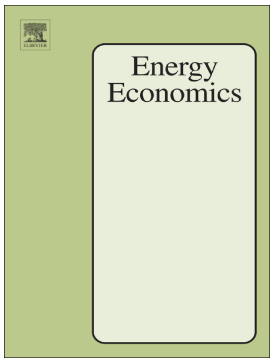
Accepted Manuscript



An equilibrium market power model for power markets and tradable green certificates, including Kirchhoff's Laws and Nash-Cournot competition

Per Ivar Helgesen, Asgeir Tomasgard

PII: S0140-9883(18)30021-5
DOI: https://doi.org/10.1016/j.eneco.2018.01.013
Reference: ENEECO 3887

To appear in:

Received date: 29 February 2016
Revised date: 17 August 2016
Accepted date: 10 January 2018

Please cite this article as: Per Ivar Helgesen, Asgeir Tomasgard , An equilibrium market power model for power markets and tradable green certificates, including Kirchhoff's Laws and Nash-Cournot competition. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Eneeco(2018), https://doi.org/10.1016/j.eneco.2018.01.013

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

An Equilibrium Market Power Model for Power Markets and Tradable Green Certificates, including Kirchhoff's Laws and Nash-Cournot Competition

Per Ivar Helgesen, Asgeir Tomasgard
per.ivar.helgesen@iot.ntnu.no (corresponding author), asgeir.tomasgard@iot.ntnu.no
Norwegian University of Science and Technology
Department of Industrial Economics and Technology Management
NO-7491 Trondheim, Norway

August, 2016

Abstract

We investigate the economic impacts of introducing tradable green certificates to promote electricity produced from renewable energy sources. We formulate a mixed complementarity, multi-region, partial equilibrium model, clearing both the electricity and green certificate markets under the assumption of Nash-Cournot market competition. We introduce a mixed complementarity formulation of the tradable green certificate policy scheme. The main contribution of this paper is to combine a public support scheme for electricity production with a power market model in which strategic generators compete and exercise market power in a capacitated transmission network with spatial energy exchange.

Any policy instrument interfering with the free market solution in a partial equilibrium model will reduce social welfare as a result of deadweight losses from the policy. These welfare losses may be substantial. We show that losses from tradable green certificates influence different market actors depending on the market conditions, but existing firms are likely to bear most of these losses.

In markets with Cournot competition, where producers act strategically, green certificates help to increase market competition if new firms are able to enter the market. Existing firms will not be motivated to compete with new generation capacity. The consumer surplus from introducing tradable green certificates under Cournot competition may increase, despite the deadweight losses the policy incurs.

1 Introduction

This paper models the use of tradable green certificates to support deployment of renewable electricity in the power market. During the last decade, many public support schemes have supported renewable electricity as a way forward to fight climate change, in addition to improving security of energy supply, promoting technological development and innovation, and providing opportunities for employment and regional development (EU, 2009; REN21, 2015). The power sector contributes more than any other sector to the reduction in the share of fossil fuels in the global energy mix (IEA, 2014). Global energy demand is rising, and

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات