# EnergyWatch

***The Journal of the Sustainable Energy Forum Inc.***

*"Facilitating the use of energy for economic, environmental and social sustainability"*

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# EDITORIAL

## Changing the Guard

Longstanding readers of EnergyWatch will recognise the title of this editorial as a reprise of the title used five years ago when John Blakeley took over editorship of EnergyWatch from Kerry Wood. After guiding EnergyWatch through twenty issues, John has taken a well-earned retirement from the task to concentrate on his teaching work. I am honoured to be have been entrusted with the task of looking after EnergyWatch and I will do my best to follow the excellent examples set by John and by Kerry before him.

EnergyWatch, as a permanent record of transactions of the Sustainable Energy Forum was launched in 1995, edited by Fiona Weightman. It had evolved from campaigning publications by Molly Melhuish in the 1980s. After work by Laura Tomat and Ian Shearer, Kerry Wood took on the role of permanent editor of EnergyWatch from 1997 to 2005.

I reproduce in this issue an introductory piece by Ken Piddington from the first edition of EnergyWatch "*The Fledgling Forum Finally Flies*". In this piece Ken eloquently set out a vision of the role of the Sustainable Energy Forum in New Zealand, which seems to me to be as relevant today as it was in those dim and distant pre-internet days.

Whilst communication technology has changed dramatically over the last 15 years, energy technology, bounded as it is by the laws of thermodynamics, has changed much more slowly. The issues of energy policy required for *"Facilitating the use of energy for economic, environmental and social sustainability"* have changed in emphasis but not much in content.

In looking back over the history of SEF, I was surprised to find that it was only ten years ago that Ian Shearer set up SEFnews as the email communication forum for the exchange of news and views around the SEF community. It is hard to remember how we used to communicate in the last century, when the postal service was praised for its speed and facsimile transmission was the wonderful new incarnation of telex technology. However in these modern days of instant bulk

**SEPT 2nd 5.00.p.m. IS THE SUBMISSION DEADLINE FOR THE DRAFT NZ ENERGY STRATEGY**

electronic messaging there is less permanence in communication. I perceive that a key role of EnergyWatch is now to capture some of that transient discussion in a permanent form.

This issue of Energy Watch focuses on the draft NZ Energy Strategy, which is out for consultation. It includes submission guidelines and articles on Renewable Electricity Generation, Feed-in Tariffs, Energy Storage, Peak Oil and Lighting, which may provide readers with background information to assist with making submissions on the draft NZ Energy Strategy. This discussion on Feed-in Tariffs may also be a useful background to the Seminar that will follow our AGM on 10th September.

The draft NZ Energy Strategy document is called *"Developing Our Energy Potential"*. It sets out a philosophy of exploitation of energy resources (primarily fossil) in order to provide for NZ's future energy needs. Thus it effectively ignores the risk of the local NZ energy scene being overwhelmed by the global issue of Peak Oil. In "Cup Half-full" I reflect on the Government's optimism about our local long term energy prospects in the context of more pessimistic views expressed in the wider global energy forum.

In future issues I plan to use my breadth of experience in the energy and climate arenas to help guide the direction of EnergyWatch. However, my preference is to see EnergyWatch using contributions from other SEF members with summaries of the various lively discussions on SEFnews.

I look forward to being of service to you, and hopefully of benefit to New Zealand, in sustaining the publication of EnergyWatch as a forum for the debate of energy issues and a facilitation of the use of energy for economic, environmental and social sustainability.

*Steve Goldthorpe, Editor*

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# The Fledgling Forum Finally Flies

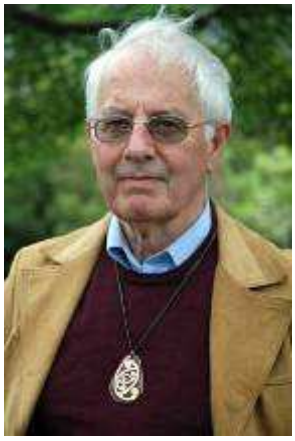
*This is a reproduction of an introductory piece written fifteen years ago by Ken Piddington for the first issue of EnergyWatch.*

This is the official newsletter of the Sustainable Energy Forum (Incorporated) of Aotearoa New Zealand.

What tone of voice will we adopt? In the weeks since the government's announcement of the ECNZ split-up, it has become clear that what SEF's role could be is as a watchdog with detailed knowledge of the energy sector, focusing on public and environmental interest. The transition to a functional market is not straightforward; games will be played and the interests of the domestic consumer and the environment will (as always) be a residual.

The Forum's monitoring role will help a number of groups, such as Consumer Coalition, Grey Power, and Federated Farmers, who are not direct players in the current industry maneuvering. And through Power for our Future (a participating member) we have direct links to community networks.

Does this watchdog have any bite? First of all, the Forum is (like a marae and like its Roman origins) no more than a meeting place for different interests. Over time however, it will produce a common approach, an ethos, which all participating support — to some extent this is already happening. So will we be just another bunch of lobbyists? Again the answer is 'not very often'. There is of course a grey area between pushing relevant information (e.g. all renewables are getting significantly cheaper) and direct lobbying. We are bound to be lobbyists for sustainability. There is the Resource Management Act to back us up in this. But when you open this newsletter you will not find another negative diatribe. We are into solutions and opportunities and we have a lot of active New Zealanders with ideas that will work (look at solar architecture in Christchurch for example).



Above all, we want individuals and communities to speak for themselves.

There will always be a section in EnergyWatch for opinion, and contributions are welcome from any quarter.

*Ken Piddington, July 1995*

The Annual General Meeting of

## The Sustainable Energy Forum Incorporated

Will be held in the EECA meeting room

8th Floor, 44 The Terrace, Wellington

On Friday 10th September at 10.00 a.m.

SEF Members may attend the AGM via teleconferencing facilities. Members wishing to register to attend by teleconference or to give their apologies and appoint proxies should contact office@sef.org.nz before 8th September.

Following the AGM a SEF lunchtime seminar will be held on the subject of

## Feed-in-Tariffs

At Turnbull House, Bowen Street, Wellington at 12:15 – 1:30 p.m.

Bring your lunch. A koha will be collected to help defray the expenses of the seminar.

# DRAFT NEW ZEALAND ENERGY STRATEGY

The Government has released its Draft Energy Strategy for New Zealand. The document "Developing our energy potential" can be downloaded from the MED website*. It also includes the Draft New Zealand Energy Efficiency and Conservation Strategy. These two strategies are open for consultation until **5 p.m. on Thursday September 2nd 2010**. SEF members are encouraged to make individual or group submissions on either or both of the strategies.

* www.med.govt.nz/upload/73919/Developing%20Our%20Energy%20Potential%20July%202010.pdf or email admin@SEF.org.nz for a pdf copy

## Key Areas of Draft NZES

1. Develop petroleum and mineral fuel resources
2. Develop renewable energy resources
3. Embrace new energy technologies
4. Competitive energy markets deliver value for money
5. Oil security and transport
6. Reliable electricity supply
7. Better consumer information to inform energy choices
8. Enhance business competitiveness through energy efficiency
9. An energy efficient transport system
10. Warm, dry, energy efficient homes
11. Best practice in environmental management for energy projects
12. Reduce energy-related greenhouse gas emissions

### Observations

The Draft NZ Energy Strategy part of the consultation document does not contain any quantified strategic objectives. All energy targets are in the attached Draft NZ Energy Efficiency and Conservation Strategy document as summarised in the next column.

That means that no quantified assessment is presented of the potential benefit to the supply side of the energy scene in New Zealand that might arise from the development of NZ's petroleum and mineral fuel resources.

