

# Climate of Opinion

The Stockholm Network Energy and Environment Update

Issue I. March 2007

## Contents

2 – Nuclear is an Environmental Necessity – Dr Patrick Moore

3 – Lessons Of Finland's New Nuclear Build – Pertti Salminen

5 – Nuclear Politics – Sacha Kumaria

6 – Microclimates – Top Stories in Energy and Environment

7 – Upcoming Event

## Welcome to *Climate of Opinion* – Helen Disney and Paul Domjan<sup>1</sup>

Welcome to the inaugural edition of the Stockholm Network's energy and environmental affairs newsletter, *Climate of Opinion*. In the following months we will be studying a range of different topics within the realm of energy and environment policy. This month, we begin with an edition dedicated to nuclear energy. Dr Patrick Moore, founder of Greenpeace and chairman of Greenspirit, states the environmental case for embracing nuclear energy. Pertti Salminen highlights some of the practices that have made Finland an appealing model for nuclear planners. Finally, Sacha Kumaria investigates the political logic behind nuclear policies around the world. If you have any comments or recommendations about *Climate of Opinion*, or would be interested in contributing an article for a future edition, please contact Simon Moore at [simon@stockholm-network.org](mailto:simon@stockholm-network.org). We hope you enjoy this newsletter.

---

## Nuclear is an Environmental Necessity – Dr Patrick Moore<sup>2</sup>

As more and more countries recognise the benefits of clean nuclear energy, a nuclear renaissance is taking place around the world

In the early 1970s when I helped co-found Greenpeace, I believed that nuclear energy was synonymous with nuclear holocaust, as did most of my compatriots. That conviction inspired Greenpeace's first voyage up the spectacular rocky northwest coast of North America to protest the testing of US hydrogen bombs in Alaska's Aleutian Islands.

---

<sup>1</sup> Helen Disney is Chief Executive of the Stockholm Network. Paul Domjan the Stockholm Network Energy Fellow in addition to being Senior Consultant at John Howell & Co

<sup>2</sup> An advisor to government and industry, Dr. Patrick Moore is a co-founder of Greenpeace and chairman and chief scientist of Greenspirit Strategies Ltd. in Vancouver. [www.GreenspiritStrategies.com](http://www.GreenspiritStrategies.com)

After helping lead Greenpeace for 15 years, I left the movement because I could not support its growing tendency to reject sustainable development and consensus politics in favour of continued confrontation and ever-increasing extremism. Today I consider myself a sensible environmentalist, promoting policies based on science and logic rather than on emotion and misinformation.

I've come to realise that nuclear energy, along with a stronger focus on renewables like hydro, wind and geothermal, is essential to providing a sustainable supply of electricity for domestic, commercial and industrial use in the future.

Furthermore, I believe nuclear energy may prove to be the key energy source that protects our planet from the negative effects of climate change, perhaps the biggest environment issue the world faces today.

We know climate change is strongly related to energy in the form of fossil fuels, which account for about 85 percent of the world's total energy consumption. Let's examine the largest global greenhouse gas emitter: coal. Although it provides cheap electricity, worldwide coal burning creates approximately nine billion tons of CO<sub>2</sub> each year, mostly from power generation. Coal-fired plants cause acid rain, smog, respiratory illness, mercury contamination, and are major contributors to greenhouse gas emissions.

On the other hand, 441 nuclear plants operating globally avoid the release of nearly 3 billion tonnes of CO<sub>2</sub> emissions annually—the equivalent of the exhaust from more than 428 million cars.

If we want to reduce our dependence on fossil fuels like coal, we must choose a cost-effective solution that's good for the environment and provides a safe, reliable baseload supply of electricity.

In my estimation, the most practical approach is to adopt an aggressive programme of renewable energy plus nuclear. Baseload sources of electricity are required for the grid and the only viable choices are hydroelectric, coal and nuclear.

Wind and solar power cannot provide baseload power due to their intermittent and unreliable nature. Natural gas, a fossil fuel, is too expensive already and its price and supply are too volatile to risk building big baseload plants. Given that hydroelectric resources are largely built to capacity, nuclear is by elimination the only viable large-scale, cost-effective and safe substitute for coal and natural gas.

