

The Week That Was (Oct 10, 2009) brought to you by SEPP

 TWTW of Oct 17 will be hosted by Ken Haapala while Fred Singer speaks in NYC on Oct 16
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Quote of the Week:

“For here we are not afraid to follow the truth wherever it may lead, nor to tolerate any error so long as reason is left free to combat it.” -- *Thomas Jefferson*

THIS WEEK

Nobody really wants the EPA to control CO2 as a pollutant. Suspicion is ripe, however, that the White House is using potential EPA action to blackmail Congress (and industry) into adopting some version of Cap&Trade. However, EPA action (based on an Endangerment Finding) can be stopped (and, certainly, delayed) by litigation. Legislation, on the other hand, is hard to undo – once signed into law. So the emphasis has to be to call the WH bluff and defeat C&T (aka Ration & Tax, but deceptively titled “**The Clean Energy Jobs and American Power Act**”) in the Senate and allow no compromises.

EPA global warming regulation is a “**backdoor energy tax**” that “can drive stocks into the ground.” Senator James Inhofe (R-OK) claims that President Obama wants to “**intimidate Congress**” into passing “\$300 to \$400 billion a year” in taxes, so that the American people will blame Congress instead of him: “*The reason why I don’t think they’ll try to do that through [EPA] regulation is because certainly this president, President Obama, knows that once the American people find out that they’re going to pay about \$2,000 a year in taxes for something that doesn’t do anything, there’s going to be an outrage. And they want to be able to say, “Oh, no, that was Congress that did it.” My feeling is they’re using this [EPA regs] for intimidation purposes and they’re going to try to intimidate Congress to do this [pass Cap&Trade].*

Meanwhile, the pre-COP negotiations in Bangkok are ending in turmoil and disagreement. A self-styled Asian Peoples’ Climate Court found the G-8 nations (that include the US) guilty of ‘**planetary malpractice**’ in violation of the United Nations Framework Convention on Climate Change and subject to a lawsuit for unspecified damages. Expect the CPH meetings to degenerate into class-action demands by *ad hoc* ‘international tribunals’ for ‘reparations’ from ‘over-consuming’ nations. It’s the perennial call for a NIEO (**New International Economic Order**), now dressed up as climate change. Having hyped the threat of climate change (cf the British Stern Report) for so many years, maybe the G-8 deserve this kind of retribution: It’s a case of ‘the chickens are coming home to roost.’

Of course, if G-8 governments were not blinded by years of scientific mis-information, they could make the case that (i) industrial development and rising CO2 levels have insignificant influence on global climate; and in any case, (ii) higher CO2 levels benefit agriculture and keep developing nations from starvation. You will find the evidence in NIPCC reports and the new websites www.plantsneedco2.org and www.co2isgreen.org

So how about making a reverse claim – and also, let’s all thank the Chinese for adding to atmospheric CO2

BTW, Bangkok also brought out the split within G-8 between EU and the US. Seems the US (under Obama) wants to do away with the Kyoto Protocol. Sounds suspiciously like George W Bush, doesn’t it?

SEPP Science Editorial (by SFS) #31-2009 (10/10/09)

UNEP updates IPCC and brings back the ‘Hockeystick’ (Part 2)

Well, it seems that UNEP has now removed the Hockeystick graph (on page 5 of its report, which claims to ‘update’ IPCC – *I wonder, however, if IPCC agrees*). They must have been greatly embarrassed when it was revealed that they copied the graph from an obscure Norwegian biologist, who found it on Wikipedia! “Those damn dirty bloggers muck up the reporting of science to the masses yet again.”

<http://wattsupwiththat.com/2009/10/05/united-nations-pulls-hockey-stick-from-climate-report/>

See also: “UN climate reports: They lie.” The hockeystick flap again; this time by UNEP not IPCC

http://www.americanthinker.com/2009/10/un_climate_reports_they_lie.html

But this is not the end of the story: There is also a problem with the new graph on p.5 of this 'modified' UNEP report (that supposedly updates IPCC-4) at www.unep.org/compendium2009/: It uses the problematic GISS data for global surface temperature, which shows post-1998 temp that are *warmer* than 1998 -- in contradiction to Hadley-CRU and to NOAA-NCDC!** And of course, the satellite MSU data (both UAH and RSS) disagree with GISS also.

