



A Newsletter on Social Justice Issues

Welcome to the October edition of Do Justice for 2024 as we continue to discuss issues of Social Justice from a Christian perspective in the tradition of Micah and St Francis. In this edition, David Hall offers thoughts on energy.

The views expressed are not necessarily those of the Diocese of Auckland.

Energy at the heart of civilisation

Over the last few weeks there has been much discussion in the media and Parliament about energy to the point when it assumed that "energy" is something new. But our use of energy can be dated back to the earliest human existence, to the hunter-gathers who used energy to keep themselves warm and to cook food. The energy they used was renewable, wood generally. Through the centuries the types and availability of energy have expanded: windmills, watermills, energy provided by animals such as horses – all types of energy that was renewable, nothing was being taken away from our environment – water and wind remained, wood grew on trees, horses ate grass and grains to provide us with energy.

In the eighteenth-century things began to change; first coal was found to be an easier way to make steam, and then oil and natural gas. Exploration for these fossil fuels became widespread and enormous industries emerged to provide them, industries that required huge amounts of capital and hence had to provide profits in return. But coal, oil and natural gas took many, many thousands of years to form deep in the earth's crust and the amount, although very great, was limited – no longer was there a balance between usage and provision. We would eventually run out of coal, oil and natural gas, maybe not for many years, probably hundreds of years but our major sources of energy were no longer renewable. By the 1950s experts were talking about "peak oil", the day when new oil funds would be less than the demand and usage¹.

About the same time the impact of the emissions from using coal, oil and natural gas were beginning to be understood, in particular that carbon dioxide given off when these fossil fuels were used was having a significant impact on the atmosphere that protected all of us from excess solar radiation and potential global warming. Climate change was with us, and we should no longer rely in the long term on fossil fuels as our major source of energy. But alternatives are available, possibly ironically, by going back to the old windmills and watermills and in the last twenty years the sun. These three sources are the most efficient and cheapest way to generate electricity - hydro, wind power and solar cells. And we in New Zealand are blessed with an abundance of water, wind and sun.

So why do we have a situation where the wholesale price (that is the price large industrial users of electricity pay for their power from the big gentailers²) is so high that industrial plants have to completely shut down because the cost of their products is too high and uncompetitive? So much so that two wood processing plants have had to shut for good, plus a plant that recycles paper and cardboard is closing at Christmas – all because of high electricity costs.

Up until the 1980s electricity was mainly generated by the New Zealand Electricity Department (NZED), which built all the major hydro-electric plants that we have today which represent 55% of our electric generation capacity³. The balance comes from a mix of geothermal, wind and a few solar cell plants plus the Huntly Power Station – (coal/natural gas) and some smaller gas turbine units around the country. In the 1950s, 60s and 70s New Zealand was known for its cheap electricity and a number of industries that needed significant electrical input were built.

The beauty of hydro-electric plants is that they are both generators and storage "batteries" as water can be held behind the dams for as long as necessary. Hence it would seem logical and sensible for solar and wind to be used whenever available and hydro only when the sun goes down or the wind does not blow. In other words, solar

¹ [Peak oil - Wikipedia](#)

² ['gentailer' – generator retailer](#)

³ [Hydroelectric power in New Zealand - Wikipedia](#)

and wind become the base generation rather than hydro which is the present choice because the plants were built many years ago and are cheap to run because their capital costs are so low.

It is during the day, when the solar cells can work, even when there is cloud, that the demand for electricity is greatest. Wind is slightly less predictable but generally New Zealand is a windy country, and wind often blows at night. So why do we have little solar compared to other countries?

The cost of solar panels has fallen rapidly over the last 20 years, and they can easily be installed on roofs as well as in larger groups close to the major loads particularly in the North Island. Solar panels on residential roofs can be used just to supply power to the house in question with a suitable battery to store any excess power generated during the day or can be connected to the electricity network to supply power to the rest of New Zealand. Of course, any transfer of power will need to be paid for at a price that is fair – something that is not the case today.

