Guidelines for Bachelor and Master theses in Sustainability Transition Policy

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All students at the FAU may write their thesis at the Sustainability Transition Policy chair if their research falls are among the topics and methods we work with. If we have the capacity to advice you, we are open to discussing a topic and research question with any student who has taken one or more of our courses. For anyone else, we must first see that you are prepared to write a thesis at our chair, which must be decided on a case-by-case basis.

We advise both Bachelor and Master theses related to energy and climate policy topics; in specific cases, topics relating to the broader sustainability policy field may work. Your advisor will be a person in the STP group well versed with either the topic or the method of your thesis. For Master theses, only STP colleagues with a PhD degree are possible advisors.

We are open to students' own topic and research question suggestions but also publish open topics connected with our own research on the web page. If you propose your own topic, remember to contact us early, because very likely it will take some time to polish first ideas into workable research questions with appropriate methods.

There are two strict requirements for writing a thesis with us. These requirements are the same for Bachelor and Master students, although the contents and expectations differ.

First, all students must write a **thesis proposal**, outlining the suggested work. This proposal must be approved by the advisor **by the start of the lecture period of each semester** (mid-October and mid-April). Before this has happened, your application to write a thesis with us is not yet accepted. Typically, writing a good and workable proposal takes 1-2 iterations with the advisor, so start well ahead of the deadline to be sure that it is done on time. You will find guidelines and hints for this below. It is the student's responsibility to ensure that all formalities are finalised in time for registration. Count of the process between first contact and an approved RQ taking 4 weeks; if you propose your own topic, it can take more than this.

Second, all students must participate in the **STP Thesis Seminar** and present their work there. Each semester there are two courses (Thesis seminar Bachelor and Thesis seminar Master) in Campo, and you must register for the appropriate one. The schedule will be announced before the semester starts, in StudOn and on our webpage (→ www.transitionpolicy.rw.fau.de).

This seminar will take place in two blocks, typically in the first week of the semester and in the middle of it, with two shorter open sessions in the between. Plan for these blocks to take about 2x5 hours (and likely less), plus the open sessions (2x1.5 hours). These seminars address issues that arise for all students, including evaluation criteria but also the process and principles of writing (e.g. what do I write where in my report; what's the point of a Discussion section; how do I cite properly) and making sense of and communicating findings (e.g. how do I communicate quantitative results; how can I synthesise qualitative findings while staying within reasonable page number limits).

We will not discuss these issues on a person-by-person basis, as participation is mandatory. In the open sessions, the advisor(s) will be present and we will discuss problems and solutions within the group of students and advisors; most problems arising are not specific to each thesis, and hence much can be learned by engaging with each other also during thesis writing.

Both the proposal and the seminar are non-negotiable, and both are designed to help you, not cause additional work or other problems.

Writing a thesis proposal

To be accepted for a thesis with STP, you *must* prepare a thesis proposal, outlining what you want to do, why that is relevant and how you want to do it. This text does not have to be long (maybe 1-3 pages). Each thesis and thus proposal is different, but each must hold three things.

A) a **<u>problem</u>** to address. This is the "topic" of your thesis, also describing why your work is interesting and relevant. Because we at the STP chair do interdisciplinary work, led by a curiosity about how to solve societal problems rather than to build disciplinary theory, it is essential to connect the work to actual problems. This can be relatively broad questions, such as "how do we increase bike traffic in Bavaria to 30% of all trips", "how can we decarbonise electricity in Finland", or "is carbon pricing a useful climate policy instrument in developing countries". It can be a theoretical problem (and then maybe the "real world" is science) but will more often be an empirical one. Deciding a topic is necessary, but it is not workable as the basis for your thesis.

B) To make the thesis workable, we need a specific **<u>research question</u>**. This is NOT a "topic" or your high-level problem question (as outlined in the previous point). Rather, your research question but a specific question describing a causal relationship of some kind, with variables hinted or explicit in it. Doing this well is very important, and also difficult. Yet, if you do not do it well, you will run in to problems during your work, because you are not exactly certain what you are going to do and what question you will answer.

So for example, "what do Germans think about wind power" is a topic, but NOT a research question, because it is a journalistic question: interesting, yes, but only if you're interested in that exact question and topic. It does not build generalisable knowledge and give insight into why opposition/acceptance happens, or what to do about it.

Related RQs could be "what drives opposition against wind power in Germany", or "how do different policies (monetary compensation, longer setback distances to buildings, or removal of aviation protection lights) affect acceptance of wind power projects in Germany". These questions clearly indicate causal mechanisms and allow for answers that are relevant to anyone interested in either acceptance, or in the energy transition in Germany or energy transitions more in general. They also allow for action-oriented recommendations, which is an additional aim of interdisciplinary research.

C) Then, finally, the **<u>Method</u>** shows how you want to answer your RQ. Here, a sketch is enough: we do not need all details (yet), but the description must be sufficiently detailed for us to understand what you want to do, assess whether it addresses the posed research question, and is doable within the frame – especially time – of a thesis. A useful method description must hold three things:

1) **what will you observe:** your data. Every empirical thesis will be based on data, which may be qualitative or quantitative, or both. This will be the basis for everything. Such data may be "energy demand data and energy policy instrumentation for Burkina Faso, 1990-2020" (if your RQ is about the effects of energy policy on energy demand in Burkina Faso), or "policy effectiveness findings (investment, emission reductions vs baseline) for carbon pricing in Latin America" (if your RQ is about the environmental (emissions) or transformational (investment) effect of carbon pricing in Latin America).

