



Tariff Unbundling and Incentive Regulation

Energy Regulatory
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Feed-in Tariffs: Definition



- **Feed-in Tariff (FIT)**

- A renewable energy policy that offers a **guarantee of payment** to renewable energy developers for the electricity they produce.
- System of payments for each kilowatt-hour of electricity generated.
(Price = cost of electricity produced + reasonable profit for producer)

Toby Couture, National Renewable Energy Laboratory
(NREL) US Dept of Energy www.NREL.gov

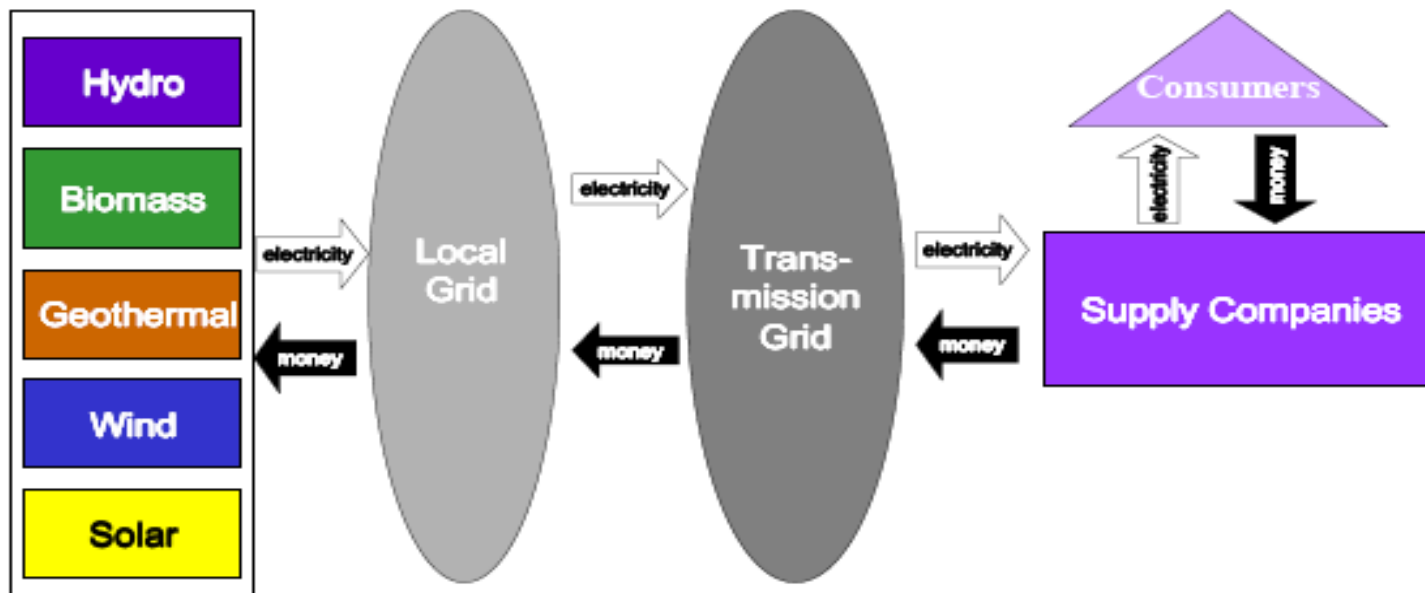
Feed-in Tariffs

“Turn farms, homes, and businesses
into entrepreneurs”

--Terry Tamminen, Former Chief Policy Advisor to Governor Arnold
Schwarzenegger



Feed-in Tariffs: Concept



Bianca Barth, World Future Council
www.worldfuturecouncil.org

Feed-in Tariffs: By Any Other Name

- FITs that differentiate by

- technology,
- resource intensity,
- project size or
- application

are considered to be “modern” or advanced, thus known as Advanced Renewable Tariffs (ARTs)

Feed-in Tariffs: By Any Other Name

- By differentiating, ARTs break any remaining links between rates paid for RE and the cost of conventional generation that renewable resources offset.
- Payments can be adjusted to reflect elements of a levelized cost of electricity generation, with a modest profit included.
 - Slightly lower payments to larger projects (economies of scale) and
 - Slightly higher payments to projects where development is costlier.

Feed-in Tariffs: Unbundling

- Unbundling separates out the costs of generation, transmission and distribution.
- Cost of Service Process:
 - Cost of service is not a science, it is an art derived from processes viewed from differing perspectives...

Feed-in Tariffs: Unbundling

- Elements of the cost of service process
 - Revenue requirement determination
 - Determine the revenue requirements of the utility
 - Cost allocation
 - Unbundle costs by function (production, transmission, distribution, etc.)
 - Classify costs (demand, energy, customer costs, etc)
 - Allocate costs among customer classes (residential, commercial, industrial)
 - Design rates
 - Traditionally: cost + reasonable return



Feed-in Tariffs: Incentive Issues

- FITs set the price and let the market determine capacity and generation.
 - Diversity of providers creates competition in new small and medium-sized providers.
- By the market responding to energy needs, a more nimble response is possible when economic factors change.

Feed-in Tariffs: Incentive Issues

- Tariffs prices are designed to encourage development of many types and sizes of renewable projects, in diverse locations.
- Each project draws on the strength of that geographic area – good wind, many sunny days, available biomass.



Feed-in Tariffs: Incentive Issues

- Goals:
 - Encourage entrepreneurs:
 - Security for investment in renewables by guaranteeing tariff rates for long terms, covering the working life of an installation.
 - 20 years in Germany
 - 25 years in Spain
 - Security lowers loan interest rates, making money more readily available to small producers and increasing energy generated from renewable sources.

