opinion/panel-in-search-of-

message-to-keep-it-in-the-game/story-e6frg6zo-1226883030099#

THE IPCC is becoming tangled in its own mixed messages regarding the cost and consequences of tackling climate change.

The political imperative -remains to highlight the risks of runaway climate change and -inject a keen sense of urgency into calls for action on a global deal to cut greenhouse gas emissions, due to be inked in Paris next year. But the message — both in terms of the science and financial cost — is making it an increasingly hard sell.

Release of the fifth assessment report in December was muddled by confusion over why global average surface temperatures had not risen for more than a decade despite strong growth in carbon dioxide emissions. After years of denial, the IPCC report finally acknowledged the “hiatus” and put forward a number of possible explanations, including natural climate variability and increased ocean heat.

Further debate followed the release last month of the working group two report into climate change “impact and adaptation”, which estimated global annual economic losses for additional temperature increases of 2C at between 0.2 and 2.0 per cent of income.

This was much lower than many had expected, given the 5 to 20 per cent estimated by Lord Stern in his advice to the British government. Today’s IPCC report shows the cost of acting to reduce carbon

emissions to keep warming below 2C could be as high as 11 per cent of global consumption by the end of the century. The political reality is that Australia has taken climate change off the G20 agenda, -Europe is scrapping its subsidies for renewables and Germany is turning back to coal.

And the IPCC is struggling for a clear message to keep its political objective on track.

9. IPCC calls for energy transformation

17 April 2014

http://www.world-nuclear-news.org/EE-IPCC-calls-for-energy-transformation-170414JC.html

Only a total shift to low-carbon generation can effectively tackle climate change, according to a report published by the UN's Intergovernmental Panel on Climate Change (IPCC). Improving the energy efficiencies of fossil power plants or shifting from coal to gas will not by itself be sufficient.
Globally, greenhouse gas (GHG) emissions continue to grow, reaching a record 49.5 billion tonnes of carbon dioxide equivalent (CO2eq) in 2010.

The energy supply sector is the largest contributor to global greenhouse gas emissions, responsible for approximately 35% of all anthropogenic emissions. In the absence of climate change mitigation polices, energy-related emissions are expected to rise to 55-70 billion tonnes CO2 by 2050.
The stabilization of GHG concentrations at low levels requires a fundamental transformation of the energy supply system, including the long-term substitution of unabated fossil fuels by low-GHG alternatives, such as nuclear, renewables, and carbon capture and storage (CCS).
In the majority of low-stabilization scenarios (430–530 ppmCO2eq), the share of low-carbon energy in electricity supply increases from the current share of some 30% to more than 80% by 2050. In the long run, fossil power generation without CCS is phased out almost entirely by 2100 in these scenarios.

The IPCC report confirmed nuclear energy among the lowest carbon forms of generation, taking into account both direct emissions and lifecycle, ranking alongside wind turbines at 12gCO/kWh. Hydro and solar have emissions of 24gCO2/kWh and 28gCO2/kWh respectively.

Although identified as low carbon options, biomass has total emissions of 220gCO2/kWh and fossil fuels with CCS 160-220gCO2/kWh, much higher than those of nuclear and renewables, although lower than high-carbon generation from gas (490gCO2/kWh) and coal (920gCO2/kWh).

On safety the report noted that fatality rates of non-hydro renewable energy, hydro and nuclear power in developed countries technologies are comparable - and are lower than those of fossil chains.

Ottmar Edenhofer, co-chairman of the IPPC Working Group III which produced the report, commented: "Climate policies in line with the 20C goal need to aim for substantial emission reductions. There is a clear message from science: To avoid dangerous interference with the climate system, we need to move away from business as usual."

The IPCC has now produced three reports for its Fifth Assessment Report, which will be compiled into a Synthesis Report, due to be published in October.

Researched and written by World Nuclear News

10. China seeks clean, sustainable energy for growth

22 April 2014

http://www.world-nuclear-news.org/NP-China-seeks-clean-sustainable-energy-for-growth-22204144.html

Nuclear power will feature in China's efforts to ensure energy security for the country's continued economic growth, premier Li Keqiang said at the first meeting of the newly-established National Energy Administration (NEA).

