



Universität zu Köln

University of Cologne

Department of Economics – Chair in Economics and Energy Economics

Prof. Dr. Marc Oliver Bettzüge

Seminar in Energy, Resource and Environmental Economics

Online Summer Term 2020/21

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## **Econometric analysis of the rebound effect**

Promoting energy efficiency has been considered one of the important tools by policy makers to reduce energy consumption and improve energy security. However, the question is whether improvements in the technical efficiency of energy use have failed to reduce energy consumption by the amount predicted by engineering models. Unfortunately, one of the most frequent answers to this question is “yes”. The failure can be ascribed to the so called “rebound effect”, according to which any increase in energy service consumption could offset potential energy savings achieved by the energy efficiency improvement. For example, consumers may choose to travel more following the purchase of an energy efficient car because of the resulting fuel cost savings. Accordingly, non-price regulations to improve energy efficiency in different sectors may neither reduce energy consumption nor help to mitigate its negative environmental consequences.

Three different kinds of rebound effects may reduce the energy savings achieved by efficiency improvements: (i) direct rebound effects: improvement in energy efficiency for a particular energy service reduces the effective cost of the service, which therefore leads to increased consumption; (ii) indirect rebound effects: the lower effective price of the energy service may lead to changes in the demand for other goods or services; and (iii) economy-wide rebound effects: a fall in the real price of energy services leads to changes in prices, quantities, supplies and demands across the economic system. Nevertheless,

due to the complexity of indirect and economy-wide effects, direct rebound effects are the most familiar and widely studied component.

Most studies confirm the existence of the rebound effect, but there is no consensus in the literature about the magnitude of this effect. This is because these studies are widely different in terms of definitions of this effect, methodological approaches, geographic regions, time periods, and the type of data used. A common approach to estimate this effect is the econometric analysis of secondary data sources that can take a number of forms (e.g. cross-sectional, time-series, panel).

In this seminar, students will review the current state of this literature. In particular, they will focus on the quantitative estimates of the rebound effect that are obtained using econometric techniques, highlighting measurement difficulties of this effect, econometric techniques to estimate it, and an overview of the evidence that is currently available.

### Schedule

20.04.2021 14:00-16:30 <i>Zoom</i>	Introductory meeting - Organizational Issues - Seminar Introduction and Overviews of Topic - Introduction to the rebound effect
27.04.2021	Deadline to Register or Withdraw from the Examination via KLIPS
tba	Guest Lecture
28.04.2021 14:00-16:30 <i>Zoom</i>	Introduction of Methodologies used in the rebound literature: The Methodologies Seminar will give: 1. An overview of the different definitions of the rebound effect that are used in the empirical estimates, 2. An overview of the econometric approaches used to estimate the rebound effect, 3. Discuss the types of data employed in the estimation of the rebound effect.
29.04.2021 14:00-15:30 <i>Zoom</i>	Presentation and Writing Skills Seminar
Group Meetings (with Mentor) Main Idea and goal, Structuring of Presentation etc.	
20.06.2021	Deadline Submission of Presentation Slides to ILIAS
22.06.2021 14:00-16:30 <i>Zoom</i>	Group Presentations Group A and Group B <b>Mandatory</b>
23.06.2021 14:00-16:30 <i>Zoom</i>	Group Presentations Group C and Group D <b>Mandatory</b>

24.06.2021 10:00-13:00 <i>Zoom</i>	Group Presentations Group E and Group F <b>Mandatory</b>
29.08.2021	Deadline Submission of Final Seminar Paper <b>Mandatory</b>

## Application

A maximum number of applicants of 30 can be admitted to the course, priority will be given to students of the WiSo Faculty. Please register on KLIPS for the seminar during the first registration period. IMES Students please register for the course by sending an email to Ms. Soberon ([m.arjona-soberon@uni-koeln.de](mailto:m.arjona-soberon@uni-koeln.de)) and include Maria Kotzias in cc ([maria.kotzias@uni-koeln.de](mailto:maria.kotzias@uni-koeln.de)).

