Monday, January 22, 2018

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Dilemmas in formulating energy policy

(Part II)

We have to beware the siren call of solar energy. It may be true that in more developed countries solar and other sources of renewable energy may make fossil fuels obsolete. As Dr. Barcelona amply demonstrates, however, poor logistics impairs realizing the full benefits of renewable. "Let us take the case of the Visayas. Enthused by sunlight's allure, Negros Island hosts among the largest solar farms in Asia. Encouraged by generous feed-in tariffs (FIT), solar power's peak outputs at noon exceed the transmission capacity to deliver supplies to Cebu and Iloilo, where we find the bulk of power demand. An added complication is the presence of geothermal power in the island of Negros. Geothermal energy competes with solar power for market access leading to the waste of excess solar which is unsold but paid for under FIT. When Negros needs the power at night the islandsuffers from the occasional "brownouts" in a sea of surplus installed capacity. This is a classic case of the folly of uncoordinated policy decisions."

The logic of the coal tax is deceptively simple. Tax coal and you discourage the lock-in on "dirty coal" by getting investors to shift to "clean" solar. Those who voted for the coal tax failed to see two contradictions inherent in the act of taxing coal. Advocates of solar were triumphant when Meralco signed a contract at ₱2.99/kWh with Solar Philippines, a proof of the viability of solar. Solar power's success, however, argues for the elimination of all forms of carbon taxes and subsidies. Investors are always free to compete, provided they do not lean on the support of the government to gain a competitive edge. Alleged "cheaper" solar cannot claim costs advantage while continuing to receive ₱8.50/kWh in FIT in a market at ₱2.50/kWh.

The solution to the problems of affordable and viable power supplies lies in fixing the poor energy logistics. Access to market is obviously a function of price, and available infrastructure and logistics which will allow the delivery of power from source to market. "Cheap" solar power, however, becomes prohibitively expensive when congested grid prevents its use. By singularly taxing coal, without resolving the infrastructure bottlenecks, consumers are hit twice. They are forced to subsidize solar power without being able to secure power supplies, while at the same time paying more for their coal-fired power supplies. We may yet see candle making become the next sunrise industry when severe blackouts finally hit us.

Dr. Barcelona summarizes the reasons why journalists often carelessly report about the superiority of solar as compared to coal in delivering adequate and clean supply of energy at affordable costs. Solar is assumed to reach price parity with coal when certain conditions exist. These conditions are:

- Peak production at noon (usually between 11 a.m. to 2 p.m.) in many countries, where solar produces the maximum.
- At night, without storage, solar does not supply. The costs of storage (still exorbitant) and back up supply (gas or coal) are excluded from the costs.
- Panel efficiency to convert sunlight (radiant energy) to power is assumed at the maximum of the range (10% to 15%), resulting in a seemingly more favorable life cycle costs.
- Panel life is assumed to last 20 years. Coincidentally, this is what solar power developers ask the government to provide as the life of the subsidies. Within this period, conversion efficiency usually declines after the fifth year,

* ENERGY CONSERVATION

MANILA BULLETIN
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implying lower production or higher maintenance costs or both, than what was assumed in the project feasibility study. This outcome results in bankruptcy as happened to many of the solar power projects in Spain that was touted as the leading proponent of solar energy at the beginning of this millennium. Dr. Barcelona saw this collapse of the Spanish solar energy sector at close range since he has been permanently residing in Barcelona, Spain for the last 10 years.

• "Learning curve" effects assure that future costs for solar panels will be lower. The "proof" is in the rapidly declining solar panel costs. Assuming both are true, would an investor profit more by doing nothing now, and benefit from the works of others who are enthusiastic in investing now so that the "learning curve" effects could deliver lower costs?