## Draft NZEECS Targets

**Electricity** 90% of electricity will be generated from renewable sources by 2025 – providing supply security is maintained

**By 2015 compared with 2008**

**Overall -** 55PJ of energy saving

**Transport** 29 PJ of savings. A 4% reduction in GJ per km travelled on land.

**Business** 16 PJ of savings in the industrial sector and 5PJ savings in the commercial sector. A 14% overall reduction in energy intensity (as GJ/$ of GDP)

**Domestic** 4 PJ of savings

**Public sector** 10% reduction in energy use

This table shows the draft NZEECS targets in the context of the 2008 Energy Data File data.

| **Consumer energy PJ** | **2008** (Energy Data File) | **2015** (draft NZEECS) |
|---|---|---|
| Agriculture | 31 | undefined |
| Aviation | 15 | undefined |
| Land transport | 191 | 162 |
| Industry | 181 | 165 |
| Commercial | 50 | 46 |
| Domestic | 62 | 58 |
| Total | 531 | 476 |

### Observations

The energy intensity targets imply that total land transport kilometers travelled would decrease by about 1.5% per year and that GDP would increase by only 0.8% per year.

# The Green Party's draft NZES Submission Guide

This is an abridged version of the guide at www.greens.org.nz/sites/default/files/NZEECS2010_SubmissionGuide_v3.pdf

**The draft NZEECS fails to state the means of achieving policy, as required by law.**

- We should oppose the deletion of all specific, measurable means to achieve the draft NZEECS policies, which are required by section 10(2)(d) of the EECA Act.
- The existing NZEECS lists 130 specific programmes and activities as the means to achieve the policies set out in both strategies, whereas the new draft deletes these and only hints at 9 programmes, all of which are existing programmes that are better described in the existing text.
- The existing NZEECS should remain in force. This consultation is a waste of taxpayer's time and money. It fails to meet the requirements of the Act.
- The Government has only considered criteria and has not developed any means to achieve its policies and objectives. The Government has failed to meet the statutory requirements of the law and has failed to commit to any actions of substance.

**The NZEECS should contain specific new actions to which the Government is committed and which it has funded.**

- The draft NZEECS should restore many of the specific actions and programmes deleted from the current strategy.
- The Government needs to show that it is committed to following through on any specific actions by fully funding all programmes in the draft strategies.

**NZES emphasises fossil fuel development**

- We should strongly oppose making the development of fossil fuels such as coal and oil a primary objective of the energy strategy. This flies in the face of the Government's commitment to transitioning to a low-carbon economy.
- This proposal is a 19th century economic development model that is obsolete and contrasts with modern requirements to mitigate climate change, transition to clean-technology and protect biodiversity.
- The statement that this Government's goal is desirable to "fully utilise" all of our fossil fuel resources is repugnant and ignores the realities of climate change and intergenerational equity.
- The Energy Strategy's statement that "oil and gas resources will flow to the highest value use" clearly shows that the Government knows New Zealanders will not benefit from their development, but rather NZ production will be exported to the highest bidder overseas.

**The NZES does not address significant market failures that prevent energy efficiency and renewables from flourishing.**

- We should oppose the laissez-faire focus on 'providing information' as the only policy to address significant market failures in the uptake of energy efficiency and new renewable sources of energy.
- Information is vital to efficient energy use and efficient markets, but it is not enough. Both the draft NZES and the draft NZEECS should clearly spell out what codes, standards and regulatory frameworks will be developed by this Government and how they will support the stated objectives. This would send clear market signals as to how this government will achieve its goal of greater energy productivity.

Another critical analysis of the Draft NZES is by Peter Hardstaff, Climate Change Campaigner, WWF-NZ, August 2010, as posted on SEFnews. It can be accessed via the SEF or WWF websites. Suggestions for a submission are at: www.wwf.org.nz/take_action/draft_energy_strategy__have_your_say/

# IPENZ: *"90% renewables is not and never was a practical target"*- A Critique

A report *"Electricity Generation – Achieving New Zealand's Objectives"**, which was published by the Institution of Professional Engineers of New Zealand (IPENZ) earlier this year, set alarm bells ringing in the SEF community.

The concern was two-fold.

Firstly, the headline-grabbing conclusion *"IPENZ considers the 90 per cent renewables target is not, and never was, a practical target."* sends a strong anti-renewables signal, which is reinforced by the report's principal recommendation *"IPENZ recommends the government….removes its objective for 90% of electricity to be generated from renewables"*

Secondly, the adoption of an overtly political stance by an illustrious engineering institution seems inappropriate. The report looks like a piece of work commissioned to rubbish the policy of the previous Government, rather than an objective independent analysis, such as might be expected from New Zealand's professional engineers. There is no indication of the ownership of the opinions expressed in the report by the *"IPENZ public policy team"*.

The conclusions reached depend, of course, on the views and assumptions underlying the analysis. Those assumptions are basically "business-as-usual".

The first four recommendations in the IPENZ report recommend that the Government: -

- *continues and strengthens the financially beneficial energy efficiency and conservation initiatives that are underway;*
- *increases public awareness of energy efficiency and demand side responses to reduce demand for electricity;*
- *re-establishes a clear energy efficiency target to enable the energy efficiency programmes' overall performance to be measured;*
- *encourages the further development of demand side management initiatives including time-of-use tariffs, smart meters, smart appliances and wider use of load control/interruptible supplies.*

These recommendations acknowledge that the solution to the problem of meeting peak demand lies with controlling the extent and timing of that demand rather than just expanding supply systems come what may.

The subsequent Draft NZ Energy Strategy generally reflects these objectives.

But the Draft NZ Energy Strategy target says:

"*The Government retains the aspirational, but achievable, target that 90 per cent of electricity generation be from renewable sources by 2025 (in an average hydrological year) providing this does not affect security of supply.*

This conflicts with the IPENZ conclusion that 90% renewable electricity is impractical:

"*It is incompatible with the New Zealand non-interventionist approach to generation investment, and this is in stark contrast to the approach of most other countries with targets."*

A non-interventionist approach is not necessarily a given in New Zealand for the long term future. Indeed, it could be argued that the complex electricity market governance system run by the Electricity Commission to create artificial competition is highly interventionist.

* www.ipenz.org.nz/ipenz/media_comm/documents/ElectricityGenerationReport-LowRes.pdf

The business-as-usual strategy includes requiring each of the competing electricity generators to guarantee supply into the grid by backing up its intermittent renewable generation with on-demand fossil generation. That strategy is a main reason why the IPENZ analysts only predict 71% renewable generation by 2025.

The IPENZ analysis relies heavily on the generation of electricity from natural gas, particularly in gas peaking stations which are deemed to be required to provide on-demand generation. However, there is no discussion of where the natural gas will come from. It is well known that New Zealand is facing a large deficit in indigenous natural gas supplies well before 2025. Is the analysis based on unrealistic expectations of major natural gas discoveries? Alternatively, is the analysis based on the importing of foreign liquefied natural gas at very high prices?

In summary the IPENZ report seems to be stating the obvious; that if we don't change the current rules of the game then we can't shift to a different paradigm and 90% renewables won't happen. However, that doesn't mean that 90% renewables might not be achievable by 2025 in the event that there is, over the coming years, the political will to make it happen. Does the Draft NZ Energy Strategy signal that political will?

# Response from IPENZ

"The work undertaken by IPENZ was subject to the normal collegial process of a professional body whereby Members with expertise in the industry had the opportunity to contribute on a number of occasions. It is a learned view drawing on the wisdom of the Membership.

"The basis of the analysis was to establish where New Zealand would be under present and likely future policy settings. The conclusion was that with emphasis on price and supply security, and the need for SOEs to maintain a return on capital there would only be slow change in the proportion of generation from renewables. The analysis of the Statement of Oppotunities scenarios showed that rapid increase was unlikely, even for the most favourable renewable option.

"IPENZ has not sighted any analysis which shows what a generation mix with 90% renewables in 2025 would look like, and whether there is sufficient lead time to have the necessary plan installed and operating in time. The challenge for those who believe that a 90% renewable target is achievable by 2025 is to define the necessary generation mix, and work out how it will be installed in time. Our understanding is that the Minister has called the target 'aspirational", which suggests that he probably concedes it is not practical.

"We recommended removal of the target because we do not believe that Government should mislead the people of New Zealand to believe that it was achievable whilst also meeting other objectives Government had signaled as more important. In this respect it is somewhat like the catching up economically with Australia by 2025 - idealistic or practical? Our view was that the Government should acknowledge how hard change is. There is no anti-renewables message, but an acknowledgement of how hard it is to increase the proportion.