So we will just have to get after UNEP until they change the graph again. Stay tuned ...

***According to Pat Michaels (private comm.), James Hansen suddenly added some arctic data of limited length to the GISS record. The anomaly there is pretty high; hence a post-1998 "warming trend" – while everyone else reports a cooling trend.*

1. Peer review fails for tree rings -- *Andrew Orłowski*
2. Cap-and-trade favors corporate over national interest
3. Study asks \$10 trillion for climate
4. John Kerry: If you enjoyed this year's recession, just wait for cap and trade
5. The real disaster is not global warming but energy policies based on hype – *Fred Singer*
6. Prologue to Copenhagen
7. Climate data don't agree with IPCC expectations -- *Marc Duchamp*
8. Why we need nuclear power: low-carbon, secure and proven -- *Scientific Alliance*

NEWS YOU CAN USE

The global surface temperature record produced by the Climate Research Unit (CRU) at the University of East Anglia is among the most influential in climate change research. It was the sole record utilized by the IPCC in its 1996 Second Assessment Report, informs both subsequent IPCC reports, and is part of the evidence on which EPA's Endangerment Finding is based. Contrary to standard scientific practice, CRU for years refused to share the raw data from which it produced this record. Then, in August 2009, CRU stated that it could not share the original data, because the data had been destroyed.

On the basis of this new information, which emerged after the endangerment proceeding comment period closed (June 23, 2009), CEI is [petitioning EPA](#) to reconsider its proceeding and reopen the comment period to allow public response to this information. Click [here](#) to view **CEI's petition** and supporting documents.

Ross McKittrick in Financial Post: **Defects in key IPCC climate data** are uncovered. Read more: <http://network.nationalpost.com/np/blogs/fullcomment/archive/2009/10/01/ross-mckittrick-defects-in-key-climate-data-are-uncovered.aspx#ixzz0TBswVcBW>

 Response by IPCC's Keith R. Briffa (30 Sept 2009) at: <http://www.cru.uea.ac.uk/cru/people/briffa/yamal2000/>
 But Steve McIntyre's preliminary post provides sufficient evidence to doubt the reality of unusually high summer temperatures in the last decades of the 20th century. If by now you are sufficiently confused by the debate over tree-ring data, read "UN climate reports: They lie." The hockeystick flap again – this time by UNEP not just by IPCC: http://www.americanthinker.com/2009/10/un_climate_reports_they_lie.html

CEPOS critique of Danish wind energy <http://climaterrealists.com/index.php?id=4060>

Climate change and insurance industry

http://www.genevaassociation.org/PDF/Geneva_Reports/Geneva_report%5B2%5D.pdf

Our efforts to overturn the **APS Statement on Climate Change** are documented in the Open Letter to the American Physical Society <http://www.openletter-globalwarming.info/Site/open_letter.html>

It petitions the APS Council to revise its current statement on climate change. The Council has advised us that it will reconsider the statement and arrive at a resolution at its November meeting. They have appointed a subcommittee of senior scientists to review the issue. We do not expect change to come easily or happily so we continue to gather signatures to strengthen the case for moderation.

Currently the Letter is signed by 155 APS members or former members. Nearly half have academic backgrounds, with the rest roughly equally divided between industry and government experience. There are 56 Fellows of major scientific societies (mostly APS), 20 APS life members, 11 members of national academies, and a Nobel laureate. A number have published major research on the global warming issue, authored books on the issue, or worked in contiguous areas of meteorology and climate. Nearly all have backgrounds in key science areas that underlie the global warming issue, including fluid dynamics, modeling of nonlinear systems, the physics of complex systems, gas phase physics and chemistry, radiation/heat transfer, phase transitions, statistics, and biological systems.

