Boosting Renewable Energy

CAPITAL MARKETS, NOT DIRECT SUBSIDIES, WILL SPEED PROGRESS

By Osman Ghani, CFA

With rising concern over the environment, a greater emphasis on renewable energy has led to a significant increase in the level of investment in such projects over the past decade. From 2004 to 2011, total investment in renewable energy grew from US$33 billion to US$257 billion, a 678% increase.

Motivated by a variety of concerns—arresting climate change, becoming more energy self-reliant, boosting economic growth and job creation—countries around the globe have been trying to develop and promote investment and research in the renewable energy market.

According to the International Energy Agency (IEA), renewable-energy technology can be classified into three different stages of commercialisation. First-generation technologies include hydropower, biomass, and geothermal power, which are widely used worldwide. The second generation includes solar, wind, and modern forms of bioenergy. The third generation encompasses bio-refinery, concentrated solar, and ocean energy-based power sources, which are still in the research and development stage and have yet to be fully commercialised.

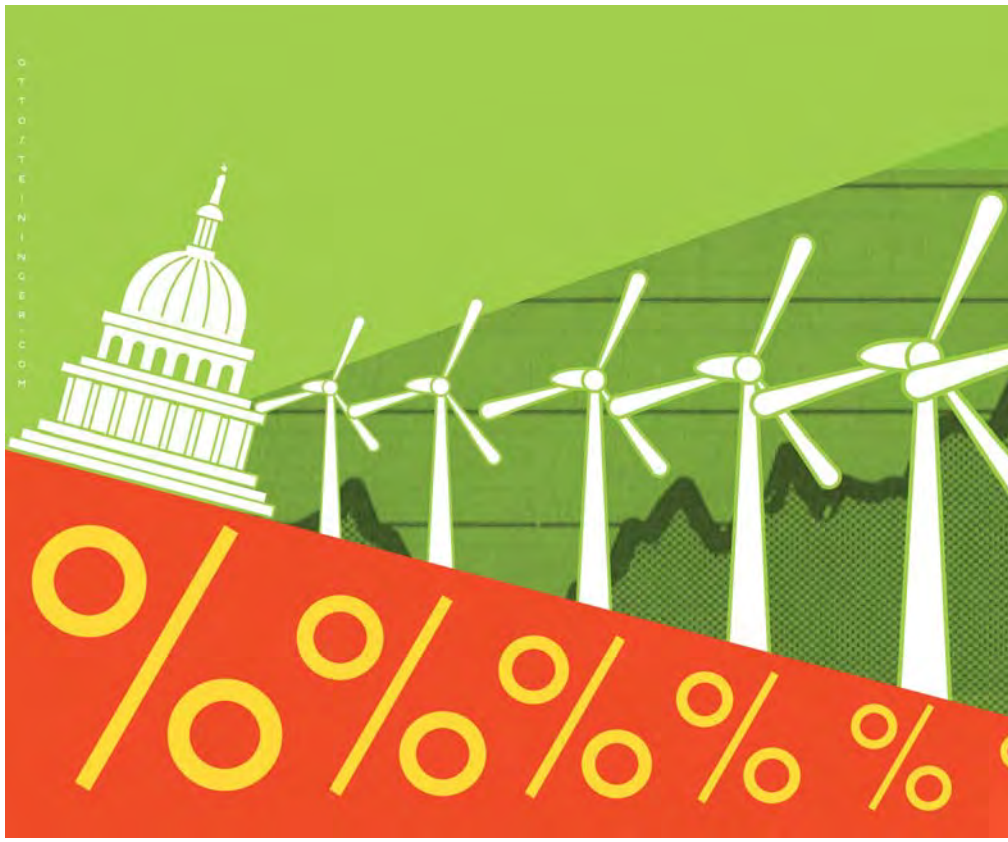
First-generation sources of power are globally commercialised and widely used at present. Second-generation technologies are less widely used but are gaining in importance and commercialisation. Because third–generation sources are still in development and offer little more than new avenues for the future, they are an important area for investment. Governments are using a variety of methods to encourage the development of third-generation technologies, ranging from direct subsidies for R&D to indirect subsidies in the form of tax rebates/credits to end-users.

These efforts have triggered numerous debates, mostly centred on whether or to what extent governments should subsidise such projects. To allow for greater efficiency in resource allocation, I argue that a more efficient mechanism would be for governments to improve market incentives to invest in such projects and not to subsidise renewable energy projects directly because direct government subsidies raise two major problems: moral hazard and risk-allocation inefficiency.

