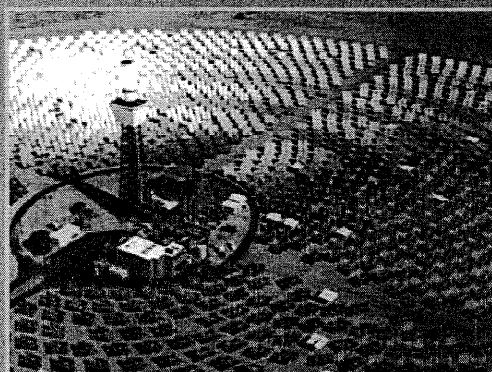
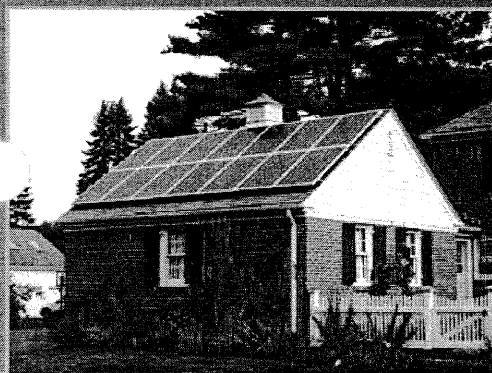
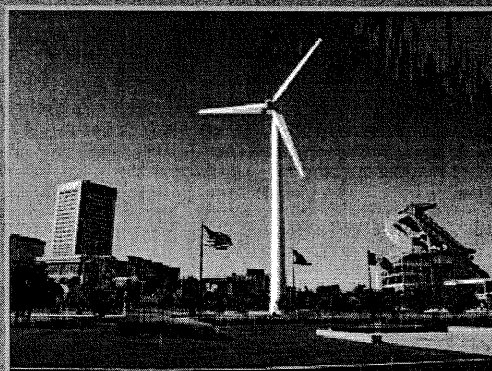
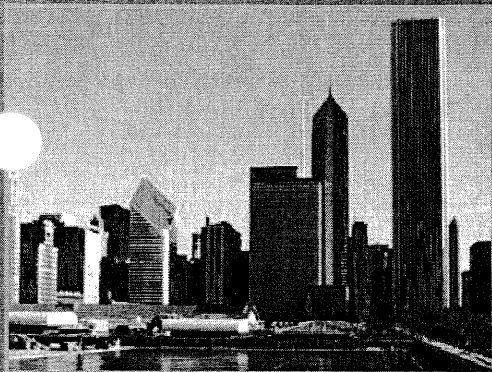




A Policymaker's Guide to Feed-in Tariff Policy Design

Toby D. Couture
E3 Analytics

Karlynn Cory
Claire Kreycik
National Renewable Energy Laboratory

Emily Williams
U.S. Department of State

Technical Report
NREL/TP-6A2-44849
July 2010

 **NREL**
NATIONAL RENEWABLE ENERGY LABORATORY

Evaluation of Incremental FIT Payment Adjustments

The rapid pace of renewable technology advancement, combined with changes in the costs of different renewable energy technologies, can make adjustments to FIT payments necessary to ensure the cost efficiency of the policy over time. Therefore, the provisions surrounding payment adjustments are a central component of a well-designed FIT policy.

As noted above, these can include either an automatic adjustment, which occur according to a pre-established formula (e.g., tariff degression, inflation adjustment); or they can be an administrative adjustment, which can occur on a periodic basis (e.g., quarterly, annually, or every three or four years). Note that these adjustments can allow prices to be tracked both downward (due to decreases in technology costs, improved operational efficiencies, technological learning, etc.), as well as upward (due to slower-than-desired rates of growth; increases in technology, labor, and/or materials costs; a tightening of supply and demand, etc.)

Automatic adjustments can help foster greater investor certainty, primarily because they are transparent and established in advance. They also provide a clear signal to manufacturers, who have to continually improve products to keep up with the planned tariff adjustment schedule. In the Spanish approach, they adjust their solar PV tariffs via a transparent formula. This allows the adjustments to occur automatically based on market growth and the desired annual amount of a given RE resource, while reducing the need for direct administrative intervention in the future.