I am not alone in my realisation that nuclear energy represents the only practical means of reducing greenhouse-gas emissions while meeting increasing global energy demand. James Lovelock, father of the Gaia theory and leading atmospheric scientist, believes nuclear energy is the only way to avoid catastrophic climate change. Stewart Brand, founder of the Whole Earth Catalogue and holistic ecology thinker, says the environmental movement must embrace nuclear energy to reduce its dependence on fossil fuels.

Sweden has always been an enthusiastic supporter of measures to improve world environmental quality and a March 2005 poll showed that approximately 80% of Swedish residents say that limiting greenhouse gas emissions should be the top environmental priority.

The same poll indicated 83% support for maintaining or increasing nuclear power in Sweden. Sweden is embracing the nuclear renaissance and at the same time doing their part in saving the environment, by helping reduce carbon dioxide emissions.

A growing network of consumers, environmentalists, academics, labour organisations, business groups, community leaders and governments now realise the benefits of nuclear energy - it is clean, cost-effective, reliable and safe. With climate change at the top of the international agenda, we must all do our best to encourage a nuclear energy renaissance.

## Lessons From Finland's New Nuclear Build – Pertti Salminen<sup>1</sup>

In 2005, construction began on the Olkiluoto 3 nuclear power plant in Finland, making it Europe's first nuclear commission in ten years, and it is expected to be in commercial operation at the beginning of the next decade. However, significant as this may be, it is Finland's financing and operating model for new nuclear construction that is of greatest significance for planners and energy intensive industries. The financing and ownership model of the Olkiluoto nuclear power plant has been completely organised by private companies. The new nuclear power plant unit will not receive governmental financial support in any form; it requires no grants or subsidies. Finland's principal consumer electricity companies are the owners of TVO.<sup>2</sup> Shareholders receive no dividends, but are compensated in the form of a stable and secure energy supply to their businesses. Even small and medium-sized power users around Finland are able to participate in this scheme.<sup>3</sup> Any surplus power generated can also be sold to the grid by the shareholders, providing an additional potential revenue source for many of the scheme's participants (see fig. 1).

75% of the initial costs of the project were financed in loans from a number of different banks. The security provided by long-term

---

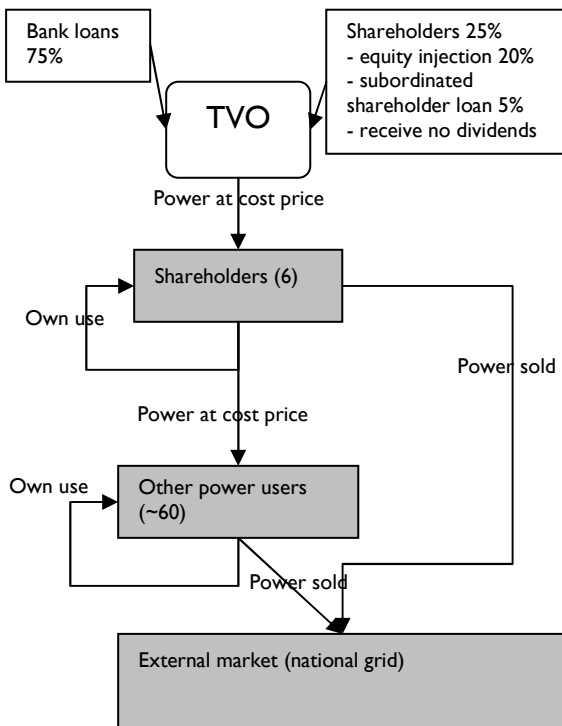
<sup>1</sup> Pertti Salminen is Pertti Salminen is Director responsible for international and EU affairs at Finnish Energy Industries (Energiateollisuus ry), the representative body for the electricity and district heating industries in Finland.