After you receive a seat in the seminar, please make sure to register for the examination on KLIPS as well (use the Lehrveranstaltungsprüfung "Seminar in Energy, Resources and Environmental Economics"). Only those, who have a seat in the seminar can register for the examination! Thus, if you decide to not take the seminar, please make sure to deregister from the course so your peers are able to enroll for the remaining spots before the exam registration phase ends. IMES students can register for examination by sending an email to Ms. Soberon and include Maria Kotzias in cc. (Deadline for examination registration: **27.04.2021!**) Once you have registered for the examination, the registration is binding and students who do not give a presentation or do not hand in a seminar paper in time will receive a failing grade. Thus, please make sure that you are able to attend the mandatory sessions before registering for the course.

## Examination

The final grade for this course will be a weighted average of (the quality of):

- A) presentation of overall topic (30% - 10 minutes - individual grade)
- B) individual seminar paper (50% - 4.000 words)
- C) research proposal (20% - <https://energie.uni-koeln.de/sites/energie/user/Lehre/Lehrstuhl/ProposalTry1.pdf> )

extra credit can be gained.

### Examination part A: a presentation (April – June):

This is the oral part of the examination. The aim of this part is to provide and receive a general overview of the different facets related to the econometric analysis of the rebound effect. Therefore, students will be allocated to one of **three general topics** within the scope of the seminar and distributed to groups consisting of 4-5 students (The topic and group allocation are at the sole discretion of the Chair in Energy Economics). **In June**, topics have to be presented to the other peers and discussed with industry experts. Each presentation should provide a general overview of the topic, analyze the current state of literature (introduce relevant literature and the methodology used in those sources) point out interesting research questions and critically discuss how the topic might evolve in the future. Students need to structure their topic, distribute the individual parts of their group presentation among themselves and deliver coherent and consistent presentation slides. In case of questions, as mentor will be able to assist the group. Each student is required to present 8-10 mins. Grading will be done based on individual performance.

### Examination part B: a seminar paper (June – August):

The aim of this part is for students to **become an expert in one specific topic** within the econometric literature of the rebound effect. The individual seminar topics will be distributed after the group presentations in June (The topic allocation is at the sole discretion of the Chair in Energy Economic). The

seminar topic allocated to a student will be from another area than the presentation topic of the respective student, allowing students to work on two different aspects within this literature. The written paper should be around 4,000 words (+-10%). Students need to narrow down the scope of their paper by choosing a research question, provide an overview of the literature, pick a methodology and critically analyze their research question in depth. Each student will have a mentor in case any questions arise when composing the seminar paper.

Examination part C: a research proposal (June – August):

The aim of this part is to hand in a research proposal, which might serve as a blueprint for your master’s thesis. Ideally, in this proposal, you should show the research question, motivation, who cares and why, importance for literature on the rebound effect, importance for policy, what are the econometric method and data used, and what are empirical/methodological challenges. Use the template given by the chair: <https://energie.uni-koeln.de/sites/energie/user/Lehre/Lehrstuhl/ProposalTry1.pdf>

Bonus points: There will be bonus points and they will be added towards your total exam score. Importantly, the criteria to have these extra points will be announced during the seminar.

**General Requirements**

The seminar is designed for students to prepare for a Master thesis in the Econometric Analysis of Energy Economics. The seminar participants are expected to gain in-depth insights into their topic independently. Thus, we expect students to already have a solid foundation in Energy Economics as well as Econometrics (i.a. have taken other courses in the Energy specialization and Econometrics) before taking the seminar. While the seminar topics will be distributed by the chair, students are expected to determine the main focus of their presentations and seminar paper themselves. The emphasis within the own topic as well as the draft structure of the paper shall be discussed with the mentor at an early stage. Furthermore, students should deal critically with the contributions of other participants. Active participation in the seminar discussion is expected. Attendance during all presentation days is therefore required. We provide a guideline for the preparation of seminar papers. This includes all design requirements. ([https://energie.uni-koeln.de/sites/energie/pdf/Guideline\\_English.pdf](https://energie.uni-koeln.de/sites/energie/pdf/Guideline_English.pdf))

**Further Information**

Allocated Modules	<ul style="list-style-type: none"> <li>• Specialization in Energy Economics – Seminar in Energy, Resource and Environmental Economics</li> <li>• Remaining seats can be allocated to students in the IMES program.</li> </ul>
Credits	6
Language	English
Examiner	Prof. Dr. Bettzüge
Cooperation partners	tba
Organization	Maria Kotzias ( <a href="mailto:maria.kotzias@uni-koeln.de">maria.kotzias@uni-koeln.de</a> )