



**Special Session:  
Teaching Energy Economics and Policy – Reflections and  
a New Open-Access  
Textbook**

# Speakers

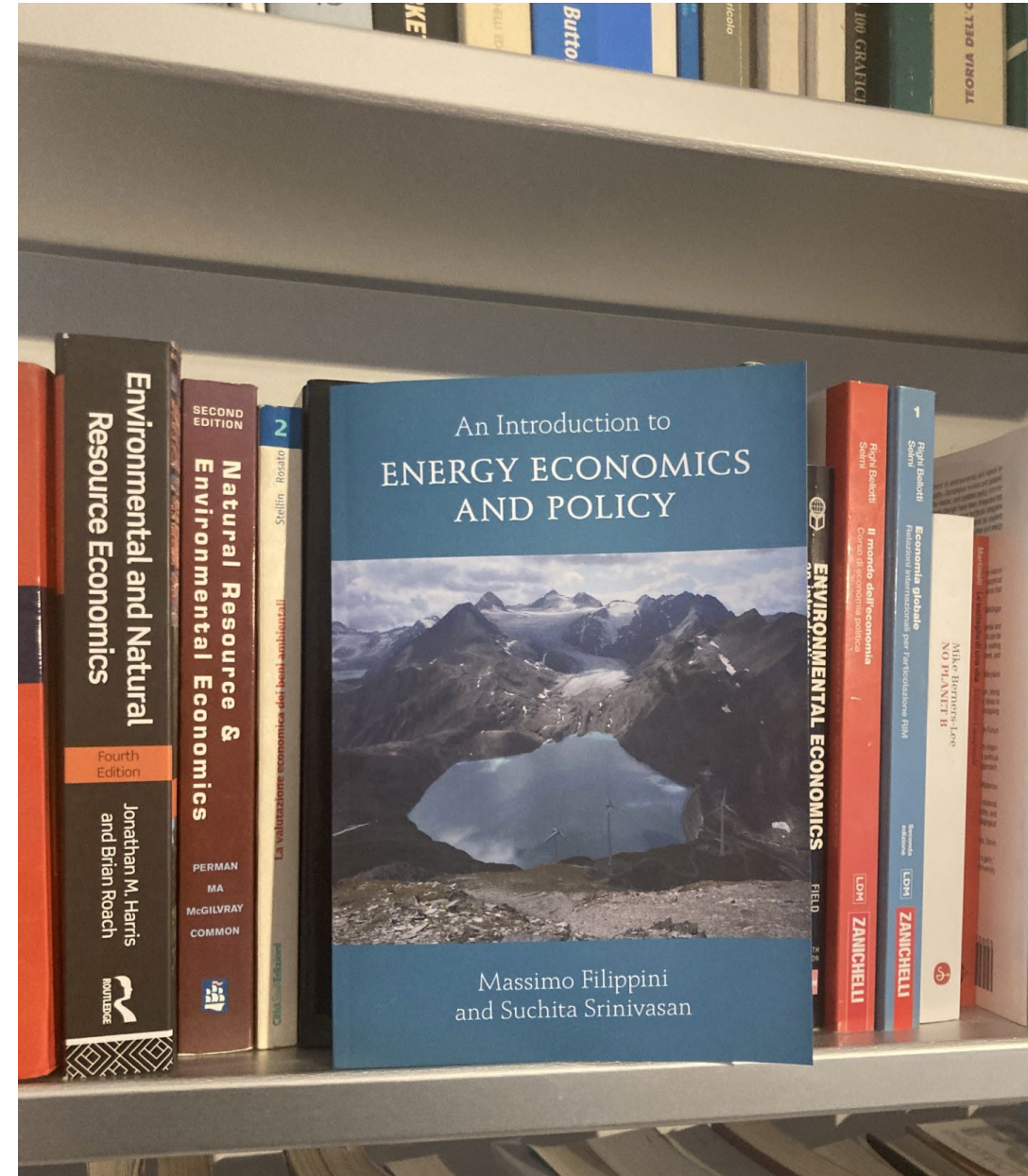
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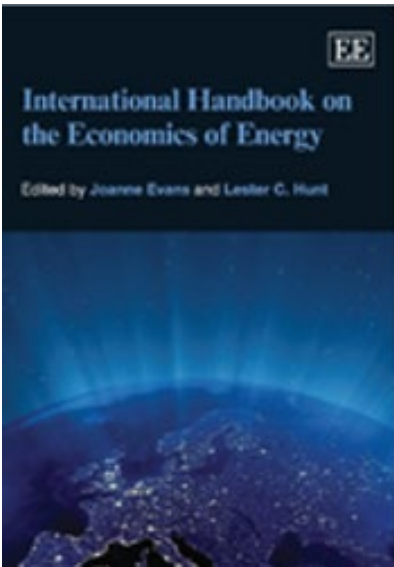
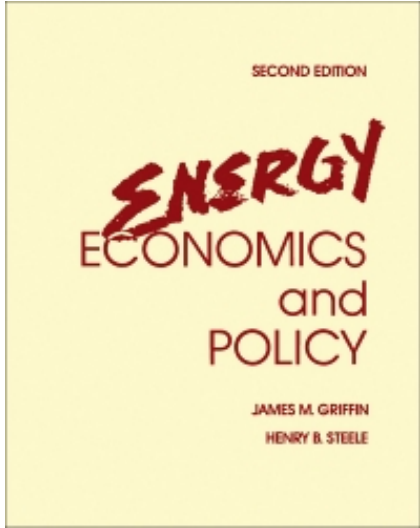
