Pricing electricity and supporting renewables in Heavily Energy Subsidized Economies

Executive Summary

David M. Newbery
Energy Policy Research Group,
University of Cambridge

Heavily Energy Subsidized Economies, HESEs, defined as having budgetary subsidies above 1.5% of GDP, spent on average 4% of GDP on subsidizing energy in 2014. HESEs choose energy subsidies financed by energy rents and energy exports as a way of passing those rents back to their citizens, and to buy public support with generous welfare benefits and subsidized energy. Faced with limited capacity to invest returns locally, and public scepticism that sovereign wealth funds will provide future benefits, it is attractive to transfer some of the resource rents directly to the population. Once subsidies are in place, the groups that benefit are likely to strongly resist their removal. Welfare economics argues that resource rents in excess of the costs of administration, justice and defence should be returned as lump sum demo-grants, or their equivalent to finance essential public services of health, social welfare and compulsory education. These precepts of public economics presuppose an efficient, trusted and uncorrupt fiscal system that may be lacking.

Just as energy taxes are easy to collect, so energy subsidies are easy to administer, even if they cumulatively lead to highly inefficient patterns of consumption with the risk of lock-in. For countries dependent on oil and gas revenues, energy price falls can precipitate severe fiscal shocks. As international pressure to alleviate climate change has increased following the legal enactment of COP21, HESEs find themselves increasingly isolated. They face the risk of either global agreements on carbon pricing, or heavy import taxes on their energy exports.

Subsidy reform is difficult but understanding their political logic suggests designing reforms that compensate the most vociferous interest groups. It is easier to make structural reforms when the resource rents have fallen and budgets are under stress. Recent experience in some Gulf countries has belied the earlier pessimism that removing fuel subsidies was almost impossible. Saudi Arabia doubled gasoline prices and trebled diesel prices between 2015-16. Bahrain, Kuwait and Qatar all made major price increases. Concepts of solidarity may allow the removal of subsidies benefitting higher income groups – and the electricity sector is therefore a good choice for further reform.

This paper examines strategies to reduce subsidies to electricity and decarbonize that sector. HESEs that have both oil and gas, and still use oil in power generation, would seem to have a simple option of switching to gas, which was the main source of electricity decarbonisation in Britain in the 1990s. HESEs that have already switched to gas face a harder task, as further decarbonisation would involve supporting renewable electricity supply, and in some cases, CCS or even nuclear power, if costs can be adequately reduced. Fortunately many HESEs have high levels of insolation that makes solar PV attractive, and some also have complementary wind resources. Cost reductions of renewables reinforce that prospect, making more urgent bringing fossil-fuel generation prices up to cost-reflective levels. That requires efficiently pricing gas in gas-rich countries to measure the efficient generating cost, including a carbon price. That allows a proper comparison of the efficient costs of gas, solar PV and wind generation. The final question is how to reform the pricing of electricity and start subsidy reform. The paper presents evidence on the magnitude and impacts of oil, gas and electricity subsidies, and discusses how the electricity sector can be weaned off subsidies while reducing its carbon emissions.

The best time to start subsidy reform is when oil and gas prices have fallen, the attraction of rents to potential opposition parties is reduced, and when the absolute level of subsidies may be at an historic low. Subsidies can be gradually reduced by linking final prices to world market prices, and escalating them in real terms over time. In the electricity sector, under-pricing was often inherited from past eras when gas had a negligible opportunity cost as the alternative for associated gas was flaring. That combined with a failure to link prices to inflation, cumulatively led to extraordinarily low current domestic prices and correspondingly excessive electricity consumption per $GDP. With gas often now in short supply, no longer a cheap by-product as associated gas, its opportunity cost has risen. The wholesale levelised cost of CCGT with low gas costs might be $35/MWh, or $40/MWh with a $10/tonne CO2 price, but could easily be double that level. At these prices, grid-scale solar PV and on-shore wind in suitable locations (notably middle East and North African countries) can be viable without subsidies, although this will depend critically on the coincidence of load and PV and wind output, as off-peak gas power will be substantially cheaper than on-peak power. Fortunately wind and PV output appears complementary in coastal desert conditions, facilitating their joint deployment.