This leads us to how users pay for electricity. There is a retail and a wholesale market. Most of us use the retail market in that we “buy” electricity from one of the gentailers at a fixed price which is usually only adjusted annually. We pay not just for the electricity we use but for the use of the complex network that gets the electricity to us, the high voltage transmission lines, the substations, the Cook Strait link etc, because so much of the hydro generation capacity is in the South Island and the load in the North Island.

Large users of electricity such as manufacturing plants pay a wholesale price for their electricity which is dependent upon the cost of the most expensive generation source (there is one exception - the aluminium smelter that has a fixed long-term contract) during half hour periods. This is why, when the South Island hydro lakes are low and hydro generation restricted, more expensive generation is required, and the price of the more expensive generation is the price for all generation. This is why the large gentailers have been making such high profits.

The present government blames the banning of further exploration of fossil fuels by the previous government for the recent record wholesale prices because of the lack of natural gas that is assumed would have kept the electricity price down. This is not the case. The Minister of Energy prior to the ban said, *“In each of the last two years only one permit has been granted for offshore oil and gas exploration. This decision does not affect current reserves or the potential finds from current exploration permits. As the industry itself admits, there is good potential for more to be found”*⁴.

So why did the gentailers not increase their investment in solar and wind knowing that they could no longer rely on natural gas as a backstop to hydro in a “dry” year? The answer is clear, the gentailers primary objective is to make profits for their shareholders and by not investing in new generation capacity they are making big profits. And the government does not mind as half the profits go to the Treasury.

To understand this situation it is necessary to look at what has happened since the 1980s and the demise of NZED. The first step was the “corporatisation” of NZED in 1988 by the Lange/Douglas government. Contact Energy was spun off in the early 1990s and sold to private investors. The rest of the power stations were then split between four companies and eventually half of each company sold by the Key Government. Over the same period the various distribution organisations, most owned by local authorities, were combined and sold. Most of us living in Auckland get a dividend from Entrust each September as former customers of the Auckland Electric Power Board as we “owned” AEPB.

For much of the 20th century the four utilities – electricity, water, gas and telephones – were owned by the state and therefore all of us. Now only the provision of water is still “owned” by us. All these utilities are very heavily plant and equipment intensive. These can however, last a long time if adequately maintained, which was generally the case until the nineteen eighties. Overall, the provision of communications services has benefitted from private investment as mobile phones and the internet have developed.

Gas was provided from coal until reasonable amounts of natural gas were found in New Zealand in the 1960s and 70s. Local authorities were generally responsible for running the coal gas plants until they were shut down.

The provision of water services by local authorities has been more problematic, the water distribution system has not been well maintained in many areas and major capital expenditure will be required over the next 40-50 years to maintain the supply of good clean drinking water throughout the country.

Up until the 1980s decisions about building and financing more electrical generating capacity was in the hands of the central government. Decisions were made on the need for electricity, the industrial need and the domestic need. Overall, needs were provided although there were years after low rainfall limited the amount of electricity from the hydro stations; as a result two large power stations were built at New Plymouth (1974) and Huntly (1976) with coal as the fuel, this was long before windfarms and solar cells.

⁴ Megan Woods, [Planning for the future - no new offshore oil and gas exploration permits](https://www.beehive.govt.nz/planning-for-the-future-no-new-offshore-oil-and-gas-exploration-permits) | Beehive.govt.nz

It has been very interesting to observe the new coalition government's response to the high peak wholesale electricity prices of August that has led to various plant closures and hundreds of people losing their jobs. Peak electricity prices caused by low rainfall and insufficient natural gas supplies. The banning of oil and gas explorations has been reversed so that more natural gas could become available and the possible building of a natural gas terminal so gas can be imported. However it takes at least 10 years from discovery of a natural gas reserve to production.

At the same time the planning process, which the previous government had already reformed but that legislation was repealed by the coalition government, was to be freed up so gentailers could build more generating capacity. The fact that the gentailers already had full planning permission for a number of unbuilt wind and solar plants was seemingly ignored. All this from a coalition government that claims to "follow the evidence"! Economic electricity from renewable sources is vital if we are to continue on this Earth in the long term.