Headed by Li, the NEA was set up to coordinate China's overall energy policies. It includes representatives from other agencies, including the environment and finance ministries, the central bank and the National Development and Reform Commission. The NEA will draft a new energy development strategy, evaluate energy security and coordinate international cooperation on climate change, carbon emissions reduction and energy efficiency.

Speaking at the administration's first meeting on 18 April, Li said

that "energy supply and security is related to the overall situation of China's modernization." He said that the country needs "a clean, efficient and safe sustainable energy development path, to provide support for stable economic growth."
He said that, in order to enhance its energy security, China will increase both onshore and offshore oil and gas exploration and development while promoting the development of unconventional oil and gas resources, such as shale gas, shale oil and coal bed methane. At the same time, China will work to increase its use of cleaner energy and improve energy efficiency. It will also actively promote the use of electric vehicles and call for coal-powered plants to be modified to reduce their emissions.
Li said that a number of projects will be launched "to improve energy security capabilities." Included in these will be the "timely launch" of new nuclear power plant construction projects in China's eastern coastal region. The country has a nuclear capacity target for 2020 of 58 GWe in operation and 30 GWe under construction. There are currently 28 units under construction, with a further 34 coastal units planned. Construction of 24 units at inland sites has been deferred.
Other projects planned to be launched soon include the construction of hydropower, wind and solar energy projects, as well as building ultra-high voltage transmission lines.
"These energy projects can ensure stable economic growth and increase China's capability to safeguard energy security," he said. He added, "China will wage a war against smog and step up ecological protection measures by further saving energy and cutting emissions."
Li said that China will accelerate the pace of reform of the electricity market "to promote direct trading, providing a more economical, high quality power protection, letting the market play a decisive role in the allocation of power resources."
China generated a total of 1.3 trillion kWh of electricity during the first quarter of 2014, a 5.4% increase from the same period in 2013, the NEA said. China's 20 operating nuclear power reactors have a combined generating capacity of 17,055 MWe and supply about 2% of the country's electricity.

11. Japan retains nuclear in energy mix

11 April 2014*esearched and written by World Nuclear News*

http://www.world-nuclear-news.org/NP-Japan-retains-nuclear-in-energy-mix-1104147.html

Three years after the Fukushima accident, which led to calls for Japan to phase-out nuclear power, the country's cabinet has given its approval to an energy policy that recommends the restart of its idled nuclear reactors.

The policy has been three years in the making, and is Japan's fourth Basic Energy Plan - previous plans were passed in 2003, 2007 and 2010. It is the first to be approved since the Fukushima nuclear accident of 2011 prompted the extended shutdown of the nuclear power plants on which the country had hitherto relied for some 30% of its electricity. A draft of the plan was published by Japan's Ministry of Economy, Trade and Industry (METI) in February.

The latest plan, like its predecessors, recognises the necessity of energy security for the country which is poor in fossil fuel resources. The policy includes commitments to "clean energy" initiatives but places emphasis on ensuring stable and secure energy supplies. Since its nuclear plants have been off line Japan has seen its fossil fuel imports and greenhouse gas emissions increase. Imports of LNG and thermal coal worth JPY 8.2 trillion ($80 billion) accounted for nearly 10% of total Japanese imports of JPY 81.3 trillion ($793 billion) in 2013.

Setting out policies for the production and supply of nuclear and other energy sources, including clean energy initiatives, the 78-page document designates nuclear energy as an important component of Japan's energy mix and looks to the restart of the country's reactors, while emphasising the priority of safety considerations in the restart and operation of any nuclear plants. Nuclear power, according to METI, is a quasi-domestic source that gives stable power, operates inexpensively and has a low greenhouse gas profile. However, the ministry noted that nuclear must be developed with safety as a priority and with constant work on preparedness for emergency. Nuclear power is an 'important power source that supports the stability of the energy supply and demand structure' it said.

