Chapter 13
Short Term Study Abroad: Renewable Energy in Germany and Switzerland

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Abstract A short term study abroad may be preferable to students who do not wish to go abroad for an extended period of time or not have the flexibility within their major for an entire semester abroad. In the summer 2015 I organized a short term study abroad trip to study renewable energy while traveling through Germany and Switzerland. The goal of the course was to provide students with an introduction to energy markets with a specific emphasis on renewable energy and applications to the German Renewable Energy Act. This paper details the process of developing the course and experiences while traveling abroad with a group of 10 students.

13.1 Introduction

In the summer of 2015 I had the opportunity to run a short term study abroad trip while working at Christopher Newport University. The course was titled "Renewable Energy Economics & Policy Analysis" and conducted while traveling through Germany and Switzerland. The objective was for students to apply economic theory to the production of renewable energy by examining energy markets at the local, national and international level and examine specific policies designed to promote the production of renewables. Students learned how fundamental economic concepts drive energy production and how various local and national institutions affect energy markets. The goal of the course was to provide students with an introduction to energy markets with a specific emphasis on renewable energy and applications to the German Renewable Energy Act, Erneuerbare-Energien-Gesetz or EEG.

As a global leader in investments in renewable energy, Germany provided an ideal setting to study emerging renewable energy markets. The Germany Renewable Energy Act, originally passed in 2000, aimed to motivate the transition to renewable energy through the use of a feed-in-tariff (Lang and Lang 2015). A feed-in-tariff

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provides energy producers a cost based price for any renewable energy supplied to the electric grid. This incentive can be applied to any electric utilities, homeowners, or private businesses that produce renewable energy. The German Renewable Energy Act was pioneering in that it allowed utilities to participate on a wide scale basis, and the purchase price of electricity was based on generation cost, resulting in different prices paid to producers for various investments in renewable infrastructure. By traveling to Germany, students were able to witness the direct results of this policy. Over the course of the 10 day trip students were able to visit the International Solar Energy Society, visit family owned farms that have invested in wind turbines and have directly benefited from the feed-in-tariffs, and visit a large scale hydro-electric facility.

This course was conducted across 4 pre-departure meetings and 10 days traveling through Germany and Switzerland. The 4 pre-departure meetings served to review basic economic concepts, provide an introduction to externalities, and to present a detailed description of the German Renewable Energy Act and feed-in-tariffs. By covering these topics pre-departure, students were able to focus and apply these topics while at site visits. It also allowed for extra free time while traveling to enjoy the cultural components abroad.

The purpose of this paper is to provide a detailed description of both the course content and trip logistics to assist in the development of a short term study abroad program. A short term study abroad trip can be as short as 2 weeks to upwards of a month and typically offered during a university's summer session. A short term trip may be preferable to some students who do not wish to go abroad for an extended period of time or for students with large major requirements that leave little wiggle room for an entire semester abroad. Despite spending an abbreviated time abroad research shows that a short term program still enhances participants understanding and awareness of other cultures and languages, appreciation of the impact of other cultures on the world, and awareness of their own identity (Gaia 2015). This paper will detail the organization that is required to get the program approved, course content, a detailed itinerary, and trials that occurred while traveling with my students.

13.2 Pre-departure Organization

Designing and coordinating the logistics of a short term study abroad can be particularly cumbersome. Organizing travel, lodgings, site visits, and guest lectures is a daunting task that may dissuade some faculty members from creating a program. Often a faculty member will secure funding to travel a year in advance to scout potential site visits and organize details of the trip. I was able to streamline this process by coordinating with Education First (EF) Tours.

EF Tours, based out of Cambridge, Massachusetts, is an international education travel agent that specializes in short term study abroad trips. In the College Study division there are over 30 pre-designed itineraries organized by discipline that can be catered to specific goals and course objectives. The Renewable Energy in Germany and Switzerland can be found under the Science and Technology programs. However, working with the program coordinator assigned to my trip I was able to ensure the visits and guest lectures could be applied to an upper level economics course.

There were many additional benefits to using a third party to coordinate the trip. EF Tours created a secure, password protected portal for the trip where students could access all necessary paperwork and submit payments through. Each time students logged into their account they could see their remaining balance, intermediate due dates, number of days remaining until departure, suggested packing lists and other trip details. Removing this burden from the faculty organizer was a huge relief in order to focus on course materials and design.