"The general view of our Membership is that we should maximise demand side measures, and establish clear long term signals for investment in the supply side.

"IPENZ will be preparing a response to the Governments invitation on the review of the Energy Strategy, and the Energy Efficiency and Conservation Strategy - these include the 90% renewable target. The deadline is the 2nd September. I will ensure that our Policy Director Tim Davin is in touch with you to ensure you are able to be actively involved in the discussions that will no doubt ensue.

*Andrew Cleland - CEO IPENZ*

# FEED-IN TARIFFS

The SEF seminar on September 10th will address the mechanism of Feed-in-Tariffs (FiTs) as a means of encouraging the development of renewable electricity generation technologies and its applicability in the New Zealand context. FiTs have been used in Europe, notably in Germany, for some time. These articles may provide some useful background information.

## Comment: Feed-in Tariff reductions in Europe to change solar PV market

15 June 2010, **IHS Research**

**The period from 2010 to 2012 is shaping up to be one of significant transformation for the European solar photovoltaic (PV) industry as it confronts regulatory incentive revisions, expanding market development opportunities and scaling competition from better financed and more robust power players, says IHS Research.**

European solar PV markets are forecasted to add as much as 15.5 GW from 2010 to 2012 at an average of 5 GW per year. In the longer term, the solar PV sector in Europe is expected to maintain its growth trajectory from an expected 6.3 GW in 2010 toward 101 GW of installed capacity by 2025, according to a new IHS Emerging Energy Research market study: *Europe Solar PV Markets and Strategies: 2010-202*5.

"In domino-like fashion, Europe's governments are revising their feed-in tariff (FiT) schemes and permitting procedures in 2010 to keep pace with PV's rapid technology and cost advances," says IHS Research Director Reese Tisdale, one of the study's authors.

"Feed-in tariffs have been instrumental in getting the Europe PV sector off the ground to date. These schemes are evolving rapidly in their designs to shape both the size and content of the market going forward."

**The case of Germany**

Considered the epicentre of the global solar PV industry, the German solar PV market faces significant changes in coming months due to proposed revisions to the feed-in tariffs expected to be enacted by the end of 2010.

As a result, German solar PV development is surging ahead of the proposed tariff reductions. While Germany is among the most cost-competitive markets in Europe, reduced feed-in tariff rates will force players to further reduce system costs.

Other markets such as Italy, Spain, and the Czech Republic are poised to follow suit with expansive tariff revisions planned in 2010. Despite tariff revisions, Germany will continue to dominate global solar PV build-out, and continued development in Italy, France, and Belgium will be also pivotal in driving the industry forward through scale, technology improvements, and deeper experience for developers, according to Tisdale.

"Europe is no longer a one-market PV industry. With development focused almost entirely on Germany several years ago, the European PV market has now diversified to five or six active countries-ultimately to stabilise the market and dampen risk," says Tisdale.

**New entrants**

Scaling solar PV activity in European markets outside of Germany has propelled a new group of utilities and power players into the industry forefront. Leading utilities and renewable players Electricité de France (EDF), and Enel are at the forefront of large-scale solar PV deployment, particularly in

France and Italy, leveraging their renewables success and experience to position for broader international competition.

As competition increases in the downstream development segment, a growing number of international suppliers are challenging the more entrenched European companies for market share. Leading this charge has been the rising presence of lower-cost Asian manufacturers.

Furthermore, the recent oversupply of the global solar PV module market, technology and manufacturing improvements, and economies of scale has led to a dramatic reduction in solar PV system costs in 2009 and 2010. Adding to this positive cost trend, the increased positions of larger industrial players such as Siemens, ABB and GE are expected to have an additional impact on the solar PV sector.

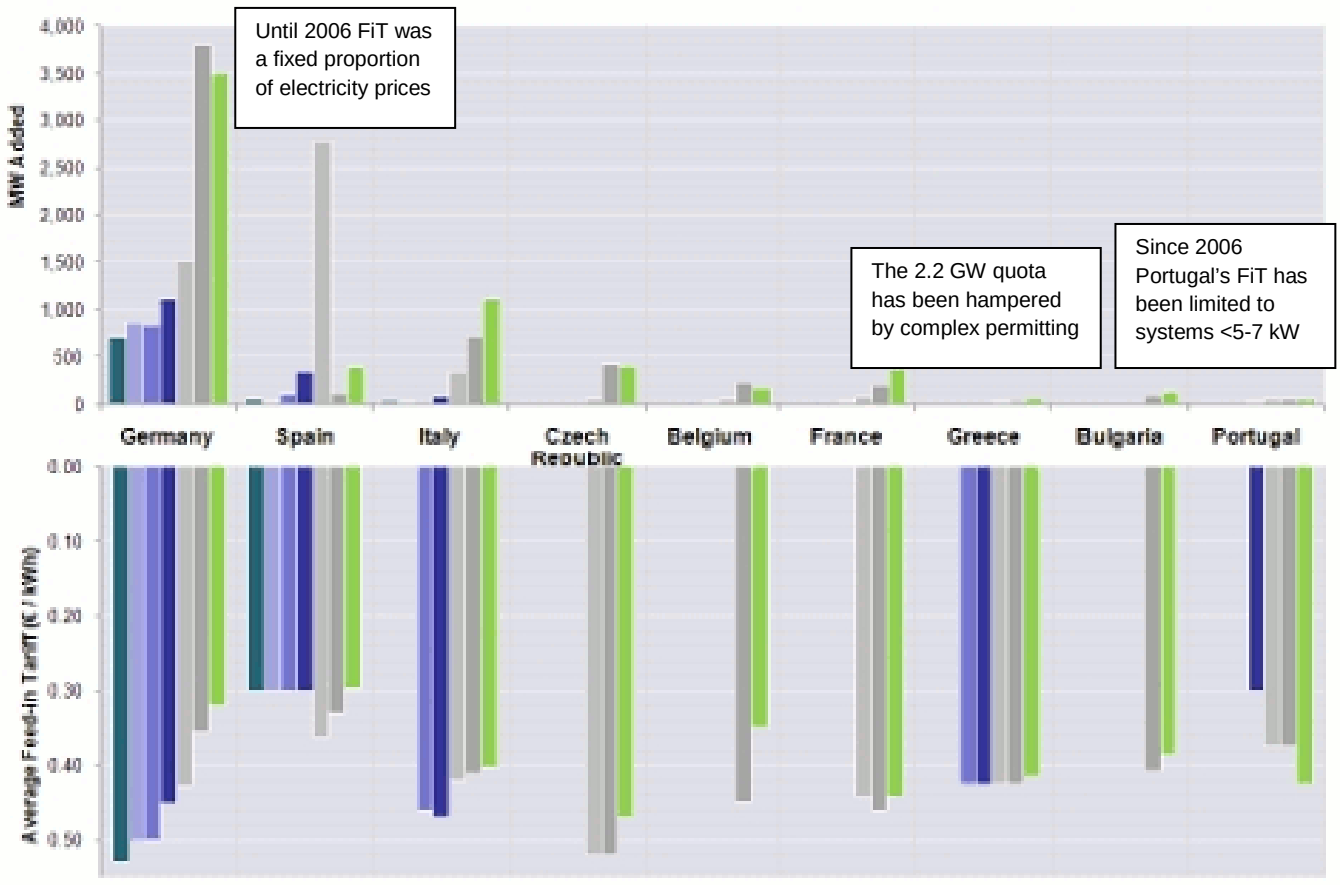
**Shift towards Asia**

"Over the past 24 months, the makeup of the PV market has shifted dramatically with the growing presence of Asian suppliers squeezing traditional European suppliers," adds Tisdale.

"At the heart of this change are Chinese companies, led by Suntech, Yingli, Trina, SolarFun and Canadian Solar, who are gaining market share through low-cost modules."