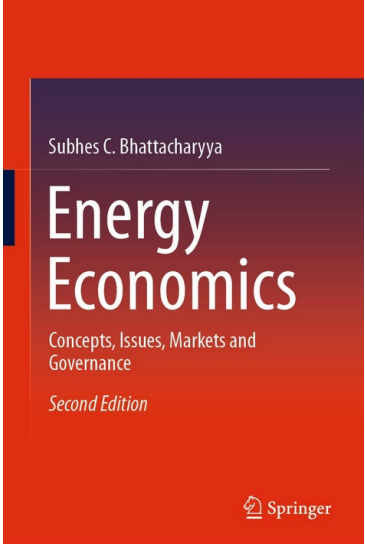
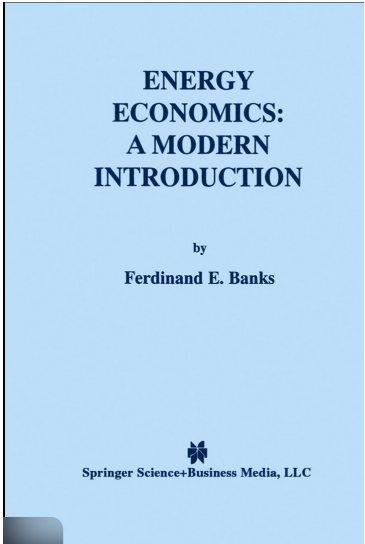
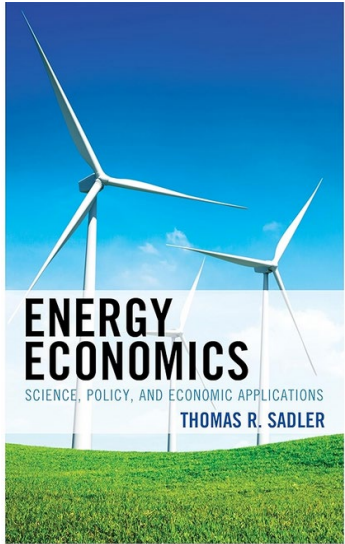
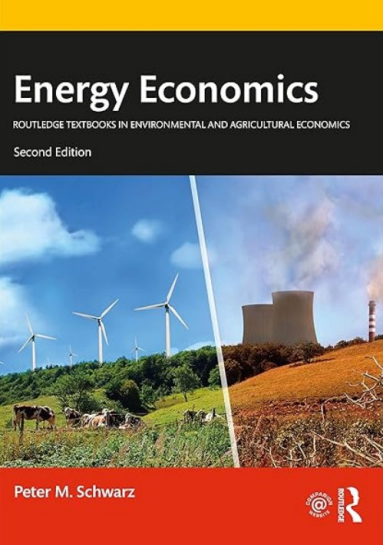
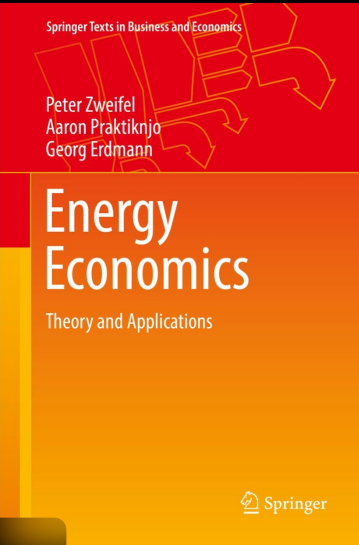
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# Structure

