Urban Pathways

FACTSHEET on Feed-in Tariffs (FITs) 2018

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Citation:
Glensor, K. Factsheet on Feed in Tariffs. Urban Pathways 2018.

Supported by:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

based on a decision of the German Bundestag

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In brief

Feed-in Tariffs (FITs) are a policy measure in which (small, distributed) producers of electricity are offered a set price for any electricity they feed-into the electricity grid. They contrast to generation prices as defined by electricity markets, which vary greatly depending on the supply and demand (and have been known to be negative for periods). As such, the conventional markets offer little security for investors, which tends to deter small-scale, distributed and renewable generators. FITs provide investment security by offering a pre-set price for electricity generated. Classically the price is fixed, but can vary according to generation type (i.e. solar PV, wind) or time of day, or other factors. The costs for FITs can be borne by consumers directly, (as in Germany), by taxpayers (as in the Netherlands), or a combination of the two approaches (as in Spain) (Couture et al. 2010).

Examples/measures

The flagship example of a FIT is Germany's EEG from 1990, arguably the centrepiece of that country's Energy Transformation (Energiewende). Furthermore, "Between 1990 and 2011, 23 EU member countries implemented a FIT to support solar PV or onshore wind development" amongst them Italy, Denmark, France and the UK (Jenner et al. 2013). They are typically implemented at national level, but some cities have implemented them (in the absence of national-level action), such as Cape Town in South Africa, and Palo Alto in the USA. The Cape Town policy is examined in more detail, below.

Results

FITs have proven to be one of the most popular policies for increasing renewable electricity generation (Jenner et al. 2013, Couture et al. 2010), resulting in the EU countries which have implementing them installing 70,000MW of solar PV and wind capacity between 2000 and 2009 (Couture et al. 2010).

Technical and financial considerations

Assuming the costs of a FIT are included in the electricity price paid by consumers (as in Germany), the financing burden on local authorities is low. If, like in the Netherlands, it is funded from tax revenues or from elsewhere, these may be borne by the local authority.

FITs typically don't involve investment in generation capacity by governments, so the financial considerations for local authorities should be low to none, as investments should be undertaken by private actors. As they reduce the uncertainty in income levels from electricity generation, they should ease financing investment in appropriate renewable electricity generation for those actors, however.

The technical considerations for local authorities include the safe mechanical and electrical installation of generation equipment, and metering the electricity fed into the grid. The local-level electricity grid must also be able to accept electricity fed-in at household level. A mechanism should be in place to control the amount fed into the grid for safety reasons, to avoid overloading the grid with excess capacity.

A further consideration is that of grid balance (i.e. the momentary supply must be close to demand), which is usually within the remit of DSOs or TSOs. While the amounts fed into the system remain small, grid balance will remain within usual variations, and easily balanceable by existing systems; if however the amounts fed in reach the limits of local balancing systems, counter-measures will be required.

Policy/legislation

To date, FITs have typically been the preserve of state or national governments, with notable exceptions at municipal level in Pala Alto, USA (www.cityof-paloalto.org), Cape Town, South Africa (www.cape-town.gov.za)(example below). Given the wide range of FITs implemented, it is probable that one can be emulated from a country or state with comparable government structures (and language).

FIT policies should cover the following aspects

- How the FIT will be funded.
- Pricing. Define how much generators will be paid, for what kind of generation, with what limits on each producer, but also on the whole system.
- Grid access (allowing generators to connect generation equipment to the grid).
- Safe connection of generation to the grid.
- Grid absolute and balancing capacity.

Institutions and critical stakeholders

The lead agency in the local authority should be the one responsible for electricity supply, generation and or distribution, or energy (efficiency) matters in general. Funding support is needed from tax or rates if the FIT will be funded from these sources.

