



Global Study Program

Collaborative Learning Abroad

2016

E-mobility and Smart Cities

Chiba University, Japan

Dresden University of Applied Sciences, Germany

E-Mobility & Smart Cities



Topic and Research Questions

Electro mobility is becoming more and more important for the development of future cities and their infrastructure. In the very near future there will be significant changes in individual and public transport systems. Because of limited natural resources and environmental aspects, several countries are therefore expected to change their traditional thinking of doing ‘transport business’. Germany, for example, aims to having one million electric cars on the country’s roads by 2020. In the year 2016, the global number of plug-in electric vehicles (EV) was set to surpass the landmark of 2 million cars, thanks mostly to the surge of the e-car market in China. In addition, the research firm Bloomberg New Energy Finance has announced that by 2022, the price of electric cars will be lower than that of vehicles using combustion engines, a situation which will provoke an electric car revolution that will see global sales reaching 41 million by 2040 (*The Guardian*, 13 October 2016).

The first collaboration between Chiba University (Japan) and Dresden University of Applied Sciences (HTW Dresden, Germany) took as a starting point these recent changes in the transport industry, and benefiting from the location of this year’s Global Study Program, which was held in Dresden, the program aimed at considering the challenges associated with the diffusion of the EV market, and at how these relate to future imaginaries of urban transport in a smart-city environment. More specifically,

the participants of this year’s program, had to consider the topic simultaneously on three separate levels: 1) learn about the basics of e-mobility and its current issues, and through visits at car factories and research centers, consider general solutions to not only improve the technology itself, but to mainly devise scenarios that make the most of the technology as it is available right now. 2) think about the infrastructure that will make these solutions possible in an urban environment, and consider also the sustainability of the use of e-cars not only for individual purposes, but also for the public transport. 3) implement e-mobility to the larger concept of smart cities and try to imagine how Dresden could be transformed into a smart city in the future through comparisons with existing smart city scenarios in Japan and around the world.

Similarly to most Global Study Programs (GSP), this program presented several challenges, which were specific to the theme.





The biggest challenge was of course the necessity of constantly having to consider issues along the three aforementioned levels, but the program was built in such a way that during the pre-course education and during the main program, lectures by both academic and non-academic specialists provided several opportunities to consider this year's theme from multiple perspectives. Students were of course not expected to know all about e-mobility, but to grasp from among the multitude of information what concerned them the most and pursue that direction, until they find a solution with which they felt confident with.

The second challenge, which, again remains common to all GSPs, was to achieve collaboration in an environment, which for the Chiba University participants was unknown, some of them having traveled abroad for the first time in their lives. It was not an easy task, but the hospitality of HTW Dresden, the variety of learning opportunities offered by all

the lecturers, public administration officials, researchers from inside and outside the university, as well as the setting of the city of Dresden, which was perhaps perfectly chosen to discuss about this theme, greatly assisted the participants in their daily group work.

In the end many good ideas were presented, some of them pushing the borders of our imagination, but all of them were proof that true innovation only stems from good collaboration!



多様性への挑戦。それが Global Study Program、略して GSP です。言語や専門の多様な学生が協働学習を行うプログラムです。今回の GSP は、ドイツのドレスデン応用科学大学で行われました。テーマは“E-mobility と Smart city”。講義とフィールドワークが凝縮された約2週間のプログラムでテーマについて学び、グループ毎にディスカッションを重ねた上で、最終日のプレゼンテーションを迎えます。つまり、GSP は英語“を”勉強するのではなく、英語“で”学問をします。リベラルアーツ型の全く新しい留学なのです。参加者は、千葉大学から工、理、園芸、法政経、教育、国際教養学部の1年生から4年生までの20人、ドイツのドレスデン応用科学大学から12人の計32人。言語と専門の違いを前に、どう相手の考えを理解し、どう自分の意見を伝えるか、そんな挑戦がGSPの醍醐味です。共通言語は、社会問題に対する問題意識。多様な意見から社会問題に対し something new を生み出すこと、それが GSP の挑戦なのです。(鈴木 万葉)

Schedule of activities

	Day	Contents
Pre-course	28 Apr	Orientation, introduction of Dresden by Ariane Heinen (J-PAC student at Chiba U)
	12 May	Safety concerns
	8~10 Aug	Preparation of cultural presentations
	5 Sep	Prof. Hayashi: <i>E-mobility in Japan</i> [skype]
		Prof. Scherzer: <i>Urban Open space & Mobility: Problems, Trends & Challenges</i> [skype]
	7 Sep	Prof. Ueno: <i>Smart cities in Japan</i>
		Prof. Bauer: <i>Introduction to the German language</i> (for ChibaU students)
	9 Sep	Workshop: Unpacking ideas & drafting interview questionnaires
	12 Sep	Prof. Dietrich: <i>Aspects of Manufacturing Technology related to E-Mobility</i> [skype]
Final Preparations before departure		
September		
Main Program	17	Departure from Chiba
	18	Arrival of Chiba University students and staff in Dresden
	19	Introduction, Orientation, Cultural Presentations and welcome party
	20	Lectures by city hall and regional administration staff: <i>the Context of Electro-Mobility</i>
		ChibaU students' presentations: <i>Smart-cities in Japan</i>
	21	Lectures by Prof. Hübner & Zipser: <i>E-Cars as part of E-Mobility</i> , & test drive
	22	Fieldwork at Porsche & BMW, visit of Monument to the Battle of the Nations in Lipzig
	23	Lecture by Prof. Becker: <i>Preference of E-Mobility with ecology in mind</i> , visit of
		Transparent Factory, interview of the public, and workshop to analyze interview data
	24	Workshop and mid-term presentations
	25	One-day trip to Saxon Switzerland
	26	Lecture by Prof. Gestring: <i>CO2-footprint</i> & workshop
	27	Fieldwork at Fraunhofer IWS & preparation of the final presentations
28	Final Presentations, feedback & farewell party	
29	Departure from Dresden	
30	Arrival in Chiba	
Post-course	8 Nov	Feedback by Prof. Ueno
	22 Nov	Feedback by Prof. Hayashi & students reflection on GSP [skype session]



