How will we heat our homes when gas gets scarce?

Richard Douthwaite

In those parts of Ireland where piped supplies are available, almost every new house uses natural gas as its main method of space heating. Last year, 30,000 of the 70,000 houses built in Ireland were equipped to be heated by gas and a further 10,000 houses switched to gas from other fuels in the course of the year. As a result, the sole current domestic gas supplier, Bord Gais, has 465,000 households as customers, each of which pays around €650 for an average of 16,500 KWh of gas a year including the fixed supply charge.

In the short term, using gas in one's house makes sense since Sustainable Energy Ireland's figures[1] show that it is as cheap as either coal or oil while Bord Gais claims that Eurostat shows it to be between 17% and 36% cheaper than competing fuels. Gas also scores better for convenience: users never have to telephone the oil distributor to refill the tank or mess around with bags of coal and buckets of ash.

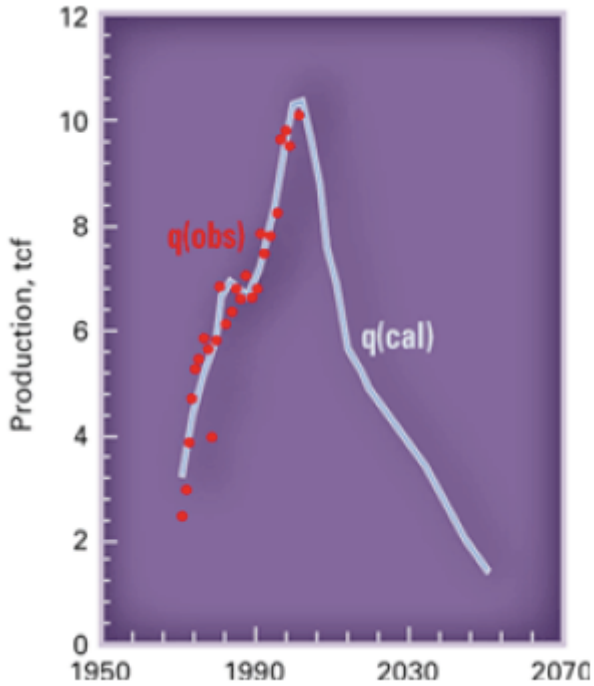
But what about the longer-term prospects for gas supplies? Could the price of gas rise very sharply in comparison with other fuels? Worse, could deliveries break down altogether as a result of terrorism or war in the countries from which our gas will increasingly come? The answer to both questions is 'Yes' and, as a result, anyone buying or building a property should ask themselves whether opting for gas heating really is a smart move.

Gas prices are likely to rise more rapidly than those of either coal or oil as it is the preferred fuel for electricity generation throughout the world. This is because it is much cheaper and quicker to build a gas-fired power station than one powered by either of the other fuels. And, once gas-fired power plants are in place - most countries have already had a 'dash for gas' - they are going to be operated regardless of the price of the fuel since, if they weren't, there would be insufficient electricity to meet the grid's demands. At present, gas supplies over 40% of Ireland's electricity and this proportion is expected to rise to 58% in five years' time. There is no way that this amount of electricity could be supplied from stations powered by other fuels in less than a decade. In the meantime, the users of both electricity and gas are exposed to having to pay whatever price the market demands. The proposal to switch Moneypoint from coal to gas was rejected solely because 79% of the country's electricity would have been made using gas by 2010 had the change gone ahead and the risk of chaos if something went wrong with the gas supply was considered to big to bear.

Another factor which distinguishes gas from oil and coal is that the market for it is regional rather than global. True, gas can be liquefied and shipped around the world like oil but it is very costly to build the necessary terminals. A recent conference on the security of Ireland's energy supplies was told that one here would cost $200 million. Gas tankers don't come cheap, either, at $165 million a piece, but the real expense is incurred in the gas exporting country, where companies can expect to spend $1.65 billion to liquefy and store the gas ready for shipment.

