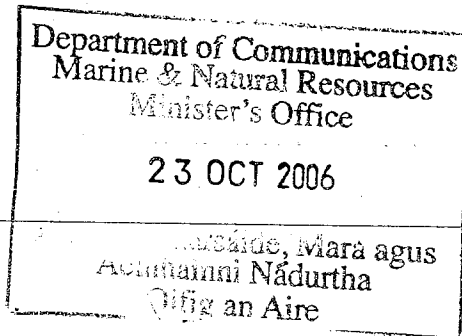


Hillside, Rostellan,
Midleton, Co. Cork
29th October 2006



Dear Mr. Dempsey,

I was prompted to write this letter following the publishing of the Government Green Paper on the electrical industry on Sunday 1st October, and seeing you being interviewed on TV in recent days about the Green Paper on Energy Policy, and the Rosport dilemma. I can assure you that I side with you completely on the latter controversy.

I sent an E-mail to some persons in your department, but obviously nobody passed on the E-mail. I am therefore sending you this letter as a follow-up, and with more information included.

I have just returned from working with General Electric (GE) in Spain, but I expect to be returning to Spain in the near future on another job contract. I have been working almost continuously for GE (on contract) in Spain and Ireland since 2003. Since I left ESB in 1996 (where I ended up as an Operations Shift Supervisor in Aghada 540 MW power station) I have been working overseas in the Electrical Power Industry in many countries and for many companies (Siemens, Mitsubishi, ESB International, etc) Pakistan, Ghana, Italy, Malaysia, Syria and Spain. I also worked in Egypt for a time with GE in 1989. In 2004 I was asked by GE to take up the position of "Lead Operations Technical Advisor" at the new 400 MW Tynagh Power Project near Loughrea in Galway (where I interfaced with ESB Networks and Eirgrid in all High Voltage electrical connection issues). I spent a year at Tynagh (my first time working in Ireland in almost 9 years), culminating in the successful hand-over of the plant to the private owners of the plant - Tynagh Energy Limited - in what was a "benchmarking" record time for the building of a Combined Cycle Power Plant (less than two years). During that 12 month period I was also involved in the commissioning and putting into service of the 19.5 MW Wind Generated Electricity project at Booltiagh in County Clare (situated between Ennis and Miltown-Malbay). In fact, I have worked on the commissioning and initial operation of about 50% more electricity (Megawatts) than is presently available on the entire ESB (Eirgrid) Network.

In all this project work I must state that I have no formal engineering credentials (BE degree), although on one occasion ESB International choose to sell my

services (in Malaysia) as "Commissioning Engineer", and in Ghana as "Shift Charge Engineer". I had attained the position of Shift Operations Supervisor in ESB (from 1982 to 1996) and left ESB because there was no prospect of rising above that station into a management position - due to ESB protocol at the time. All my High-tech knowledge is "self-gained". I have a High Voltage Switching "licence" from ESB (up to 220 kV, as they trained me to carry out this function), and during the back-energising of the main Tynagh 220 kV transformer I was fully responsible for the condition of the Main (220 kV) Transformer. During this period I came to realise that ESB apply more stringent regulations to the Independent Electricity Producer than they apply to their own plants. I have been on both sides of the fence (so to speak), so I can testify to this fact. Anyway, I don't want to go into that argument at this stage.

I also wish to bring to your attention a letter I sent to the Irish Examiner a few weeks ago (by E-mail from Spain), and which they published. You may not have seen it, but I believe it has merit and should be considered by your department. I am also attaching a letter relating to the protests that surround the building of the Shell Natural Gas Refinery in County Mayo and the various energy and social connections that are part and parcel of Ireland's need for gas and electricity supplies.

If I may remind you about the increasing demand for electrical power which is an intricate part of the "fueling" of Ireland's "Celtic Tiger" economy. You can read from the attached letter I had published to the Irish Examiner recently - which will inform you about where I stand on this matter.

I am amazed that many Irish people that I come into contact with are unaware that the continued growth in our economy requires a demand of almost the equivalent annual growth percentage in imported fuel (energy) supplies (in the form of Oil and Coal, but mostly Natural Gas) as related to Ireland's economic growth ratio. The small difference is made up by wind generated energy.

As has been apparent over the past year and more, the suppliers of these important fuels know quite well that they are in a seller's market, and can hold the western economies to ransom if they so wish - similar to what happened between Russia and the Ukraine and as happened with the shortage of petrol supplies from the Middle East to Ireland and Europe back in the mid-70s, which created the endless queues at garages to obtain minimum amounts of petrol for our cars.

However, the biggest fear that is not emphasised enough is the impending shortage of electrical power that is essential to keep this nation's economy expanding at even a minimum rate. I should say at this juncture that ESB are in a no-win situation as they have been prohibited from building any new power stations for many years

and are doing their best to keep their ageing plants on line. Therefore all Ireland's increased demand from now on must be met from the few Independent Power Producers – Tynagh, Alcan, Veridian, etc), and some other IPPs who are reluctant to enter the Irish market as they see far too many many restrictions that don't exist in other of the EU deregulated electricity markets.

