Quantifying system-wide financial costs and benefits of PV in South Africa

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Abstract:
The South African power system is currently under severe constraints. Controlled load shedding occurred several times in 2014. Diesel-fired gas turbines, which are meant to be the barely-everused “safety-net” of the power system, ran at more than 15% average annual load factor in 2014. At the same time, the South African Department of Energy is procuring new power generators, particularly renewables such as wind and PV. By the end of 2014, about 1 600 MW of new capacity (600 MW from wind and 1 000 MW from PV) was commissioned and fed energy into the grid. In this study, the electricity-system-wide direct financial costs and benefits in South Africa from the first 1 000 MW of PV that came online in 2014 are quantified. The two effects of PV that are quantified in this study are the fuel savings in the conventional fleet, as well as the avoided “unserved energy” during the year 2014. First PV projects in South Africa generated financial benefits of R2.8 billion (€ 200 million) in 2014.