Through the first quarter of 2010, 8 of Europe's top 15 solar module suppliers are Asia-based highlighting a shift toward a more global supply chain from the more entrenched German suppliers that have been so successful in the past, according to the study.

*This article is featured in: Renewable energy Focus* - Photovoltaics (PV) • Policy, investment and markets




EU Feed-In Tariff Impacts on Solar PV Build-Out, 2004-2010 (Euro/kWh, MW) Source: HIS Emerging Energy Research, Europe Solar PV Markets and Strategies: 2010-2025

# A Feed-in Tariff System for New Zealand

**by Stephan Heubeck**

This years SEF AGM in Wellington on the 10th of September 2010 will be followed by a lunch time seminar on the topic of Feed-in Tariff (FiT) systems. As a primer, this article attempts to give an overview about FiTs, in particular for people not very familiar with the topic.

**What is a feed-in tariff system?**

A FiT system is a supply side focused renewable energy policy that provides a level playing field for renewable generators, particularly at small scale, and provides a high level of stability, planability and regulatory certainty for environmentally sensible electricity generation schemes.

A true FiT system contains 3 key features:

- Priority connection, transmission and use of electricity generated in small scale (renewable) set-ups guaranteed for extended periods of times.
- Long term (e.g. 20 years) fixed prices for electricity from such set-ups with different rates for different schemes according to size, type of generation, co-benefits and commissioning date in accordance with the local conditions in each respective country
- National cost pass-on and equalisation scheme.

A true FiT system is therefore (transparently) cost neutral to tax payers, lines companies and electricity retailers. The system guarantees stable earnings for operators of small scale renewable set-ups and predictable returns for investors. Additional costs associated with the FiT systems as well as additional savings (e.g. avoidance of transmission costs, order of merit effect reductions in wholesale electricity prices, time value of the equipment etc.) are directly and transparently passed on equally on a pro rata basis to all electricity end users. A FiT is not a subsidy, but a market steering mechanism of insurance character.

**Why should NZ adopt a FiT system?**

New Zealand has outstanding resource potential for renewable electricity generation. However, over the last 3 decades the share of renewable generation has declined steadily (MED 2009). Consequently electricity GHG emissions have become the fastest growing GHG category in NZ, roughly doubling from 1990 to 2005 (MfE 2009). Increasing the share of renewable generation within the NZ electricity mix would therefore be a logical step to address both problems, but also an effective tool to increase national electricity supply security.

One major problem for large scale renewable generation in NZ is that the most promising (i.e. most economic) projects can't be consented. This is mainly a result of stiff public opposition stemming from the intrusive nature of large scale projects (visual impact, habitat destruction etc.) and the fact that these projects tend to disenfranchise large parts of the communities in areas where they are developed. Additionally large projects have become very difficult to finance as lenders have grown more risk adverse in the wake of the global financial crisis, a problem aggravated by unpredictable project returns, courtesy of the NZ electricity spot market. It is questionable if large scale generation projects can continue to be developed without government intervention. Recent intervention measures include underwriting the natural gas supply for Huntly e3p as well as the fact that 3 out of 4 major NZ wind farm developments

received PRE credits. Focusing on generation projects that are planned or being built, it has to be acknowledged that currently a much greater number of projects are not proceeding than are actually being built. Examples of stopped or deferred projects include; Project Hayes, Awhitu, Hauāuru mā raki, Mount Cass, Waitahora, Windy Peak, Te Mihi, Project Aqua; while major dam projects on the Mohikinui and lower Clutha river will yet have to face year-long legal battles before construction can even be considered.

An indicator of the devastating effects of these trends is the Electricity Commission Annual Security Assessment 2009, citing that:

"…despite the need for new generation, investment appears to be slowing. Over 600 MW of new generation that was rated as "medium" or higher probability for 2010 or 2011 in the 2008 assessment has since been deferred until at least 2013 or cancelled."

However, if fewer and fewer large scale generation projects in NZ are executed due to reasons named above, then there is a sustained need to look at encouraging smaller scale generation projects that can be developed faster and attract much less opposition since their externalities are much smaller in scale and generally positive in nature. It could be expected that smaller, locally (community) owned and operated generation projects should attract less opposition than absentee-owned larger generation projects. This has recently been confirmed by a US DOE funded study (Lantz and Tegen 2009). For NZ, a FiT supported generation portfolio could be a game changer in this regard. Thousands of smaller, locally owned generation set-ups would find their niche where large projects can't get approval and satisfy the projected increases in electricity demand. Furthermore, a much larger and diverse number of new generation project investors will be able to secure funds for new generation projects, partially due to the price stability and legal certainty provided by a FiT system, even at times when the handful of traditional developers of electricity projects in NZ have problems obtaining finance.

Beyond the consenting and financing issues, a FiT supported portfolio of small scale generators would enhance New Zealand's electricity supply security in a number of ways. Source diversification is very important in this regard as a FiT portfolio should include as many renewable resources as possible. After the mainstream renewables wind and hydro, biomass, small geothermal and co-generation set-ups that are hardly manageable by incumbent generators. Spatial diversification within the FiT portfolio would make intermittent resources like wind more manageable and avoid future transmission bottlenecks. Rather than a handful of mega wind parks currently on the drawing board, a larger number of much smaller wind installations throughout the country would put less strain on our transmission network and smooth out production peaks and troughs.

**Beyond energy**

The positive effects of a FiT system don't begin and end with the provision of more secure, greener and better electricity. In addition, a sensible FiT system would provide employment benefits; rural, technological and Maori development, improvements in the balance of trade and numerous secondary environmental benefits, just to name a few.

The positive employment benefits of small scale renewable electricity generation projects have been proven overseas time and again, (e.g. Lantz and Tegen 2009) determining an up to 3 times greater employment effect for small scale community owned wind projects in comparison to large scale absentee-owned projects. In Germany the FiT system in place for less than a decade provides employment for 186,000 people, both in equipment manufacture and project construction and operation (BMU 2009). In the NZ context it is important to keep in mind that a large proportion of the employment created by a FiT system would be in traditionally weak

regions with high unemployment, (e.g. Central NI, Gisborne, West Coast etc.), as many resources for FiT based generation projects (e.g. woody biomass, micro-hydro etc.) would be concentrated in these regions. More employment in these rural regions would provide a general economic stimulus, and for farmers and Maori interests small scale FiT supported energy projects could become a means for diversification of current activities and potential synergies, and a welcome tool for economic risk minimization.

Successive governments have stressed that NZ can't expect to continue to prosper by relying on exports of milk powder, logs and sheep skins. Renewable energy can offer some means for economic diversification and the creation of future (niche) industries. Although we have foregone the chance to become a leader in wind energy, there are still opportunities to develop specialist capacities in fields like biomass and mid-temperature geothermal energy for our country. New Zealand companies like LanzaTech and Greenlane Biogas have proved that it is possible, albeit not easy, to become a world leading Kiwi company in niches of the renewable energy arena. The introduction of a FiT system in combination with our outstanding resource potential could provide a small but stable home market for many renewable electricity technologies made in NZ, and help to develop home-gown ideas, engineering capacities and ultimately exports.

While it would take several years for these effects to materialize on New Zealand's current account, other effects of a FiT system on our balance of trade would be felt more immediately. Most of the large scale generation developments carried out in recent years were heavily reliant on overseas technology and equipment, transferring large sums of money off-shore. Generating more electricity via a FiT supported portfolio of a lot more, smaller set-ups would offer the opportunity to use more home-grown equipment and materials, furthermore some currently underdeveloped resources like biomass would have a much narrower CAPEX to OPEX ratio, providing an ongoing stream of income to local, rather than a one-off transfer to foreign economies. A rapid expansion of FiT supported renewable generation would also offer the opportunity to offset fossil fuel imports from overseas currently required to power Huntly (coal) and Whirinaki (diesel).

