

Chilean nuclear energy: diversification and competition

Average US retail residential prices of electricity, including taxes, have been for the last 12 months to March 2009 US\$ 11.58 cents per KWh, whereas in Chile that figure has been around US\$ 20 cents or over. Since 1960 and in real terms, US retail residential prices have averaged US\$ 11.5 cents per KWh and moved between US\$ 10 and 13 cents, approximately. US wholesale prices paid to electric power producers have been moving close to half those figures[1]. In the Chilean case, if nothing relevant is done soon, we are doomed to face electricity prices at the power generation level and for the next 15 years one third more expensive than these long term historic prices. The negative impact and relative disadvantage over our whole economic system is obvious. That excess return unnecessarily paid by consumers – close to US\$ 1.600 million per year - in favor of consolidated electric energy producers should not take place and is not even needed to have electricity investments, for they just need a normal return to be justified.

Our market lacks competition. Recent bidding processes[2] have been a sufficient proof of that: prices went unreasonably up and the “contested” market was basically distributed among the same major existing actors. Other similar processes were even postponed to previously solve “potential market imperfections” after having witnessed these results. If compared to US price conditions, it would take a big leap of faith to argue that prices in the US have been consistently subsidized. Given tradable energy commodities, similar technologies and capital costs, energy prices should converge, unless tax or regulatory distortions or mainly uncompetitive markets do exist.

We have been moving out of subsidized natural gas from Argentina and been very near to a rationing status. But that does not justify surrendering to long term conditions from dominant generating companies that conveniently faced no credible competitive challenges in the short term. As for the recent bidding processes, 10 to 15 years contractual arrangements should soon incorporate a “competitive” clause, so as to return excess charges to consumers in case there are consistent lower costs to generate that already hired energy. A look at prices beyond our borders, especially in the US, would help a lot to determine those “competitive” price conditions. To be fair, the clause would have to work both ways.

But for the longer term, the implicit collusive scenario has to be changed. Nuclear energy from new third parties is one effective way. Another one, complimentary, is to have vigilant competition authorities.

By the end of this year, Chile will have close to 14.000 MW of electric power capacity. At a 5% annual growth rate, in 15 years we would need twice that capacity; at 6%, over 33.000 MW. Even if we assumed efficient 10.000 MW of additional hydroelectricity capacity, the difference would have to be made up of coal, LNG, renewable and nuclear energy. Given a 90% load factor or availability of nuclear plants, as in the US, which favorably compares to an average of 60% in hydroelectricity or 30% in wind operations, 3.000 MW would annually generate close to 24 million MWh, or over 40% of present annual electricity consumption of around 56 million MWh, or close to 20% of future annual electricity consumption in 15 years time.

[1] Energy Information Administration, Department of Energy, US.

[2] SIC Chile, over 27 million MWh energy consumption per year under bidding processes

Nuclear plant investments vary approximately between US\$ 2.000 and US\$ 3.000 per KW, not including interest rate costs during an expected 5 year construction period. Electricity would cost around US\$ 6.4 cents per KWh including payment for a 40 to 60 year capital investment and operational costs[3]. This final electricity cost would have to be compared with the energy prices plus the power capacity charges that are made in Chile. The abovementioned bidding processes resulted in total prices around US\$ 9 cents per KWh to be paid to existing generating companies for 10 to 15 years. None of these figures accounts for global warming externalities through carbon taxes or cap and trade carbon schemes that will affect fossil based generation. A US\$ 10 tax or permit per ton of CO2 would approximately imply US\$ 1 cent charge per KWh from a coal based power plant.

To enable these nuclear investments, the Chilean State would have to give financial guarantees to credibly confirm that this energy would remain "valid" during the whole life of the project, possibly increasing in value the lower were long term nuclear energy prices per KWh. Selling energy – and power capacity in Chile - under long term contracts at US\$ 6.4 cents per KWh for close to 20% of this country electricity consumption would give a clear signal to all the rest of suppliers about efficient prices, normal returns and abnormal excess returns. The northern mining sector could easily and credibly accommodate its increasing energy needs to the first 1.000 MW nuclear plant. Other big consumers and distributing companies – under the right incentives to look for lower prices for its energy to be sold to regulated consumers – would then follow. Unitary capital investments under a 3.000 MW nuclear development plan could eventually decrease, and so would do related transmission investments. Being a serious country, with a low risk premium and going down, allows it to take this diversifying and economically convenient path.

In summary, introducing short term "competitive" clauses for 10 to 15 year existing contracts and starting now a simultaneous nuclear development plan with new third parties would eventually dislodge the implicit present collusive environment. Renewable energy, given its relatively inferior massiveness potential – 2.2% in the US electricity generation, for example-, could not do this trick. Furthermore, the EU, the US and Japan – all energy deficient countries - will certainly have, on a grander scale, the same interest to develop nuclear energy by themselves and countries like ours to weaken the big oil and gas collusive – implicit and explicit – cartels.

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[3] World Nuclear Association Nov 2008