<sup>2</sup> The full listing of TVO shareholders can be found at <http://www.tvoy.fi/469.htm>. The second column indicates the ownership of Olkiluoto 3. The 60% stake attributed to Pohjolan Voima Oy (PVO) includes stakes of approx 25% of TVO held by UPM-Kymmene and 9% by Stora Enso (both forest industries companies). See also <http://www.pvo.fi/Page/80f7252e-20ba-4057-b316-5e3c84a80c78.aspx> or [http://econ-www.mit.edu/faculty/download\\_pdf.php?id=1358](http://econ-www.mit.edu/faculty/download_pdf.php?id=1358) (pp. 37).

<sup>3</sup> The complete current listing of customers can be found at <http://www.tvoy.fi/uploads/Attachments.pdf> (pp. 4).

arrangements with customers have made this investment far more palatable (see fig. 1).

Fig. 1. Finance and energy flows, TVO Olkiluoto 3 Project.



It should be the task of the private sector to invest in energy production, preferably without state aid, and the Finnish ownership model, built on long term commitments, and less sensitivity to fluctuations in the market price of electricity, represents an ideal means of achieving this. It also gives more predictability for industries which are planning major investments in energy intensive processes (for example, in the 'forest' industries, such as timber and paper producers or in metalworking as well as the electricity utilities). When industrial consumers can buy their electricity at cost price, downward pressure is applied to prices in the power exchange market, reducing the cost to consumers across the board.

The output of Olkiluoto 3 will be approximately 1,600MW. Total thermal efficiency, at higher than 37%, is exceptionally high for a nuclear power plant (30-33% being the usual thermal efficiency level). The design technical service life of the plant unit is 60 years. Olkiluoto 3 meets all the

Finnish and international safety requirements laid down for nuclear power plants.

By 2010, the demand for electricity is estimated to increase to 96TWh in Finland. In 2000, the demand was 79TWh and in 2006, 90TWh. Thus, annual growth has been around 2%. By 2010, the consumption of electricity is estimated to be increasing at a rate of 1.5% per annum, declining to a rate of 1% per annum after 2010. This time period will coincide with old power plants reaching the end of their operational lives.

Olkiluoto 3's annual production will be about 13TWh; an amount smaller than demand for power will increase by over the course of the construction period. To satisfy growing demand for electricity while tackling climate change, Finnish power companies have invested in renewable energy sources during the last decade. Nevertheless, the gap between demand and capacity has been growing steadily. During the coldest part of winter, the capacity situation in Finland is severely strained, and more than 2000MW of electricity is imported, round the clock. We now we need Olkiluoto 3 more than ever.

The main reason for increasing nuclear power is the effort to restrict the use of fossil fuels and CO2 emissions. The steady price of nuclear electricity and Finland's limited indigenous energy resources were also contributing factors. Moreover, public opinion is positive towards new nuclear power. In fact, the new nuclear power unit is part of Finland's National Climate Strategy, which was adopted in 2001. The Strategy ensures that Finland can keep her international emissions reduction commitments.

Already, many lessons are being learned from the Olkiluoto 3 project. First of all, because of a negative political decision in 1993, the project started ten years too late. Secondly, a lot of valuable know-how has been corroded since the construction of the four existing nuclear power units, which makes the project even more challenging. Thirdly, openness and integrity of the information concerning the political decision-making process as well as the building work and cooperation with safety authorities is crucial for the success of the project.

But it is lessons from the financing of the project that may be of most relevance to other European countries. A country like Germany, should it rediscover its sympathies for nuclear, may be able to apply a similar arrangement with its remaining manufacturing base being of sufficient size to cover the costs. Alternatively, in many parts of ‘new Europe’, where heavy, high-energy industry is still strong, Romanian steel or Polish mining industries may find similar appeal to a nuclear programme that provides a secure supply of energy at a stable price.

---

### Nuclear Politics – Sacha Kumaria<sup>1</sup>

Around the world, campaigning on environmental issues is now seen as key to winning elections. Politicians in Germany, France and Italy have long rallied against corporate polluters and American energy profligacy. In Britain, the three major parties are all seeking to burnish their green credentials at each others’ expense. And in California, the world’s most famous Humvee owner recently cruised to re-election by pledging to mandate reductions in greenhouse gas emission.