The positive secondary environmental benefits of a FiT system are very divers. Beyond removing some of the need for large scale projects and their associated negative externalities like habitat destruction, there are many positive effects associated with biomass and waste based projects in particular. Removing currently windrowed forestry waste from plantations for use in FiT supported, distributed generation facilities, reduces the risk of forest fires, and also removes a potential source of fugitive GHG (methane) emissions. Use of farm wastes for biogas based generation can reduce both, fugitive GHG as well as odour emissions. The use of segregated organic municipal solid waste in regional biogas digestion facilities, can minimize the amount of waste going to landfill, and recover valuable nutrients for agriculture, thereby reducing the pressure on finite phosphorus resources.

**Scope of a NZ FiT system**

A FiT is a very flexible and adaptable tool and each country that adopts FiT's can tailor them to fit its individual needs and resources. From a risk management point of view a NZ FiT should cover as many renewable resources as possible (and potentially fossil fuel based co-generation above a certain level of efficiency). However individual tariff rates can be used to steer the development of individual resources, also as a function of time. As an example, a NZ FiT could initially spur the development of waste, biomass, micro-hydro, small geothermal and co-generation developments, while the development of other resources such as

smaller scale wind, ocean and solar would be enabled but promoted to a lesser degree. A similar approach could be used for the size of individual developments. While it is desirable to enable FiTs for a range of scales as broad as possible (household scale to 10 – 20 MW, the cut-off point for incumbent generators), stepped tariffs can be used to promote projects that are easiest to integrate with the existing grid infrastructure, or represent an ideal scenario in terms of logistics, or minimize environmental target conflicts, over other sizes. Such steps could ensure that the gross cost of a FiT systems borne by the electricity end users are kept to a minimum (single digit % of current electricity price), and are quickly (over) compensated for by the gross gains realizable through the FiT system (e.g. avoidance of transmission costs, order of merit effect reductions in wholesale electricity prices, time value of the equipment etc.). Internationally, even in countries that have introduced "relatively luxurious" FiTs, the gross cost of the FiT system rarely exceeds 5% of the retail price per kWh, while the gross gains due to the system generally start to compensate for the majority of these increases within the first decade (BMU 2009), in particular in areas where transmission systems are close to capacity.

Over time, and as technology progresses, and the economic and natural environments change, these tariff levels can be altered for new entrants, in order to optimize the overall outcomes of the system, while maintaining financial and legal stability for generators who have joined the FiT system in the past.

All in all, a FiT system can give our country only as much as we allow it to deliver. It is a flexible tool that can be fine-tuned to suit our individual needs and issues; however it won't be a silver bullet that can take care of all our energy and environmental problems. However considering the many grid-locks our electricity system is facing, and the many secondary benefits FiTs can provide, the feed-in tariff system has to be considered as a concept whose time has come, and NZ would be well advised to investigate it further.

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*Stephan Heubeck*

## SEF Seminar – 10th Sept

### Turnbull house 12.15 – 1.30 p.m.

Feed-in tariffs are used in many countries to promote the adoption of renewable energy technologies. But they are not used in New Zealand, and opinion is divided on whether their adoption here is a good idea.

The Sustainable Energy Forum (SEF) is holding a seminar in Wellington on Friday 10 September to discuss this issue. Stephan Heubeck of REFIT-NZ, an organisation formed to advocate for the introduction of feed-in tariffs in New Zealand, will speak in favour of their introduction. Energy analyst Steve Goldthorpe will offer a more cautious view. There will be plenty of time for questions and discussion.

# ENERGY STORAGE

It is argued that the intermittent nature of electricity generation from wind turbines and other renewable energy sources means that back-up on-demand generation greater than can be supplied by the NZ hydroelectric capability will be required. Accordingly, it is argued that additional fossil generation is essential to ensure security of electricity supply. SEF member Alastair Barnett offers the following perspective in this issue.

## Energy Storage Needs in New Zealand

by Alastair Barnett

One of the big advantages of hydropower as a source of electricity is the intrinsic dual capacity for power generation and energy storage.

This means that sudden changes of supply (from rainfall) and demand (from the national grid) can be accommodated and smoothed out with little effect on system reliability or generating efficiency. However because generation capacity and storage capacity are not directly linked, separate planning for each is essential. For example, the structures retaining our largest storage reservoirs have negligible generating capacity, so following water release the stored energy is only realised over the next few hours (or even days) by the chains of generation units set up downstream.

For many years this duality has been recognised, and to meet increasing demand, storage had been expanded in tandem with generation. The Lake Taupo control gate was completed in 1942, Lakes Tekapo and Pukaki were raised and controlled in the early 1950s, Lake Hawea was dammed in 1958, and the Pukaki storage was substantially further enlarged in the late 1970s.

Since then the demand for electricity has grown substantially, but no significant further hydro storage has been added. Instead thermal energy has been treated as the mainstay for meeting new demands for power, so energy storage planning has increasingly concentrated on stockpiled mineral reserves, with corresponding low interest in expansion of hydro storage.

This shift in priorities is well represented by the change in methodology used to analyse hydro storage for national planning purposes. Until the late 1980s, hydro storage planning used engineering models, which sought to provide security of supply by catering for projected demand up to a drought of stated return period. If more storage was required, in principle standard engineering analysis compared the cost of the cheapest storage project with the cost to the national economy of supply failure.

In practice this economic analysis was not always applied formally, as scoping estimates always indicated that the cost of even a month of national supply failure far exceeded the cost of available storage expansion options. (The cost to Auckland of the 1998 Mercury power system collapse suggests that this assessment was correct.) Instead the balance between cost and return was more often indirectly set by the choice of design return period at which failure was tolerable.

In assessing storage expansion options, the improvement available from specific schemes was tested on known historical dry years. This required detailed consideration of operational strategies for the major generating centres, and intensive effort was put into determining linkages between specified storage discharges and the installed capacity for subsequent use of that energy by downstream power generation. In the Upper

Waitaki alone, some 100 man-years of work went into the calibration of system control models. For example, this picture shows a gauging survey boat calibrating flows through a control gate at Tekapo A.

However the engineering model was discredited by an international political consensus that centralised planning was out of date, so replacement by a business model was timely. At first the business model was thought to supersede any need for national planning, but breakdowns such as the 1998 Mercury collapse in Auckland forced a rethink. Evidently economic disincentives alone were incapable of preventing such failures, and indeed no serious effort was made to calculate the resulting damage to the Auckland economy and penalise Mercury accordingly.

Instead central oversight was reintroduced. Institutional memory of the engineering model had faded, so the considerable costs of setting it up were written off and a new business model was developed. Superficially this has an economic rationale similar to that of the engineering model – when the cost of supply failure exceeds the cost of the cheapest storage project, that storage is supposed to be provided.

However no new storage developments have been announced in the last twenty years. This is dangerous, because recent trends have been moving in favour of renewable energy, particularly in electrical form with the push to transfer rail and road transport to cleaner power sources. This steepens the power demand increase curve well above the old engineering projections at the same time as climate change concerns drive the retirement of thermal generation formerly used to reduce dependence on hydro storage. Indeed, the growing importance of intermittent generation, especially from wind, places an even greater load on backup storage capacity.

This makes it obvious that any model running a realistic projection of successive dry year hydro storage operations should reveal a desperate state of shortage, becoming even worse as reliance on renewable energy increases.

Why are the results of applying the business model totally different?

The cost of supply failure is now based on the cost to the business, not to the whole economy, and (as seen in the 1998 Auckland breakdown) the costs of supply failures can be avoided by far easier methods than building storage. The market also forces prices up at times of shortage in an attempt to reduce demand, and this creates a perverse incentive which automatically limits losses to the generators, and may even provide windfall profits.

At the same time, the cost of storage development to an individual business has become far less certain, because public opposition to a profit-generating development project is likely to be more intense and determined than to a publicly-owned project. The costs of overcoming such opposition then begin to dominate the engineering costs, to the extent that there is a reluctance to commit even to engineering feasibility studies because of doubts the project will ever be completed regardless of the favourability of engineering reports. The abandonment of Project Aqua is a chilling influence on any would-be hydropower developer.