To say the least, these conditions are heroic and more often than not are unfulfilled. Dr. Barcelona throws the final punch by asking the rhetorical question: If solar is indeed competitive with coal or gas, why do you need to subsidize solar? In another article that appeared in the local press, Dr. Barcelona quotes Microsoft's founder, William Gates who succinctly argued how costs comparisons between coal and solar become a disservice to the environmental cause. According to Bill Gates, "Photovoltaic solar is not economical. Its intermittency is a major problem. When environmental enthusiasts point to photovoltaic solar as having a similar cost to hydrocarbons, what they mean is that at noon in Arizona that may be the case. However solar does not come at night. So the fact that at one moment you reach parity, so what? Distinguishing a real solution from a false one is actually very complicated."

More often than not, subsidies do not result in wide-scale deployment of renewable, more so with solar energy, the poster kid of subsidies. "Concrete data on the Philippine energy sector may illustrate this truism. Philippine coal-fired power's economic costs would be about ₱7.29/kWh, while PV Solar would be about ₱9.09/kWh. Financial costs based on acquisition prices would be about ₱3.00/kWh to ₱4.50kWh. This compares with PV Solar's feed-in tariff (FIT) of ₱8.50/kWh. With PV Solar equipment costs having fallen sharply, its economic cost is below the feed-in tariffs. While the learning curves effects favor PV Solar's improved cost competitiveness, fuel and power prices from coal-fired and gas-fired power fell from a peak of ₱8.00/kWh to its present levels of ₱2.00 to ₱3.00/kWh. The FIT subsidies actually widened to ₱5.50 to ₱6.50/kWh, or up to a third of revenues. It is clear from these figures that when subsidies are set at the level of the cost differences, it is difficult to determine what is the "correct" level. As power prices increase, renewables need less subsidies but nevertheless continue to collect. When this happens, there is a pressure from consumers to ask regulators to reduce the subsidies because the renewables are raking it in at the expense of the consumers. Here lies the paradox: Generous subsidies do not result in wide-scale renewables deployment. When solar is highly dependent on subsidies to be profitable, changing government priorities that cut subsidies turn supposedly secure revenues into the very source of uncertainty that can bankrupt the venture."

In his book, Dr. Barcelona provides ample evidence on other paradoxes related to generous subsidies. He found out that it is not true that as increasing renewables capacity is installed, their costs would fall. On the contrary the evidence is that when subsidies are too generous, the costs decline more slowly than markets without subsidies. The most damning evidence against solar showed that growth and profitability do not go hand in hand. His story is quite dramatic: "One sunny morning in 2013, leading journalists herald the dawn of renewable's new era. Solar is sold at a price lower than coal, so the headline says. As analysts scramble to validate their financial models, most could only scratch their heads and were at a loss for answer. The next batch of headlines came to their rescue. Investors and advocates of 'competitive' solar power were up in arms. The cause: Governments in Europe cut renewable' subsidies drastically. Within weeks, 'high growth' solar companies filed for bankruptcies, with wind struggling to make ends meet while barely remaining afloat albeit financially moribund."

I repeat what I said at the beginning of this two-part article: The dilemmas involved in formulating a balanced energy policy for the Philippines can only be resolved by having an expert knowledge of technology, economics, geopolitics and other related sciences. There is no substitute to serious study and reflection. All those involved in this continuing process of formulating energy policy can start by making the intellectual effort to read the book Energy Investments: An adaptive approach to profiting from uncertainties by Ricardo Barcelona. I must warn the reader that it is not an easy read. Members of Congress may first want to assign their technical staff to digest the content of the book for them.

The same can be advised to heads of the Executive departments and members of the Judiciary, except those who have had advanced degrees in economics or management. Needless to say, the book is a must read for the private investors who are rightly bullish about the Philippine energy sector. Despite the admittedly bright prospects facing them, there are still uncertainties from which they can profit if they follow the evidence-based advice given by Dr. Barcelona in his book, which will soon be available in all leading book stores in the Philippines. The publisher of the book is Palgrave Macmillan.

For comments, my email address is bernardo.villegas@uap.asia.