All of Japan's 48 operational nuclear reactors are currently off line pending clearance from the Nuclear Regulation Authority (NRA) under new regulations that came into force last July. To date, restart applications have been lodged for 17 of those reactors. The first reactors could restart later this year after completion of the NRA's review process.

Construction of Ohma 1 - a 1383 MWe ABWR - was suspended following the Fukushima accident, but was the first Japanese nuclear construction project to restart, although no start-up date has been given.

Researched and writtenby World Nuclear News

12. German law limits renewable

growth

09 April 2014

A new law approved by the German cabinet aims to keep down the costs and slow down the rate of growth of renewable energy as the country continues with its energy transition.

http://www.world-nuclear-news.org/NP-German-law-limits-renewable-growth-0904147.html

The *Energiewende* policy adopted by Germany in 2011 in reaction to the Fukushima nuclear accident in Japan calls for the closure of all of the country's nuclear power plants by 2022, pushing to replace the lost capacity with an increase in renewables.

However, susbsidies aimed at stimulating the growth of renewables have driven up prices of consumer power. residential electricity prices increased 12.5% in 2013 compared with the previous year to some 30 cents per kWh. The new reforms to Germany's law on renewable energy, approved by the country's cabinet, seek to address this by making the expansion of renewables more gradual and predictable, while revising the policy on financial support. "Corridors" for the expansion rates of different renewable energies will control the annual rate of growth so that by 2025 renewables will provide 40-45% of the total electricity, rising to 55-60% by 2035. The new provisions will apply to all plants going online as of 1 August.

The law also sets out a new approach to the average support that new renewable plants can expect to receive. The subsidies received by new wind, biomass and photovoltaic plants average out at 12 cents per kWh but vary according to the individual technology, with onshore wind plants receiving the lowest ranging from 8.9 cents per kWh for onshore wind to 19.4 cents per kWh for offshore wind.

To further governmental aims to gradually reduce subsidies and integrate green power into the market, the law also obligates new renewable plants to market their power directly in competition with conventional power generators. Although initially this will only affect plants with an output of 500 kW or more, by mid-2017 the obligation will extend to all plants with an output over 100 kW.

Introducing the new law, German economics minister Sigmar Gabriel said that the reforms aimed to make the expansion of renewable energy more predictable, without any sudden increases in costs - although he said the government could not "promise" cheaper electricity as a result.

Meanwhile, legal challenges by the operators of Germany's remaining nuclear power plants and those already forced to close

down continue at both the national and European level, with utilities pressing claims for compensation and in particular suing the government over an ongoing nuclear tax introduced in September 2010, before the turnaround in energy policy.
Researched and writtenby World Nuclear News

13. **23 April 2014** Last updated at 10:55

Eight renewable energy projects approved

http://www.bbc.com/news/business-27121801

Eight major renewable energy projects, expected to support 8,500 jobs, have been given government approval.

The contracts, which include offshore wind farms and conversions of coal-powered plants to run on biomass, are the first awarded under the government's energy market reforms.

Energy Secretary Ed Davey said the projects would help power up to three million homes.

He also expects them to attract £12bn in private investment.

The eight projects will all receive one of the government's Contracts for Difference (CfDs), which effectively guarantee prices for renewable energy suppliers.

These could cost up to £1bn each year in subsidies, but the government says they would encourage firms to invest much more than that in low-carbon electricity generation.

The approved schemes include offshore wind farms in Liverpool bay, and off the Moray, Norfolk and Yorkshire coasts.

However, electricity producer Drax said it had started legal proceedings against the government over a decision not to support the conversion of one of its coal-burning units to biomass under the scheme.

Although the conversion of one of its units at Selby to biomass has got the go-ahead, the government said the proposed project for converting Drax's Unit 3 at the plant did not meet all its assessment criteria for the CfD scheme.

In late morning trade in London on Wednesday shares in Drax were down by 13%.