Administrative revisions could provide a more adaptable pricing framework by tracking market trends more closely than one based on a predetermined formula, or a fixed adjustment schedule. These incremental, administrative revisions could allow tariff levels to be adjusted in direct response to changing market trends in order to reduce the risks of both over- and under-compensation.

Either way, if FIT payment adjustments are too large, too often, or too sudden, they could jeopardize investor confidence, which increases market uncertainty – both of which could significantly slow the rate of renewable energy development and increase the future costs of deployment (Deutsche Bank 2009). Periodic revisions that require administrative oversight every year, and especially quarterly, are also likely to increase the administrative burden of the program. Whichever approach is used to implement FIT program revisions, the challenge is to strike a balance between overall policy stability and flexibility. This ensures that the payment levels accurately reflect renewable energy project costs but still allow for a reasonable return.

5.5.1.2 Incremental Fuel Price Adjustment

For renewable energy resources dependent on a fuel (such as biomass), it is possible to introduce a fuel adjustment clause that allows the market price fluctuations to be tracked in a more flexible manner. For example, Spain applies a fuel price adjustment every three months for resources dependent on a fuel (Spain 2007).

Evaluation of Incremental Fuel Price Adjustment

By allowing fuel price adjustments to occur more frequently, policy designers can better track the market trends for the resource price and provide investors with a revenue stream that is more closely adjusted to actual price fluctuations. This also provides the RE developer with greater flexibility by adjusting the FIT price to compensate for changing market conditions. Because

future biomass fuel prices are hard to predict, contracts with built-in fuel price adjustments, more frequent revisions, or both may be desirable for renewable resources that are dependent on a fuel. This can be done by automatic adjustments based on an agreed-on formula or by administrative revisions.

However, the unpredictability of future fuel prices can make it challenging to design accurate fuel adjustment mechanisms. FIT policy designers can address this through shorter contract terms or more flexible pricing arrangements for the electricity generated from biomass sources.

5.5.2 Comprehensive FIT Program Adjustments

Comprehensive FIT program adjustments require a more detailed revision of the policy framework than the FIT payment adjustments examined above – they involve a more detailed consideration of policy goals and overall policy structure. These adjustments can include program eligibility, the duration of support, the presence of caps or targets, and other factors. Comprehensive program revisions typically involve a more detailed review of the policy's success, while highlighting where changes need to be made based on both evolving policy goals and changing technology costs and market conditions. FIT program revisions allow prices to be tracked both downward (due to decreases in technology costs, improved operational efficiencies, technological learning, etc.), as well as upward (due to slower-than-desired rates of growth; increases in technology, labor, and/or materials costs; a tightening of supply and demand, etc.) in a way that is supplementary to FIT payment adjustments.

These broader changes to the FIT program structure generally happen less frequently (typically every two to four years). This is important because it sends a more reliable market signal to project developers and, more important, to RE investors, who tend to prefer stability and predictability of policy changes (Deutsche Bank 2009, Dinica 2006, Wang 2009). These can be broken down into periodic revisions (which occur at fixed intervals) or be based on the attainment of capacity milestones. The advantages and disadvantages of program adjustments are explored at the end.

5.5.2.1 Periodic Program Revisions

Periodic revisions establish a fixed schedule for FIT program revisions, which are typically scheduled to occur every few years.

For example, Germany has program revisions planned every four years, and the German Parliament has to approve amendments to the tariff levels before they can be enacted into law (Germany BMU 2007). The OPA in Ontario plans to perform comprehensive program revisions every two years in its FIT framework (OPA 2009a). This predictable revision period creates a stable investment environment during the four-year period, while ensuring that the policy retains the ability to track market cost trends and technological improvements.

Evaluation of Periodic Program Revisions

By setting predetermined revision dates, policy designers can increase the overall transparency of the FIT policy for investors, while providing a stable schedule for tariff and policy revisions. This stability can foster investor confidence and drive more rapid RE deployment.