Ireland has no plans for an LNG terminal but a number are to be built in Britain, including two at Milford Haven. Without such a terminal, we will have to rely on the fuel that reaches us by pipeline, which means that we can only buy it from an LNG terminal abroad or a limited range of producers. We won't be able to shop around. Europe has used up half of all its gas and its output is now at a peak, as the graph shows. As a result, the International Energy Agency expects that by 2030, 82% of the EU's gas will be imported, much of it through pipelines from Russia and the Caspian Basin. If anything happens to disrupt those supplies – and Ireland is right at the end of the pipeline - the limited amount of gas that might be available from the British LNG depots will not be adequate to make up the shortfall. Electricity supplies here will be limited to a number of hours a day and domestic gas supplies may be stopped altogether.

European gas production now at its peak



Source: *Oil and Gas Journal*, 16 August, 2004

The EU has recognised this problem and has issued a directive which Ireland will have to incorporate into national law by this time next year. Under the directive, ensuring the security of supply can be regarded as a public service obligation. This means that the government can pay a company to, say, keep sixty days' supply of gas on hand at all times in case external supplies are disrupted. Oil supplies are already protected in this way – the National Oil Reserves Agency keeps 90 days-worth of oil in tanks around Europe in case problems develop in the Middle East or elsewhere.

The directive requires that governments ensure that households don't have their gas supplies cut off as a result of heavy demand in cold weather or if there is a "partial disruption" of national gas supplies. But there is a let-out clause – gas can be cut if the disruption is total and, even if it is not, national circumstances can be taken into account. This might mean giving preference to keeping the lights on rather than keeping people warm. "It is up to each individual government to transpose the Directive into legislation and put its own arrangements in place (which may or may

not include storage facilities) for a range of events" a Bord Gais spokeswoman told *Construct Ireland.*

A weakness in the supply of gas to Ireland is that both of the interconnector pipelines run on almost the same route under the sea to south-west Scotland so, if anything happens to the pipeline system in Scotland, Ireland is bound to be affected. The construction next year of the pipeline from Dublin to Belfast won't reduce risks very much as it will link with another interconnector, running from Northern Ireland to, as you might have guessed, Scotland.

Even if nothing goes wrong with the interconnectors or the Scottish pipelines, Britain may not have the gas to send us. Its North Sea gas output is expected to reach its peak next year and then decline steeply. Already, the country is having to import increasing amounts of gas from continental Europe and in March this year a report by the Trade and Industry committee of the British Parliament warned that some customers' gas supply may have to be temporarily suspended. The committee's chairman, Martin O'Neill, told the BBC[2] the UK was "virtually at the whim" of unregulated monopolists in Europe when importing gas.

"In one or two instances major British importers of gas found it rather difficult to get more than about two prices for long contracts which they wanted to strike last September," he said. "That suggests that there may have been some of the players who were frankly holding back supplies in order to see if the market would rise."

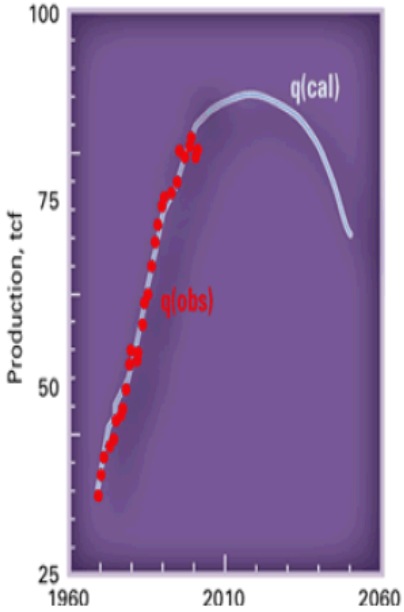
The problem was exacerbated by the small size of the interconnector pipe through which the UK got its European gas supplies. The pipe was designed on the assumption that the UK would never import more than it exported, Mr O'Neill said.

Ah, but won't Ireland have its own supply from the Corrib field and won't we be able to use that? readers will probably be thinking at this point. Yes, we will, but even when Corrib is fully operational in 2008, Irish sources (including what's left from the Kinsale/Seven Heads fields) will only meet around threequarters of the national demand. After that, the situation deteriorates quickly and by 2011, Corrib gas will supply less than half of the expected market, a sixth by 2016 and, by 2020, just when the world supply situation is beginning to get very tight, there will be little or nothing of it left at all.

And don't think that Corrib gas will be any cheaper than gas from any other source. It will, of course, be sold at whatever price is ruling on international markets. Moreover, the money paid for it will not stay in Ireland. It will go to Shell and its two partners and the effect on the balance of payments will be exactly the same as if the gas came from Russia or anywhere else. As a result, it is a mistake to think of Corrib gas as Irish gas. It belongs to multinational companies who will dispose of it to their best advantage, not ours.

The world supply of gas will be getting very tight in 2020 when the Corrib gas runs out because production will be growing very slowly, if at all. This chart from the *Oil and Gas Journal*[3], predicts that, after a period of slow growth, supplies will peak at about that time.

World gas supply expected to peak in 2019



Other experts think that gas supplies may stay on a plateau between 2015 and 2040 before falling off steeply. However, given that world oil production has probably peaked already and by 2040 could be around half its current level, there will be enormous competition from former oil users for supplies of what is a clean and convenient fuel.

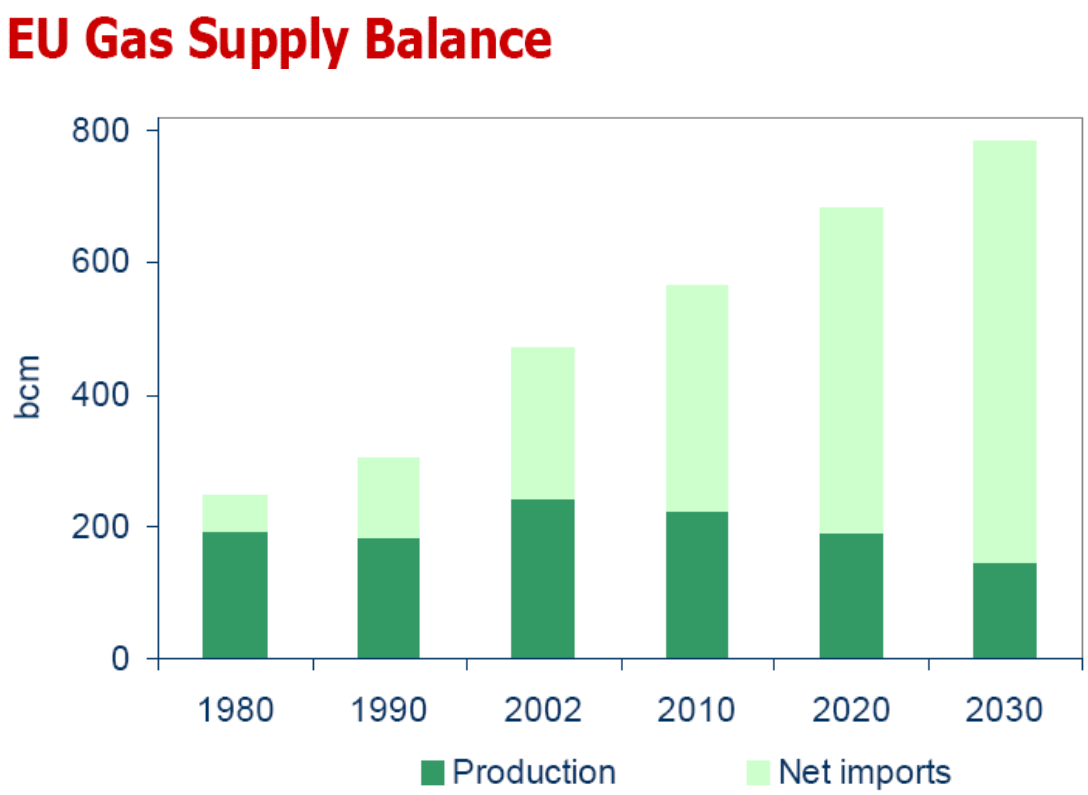
So, if gas is likely to become much more expensive and supplies could be restricted by difficulties in Britain or cease altogether as a result of terrorism or civil disturbances, what should property buyers and developers do? The only sustainable solution open to them is to minimise the amount of heating that their properties require, and then to supply that heat from a renewable energy source. A good example of what can be done is provided by the BedZed development near Carshalton in Surrey which I visited recently. There all the energy requirements of a hundred households plus some office and workshop space are met by photovoltaic panels and a CHP system burning woodchips made from tree surgeons' trimmings which would otherwise have gone to landfill. It is estimated that 30,000 houses in the London area could be heated from this fuel source alone! Bill Dunster, BedZed's architect, reckons that, if 5,000 similar units were built each year, their cost of construction, including the 12-inch thick rock wool insulation and triple-glazed windows, would be no more than that of a conventional house.

