

# Is Fracking good for us?

**Energy security, Energy prices and the Environment<sup>1</sup>**

■ by John Weaver

**Fracking may have the potential to provide gas security for the UK for the foreseeable future, and its risks of pollution may be controllable. However, a Christian perspective firstly sees a duty to God's natural world, whereby fossil fuel consumption must be reduced not increased; and secondly demands a change of heart so that we become God-centred not human-centred and live in peace and harmony with the natural world.**



## Introduction

**F**racking, which is short for hydraulic fracturing, is the process of drilling down into the earth and injecting water, sand and chemicals into the rock at high pressure which allows the gas to flow out to the head of the well. The process is carried out by drilling horizontally into the rock layer.

In December 2013, a report commissioned by the Department of Energy and Climate Change (DECC), said more than half of the UK could provide suitable sites for fracking. The report shows that 100,000 sq km of land is available for drilling. The figures in the DECC report are based on conjecture because it's not known how readily the rocks in the UK can be fracked to release their gas. The British Geological Survey estimates there may be 1,300 trillion cubic feet of shale gas present in the north of England alone. The process to extract it has led to protests from environmentalists, who fear that the technique could cause small earth tremors, water contamination and environmental damage.

In the United States, where fracking has revolutionised the energy industry, a number of environmental concerns have been recognised.

The first is that fracking uses huge amounts of water that must be transported to the

fracking site, at significant environmental cost. The second is the worry that potentially carcinogenic chemicals used may escape and contaminate groundwater around the fracking site. The industry suggests pollution incidents are the results of bad practice rather than an inherently risky technique. In the UK the huge amounts of water would in some places need to be shipped in by tanker with a resultant strain on local water treatment, and transport infrastructure.

The UK government has a strong regulatory regime for exploratory activities, based on over 50 years of experience of regulating the onshore oil and gas industry nationally, but the government is committed to continuous improvement.<sup>2</sup> DECC states the risk of water contamination is low provided operations follow industry standards and obey the regulations. Extraction takes place well below the aquifers that provide drinking water. The environmental regulator (Environment Agency in England, Natural Resources Wales or the Scottish Environment Protection Agency) works with the Health and Safety Executive to ensure the well is constructed to a high standard to protect aquifers and drinking water supplies. The government is confident that the regulatory system will continue to provide robust protection of surface water and groundwater. Fracturing rock for shale gas and oil is likely to use large



- ▶▶ volumes of clean water, though the amount is not exceptional compared with other industrial or leisure activities, and there is the likelihood of reduction in water usage as the process continues, when water can be recycled. The volume will depend on the site, and water companies will assess the amount of water available before agreeing to supply an operator.<sup>3</sup>



*Fracking rig processing shale in the United States*

There are also worries that the fracking process can cause small earth tremors. Two small earthquakes of 1.5 and 2.2 magnitude (on the Richter Scale) hit the Blackpool area in 2011 following fracking. Dr Ernie Rutter, Professor of Structural Geology at the University of Manchester, states that while this is a potential hazard of the technique, they are unlikely to be felt by many people and very unlikely to cause any damage.

From a Christian point of view the most important concern, which environmental campaigners recognise, is that fracking is distracting energy firms and governments from investing in renewable sources of energy, and is encouraging continued reliance on fossil fuels. While the UK government hopes to increase the amount of electricity from renewable sources from 11% in 2012 to 30% in 2020, approximating to 15% of total energy,<sup>4</sup> the greater availability of shale gas is likely to remove the urgency of this policy. We need a 21st century energy revolution

based on efficiency and renewables, rather than increased burning of fossil fuels that will add to climate change.

Greenpeace climate campaigner Lawrence Carter observed the irony that *Total*, a French company, have been prevented from fracking in France because of the French government's environmental concerns, but have been allowed by the UK government to drill here.

However, the oil and gas industry maintains that fracking of shale gas could contribute significantly to meeting the UK's future energy needs. A DECC report in April 2013 said shale gas in the UK may help to secure energy supplies, but may not bring down gas prices.