Collaborators

HTW Dresden

- Rector Mr. Roland Stenzel
- Mr. Thomas Himmer
- Mr. Jochen Dietrich
- Mr. Cornelius Scherzer
- Mr. Stephan Zipser
- Mr. Manfred Hübner
- Mr. Ingo Gestring
- Mr. Gunther Naumann
- Mrs. Gudrun Schumann
- Mrs. Ute Wadehn-Peña

HTW International Office

- Mrs. Juliane Terpe
- Mrs. Kirsten Schellenberger
- Mr. Daniel Kästner
- Mr. Martin Kühn
- Mr. Kilian Völkel

International Guest House

- Mr. Hans-Joachim Lange

TU Dresden

- Mr. Becker

City of Dresden

- Mr. Frank Fiedler
- Mrs. Kerstin Burggraf
- Mr. Axel Wittstock

SAENA

- Mrs. Cathleen Kloetzing



SRD

- Mr. Budich

DVB

- Mr. Roch

Fraunhofer IWS

- Mrs. Birgit Mörbe

DREWAG

- Mr. Jens Winkler

ENSO

- Mr. Carsten Wald

Chiba University

- Mr. Kōichi Hayashi
- Mr. Takeshi Ueno
- Mr. Takei Masahiro
- Mr. Lars Bauer
- Ioannis Gaitanidis
- Hiroki Igarashi
- Satoko Shao-Kobayashi



Program Components

Framework

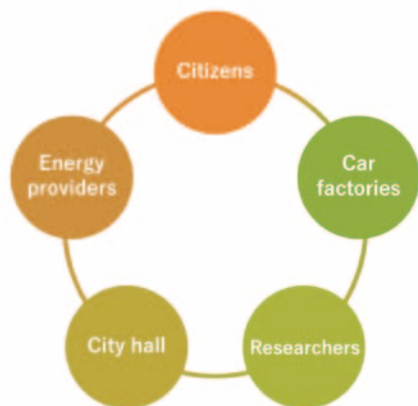


Learn about the basics of e-mobility and its current issues and devise scenarios that make the most of the technology as it is available right now

Think about the infrastructure that will make these solutions possible and sustainable in an urban environment

Implement e-mobility to the larger concept of smart cities and try to imagine how Dresden could be transformed into a smart city through the use of existing scenarios in Japan and around the world

Stakeholders



Challenges

1. Available offers or products
2. Cruising range / Infrastructure / Charging stations
3. Batteries: price, charge duration, safety
4. Government funding and support
5. Electro-mobility and supply-chain management
6. Demographic development, public awareness, acceptance of e-mobility
7. Sustainability / environmental aspects of urban mobility and e-mobility

Final presentations

Framework	Battery	Reducing the price of EV	Automotive sharing	Public transport for citizens	Aging society and e-mobility	Urban mobility
Ken Masafumi Luisa Hironari Erika Alex	Wataru Soraya Markus Patrick	Yoshitaka Sayaka Nakako André	Paul Larissa Kazuya Mitsuki	Mayo Kenta Dirk Maoko Florian	Kohei Yuya Mose	Yusuke Minami Peter Max Saoki Chisa

First of all, the state of the art in the world and especially in the two participating countries was addressed through several pre-course education sessions and the preparations by Chiba University students of presentations on case-studies from Japan. It was therefore subsequently found that the main challenges facing electro-mobility today could be grouped under seven categories: the availability of vehicles, the cruising range of the cars and the quality of the infrastructure, the price and safety of the batteries, the lack of government support, issues in supply-chain management, the low public awareness and acceptance of this technology, and, finally, the environmental aspects of emobility, especially in an urban setting. Based on these investigations, four themes were pointed out among the organizers at HTW Dresden and the program was then built accordingly.

The first main theme concentrated on the context of electro-mobility, with presentations and discussions on issues such as urban structures, open space quality and mobility, forecasts and scenarios on mobility in Dresden, sustainable urban mobility and urban development. Relevant aspects of problems and potentials of urban development, integrated transport systems and electro-mobility were emphasized during presentations and the ensuing discussions with staff from Dresden's city hall and from the state of Saxony.

The second theme focused on e-cars, including presentations on an electric road-sweeper project, on hybrid or electric vehicles (accompanied by exercises with e-scooters and hybrid cars at the Faculty of Electrical Engineering). This subject was further connected with a field research trip on hybrid vehicles. It was realized with a field trip to Leipzig (i-exclusive tour at the BMW plant and a

guided tour at the Porsche plant) and a visit of the "Transparent Factory" in Dresden.

The second week of the program started with the third theme, which concerned electro-mobility and supply-chain management, and which included a lecture and student-exercise about CO2-footprint of various transportation systems. This was followed by the last topic of investigation: battery issues, which were considered during a visit of the Fraunhofer IWS Dresden, where a wide range of technical and functional aspects of e-mobility could be illustrated.