The business model run by the Electricity Commission does little to assist with assessing national needs for energy storage. In place of the intensively calibrated engineering model, hydro storage is now

represented as a single pond floating somewhere in Cook Strait, with stored energy available instantaneously anywhere it is needed. Therefore water in Lake Tekapo is available equally to the Waikato and Waitaki stations, and conversely water in Lake Taupo can readily be discharged into the Clyde dam reservoir if required there.

The first half of 2010 particularly showed up the crudeness of this model, when the national pond levels suggested the year was wetter than average. Actually Lake Taupo was the lowest for forty years with storage virtually empty, while the South Island lakes were bursting at the seams. Yet the latest report from the Electricity Commission states "The Commission did not study dry-year dispatch as it is expected that market participants would effectively manage hydro storage using the capability of the grid to transfer power from North to South during periods of low demand." To be fair the EC report predates the latest North Island drought, but this is hardly a suitable strategy for 2010!

This year the business case for attempting engineering feasibility studies came into further question, following the arbitrary action of government in appropriating the Tekapo system from Meridian. This means that if new storage is developed by any generator, there can now be no confidence that it will be available when needed, as in the interim it may have been seized and transferred to competitors.

The smart thing for businesses to do is therefore hope that a competing generator will build any required new storage. This will then reduce the probability of supply failure for all generators, but with all costs and uncertainties of public opposition being carried by the competitor.

If we build more and more renewable generation capacity without matching provision for energy storage, any reasonable modelling projections should predict supply breakdowns during dry years of ever-increasing probability. Unfortunately everyone seems to think that running such projections is a job for someone else, so we are likely to discover the problem only by hard experience!

*Alastair Barnett*

## Response from EC

The Electricity Commission uses multi reservoir stochastic optimisation models for analysis, and participants use them for hydro scheduling and river chain management (SDDP & Plexos), including Spectra, the model used by ECNZ. The standard of modeling and access to data has improved since the Electricity Commission was formed.

The need for hydro-firming is a function of the installed base of hydro plant (not demand growth). Since this has not changed appreciably, then on the whole, there is adequate hydro firming from existing thermal plant provided the winter energy margin is not eroded. New plant, such as Contact's new mid order Open Cycle Gas Turbines and gas storage facility add both peaking and energy storage. As thermal plant is retired, new hydro firming plant will have to be provided. This could either be more hydro storage, or more likely, thermal plant.

*Bruce Smith, Electricity Commission*

# Energy Storing Wind Dam or Flywheels?

Many SEF members will remember the frequent postings on SEFnews from Allan McCreadie extolling the virtues of his Energy Storing Wind Dam concept. Sadly Allan passed away last year. However, the legacy of his location-sensitive vision was preserved at www.greenzephyr.co.nz.

A grid-scale energy storage concept using flywheels was posted on SEF news by Kerry Wood.
www.greenbang.com/worlds-first-grid-scale-flywheel-energy-plant-to-go-online-soon_15001.html

# PEAK OIL


The Draft NZ Energy Strategy is founded on the expectation that one way or another New Zealand will be able to obtain as much oil as it wants indefinitely. The Government's emergency response strategy only relates to temporary disruptions to the flow of oil, not a permanent global oil shortage that could rise from global oil production no longer being able to keep up with global oil demand.

## The draft NZES says:-

*"New Zealand will continue to rely on oil for decades to come. Discovery of more oil within our territory or production of alternative liquid fuels, such as biofuels or converting coal to liquids (with CCS), could help reduce our exposure to international oil supply disruptions and have a positive impact on our balance of payments.*

*"Even with local discovery or production of liquid fuels, the price to New Zealanders will remain in line with international oil prices. We anticipate that oil prices will remain volatile but on an upward path over the coming decades and that this price path (especially price spikes) will help to stimulate the use of alternative energy sources whose prices are not impacted by the oil market. Such alternatives include electric vehicle technologies and fuel cells.*

*"Diversifying transport energy sources will help New Zealand's energy security and resilience. The Government will not pick winners: ultimately uptake of new energy sources and technologies will depend on the decisions made by consumers as they respond to oil prices.*

In contrast, to this optimistic view of global oil supply prospects and the ability of New Zealand to disconnect itself from global oil shortages, a more pessimistic view has been presented by the UK's Chatham House to advise business leaders and insurers.

## Lloyds 360° Risk Insight[1]

By Chatham House – 2010

**Conclusions**

1. Energy security is now inseparable from the transition to a low-carbon economy and businesses plans should prepare for this new reality.

2. Traditional fossil fuel resources face serious supply constraints and an oil supply crunch is likely in the short-to-medium term with profound consequences for the way in which business functions today.

3. A 'third industrial revolution' in the energy sector presents huge opportunities but also brings new risks. Of particular importance for new technologies is the risk of constraints on raw materials such as rare earth metals, as scarcity may drive up costs.

4. Energy infrastructure will be increasingly vulnerable to unanticipated severe weather events caused by changing climate patterns leading to a greater frequency of brownouts and supply disruptions for business.

5. Increasing energy costs as a result of reduced availability, higher global demand and carbon pricing are best tackled in the short term by changes in practices or via the use of technology to reduce energy consumption.

6. The sooner that business reassesses global supply chains and just-in-time models, and

[1] www.chathamhouse.org.uk/files/16720_0610_froggatt_lahn.pdf

increases the resilience of their logistics against energy supply disruptions, the better.

7. While the vast majority of investment in the energy transition will come from the private sector, governments have an important role in delivering policies and measures that create the necessary investment conditions and incentives.

The North Auckland Energy Group challenged the Minister of Energy with the question *"Can you please update us on the ministry view on energy security in the light of latest UK report from Chatham House which follows many similar?"*. The following response was received from Dr Richard Hawke Energy and Environment Group Manager at MED.

# Response from MED

The article to which you refer contains a diverse range of issues; this letter will address those relating to peak oil.

"Despite the uncertainty surrounding peak oil, the Government's approach is to prepare for the future now. While we are going to require fossil fuels for the foreseeable future there are actions that can reduce our dependence on oil and facilitate a transition to alternatives.

"While it is well known that oil is a non-renewable resource and a decline in production of cheap and easily accessible oil from traditional sources is inevitable, it is still uncertain when this decline will occur. The problem with accurately projecting when a decline will occur lies in the fact that there are basic questions about the quantity of the world's oil resources that remain unanswered.

"The first part of the problem is that there is no way to know how much oil remains to be discovered and how future exploration and production technologies will affect the oil market. The second part of the problem is that, even where robust data exists, there are limitations on how much of this data is made available. With the right kind of international co-operation, data transparency could be increased and this limitation alleviated.

**"The Government considers that the International Energy Agency (IEA) and the US Geological Survey (USGS) provide the most credible information on the global oil market. It is worth noting that the IEA's World Energy Outlook 2009 states that global oil production is not expected to peak before 2030, and will be large enough to support the projected rise in demand until 2030.**[2]

"Transport fuels are included under the new Emissions Trading Scheme (ETS) and will be introduced on 01 July 2010. The ETS may reduce demand for oil and accelerate a shift to alternative transport fuels.

"The Government encourages entry of both biofuels and electric vehicles into the New Zealand market, and will act to stimulate new market developments or remove barriers where appropriate. It has put in place a grants programme for production of New Zealand biodiesel to put it on the same favourable financial footing as bioethanol. The Government has also exempted electric vehicles from road user charges till 2013 to encourage uptake.

"Ultimately, the uptake of new energy sources and technologies will depend on the decisions made by consumers as they respond to oil prices.

"Minister Brownlee is also updating the New Zealand Energy Strategy this year. The strategy will outline the New Zealand Government's intentions with respect to energy security along with other aspects of energy policy."

*Dr Richard Hawke, MED, 25th June 2010*

**Is this saying that the draft NZES is based on the optimistic assumption that Peak Oil will not occur until sometime after 2030?**

[2] Emphasis added by Editor

# Cup Half-full?

**By Steve Goldthorpe**

It is said that the optimist sees a cup as half full, whilst a pessimist sees the same cup as half empty. So it is with oil.