In terms of fuel security, if Britain can extract 10% of its estimated shale gas reserves, it could supply the entire country for 50 years. Shale gas has certainly helped boost the domestic energy industry in the US in recent years. The business lobby group, the Institute of Directors, suggest that shale gas could be a 'New North Sea' for Britain. Cuadrilla Resources announced in April 2014 that shale gas production in Britain could begin within four years.

Under government planning, up to 2,880 wells could be drilled for oil or gas in a new licensing round, generating 16,000 to 32,000 jobs. But drilling on such a scale would markedly increase lorry movements and could squeeze water supplies for local communities.

In addition, greenhouse gases produced during the exploration phase could be up to 0.96 million tonnes of CO<sub>2</sub>, which would be just over 15% of the UK's emissions from all oil and gas production, although the resulting home-grown gas would have lower emissions than imported liquefied gas.

### **Energy supplies and climate change**

As population grows, so does the demand for energy; however, a large proportion of the population growth will occur in the world's poorest countries and it is expected that ▶▶

►► energy consumption in these countries will grow disproportionately throughout the 21<sup>st</sup> century as developing countries bring their per-capita energy consumption closer to equity with the developed world. We recognise global inequality and poverty, but Marvin Soroos<sup>5</sup> asks how the environment will survive if we achieve the promise of global prosperity for the four-fifths world.

The global population reached seven billion people in 2011, and is now growing by one billion people every 12-14 years and is projected to reach over nine billion by 2050 and about 12 billion by 2100.

Forecasts of energy demand by the end of the century vary, but there seems general consensus that, without a significant change in current trends, energy demand will double over the first 30 years of the 21<sup>st</sup> century from around 10 Gtoe (gigatonnes of oil equivalent) to 20 Gtoe. If these trends continue, by the end of the century, energy demand will have increased to about 50 Gtoe. Thus, energy demand will have increased by a factor of five, while population will have doubled.

Since there are serious limitations on the total amount of energy that can be produced from renewable resources and since expansion of nuclear power will be denied to many developing countries, it is expected that, in the early part of the 21<sup>st</sup> century, this increased energy demand will largely be supplied from fossil fuels. This will escalate greenhouse gas (GHG) emissions at a much faster rate than anything yet forecast; all this at a time when environmentalists are advocating cutting such emissions by as much as 80%.

Many independent commentators in the field of energy believe that 'peak oil', closely followed by 'peak gas', will occur within the next five to ten years. The only fossil fuel available for use in the latter part of the century will be coal. Deposits of coal around the world are relatively high but the rate at which they are being depleted is increasing with ever higher energy demand.



*We recognise global inequality and poverty, but how will the environment survive?*

Furthermore, coal produces more CO<sub>2</sub> per unit of energy than do either oil or gas, further exacerbating GHG emissions.

While nuclear power produces no CO<sub>2</sub> emissions, it does waste huge amounts of heat energy and carries the environmental concerns of radioactive leakage and waste disposal. As many of the UK's nuclear power stations reach the end of their lives the UK government has given the go ahead for the first new power station, Hinkley Point C in Somerset, to be commissioned in 2023.

Fracking has clear potential for addressing our concerns over energy security, which were highlighted early in 2014 with the crisis in Ukraine. Fracking has revolutionised the traditional shale oil industry in North America and turned it from a commercially uncompetitive process into a remarkably cheap one. It is this 'cheapness' that has attracted the interest of the UK Government, who are now even seeing it as a cheaper, more acceptable alternative to new Nuclear build (which has made little progress in the past decade). While this may have some technical merit, it should also be noted that the current fascination with fracking is entirely because of its promise of a 'return to cheap energy'; the very root cause of our over-consumption in the first place. The impact of the vast, unaccounted-for quantities of CO<sub>2</sub> this will put into the atmosphere appears to be ignored. From an ethical perspective, this ►►

- ▶▶ raises serious questions, since shale gas/oil do not in any way meet any of the normal criteria for 'sustainability'.

The potential increased supply of gas through fracking means an increase in GHG emissions, which in turn means a greater threat of long-term, irreversible climate change.