As it is perhaps clear from the above, during these field research visits, the program participants had the opportunity to discover the perspectives of, and subsequently interview the main stakeholders of the e-mobility market: the car factories, the researchers, the citizens, the energy providers and the public administrators. Based on a combination of the knowledge associated with each of the themes of the program, with the collection of the variety of perspectives expressed by the different stakeholders, the students were then asked to select an aspect of e-mobility that they wanted to suggest improvements to for their final presentations.

The final presentation groups were compiled so that members roughly shared the same interest in regards to a chosen topic, but had collected data on different stakeholders. In the end the presentations were arranged so that the entire session took the form of a single narrative, starting with proposals concerning e-cars, continuing with proposals regarding e-mobility and infrastructure, and ending with a general plan to turn Dresden into a smart-city. In this way, we returned to the three level-structure of the original problematic, which now, hopefully, seemed much clearer.

様々な学部からの参加がこのプログラムの魅力であり、GSPの参加条件にテーマに関する専門性は求められません。そのため、事前教育の際に、全員が議論に参加できるようにドイツと日本双方の先生の講義を受け知識の足並みを揃えます。事前教育が終わればドイツ・ドレスデンでのプログラムが始まります。現地でも市役所や電力会社からEV・スマートシティに関する様々な視点からの話について聞くほか、工場や研究施設を見学し、さらに市民の声をフィールドワークから得えます。そこから興味のある内容ごとにグループに分かれ、現地の学生とのディスカッションを経て中間発表を行います。先生からのフィードバックを受け、フリーデーで現地の学生との交流を図りつつ最終プレゼンに向けさらにディスカッションを重ねます。このディスカッションの多さがGSPの魅力と言えよう。最後に各グループからプレゼンテーションを行い、フィードバックを先生から受けます。事後教育ではパンフレット作成のほか日本の先生からのフィードバック、ドイツの学生・先生とのトピックの今後についてのディスカッションをします。(郡山 知紗)



Pre-course Education

Studying the Disciplines & Fields

We started the pre-course education sessions for this GSP in May. What we did during these sessions was the following: 1) made two presentations—one on culture and the other on electric vehicles (EV) and smart-cities in Japan and 2) attended lectures, in person and via Skype, given by Prof. Hayashi, Prof. Scherzer, Prof. Ueno and Prof. Dietrich, relating to EV and smart-cities. From my perspective, going through the process of making the presentation on EV and smart-cities in Japan was especially valuable.

To make this presentation on EV and smart-cities in Japan, every Chiba University student was tasked to search for different journal articles about EV and smart-cities so as to become more familiar with these topics. This was especially helpful because not all participants were engineering or science majors. The 21 students from Chiba were from different disciplinary backgrounds. The diversity of these backgrounds became useful later, during group-work. I, myself, a politics and policy studies major, was interested in how we can implement policies about EV or smart-cities. It was very hard for me to learn about the mechanism and problems of E-mobility.

Regarding the subject-matter and contents that needed to be covered, we were divided into five teams and, using the information obtained from our journal article search, we had to make presentations and offer possible solutions to existing issues. We also had to

come up with additional solutions based on our own ideas. These additional solutions had to be revised several times as they sometimes lacked originality. Through this experience, I became aware of the challenges associated with coming up with new and innovative ideas that can be applicable to an existing context. We also had to work on the comprehensibility and esthetic of the presentation documents. We practiced our presentations many times in order to have them fit within a 10-minute timeframe and ensure that our message was clear and concise. We were helped by watching the lectures given by the professors. These were not only very interesting, but also served as good guides for our presentations.

I learned a lot from these pre-course education sessions; what I found especially useful was learning about the importance of how ideas are conveyed and how to work efficiently within a defined timeframe. (Masafumi)





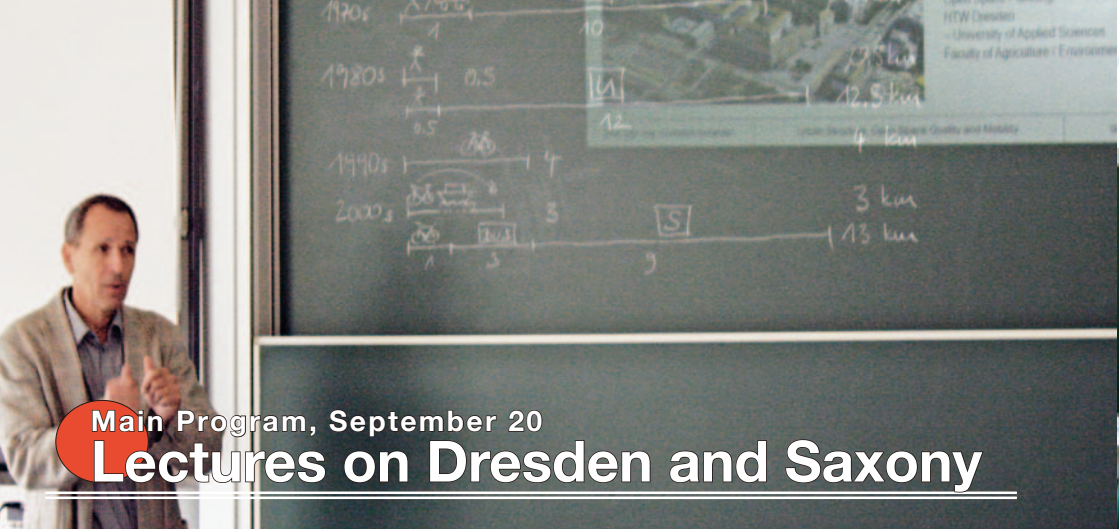
Pre-course & Main Program Cultural Presentation

