



**University  
of Basel**

Faculty of  
Business and Economics

# 2<sup>nd</sup> MASTER'S THESIS SEMINAR SUSTAINABLE URBAN DEVELOPMENT

**WE ARE ACCEPTING  
APPLICATIONS!**

**CLOSING DATE  
MARCH 11, 2019**

**Energy efficiency of  
commercial  
buildings?**

**Mandates or  
markets?**

**Join us for a guided  
master's thesis  
opportunity**

**Co-supervision by  
Prof. Gantenbein &  
Prof. Kachi**

## **Interested in writing your thesis on the topic?**

**Prof. Pascal Gantenbein** and **Prof. Aya Kachi** from the Faculty of Business and Economics at the University of Basel are happy to announce the 2<sup>nd</sup> round of a guided master's thesis seminar on sustainable urban development.

Selected master's students will work on an individual thesis on the intersection of sustainable urban development, commercial real estate, and political economy of sustainability policymaking.

### **FOR QUESTIONS CONTACT**

**Pascal Gantenbein**  
pascal.gantenbein@unibas.ch

**Aya Kachi**  
aya.kachi@unibas.ch

### **APPLICATION INFORMATION**

**<https://goo.gl/a8He9U>**



# The 2nd Master's Thesis Seminar on “Empirical Research in Sustainable Urban Development”: Application Instructions

Prof. Dr. Pascal Gantenbein & Prof. Dr. Aya Kachi

*Faculty of Business and Economics  
University of Basel*

February 15, 2019

## WELCOME

**Prof. Dr. Pascal Gantenbein** and **Prof. Dr. Aya Kachi** from the Faculty of Business and Economics at the University of Basel are happy to announce the 2nd round of the guided master's thesis seminar “Empirical Research in Sustainable Urban Development”. Upon evaluation of the applications, selected master's students will work on an individual master's thesis on the intersection of sustainable urban development (SUD), commercial real estate, and political economy of sustainability policymaking.

**This document** describes the background of this research topic and the application process. Please read the following carefully and prepare your one-page application document.

**This topic is a relatively new** area of research - therefore we are not expecting you to be an expert of SUD from the start. Rather, we are looking forward to working with motivated master's students, who will be fully engaged in investigating and answering their questions based on empirical evidence. We hope to see creative research ideas from many of you.

Your thesis will be **co-supervised** by both professors, and will be written in **English**. If you have any questions regarding the application, please do not hesitate to contact us.



Financial Management  
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## 1 IMPORTANT DATES FOR YOUR THESIS PROJECT

When	What
Mar 11, 2019	Application deadline
Mar 18, 2019	Selection completed
Mar 22 or so (Doodle)	Kick-off meeting
Mid April, 2019	Finalize research question. Literature and data search.
Mid/End April - Early/Mid August, 2019	Thesis writing (15 wks)
Mid May, 2019	Midterm presentation (informal)
August, 2019	Mini conference presentation

## 2 HOW TO APPLY

Step 1	Read and think
	Read the "Appendix: Project Background" to learn about a broader background of the current research topics in SUD. Look also at some suggested research questions at the end, and think <b>how you want to contribute to these literatures through your master's thesis project</b> . You might want to conduct additional literature and data search to consolidate your own ideas and strengthen your research proposal.
Step 2	Write a one-page research proposal
	<p>Prepare a one-page application document. This should serve as a <b>combination of your (1) motivation letter and (2) research proposal</b>. Please include the following points. As you work on the one-page proposal, try to imagine your research process as concretely as you can at the moment.</p> <p><b>Contents</b></p> <ul style="list-style-type: none"> <li>• Your name &amp; e-mail address.</li> <li>• The why – Why are you interested in joining this guided thesis-writing? Why interested in SUD?</li> <li>• The what – What potential research question(s) are you interested in working on?</li> <li>• The how – How do you plan to answer the above research question?             <ul style="list-style-type: none"> <li>– Mention 1-2 published articles (literature) that are related to your interest.</li> <li>– What kind of empirical analyses do you plan to conduct?</li> <li>– What key data (or variables) would you need for this?</li> <li>– If you have already found a potential data set to use, that's great, and it would be good to mention here. If you do not see readily available data that you need, you might want to mention how one could/should measure them.</li> </ul> </li> </ul>

