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The Benefits and Challenges of Using Feed-In Tariff Policies to Encourage Renewable Energy

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Addressing climate change requires rapid reductions in the use of carbon based energy sources that pollute the environment, yet electricity is a key resource for all societies. Governments across the globe are therefore looking for new ways to maximize electricity generation from clean, renewable sources – including wind, solar, and geothermal sources.

But governments face a key dilemma: in the early stages, electricity from renewable sources may be more expensive than electricity generated from burning coal or other fossil fuels. Conventional fossil fuels have had a long history of investment, including through government tax breaks and other kinds of public subsidies, and their market prices do not factor in the true costs of harms to the environment. To create a more level economic playing field for renewable energy, many national and state governments are using various policies. Governments may try to boost the supply of new kinds of energy by investing in science and technological development. Or they can boost the demand for electricity from renewable sources in two principal ways: *renewable portfolio standards* mandate that certain percentages of all electricity in a state or region come from renewable sources, and *feed-in tariff policies* establish long-term contracts to buy electricity from renewable energy projects or companies.

Renewable portfolio standards have been widely adopted by U.S. states. Currently, feed-in tariffs are used most extensively in Germany. The Canadian province of Ontario launched a major program in 2006, and California and various U.S. municipalities have also adopted small-scale feed-in tariffs. To identify benefits and challenges of feed-in tariff policies, my research surveys efforts in various countries and takes a close look at implementation of the Ontario program.

How Feed-In Tariff Policies Work

The idea behind feed-in tariff programs is to guarantee a market for the electricity generated from wind, solar and other renewable sources, helping investors to expand such technologies. Although feed-in tariff designs vary, they typically include several components.

- The program sets a standard purchasing price per unit of electricity supplied by a project generating power from clean, renewable sources.
- The program guarantees that electric utilities serving a region or locality will purchase all of the clean electricity made available, at contract prices guaranteed for up to 20 years.
- Most programs set limits on eligible technologies' project size.

Ideally, both governments and investors benefit from feed-in tariff programs. These programs reduce risks and regulatory obstacles, create stable markets, and allow companies or projects to borrow at more affordable rates. As new technologies are deployed, models and experience suggest that prices will decline through learning and innovation. Many studies of feed-in tariff programs find that they have effectively reduced the costs per unit of renewable energy.

Depending on how they are designed, feed-in tariff policies can also increase community ownership of energy resources. Standard contracts are easier to utilize and thus allow not only corporations but also community groups to develop projects. In turn, community ownership may make it easier to build public support for new technologies such as wind turbines.

The Challenges Programs Often Face

Feed-in tariff programs, including those in the United States, Canada, Germany, Spain, China and India, have delivered many benefits – but they have also run into a variety of challenges. Although there may be consensus as a new program is designed and enacted, this does not necessarily translate into effective prices or continuing public support. Certain challenges are predictable – and there are measures that can be taken to minimize difficulties.

- Local groups have ended up protesting the technologies deployed in feed-in tariff projects, particularly large-scale wind farms. Guaranteed high rates encourage corporate investors to act quickly without local participation. This is especially likely in the United States, where federal incentives for renewable energy are based on accelerated depreciation tax write-offs and tax credits, both of which are especially valuable to corporate investors. Programs can potentially reduce opposition to new technologies by *requiring* community ownership.

- Private actors and government officials may not have equally good information when prices are initially set for feed-in tariff programs. The guaranteed price may turn out to be too high, which can erode support for the program and lead to unnecessary public costs. Ideally, programs should require price to adjust as the amount of production capacity increases. This dynamic design has been used with success in Germany.

- Even if price adjustment mechanisms are built in from the start, feed-in tariff programs experience inherent tensions between maintaining policy stability to ensure investor confidence and adjusting the policy when unforeseen problems or new information arises. To maintain support, policymakers may need to build in plans for future renegotiations.

- As governments increasingly use feed-in tariffs and other policies to encourage renewable energy, jurisdictional clashes and legal challenges can result. If the program includes rules mandating local sourcing or job creation, the policy may clash with international trade agreements or interstate trade law. Programs should be carefully crafted to minimize foreseeable problems and maximize cooperation with other regions and countries.

Although feed-in tariffs are no magic bullet, they have proven to be a valuable tool for communities, regions, and nations committed to speeding transitions to the use of renewable energy to produce electricity. With careful attention to challenges that can arise as programs are designed and implemented, feed-in tariffs can become steadily more effective in the years ahead, helping society to effectively address climate change.

Read more in Leah C. Stokes, "The Politics of Renewable Energy Policies: The Case of Feed-In Tariffs in Ontario, Canada." *Energy Policy* 56 (2013): 490-500.