On the 8th, 9th and 10th of August, Chiba University students participated in workshops to prepare presentations on Japanese culture. During these workshops, we created a prototype presentation that we revised and perfected. Through giving the presentation and the editing process, we were able to get advice from teachers and feedback from evaluation sheets from other students. This process really helped to improve the quality of our work. (Kohei)



The cultural presentations were the first “getting to know you” for participants of the GSP. Participating students in this year’s GSP from Japan and Germany chose some great and unique topics to share useful, mostly historically or traditionally-based, information on their respective countries. For example, the Japanese students gave presentations on the *shamisen*, a Japanese musical instrument, and about the term *mottainai*, an old Japanese term that means roughly “what a waste”—both of which are experiencing a revival in recent times. The German students gave presentations about the high-speed highways called “Autobahn”, German bureaucracy and about drinking habits. All participants came away with interesting and new information that hopefully became material for the first ice breaking discussions between students. (Andre)

事前教育はドイツに行く約3カ月前から始まりました。事前教育の内容は大きく分けて3つ。まず1つ目は、「日本における都市の変化とそれによる交通への影響」について学生発表の準備です。これは各自がスマートシティやEVなどのキーワードを頼りに論文を探し、グループごとに各自の論文から得た異なる情報を用いて多角的な視点から現代の交通や都市の問題の新たな解決策を模索しました。2つ目は、「文化紹介」の発表準備です。文化紹介では他の国へ行くGSPの人たちと合同で発表練習をする機会がありました。文化紹介はただ日本の文化を紹介の情報を提示するのではなく、その文化に対して新たな観点から紹介しました。3つ目は、外部の先生による都市構造やEVについての講義です。講義を通し、プログラムに参加した全員が持続可能な社会についての基礎知識を得ることができ、ドイツでも有意義な活動ができたのだと思います。講義はSkypeを通しDresdenの学生と共に受講することもあり、ドイツに行く前からDresdenの学生と協働学習を行っているのだという意識を持ちました。(村井 早耶夏)



Main Program, September 20

Lectures on Dresden and Saxony



The lectures were interesting and the information we got about the general ideal behind the concept of Dresden's public transportation and about its planned future development was nicely covered, for example: how they intend to provide energy for e-vehicles, which are going to be much more common in the next decades, or how they plan to improve traffic flow during rush hours—a big problem right now. My personal highlights of the morning were the discussions with the presenters from the city hall, and listening to the questions asked by Chiba University students which enabled me to understand what interested them about this special topic and how they assimilated the information learned through the presentations. In conclusion, the topics we heard about that day covered the foundational information of this area. I'm sure the contents must have interested Chiba University students as well because it was probably all new to them. These lectures also made me wonder how the city hall in Chiba plans for future development of their area and how they try to face and overcome similar challenges. (Patrik)



Main Program: September 20 Smart-cities in Japan

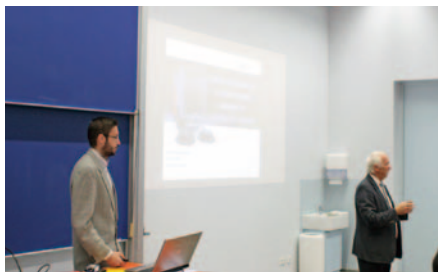


In the afternoon, Chiba University students gave presentations on the theme of 'electric vehicles and smart cities in Japan.' City Hall personnel who had given lectures on EV that morning were present for these presentations. There were five presentation groups, and Chiba University students had been preparing for this day for about three months. Each team made the presentation about EV with various ideas from journal articles which they had sourced in June. Each team considered EV from different viewpoints. Some examples of content that was presented: 'How can we spread the use of EV?', 'Relation of EVs and traffic jam', 'Correlation between smart cities and EV', 'EV diffusion policies by changing viewpoints'. After the presentations, we were given helpful feedback from the teachers and City Hall members. Those opinions were helpful for the following GSP activities, especially the final presentation. (Nakako)

今回のプログラムの目的は電気自動車をはじめとする E-mobility の普及可能性やスマートシティについて議論することです。その時に大切なことは、自分の視点のみから意見を述べるのではなく、さまざまな人の立場を考慮し、話し合いを行うことです。そこで、都市の E-mobility に関連する人々たちを市役所、研究機関（大学）、市民、自動車工場、自動車会社の 5 つのステークホルダーに分け、それぞれの意見を聞くことになりました。この日は、そのうちの 1 つである市役所の方々の話を聞きました。ドレスデンのトラムやバス等の公共交通機関や 2025 年に向けた持続可能な都市交通計画について知ることができました。プレゼンテーションの後の質疑応答でより理解を深められたと思います。その後、千葉大学の学生から、事前教育の際に作成したプレゼンテーションの発表を行いました。日本で実施されているスマートシティの実例や電気自動車に関する日本政府の取り組みなどを紹介しました。ドレスデンと日本の都市交通の現状と将来に向けた計画、市役所の立場を知ることができた 1 日でした。（小澤 英李佳）



