



# International experiences with tender procedures for renewable energy – A comparison of current developments in Brazil, France, Italy and South Africa

Benjamin Bayer\*, Dominik Schäuble\*, Michele Ferrari

*Institute for Advanced Sustainability Studies e.V., Berliner Str. 130, 14467 Potsdam, Germany*

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## ABSTRACT

Tenders are a fast spreading instrument to attract and procure new generation capacity from renewable energy sources. However, there is a need for current analysis of experiences as in many countries tenders were introduced only few years ago. The objective of this study is to provide an up-to-date comparison of tender results for wind power and photovoltaics in Brazil, France, Italy and South Africa. We analyze and discuss rates of completion, market concentration and auction prices, based on data and literature research as well as expert interviews.

Data on project status shows that rates of on-schedule completion are well below 100% ranging between 14% in Brazil and 41% in South Africa (wind). However, final rates of completion of 100% are possible (South Africa). With exception of France current data suggests cancellation rates of less than 5%. A systematic connection between project cancellations and the instrument of tenders could not be identified.

The market share of the five largest owners differs largely between the countries and ranges from 33% (Italy) to 70% (South Africa). Despite the high level in South Africa, the significant oversubscription of tender volumes suggests that free price formation likely was not constrained. Nevertheless, small actors (< 50 MW total capacity) are rare in Brazil and South Africa. For Italy their share cannot be determined due to lack of data.

In all countries except Brazil auction prices have continuously fallen by 33% (Italy, wind energy) to 76% (South Africa, photovoltaics). In Brazil, the auction price increased from auction round eight to 14 from 50% to 85% of the first auction price. However, auction prices are highly dependent on factors outside of the support scheme of tenders (e.g. interest rates), so that their evolution and level are not a suitable indicator to determine whether tenders lead to minimal support costs.

## 1. Introduction and methodology

Tenders were utilized in early 2015 in at least 60 countries as an instrument to attract and procure new generation capacity from renewable energy sources [1]. It should be noted that, despite the relatively large number of countries using tenders, they have only in recent years taken on a key role as a support scheme in the expansion of renewable energies. This means that there is an ongoing need for analysis and evaluation of recent experiences made with tenders. All the more since an increasing number of countries is now making the switch to tenders as an instrument to promote the expansion of renewables.

As a rule, tenders determine the assignment of guaranteed remuneration payments over long periods of time (often 20 years). The key differences to the widespread feed-in tariff models are the restriction of support to the group of successful bidders and the use of competition-based pricing. With the feed-in tariff model, support rates are

determined through administrative regulations. Every operator of a renewable energy system is entitled to remuneration payments provided that he fulfills certain requirements and obligations (see e.g. [2]).

The theoretical advantages of a support scheme based on tenders lie first and foremost in the more precise steering of expansion and in the lower risk of excessive support that can be achieved through the competition-based determination of remuneration rates. One potential disadvantage is the fact that while tenders allow a capping of the expansion of renewable energy, it is impossible to ensure that the targeted expansion rates are actually achieved. There is also the risk of market concentration in the medium term, which can lead to market power and excessive rates of return for competitive actors. An overview of the opportunities and risks associated with tenders is given in Klessmann et al. (2016) [3], for example.

There is a wide range of literature on the topic of tenders and the associated international experience. In recent years alone, numerous

\* Corresponding author.

E-mail addresses: [benjamin.bayer.work@gmail.com](mailto:benjamin.bayer.work@gmail.com) (B. Bayer), [dominik.schauble@iass-potsdam.de](mailto:dominik.schauble@iass-potsdam.de) (D. Schäuble).

studies were published that examined tender designs and the experiences of different countries, e.g. [4–14]. In addition, numerous case studies have been published, which analyzed the experiences of different countries with tenders for renewable energy (e.g. Brazil [15–19] and South Africa [20–22]). Furthermore, the country-specific experiences are at the focus of joint studies that focus on specific technologies (e.g. wind energy) or country groups (e.g. IEA countries) [23–26].

Despite the wide range of literature on tenders, there have been very few attempts so far to systematically compare the results of tenders and to explain the differences in a country-specific context. Though there is a general lack of data on the international experience, del Río and Linares (2016) conclude that tenders result in comparatively low remuneration rates [27]. Furthermore, they conclude that tender schemes tend to have low completion rates – this is for example true for Brazil, Ireland, Portugal, Peru and the United Kingdom [27]. So far, there is however no comparative analysis on the topic of market concentration.

Moreover, the existing literature (except [19] for Brazil) lacks of analyses on market concentration, despite the known risk and the potentially significant impacts on the efficiency of the support scheme and on support costs. Additionally, previous analyses on the current development (e.g. [19] for Brazil and [20] for South Africa) were only able to estimate the completion rate of recent auction rounds, as the results were not yet (fully) available at the time of publication.

