



# Energy

## Purpose

This Discussion Paper is published by the Quaker Earthcare Committee as part of a series exploring contemporary Quaker thinking on a range of critical environmental issues. The papers are written by a range of authors with expertise in the relevant area.

## Summary

Our economy and way of life is based on cheap and available energy, particularly energy from fossil fuels. Such energy is becoming more difficult to obtain. The cost is likely to increase and eventually lead to recession. Such fuels also contribute to global warming. Humans need to live with less and use energy that is renewable and sustainable.

## Background

Use of fossil fuels contributes to global warming. Just as much a problem is that within about 20 years liquid petroleum supplies will have significantly declined. The United States Department of Energy has estimated that the production of all liquid fuels, including oil, will drop within 20 years to half of what it was in 2009.<sup>1</sup> Claims that fracking<sup>2</sup> will solve this problem have been shown to be without justification: they may extend the time period out beyond the 2009 estimate, but not significantly delay the decline.<sup>3</sup>

Perhaps the more serious problem concerns EROEI ratios. EROEI is **Energy Return on Energy Invested**, also referred to as "net energy". A 100:1 ratio means that for every one energy unit used in getting oil, 100 energy units were obtained. The ratios are declining significantly so that more energy is required to obtain energy. In the US in 1930 the EROEI ratio for oil was at least 100 barrels returned for each barrel invested, but declined to about 30:1 in 1970 to from 11 to 18: 1 in 2000.<sup>4</sup> As the EROEI ratio decreases, more investment will have to be diverted from other products and services to maintain current levels of supply. The cost of energy is almost certain to increase.

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<sup>1</sup> <http://www.eia.doe.gov/conference/2009/session3/Sweetnam.pdf>

<sup>2</sup> Fracking creates fractures from a wellbore drilled into reservoir rock formations to release petroleum, natural gas (including shale gas, tight gas, and coal seam gas), or other substances for extraction. [http://en.wikipedia.org/wiki/Hydraulic\\_fracturing](http://en.wikipedia.org/wiki/Hydraulic_fracturing)

<sup>3</sup> <http://www.postcarbon.org/> ; <http://energypolicyforum.org/> ; <http://shalebubble.org/the-reality/>

<sup>4</sup> <http://www.theoilrum.com/node/3810>

It may be thought that renewable energy will be the answer. But renewable energy is dependent on significant amounts of fossil fuel energy, and cannot be an adequate substitute. Adair<sup>5</sup> states

*an enormous amount of fossil energy is required to manufacture, install and operate all forms of renewable energy systems. Without the input of fossil fuel the existing renewable energy projects could never have been built and could not be maintained in operation.*

The EROEI ratio for many forms of renewable energy is not high. This does not mean that we should not move to renewable energy, but that it cannot be a complete substitute for fossil fuel at current and higher levels of energy use.

Trainer estimates that to meet projected energy demands by 2050 under a Business As Usual model, renewable sources could only meet one third of this demand under present Australian per capita energy consumption.<sup>6</sup>

If oil costs rise<sup>7</sup>, recession is likely to follow. Four out of the five recessions experienced since 1970 can be explained by increased oil prices.<sup>8</sup> But in the future it will be a long term recession, if we continue to depend on current levels of energy use. Rather than increasing the supply side, we need to look at the demand side, and begin to live with less energy. There is a need to change our values, institutions and systems so that we reduce our need for materials and energy.

Nuclear power plants provide about 6% of the world's energy and 13-14% of the world's electricity. There are around 440 nuclear power reactors in operation in the world. Safety is an issue with the accidents at Three Mile Island (1979), Chernobyl (1986), and Fukushima (2011) being the most well known accidents. Building more plants create a greater possibility of accident, exposure to terrorist activity, and difficulties with waste disposal. China has 25 nuclear power reactors under construction, with plans to build many more. Germany decided to close all its reactors by 2022, and Italy has banned nuclear power. Following Fukushima, the International Energy Agency halved its estimate of additional nuclear generating capacity to be built by 2035. But the US Nuclear Regulatory Commission this year has issued a licence for two new reactors. This will be the first in the US since before the Three Mile Island accident in 1979. Whatever the views about the merits of nuclear power, because of widespread public concern about them and the long time needed for planning and building new plants, nuclear energy can only be a small part of the solution to global warming or liquid fuel depletion.

Currently we are living beyond the capacity of the Earth's ecosystems to sustain life. Climate warming is but one indication of this. The evidence from ecological footprint analysis is another. Today humanity uses the equivalent of 1.5 Earths to provide the resources we use and absorb our waste.<sup>9</sup> The picture of energy given above is another indication that our economies are unsustainable and we need to downsize to within the capacity of Earth to support life. This includes our energy use.

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<sup>5</sup> <http://www.resilience.org/stories/2010-11-25/how-sustainable-renewable-energy>

<sup>6</sup> Trainer, T. 2012. Can Renewable Energy Sustain Consumer Societies? A Negative Case. Simplicity Institute Report 12e

<sup>7</sup> Prices may be subsidised, but the costs will still increase even if they are paid initially by the government rather than the consumer.

<sup>8</sup> Lambert J, Hall C, Balogh S, Poisson A, and Gupta A. Nov 2012. EROI of Global Energy Resources Preliminary Status and Trends. State University of New York, College of Environmental Science and Forestry. Report for UK's DFID.

<sup>9</sup> [http://www.footprintnetwork.org/en/index.php/GFN/page/world\\_footprint/](http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/)

Of our testimonies, simplicity seems to be the most relevant one for living within the earth's limits, although it is sometimes misleading to focus on one leading to the exclusion of others.

### **Discussion**

1. Imagine and describe how your household can operate on 1/3 of its current energy usage.
2. Imagine and describe how your work/office/factory/enterprise can operate on 1/3 of its current energy usage.
3. Imagine and describe how your suburb/community can function in a non-growth economy, say with a third of households having no-one in paid employment (as we currently know employment).
4. What would your suburb/community look like (and with particular regard to energy use) if it operated within the Earth's capacity to support it?
5. What would you consider the most important tasks to do with what energy is available?
6. What are the likely conflicts as we transition to this type of society, and how can these conflicts be resolved peacefully?
7. What are the moral and spiritual foundations needed for such a society?

How do you understand the testimony of simplicity? How can our Quaker Earthcare Statement help?<sup>10</sup>

Quaker Earthcare Committee  
Canberra  
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<sup>10</sup> (<http://www.quakers.org.au/displaycommon.cfm?an=1&subarticlenbr=264>)