Main Program: September 21 E-Cars and Test Drive



On September 21st, we had the chance to have a look at electric and hybrid engines at the test facilities of HTW Dresden. They had a Porsche Cayenne available which allowed the professor to explain the mode of action using a practical example. It was interesting to see how two types of engines can work together and how intelligent the systems are. After a detailed lecture and a lot of theoretical input, we got the chance to go for a short test-drive with the car. Unfortunately, the road was not very wide, but it was amazing to experience the acceleration of this powerful engine. We also had the possibility to try different types of e-scooters. In spite of some students experiencing difficulty riding the scooter, everyone managed it and came back in one piece. After we finished the test drives and had lunch, we met back at the classroom and talked about the next day. We decided if we wanted to go to Porsche or BMW, and polished the questions we wanted to ask to the guides at the automobile plants. (Florian)





Main Program: September 22

Fieldwork at BMW & Porsche



On September 22nd, we visited the BMW and Porsche plants. Both of the companies have their own policy and strategy. For example, BMW takes into account environmental problems. The car materials can be created from used plastic bottles, leaves, wool and so on. Furthermore, the electricity of the plant is generated exclusively from renewable energy such as wind and sunlight. On the other hand, Porsche introduced their 'hand-made' approach. At first, I thought this system was impractical because the company spends a lot of time training employees and spends a lot on labor costs compared to companies who use robots. However, in the long term, this is an efficient way of doing things because the designs of cars are always changing. In other words, the car manufacturing process has to be adaptable. Through this special experience, we learned a lot of things related to e-mobility and smart cities and used a lot of the information obtained for the final presentation. (Hironari)

車の製造過程を見たことがある人は少ないでしょう。21日には大学構内で実際に電気自動車や電気スクーターに触れ、運転し、e-mobilityについてのより具体的なイメージをもつと同時に、研究に携わる教授や研究生にその場で話を聞くことができました。9月22日には、2グループに分かれてBMWとボルシェの工場で製品や製造過程を見学。e-mobilityには不可欠なバッテリーや素材について、また今までのe-mobilityの歴史について、実際の物を目の前にして学ぶことができました。自分は文系で、現地での講義にあっても電力効率や材料、力学的な話は理解できるどころが少なく、イメージをもつぐらいいました。しかし、21日、22日の活動で、現場に立つ人の話を聴き、現物を目のあたりにすることで新しい興味やイメージを得えました。この活動は、最終プレゼンにむけて、それぞれが自分の目標とするものを捉えはじめ、「自分はどこで貢献できるか」「専門知識に乏しいなら、専門外からアプローチする方法はないか」を具体的に考える良い機会となりました。(渡邊 有哉)



Main Program: September 23

Fieldwork at Transparent Factory



The Transparent Factory was built in 2001 in the heart of the city of Dresden to introduce the world to something unique: an opportunity to experience Volkswagen manufacturing up close, through the Phaeton. The Phaeton has been the “masterpiece” of the Volkswagen brand for more than 14 years. The exhibition that is now open is the first stage in a new direction for the Transparent Factory: its production technology will be turned into a flexible assembly operation within the coming years. This means that Dresden is perfectly positioned for the assembly of premium and luxury models as well as electric vehicles. At the moment, there is a new exhibition in the Transparent Factory which is about the future of driving. This exhibition is separated into five themed areas: electro mobility and digitalization, driver assistance systems, the history lane, the innovation lane and a vehicle exhibition. These exhibits show visitors exactly how electro mobility works. Thanks to an interactive, full-size, glass-frame model of the e-Golf, they can take a close look at the components of electric drives. The second area displays the latest driver assist systems that make driving simpler and safer. The history lane display covers the roots of the Saxony carmakers, their progression over the years and the development of the electric drive. The fourth area presents the future of mobility. In addition, the XL1 one-liter car and the cult Volkswagen bus. (Larissa)



Main Program: September 23 & 24 Interviews and Workshop



On the afternoon of September 23rd, we were divided into several teams and interviewed Dresden citizens. We talked to many men and women of all ages (e.g. an old couple, a housewife with her dog, a student, an office worker on his lunch break, a father with his child). Our questions were about topics that each student had researched. For example: 'What do you think about electric cars?', 'Are you satisfied with Dresden's public transportation?', 'Do you know the autonomous driving system?' and 'Would you like to buy the an electric vehicle in the future?' Naturally, not all Dresden citizens can speak English, so sometimes German students helped with translating into English for the Japanese students. Dresden citizens were very kind and were happy to answer our questions. Many teams talked about the information obtained from these interviews in their final presentations because the citizens' opinions are very important to consider in GSP. (Mitsuki)

9月23日、我々はドレスデン市の中心部にある Transparent Factory を訪れた。その名の通り、ここは全面ガラス張りの近未来的な自動車工場で、VW 車の生産工程をガラス越しに見学することができます。ガイドツアーに参加した我々は、館内の展示を見て回りながら過去から現在、そして未来に至るまでの E-car のあり方について色々説明を受けましたが、これは前日の工場見学とはまた違った形でドイツの自動車生産を知る、良い機会になったと思います。その日の午後は市民にインタビューをするため、各班に分かれてドレスデンの街に繰り出しました。ドイツの学生の助けを借りながら、高校生からお年寄りまで、道行く人を呼び止めては皆それぞれが用意していた質問を尋ねたのですが、これまでの学生同士の議論では出てこなかったような意見も聞くことができ、非常に参考になりました。現地生活している人の話を直に聞けるというのは GSP ならではの貴重な体験であり、何よりそうした形で彼らと交流ができたのは嬉しいことでした。また、ともに街を歩いて回ったドイツの学生とも一層、仲を深められた一日でした。(大野 亘兒)



Main Program: September 24
Mid-presentations



On September 26th, we were working on mid-term presentations. We spent a lot of time searching for a good solution for our topic. In the morning, we were divided by our supervisor into seven groups. Each group had 4-5 students. The groups were divided according to common interests. Peter, Minami, Yusuke, Saoki and myself worked on the topic of urban modeling.