With this study, we hope to make a contribution to closing this gap. The aim of the study is to present an up-to-date comparison of key tender results in Brazil, France, Italy and South Africa, and to discuss the developments observed and their causes in qualitative terms. For this purpose, we will update the time series of the indicators “auction prices” and “rate of completion” in the countries examined. We will conduct the first-ever assessment of market concentration based on the indicators “cumulative number of market participants” and “market share of the five largest market actors.” We will also investigate the reasons for the development of tender results by way of expert interviews and a review of secondary literature.

We will limit this study to the countries Brazil (wind), France (PV), Italy (wind) and South Africa (wind and PV). In the years 2013 and 2014, these countries showed an average technology-specific expansion of more than 200 MW, conducted auctions in the recent years and have been utilizing the instrument of tenders long enough for the completion deadline in at least one auction round to have expired. Further countries do not meet these criteria due to various reasons. Countries like China, Ireland or Portugal or Uruguay do not anymore conduct auctions to procure new generation capacity from renewable energy. The four countries held the last auction in 2007, 2003, 2008 and 2012 respectively. Countries like Germany, Spain, Mexico or Zambia have only recently introduced auctions which implementation deadline has not been met at the time of writing. Furthermore the number of countries that expanded the capacity of a specific renewable energy technology of more than 200 MW in 2013 and 2014 is very limited. Countries like Peru did not reach such an expansion in the mentioned years.

Section 2 provides an overview of the tenders examined. In Sections 3 to 5, the results of the auctions are presented and discussed. The conclusion follows in Section 6.

## 2. Countries examined

We examined tenders as a support scheme in the countries Brazil, France, Italy and South Africa for the technologies of photovoltaics and wind power. Table 1 shows key background information on tenders in the countries examined. In Brazil and France, the completion deadlines of seven or eight rounds of auction are already expired, while Italy and South Africa, experience is limited to one or two auction rounds.

The overview shows that the motivation for introducing tenders varies considerably. In Brazil and South Africa, tenders are used to enable the large-scale expansion of photovoltaics and wind power. The objective is for both technologies to become an integral component of

the energy mix. In France and Italy, by contrast, the emphasis was on limiting the expansion of photovoltaics and wind power.

Already the varying motivations for the introduction of tenders provide an indication of the different stages of progress in the expansion of photovoltaics and wind power in the four countries. The share of photovoltaics and wind power in gross electricity production in Italy was 13% at the end of 2013. In France, the share was 4%, in Brazil 1%, while in South Africa it was just above zero.

Furthermore, the expansion of photovoltaics and wind power takes place under very different circumstances. Italy and France are among the industrialized countries with a relatively high per capita gross domestic product (GDP) of USD 35,463 and USD 39,328 respectively (at purchasing power parity in 2012) [28]. The per capita GDP of the two developing countries Brazil and South Africa is three times as small: USD 13,049 and USD 15,893 respectively (at purchasing power parity). In Brazil and South Africa, the economy grew by over 3% on average over the last ten years, while economic growth was under 1% in France and in Italy it was even on the decline [29].

The role of tenders in the expansion of (renewable) energy generation capacity also differs considerably from country to country. In Brazil, tenders have been the central element since 2004 to expand generation capacities [8]. Since 2004, power plants of the different technologies (e.g. hydropower, gas) with a capacity of over 90 GW have been awarded contracts through tenders.<sup>1</sup> When tenders for wind power were introduced in the year 2009, the specific characteristics of this technology were taken into account in the tender design. In South Africa, by contrast, the state electricity supply company Eskom, which generates 96% of South Africa's electricity, was responsible for the expansion of electricity generation capacity [20]. Until the introduction of tenders for renewable energy in the year 2011, independent electricity producers thus played only a minimal role. In South Africa, the instrument of tenders itself is also a regulatory novelty. In Italy and France, tenders are only used for certain technology segments, while other (renewable) technologies have to refinance themselves purely through revenue from the electricity market or can profit from other support schemes. France, for example, uses a feed-in tariff in order to create financial incentives for the installation of small photovoltaic, wind power or hydropower plants [31]. In Italy, small wind plants and wind parks with a capacity of up to 5 MW receive a regulation-based remuneration (feed-in tariff). Incentives for photovoltaic systems are created through tax exemptions, certificates and self-consumption regulations [25].

## 3. Rates of completion

### 3.1. Development of indicators

Tenders allow regulators to actively steer the expansion of renewable energy. In the ideal case, all projects that are awarded a power purchase agreement in the tenders are completed within the deadline; i.e. the on-schedule rate of completion is 100%. In practice, however, delays in project completion can occur, or projects that have received contracts are cancelled during the planning or construction phase.

The data quality with regard to the project status differs considerably from country to country. Only in Brazil, the regulatory authority publishes the current project status on a monthly basis (see Table 2). In South Africa, the last time the regulatory authority published such a status report was in April 2016. In Italy and France, no (public) monitoring takes place. For these countries, we have used secondary literature to estimate the current project status.

In Fig. 1 we show the current project status for photovoltaics and wind power in the countries Brazil, France, Italy and South Africa. This illustration takes into account all auction rounds with completion

<sup>1</sup> Own analysis based on [30].

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