In addition to flights and lodging, all on site transportation was arranged by EF Tours and a Tour Director was assigned to our group. The guide provided by EF Tours was with us from the moment we were picked up at the airport until our departure. His role was to manage all logistics including hotel check-ins, local transportation, and help with any language barriers. This allowed me to focus directly on my students and the course material while on site.

The final cost of the trip to students was $3671. This included roundtrip airfare, lodging, on-tour transportation, daily breakfast and most dinners, and site visits and guest lectures, and the full time tour director. In order to reduce the price of the trip, Christopher Newport University agreed to travel with a group from Butler University. This increased our numbers to roughly 40 students and faculty combined. This size was a bit cumbersome while traveling abroad however combining tours allowed both universities to take advantage of reduced costs to students.

13.3 Course Design

The course “Renewable Energy Economics & Policy Analysis” was designed as an intermediate level economics elective offered during the summer term. The object was to provide an introduction to energy markets with a specific emphasis on renewable energy. Students applied economic theory to the production of renewable energy and analyzed specific policies designed to promote the production of renewables. The objective identified were as follows:

- Understand how basic economic concepts influence energy production and use.
- Understand how local, regional, and global intuitions affect energy markets and prices.

- Describe the challenges associated with the production and use of various renewable energy sources.
- Understand how restrictions implemented by various energy policies impact energy markets.
- Understand how various energy policies can provide incentives for investment in developing technologies.

The course was offered under the prefix "Econ 395: Intermediate Topics in Economics." The prerequisites for this special topics course were simple, any introductory course in economics. At Christopher Newport University, this included one of the following courses: Principles of Macro or Microeconomics, Environmental Economic Literacy, or The Economic Way of Thinking. Although some exposure to economics was necessary, the 4 pre-departure meetings served to catch some students up and provide them with the materials necessary for successful completion of the course. Additionally, by minimizing the perquisite requirement the Economics Department was able to market the study abroad opportunity not just to economics majors but the campus wide community.

Students that enrolled in the course were from a variety of majors, these included senior economics majors and sophomores that had only one previous economics course. This made teaching an upper level economics elective a challenge, however this had been accounted for in the course design. Prior to departure, there were four 2 h class sessions. These classes were offered once a week during the last month of the spring semester. The sessions served a dual purpose—they helped students with little economic background to catch up to the higher level material, provide students who had not taken the Environmental Economics elective a background in market failures and externalities, and helped to meet the contracted 42 h of course content. Since the trip was only 10 days it was difficult to meet this requirement entirely abroad. These meetings were conducted once a week during the spring semester following the return from spring break. Students filled out a survey with their schedules and I selected a time that worked best, usually in the evenings. Although our trip was not scheduled until the end of May, I found holding these meetings during the semester advantageous since students were still on campus. If these meetings were to be held in May in the days leading up to the trip, students would have needed to secure housing. What follows are the topics covered in each of the four pre-departure meetings.

- Meeting 1: Overview of energy supply & demand and basic economic concepts
  - Review of principles of microeconomics
  - Introduction to energy economics
  - Overview of trip expectations
- Meeting 2: Externalities and public policy
  - Review of externalities
  - Discussion of property rights, Pigouvian taxes, cap-and-trade, and other incentive-based policies

- Meeting 3: Criteria for evaluating public policies
  - Introduction to the German Renewable Energy Act (EEG)
  - Europe's 20-20-20 strategy
- Meeting 4: Financing energy development
  - Feed-in-tariffs, energy credits
  - Renewable portfolio standards
  - Discussion on sustainability

The course requirements of the course were broken down as follows:

Pre-departure Problem Set Following the completion of the four pre-departure meetings, students were assigned an extensive homework assignment to be submitted prior to departure. The purpose of this assignment was to demonstrate proficiency of the material presented in pre-departure meetings. It was distributed at the last meeting and due 1 week before departure. A sample of questions are listed below:

- Define command and control environmental strategies and incentive based strategies. Provide examples of each.
- Explain the concept of a feed-in tariff and how it has helped promote investment in renewable technologies in Germany.
- Describe the characteristics of a natural monopoly. Why are natural monopolies, like an electric utility usually regulated?
- What are the major goals and targets of the German Renewable Energy Act?