The **Bakken oil**-discovery potential: A major source of US domestic oil

<http://www.usgs.gov/newsroom/article.asp?ID=1911>

BELOW THE BOTTOM LINE

COPENHAGEN, Sept 30 (Reuters) - Tokyo governor Shintaro Ishihara warned on Wednesday the **2016 Olympics** could be the last Games, with global warming an immediate threat to mankind. "It could be that the 2016 Games are the last Olympics in the history of mankind"

From reader Tom Burch: *Willy Nelson once said. "People think I'm crazy, but it keeps me from going insane." I am starting to feel a bit like Willy myself.*

This just in -- from Oct 8 **Drudge Report**: "[Saudi Arabia has led a quiet campaign during these and other negotiations demanding behind closed doors that oil-producing nations get special financial assistance if a new climate pact calls for substantial reductions in the use of fossil fuels.](#)" *Imagine that.... Cap-n-trade screws us up front and then the Feds give taxpayer bailout money to the Saudis -- screwing us from behind.*

From Best of the Web (WSJ): **We Blame Global Warming**

"Calif. Wildfire Stalled by Record Low Temperatures"--headline, [Associated Press](#), Oct. 7 "Some Idaho School Kids Enjoy an Early Snow Day"--headline, [KTVB-TV](#) Web site (Boise), Oct. 7

The 'climate-change song' goes international: Ein Lied für das Klima

<http://www.telegraph.co.uk/earth/earthnews/6253847/Lily-Allen-and-Duran-Duran-record-climate-change-song.html> Here an excerpt (melody of 'Midnight Oil')

*The time has come A fact's a fact
The heat is on No turning back
How can we dance when our earth is turning
How do we sleep while our beds are burning...*

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1. IF A PEER REVIEW FAILS IN THE WOODS....

By Andrew Orlowski, The Register, September 29, 2009.

http://www.theregister.co.uk/2009/09/29/yamal_scandal/

A scientific scandal is casting a shadow over a number of recent peer-reviewed climate papers. At least eight papers purporting to reconstruct the historical temperature record may need to be revisited, with significant implications for contemporary climate studies, the basis of the U.N. Intergovernmental Panel on Climate Change's (IPCC) assessments. A number of these involve senior climatologists at the British climate research centre CRU at the University East Anglia. In every case, peer review failed to pick up the errors, says the *Register*.

At issue is the use of tree rings as a temperature proxy, or dendrochronology. Using statistical techniques, researchers take the ring data to create a "reconstruction" of historical temperature anomalies. But trees are a highly controversial indicator of temperature, since the rings principally respond to CO2 level, and also to humidity, rainfall, nutrient intake and other local factors.

Picking a temperature signal out of all this noise is problematic, and a dendrochronology can differ significantly from instrumented data. In dendro jargon, this disparity is called "divergence." The process of creating a raw data set also involves a selective use of samples -- a choice open to a scientist's biases. Yet none of this has stopped paleoclimatologists from making bold claims using tree ring data:

- o In particular, since 2000, a large number of peer-reviewed climate papers have incorporated data from trees at the Yamal Peninsula in Siberia.
- o This dataset gained favor, curiously superseding a newer and larger data set from nearby.
- o The older Yamal trees indicated pronounced and dramatic uptick in temperatures.

How could this be, asks the *Register*?

- o Scientists have ensured much of the measurement data used in the reconstructions remains a secret - failing to fulfill procedures to archive the raw data.
- o Without the raw data, other scientists could not reproduce the results.
- o The most prestigious peer-reviewed journals, including *Nature* and *Science*, were reluctant to demand the data from contributors, until now, that is.

But at the insistence of editors of the Royal Society's *Philosophical Transactions B* the data has leaked into the open -- and Yamal's mystery is no more, says the *Register*:

- o From this we know that the Yamal data set uses just 12 trees from a larger set to produce its dramatic recent trend.
- o Yet many more were cored, and a larger data set (of 34) from the vicinity shows no dramatic recent warming, and warmer temperatures in the Middle Ages.
- o In all there are 252 cores in the CRU Yamal data set, of which ten were alive in 1990. All 12 cores selected show strong growth since the mid-19th century.

The implication is clear: the dozen were cherry-picked, says the *Register*.

2. CAP-AND-TRADE FAVORS CORPORATE OVER NATIONAL INTEREST

The "Clean Energy Jobs and American Power Act" introduced by Senators Barbara Boxer (D-Calif.) and John Kerry (D-Mass.) favors corporate interests over our national interest, says the Free Enterprise Project of the National Center for Public Policy Research. The bill calls for a 20 percent reduction in emissions, exceeding the 17 percent target in the House' Waxman-Markey legislation passed in May.