Feed-in Tariffs: Incentive Issues

Limit the dollars at risk:

- capacity caps - only recognizing certain technologies, certain producers, (only community owned, school operated, etc) and open to a certain market. Often viewed as a “pilot project”.
- The danger of this approach is higher costs to stop/start a project then growing a market with a long-range view.

Feed-in Tariffs: Incentive Issues

- Common problems:
 - Setting the tariffs (prices) too low so development is not attracted,
 - Setting a limit on project size (especially one too low to allow capacity to develop).



Feed-in Tariffs: Costs

- Connection to the grid: paid by the plant operator
- Essential grid upgrades: paid by the grid system operator
- Metering devices: paid by the plant operator
- Renewable Energy contribution: paid by consumer (only 3-5% of bill)
- German Experience: FIT energy surcharge added approximately 625 ₮ (\$4.18 US) to the monthly electricity bill per household in 2007

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Feed-in Tariffs: Structure

- In their pure form, FITs are:
 - Simple, comprehensive and transparent,
 - Provide simplified interconnection,
 - Provide a sufficient price to encourage development,
 - Long enough contract to reward investment,
 - Differentiated by technology, size and resource intensity.

Feed-in Tariffs: Structure

- FITs can be implemented alongside existing renewable energy programs, i.e. net metering.
- FITs may be sufficient by themselves in pure form or in combination with other tariffs – hybrid.
- Customized to each country's needs.

Feed-in Tariffs: Benefits



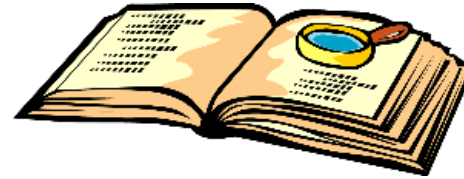
- More equitable – enabling everyone (homeowners, farmers, cooperatives & businesses) to profit from renewable energy.
- Payments are not tax credits that only benefit those with tax liabilities.
- Most successful way of developing renewables markets with associated social, economic, environmental and security benefits. (Local jobs re-circulate 300-600% more money than money sent out of state/nation.)
- Greater flexibility accounting for changes in technology and the marketplace.
- Encourage growth of small and medium-scale producers.
- Low transaction costs.
- Ease of financing by offering predictable revenues.
- Low barriers to entry with minimal administration.

Feed-in Tariffs: Cautions



- If prices are not adjusted over time
 - Too high: consumers may pay too much, with undue profits for providers.
 - Too low: not enough providers will enter the market.
- Must be able to connect to the grid in a simple, timely way with reasonable costs.
- Renewable Energy trade may be restrained due to domestic production requirements (This issue faces all RE sources.)
 - The more a market is opened with diverse technologies, the more it offsets the low early cost factor of the Quota system.)

Quotas: Definition



- Extensively used in the US:
 - opposite of FIT.
 - Government mandates a share of electric generation comes from RE sources, with that share increasing over time, with a final target and end-date.

Quotas: Benefits



- Promote least-cost projects (cheapest resources used first, low early costs, i.e. “cherry picking”).
- Theoretically provides certainty for future market shares for renewables.
- Perceived as being more compatible with open or traditional power markets.
- More likely to fully integrate renewables into electricity supply infrastructure.

Quotas: Cautions



- High risks and low rewards for equipment manufacturers & project developers, slowing innovation
- Price fluctuation in “thin” markets, promoting instability and gaming
- Favors large, centralized plants over small investors due to greater investment risk.
- Concentrates development in areas with the best resources (high transaction costs)
- Lack of flexibility to respond to a changing market.
- Complex design, administration and enforcement, leading to a lack of transparency



The Michigan Picture

- Implementing a Renewable Portfolio Standard (RPS) as part of 2008 PA 295.
 - RPS is the most common state-level policy in the US today.
 - 28 states have mandatory RPS policies (plus the District of Columbia) and 5 states have voluntary RPS goals.
 - Essentially a quota-based model requiring 15% renewable energy by 2015.
 - Fairly moderate requirement, perceived by legislators to reduce rate shock to the customers.



The Michigan Picture

- Implementing a RPS means a utility needs to determine how it will meet the RE requirement.
 - Competitive bids submitted through Requests for Proposals (RFPs), containing costly analysis without a guarantee of any return if the proposal is rejected.
 - If the bidder avoids the cost of an in-depth analysis and are selected, then they must figure out how to provide the energy for that price!



The Michigan Picture

- Studying the use of FITS in conjunction with RPS, with final rules for net metering being put into place as we speak.
- Two major utilities doing pilot projects:
 - **Consumers Power Company:**
Limited to 2 MW of solar (out of 8,000 MW system total)
Request for Proposal has not been released, but there is already a high level of interest by prospective providers for well over the 2 MW amount.
 - **Detroit Edison:**
Net metering pilot project for 5 MW of electrical generation
(out of 10,000 MW system total)

Resources



- Feed-in Tariffs: Accelerating the Deployment of Renewable Energy, Miguel Mendonca, Earthscan, 2007
- “Feed-in Tariff Policy: Design, Implementation, and RPS Policy Interactions”, Karlynn Cory, Toby Couture and Claire Kreycick, Technical Report NREL/TP-6A2-45549, March 2009
- “Core principles for effective power sector reform”. Paul Moffatt, Senior Counsel, office of the General Counsel, EBRD and Vesselina Haralampieva, Associate, Office of the General Counsel, EBRD
- <http://www.wind-works.org/index.html> Paul Gipe