Sir John Houghton, former chair of the Intergovernmental Panel on Climate Change (IPCC) Science Working Group for the 3<sup>rd</sup> and 4<sup>th</sup> reports, has noted the following main points in the IPCC Fifth Report, September 2013:

- It is extremely likely (i.e. more than 95% probability) that human influence on climate caused most of the observed increase in global average surface temperature from 1951-2010.
- There is high confidence that this has led to warming of the ocean, melting of snow and ice, a rise in global mean sea level and to more climate extremes with increased intensity.
- Further warming will result from continued emissions of greenhouse gases, causing changes in all parts of the climate system. Considerable reductions in greenhouse gas emissions will be required if climate change is to be limited.
- Indicators of a changing climate include: rapidly decreasing sea-ice in the Arctic; increased occurrence and intensity of climate extremes such as heat waves, floods and droughts; and an average rate of sea level rise that since 1900 has increased from about 1cm/decade to over 3 cm/decade.
- A further confirming indicator of a warming climate has come from recent observations of ocean temperatures. The oceans are a crucial integral part of the climate system; their thermal capacity is well over 100 times that of the atmosphere so although ocean temperatures change comparatively slowly, they are crucial indicators of changes in the overall climate.<sup>6</sup>



*"For farming there will be more droughts, more floods, less reliable rain, and more water shortages will mean worse harvests and higher food prices for most regions"*

The Fifth Assessment Report was approved, and the full report accepted, by the IPCC on 30<sup>th</sup> March 2014 and the media picked up the key concerns for people around the world. For farming there will be more droughts, more floods, less reliable rain, and more water shortages will mean worse harvests and higher food prices for most regions. There will be more frequent storm surges, coastal flooding, and increasing rise in sea-level. It will be harder for many fisheries to make a living, especially tropical ones, as the seas get warmer and more acidic, and coastal ecosystems change. Heatwaves will pose increasing risks to health and lead to premature deaths. There will also be the dangers of violence as unstable food prices and more competition for resources will make conflict more likely. More people will be forced to move to make a living, and more people will be at risk from water-borne diseases.

The UK Government has recently focused on energy prices and fuel poverty. Fracking is a pragmatic, short-term response, which sees the government 'taking its eye off the ball' with regard to Green policies. There will be less emphasis on renewable sources of energy, which will inevitably affect national GHG emissions, leading to greater possibility of climate change. The second half of 2013 has seen the British public (or at least the Media and Government) become obsessed with the escalating 'cost of energy'; the Prime Minister and the Leader of the Opposition have been competing to make different promises to 'cap' energy costs, which neither is likely to be able to deliver. ▶▶

▶▶ In the Chancellor's Autumn Statement (December 2013)<sup>7</sup>, the Government succumbed to back-bench pressure and weakened the insulation scheme for poorer households, known as the Energy Company Obligation (ECO), simply in order to cut £50 from consumer energy bills. This may well please the electorate but it is manifestly not sustainable and will almost certainly mean that we, as a nation, will go on exhausting our precious energy resources, to say nothing of the resulting changes in climate.

The Autumn Statement also further reduced incentives for both onshore wind and solar photovoltaics. Again, this appears to be a populist measure but it makes the likelihood of achieving the 2020 targets for renewable energy even less probable. All of these issues raise significant ethical questions, which appear not to have been considered in the current quest for 'cheap energy'.

### Bible and ethics

What then is the Christian response to fracking?

In our modern industrialised and commercial world we have removed the thought of any divine influence other than as an initial creative power. We have a mechanistic cosmology of cause and effect, in which human manipulation and use of natural resources is divorced from any sense of God's ongoing care and concern for creation.<sup>8</sup>

The Incarnation brings into focus both the presence of God in creation and God's desire to redeem a broken world. We see in the prologue of the Gospel according to John (John 1:1-18) that the pre-existent Christ is not only Lord of the lives and bodies of Christians but Lord of the whole created order, and the implications of the resurrection extend beyond the lives of Christians to reveal God's intention to restore the righteous peace, or *shalom*, of the whole of creation.<sup>9</sup>

Without an understanding of God's constant presence (immanence) in creation and of God's ultimate purposes for creation ethics becomes focused on the effects on human beings. In

today's society, there is an absence of the Christian tradition of understanding creation as belonging to God and not under human ownership. As human beings we experience our life in this world as a gift from God, whereby creation is under our care. But sadly we are losing or have already lost touch with God's wisdom.

