

# Nuclear Power

The bright future?

# Facts and Stories

There are facts:

undisputed facts like the theoretical energy yield per Kg of a particular fissile isotope

Disputed facts like the real carbon footprint of nuclear energy

- Lovelock says it is 0.5 times that of wind power (Lovelock, 2009: 69) – others claim it is 25 times when mining, transport and construction are included.

There are assessments/projections containing undisputed facts, disputed facts, and predictions

- like nuclear energy's longer-term sustainability
- which depend on e.g. the future political security of Kazakhstan

# Facts and Stories

Particularly evidently in the case of an issue like nuclear power, people's attitudes are shaped not as a bald set of facts that are fed into a consequentialist calculator and out comes the answer, but by stories they construct, little narratives with narrative shape and colour.

# Facts and Stories

What is the story of energy generation from nuclear fission?

# Porritt's Story

Its early history was "filled with brilliant scientists who cared deeply about humankind and were intensely proud of the 'incalculable benefits' that their new technology would bring. Or so they thought. Potential downstream costs and liabilities were promptly dismissed as unsubstantiated scaremongering. But take a long hard look at that nuclear genie lurking in the ruins of Chernobyl, in the psychological aftermath of Three Mile Island, in the terrifying illegal trade in enriched uranium and plutonium that causes security services round the world more sleepless nights than any other single threat to our wellbeing." (Porritt 2000: 114-5)

# Some types of story

Nuclear technology was conceived in violence and will always be associated with it

Nuclear technology is the most tragic example of the way 20<sup>th</sup>-Century science's bright ideas turned out disasters in practice (cf. also leaded petrol, CFCs as refrigerants)

Nuclear technology has shown itself a benign, efficient and almost carbon-neutral means of electricity generation. Look at France for a great illustration of its success. It has caused few deaths and little pollution.

# The significance of narrative in ethics

In some areas of ethics, such as medical decision-making, the stories people carry are of central importance

But they are not to be underestimated in any debate about which people are passionate

People with different stories tend to talk past one another

# What stories are being carried into Copenhagen?

Humans are clever creatures and when they really need to they can fix anything

Humans can adapt to most change provided they can hold onto the best of what they have

Humans (especially rich ones) are greedy, arrogant creatures who need to learn to live much simply and with much more respect to the planet

The planet is very resilient and abundant in resources. It will absorb, and support, any amount of human activity and development.



# A good example of a shift in an issue in environmental ethics

Attfield 1999 – an intergenerational issue – problems with decommissioning and safe storage of waste rule out imposing this on future generations

Light and Rolston 2003 – one mention in a long anthology!

# Deontological or consequentialist ethics

Used to be a good example of these tensions

The duty of avoiding a major accident/terrorism risk

Against the probable net benefits in terms of energy security and (arguably) cost.

# Climate change

Changes all that.

Now there look to be duties on both sides....

# The significance of Lovelock's views

In *The Revenge of Gaia* (2006)

And *The Vanishing Face of Gaia* (2009)

A trenchant advocacy of nuclear power as a way *nations* can ensure their survival.

Wholesale rejection of potential of most renewables, especially wind power (but see Jacobson and Delucchi 2009)

# Precautionary Principle

Could be applied in either direction to assert that nuclear power should not be risked because we do not know how to make either its operation or its waste sufficiently safe to avoid major contamination of the planet.

or to assert that nuclear power is necessary because it would be unwise to risk the consequences of appreciable climate change, which would carry with it the prospect of the submersion of whole countries such as Bangladesh

# A Web exercise

## Assessing the available information

Information of this sort is rarely presented from a strictly neutral point of view. In particular, the World Wide Web provides a rich source of accessible information. Indeed, there is more information than we can possibly handle. It is important for students to be aware that everyone has their own personal 'filtering processes', which can all too often mean focussing on the information they want to find to support a predetermined view.

Organisations, moreover, seek not only to inform but to influence those who visit their sites. Below are the addresses of three web sites which have been selected to illustrate different ethical positions and the way information is used to promote certain views and counter the views of others.

Greenpeace International

([www.greenpeace.org/international/campaigns/nuclear](http://www.greenpeace.org/international/campaigns/nuclear))

The International Atomic Energy Agency ([www.iaea.org](http://www.iaea.org))

The World Nuclear Association ([www.world-nuclear.org/info](http://www.world-nuclear.org/info))

The student should visit each site in turn. In each case they should consider:

- i) what point of view the site-owner wishes them to adopt
- ii) how the language and images used tend to reinforce that view and
- iii) what hard information is being presented.

Finally, they should ask themselves whether visiting the sites changed their point of view. Again, this question should be focussed by referring students back to key ethical questions such as - what was the change in their *valuing* of different elements of the situation? E.g.

- What value you put on the lives of people in this and other nations?
- What value do you put on the well-being of future generations as compared with the present one(s)?
- What values you apply to ecosystems and the health of the biosphere?

# Wedges

In the formulation of Pacala and Sokolow (2004) we need seven 'wedges' to restrict the impact of climate change to 3-4 degrees rise in GMST.



# Wedges

One of the seven could come from  
700 1GW nuclear plants.

Should it?

# The other wedges

Doubling the fuel economy of the world's cars

More efficient buildings and electricity generation

Carbon capture/storage on 800 coal-fired power stations

2 million 1MW wind turbines

2 million Ha of land covered with solar panels

250 million Ha devoted to biofuels

# Wind water sunlight

Jacobson and Delucchi (2009)

Claim nuclear energy results in 25 times as much carbon footprint as wind, when reactor construction, uranium refining and transport are considered

Call for 3.8M large wind turbines (occupying 1% of the world's land area), 90000 solar plants, plus numerous geothermal, tidal and rooftop photovoltaic installations.

To supply 100% of world energy needs by 2030.

# References

Attfield, Robin, *The Ethics of the Global Environment* (Edinburgh: Edinburgh University Press, 1999)

Bryant, John, et al (eds.) *Bioethics for Scientists*, (Chichester: John Wiley, 2002) Chs 3-5. Ch.3 on relevant areas of ethical theory, Ch.4 on the rainforest as a case-study, Ch.5 on case-studies on nuclear power and the use of DDT.

Jacobson, Mark Z. and Delucchi, Mark A., 'A Path to Sustainable Energy' *Scientific American* 301 (5) 38-45 (2009)

Light, Andrew, and Rolston, Holmes, III (eds.) *Environmental Ethics: An Anthology* (Oxford: Blackwell, 2003)

Lovelock, James, *The Revenge of Gaia* (London: Allen Lane, 2006) and *The Vanishing Face of Gaia* (London: Allen Lane, 2009)

S. Pacala and R. Socolow, 'Stabilization Wedges – Solving the Climate problem for the Next 50 Years Using Current Technologies', *Science* 305 (5686), August 2004, pp. 968-72, and comment in Mark Lynas, *Six Degrees: Our Future on a Hotter Planet*, London: Fourth Estate, 2007, pp. 293-98)

Porritt, Jonathan *Playing Safe: Science and the Environment* (London: Thames and Hudson, 2000) See Ch.3 on risk