Boxer-Kerry lacks many important details, including a disclosure of which industries will benefit from free emissions credits. "In the rush to legislate, the Boxer-Kerry bill is silent on key elements, such as how the

government will hand out free emissions allowances that are worth billions of dollars. With that amount of money left on the table, it opens the door for a behind-the-scenes lobbying fest that will reward well-connected companies while looting taxpayers," said Tom Borelli, director of the Free Enterprise Project.

- o Waxman-Markey awards most of the estimated \$777.6 billion of free allowances to industry between 2012-2020; utilities were the biggest winner in the "House bill lottery," receiving 35 percent of allowances.
- o President Obama originally wanted to auction all the emission credits with the revenue going to reduce the budget deficit.

In addition to the allowance windfall, a few select companies will benefit from specific provisions:

- o Caterpillar would gain from sales of its newly-developed hybrid bulldozer, because the bill empowers the EPA to issue new emissions standards for new heavy-duty vehicles and engines and for non-road vehicles and engines.
- o The Caterpillar hybrid bulldozer is priced about \$100,000 more than conventional bulldozers -- an added cost that will be passed on to construction projects.

The Boxer gift to Caterpillar may be a reward for CEO Jim Owens. Under Owens, Caterpillar is a member of the U.S. Climate Action Partnership (USCAP) -- a coalition of corporate and environmental special-interest groups lobbying for cap-and-trade. Owens is a member of President Obama's Economic Recovery Advisory Board.

"Owens is putting his personal short-term interest over our national interest. He has previously acknowledged that cap-and-trade can harm the competitiveness of our manufacturing industries, yet he remains a member of USCAP," added Borelli.

"It's clear the only winners with cap-and-trade will be the lobbyists, CEOs, and their environmental allies. The bill represents a huge transfer of wealth in the amount of hundreds of billions of dollars to industry. While the Washington elite benefit, the rest of America will end up paying the cost through higher energy prices, slower economic growth, and sending jobs overseas," said Borelli.

Source: PRNewswire, October 1, 2009. <http://www.prnewswire.com/news-releases/senate-cap-and-trade-bill-favors-corporate-interests-over-national-interest-63246017.html>

3. STUDY ASKS \$10 TRILLION FOR CLIMATE

An investment of \$10 trillion in renewable energy and other carbon-abatement technology will be necessary over the next two decades to limit the rise in the Earth's temperature, the Paris-based International Energy Agency (IEA) warns in a new report.

The IEA, energy adviser to the world's richest nations, urges more-aggressive reductions in carbon emissions than what many nations are currently planning. In the report, to be released today:

- o The IEA calls for investment -- in clean-energy initiatives such as solar power, new nuclear plants and other measures -- of \$500 billion a year over the next 20 years.
- o That is 37 percent more investment than what the IEA estimated was necessary just a year ago.
- o Some analysts put the current level of investment in clean energy at around \$100 billion a year.

The additional investment called for could be particularly expensive for consumers in developed nations such as Germany and the United States, which would likely face higher costs to fill up their vehicles and keep their lights on.

The IEA also says sales of vehicles powered by the internal combustion engine will need to fall from around 95 percent of the world's total purchases today to 40 percent in 2030; electric and hybrid vehicles would need to account for the majority of new vehicle sales over the next 20 years.

Source: Spencer Swartz and Selina Williams, "Study Asks \$10 Trillion for Climate," *Wall Street Journal*, Oct 6, 2009. http://online.wsj.com/article/SB125479738472566689.html?mod=WSJ_hps_MIDDLEThirdNews

SEPP Comment: Maybe it's time to defund the IEA

4. JOHN KERRY: IF YOU ENJOYED THIS YEAR'S RECESSION, JUST WAIT FOR CAP AND TRADE

Senators Barbara Boxer (D-Calif.) and John Kerry (D-Mass.) introduced draft legislation of a cap and trade bill with slightly more stringent near-term carbon reduction targets and Kerry's message was simple: The recession worked so well to reduce carbon dioxide emissions, let's keep it going. Senators from both sides of the aisle expressed concerns about the target but Kerry argued since the recession gave us a head start on greenhouse gas reduction, we can kill the economy some more.