We gain a broader understanding of God's concern for the care of creation through the Old Testament concepts of Sabbath and Jubilee: a day for rest from the six day working week; rest for the land in the seventh year; and the fiftieth year of Jubilee when debts



### God entrusting the creation to Adam

Jan Breughel the Younger (1601-1678), *Creation of Adam*

*"In today's society, there is an absence of the Christian tradition of understanding creation as belonging to God and not under human*

are cancelled, slaves set free, and the equal division of land restored. Peter Carruthers<sup>10</sup> suggests that Sabbath and Jubilee give three principles for farming and food production: sharing – with the poor; caring – for the earth; and restraint – of power and wealth. But there are imbalances in the world food system, a growing industrialisation of agriculture, and the rapid exhaustion of fossil fuels, which are destroying the environment in our 'Sabbath-less society.' ▶▶

▶▶ The Sabbath principle brings rhythm to our lives and for our treatment of God's creation. It offers us a framework for sustainable living. This is not just a pause for breath before carrying on consuming, and not just for humans. Jonathan Sacks expresses the vital place of the Sabbath for Jews:

*On the Sabbath, we do not work, nor are we permitted to employ others to work. All relationships of hierarchy and dominance are temporarily suspended, one day in seven. During the six weekdays, we think of ourselves as creators. On the seventh, we become aware that we are also creations - part of the natural world order, whose integrity we are bidden to respect. The Sabbath is thus the most compelling tutorial in human dignity, environmental consciousness, and the principle that there are moral limits to economic exchange and commercial exploitation. It is one of the great antidotes to commercialization and commodification.<sup>11</sup>*

To rest on the seventh day, therefore, is not just to have time off work, it is to remember who we are, what we are, and why we are here. Every aspect of our lives individually and collectively are to be viewed in the light of the Creator's intentions for us. How we spend our time determines the quality of our lives, as well as the quality we can add to the lives of others.

The technical control of time (departing from the natural God-given rhythms) is human-centred and takes our times away from a relationship with the creator. The emphasis on fracking as a short-term solution to our energy needs does just this. There is a failure to consider the impact of further GHG emissions on the environment and on the lives of people in the poorest parts of the world, where they are unable to address the effects of climate change.



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The call of Christ is expressed as 'Whoever wants to be my disciple must deny themselves and take up their cross and follow me'<sup>12</sup>. This is a different sort of life, a Christ-like life, a life that is 'in Christ'. It is to deny self – move away from a selfish materialistic life style; take up the cross-shaped life of sacrificial love – sharing God's good gifts of creation with all; and follow Jesus – in his compassion for others and for the world. The call is to join in Christ's redemptive mission.

The depletion of finite resources, be it fossil fuels or ocean plankton, sees us consuming the capital on which our economy is built, and this is irreplaceable. There are two important theological issues here: our relationship with the environment; and our relationship with the rest of the living world, especially other human beings. We have God's faithful provision of natural resources; and a God-given human wisdom and understanding allowing us to explore and experiment as part of our creation in the image of God, to whom we are each accountable. A call for wise stewardship questions the use and exhaustion of natural resources; and our concern for all human life in this and future generations.

This is not a scientific problem but is based far more profoundly on human beings striving for power and control, which is the picture of the original 'fall' from grace in Genesis 3. The ecological crisis gives theology, science and technology a common task in saving the planet, as we share a common destiny. The relationship between human societies and the natural environment has been lastingly, if not irreparably, destroyed by human technologies which have exploited nature. Our attitudes derive from fundamental human convictions about the meaning and purpose of life.<sup>13</sup> We ▶▶

▶▶ must look for a theology of sustainability and recognise that this is part of the whole doctrine of creation. Sharing God’s covenant with creation and all human beings gives us basic guiding principles of relationship, justice and avoiding sin.