However, with energy demand set to soar over the coming decades, the same politicians are less consensual about the solutions than the problem. A cornucopia of technological and fiscal remedies have been debated, dismissed and rehashed amidst constant pleas for greater self-restraint. Yet one idea – a shift to greater reliance on non-polluting nuclear power – has crept back into the public discourse since its nadir on April 26th 1986, when a Soviet reactor went into meltdown at the Ukrainian town of Chernobyl.

It is one of life’s supreme ironies then that policy decisions made by the Russian government – an institution not ranked amongst history’s great environmentalists – are amongst the key drivers

behind European governments’ willingness to re-embrace nuclear power. Were dual concerns about the reliability and desirability of Russian gas supplies not so prevalent in the media, Europe’s political discourse about solutions to climate change would certainly be less frantic, if not less robust, than at present.

Yet the nuclear debate within Europe is nuanced greatly by the individual politics of different nation states. Finland is currently building the first nuclear reactor commissioned in Europe for a decade at Olkiluoto, the site of its two existing plants. Jorma Aurela, the Finnish trade and industry minister who licensed Olkiluoto-3 has long argued that climate change is the number one reason behind the licensing decision, but has never hidden his government’s concerns about their 100% dependency on ever-more expensive Russian gas.

In Lithuania, which generates 70% of its electricity at the Ignalina Soviet-built nuclear power reactor, the issue is even more pressing. One of the terms of Lithuania’s accession to the EU was that it shutdown the reactor by 2009. Yet having shut down one reactor in December 2004 at Brussels’ insistence (and thereby curtailed energy exports to neighbouring Baltic States), concern in the region about growing reliance on Russia has prompted Lithuania, Poland, Latvia and Estonia to lobby the EU to allow them to build a new nuclear power plant on the very same site. Even Ukraine is busy constructing four new reactors.

Underpinning these geo-strategic concerns is a new-found confidence about the safety and efficiency of nuclear technology itself. New pressurised-water reactors (PWRs) are designed to ‘fail-safe’, whereby a malfunction leads to an automatic cessation of power generation to allow heat to dissipate safely and the containment of the fuel and waste in a sealed vessel. Two types of PWRs have long dominated the market – American-designed light-water reactors that require expensive enriched uranium and Canadian designed (CANDU) reactors that use expensive heavy-water but cheaper natural uranium. Indeed, advances in nuclear safety mean that cost is now the major battleground upon which the debate is being waged. Unlike hydrocarbon-based power generation, raw fuel

---

<sup>1</sup> Sacha Kumaria is a Research Associate at the Centre for Energy Policy Studies at Cambridge University. He was formerly an advisor to BP and former Assistant Director of the Stockholm Network. He is writing in a personal capacity.

costs are still not a major factor in nuclear's economic calculus because uranium is energy-rich and reliable suppliers such as Australia, Canada and Kazakhstan compare favourably to Russia and OPEC.

The dilemma facing the British government is an interesting exercise in nuclear politics and economics. Dwindling North-sea gas reserves recently tipped Britain, which produces 20% of its electricity from 23 nuclear power stations, into energy dependence on foreign sources. But 22 of these plants are mandated to close in the next two decades, and no new plants have been built since the 1970s.

Given these figures, one might expect a public acquiescence to nuclear new-build. Yet many remember the repeated bail-outs of British Energy, a nuclear power-station operator, in the 1980-90s, and as recently as 2005, a £50b government fund was set up to deal with the nuclear-waste issues arising from British Nuclear Fuels (BNFL) insolvency issues. The British government has therefore had to promise not to subsidise new nuclear-power stations. But this has raised doubts about their ability to compete commercially given the inevitable expensive delays to the planning process and the legacy issues of nuclear waste.

To either side of Britain's position lie France and Germany. The former produces 79% of its electricity from 59 nuclear-power stations, and their state-backed provider EDF is so wealthy that it can actually fund new plants out of current revenues. By contrast, Germany has always been ambivalent about nuclear power, and a severe malfunction during a test at a new pebble-bed reactor ten days after the Chernobyl accident in 1986 solidified public sentiment against it for two decades. A deal between the SPD and Green coalition parties in 1999 agreed to phase out nuclear power, yet CDU Chancellor Angela Merkel has recently argued that nuclear must be part of the energy mix.

