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Fiscal Incentives to Eligible Companies: A Right Step in Encouraging Investors in the Renewable Energy Market

Introduction

The global energy system based on hydrocarbons is undergoing a foundational shift. Global demand for electricity is expected to rise by more than 80 percent from 2010 to 2040, driven by increases in population and GDP. Approximately 20 percent of global electricity generation now comes from renewable energy sources. Renewables accounted for over half of total net additions to electricity generating capacity worldwide in 2012. Energy generation from renewables is expected to increase by almost three times its 2010 level in 2035, with the share in energy generation mix increasing to 31 percent (KPMG, 2013). In terms of primary energy, it is already technically possible to generate many multiples of global energy supply using solar energy. Similarly, there is ample wind or geothermal power to meet all of today's global electricity demand. Perhaps more importantly, much of this global solar power potential is concentrated in developing countries, but there is also high potential in other areas (Griffith-Jones et al, 2013).

Global investments in renewable energy have also seen sharp increases in recent years, from US$41 billion in 2004 to US$268 billion in 2010 before dropping to US$244 billion in 2012 (KPMG, 2013). Investment level in 2013 was also lower than that in 2012. The decline in investment between 2010 and 2013 is explained by factors such as the uncertainties about renewables policy in developed economies, cuts in tariff support, downswing in prices, and overcapacity in the manufacturing supply chain. Renewables investment has also seen a continued north to south shift toward emerging markets. In 2007, developed economies in the north invested 250 percent more in renewables than the south. Now the gap has shrunk to 18 percent, and emerging markets are on track to surpass the north in the next few years. Total renewables investment in developing economies rose 19 percent in 2012 to US$112 billion, while investment in developed countries dropped 29 percent to US$132 billion (KPMG, 2013). While all developing countries have seen rapid growth, the figures are dominated by China, Brazil and India.

Despite the expected high growth in global demand and the huge investment, the economics of renewable energy is generally not competitive, as production costs per unit are usually higher compared to that for fossil fuels. In part, this reflects the relative maturity of technologies, but the significant cost difference of renewable energy production (depending on factors such as wind speed and degrees of solar intensity) is also a major factor. Although one can expect the costs of renewable energy to fall relative to fossil fuels, particularly in countries with high renewable energy potential, fossil fuels are likely to retain a cost advantage in most cases. This points to the need for the basic economics of renewable energy to be altered, either by increasing the cost of fossil fuel-based energy, reducing the costs of renewable energy or boosting its returns (Griffith-Jones, 2013).

Renewable energy is the future for global electricity generation to meet the growing demand. Indeed, in countries such as Ghana where power outages from fossil fuels have become a serious constraint on economic growth, renewable energy provides a perfect substitute. Unfortunately, renewable energy development does not only involve high initial costs, it also faces a variety of significant risks that make the financing of renewable energy investments difficult in developing countries. The general risks associated with renewable energy technologies are particularly pronounced in low-income countries that lack the track record, overall business infrastructure and professional expertise in these technologies. This is exacerbated by such investment risks that are typical of many developing countries: political risk, currency risk, and commercial risk. These factors increase the costs and risk profile of investment in renewable energy in developing countries, making the return expectations of potential developers and their financial backers to reach prohibitive levels.

Fiscal Incentives

Relative to conventional power generation projects, investments in renewable energy usually have high up front capital costs and commercial risks as well as longer investment recovery. Because private investors typically focus on financial returns rather than social benefits, governments may need to support investors of renewable technologies. In Ghana, the government can use a variety

of incentives to encourage private investments in renewable energy. Fiscal support instruments such as tax and non-tax incentives that lower the costs of doing business are the most common ones that can be employed. Some countries use tax incentives to stimulate private investment in renewable energy while others resort to increasing taxes and imposing fines on firms and activities that harm the environment. Many other countries promote renewable energy by providing investment incentives to attract capital to specific technologies, locations, and types of renewable energy production (McGregor and James, 2011). These incentives provide awards for the initial investment regardless of how much electricity is generated. Fiscal incentives are provided through subsidies, tax provisions, and exemptions. They are typically intended to reduce costs related to investment (initial capital outlay) and plant operation (production).