Many of ESB's ageing power plants are long past their "Sell -by" date. As an example I began working at a new thermal power station in the south-east of Ireland back in 1967, and the projected life of that station was reckoned to be 25 years. That station continues to supply electricity into the national grid and is approaching it's 40th birthday, despite several intents of ESB to close it down over the years. ESB just cannot do without such power generation so they are "flogging" these plants to the end. If I may compare these plants to private cars that are expected to undergo the NCT bi-annually - if most ESB plants were required to do a similar test they would surely fail under "emissions" standards.

The problems with aging power plants are many, including poor energy conversion efficiency and more importantly the dangers from corroding boiler and turbine pipework and other materials (as became apparent in a power station in the south west a couple of years ago – which now has to have its boilers areas monitored by CCTV). Another factor is bad emissions from these plants, which are hugely unacceptable in today's environment conscious world. I will steer clear of the supposed global warming/CO2 emissions discussions at this time, as that is a whole confused area where I have an opinion that is not in parallel with that of most "experts".

As you know, modern power plants are mainly of the "Combined Cycle" (CCPP) design - using a gas turbine as the primary generator making two thirds of Unit load, with a steam turbine then using waste heat for the final third of plant output. A CCPP gives a thermal efficiency of around 55% (versus the ESB's ageing power plants average efficiency of around 37%, which is the generous value I estimate without having had access to company details). An important factor in the equation is that modern CCPPs have their chimney emissions strictly controlled by government (environmental law) regulations.

As I said above, I have been working in an independent capacity in many overseas countries for the past 10 years (since retiring from ESB in 1996) and the advances in the control of stack (chimney) pollutants has been to the fore-front of modern power station development as I have found during my times working in even so-called third world countries (Pakistan, Ghana, Syria, etc).

In the opinion of most experts, the worst pollutant from power station chimneys is Nitrous Oxide (NOx) gas, as this is the gas that gets most consideration for

elimination as part of the waste gas creation which is an intricate part of electricity production from fossil fuels. To remind your good self Minister, NO_x is the gas that dentists use to knock-out their patients before particularly difficult dental operation work. Irish power stations produce many tonnes of it daily, and nobody makes an issue of this. NO_x might be termed "an opiate", which dulls the senses even in small amounts (and is sometimes called "laughing gas").

Modern CCPPs are required to install emission control systems, called CEMS (Chimney Emission Monitoring Systems) where stack gas contents are measured (for NO_x, CO₂, CO, N₂, O₂, etc) and these measured values are transmitted outside the plant to independent monitoring stations, so there is no way these checks can be bypassed.

Many of the ESB plants have a derogation from such chimney emissions monitoring but are in reality producing many times more NO_x than the newer CCPPs - per megawatt generated - due to their outmoded "firing" technology.

If I may simply go into the reasons why, there are several and some quite obvious explanations. For a start, the fuel per megawatt is lower for the newer CCPPs, but in the earlier (ten years or more in service) gas turbine oil/gas fuel combustion systems the fuel was fired at a core temperature in excess of 2000 degrees Celsius, with the hot gas then cooled by air dilution to around 1200°C before admission to the power turbine section.

As the normally inert Nitrogen (79% in the Atmospheric Air) was found to readily combine with spare (cooling) Air (about 16% in the exhaust gasses after combustion) at temperatures above 1600°C, a way had to be found to hinder this undesirable chemical reaction.

The experts found several answers, but the most practical was with using Dry Low No_x combustion technique which (ironically) was discovered by General Electric (the world's premier power plant manufacturers) following tests carried out in a Dublin gas turbine power plant years ago (with ESB co-operation), and as I was there at the time (training Saudi Arabian personnel), I had first hand experience of the GE testing.

The simplest answer was to have "staged combustion", so that the temperature was developed over a longer firing period and did not reach the high (N₂/O₂) combination temperature (and still was sufficiently hot enough for exchanging energy to drive the power turbine).

Surely it is time for the Irish government to take the lead in promoting the building of new CCPPs before the situation gets much worse with regard to Ireland's electricity supply?

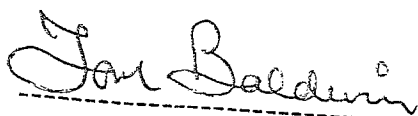
~~Sadly, as with the Shell Refinery at Rosspoint, there seems to be a reluctance to~~ confront the vested interests even if they are in a minority - whether it be for the building of new low polluting power plants, or for the bringing ashore of an indigenous gas supply that will make the Irish nation far less dependent on imported fuel from countries who care little about our dependency on their fuel gas and oil.