"Let me emphasize something very strongly as we begin this discussion. The United States has already this year alone achieved a 6 percent reduction in emissions simply because of the downturn in the economy, so we are effectively saying we need to go another 14 percent."

In other words, 10 percent unemployment is the new norm, says the Heritage Foundation:

- o It took a year for the United States to reach 10 percent unemployment through the financial meltdown and the housing crisis.
- o If the trade-off is a 6 percent reduction in emissions for a 3.5 percent reduction in unemployment in one year alone, we could get to a 20 percent reduction in carbon dioxide by October 2011 and push the unemployment rate to 18 percent.
- o On the bright side, we'd still be below Spain's 19.3 percent.

Make no mistake, this bill is a jobs destroyer, explains Heritage:

- o Despite attempts to market cap and trade as a "clean energy jobs" bill, net job losses approach 1.9 million in 2012 and could approach 2.5 million by 2035.
- o Particularly hit hard is the energy-intensive manufacturing sector, which according to the Heritage Foundation economists, would lose 1.4 million jobs by 2035.

For the record, you won't hear proponents of cap and trade calling it a "green" jobs bill anymore. That doesn't poll well. It's "clean energy" jobs now, says Heritage:

- o Cap and trade will drive up energy prices so high to force people to use less energy.
- o Consumers will drive less, fly less and companies will pump out less CO2 because people will buy less. But people still need to drive their cars and turn on their lights.
- o All cap and trade does is force people to spend more to use less.
- o The trade-off for reduced carbon dioxide emissions is reduced economic activity.

Source: Nick Loris, *Heritage Foundation*, October 5, 2009. <http://blog.heritage.org/2009/10/05/john-kerry-if-you-enjoyed-this-year%E2%80%99s-recession-just-wait-for-cap-and-trade/>

5. THE REAL DISASTER IS NOT GLOBAL WARMING BUT ENERGY POLICIES BASED ON HYPE

Gwynne Dyer's lurid jeremiad (*Columbus Dispatch*, Oct 1, 2009) of imminent Global Warming disasters should be contrasted with the observed fact that the climate is actually cooling -- all while CO2 levels are rising. Evidently, the climate fluctuates both up and down, as it has been doing for millions of years, and pays no attention to what humans are doing. The problem with Dyer and other 'warmistas' who are peddling climate hype is that it provides fodder for energy policies that are capable of causing genuine disasters: higher prices for electric power, more job losses, and lower economic growth -- all on top of the present recession.

Of course, there are some who have figured out how to profit from the climate scare: federal subsidies for windmills that produce piddling amounts of unreliable electricity at huge cost; federal support for luxury cars that only Al Gore and his pals can afford; and new-fangled light bulbs that people do not want but are forced to buy. Congress is producing bills (Waxman-Markey and Boxer-Kerry) that don't even mention the word climate in their titles yet pretend to 'save the Earth' from warming while raising taxes. And guess who pays for all this craziness?

S. FRED SINGER

*Prof of Environmental Sciences (Emeritus), Univ of Virginia
BEE (Ohio State U), PhD (Princeton), and DSc (hon) from OSU*

6. PROLOGUE TO COPENHAGEN

<http://www.nzcpr.com/guest166.htm>

Excerpt: The so-called evidence emanates from a vociferous group in the scientific community who, for a variety of reasons, are set on promoting predetermined conclusions not supported by empirical data or real-world observations. The science they rely on is all about the number of scientists who agree with them and claims of consensus to suppress quality control in climate research. "Taking a vote is a risky way to discover scientific truth", warned climatologist Reid Bryson.

The planet has warmed and cooled several times over the past 150 years, all within the range of natural climate variability. There are no published scientific papers that show irrefutable proof that any of this is human-caused. Proof is not to be mistaken for the output of hypothetical climate models, none of which has been shown to reliably predict climate. Proof is not merely evidence of warming coupled with the default conclusion "it must human-caused" when we don't know how else to explain it. This is nothing more than admission of ignorance. Even the UN's Intergovernmental Panel on Climate Change (IPCC) acknowledges changes we have seen may be natural. The following statement appears in a major IPCC report "Climate Change 2001":

"The fact that the global mean temperature has increased since the late 19th century and that other trends have been observed does not necessarily mean that an anthropogenic effect on the climate has been identified. Climate has always varied on all time-scales, so the observed change may be natural."