In this type of situation, moral hazard is caused primarily by the lack of an efficient enforcement mechanism. With direct government subsidies, funding is organised and reviewed by politicians and governmental agencies. This arrangement introduces biases in the investment project, with politicians favouring "pet" projects or projects that may create jobs in their jurisdictions. In addition, there is no market mechanism to force efficiency gains because funds are provided by taxpayers and because, without the feedback mechanism of a market structure, a proper risk–return assessment is not made.

The feedback mechanism comes from capital markets putting pressure on company managers to become more efficient, invest only in profitable investments, and be accountable to investors. If managers do not meet market expectations, capital markets can stop further investment until the company rectifies its actions.

With government subsidies, however, such a feedback mechanism is absent. In effect, government subsidies encourage investment in projects that are less profitable and less efficient than would be the case in a market structure. Part of the explanation is that government policy is biased by the ideological



positions of the responsible politicians or by short-term local economic consequences of undertaking the project, which ignore the net social impact on the entire country. Governments may incorrectly adopt or reject decisions based on personal motives and ideologies having little to do with the actual risk–return trade-off of the project.

To reduce the inefficiency introduced by direct government subsidies/grants, a better way is needed. Instead of direct subsidies, governments should promote the creation of investment vehicles that target investments in renewable energy. The incentives would come from giving tax rebates to investors (in the form of either a reduced tax rate levied on profits from the investment, a tax rebate which is a function of the amount invested in the vehicle, or a combination of both).

How would this work? Consider a basic valuation model: $P_0 = \frac{\Sigma CF_i}{d_i}$, where P_0 is the current market price, ΣCF_i is the sum of net returns, and d_i is the discount factor of the project. A tax credit on initial investment would have a result that causes a reduction in P_0. Tax credits on returns would have an effect on ΣCF by increasing the net returns (after tax). Tax credits on returns also could be seen as reducing the discount factor (holding returns constant), given that the credits would reduce the level of risk associated with the project.

Thus, government tax incentives could encourage capital markets to extend capital to such projects. A change in government policy towards renewable energy could allow companies seeking investment to adapt the risk–return profile of a project to make it more appealing to a wider range of investors (i.e., by increasing the expected return or reducing the risk given a level of return). If more investors are attracted to the market for renewable energy, the level of capital offered for such projects will increase and resource-allocation efficiency of society as a whole will improve. Resource efficiency should increase because capital markets would be interested in achieving the highest return on investment, putting pressure on managers of renewable energy projects to be more efficient, invest in commercially viable projects, and reduce wastage.

Capital markets would force resources to be allocated to those projects with the greatest expected return. This concept also applies to R&D projects. The introduction of market participation in renewable energy would not have a detrimental effect on R&D but instead should have a positive effect. Because investors would prefer investments with the greatest expected return, a "screening" mechanism would favour commercially viable projects or those with a greater level of potential commercial viability. Projects that are less commercially viable or that offer lower expected return would be ignored.

One of the functions of capital markets is to ensure the efficient management of risk. If governments directly subsidise projects and capital markets are not involved, the risk of the project will be borne by taxpayers alone. Capital markets allow risk to be shared amongst market participants according to the risk appetite of investors, meaning that risk is borne by market participants willing and able to bear it.

Finally, in setting the tax rebates and rate structure for the investment vehicles, governments need to keep in mind the type of project that is being funded. First-generation projects are widely used and are more commercially viable, compared with second- and third-generation technologies. Because first-generation projects are less risky, they should have a lower tax rebate and tax credit attached to them. Third-generation projections should have the most generous rebates and credits. The right mix of incentives for each stage is needed to ensure that market participants invest in all three types of projects. If the same incentives were offered for all stages, market participants would invest only in first-generation projects, which would have the lowest level of risk for a given level of return. Policymakers must keep the commercial risk of investments in mind when designing incentives.

The need for and efficiency of capital markets versus direct government subsidies has been shown to significantly improve the contracting efficiency of related types of investments/instruments. For example, the creation and expansion of weather-related derivatives points to the desirability of capital markets in such types of investments. Weather-related products, such as catastrophe bonds ("cat bonds") and weather derivatives, allow capital market participants to hedge away their exposure to extreme outlier events. Such instruments allow a more efficient allocation of resources and risk sharing than would be the case if a government either directly or indirectly insured (subsidised) the hedger to the transaction.

The growth of weather-related instruments points to the ability of capital markets to efficiently allocate resources and risks amongst market participants, thereby ensuring that social welfare is optimized. Such a market cannot properly function if governments provide subsidies directly, because doing so would lead to inefficiencies and would skew the return, thereby introducing an element of "dead weight" losses to society as a whole.

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