The way ahead is not therefore to think that gas will always be available. Within the lifespan of every house being built today, it won't be, at least at an affordable price,. Consequently, no building of any sort should get planning permission unless it will be feasible to heat it without using coal or peat once oil and gas have become expensive and scarce. The only energy sources that we can be sure that Irish people will be able to afford to use at that time will be those that they own and operate themselves. Wood chips from short-rotation forestry will be one of these sources and a communally-owned CHP plant should be part of every housing estate design from this day on.

Knowing that one's supply of heat was secure and that its cost was based on Irish price levels might prove very popular with purchasers. After all, as the table below shows, gas prices rose by 22% between December 2002 and October 2004, far more than most people's wages, something that one can be reasonably sure wouldn't be the case with renewable energy supplies. Certainly, BedZed residents get a more convenient heat supply than they would do if each house had its own gas boiler (they have nothing to maintain) and they know that only wage increases rather world demand will put their heating bills up. This must be one of the reasons that there are over 1,000 names on the waiting list to buy or rent BedZed units. As you leave BedZed, you pass a conventional housing estate built to exactly the same density. The 'For Sale' signs are everywhere.

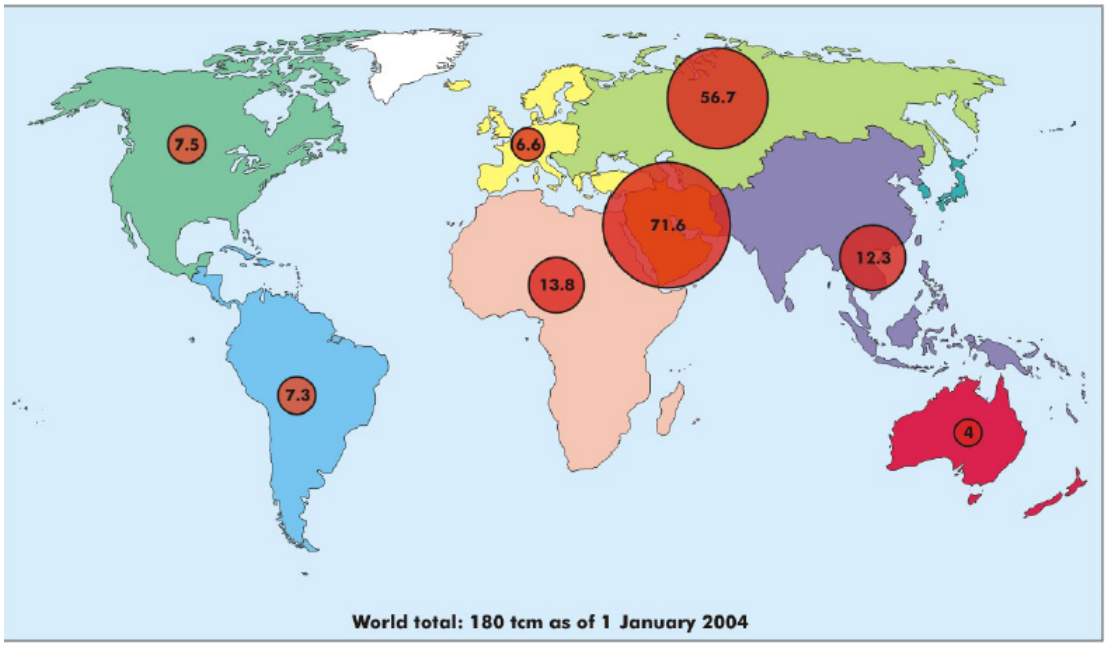
Year	**Unit cost/kWh**	**Supply charge**	**Total Cost**	**Net cost per kWh**.
2004 (Oct)	2.713 cent	€204.59 p/a	€652.23	3.95 cent/kWh
2003 (April)	2.446 cent	€184.48	€588.07	3.56 cent/kWh
2003 (January)	2.242 cent	€169.02	€539.02	3.27 cent/kWh
2002	2.22 cent	€167.52	€533.82	3.24 cent/kWh