The notion of an unchanging climate has been used to deceive us. It is a conveniently forgotten fact that most of the industrialised world went into hysterics during the forty years of global cooling beginning in the late 1930s. It has now been replaced by global-warming hysteria over a temperature rise over 100 years of less than one degree, a trend that started before modern industrialisation caused atmospheric carbon dioxide concentrations to rise.

7. CLIMATE DATA DON'T AGREE WITH IPCC EXPECTATIONS

By Marc Duchamp, Environmentalist, President of Save the Eagles

"Ice is expanding in much of Antarctica, contrary to the widespread public belief that global warming is melting the continental ice cap." <http://www.news.com.au/story/0,27574,25348657-401,00.html>

"The ice melt across during the Antarctic summer (October-January) of 2008-2009 was the lowest ever recorded in satellite history" <http://www.worldclimaterreport.com/index.php/2009/10/06/antarctic-ice-melt-at-lowest-levels-in-satellite-era/>

And how about the Arctic ? In keeping with the global cooling of the last years, annual summer melting is no longer getting worse, contrary to what we are being told. Here is the actual data, which responsible people find to be more reliable than Ban Ki-moon's personal observations ("I went to the north pole this summer, and saw the ice melting") <http://arctic.atmos.uiuc.edu/cryosphere/IMAGES/global.daily.ice.area.withtrend.jpg>

BTW, if the poles were melting, why would Venice, the Maldives, and Florida be thriving? Where are the floods? In fact, ocean levels, which have been naturally rising by a cumulative 120 meters since the last ice age 15,000 years ago, have been stable for the past 2 years, which is not surprising, as world temperatures have been declining <http://climateresearchnews.com/2008/12/short-tem-sea-level-trend-shrinking-since-2005>

World temperature record evidencing global cooling: <http://www.cru.uea.ac.uk/cru/climon/data/themi/g17.htm>
Source : Met Office CRU - a UK government quango hardly suspect of favouring climate scepticism.

IPCC scientist admits to global cooling and predicts it may last one or 2 more decades:
<http://www.newscientist.com/article/dn17742-worlds-climate-could-cool-first-warm-later.html?DCMP=OTC-rss&nsref=online-news#>

How much more evidence is needed before the mainstream media, and the public whose opinion they influence, realize that climate change is a natural phenomena, and that people with a political/financial agenda have been hijacking for their own gain?

Carbon taxes and protectionism will only deepen the present recession into a depression, with no benefit for climate whatsoever since it is now naturally cooling. But vested private interests like Al Gore's business group, and multinationals like General Electric, Iberdrola, Vestas etc. make a killing at taxpayers' expense. This is the biggest scam in recorded history.

8. WHY WE NEED NUCLEAR POWER: LOW-CARBON, SECURE, PROVEN

The Scientific Alliance, Cambridge CB4 0WS UK, 8th October 2009

When sceptics or agnostics raise questions about the current received wisdom on climate change, one of the more reasonable responses is to suggest that, since the projected consequences could be so catastrophic, precautionary action would surely be a sensible route to take. Even people not convinced by the IPCC arguments might think that some kind of insurance against a possibility of catastrophe would be justified.

The problem is that many of the favoured policy prescriptions are both drastic and unproven. Most plans for reductions in carbon intensity focus on increased use of renewable power, in particular wind, since this requires a lower subsidy than alternatives. But, as has been pointed out many times before, wind power is essentially erratic and output varies in unpredictable ways from day to day, hour to hour and even minute to minute. This can cause problems for the distribution grid, which must be kept balanced at all times, but significant amounts of wind power can be managed.

A bigger problem is that the output is essentially uncontrollable, short of shutting turbines down (as indeed has to be done to prevent damage when the wind speed is too high). Not only does a source of reserve power have to be on standby to meet demand at some times, but at others there can be a danger of the grid being swamped by excess power. An excellent study of this situation in Denmark ("Wind Energy - the case of Denmark," written by Hugh Sharman and Henrik Meyer, published by the CEPOS think tank) - which has for many years been one of the leading generators of wind power - illustrates the consequences in quantitative terms.