We had to find out the main problems of urban modeling and come up with solutions. For this topic, we also presented about a compact city in Japan, for example the case of Aomori. We compared advantages and disadvantages of smart cities and how we can adapt new smart cities for electrical vehicles. We thought about creating compact cities that are easy to live in and environmentally friendly. Other groups were busy with other topics. For example, team 3 tried to find out how we can better advertise electric vehicles. The survey was carried out on local residents. Group 7 dealt with battery efficiency and standardization of charging systems. Group 5 covered the topic of autonomous driving. Groups 6 looked at how we can improve our public transport situation. They have a lot of interesting solutions for example: bike or car sharing, ticket sharing, improvement of payment system and so on. In the afternoon, all proposals were presented to the rest of the groups and we received feedback from teachers. (Max)



Main Program: September 25

Break: Saxon Switzerland



We took a small trip which began with a train ride from Dresden to Schöna, with a wonderful view along the way of the small villages on the other side of the river Elbe. After arriving in Schöna we took a ferry to cross the river Elbe and got to Hřensko, a little village in the north of the Czech Republic, directly past the border with Germany. The hiking tour started along a path by the river Kamenice, through a thick spruce forest. We crossed through a pitch-black tunnel along the way. After about one third of the way we reached the Wilde Klamm which we crossed on a small barge with a bargeman who used a long rod to push the boat across the water. During the cross, the bargeman told us about the history of the area and the quirky rock formations. The passage lasted about 15 minutes. After this we continued hiking to Mezna and then back to Hřensko where we sat down in a restaurant and ate and drank local specialties, like goulash with dumplings. (Peter)

24日・25日、この2日間は1つの切り替えし地点でした。24日は中間発表日。私たちは現地学生と共に7つの班に分かれました。事前教育から始まり、現地で学び、気づき、考えた知識を発表へと形作る日でした。しかし、プレゼン作成の締め切りは当日正午まで。限りある時間の中で各班は、話し合い、考え協力しながらプレゼンを形にしていきました。そして中間発表。7つの班が各テーマの発表をします。構想を練り続け、他の班のプレゼンを聞けば聞くほど自班・自身に足りない要素が浮き彫りになります。最終プレゼンに向け、各班の反省や先生方からのフィードバックを踏まえた上で各班、各自の役割や出来ることを考えさせられました。25日は前日までとは大きく変わり、ハイキングへ行きました。現地の学生・教授と共にチェコの国境へ行きハイキングをしながら国境を超えました。前日までの重圧もあり、皆が東欧の綺麗な林の中を和気あいあいと歩きました。話をする時間も増え、現地学生とお互いについてより深く知り合いました。帰りの電車では、車両の皆で国歌を歌うなど、ドイツの国柄、文化に触れることが出来ました。(久我 和也)



Main Program: September 27

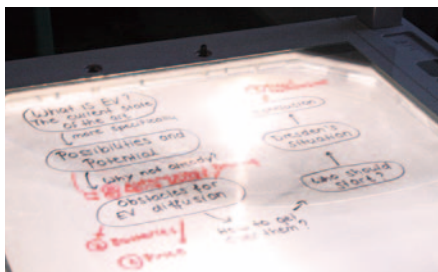
Preparation for Final Presentations



We had a special class on Supply Chain Management. The teacher asked us 'If you are going to transport your products from Chiba to Dresden, which means of transportation will you use?' There were a lot of alternatives. By sea or air? Which ports or airports were you going to use? Each group had original viewpoints and came up with a plan for transportation. We had to consider many aspects such as costs, days, and efficiency. I can safely say that this class required us to have various viewpoints which helped to broaden our perspectives. We then visited the Fraunhofer Institute, one of most famous research institutes in Europe, where we were presented with cutting edge technology. They showed us the laboratory of battery condensers and their equipment for metal processing. The structure of modern condensers and its manufacturing process impressed us and we realized how much battery technology had improved over the last few decades. The huge laser for metal processing was also an exciting thing for us to see. We had never seen such a huge laser. Its control technology was brilliant. We had never imagined we would see such incredible technology, and at the same time, we realized the challenges facing EV technology are still many and there are still a lot of problems that need to be solved. (Soraya)

Main Program: September 28

Final Presentations



Our work culminated in the final presentations—the grand finale of our collaboration. In this last presentation, topics were distributed amongst several mixed teams. We took what we had learned during the past ten days, evaluated our experience and came up with an outlook for the future. The presentations were designed to give a comprehensive overview of our research results even to someone not familiar with EV or mobility, spiced up with some “what ifs” (with more or less serious suggestions to build batteries into every spare space of a car, even into rims and tires.) With this last, rather massive effort, we not only applied our collaboration skills one last time, but also solidified our newly acquired knowledge and, knowingly or not, prepared our and our listeners’ minds to stay interested and informed about electric mobility. (Alexander)