Subsidies and Rebates: Subsidies and rebates can be provided to buy down the initial capital cost of the system so that consumers can enjoy lower prices. Equipment rebates can be provided to target specific types of renewable energy technology. Direct equipment sales programs also allow consumers to buy or lease renewable energy systems directly from manufacturers at below-retail rates. Many countries offer rebate programs to promote installation of renewable energy systems. In some cases, rebate programs are combined with low or non-interest loans. In Japan, Germany, Australia and the United States, subsidized capital costs for solar system are provided as part of their renewable energy market transformation programs. Some countries also provide subsidies for research and development spending that allow for some percentage deductions of capital costs, essentially creating a type of subsidy via tax breaks. In some cases cash subsidies are also provided.

Tax Relief Incentives: Tax relief incentives have also been employed extensively in many countries. The most common tax relief incentives include the following:

Investment Tax Credits. Investment tax credits and allowances are tax deductions linked to the amount of investment and can provide valuable benefits to producers. Investment allowances are typically one-time deductions of capital costs beyond regular depreciation and have a financial benefit similar to accelerated depreciation. In India for example, companies can deduct 100 percent of the capital costs of renewable energy projects. In the United States, companies receive 10 percent tax credit for purchases of solar and geothermal renewable energy property, subject to certain limitations. But because renewable projects are long-term investments, such deductions are only useful when losses typical in the early years of renewable energy projects can be carried forward to years when firms start to generate profits. In addition, tax deductions can be provided to small producers of renewable energy that either reduce reliance on utility grids for their power or even supply excess energy to the grids.

Production Tax Credits. A production tax credit provides investors or owners of qualifying properties with an annual tax credit, based on the amount of energy produced by that facility. By rewarding production, these tax credits encourage generation of renewable energy and improve operating performance. Tax holidays can be given to renewable energy producers and their profits exempted from income tax for a fixed number of years. The benefits of tax holidays generally do not depend on the amount invested, so they do not encourage large projects as is the case with investment allowances and accelerated depreciation. In Denmark, a production tax credit provides tax relief for wind power. In the United States, the Renewable Electricity Production Credit provides credit for electricity generated by wind, closed-loop biomass, or poultry waste resources.

Accelerated Depreciation. Accelerated depreciation allows renewable energy investors to receive tax benefits sooner than under standard depreciation rules. The effect of accelerated depreciation is similar to that of investment tax credits. In the United States, businesses can recover investments in solar, wind, and geothermal property by depreciating them over a period of five years, rather than the usual 15-20-year depreciation lives of conventional power investments. As of 2004, India's accelerated depreciation policy allowed 100 percent depreciation in the first year of operation, helping to spur the largest wind power industry among developing countries. Germany also provides investment tax credits accompanied by technical design standards and certification requirements (Beck and Martinot, 2004)

Property Tax Incentives. Property tax incentives for renewable energy are generally implemented in one of three ways, viz. (i) renewable energy property is partially or fully excluded from property tax assessment, (ii) renewable energy property value is capped at the value of an equivalent conventional energy system providing the same service, and (iii) tax credits are awarded to offset property taxes.

Personal Income Tax Incentives. Credits against personal income taxes can be made available for the purchase or conversion to eligible renewable energy systems and renewable fuels. Many states in the United States provide personal income tax incentives. In some cases, taxpayers can deduct the interest paid on loans for renewable energy equipment.

Tax Exemptions. Various tax exemptions such as income tax exemptions on income from renewable power production, value-added tax, sales tax, excise duty exemptions on equipment purchased, and reduced or zero

import tax duties on assembled renewable energy equipment or on components can also be provided to support renewable energy generation. Some countries provide property tax exemptions and some do not tax land leased or bought to generate renewable energy. Many countries have policies that provide retail sales tax exemptions for eligible renewable energy systems and renewable fuels. Most exempt 100 percent of sales tax for capital expenses and provide specific cents-per-gallon exemptions for renewable fuels. In the Netherlands, for example, green-power is exempt from fossil-fuel tax on electricity that is paid by end-users. India also allows 5-year tax exemptions on income from sales of wind power (Clement and others, 2005).

Financial Incentives: Financial incentives focus on the provision and cost of project finance. This can be a major issue for big renewable energy projects such as geothermal power, which require large amounts of capital and therefore face substantial investment risks. These incentives often take the form of investment grants, subsidized loans, loan guarantees, and insurance at preferential rates.

Loans. The government can implement incentive programs that provide financing for the purchase of renewable energy equipment and machinery. Some governmental agencies like the Carbon Trust in the UK provide interest-free loans for the purchase of renewable energy equipment. In the United States, loans are available to virtually all sectors for the generation or purchase of renewable energy. In some developing countries, notably India, China, and Sri Lanka, multilateral loans by lenders such as the World Bank have provided financing for renewable energy, usually in conjunction with commercial lending. Others, such as Bulgaria also provide loan support mechanisms for new renewable energy production.