'Secure, clean energy'

The projects approved are:

- Beatrice offshore wind, Outer Moray Firth
- Burbo Bank offshore wind, Liverpool Bay
- Drax 2nd biomass conversion unit, Selby
- Dudgeon offshore wind, north of Cromer
- Hornsea offshore wind, off the East Yorkshire coast
- Lynemouth biomass conversion, Ashington, Northumberland
- Teesside biomass with combined heat and power, Middlesbrough
- Walney extension offshore wind, off Walney island

Mr Davey said there were more potential renewable energy projects than the government was able to back, and if one of the eight initial projects did not go ahead, then another similar project would be supported.

There were 57 original applications for backing.

"We are confident that the eight will go ahead, but if a company decides not to go ahead.... there will be another one queuing up behind," Mr Davey told the BBC's Today programme.

"These investments are critical to make sure we have got secure, clean energy," he said, pointing to energy supply issues arising from the Ukraine crisis.

Mr Davey also said the projects would add nearly 5% to the UK clean energy supply.

"These are the first wave of our reforms, designed to stimulate investment in low carbon energy, but in a more affordable way than previously," he said.

However, he added that the measures would add 2% to household energy bills by 2020, when it is hoped some 30% of electricity will come through renewable means.

The Department of Energy and Climate Change (Decc) said it expected the investment contracts for the successful projects would obtain parliamentary approval in May 2014, when they would then take legal effect.

'Access rights'

Mr Davey also discussed fracking, and whether companies would be allowed to drill under private land without the permission of owners.

It comes a day after Whitehall sources confirmed to the BBC that ministers wanted to give energy companies the right to run shale gas pipelines under private land.

Mr Davey told the BBC that the government was "looking at the access rights".

"The question is how those land owners are compensated and how those projects can go ahead," he added.

14. Global dip in renewable energy investment

By Mark Kinver
Environment reporter, BBC News

http://www.bbc.com/news/science-environment-26923260

Global investment in renewables fell by 14% during 2013, but the percentage of electricity generated by renewable sources

still grew, a report shows.

It said investment fell for the second year in a row because of cheaper technology, but also as a result of uncertainty surrounding energy policy.

However, falling costs meant renewables accounted for 8.5% of the global electricity mix, up from 7.8% in 2012.

Renewables accounted for 43.6% of newly installed generation capacity in 2013.

The report - **Global Trends in Renewable Energy Investment 2014** - was produced by the United Nations Environment Programme (Unep) and Bloomberg New Energy Finance.

Falling costs

The assessment said the US $214.4bn (£129.2bn) worldwide investment in the renewable sector during 2013 was 23% below the 2011 record.

One of the report's lead editors, UN energy expert Eric Usher, described 2013 as a "mixed year" for global renewable energy.

Identifying the reasons behind the fall in investment, he explained: "One of the major factors was the fall in the cost of equipment.

"Another negative factor was a touch of policy uncertainty, which saw investors delay spending their money."

He told BBC News that the fall in the cost of the clean energy technologies - particularly solar - had "left some governments thinking that they had been paying too much and reviewed their subsidies".

Mr Usher added that while some nations, such as Germany, had been able to adapt very quickly, "other nations have not handled it quite so well, causing nervousness among investors".

He explained that for a number of years, there was overcapacity in

the sector and supply was greater than demand, making it difficult for firms to record a profit.

But lower costs, improved efficiencies and market consolidation had allowed companies to return to profitability.

Mr Usher observed that there were a number of positive signs during 2013, including the fact that the renewable energy sectors in a number of nations, particularly in Latin America, were able to grow completely free of government subsidies.

He added: "For the first time in 2013, China installed more new generation capacity using renewables than fossil fuels.

"So it is a good sign for the sector that the world's largest emerging economy is taking the sector very seriously indeed."

Responding to the assessment, Unep executive director Achim Steiner said: "A long-term shift in investment over the next few decades towards a cleaner energy portfolio is needed to avoid dangerous climate change, with the energy sector accounting for around two-thirds of total greenhouse gas emissions.

"The fact that renewable energy is gaining a bigger share of overall generation globally is encouraging. To support this further, we must re-evaluate investment priorities, shift incentives, build capacity and improve governance structures."

The report's findings are being presented to a Future of Energy Summit in New York, US, which runs until Wednesday.