- Motivation
- What is new ?
- Why open-access ?
- How can it be used in teaching?
- Textbook and Generative artificial intelligence applications



# Motivation



# Motivation

- Write a novel introductory textbook that is distinct from existing ones in the market, focusing on the energy transition and the policy measures required to achieve it.
- Integrating insights from research in behavioral economics and development economics
- Sharing my teaching experience and notes with students and colleagues
- Book several years of teaching experience at ETH Zurich (alone and then during the last years with Suchita) with master students with a background in engineering

# What is new?

- Behavioral economics with emphasis on bounded rationality
- Developing countries
- Energy economics and energy policy have more or less the same weight
- Important discussion on market failures that include behavioral anomalies
- No systematic discussion of energy markets for fuels
- Introduce from the beginning the idea of sustainable development and energy transition
- Online exercises (multiple choice questions) <https://wp-prd.let.ethz.ch/exercisesfortextbookeep/>
- Box with summary of papers related to the chapter

# Investments for the energy transition

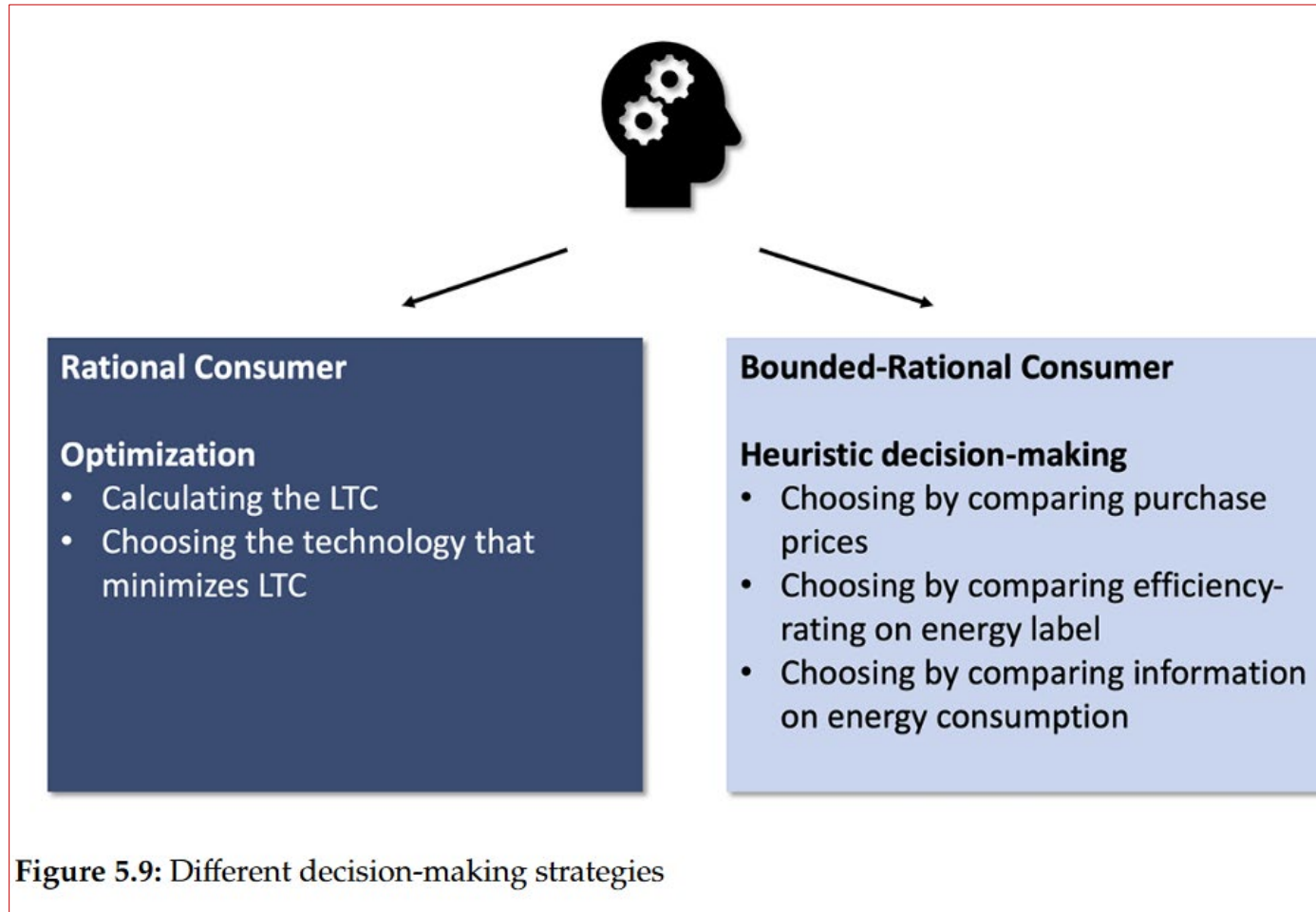


- Promoting sustainable investments

- Energy efficiency
- Renewable energy sources
- Power grids
- Digitalization and decentralization of the energy system
- Energy investments have a very long lifespan and show benefits and costs over time
- Intertemporal optimization  
➔ complex decisions



# Different decision-making strategies in the choice of an investment





**Table 2.2: Behavioural anomalies**

<b>Bounded rationality</b>	
<b>Behavioural anomalies</b>	<b>Impact</b>
<ul style="list-style-type: none"><li>▶ Cognitive limitations in evaluating complex tasks</li><li>▶ Loss aversion: a pattern of preference for avoiding losses rather than acquiring equivalent gains<ul style="list-style-type: none"><li>• Status quo bias: a strong tendency to remain at the status quo</li><li>• Endowment effect: humans assign greater value to specific goods that they own than to identical goods they do not own</li></ul></li><li>▶ Framing effect: the choices of individuals can be influenced by the way the positive or negative aspects of the same decision are highlighted.