遠足で束の間の開放感を味わった後、最終発表に向けたチーム編成の小変更と対峙します。困惑や憤りを口にするメンバーもいました。先生方が各チームに何を要求し、自身にはどんな働きが期待されているのか、各自が思いを巡らしました。しかし時間が足りません。提案に確信がもてず、連携や意思疎通に苦心する現実がありながら、最終発表日が目前に迫っていました。自らを絶え間ないプレッシャーに晒す二日間が始まりました。最終発表の直前まで高密度に情報や体験のインプットが続きます。26日の午前には講義にて SCM や EV 充電系の仕様、物流への EV 利用について学び、午後には ENSO の社員の方に直接質問できる機会が与えられました。27日の午前にはフラウンホーファー研究所を訪れ、リチウム電池の製造過程やローコストな硫黄電池の研究に関して見聞を広めました。両日とも午後は発表の準備に取り組みます。これまでに得た知見を取捨選択し、ぼんやりしたイメージに骨格を与えてオリジナルなアイデアを研ぎ澄ましてゆきます。それぞれが自分らの GSP 参加を意味あるものにすべく、全力を投じました。その夜はおそらく皆あまり寝ていません。(村松 賢)

Final Proposals



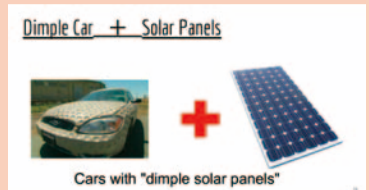
Team 1: What is EV? The Current State of the Art

We constructed the framework for the topic we were investigating—Electric Vehicles (EV). We had to include all general statements from the other groups and answer the question: ‘Who should start promoting EV to the society?’ EV offer a solution to reduce greenhouse gas emissions and local air pollution, but their market penetration is still low. The market introduction of EV can be seen as a milestone in order to reduce the environmental burden imposed by the transportation sector. We concluded that citizens should take the first step and inform themselves about EV in general. (Luisa)



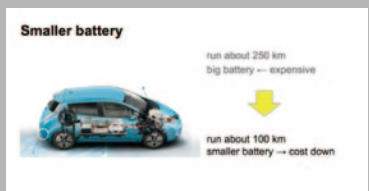
Team 2: Batteries for EV

Our first idea was to modify the surface of the car body by adding dimples to make use of the Golf-Ball-Effect which would reduce the air resistance of the car and make it more energy efficient. The second idea was about a new type of car sharing. This new car sharing model would rely on a large network of sharing stations, each having spare cars with fully charged batteries; those customers whose car batteries run out before the end of their journey, could then switch cars without waiting for charging time. The last two ideas had to do with making use of the empty spaces in cars for battery storage. (Markus)



Team 3 : Reducing the Price of EV

We proposed several ideas. The first is to remove some functions of EV, such as the sound system and the car navigation system, which consume a fair amount of battery life, and rely on smartphones to fulfill these functions instead. The second is to make an EV with a smaller engine, designed for shorter distances (e.g. 100 km) which would suffice for work commutes and other shorter-distance activities. The third is to offer a network system of locations where people could stop and easily swap out batteries if they need to travel longer distances. We also proposed ideas to work in collaboration with real estate companies to reduce the cost of EV. (Yoshitaka)



Team 4: Autonomous Driving

Our presentation first introduced the technical and ethical issues, such as hacking and critical system failure, and addressed the questions of ‘Who is responsible for accidents?’ or ‘Who should be helped first if an accident occurs—the driver or the pedestrian?’ Furthermore, we introduced a system for implementing autonomous driving. In short, the first step should be the testing of autonomous vehicles under ideal circumstances, in a controlled environment, until it is determined that they operate in a relatively safe way. The last step should be the introduction of autonomous vehicles in cities. Some cities have complex infrastructures, extremely high traffic density and higher risks of unpredictable occurrences. (Paul)



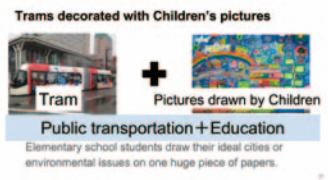
Team 5: Along with Your Life

We discussed how to increase the number of users of public transportation by 1) rewarding users of public transportation and 2) expanding the function of public transportation. To achieve the first objective, we suggested three ideas: consolidate public transportation of several companies to provide a unified e-card, adaptive public transportation lines and reward the consumer. To achieve the second objective, we proposed two ideas: holding day-to-day activities on public transportation and offering a space for citizens to hold special events inside the public transportation vehicles (e.g. NPO or NGO events) and children draw pictures of their ideal city and use them to decorate the outside of trams. (Maoko)



Team 6: E-Mobility and Aging Society

To illustrate a fictitious scenario, we described a day for grandparents who live in a city near Dresden. We envision these grandparents using a LAC (Lonely Autonomous Car), which enables them to travel by car to meet their family. The LAC is signaled through a smartphone app. Once on the e-highway, these grandparents can connect to a road train. Once attached to this train they can charge their LAC's batteries and save energy. The truck is connected to an overhead cable but have also a battery for overtaking. When they arrive at their destination along the Elbe River, they take out a foldable e-bike stored in the LAC and go for a bicycle tour with their grandchildren. (Mose)



Team 7: New Smart City

We came up with a definition for a new smart city, which includes six elements: energy, wellness, facility, mobility, security, and community. To realize this, we proposed to connect Dresden and neighboring cities in a more efficient manner so as to ease traffic congestion from uneven population distribution. In the central part of the city, there would be a multi-purpose, commercial facility—a type of collective establishment. The first floor would have spaces for commercial activities. The second floor would have spaces for events and relaxing. The third floor would be the living space. Open spaces in the areas that include Dresden and neighboring cities would be used to cultivate crops and produce renewable energy. (Yusuke)



Participants

Alexander Lanchev

I didn't expect to have such an opportunity for this international exchange program. I hope that future students will have a similar chance to take a peek outside their usual boundaries.

