

# Martyn Goss – Reflections on Renewable Energy

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## A: The Past

In today's world, it is so easy to take our energy supplies for granted. At the flick of a switch or push of a button, we have instant light, heat and power literally at our fingertips. We are virtually all connected to an electricity grid that is essential to our lives, and which fuels our homes, workplaces, shops, schools and hospitals, and so on.

But there are troubles ahead. Our electricity supplies have mainly been sourced from fossil fuels – coal, oil and gas. Some listeners will remember the now-closed coal-fired power stations at Plymouth and Yelland, which used to supply much of Devon. However, these fuels are both running out and also producing climate changing emissions. We cannot go on as we are and need to look for new and old energy resources, which are renewable and not finite.

So it is likely to be a sense of 'back to the future' in coming generations as we seek to update some of these technologies and discover new ones.

This week I'll be looking at some of these possibilities and reflecting on them. It is unlikely that there is one answer to our global energy crisis: we shall almost certainly require a diverse mix of power sources and become less dependent on the uncertainties of imported oil, gas or uranium.

How we use energy raises important *ethical* questions which should concern us all? Is a source of energy sustainable? Does it benefit more than its immediate retailers or consumers? What are the long-term consequences on the environment and on people elsewhere? Why exactly do we see some energies as good, others as bad?

For people of faith, energy is seen as a divine gift and as part of the creative process which sustains life on Earth. It is not an add-on but an integral part of the wider ongoing evolution of the planet, in which we human beings have our own purposeful role. If it were not for the forces of nature, we would not be here. But as we are, we need to think about what we are doing and where we are going....

## B: Earth

The geology of our planet itself provides energy. Envisage the sheer force of a volcanic eruption or the devastating movement of tectonic plates which prompt earthquakes. This is the raw power of the Earth found in its core structures of rock, minerals and heat.

In terms of renewable energies, this can be harnessed for human use in forms of ground-source or geo-thermal power. Water pumped into hot-rocks through a bore-hole hundreds of metres below the surface is one example, giving up its warmth through pumps and heat exchangers.

In Devon, such a scheme operates at the Tavy Business Centre near Tavistock, where hot water from a hole in the ground supports a wood-based heating system for a set of industrial units within the Dartmoor National Park.

Another version is the laying of coiled pipes underground in, say a field or car park, which can also draw out the natural warmth of the soil and again be converted into low level heat for a building. At Hatherleigh Community and Enterprise Centre, for instance,

a ground-source heat pump will be meeting about 95% of the heat load of the building, with a high efficiency boiler providing top-up water heating as required.

One of the writers of the Psalms talks of God as Rock. Rocks are not just solid and secure structures; they are also potential sources of energy. For some, the encompassing warmth of the Earth demonstrates the power of love which holds life together, and for some of us this source of being we may call Creator God of sky and stone, heaven and earth.

## **C: Air**

I was recently looking at a photo of some working windmills in Greece. These were located on a small mountain top overlooking the sea, built from stone and painted in black and white. They were constructed in the 16<sup>th</sup> Century and are a vivid historical example of human activity tapping in to the power of the wind.

Today, whether we like them or not, wind turbines provide a growing amount of our electricity. The intentional act of extracting energy from moving air and turning it into a manageable force is a marvel of science and tested by time.

Most of Britain's future wind energy will be supplied by off-shore arrays – large collections of huge turbines which in due course we shall come to take for granted, as we did the coal spoil heaps of industrialisation. Both are temporary symbols of their ages.

But we shall also require wind energy from appropriate locations and buildings closer to where we live. Already we see smaller wind machines alongside our roads and in Devon fields – including farmland near Okehampton and South Brent and even on top of buildings such as Exeter's Civic Centre. We are able too, to extract warmth from the air to heat our homes.

The wind itself holds a sense of mystery and wonder. Maybe windmills really are awe-full. For the Hebrews and Greeks, the air or wind is also the Spirit. The spiritual life is that which is focussed on the non-measurable aspects of living and loving. Each time we breathe, we convert the air into energy for our bodies. Clean air is a vital element for all living beings, and energises everything. That makes it fundamental for life in the future, as well as the past and the present.

## **D: Fire**

The answer to all our energy problems is staring us in the face, as the saying goes! In reality, all our energy comes from the fires of the sun and as we begin to explore new ways of harnessing the power of light, we are taken into the realm of solar technology.

In practical terms, there are two active forms of using the sun's light. One is to turn this into heat through solar thermal panels to provide hot water. The second, is to convert daylight into electricity, through photo-voltaic cells. Increasingly, we see solar panels across Devon which do precisely this.

As the technology improves, sunlight is likely to grow in importance, and has the advantage of being able to be used locally without the need of huge power stations - witness small plaques on roadside signs or street lamps.

The churches are moving rapidly in this direction and there is a programme encouraging parishes to install such systems on the south-facing roofs of church buildings in Devon,

as illustrated at St. John's in Torquay. They are already evident on individual homes, industrial units and farms, and will soon be extended to community centres and shared buildings.