Yet the biggest uncertainty about nuclear power, that of the cost, reflects the uncertainty of the cost of the one of the great issues of the day – climate change. As a recent report commissioned by Australian Prime Minister John Howard argued

– much to his chagrin – nuclear power is only likely to be competitive when the cost of greenhouse gas is factored in. At present, it is the absence of that calculation within stable carbon-markets, rather than political will or private-sector finance, which poses the biggest obstacle to a new generation of nuclear power stations.

---

## Microclimates – Top Stories in Energy and Environment

European leaders have been speaking optimistically about possibilities for a post-Kyoto climate pact. However, reports indicate negotiations are not proceeding so smoothly, with a group of nations led by Germany pushing for very stringent targets, while a group led by the UK advocates a less tough regime that it believes would have more chance of being adopted by the world's largest emitters.

<http://www.guardian.co.uk/uklatest/story/0,,-6413452,00.html>

In the aftermath of the Intergovernmental Panel on Climate Change's much-heralded report assessing the status of climate science, the UN Foundation has released a series of policy recommendation in a publication entitled *Confronting Climate Change*. Their recommendations include a combination of adaptation to the effects of climate change and emissions management, including greater use of biofuels, slowing deforestation, and other policies.

<http://environment.newscientist.com/channel/earth/dn11274-united-nations-scientists-join-climate-change-chorus.html>

Proposals from the EU's tax commissioner to increase fuel levies across the continent, in order to prevent so-called fuel tourism, have been met with disdain from member countries, and also from the internal market and budget commissioners.

<http://www.ft.com/cms/s/d9f81c82-bddf-11db-bd86-0000779e2340.html>

Permission for Britain's energy companies to begin a new round of nuclear construction were put on hold this month, after Greenpeace won its fight for a judicial review of last year's Energy Policy Review. While this decision does not permanently reject the possibility of new nuclear development in the future, it does mean that the government must embark on a more demonstrably thorough consultation process before permission is given.

[http://news.bbc.co.uk/1/hi/uk\\_politics/6364281.stm](http://news.bbc.co.uk/1/hi/uk_politics/6364281.stm)

## Upcoming Event

### ETS: A Good Example to Follow?

Date: 29 March 2007

Venue: Hotel Amigo Rue de l'Amigo 1-3, Brussels

Timing: 7:00pm – 8:00pm (cocktails to follow)

Featuring:

Howard Chase Director, European Government Affairs - BP

Jill Duggan, Senior Team Leader, Climate and Energy: Business and Transport, DEFRA - UK

Paul Domjan (chair), Stockholm Network Energy Fellow

Since the Kyoto Protocol, countries both inside and outside of the protocol have been trying to find new approaches to curb emission of greenhouse gases. In 2005 the European Union adopted the Emissions Trading Scheme (ETS) in an attempt to provide economic incentives for reducing emissions of pollutants. Companies exceeding a permitted quantity of emissions must buy credits from those who pollute less than their allowance. The ETS is being closely watched as the first serious international attempt at a carbon-trading system. In the US, regional governments, such as California and the US north-eastern states, are implementing their own carbon trading schemes.

However, despite this apparently market-oriented upside, ETS also has considerable limitations. It is very difficult and extremely

expensive to assess emissions. ETS has a very limited scope, excluding agriculture, and for the moment, transportation from its remit. Accordingly, the UK has unilaterally and controversially implemented a carbon tax on airplane tickets, introducing the possibility of some types of carbon emissions being traded on a European level while others are taxed on a national level. Many have argued that ETS's method of allocating of permits on the basis of past emissions acts as a subsidy to polluters and a barrier to entry to new firms in carbon-intensive industries. Finally, it has proven very difficult for governments to agree on binding targets. National governments have typically granted excessive numbers of permits, leading to a collapse in the carbon price. Tellingly, among EU member states, only the EU is forecast to meet its Kyoto commitments.

Despite its difficulties, ETS is the obvious model both for other jurisdictions looking to implement carbon trading and for whatever system will replace Kyoto when the accord expires in 2008. So one must wonder whether ETS is a good example to follow?

Sign up at <http://www.stockholm-network.org/conferences/events/upcoming.php?event=81>