But even a conceptual thesis will be based on data: you will base your argumentation on something, maybe some literature or philosophical strain or whatever: that will then be your "data".

2) **how will you observe that data**: data sources, dataset creation and/or preparation. This describes your data sources, and is intended to show, before you start working, that the data you need exists or can be generated. If you work with existing data, derived by others, this will be links and descriptions of that data, showing what it is, that it fits your work, and where the data exists. If you must derive data yourself, for example through surveys or modelling, you describe how you plan to do that. If your approach requires manipulation

of an existing dataset, you describe how that manipulation will be done and what the effects on the data are. Especially for quantitative theses, this is essential: even the best method will not work if the data is not available, too coarse, or actually not reflecting what you think it reflects.

3) **how will you evaluate that data to answer your RQ:** your method, showing how you determine whether the observations are large/small, 5.14, red/green, yes/no, etc. This is often forgotten, because we focus so much on how we will derive our observations – but without clear evaluation frames, we cannot know how you will answer the question, whether you will do so systematically and transparently, or just by guessing. (hint: guessing is not a good method, and so just saying something is big/small yes/no is also not a good method). Sometimes, the evaluation is trivial: larger emission reductions tend to be better than smaller ones, for example. But often, it is not: maybe slower emission reductions are actually better in some case, for example if immediate fast emissions reductions would trigger lock-in into emitting tech (e.g. it may be better to run a strongly polluting lignite power station a bit longer and eventually replacing it with a wind farm than to close it immediately and replace it with a natural gas station which will then run and pollute for another 40 years).

If your method is qualitative, the method as such is often not super complex. Still, you must be specific and say how you will do your analysis. For example, what will you code how and how will you evaluate the coded data? OK, you will do process tracing, but how? OK, you will do a (systematic) review, fine, but with which variables exactly? And so on. Qualitative research is no less rigorous than quantitative (actually, it's often MORE rigorous!) just because it has less or no mathematics.

If your evaluation method relies on modelling of some kind, or on statistical analysis, it is essential that you describe the method in detail. This is to protect you, not to annoy you: often, statistical analyses are proposed in too simplistic terms (e.g. confusing correlation with causation), and doing a valid analysis can sometimes be very complicated and not necessarily suited for a thesis. Here, we are going to be picky, which is in your interest: the worst that can happen to you is to realise mid-way that the work you're doing is not feasible.

Thoughts on feasible and problematic methods
Below, we gather some recommendations for topics and methods suitable for theses. These are to be seen as well-meaning thoughts rather than orders. But if you find that you wish to go against the advice below, you must motivate it well and credibly demonstrate that it will be feasible in your particular case, because of some clearly specified reasons. One such reason could be that you will do it in the context of one of the STP research projects, and data and/or method are already present. It is also possible that you have demonstrated experience with a specific complicated method, so whereas it may be too hard for most, it could still be OK for you.

Methods appropriate for a thesis
The key point is that your proposed work must not only be interesting and relevant, it must above all be doable in the time frame of your thesis. This is why we insist on the proposal.

There are many, many useful and doable methods, so it is hardly possible to list them all. In the past, methods of great (because they finished, and got good grades) simple quantitative methods such as regression analysis, (more or less systematic) reviews, process tracing of different kinds, text coding or other forms of policy (text) analysis, each sometimes flanked by interviews, and so on and so on.

Experience of methods that sometimes cause problems
It is not possible to say that some methods are worse than others, or even too complicated for a thesis. However, several methods frequently cause problems for thesis students, because they take too long or

it turns out that the student is less prepared and experienced than they thought. Here is a list of four in principle very good and useful methods that nevertheless have caused problems in the past.

1. **Large-n surveys**, both to the public and to selected stakeholders, are often problematic for Master theses, and generally unfeasible for Bachelor theses. Because this method requires a large number of responses, it takes long time to gather the data. If a survey has already been done (incl. by someone else, and you re-analyse the data) or is presently running in some context, it may work. Instead, interviews may work better, because they don't require very many respondents (yet, see next point).

2. **Interviews** are a good method for Master theses, IF contacts are already established. You will not "interview 10-15 representatives at the ministries for energy in Morocco and France", so don't propose that. Instead, assume that you may be able to do 2-3, at best, and think about how these interviews will enrich some other analysis. It is generally not possible to have interviews as main/only data source for a thesis. For Bachelor theses, interviews are rarely good, because they take too much time for too little information.

3. **Statistical analysis** is a common method, both for Master and Bachelor theses. Often, simple regressions suffice to say something meaningful about a dataset. Definitely go for that! But sometimes, more complicated methods are needed, such as difference-in-difference or other approaches requiring the construction of counterfactuals (e.g. empirical analysis of "what are the effects of Instrument X in country Y"). This is very complicated and unless you are already well-versed with them, you should avoid that because of high risks that you get stranded halfway through. If your (Master) thesis takes place in one of our projects, with a method and data provided by an advisor who commands this particular approach, it can work.

4. **Modelling** of different kinds is sometimes useful. But as above, modelling is often very complicated and requires substantial skills (incl. coding skills) to be at all feasible. For a Bachelor thesis, it is generally not feasible. If your work takes place within an STP project, with existing code and data, it may be feasible for a Master thesis.