Source: Bord Gais

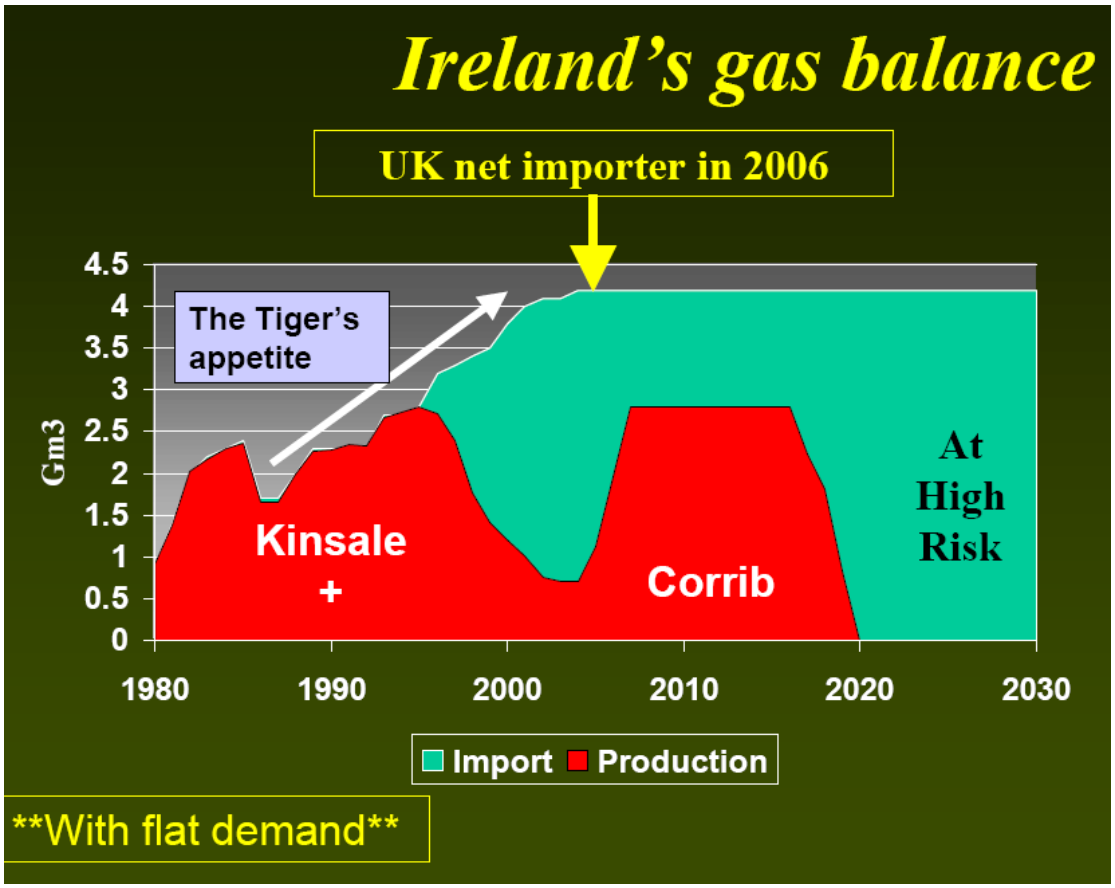


Source: International Energy Agency

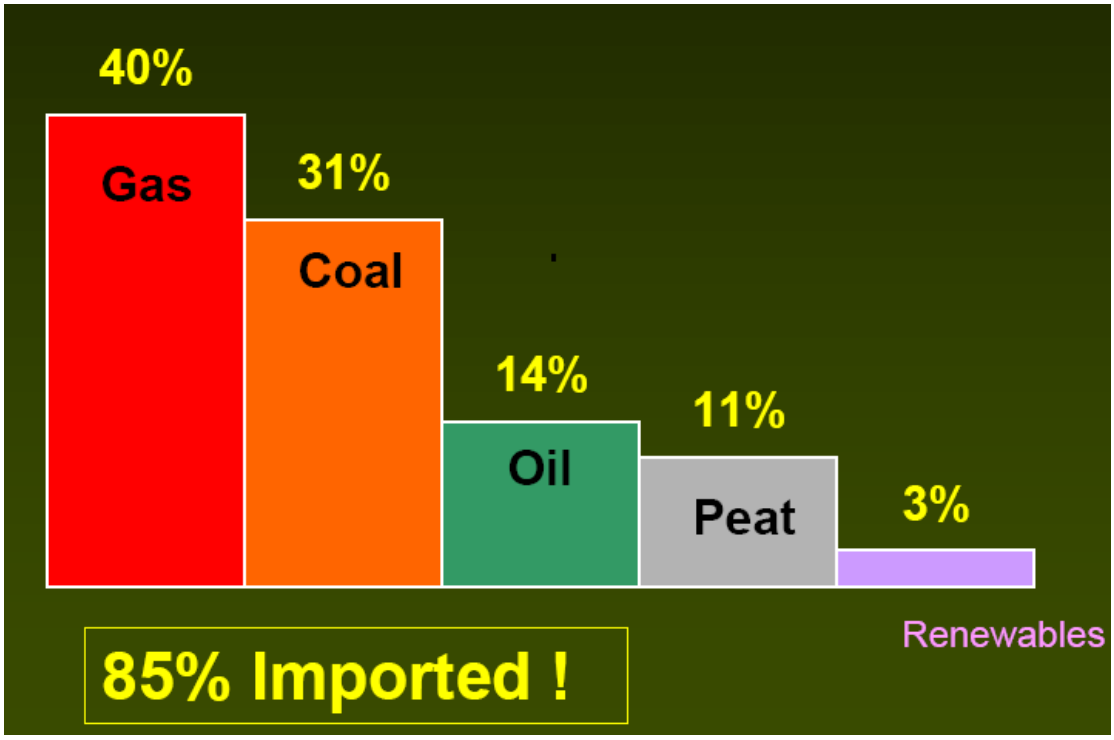
Proven Natural Gas Reserves



Source: International Energy Agency



Source: Colin Campbell



Source: Colin Campbell

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[1] http://www.irish-energy.ie/uploads/documents/upload/publications/Domestic_Jan_2005.pdf
[2] http://news.bbc.co.uk/1/hi/business/4375717.stm
[3] 'Multicyclic Hubbert model shows global conventional gas output peaking in 2019' by Asher Imam Richard A. Startzman and Maria A. Barrufet, 16 August, 2004