	<b>Format</b> <ul style="list-style-type: none"><li>• A4 paper</li><li>• Length: 1 page</li><li>• Font size: 10 - 12 point font</li><li>• Single-spacing</li><li>• Language: English (Do not worry too much about the grammar.)</li><li>• File: .doc, .docx or .pdf</li></ul>
Step 3	<b>Submit the proposal (Deadline: 23:59 of March 11, 2019)</b>
	<ul style="list-style-type: none"><li>• Submit your application using an online submission portal <a href="https://goo.gl/forms/qEyt1WwgLinLIKp12">https://goo.gl/forms/qEyt1WwgLinLIKp12</a></li></ul>

We look forward to your applications!

## A APPENDIX: PROJECT BACKGROUND

### SUD AND INCENTIVES FOR ENERGY EFFICIENCY IN LARGE-SCALE COMMERCIAL BUILDINGS

#### Summary

Energy transition is a vital component of sustainability transitions. A successful transition, however, requires a lot of work - a comprehensive transformation both in energy supply infrastructures and energy consumption patterns.

In this guided master's thesis project, we would like to provide you with help particularly in analyzing patterns of energy-efficiency investments in large-scale commercial real estate projects.

What motivates city and commercial developers to incorporate energy efficiency factors in their new projects when it certainly comes with large costs? What is the optimal balance between policy mandates and market incentives? What are the rent-related consequences of sustainability factors in these projects?

#### Detailed background

##### A.1 Empirical study for the supply-side of SUD is our target!

Energy transition is a vital component of sustainability transitions. A successful energy transition requires a comprehensive transformation both in energy supply infrastructures and consumption patterns from the demand side (Miller et al. 2015; Safarzyńska and van den Bergh 2010). Master's theses in this "seminar" aim to achieve a better understanding of supply infrastructure, by identifying the optimal amount and types of government policies/mandates that can eventually provide not only sufficient but also self-amplifying developer incentives for investing in energy efficiency. Your theses will attempt to identify a set of public-sector and private-sector determinants of building efficiency investments mainly by developers. Due to its ultimate goal of deriving concrete policy implications, your projects should be empirical and positive, not solely theoretical and normative.

##### A.2 Existing supply-side research has focused on electricity, transport, & residential sectors

You might not have thought about types of energy use, but generally, sources of energy use are categorized into 4 sectors: (1) electric power (electricity), (2) transport, (3) residential, and (4) commercial sectors. (See Fig.1 below for a quick summary.) Within the supply-side studies, much research has investigated the electricity sector, focusing on measures for greenhouse gas (GHG) emissions reduction. This includes studies on political and economic costs of renewable energies (e.g. Frondel et al. 2010) as well as issues surrounding the integration of renewables in a given energy supply system (e.g. power storage potentials) (e.g. Beaudin et al. 2010; Turner 1999). Others in Urban Economics have investigated energy efficiency and GHG emissions in 2 other sectors - namely transport and residential sectors (Kahn et al. 2014, 2). This literature has placed a significant emphasis on quantifying marginal carbon emissions associated with an additional household's energy usage. Many studies have targeted rapidly urbanizing countries like China (e.g. Zheng et al. 2011, 762), but have also taken advantage of rich data from historically large carbon emitters such as the United States (US) and Australia (Glaeser and Kahn 2010; Graff Zivin et al. 2014; Perkins et al. 2009).