There is a clear need for wisdom in dealing with the decision-making that surrounds an issue such as fracking. The Bible presents us with two aspects of wisdom: observing and knowing. On the one hand, wisdom comes from observation, from the careful collecting of evidence; it is a technical skill requiring discipline and humility, or the ‘fear of the Lord’. On the other hand, wisdom has a personal, relational quality, symbolised by the figure of Lady Wisdom in the Book of Proverbs (see for example 8:1-36). Wisdom is learning to be attuned to creation and to its creator, vibrating with its rhythms of life, living in sympathy with others. In this theological dimension, the wise live in a world where they are always receiving the offer to participate in God’s own wisdom, seeing the world as God sees it. Technical and relational wisdom thus belong together, each assisting the other.

Scientific knowledge and the resulting industrial techniques are vital and God-given, but the technological manipulation of living things may not be good stewardship, and may lead us to miss the need for justice in the face of global inequality and poverty. We need a wisdom that goes beyond technique, where we listen to God and walk with God in God’s garden, seeing a return to the initial relationships of creation: even paradise regained. It is for us to be in tune with God’s promises and purposes.

Fracking is technically possible, but it may not necessarily be the wisest use of the planet’s resources, and may certainly lead to greater harm for God’s good creation.

We look for Christian disciples to embody an alternative narrative, sovereignty and hope, where loving God and loving neighbour mark our character (Matthew 22:37-40).

As the Native American Indians say:

*Only when the last tree has been cut,  
the last river poisoned,  
and the last fish caught,  
only then will you realise  
that you can’t eat money*<sup>14</sup> ■

- 1 A version of this paper was first presented to the Worcester Bible and Science group, 18th February 2014
- 2 UK government website <https://www.gov.uk/government/policies/providing-regulation-and-licensing-of-energy-industries-and-infrastructure/supporting-pages/developing-shale-gas-and-oil-in-the-uk>, accessed 20.05.14
- 3 DECC publication, ‘Developing Onshore Shale Gas and Oil – Facts about ‘Fracking’ [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/270980/Developing\\_Onshore\\_Shale\\_Gas\\_and\\_Oil\\_Facts\\_about\\_Fracking\\_140113.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/270980/Developing_Onshore_Shale_Gas_and_Oil_Facts_about_Fracking_140113.pdf), accessed 20.05.14
- 4 Taken from DECC publication, ‘UK Renewable Energy Roadmap Update 2012’, [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/80246/11-02-13\\_UK\\_Renewable\\_Energy\\_Roadmap\\_Update\\_FINAL\\_DRAFT.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/80246/11-02-13_UK_Renewable_Energy_Roadmap_Update_FINAL_DRAFT.pdf), accessed 20.05.14
- 5 Marvin S Soroos, ‘From the End of History to the End of Nature’ in Harto Hakovirta (Editor), *Six Essays on Global Order and Governance* (Finland: Figure/Safir, 2003) p.40
- 6 John Houghton, JRI Newsletter, November 2013, available at: <http://www.jri.org.uk/newsletter/JRInews-November-2013-web.pdf>
- 7 Chancellor George Osborne’s Autumn Statement, 05 December 2013; <https://www.gov.uk/government/topical-events/autumn-statement-2013>
- 8 Michael S Northcott, ‘Ecology and Christian Ethics’, in Robin Gill (ed), *The Cambridge Companion to Christian Ethics*, Cambridge: CUP, 2001, p.210
- 9 Northcott, op.cit., 2001, pp.214-5
- 10 Peter Carruthers, ‘Creation and the Gospels’ in Sarah Tillet (ed), *Caring for Creation, Biblical and Theological Perspectives*, Oxford: Bible Reading Fellowship, 2005, p.74
- 11 Jonathan Sacks, *To Heal a Fractured World, the ethics of responsibility*, London: Continuum, 2005, p.169
- 12 Mark 8:34 TNIV, London: Hodder & Stoughton, 2004
- 13 Jurgen Moltmann, *God in Creation. An Ecological Doctrine of Creation* (Gifford Lectures 1984-1985), London: SCM, 1985, p.23
- 14 Margot Kassmann, ‘Covenant, Praise and Justice in Creation’ in David Hallman (Editor), *Ecotheology: Voices from South and North* (Geneva, WCC and Maryknoll, Orbis, 1994) p.49

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