Journal Articles Students were instructed to bring a notebook on the trip. They were expected to take notes at all site visits and write up a brief analysis. Each journal entry had two parts. First, students were expected to write a summary of the site visit and/or guest lecture that they participated in. The second part of the journal entry was to apply the day's activities to material that was covered in the pre-departure meetings. While traveling, I only expected students to keep notes on each visit. The journal entries were completed and emailed to me 2 weeks upon returning home. This gave students the time to reflect upon the visit and write a thorough and thoughtful journal. Over the day 10 trip I required 8 journal entries, one for each day except for when traveling. A sample of one journal entry is copied below.

> The residential and commercial solar installations we observed in Heidelberg were only made possible by the Energie-EG, the law passed by the German government that we studied prior to our departure. Specifically, it was the part of the law that gave assurance that the solar investors could sell their excess energy production back to the grid, and utilities would be forced to purchase it, no matter what, at a fixed feed-in tariff of 22.1 euro cents per kWh.
>
> Furthermore, though much has been made of the Renewable Energy Act in Germany, I still saw considerable signs of fossil fuel development. Of course, this makes sense because to completely wean a country off of fossil fuel would effectively be economic suicide. Still, I was surprised to see—looking off into the distance from the ramparts

> of Heidelberg Castle—the smoke stacks of Mannheim Coal plant burning away. Though much had been made by our tour guide of the progressive policies of Freiburg, one of the larger cities in the county of Baden-Württemberg, some research into the statistics of the county's energy production reveal that it is not that much ahead of the rest of Germany, on average, in its renewable generation. Figures from 2013 taken by the Baden-Württemberg Statistisches Landesamt show that the renewable sources represent just 11.9% of total energy consumption, which is only 1.5% greater than the 10.5% share of renewables in energy consumption in Germany more broadly. What's more, I was surprised to learn that nuclear energy represents 15.3% of all energy consumption in Baden-Württemberg, compared to 7.7% on average in Germany nationally. With so much local resistance to nuclear power, and the effective dominance of the Green party in local politics, I would have thought that renewable sources would play a much larger role than they do, and that nuclear would at the very least be a smaller player due to local public discontent.[1]

Final Paper Upon return home students wrote a research paper on a topic of their choice. The paper should provide a critical evaluation of a specific site visit, energy market or policy or a topic covered while traveling. There was a great degree of freedom given to students on their chosen topics and structure of the paper. Prior to the end of the trip, students were to discuss their topic with the trip leader during down time on busses or before/after dinner in the evenings. The paper was to be approximately 3000 words. Some of the topics chosen included tradeable renewable energy credits, large vs small scale hydropower, renewable portfolio standards and further examples of feed-in-tariffs.

13.4 While Abroad

Each day typically consisted of one site visit followed by a 'class meeting' upon return to the hotel. Depending on the individual trip, visits lasted between 2–6 h. On each visit, students were expected to actively interact with the guides and planned activities while taking notes for their journal entries. Class meetings were held most days, time permitting. This time was used to apply the material presented on the visit to the material covered in the pre-departure meetings. Additionally, students proposed final paper topics based on these visits. Each class lasted approximately 1 h.

- Day 1: Flight to Frankfurt, Germany
- Day 2: Heidelberg
  - Arrive in Frankfurt. Immediately travel to Heidelberg
  - Walking tour of Heidelberg
  - Heidelberg Castle

[1]Special thanks to Thomas Hall for providing a copy of his journal.

  - One hour afternoon class[2]
  - Welcome dinner.
- Day 3: Heidelberg
  - Visit Solarpark Bruhrain. Completed in 2007, the park is home to 29,250 modules which provide enough electricity for approximately 1500 households
  - One hour afternoon class
- Day 4: Freiburg
  - Travel to Freiburg.
  - Visit to the Innovation Academy, a non-profit association that focuses on issues of climate protection, for the following activities: guest lecture on sustainable development, visit to the Heliotrop, and visit to the solar housing estate
- Day 5: Frieburg
  - Solar energy tour of Frieburg
  - One hour afternoon class
  - Excursion to Breitnau Bio Energy Village
- Day 6: Lake Constance
  - Travel to Lake Constance
  - Bodensee Solar lake cruise
  - Lecture on renewable and lake preservation
- Day 7: Lucerne
  - Travel to Lucerne
  - Walking tour of Lucerne
  - Excursion to Mount Pilatus
- Day 8: Lucerne
  - Guided tour of Grimsel power plant
  - One hour afternoon class
- Day 9: Lucerne
  - Guided tour of Entlebuch Biosphere
  - Free afternoon in Lucerne
  - Farewell dinner
- Day 10: Departure flight from Zurich to United States

[2]Students participate in a 1 h class conducted by trip leaders to recap various excursions. These lessons are in the form of lectures and discussions and pertain to the day's activities and relation to course material. They are conducted at the beginning or end of each day, time permitting.