</li><li>▶ Limited use of information<ul style="list-style-type: none"><li>• Limited attention paid to some information related to a decision</li><li>• Limited salience of relevant information</li><li>• Faulty priors/beliefs about which information is relevant</li></ul></li></ul>	<ul style="list-style-type: none"><li>▶ Difficulty to compute the lifetime cost of energy-consuming durables</li><li>▶ Limited use of information that can be due to limited salience of the level of energy efficiency of a durable (cars, electrical appliances, etc.)</li><li>▶ Heuristic decision-making (e.g. the use of a rule of thumb) instead of undertaking complex calculations</li><li>▶ A tendency to keep old durables, to avoid changes in models and brands of durables</li></ul>

**Table 2.2:** Behavioural anomalies

<b>Bounded willpower</b>	
<b>Behavioural anomalies</b>	<b>Impact</b>
<ul style="list-style-type: none"><li>▶ Attitude-behaviour gap: inconsistency observed between consumer attitudes and actions</li><li>▶ Myopia in inter-temporal choices: cognitive myopia/present bias, near future rewards, are valued higher than more distant rewards because of varying discount rates</li></ul>	<ul style="list-style-type: none"><li>▶ Individuals value the environment; however, they keep old appliances, and do not behave accordingly</li><li>▶ Due to myopia and present bias, consumers tend to give weight to the upfront cost of a durable or of an investment in energy efficiency and undervalue its future operating cost or benefits.</li><li>▶ Individuals may underestimate current climate risks and tend to procrastinate on the adoption of adaptation strategies.</li></ul>

# Bounded Rationality and Energy-related financial literacy

- Simon (1950): “people are not perfectly rational due to their limited cognitive abilities, time constraints, and available information.”
- **Energy-related financial literacy** is the combination of **energy-related knowledge** and **cognitive abilities** needed to make decisions regarding investments in **the production of energy services and their consumption.**

Empower the Consumer! Energy-related Financial Literacy and its Implications for Economic Decision Making