André Hartenberger

This program taught me a lot about different aspects of electric mobility. It also helped me to understand the overall situation, beyond batteries. We also had very interesting field trips.

Chisa Koriyama

I experienced difficulty in conveying my ideas and matching them with others' ideas. I can say that this program was a great experience and I want to make use of what we learned.

Dirk Wetzig

This was my first time participating in such a program. It widened my view of how to approach working in an intercultural context, with people from different fields.

Erika Ozawa

By studying with German students, I became familiar with different ways of thinking and I can understand the importance of listening to others' opinion.

Florian Concepcion

I was very happy to participate in the GSP and can take a lot of new skills away with me. Also, it changes my way to think about the possibilities to use alternatives to my private car.

Hironari Arima

I realized that I could not tell German students what I really want to say by only looking up the word in a dictionary. It was important to listen and use/repeat the words or phrases they said.

Kazuya Kuga

This project changed my values. I acquired a bigger thinking scale and a more nuanced point of view. This project is a turning point in my life. "He who moves not forward, goes backward."

Ken Muramatsu

It was a turbulent program. I had to interpret a large quantity of information every day. There were feelings of irritation and accomplishment mixed in. I came to appreciate the difficulty and wonderfulness of communication.

Kohei Watanabe

I was really helped by my fellow students as well as many others. I couldn't have made it through this program without their help. Hopefully, I will become more ambitious than before.

Kenta Someya

I learned it's easy to push my ideas but it's also important to listen to others' ideas and to try and compromise. I feel I can do more for something related to this GSP topic. I'll think about what I can specialize in in the field of environmental issues.

Larissa Wurster

GSP was a great experience and I had a lot of fun with the whole group. Furthermore, I think that I learned a lot during the program, for example how I can work with people from another culture. I hope that we all meet next year in Chiba.

Luisa Bahmann

All in all I can say that I made new friends, improved my English, strengthened my self-confidence and learned how to deal with problems in communication—so I think this program was a great success.

Maoko Hirata

When we made the presentation, we had to argue with each other and sometimes I felt frustrated because I couldn't articulate my opinion with accuracy. However, this experience made me stronger.

Masafumi Wakabayashi

This was a wonderful opportunity to learn about a topic from various sources. This program definitely stimulated a motivation for learning more about language and the topic in question.

Markus Baumgardt

The whole program was very interesting. But we sometimes stuck too much to the timetable and there was not enough spare time. Yet, all the fieldtrips to BMW, etc. were very interesting.

Max Fertich

It was a very nice experience. It was interesting to learn some new information about E-Mobility and about other kinds of science. I would, of course, like to take part in the next program.

Mayo Suzuki

I have some regrets because I felt my performance could have been better. But, I was able to identify some of the difficulties and I will work on overcoming these gradually. I would like more occasions like these to improve English skills and other abilities.

Minami Sato

I think I have to study English more. It was very hard to say my opinion during some discussions. So, it took long time to make the presentation. But, I was glad when I could get through to students from Germany.

Mitsuki Ueda

Discussion was sometimes difficult, but I felt pleasure when we were able to share our feelings. This was a valuable experience and I am very grateful for the wonderful encounters. Thank you & Danke schön!!

Mose Kreher

I had imagined the GSP program differently, my expectations were exceeded in a good way. The focus was on social interaction and the development of working methods pleased me greatly.

Nakako Watanabe

It is important to be able to express what one doesn't know with clarity. This is fundamental to communication with anyone.

Patrick Praes

On the whole it was fun experience, but some of the lectures weren't so interesting. The group work was the best part and I liked the overall working atmosphere. Furthermore, it was quite interesting to work with students from another country.

Paul Riehl

This project was a great addition to my life. I will never regret having participated in this GSP because I learned a lot about E-Mobility and improved my social skills. Overall it was a hard but very satisfying.

Peter Matthes

It was a very nice experience to participate in this program, to meet and work with Japanese students on presentations. I learnt different things about e-mobility and smart cities. I would participate again in this program, particularly in Japan.

Saoki Yamabe

This program gave me moments of frustration when it came to speaking English and experiencing some challenges with cooperation. But it also gave me moments of fulfillment. I want to try GSP again!

Sayaka Murai

I was inspired by the workshops with students in Germany. I am not good at speaking English. But I feel it is important not to give up and try to express my idea again to be understood.

Soraya Shizumi

I obtained great benefits from GSP. The high-level studies about batteries and the visits to car factories motivated me to study more about technology and challenge current problems using "flexible thinking".

Wataru Ono

Joining GSP was a meaningful experience, cooperating with foreign students and discussing problems in English while working toward the same goal. What I experienced was wonderful and unforgettable.

Yoshitaka Matsumura

I joined GSP for the second time, but this was completely different from the previous one. Sometimes I noticed different ways of thinking and how to use time. This was an interesting experience.

Yusuke Matsue

It was a valuable experience for me. The last presentation, accepting others' opinions helped to come up with new ideas. I couldn't convey what I really want to say in English as well as I wanted.

Yuya Watanabe

I enjoyed participating in group work and helping others by expressing my ideas. This is short-term program, but I've grown up so much during the time. "It always seems impossible until it's done." I was able to feel this.



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