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CORRECTION
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Corrigendum: South Africa After Paris-Fracking Its Way to the NDCs?

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A Corrigendum on

South Africa After Paris-Fracking Its Way to the NDCs?
by Orthofer, C. L., Huppmann, D., and Krey, V. (2019). Front. Energy Res. 7:20. doi: 10.3389/fenrg.2019.00020

In the original article, there were two errors. First, for historical vintages of some power plants, in- and output coefficients of commodities and emission coefficients were missing. This affects only a few older plants and mostly in the near-term, i.e., the early modeling periods (2020, 2030). Second, there was a bug in the post-processing script that calculates total installed capacity of technologies. Instead of summing over different vintages, the script was summing over different years of activity which led to most notable deviations for some emerging conversion technologies (e.g., solar PV).

A correction has been made to the Results section, subsection Reaching the NDC Pledge Without Domestic Shale Gas, Paragraph 2.

The corrected paragraph reads:

Focusing on the power sector, the introduction of a carbon price leads to a diversification of the fuel mix. In the absence of climate policy, coal will remain the dominant fuel source for power generation, with coal power plant capacities increasing to 100 GW total installed capacity. By 2050, the total annual power output from coal plants increases to 630 TWh by 2050 (Figure 5). With increasing carbon prices and correspondingly higher electricity tariffs, electricity demand decreases relative to the baseline and generation from renewable energy sources provides a growing share of installed capacity. Already a moderate introductory carbon price of 10 USD/tCO_2 could reduce power demand by 15% and motivate the installation of over 100 GW of renewable power generation capacity thereby more than halving the power generation from coal by 2050. Additionally, coal power plants with carbon capture and storage (ccs) technology will become economically viable and thus further decrease energy related emissions. This power plant portfolio would require a coal power plant fleet for base load of approximately 45 GW. If the carbon price is introduced at 30 USD/tCO_2 the coal power plant fleet will contribute no more than 5% of installed capacity by 2050. Instead, renewables will dominate the power plant fleet with approximately 140 GW of combined installed capacity supported by 70 GW of gas-fired power stations for peak load purposes, respectively.

Furthermore, a correction has been made to the Results section, subsection Deployment of Shale Gas Over Time, sub-subsection The Power Sector, Paragraph 2.

The corrected paragraph reads:

In a no-carbon-price scenario, moderately priced shale gas (3 USD/GJ) has a small to negligible impact on the power system. Over the entire time horizon the majority of the electricity remains to be produced by coal fired power plants (80%). At a carbon price of 10 USD/tCO_2 renewable power generation multiplies to approximately 60% of the total power demand of 2050. Supported by gas power plants, renewable power reduces coal power generation to below 10% of total installed capacity. If carbon prices increase further to 30 USD/tCO_2, coal power generation could diminish

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by 2050 as renewable and gas power stations are complemented by nuclear power facilities to meet electricity demand.

In line with fixing the above mentioned model issues, the GitHub-repository and figures were updated.

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.