

Net metering and net feed-in tariff for embedded solar PV in South Africa

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Abstract

Due to drastically reduced prices for Photovoltaic (PV) systems and significantly increased electricity tariffs in the last five years, embedded PV generators are now attractive for many electricity customers in South Africa as a supplement to their main electricity supply. But embedded PV is not only attractive for individual electricity customers; it is also a cost-competitive new-build option in South Africa for the power system as a whole and a supplement to the fleet of new large, central power generators. At the same time, the South African power system is currently under severe constraints, with several controlled load shedding events in late 2014 and during the first months of 2015. Embedded PV fulfils the requirements to address the electricity crisis that South Africa is currently facing in three dimensions: First, it is cheap with effective tariff payments of 0.8-0.9 R/kWh required to stimulate the market; second, it can be implemented fast, because of the distributed nature many thousands of projects can start implementing at the same time; third, it can be significant, with estimated 500-1,000 MW of annual new-build capacity that could be ramped up quickly. That is a system view. A large uptake though without any countermeasures will put the financial stability of electricity distributors (municipalities and Eskom) at risk, because self-consumed PV energy reduces the sales and therefore gross-margins of distributors, which they need to cover their fixed cost of building, operating and maintaining the distribution grid, as well as cost of metering and billing. The CSIR Energy Centre therefore developed a Net Feed-in Tariff (NETFIT) concept in which electricity distributors are made financially indifferent to embedded PV, and in which the business case for the PV owner is de-risked at the same time. The concept differs from the also widely known “net metering” approach in the sense that it stimulates embedded PV as part of the overall power-generation fleet, regardless of what the specific load at the customer’s site is, and it compensates municipalities financially for the portion of the fixed grid cost of electricity distributors that they cannot recover from electricity sales anymore due to self-consumed PV electricity. The NETFIT concept is estimated to lead to no net costs to the system compared to alternative new-build options.