Although on paper the country generates about 19% of its electricity from wind turbines, this figure is misleading. In practice, at windy times or when demand is low, wind-generated electricity is exported via interconnectors to neighbouring Sweden and Norway, which can use the power to pump water into storage

for their hydroelectric plants. However, because these countries do not actually need the power when it is generated, the price they pay is very low. In effect, Danish consumers not only subsidise their own country's power generators (and, in so doing, pay the highest electricity prices in Europe) but also make a contribution to the costs of generating power in Norway and Sweden.

The result is that, although theoretically generating 19% of its needs from wind, the actual average contribution over five years has been 9.7%, with the figure dipping to 5% in 2006. Some carbon dioxide emissions were certainly averted, but at a cost of nearly 90 euros per tonne of CO₂. To compound the error, there is a political consensus in Denmark to generate half of the country's electricity from renewables, largely wind, by 2025.

The cost of fulfilling this ambition has not been estimated. Neither has the practicality of achieving it. Denmark is in a favourable geographical situation, being a rather small country sitting between two larger ones (Sweden and Norway), which are at present able to balance Danish electricity supply and demand. However, this may not be possible if Denmark really does push ahead with its proposals. The logical way forward (assuming sufficient latent capacity exists) would seem to be for the Danish government to pay Norway and Sweden to install additional generating capacity and run down its own power stations. Taking that route should lead to a 100% clean, controllable and reliable renewable power supply, with none of it generated in Denmark.

But there is another option for emissions reductions. Sweden already generates over 40% of its electricity from nuclear plants. Like many other countries, its initial enthusiasm waned and there has been a ban on building further reactors for the last 30 years. However, the government has recently announced a reversal of this policy, in light of the perceived need to reduce carbon-dioxide emissions. Denmark already receives a proportion of its needs from these Swedish plant, and that proportion could increase significantly in years to come.

Sweden has come to the conclusion that nuclear represents the best way at present to provide affordable, reliable power with no CO₂ emissions. Yes, there remains the issue of high-level waste disposal, but there is an existing legacy that has to be dealt with in any case, so this is not a new problem, and the current generation of reactors produces relatively low levels of waste. The other plus compared to wind power is that in the 50 or more year life span of a nuclear generating station, wind turbines would have had to have been replaced perhaps three times and would also undoubtedly have suffered considerable downtime during their operational life. Replacement is not just a large cost, but also technically difficult and dangerous for the increasing numbers of offshore turbines.

Many governments have reached the same conclusion as the Swedes, and now further support for nuclear comes from a different and very authoritative source, the UK government's chief climate change and energy adviser, David MacKay, in a recent Cambridge talk reported in the *Times*. He has come to the conclusion that renewables such as wind could make only a minor contribution to the country's energy needs. Unlike some climate change campaigners, who focus on reducing energy use, MacKay argues that the UK will need to generate three times the current amount of electricity by 2050 to cover a wholesale conversion of road transport to electric power.

His proposal would involve building 40-50 GW of new nuclear generating capacity, compared to the current 12 GW (which accounts for about 15% of the country's current needs, but which will be run down over the next few years). Of course, given the projected trebling of energy demand, even this level of nuclear power would still only bring us back to the situation we had a few years ago, with about 20% of demand coming from nuclear.

This is not a new position for MacKay, who makes it clear that he is providing options rather than favouring any particular technology. In his ground-breaking book 'Renewable energy: without the hot air', he proposes five energy generation scenarios, with the choice depending on what would be politically and socially acceptable. The economic argument favours nuclear, and in this scenario he includes 115 gigawatts of capacity, double that currently installed in France.

Whatever the total demand and the contribution of nuclear, a mix of other technologies is proposed to provide for total power needs. These include, for example, solar power from north Africa, and coal-fired stations with carbon capture and storage. Wind also has its part to play, but this is minor.

MacKay makes his proposals on the basis of a rational analysis of the likely demands and what each generating technology can provide. Despite its recent renaissance, nuclear power still has its critics, but the inescapable conclusion of any objective review is that it remains the only proven, affordable means of reliably generating low-carbon electricity. It is for opponents of the technology to demonstrate that viable alternatives exist.