Back in the late 1970s the Marathon Oil Company brought Ireland's first Natural Gas ashore at my home area of East Cork. The onshore terminal at Inch is almost a stone's throw from where I live, and the pipeline runs underneath the strand where my family have been swimming and playing in the sand during the summer months. The pressure of the gas in the pipeline was initially above 160 bar (atmospheres) and even when the pressure began to decay as the Methane gas was being extracted in huge amounts, Bord Gais built pumping stations along the route of the pipeline to Cork and Dublin in order to "pack" the lines with high-pressure during periods of low demand.

This pipeline is now over 20 years old, and is passing under the land and across rivers (incl. the M50 in Dublin), near farmyards and villages all across the nation, and nobody is complaining and calling for it to be shut down.

I personally would be against the governments "selling-out" of Ireland's natural resources to any foreign interests, but in the situation with the Shell-to-sea campaign arguments I realise that the lesser of two evils should apply. If we do not get this gas ashore soon, and we also do not begin to build new power stations to use the gas, then lives will surely be lost by the deprivation of the general population of the means to heat and light their homes, without having to pay an increasing price for Siberian gas and Middle Eastern oil.

Regards,



Tom Baldwin

Letters extra Irish Examiner

The Irish Examiner, Academy Street, Cork, 021 4272722, fax 021 4275112.

letters@examiner.ie

Monday, September 18, 2006

NIMBYs should not be allowed to scupper power plant project

I WISH to comment on the refusal by An Bord Pleanála to allow a power station to be built at Little Island in Cork harbour.

Our NIMBYs (Not-in-My-Back-Yard) astound me. Nobody wants anything built near them anymore. The NIMBYs seek to build their houses in areas of seclusion where they can live idyllic lives away from the common citizen and demand that their personal needs take precedence over the common good.

However, these same people still want a reliable supply of electricity to power their TVs, computers and other hi-tech gadgetry and to keep them enlightened and warm in winter. At the same time they expect some other community to accept a power station without demur.

The latest generation of power station turbo-generators are most efficient compared to what went before. Modern combined cycle power plants (CCPPs) give more than 55% efficiency.

Compare this to the 37% average of ESB plants. Even the best of the larger of conventional ESB plants (burning natural gas, oil or coal) are pushed to achieve 40% efficiency. The first set of the ESB's combined cycle plants were commissioned more than 20 years ago and this equipment is run by 'old' technology at this stage. The technology associated with these ageing plants

has been greatly superseded by advances in design and better turbine and compressor construction materials.

An example is the ability of gas turbine (GT) blading to withstand extremely high temperatures (which contributes to increased efficiency and higher output) thanks to space-age research and developments in the prevention of overheating of space modules on re-entry through the earth's atmosphere by the application of specialised heat-resistant ceramics.

The basic requirements of modern CCPPs include an adequate high pressure supply of gas fuel as close as possible to the plant; the availability of water for the cooling systems and for use in the boiler and steam turbine; and proximity to a high voltage (HV) power line ensuring there will be no 'long-runs' of 220 kV lines from the plant to the nearest HV sub-station. The site at Little Island has all of these essentials, and more.

To place the same power station in a remote location would be costly and wasteful.

The transmission of electricity over long distances leads to a 'line loss' of up to 5%. Ideally, a plant should be constructed close to a zone of high demand, like Cork and Little Island industrial estate.

The 400 mw that would be generated from the Little Island CCPP

would use only the same amount of gas fuel as a certain conventional power plant further down Cork harbour with a maximum output of 270 mw. This could be classified as up to 130mw of free electricity for the nation.

Erگرد, the national grid operator, has several 'open cycle' gas turbines available for use.

These were installed for 'peaking' use only but, only brought on when there is a short period of high demand, but they are being used increasingly to replace power plant on forced or scheduled outage.

The efficiency of these 'simple cycle' machines is less than half what the proposed Little Island CCPP would be.

In fact, with the ever increasing numbers of 'amber alerts' on the national grid it is only a matter of time before there will be extended blackout periods for many consumers — most likely during the coldest period of winter.

It is conceivable there could be loss of life during such periods — when there would not be enough electrical power to go around.

Another factor that should be taken into account is the production of greenhouse gases, primarily carbon dioxide.

The greater efficiency of the Little Island CCPP would have contributed to a sharp reduction in carbon dioxide generated by our electricity

producers with the replacement of the 'heavy' fossil fuels for Erگرد's requirements.

Also, with the latest combustion system installed in the new plant, there would be a large reduction in other atmospheric pollutants such as nitrous oxide and carbon monoxide.

The replacement of coal- and oil-fired electricity generation by the new CCPP would also eliminate a lot of our sulphurous oxides, as the proposed Little Island CCPP would produce no such pollutant. The reduction in all these power plant effluents would surely make some contribution to better general health.

One major consideration relating to the construction of the Little Island CCPP would be the utilisation of a valuable native fuel source — natural gas from the Corrib gas field, which is also long overdue.

The NIMBYs in that isolated part of Ireland must also be made fully aware of the greater good that would result from delivery of this resource without further delay.

Finally, I wish to point out that I have no affiliation to any group proposing the building of the Little Island power plant.

Tom Baldwin

Weston
45, 100
Cork