As our modern fuel-consuming civilisation advances through the 21st century there is increasing acceptance of the limited nature of the resources that we rely on. However there is a wide range of opinions on the urgency that needs to be applied to changing direction.

It is inevitable that the availability of conventional oil will peak and then decline, but the exact timing of the phenomenon of Peak Oil will only be determined by future data analysts with the benefit of hindsight.

The optimist will argue that the cup is half full, that there is still a large amount of conventional oil to be extracted and that exploration is bound to result in more oil resources being discovered. In addition, as the oil price increases, the economic viability of unconventional sources of precursors to transport fuel will be enhanced.

In contrast the pessimist will point out that the cup is half empty and that the task of adding oil to the cup is increasingly difficult, that the ever increasing demand for transport fuel is straining the capabilities of the oil producers and that that the energy investment for energy return for unconventional oil is much greater than for conventional oil.

The International Energy Agency has traditionally been in the optimist camp. However, for some years there has been a trend in the IEA reports of becoming increasingly conservative/pessimistic about future global oil supplies over time. The IEA's November 2009 World Energy Outlook predictions of global oil production (presumably both conventional and unconventional) peaking post-2030 are also problematic in view of the IEA chief economist Fatih Birol stating in August 2009 *"The public and many governments appeared to be oblivious to the fact that the oil on which modern civilisation depends is running out far faster than previously predicted and that global production is likely to peak in about 10 years – at least a decade earlier than most governments had estimated."* [3] This is but one discussion on the shifting position of IEA advice.

The recent disaster in the Gulf of Mexico has made the public aware of the extreme locations where the oil industry has to work to keep us in the manner to which we have become accustomed. The Deepwater Horizon was aptly named as a symbol of endeavours at the forefront of technology. It is optimistic indeed to assume that the technology can be pushed ever harder to keep the supply of oil increasing year on year for two more decades.

At a parochial level, the draft NZES appears to take the view that security of supply of oil in NZ will result from increased indigenous production of oil. However, when overseas investors are funding oil exploration, it is inevitable that any oil produced will be fed into the global oil marketplace and that there will be no preference for supply to the country of origin. When global supply permanently falls short of global demand someone will have to go without. As a small consumer in a remote location, NZ might find itself at the back of the queue for the next barrel of oil.

When I came to New Zealand from Britain I found it remarkable how optimism was an embedded part of the New Zealand culture, compared with a gloomy sense of pessimism that I commonly observed in the British psyche. Whilst optimism is empowering, on matters as vitally important as the future of our New Zealand lifestyle, it would be prudent for the Government to take a broader view and consider a few **"What if"** scenarios.

[3] www.independent.co.uk/news/science/warning-oil-supplies-are-running-out-fast-1766585.html

# SHEDDING LIGHT ON LAMPS

The International Energy Agency produced a report* entitled *"Phase out of incandescent lamps"* Since early 2007 almost all OECD and many non-OECD governments have announced policies aimed at phasing-out incandescent lighting within their jurisdictions. This study considers the implications of these policy developments in terms of demand for regulatory compliant lamps and the capacity and motivation of the lamp industry to produce efficient lighting products in sufficient volume to meet future demand. To assess these issues, it reviews the historic international screw-based lamp market, describes the status of international phase-out policies and presents projections of anticipated market responses to regulatory requirements to determine future demand for CFLs.

SEF member David Cogan argues that such policies need to be tailored to suit the diverse expectations of users in different countries.

*www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2256

## By David Cogan

A lamp is a lamp is a lamp. Yes? Actually - No.

A lamp is part of a luminaire, which is part of a lighting installation.

Change the lamp, and you run the risk of changing the characteristics of the luminaire resulting in the lighting installation not performing properly.

The humble General Lighting Service (GLS) incandescent lamp has two main faults. It has low efficacy and a short running life. In all other respects it is an excellent lamp. It comes on virtually instantaneously at full brightness, it has a good colour appearance, excellent colour rendering, does not produce harmonics, has a unity power factor, is inexpensive, contains no harmful chemicals, its brightness can be adjusted (i.e. it is dimmable), it withstands frequent switching, is unaffected by temperature, it is durable (it lasts indefinitely if it is not energised) and a large number of luminaires have been designed around it. Twelve features that may or may not be true of a compact fluorescent lamp with integral ballast (CFLi) that is being heralded as the replacement technology.

So The Philippines phased out incandescent lamps. That is good. Why can't New Zealand follow the example? Well, perhaps we could, but those whose business it ought to be to do so did not follow the example properly.

What The Philippines did was to:-

- Test a range of CFLi units under local conditions noting the problems found;
- Inform the manufacturers of the problems encountered, and get them to change their designs to resolve the problems;
- Wait the best part of ten years for good CFLi units to infiltrate and take over the market, to the extent that a CFLi became "just a normal lamp";
- Withdraw GLS lamps from sale.

What did the Australian energy efficiency bureaucrats do?

- Announce they were going to ban GLS incandescent lamps and urge their New Zealand Counterparts to do likewise.
- Dust off the plans for imposing minimum energy performance standards for refrigerators, and replace the words "*refrigerating appliance"* with *"incandescent lamp"*.
- Propose a Philippines-like performance specification for CFLi technology.
- Act surprised when people complained.

What were the results in Australia? Low-voltage tungsten-halogen incandescents

are still allowed, despite their luminaires and lighting installations being inefficient, producing poor quality lighting. In some cases they are dangerous in Australia, where shredded newspaper (sorry, macerated cellulose insulation) in the ceiling space has been set on fire by downlights.

It turns out that mains voltage tungsten halogen incandescents, hailed as the nearest lookalike to a GLS incandescent, can improve either on the GLS lifetime, or its efficiency, but not both - and not economically.

The local CFLi performance specification used in Australia does not adequately reflect local light usage there, in that many lights are switched frequently but not run for long times. This contrasts with The Philippines where the one lamp in the one room is switched on at dusk and off at bedtime. Some CFLi units fail early. As a rule of thumb, the worst CFLi units have a 20 minute reduction of working life each time they are switched on.

The harmonics from some models are dangerously high for New Zealand's weak (i.e. high impedance) electricity supply and distribution system. I have come across three installations where CFLi units have interacted with the ripple control to produce unlimited cold water from the hot water tank - an unwelcome form of energy saving!

Look at the list of features above and insert your own gripes. Add a comparative loss of performance when fitted to a luminaire designed around a GLS incandescent, and in some cases they can look very incongruous or even ugly.

Conclusions:

- There are still many instances in New Zealand where a GLS lamp is the most suitable lamp; especially in the 54% of lighting outlets that are hardly used.
- The alternatives are often not suitable.
- The energy efficiency bureaucrats have approached the issue in the wrong way.
- It is right that New Zealand did not ban GLS incandescent lamps
- It is right to criticise New Zealand for not producing an effective programme to improve domestic lighting efficiency (N.B. "lighting efficiency", not "lamp efficiency").

May the light of reason and understanding shine down upon us all.

*David Cogan*

# BITS AND BOBS

## UCG - $22M for Underground Coal Gas Pilot in Waikato

Solid Energy says gas produced from burning coal deep under the Waikato could help boost NZ's energy security. It plans to spend $22m in a pilot project working with Canadian firm Ergo Exergy, which has developed the technology to convert coal into synthetic gas deep underground. It hopes to start drilling into a coal seam north of Huntly within weeks to tap into one billion tonnes of coal in the Waikato, most of which is otherwise inaccessible.

The process involves pumping air into a coal seam hundreds of metres deep, which is ignited with hot coal and then burns at temperatures up to $1000^{O}C$. The air, heat and pressure from being deep underground initiate a reaction, which turns the coal into syngas, which is released up another steel-cased well. For the pilot plant, sited on private land, Solid Energy plans to drill up to 7 wells into an underground coal seam 400 metres below the surface.

*New Zealand Energy and Environment Business Week – 16th June 2010*

**Editor's note:-**

An Underground Coal Gasification (UCG) test burn was successfully conducted in the Waikato by ECNZ in 1994. The project concept was revisited by ECNZ in 1996/7, but shelved due to concerns over yields, economics and groundwater contamination. UCG gas has about triple the greenhouse intensity of natural gas.