National policy frameworks are relevant insofar as they affect the local authority's mandate to raise tax for FITs or add a change to consumers' bills. The national level may also need to change legislation to allow private actors to connect generation to the grid. National-level agencies, or the bodies/companies responsible for the grid and electricity generation, may also need to be included concerning matters related to generation, grid capacity and balancing.

Other relevant stakeholders include responsible for or representing electrical worker training and/or certification regarding proper and safe installation and maintenance of systems and also line/equipment maintenance.

Transferability

The large diffusion of FITs at national and state level points to the ease with which they can be transferred. As the remit for the electricity system often resides above municipal level, however, implementing FITs at municipal level is challenging, although Cape Town and Palo Alto show it can be done.

Case study: Cape Town, South Africa

Context

Cape Town is South Africa's second most populous city, with 3.7m people inhabiting its metro area. It has set itself the goal of reducing its CO2 emissions by 37% of 2012 levels by 2014, 9.3% from electricity efficiency, 15.9% from cleaner electricity supply (and 11.2% from transport efficiency). Currently, most of the city's electricity is generated from coal, but 3.6% of the supply utility's generation is from renewables.

The situation regarding electricity supply in Cape Town is complex. Cape Town is responsible for electricity distribution and retail for 75% of Cape Town (engineeringnews.co.za). Throughout South Africa, 30% of the municipalities income is derived from electricity retailing (soventix.co.za). Further complicating this is that the tariffs are made so that around 50% of customers are subsidised by wealthier households (htxt.co.za). With the drop in price of PV panels, it is becoming feasible for wealthier customers to install systems to go off-grid, undermining the system.

The governing legislation for electricity generation contains limitations on licencing producers. Namely, electricity generators below 1MVA (≈1MW) are exempt from licencing requirements, as is generation equipment intended for own use.

Small Scale Embedded Generation (SSEG) is name of the city's feed-in tariff (FIT). This is part of Cape Town's strategy to reduce emissions from electricity generation and keeping wealthier households as customers rather than going off grid. The policy has the goal of having an installed capacity of 120MW by 2020 (IDP 2017-2022), primarily on commercial buildings. For residential customers, a more cost-effective meter is being pursued to allow for more installations. For approved residential and some non-residential connections, customers can offset their electricity usage with that they generate from their own small-scale (<1MVA) on-site generation (but their purchases must exceed their generation). In 2017/18, the feed-in tariff amounts to 34-62% of the purchase price (per unit) of electricity in the city .

Image: Cape Town (Source: Vijandren Naidoo, https://www.yumpu.com/en/document/view/59543960/vijandren-cape-town)

In action

In the absence of action from the national level or from the generation utility (Eskom), Cape Town municipality proceeded themselves. This required some creative legislation and wording, however. To avoid the need for licencing according to the Electricity Regulation Act, Cape Town's FIT applies only to installations below 1MVA (≈1MW) and to net users, which in practical terms means participating customers must use more than they produce. Also, adoptees of the FIT are "small scale embedded generators" not independent power producers as "these require an expensive licence to operate, and are subject to rigorous safety checks" (htxt.co.za).

On the technical side, a qualified engineer must certify their system, which is expensive, but the city is trying to have the national wiring code amended to allow electricians to certify installations, lowering the barrier to entry. Local rules also dictate that the installations are fitted with 'anti-islanding' systems to ensure the safety of technicians working on power lines and other equipment (htxt.co.za).

Results

The policy should contribute to Cape Town's goals of reducing GHG emissions from electricity while maintaining it's incomes from the electricity business and, crucially, maintaining the presence of wealthier customers on-grid and thus the subsidies for the city's poorer residents. It can be expected that there will be jobs created installing and maintaining the systems also.

The national regulator, NERSA, has undertaken stakeholder consultation on the regulation surrounding small-scale embedded generation (NERSA 2015), and is currently drafting (new) legislation on the topic. In the meantime, 17 further municipalities in South Africa's Western Cape province have adopted SSEG policies (or are doing so) (Greencape.co.za).

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