For people of faith, 'Light' has a special religious significance. It is a word used in different ways to describe our understanding of God. 'The light shines in the darkness'; Christ is called 'the light of the world'; people are called 'Children of Light'; we say "illuminate" or "enlighten us" as we pray, and so on. Light is used as a metaphor which strongly symbolises the divine.

And for all of us on Earth, sunlight has equally a life-giving significance. It provides radiated heat across millions of miles from the sun itself and empowers photosynthesis, and thereby the natural processes of plant and animal evolution. No light – no life. It is as basic as that.

## **E: Water**

We connect the word 'Water' with the word 'well'. Wells offer sources of life-giving water and indeed we use 'well' as an adjective to describe health and wholeness. Are you *well* today? To disconnect healthiness and water would be like taking the wings off a bird. Our bodies are comprised of more than 80% of water. We thirst and die without it. Water is the fount of life.

Not surprisingly, we have taken the power of water to improve our lives still further. In older times water-wheels, drawing on the natural flow of streams and rivers, were the places to grind corn or other seeds to make them more digestible - the resulting flours being turned into breads.

The cliff railway between Lynton and Lynmouth in North Devon uses the weight of water as a source of energy to propel its carriages.

More commonly, hydro-power has been developed, in which the force of moving water causes turbine blades to revolve and produce electricity. Buckfast Abbey in South Devon operates three water turbines from flows from the river Dart. These produce electricity which supplies the wider community through the national grid.

Now scientists are developing new ways to extract the power of waves and the strength of tidal movements to do the same. These are potentially very significant for Devon and its two coasts.

Some Biblical writers talk of streams of water providing life and justice, and the truth welling up out of the Earth. Water is an element deeply associated with the origins of life. From a faith perspective it contributes to our experience of a God who was revealed to the wandering Israelites as a 'pillar of cloud' – present in the droplets of water combined with air. Water is indeed a deep well for energising life throughout the world.

## **F: Biomass**

In the last four days, we have been looking at the four elements of Earth, Air, Fire and Water, and their potential for providing us with renewable energy to run our homes, jobs, schools and other services. Today, we add to the list the role of plants and even animals to supply us with power...

The mass production of say, palm oil, has proved to be environmentally disastrous, and other bio-fuels such as ethanol from sugar cane are equally contentious, none the least because they are often grown in place of food crops. Such monocultures can prompt hunger or famine in poorer countries and communities.

But there are more positive ways of turning plant matter into heat and light, and much closer to our own homes in Devon. Perhaps the most obvious is to grow trees and manage them sustainably to supply logs, wood chips or charcoal for efficient burning stoves, and with little pollution. Locally managed woodland can enhance the landscape, improve habitat and also provide jobs – and can be replaced on an ongoing basis. Castle Drogo on Dartmoor has won an award for its Biomass heating system, all fuelled from its own estate.

Another indirect form of renewable energy from plants is to reproduce methane gas from anaerobic digesters, which consume agricultural or food waste and produce organic compost as a bi-product. We have such schemes operating at Langage Farm near Plymouth and at Holsworthy. Heat from manure used to warm Victorian greenhouses, and across the county, countless farms and smallholdings have been self-sufficient in plant fuels for generations.

One sentence in the book of Revelation cites leaves and trees as being sources of healing for the world. Maybe this is an insight as to the potential role vegetation can play in providing us with clean, natural energy. Trees have a vital role both in the planet's ecology and in the human economy. To plant and nurture trees for future energy supplies develops this tradition, and offers us hope at a time of uncertainty. The *Tree of Life* is an important symbol for us all.

## **G: The Future**

So where do we go from here? This week I've been reflecting on renewable sources of energy and how we can use air, light, water, etc. to power our communities. Slowly but surely our dependency on the fossil fuels of the past has to end. Future generations will not have convenient or cheap oil or gas at their disposal. Whatever else, the future cannot be a continuation of the present. Pollution and declining resources suggest otherwise.

There are additional challenges for the National Grid's capability in the years to come. The capacity of parts of the Grid in the Southwest is particularly stretched, even without the coming demand of electric vehicles.

Clearly there are no easy solutions and some of the new or renewed technologies bring their own concerns.

However, the future of our power supplies does lie to some extent in our own hands. We will have to produce much more of our electricity and energy locally, and not waste precious resources in transmission. Devon is rich in renewable energies – if they can be developed and managed sensitively for the benefit of all. Hours of sunshine, consistent prevailing winds, reliable tides, continual waves and rivers, regenerated woodlands and forests, and constant warm land are all abundant in our county. These natural sources offer massive opportunities and are less harmful to the ecological balances of life so disrupted by burning coal or petrol.

In future, let us act to conserve energy as and when we can. Let us look to installing more efficient lighting, heating and transport systems. And may we develop more

natural energy in our local communities. All of these, and more, can provide a kaleidoscope of possibilities – a diversity of solutions.

In Christian Scriptures the New Testament writers talk of important times in history - moments or seasons of critical change and choice - as '*kairos*' points. Surely we are on such a cusp or *kairos* right now, and we must be bold enough to make the right decisions for the common good and to sustain the Earth. Let's hope we become the future we aspire to, and live to make this a reality for the world to come...

**Martyn Goss. July 2011**