13.5 Trials Abroad

As with any travel one should expect the unexpected. Prior to departure there were several group meetings to discuss all aspects of the trip. Multiple emails were sent reminding students about passport requirements, packing lists, dress codes for site visits, and conduct expectations. Despite the preparation my group experienced a multitude of unforeseen circumstances that called for flexibility and adaptation while traveling.

The first interruption occurred at the very beginning on the trip on day one. Our initial itinerary departed from Norfolk, Virginia to Atlanta, GA for a brief layover before traveling to Frankfurt, Germany. On the first leg of our journey, thunderstorms prevented our flight from landing in Atlanta. We rerouted to Savannah, GA to refuel before returning to Atlanta. By this time we had missed our connection to Frankfurt and had to spend the night in Atlanta. The support from EF Tours was greatly appreciated working out the rescheduling logistics. The next flight to Frankfurt out of Atlanta was entirely booked so our group flew to Detroit, MI the following day before catching an overnight flight to Frankfurt. The airline helped to obtain hotel vouchers for the night but in some instances, students were tripled up in their rooms for the evening.

During this chaotic travel experience, several students had not packed according to suggested guidelines. Some students did not pack a carry on with a change of clothes and one student packed necessary medication in checked luggage. These problems were solved with the help of the airline tracking the bag in question and an emergency trip to Target before settling in the hotel for the night. However, based on my experiences, I suggest meeting at least 3 h prior to departure. Not only will this allow students who may be running late extra time but also to run through checklists that include, but not limited to, passports, medications, and correct packing methods. There is extra time to repack luggage or remedy any other unforeseen circumstances.

Once our group reached our destination, the stress from our hectic travel experience quickly faded as we caught up with our planned itinerary. Our next unforeseen hiccup concerned the internet connectivity. EF Tours had booked hotels that offered complimentary internet access. However, in order to reduce costs these hotels were smaller boutique hotels outside of the cities we were visiting. When 40 students simultaneously check into and log online to check emails, call home, conduct research, or stream videos the internet bandwidth was not large enough to support the demand. It would take several minutes to load a single webpage or simply not work at all. Although this issue was brought to EF Tours, there was little that could be done during the trip as the hotels were already booked and prepaid. The only solution to this was to take advantage of public wi-fi at various cafes and restaurants during our free time. Students nearly always searched out a McDonalds, Starbucks or other familiar fast food chain to use the free wi-fi. My recommendation is to find the nicest hotel or cafe and purchase a coffee, snack, or other beverage. The waiter will almost always provide you with the lounge's password protected wi-fi. This is a more secure option and usually far more comfortable than a plastic booth at McDonalds.

Despite a handful of hiccups, both students and faculty were able to roll with the punches and make the best of all of the unforeseen circumstances. When taking students abroad it's crucial to know ahead of time that any situation can arise and you will need to be prepared to handle almost anything.

13.6 Conclusion

Developing and running a short term study abroad program requires a significant commitment on behalf of the faculty member. It is considerably more work to organize the course in a remote location, secure necessary university approvals, recruit students to register for the trip, and teach on location than it is to prepare a traditional course in the classroom. However, for all of the extra effort involved with offering such a course comes with extra reward. For the majority of my students, this was their first time traveling outside of the country. Students' learning extended well beyond the classroom. In addition to learning the required course content, students were able to experience new cultures, see new regions of the world, and experience all the highs and lows of travel. Many of the students on this trip keep in contact several years later.

From my experiences running my first study abroad program, I have learned a lot myself and am better prepared to run a future program. Although I would consider my first trip a success there are several changes I would make in the future. In order to see as much as possible, our group traveled to new locations almost daily. The most time spent in a single hotel was 2 consecutive nights. There was a significant amount of time lost to traveling between locations for such a short trip. For a future trip, I would limit the number of locations to reduce travel time and further take advantage of what a village or city has to offer. Additionally, despite reviewing packing lists, codes of conduct, and course expectations for what seems like countless times, it never hurts to review them one more time. This may have reduced some stress at the start of our trip.

Despite a few hiccups along the way, the experience for both myself and my students was invaluable. Given another opportunity, I am eager to offer a similar program again in the future.

References

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