*Julia Blasch, Nina Boogen, Claudio Daminato, Massimo Filippini*

 Open Access Article

**Abstract:**

Untapped energy savings potential in the residential sector might lead to substantial welfare losses. While several studies have focused on the role of behavioral biases in explaining the lack of adoption of energy-efficient durable goods, little is known about the role of limited energy-specific knowledge and financial literacy. In this paper, we propose an integrated concept of ‘energy-related financial literacy’, which combines both energy cost-specific knowledge and skills needed to process this information. Using data from a large household survey in three European countries, we explore the determinants of different measures of literacy and, most importantly, we provide empirical evidence on the association between limited knowledge and skills to perform an intertemporal optimization and the adoption of energy-efficient light bulbs. Our findings support the promotion of energy-specific financial education programs and tools to increase the adoption of energy-efficient durable goods.

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Published in Volume 10, Number 2 of The Quarterly Journal of the IAE's Energy Economics Education Foundation.

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# Results for a sample of 4600 European households

## Penny project, EU

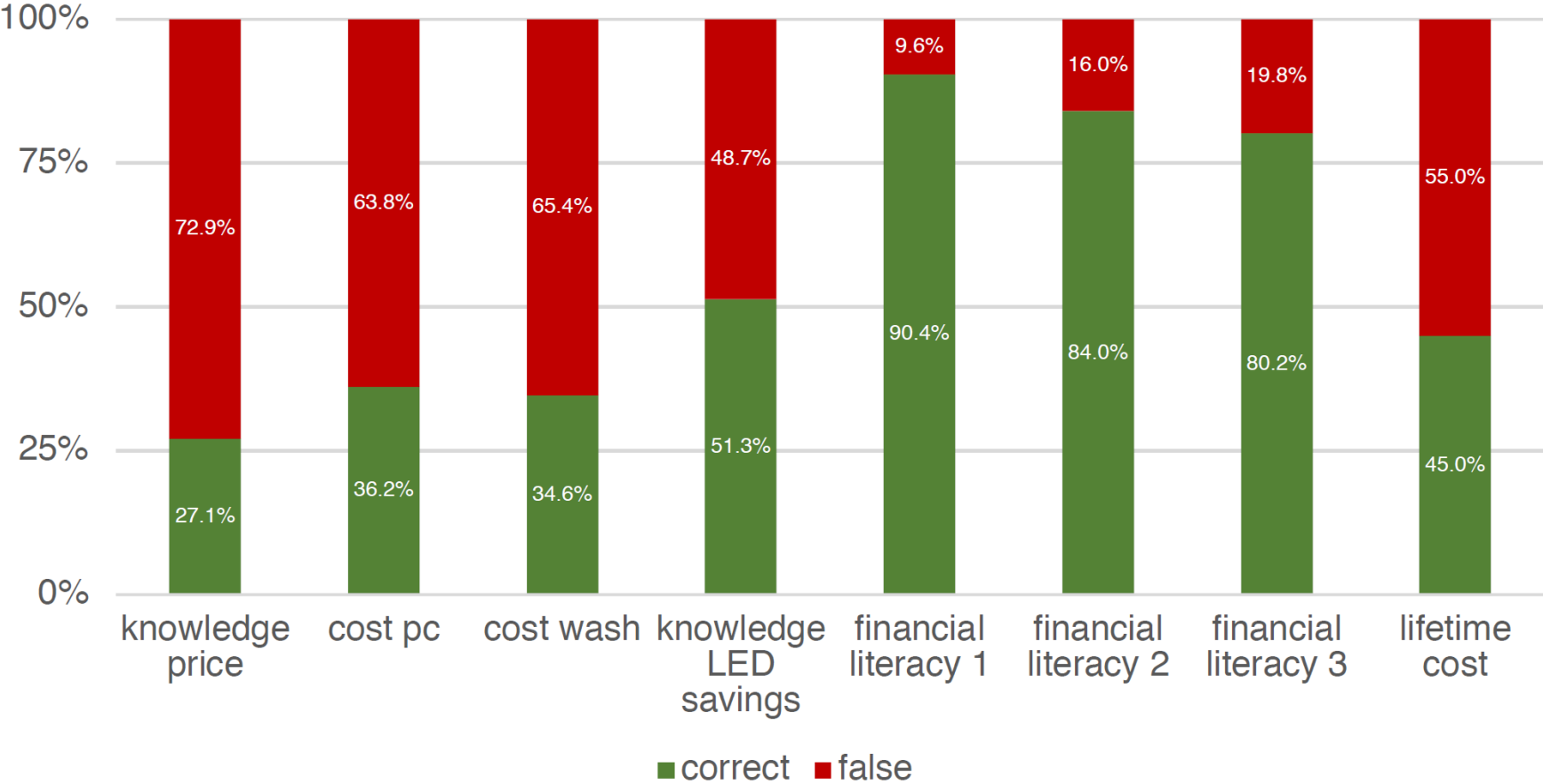


Figure 1: Results of survey questions on energy-related financial literacy.

Source: Blasch et al. (2021)

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Additional Resources for this publication at <https://wp-prd.let.ethz.ch/exercisesfortextbookkeep/>

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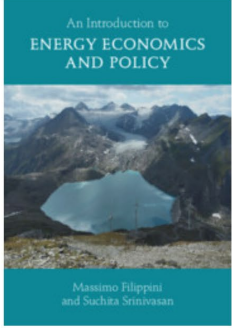
- To provide students worldwide with free textbooks, particularly in developing countries.
- Students often do not purchase textbooks.
- For colleagues who may be interested in the entire book or just specific chapters.
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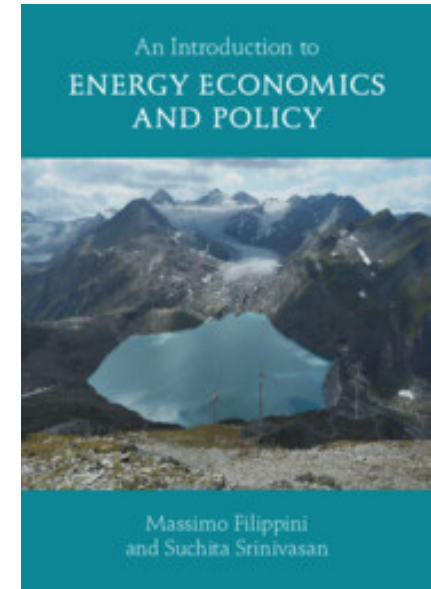
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- Single chapters
- Slides
- Textbook suitable for
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  - Students from other disciplines who have completed at least one introductory course in economics are welcome.
