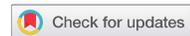


ARTICLE



## Encouraging the use of self-service business intelligence – an examination of employee-related influencing factors

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### ABSTRACT

This study examines which factors influence the use of self-service business intelligence (SSBI) applications. To analyse the interdependencies, we develop a structural equation model (SEM) and test it by surveying potential users of SSBI across different sectors. The SEM shows that the intention to use is significantly influenced by the expected contribution of SSBI to information needs, which is significantly influenced by business intelligence (BI) experience, SSBI flexibility, SSBI expected time savings and the importance of data quality. The perceived attention of a company to data quality has a significant negative influence on the intention to use. These results imply that the mere introduction of SSBI is not sufficient for successful use. Training on how to use SSBI and how SSBI can change individual ways of working are important components. A well-designed concept for ensuring data quality also promotes the intention to use. In addition, we found that the utilitarian value is independent of the decision environment.

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## 1. Introduction

In an era of digitalisation, organisations are increasingly expecting their employees to make data-based decisions to achieve a competitive advantage (Convertino & Echenique, 2017). This development requires greater flexibility and faster decision support. Classical business intelligence (BI) standard reporting is often not able to meet these demands to a sufficient extent. The use of self-service BI (SSBI) software is considered to increase flexibility and thus contribute to meeting these new demands (Imhoff & White, 2011). SSBI can also help to reduce the workload of the IT department and free up resources for other activities. Time savings can also be the reason for the introduction of SSBI applications, as analyses are carried out directly by business users and not by IT department staff (Imhoff & White, 2011). Nevertheless, the IT department can still retain some control over the analysis plans with an SSBI governance strategy (Clarke et al., 2016). SSBI environments are designed to 'empower casual users to perform custom analytics and to derive actionable information from large amounts of multifaceted data without having to involve BI specialists' (Alpar & Schulz, 2016, p. 151). Nevertheless, implementing SSBI software alone does not necessarily lead to a better BI environment (Burke et al., 2016). It



# Competitive and risk-adequate auction bids for onshore wind projects in Germany

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## ABSTRACT

In recent years, auction mechanisms have gained in significance in the context of renewable energy deployment. An increasing number of countries have adopted auctions for the allocation of permits and financial support for renewable energy projects, thereby increasing competition among project developers. As a result, profit margins have decreased significantly while sensitivity to risks and uncertainty has increased. The adequate quantification of bid prices is a key challenge. We present a modeling approach to determine competitive and risk-adequate auction bids. The contribution of this paper is an improved method for quantifying marginal cost, which is the minimum sales price per unit of electricity through which the investment criteria of all project stakeholders are fulfilled. In our financial model, the risk-adequateness is determined through the investment criteria of equity investors by means of the adjusted present value, and those of debt investors by means of the debt service cover ratio, through Monte Carlo simulations. The resulting marginal cost serve as the starting point for strategic bidding optimization, regardless of the pricing rule in the contemplated auction design. To demonstrate the integrability of our mathematical model with strategic bidding optimization, we check its applicability in a case study, which shows how a German project developer should bid to realize an onshore wind farm project. We show that our model enables the quantification of bid prices that are both competitive and risk-adequate.

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## 1. Introduction

Policymaking in various countries has focused, in particular, on accelerating the deployment of renewable energies through extensive investment incentives and financial support policies that have low market exposure (Abolhosseini and Heshmati, 2014). These support policies provide favorable investment and financing conditions due to high revenue certainty and stability (del Ro and Linares, 2014; Huntington et al., 2017). The consequential expansion of deployment has led to a highly competitive situation for wind turbine manufacturers and, therefore, rapid technological efficiency improvements (Butler and Neuhoﬀ, 2008). However, these policies have also led to costly market distortions and significant subsidy costs resulting from the high level of

remuneration induced by a lack of competition in project markets (Huntington et al., 2017). While technology improvements have constantly reduced the prices of wind turbines and solar systems (Taylor et al., 2015), these support policies have been ineffective in appropriately translating the cost reductions into lower financial support (del Ro and Linares, 2014). Thus, today, policymaking is shifting toward more market-based support policies, for example, feed-in premiums, auctions, quota obligations, and investment aid (Adib et al., 2016; European Commission, 2013). In particular, auctions have been implemented increasingly in recent years (Winkler et al., 2018).

Auctions introduce competition among project developers for procurement rights or remuneration contracts and are intended to manage the expansion of deployment via predefined tender volumes (del Ro and Linares, 2014). Increasingly, auction mechanisms determining feed-in tariffs or premium levels are the focus of policymaking (del Ro and Linares, 2014), for example, in Germany (Hake et al., 2015), Brazil (Ellabban et al., 2014), Mexico (Alpizar-Castro and Rodriguez-Monroy, 2016), and South Africa (Eberhard and Naude, 2016). Under these mechanisms, project developers compete by specifying their desired level of remuneration and only the most competitive projects are granted funding (del Ro and Linares, 2014). When correctly implemented, this prevents the overcompensation of project developers (del Ro and Linares, 2014; Abdmouleh et al., 2015; González and Laca-Arántegui, 2016) and is likely to result in comparatively low

**Abbreviations:** APV, Adjusted present value; CAPEX, Capital expenditures; CAPM, Capital asset pricing model; CDF, Cumulative distribution function; CVaR, Conditional Value at Risk; DEP, Depreciation; DSCR, Debt service cover ratio; DSC, Debt service capacity; EBIT, Earnings before interest, and taxes; EBITDA, Earnings before interest, taxes, depreciation, and amortization; EEG, Renewable Energy Sources Act; FCF, Free cash flow; INT, Annual interest payment; KPI, Key performance indicator; LCOE, Levelized cost of electricity; MC, Monte Carlo; MCP, Market clearing price; NPV, Net present value; OPEX, Annual operating expenditures; PDF, Probability density function; PERT, Project evaluation and review technique; TAX, Taxes on EBIT; VaR, Value at Risk; WACC, Weighted average cost of capital.

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