

Establishing performance records for prognoses using Canadian oil sands as example

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Abstract

Note: Old abstract, taken from Master Thesis

Crude oil plays an important role for the global energy system. As there is ample evidence that conventional oil production will have peaked by 2020, unconventional oil has attained a stronger focus. In particular, oil derived from bitumen from Canadian oil sands has been proposed as a possible remedy to global oil depletion.

This study aims to test the hypothesis that forecasts on the Canadian oil sands published between about 2000 and 2010 have been overestimating production significantly. A large compilation of oil sands projects, prognoses and production data has been established using openly available databases and reports. Conversion, standardization and analysis of the data was done using the statistical programming language R. The resulting programming code and databases have been compiled into a package available free and open-source online.

The statistical analysis shows a significant bias of the prognoses towards an overestimation of oil sands production. The compilation shows that most authors tend to overestimate the rate of expansion of the industry. Therefore, any prognosis on the expansion of the industry should be examined thoroughly before use.

Keywords: oil sands, unconventional oil, analysis, heavy oil

Contents

1	Introduction	3
2	Methods	3
3	Discussion	3
4	References	4

1. Introduction

Oil produced from Canadian oil sands has been pointed out as a possible remedy to mitigate a future decline of conventional oil production. Since the so-called *Hirsch-report* [?], which proposed the further expansion of the industry as a means to sustain global economic welfare, numerous articles, publications and comments have been submitted to the public for evaluation. Among these are several outlooks and prognoses for the future development of the oil sands industry.

However, these prognoses are rarely made accountable for their performance compared to the actual course of events later on. Since energy strategic decisions heavily rely on the choice of the prognosis that supports the decision, informed choices should evaluate the performance of earlier prognoses made with the same model.

Surprisingly, performance ratings of historical prognoses have not been established as a standard tool when choosing a model, and, in fact, do not exist for most of the models.

This article evaluates the performance of several prognoses made on the development of the production from Canadian oil sands made between 2000 and 2012. It shows that prognoses have tended to overestimate production vastly. It furthermore attempts to visualize the performance ratings by "*correcting*" recent prognoses, assuming similar ratings.

Finally, the article discusses the need for more open models and recommends including the evaluation of performance ratings of earlier prognoses of a model into deciding upon energy strategies.

2. Methods

For this article, 19 sources have been reviewed. These can be seen in table [1](#).

- *[include short descriptions of the sources]*
- description of data-collection, conversion, interpolation
- short description of mathematical model for performance ratings (mean deviation, time lapse, growth deviation, error as a function of time, etc)
- short description of application of performance ratings of "*old*" prognoses to recent prognoses

Mention: Since no source has disclosed details as of how the prognoses were made, the forecasting models were assumed to remain constant over time within each affiliated institution. This is the closest guess, but can of course be proven wrong by the respective institution by simply publishing the changes of their models between publication dates.

3. Discussion

- limitations of the calculations and assumptions within this article
- lack of insight into models of respective institutions
 - Why? general bias? Purely industrial interests in the prognoses?

Source	Type	Page	Year	Institution/Affiliation
?	D	43,44	2000	NEB
?	T	19-24	2002	TD Securities
?	D	56	2003	NEB
?	T	138-150	2004	CERI
?	D	8	2004	ACR
?	D	4, 2.16	2005	AEUB
?	T	App tabl 1	2006	CAPP
?	D	24	2007	NEB
?	D	20	2009	NEB
?	T	App A3.31	2011	NEB
?	D	33, 40	2011	CERI
?	D	3	2011	CERI
?	T	App B.1	2012	CAPP
?	D	26	2012	Citibank
?	T	Tab 4.2-2	2012	Statistics Ca
?	T		2012	Government
?	T		2012	CAPP
?	T		2012	OSR
?	T	107, 3.5	2012	IEA

Table 1: Sources of data. *Type* will indicate whether the corresponding data was extracted via **T**ables or **D**iagrams.

- Can this be changed? Need for *open models* that can be peer-reviewed and reproduced!
- Appeal to consult performance ratings before relying on a prognosis

4. References