  - This text can serve as a secondary source for graduate students in economics.



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# How to use it?

- All the book
- Single chapters
- Slides





### **Only use the book with the chat**

Ask to summarize a chapter (e.g., “Please summarize chapter 1”)

- Discuss the summary with students and check if the summary is correct

Ask to summarize the chapter but build in a mistake (e.g., “Please summarize chapter 1 but do not mention CO2 emissions”)

- Discuss the summary with students and if the summary is correct



### **Newspaper article related to a chapter; only use the chat.**

Ask to explain the article using the relevant chapter (i.e., “Please explain the newspaper article using chapter 1 of the textbook”)

- Discuss the summary with students and check if the summary is correct

Ask to find 3 arguments supporting the article and 3 against the article using the relevant chapter (i.e., “Please find 3 arguments supporting the newspaper article and 3 against the article using chapter 1 of the textbook”)

- Check with students if the arguments are correct and if anything important is missing
- Discuss which arguments are most convincing



### **Use the book in a podcast**

Make a short (3min) podcast that summarizes the chapter

- Discuss the summary with students and check if the summary is correct

Make a short (3min) podcast that summarizes the chapter but requires that one podcaster is highly liberal and the other one extremely interventionist (might be difficult to obtain a good podcast)

- Discuss the summary with students and check if the summary is correct

# Class activity example

- *Reuters article: US House Republicans seek to kill EV tax credit loan program*
- Activity: use lecture slides and news article with GenAI (students upload both):
  - Prompt:
  - please explain the reuters article using the concepts from the book attached
  - provide arguments pro and contra for the tax ban using lecture concepts.
  - Discuss
- Alternative: create a podcast based on the article and the relevant chapter in the book with and without a couple of mistakes and then ask students to find the mistake

# Choice of the Picture and video