UCG trials have been undertaken at many locations worldwide since the 1950s, but the concept has achieved no runs on the board as a steady state commercial scale economically viable fuel gas production technology.

## Introducing your editor

As it happens, the publication of the first edition of EnergyWatch was the same month that I arrived with my family as a new pommie immigrant in New Zealand.

I had previously spent 16 years in R&D in the UK coal industry doing technical and economic assessments of coal liquefaction, carbon capture and storage (CCS) schemes and other coal conversion technologies. I was invited out to NZ in 1994 as an expert witness on CCS for the call-in of the Taranaki Combined Cycle power station consent.

My wife and I recognised New Zealand as a good place to bring up our four teenagers. So, leaving a heritage of three generations of Goldthorpes working for the British coal industry, we took the pay off from that sunset industry and set forth to the brave new world.

I worked for 7 years with an environmental engineering consultancy firm in Auckland on air quality and greenhouse gas inventory issues and on technology assessments (including UCG) for ECNZ. I then became an independent energy analyst and we moved north to a semi-retired lifestyle in the rural township of Waipu, where I am involved in various church and community activities and run a small backpackers hostel.

I have been an active member of SEF since 1998, making contributions to debates on SEFnews etc. and in taking on administrative tasks. With my more relaxed lifestyle I am enjoying this new role as your editor.

*Steve Goldthorpe*

## AGM - Friday Sept 10th

**EECA, Level 8 - at 10.00 a.m.**

Members wishing to register to attend by teleconference or to give their apologies and appoint proxies should contact office@SEF.org.nz before 8th September.

# SEF ACCOUNTS FY 09-10

These draft accounts for the financial year to 31st March 2010 will be presented for approval at the SEF AGM on 10th September.

**Income**

| | |
|---|---|
| Individual subs | $6,020 |
| Low income subs | $ 679 |
| Corporate subs | $2,475 |
| Library subs | $ 398 |
| Donations and koha | $ 333 |
| Bank interest | $ 46 |
| **Total** | **$9,951** |

**Expenditure**

| | |
|---|---|
| Office management | $ 505 |
| Post, and web services | $1,441 |
| EnergyWatch (3 issues) | $5,672 |
| Venue hire | $ 60 |
| **Total** | **$7,678** |

**Reconciliation**

| | |
|---|---|
| Bank balance at 31.3.09 | $9,977 |
| Bank balance at 31.3.10 | $12,250 |
| Net surplus FY 09/10 | $2,273 |

(only 3 issues of EW included in FY 09-10)

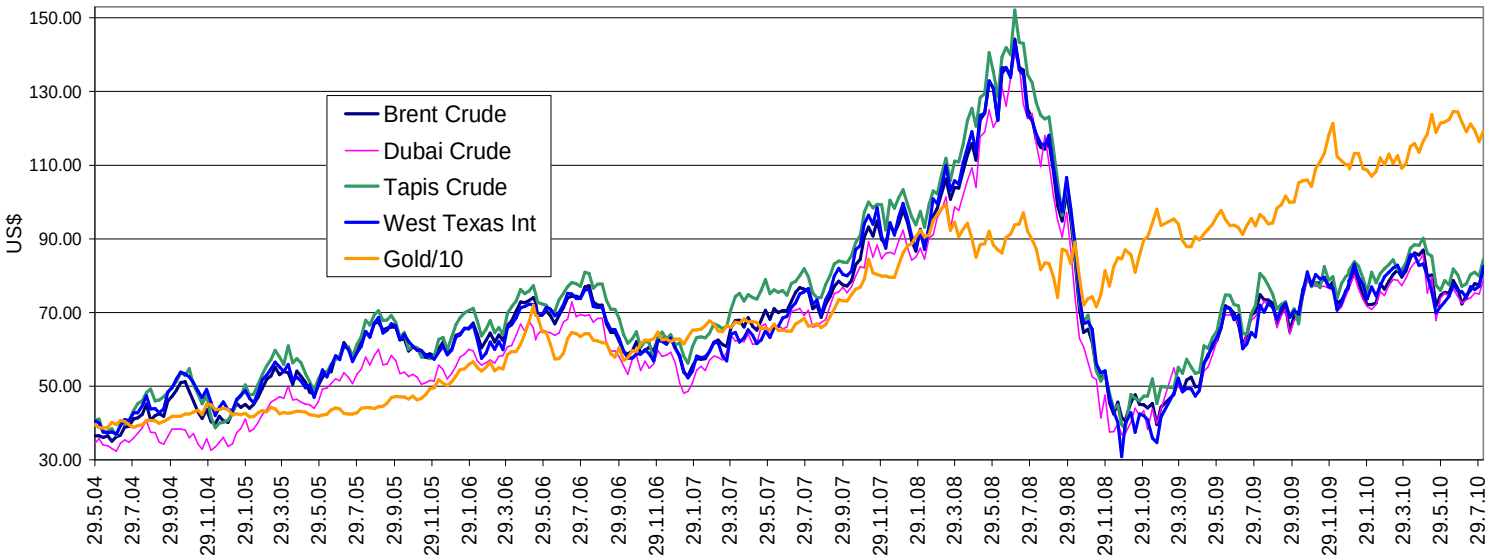
**Membership**

| | |
|---|---|
| Individual | 114 |
| Low income | 22 |
| Corporate | 9 |
| Libraries | 7 |

Any SEF member wishing to see further information from the 2009/10 accounts should contact the treasurer at Treasurer@SEF.org.nz.

# Neil's Oil Price Chart

The oil is price again creeping above US$80/barrel. This chart, compiled by SEF member Neil Mander tracks a basket of oil prices in comparison with the gold price. (Source NZ Herald)




## REMINDER

The draft New Zealand Energy Strategy and the draft New Zealand Energy Efficiency and Conservation Strategy are now open for consultation. The consultation deadline is 5.00.p.m. on Thursday 2nd September 2010 by email to nzes@med.govt.nz.

The documentation can be downloaded from the MED website.

# Join our sustainable energy news & discussion group

SEF Membership provides a copy of our quarterly EnergyWatch magazine. In addition, many members find the SEFnews email news and discussion facility an easy way to keep up to date with news and views as it happens. The discussion by the group of sustainable energy "experts" who have joined the service offers an interesting perspective.

Non-members are invited to join the SEFnews email news service for a trial. To do this send a blank email to: <SEFnews-subscribe@yahoogroups.com>. To help us stop spammers, non-members need to supply a name and contact details, and a brief statement of their interest and/or involvement in sustainable energy issues, before their trial is approved.

As with all Yahoo groups, SEFnews emails can be received "individually" (as they are sent) or as a "daily digest" (grouped into one email per day). If you have a Yahoo ID you can also switch emails on and off, or read the news on the web – a handy option for travelling Kiwis. YahooGroups saves all of our text emails for later reference, and there is a search function so that you can review the thousands already stored over the last 6 years.

Some busy people using a work address prefer to use the Rules function in their email software to automatically save SEFnews emails to a separate folder for later reading. If you do not want a Yahoo ID, the administrator <admin@sef.org.nz> can select the 'daily-digest' option for you.

For climate change news, join the Climate Defence Network email news group: climatedefence-subscribe@yahoogroups.com


## EnergyWatch

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Publication is normally four times a year, and EnergyWatch is posted on the SEF website (www.energywatch.org.nz) as a PDF file, two months after distribution to SEF members.

**Contributions Welcomed**

Readers are invited to submit material for consideration for publication.

Contributions can be either in the form of Letters to the Editor or short articles addressing any energy-related matter (and especially on any topics which have recently been covered in EnergyWatch or SEFnews).

Material can be sent to the SEF Office, PO Box 11-152, Wellington 6142, or by email to editor@sef.org.nz, or by directly contacting the Editor, Steve Goldthorpe at PO Box 96,Waipu 0545.


## SEF membership

Memberships are for twelve months and include four copies of EnergyWatch. Membership rates are:

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| Low income/student | $30 |
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