Grants and guarantees. Grants and guarantees can also be provided to renewable energy generation. For example, beginning in 1979, Denmark provided rebates of up to 30 percent of capital costs for wind and other renewable energy technologies. In the United States, many public utilities provide grants for renewable energy, ranging in various sizes (Beck and Martinot, 2004). Australia provides grants to support the development of a range of renewable energy technology. In Indonesia and other countries, renewable energy development funds have been established to provide financial support for data collection and high quality information about renewable energy exploration and development. The funds also provide guarantees for contractual risks in relation to government actions to facilitate the implementation of large renewable energy projects.

Production Incentives. Two other types of incentives considered to be powerful in unlocking private investment in renewable energy are the establishment of targets for renewable energy generation and the introduction of feed-in tariffs. Provision of quotas is another production incentive that the government can provide, but it is not as powerful as targets and feed-in tariffs.

Renewable Energy Targets: Renewable energy targets are usually set as a percentage of the primary energy and/or electricity generation mix. Targets are considered key as they provide the backbone of any country's overall renewable energy strategy and the framework within which incentive mechanisms, such as feed-in tariffs or quotas, are placed. They provide clarity and a higher degree of certainty to private sector actors, increase the reliability and trustworthiness, and ultimately the effectiveness of mobilizing private investment in renewables. But, targets alone without the establishment of incentives cannot create the level playing field required in situations where renewable energy technologies have not yet achieved grid-parity ((Renewable Energy Policy Network21[NEN21], 2006; UNEP, 2013).

More than 25 developing countries have put renewable energy targets in place, including 13 countries in Africa. These countries have acknowledged the importance of energy targets in national development and poverty reduction plans. Despite such political support and endorsement, however, some of the same countries have to date failed to put in place the supportive policies needed to create the level playing field. Without these policies and incentives, investors and independent power producers will continue to place emphasis on conventional energy options. It is interesting to note that those sub-Saharan countries that appear to lead the way in the expansion of renewable energy have also put in place concrete measures that go beyond political statements. Notably, these countries include Kenya, Uganda, Madagascar, Cape Verde, Cameroon, Rwanda and Mauritius (UNEP, 2012; REN21, 2011).

Feed-in-Tariff. Of all the incentive instruments that can be established by the government, feed-in tariffs are the strongest in leveraging private investment and finance for renewable energy. A feed-in tariff is a policy instrument where long-term purchase contracts are offered to renewable energy producers at a fixed price or with a fixed premium to the market price. For potential financiers, output-based incentive systems such as feed-in-tariffs can considerably enhance the risk-return profile of renewable energy projects. First, the disadvantages associated with the costs of renewable energy sources are compensated for by providing an above-market price premium, which enhances the profitability of projects and returns on investment. Second, market risk can be entirely mitigated

as feed-in-tariffs and other renewable energy production incentives are mostly offered at a predetermined level and over a predetermined number of years. This allows medium- to long-term certainty on prices and revenues, and revenue projections become more accurate, which can be particularly effective given the extreme volatility of energy prices (Weron, 2007).

As at early 2010, more than 30 jurisdictions in developing countries, either at the national or sub-national level, had feed-in-tariffs in place. In sub-Saharan Africa, however, this had only been the case in Mauritius(1988), Uganda (2007), the United Republic of Tanzania (2008) and Kenya (2008) (REN21, 2010; UNEP, 2012).

Quota System. A not too popular production incentive is the award of quotas to generators. These awards are certificates that can be sold in the market but with no price guarantee.

Policy Instruments

The government can also use policy instruments to promote renewable energy that can provide a wide range of benefits without directly burdening the budget. They include creating a level playing field, providing easy access to market and utility grids, and mitigating political and regulatory risks. In addition, public funding and the use of public procurement system, customer education, and information disclosure can also provide important support to renewable energy generation.

Creating a level playing field. Governments need to create level playing fields, in terms of profitability between innovative and promising renewable technologies and conventional fossil fuel-based generation options. There are many factors, ranging from capital-intensity of renewable energy technologies to continued provision of subsidies to fossil fuels that make renewable energy generation in the short term more costly or more difficult to implement than conventional fossil fuel-based technologies, particularly for large-scale generation. Meanwhile, the benefits of renewable energy generation tend to materialize in the medium to long term while private investors, given their role in competitive markets are more interested in pursuing ventures that are of immediate financial interest. It therefore becomes the responsibility of the public sector to put in place mechanisms that support activities which are beneficial and strategic to the economy in the medium term and financially attractive to the private sector in the short term. This requires, in the first instance, the establishment of public incentive mechanisms that create for the private sector a financial 'level playing field' between renewable and conventional energy technologies (UNEP, 2012).