**Figure 1:** Target sector of thesis topics

Power	Sources of energy use (sector)			
	Transport	Residential	Commercial	
			X	Supply
				Demand

### A.3 We should also look at the commercial sector, especially investor incentives and the role of policy mandates, because the potential impact is substantial

However, the Urban Economics literature has largely neglected the commercial sector, which actually accounts for substantial energy use. In the US, 40% of the total energy use stems from both commercial and residential buildings, among which about 44% is from the commercial sector (EPA 2008). Some in the field of Urban Economics have investigated the technical aspect - the effect of building characteristics on their marginal carbon emissions in the context of the US commercial sector (Kahn et al. 2014, 14-24). These analyses provide useful insights into the energy performance of existing commercial buildings; however, we still lack a good understanding of developers' motivation for energy-efficiency concerns and investments. This information is crucial if one wants to develop a policy framework to promote sustainability transitions.

Given the current rapid pace of new constructions and the recent trend for an increasing scale of each commercial complex, promoting sustainability concerns in commercial real estate projects has a large potential for advancing sustainability transitions, yet our understanding of the role of policies that promote related investments is limited. This is the primary motivation for this thesis project.

### A.4 What does the Real Estate literature tell us about SUD?

When it comes to the study on developers' incentives, the understanding of the role of policy is rather thin also in the real estate literature. Previous empirical discussions have primarily focused on two issues. One is to establish new measures of project valuation, incorporating sustainability concerns (Lützkendorf and Lorenz 2005), and measuring the willingness to pay for green features of buildings (Robinson et al. 2017). The other type of studies investigates incentives for developers' sustainability investments – the literature mostly confirms that sustainable real estate is a financially viable option for companies as a risk-diversifying and asset-portfolio optimizing strategy (Ellison et al. 2007; Geiger et al. 2013; Read and Sanderford 2018). So far, both topics have been discussed from the corporate finance perspective, which is useful for evaluating existing development projects, but not necessarily for optimizing future policy frameworks to promote sustainability concerns.

### A.5 The socio-technical transition literature and the remaining questions

Traditionally, the Socio-technical Transition literature (in Sociology) has been leading policy analyses related to sustainability transitions. The literature has established the importance of an integrated (multi-actor) policymaking process, which encourages cooperation between local governments and developers (Bentivegna et al. 2002; Pivo 2010). This finding illustrates the positive effect of the multi-actor participative process on the macro level. Yet we still lack the knowledge about the extent to which policies and private interests can collectively promote SUD investments – micro mechanisms are missing.

## A.6 Potential research questions?

The quick literature review above brings at least the following issues to the forefront of the empirical research agenda. We think that these, or variations of these, could be your potential topics for the thesis. However, this is not to say that possible research questions should be limited to the following. We welcome your logical and creative edges for contributing to this broad literature.

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**Q:** How can we measure quantitatively the level of investments by commercial real estate developers in building energy efficiency? Relatedly, do these measures already exist or would one (an organization, researcher, governments etc.) need to collect data in the future?

**Q:** How do rents and prices differ across different types of energy efficient (or “green”) buildings? Is it possible to measure costs and benefits of green buildings?

**Q:** Are investments in energy efficient housing more profitable even when taking into account the higher building costs for such investments?

**Q:** How do differences in tax deductions and subsidies affect the rent premium of energy efficient housing?

**Q:** What are the main determinants (both in the public and private sectors) of commercial real estate developers’ investments/attention in building energy efficiency in Switzerland? (Since it is a small country, qualitative empirical analysis would also be fine, in case “large-N” data are not readily available.)

**Q:** What are the main determinants (both in the public and private sectors) of commercial real estate developers’ investments/attention in building energy efficiency in the US?

**Q:** ...in the UK?

**Q:** ...in Germany?

**Q:** What incentives for “green” buildings are necessary, and for whom should these incentives be targeted, in order to better manage the transition towards higher energy efficiency in urban development?

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Side notes: in case you are interested in one of the “incentive” and “determinant” questions, it might be useful for you to pay attention to the following points as you construct your own research questions:

- The effect of mandates from the government.
- The effect of associations, programs, networks that connect investors.
- The relative effect of governments’ mandates and investor-oriented incentives.

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