Providing easy market access. Governments have to provide investors easy access to markets and utility grids on competitive basis. In addition to not facing a 'level playing field', it is often the legal and regulatory set-up of countries' electricity sectors that makes the deployment of renewable energy technology burdensome for those who have the required capacity to drive it. Electricity systems are frequently characterized by the domination of state-owned national power utilities with legally endowed monopoly and a vertically integrated supply chain, or similar set-ups. By default, these utilities lack the incentives and flexibility to provide easy grid and market access on fair terms to third-party and private sector independent power producers. Another complication of this type of energy sector structure is that it renders energy provision susceptible to political interference, typically aimed at keeping energy prices low, which can seriously undermine the financial sustainability of the overall national model for power generation. Market liberalization efforts through the vertical and horizontal unbundling of monopolistic structures to create true competition in the local electricity markets are a necessary step towards scaling up private investment in renewable energy. Without access to the market, the required skills, technologies and financing will not move (UNEP, 2012).

Market facilitation by governments also supports market institutions, participants, and rules to encourage renewable energy deployment. A variety of policies are used to build and maintain this market infrastructure, including policies for design standards, accelerated siting and permitting, equipment standards, and contractor education and licensing. In addition, policies to induce renewable technology manufacturers to site locally and direct sales of renewable systems to customers at concessionary rates facilitate market development (Beck and Martinot, 2004). The location of renewable energy facilities is also driven by the availability of renewable resources as well as by consumer demand and physical and economic access to the grid. In addition, increasing access to land and facilitating property rights and permits help promote renewables as non-tax incentives (McGregor and James, 2011).

Mitigating political and regulatory risks. Even as renewable energy technologies become increasingly competitive and profitable, and even as access to local electricity grids and markets is increasingly enabled, the set of investment risks encountered in developing countries remains a persistent challenge. In many of these countries, regulatory and macroeconomic risks tend to be so pronounced, making the return expectations of private investors commensurately high that many viable and financeable infrastructure projects are impossible to undertake. Almost all infrastructure projects in developing countries that involve private participation such as electricity generation are also affected by political,

regulatory and macroeconomic risks. Such projects aimed at delivering a 'public good' are particularly exposed as they tend to have immediate counterparts, either a publicly-owned utility or other types of public entities that are susceptible to political interference. Furthermore, renewable energy projects are particularly exposed to and affected by political and regulatory risks for reasons such as the reliance on public incentive mechanisms, capital intensity of the technology, and technological risks (UNEP, 2012). To attract large-scale investment in renewable energy, policies should be designed to mitigate the political, regulatory and macroeconomic risks.

Mitigating the regulatory risks also requires that the approval and planning processes must be transparent and streamlined. The responsibilities of grid or utility companies must be clearly defined and the country should implement a "one-stop-agency approach" as opposed to a situation where investors have to submit applications to a number of authorities and interested parties for approval. Land-use for renewable energy should also be prioritized so that applications have much more chances of approval to reduce time and development costs. Requirements for approval of applications and the processes for renewable energy installations should be clear, simple and straightforward. In some cases, building regulations should require mandatory use of renewable energy, as is the case in some states in Germany, thus forcing investors rather than just attracting them to renewable energy use.

Public investment and procurement. Public funding of renewable energy development can be done through a number of means to serve a variety of purposes. They include paying for the difference between the cost of renewables and traditional generating facilities, reducing the cost of loans for renewable facilities, providing energy efficient services, funding public education on energy-related issues, providing low-income energy assistance, and supporting research and development. Some analysts suggest that national clean energy funds seem to be one of the more effective policies in promoting renewable energy development.

Government procurement policies can also aim at promoting sustained and orderly commercial development of renewable energy. Government purchase agreements can reduce uncertainty and spur market development through long-term contracts, preapproved purchasing agreements, and volume purchases. Government purchases of renewable energy technologies in early market stages can help overcome institutional barriers to commercialization, encourage the development of appropriate infrastructure, and provide market path for technologies that require integrated technical, infrastructure, and regulatory changes.

Customer education and mandatory disclosure of information. General education to raise consumer awareness about renewable energy and the environmental impacts of energy generation is critical. To this end, electricity restructuring policies should mandate that information be provided to customers about choice of electricity providers and characteristics of electricity being provided. Government's renewable access laws should provide property owners or consumers the right to continued access to a renewable source. Policy mechanisms should include access laws, development guidelines addressing street orientation, zoning ordinance with building height restrictions, and renewable permits that promote the installation and use of renewable energy systems.

Effectiveness of Incentives

Renewable energy policies should be cost-effective and promote development, i.e., ensuring that their benefits more than cover the direct and indirect effects of investments made in them. The effectiveness of such policies should be measured in terms of reduction in technology costs over time, increased access to electricity, reductions in power outages, lowered or stabilized pollution, and a rising share of renewable energy in the mix of power resources. First, there are varying levels of difficulty with respect to connecting renewable energy systems to utility grids. In cases where the interconnection process is burdensome and costly, the effectiveness and value of incentive programs that encourage the installation of grid-connected technologies is severely compromised. Second, a weak infrastructure, including a shortage of qualified installers and inadequately trained building inspectors, can discourage consumers from purchasing renewable energy systems. Offering generous incentives to increase demand before an adequate distributor and installer infrastructure is in place can frustrate potential participants and delay or discourage installations. Third, a more comprehensive renewable energy education campaign may be necessary to increase the deployment of renewables. Inadequate understanding of the types and benefits of renewables in general can become a major barrier to technology adoption. Educating and partnering with renewable energy businesses and advocacy organizations can leverage marketing activities and bolster interest in incentive programs. Given the attitudes that appear to play a role in the renewable investment decision, marketing campaigns designed to educate and mold attitudes of the general public accordingly are necessary to generate new interest in renewables. Fourth, governments have used tax credits as the predominant tools to stimulate

the deployment of renewables. Most tax credits are designed to be claimed over periods of time, ranging from one year to say 15 years, while a few have no expiration date. Tax credit programs vary widely with respect to system quality and performance provisions. While most at least call for compliance with government and industry installation and operating standards, some require detailed technical information, projected energy savings documentation, or post-installation certification (Gouchoe, Everette and Haynes 2002).

A policy model that combines tax and non-tax incentives increases confidence among investors and provides developers and equipment manufacturers with the funding needed to carry out projects. International experiences indicate that the appropriate introduction and use of policy instruments at different stages of renewable energy development are critical for the sector's development. An integrated policy approach to creating an enabling business environment for renewable energy is also very essential. Having the right policies is critical for the success of renewable energy development because in the early stages of market development, the public sector can play a make-or-break role. But government support and interventions must be judicious. Otherwise they can impose additional costs on private investors by increasing regulatory burdens and distorting the playing field, not to mention becoming a potentially huge budget liability (McGregor and James, 2011).

Conclusion

Developing a sustainable renewable energy generation is a complex and challenging task. Advancement of renewable energy technologies faces informational, financial and institutional barriers. As a result, countries have adopted an assortment of approaches to reduce financial barriers to their deployment. Policies that support the development of renewable energy seem to be most effective in higher-income emerging markets with good business environments that are committed to increasing their use of low carbon energy resources and are encouraging the development of domestic renewable manufacturing and service industries.

Incentives are an important tool that can help consumers and businesses overcome the barrier of high initial costs of renewable energy technologies. But to be effective, these incentive programs should be considered as one component in a comprehensive approach to creating a sustainable market. Without other supportive policies, including education and outreach programs, a standardized and quick interconnection process for grid-connected systems, and complementary financial incentives, the effectiveness of financial-incentive programs in stimulating market development will be compromised. In designing incentives therefore, a wide range of factors, such as partnerships and alliances among administrators, advocates, investors, lending institutions as well as governance, economic and political stability should be considered.

The following principles can help guide policymakers:

- Investment incentives must be effective in encouraging investment. For example, incentives must be large enough to facilitate investment and stable enough to help protect returns from sunk investments. But there must also be enough flexibility in the incentive regime to adapt to technological and market changes.
- Incentives should be tailored to the stage of renewable energy development in a country and designed in accordance with other government policies and energy market conditions.
- Incentives should be part of broader policies that encourage investments in renewable energy, such as improvements in the investment climate.
- Incentives—especially subsidies—should have a set budget so that they do not drain resources from other needs, especially in developing countries.
- Support for renewable energy should not only seek to attract investment in the short run, but also to guarantee that the mechanisms used are the most efficient.
- Incentives should be phased out as renewable energy sources and providers mature, prices fall as scale economies expand and learning curves shrink, and cost disadvantages diminish.

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