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SMAGRINET

POWERING SMART GRID
EXPERTISE IN EUROPE

his project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 837626

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TAL TECH
Univerza v Ljubljani
TECHNISCHE UNIVERSITÄT DRESDEN
LOBA
CIVITTA
ktu kaunas university of technology 1922
Technische Universität Berlin
ETL ESTONIAN ELECTRICITY INDUSTRIES
UNIVERSITÉ DE LORRAINE

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Executive Summary

The long-term strategic objective of the SMAGRINET project is to educate a generation of researchers and engineers who are equipped to develop, improve, and deploy new energy technologies, and can meet the challenges of the energy transition.

Work Package 3 of the SMAGRINET project aims to provide master's students from participating universities with the up-to-date knowledge on operational problems of modern power grids and focus on combining the social, technological, and industrial dimensions.

Three challenge and case-based modules at the master's level, linked to European university programmes were developed at participating universities and valuable insights were delivered to support the academic knowledge in the form of industry-academia collaboration in SMAGRINET International Mobility Programme (T3.3).

This report gives an overview of these SMAGRINET Mobility Programme activities, which were carried out to compliment the SMAGRINET modules. The document outlines:

- The activities at a glance and the overview of adaptions to carry out the programme during COVID-19 pandemic;
- Deeper insights and analysis of the different Mobility Programme activities:
  - Internships
  - Roadshows
  - Online session
- Opportunities for the future

In conclusion, the document analyses how the Mobility Programme has worked on preparing the next generation of engineers with interdisciplinary operational and problem-oriented skills and summarizes whether the target and objectives have been reached.

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1. Overview of the activities

SMAGRINET Mobility Programme activities were developed to find a practical output for the knowledge acquired in the SMAGRINET Modules taught at the universities. Acting within the constraints of the global pandemic, the most relevant available opportunities were detected at the industry.

Selected students from all six participating universities were included in the Mobility Programme:

- Technological University of Kaunas (KTU) and Technological University of Dresden who were teaching Module 1 “Artificial Intelligence in a Smart Grid with Prosumers”
- Tallinn University of Technology (TALTECH) and University of Lorraine (ULOR) teaching Module 2 “Economic Operation and Societal Challenges”.
- Technical University of Berlin (TUB) and University of Ljubljana teaching Module 3 “Connection Planning in Smart Grids”.

SMAGRINET Mobility programme activities took place from July 2021 until March 2022, preceded by preparation in close collaboration with industry and universities.

The activities included long-term options (from 3 to 8 weeks) in form of internships at the companies, and concentrated short-term activities, involving several companies and institutions in form of hybrid roadshows (2-3 days) and a virtual session.

1.1. COVID-19 caused programme adjustments

The mobility programme was initially planned to be offered in parallel with the modules and in 2 phases (first phase M18, second phase M29), but due to ongoing pandemic adaptions were made, and Mobility activities were carried out according to possibilities from July 2021 until March 2022. This was made possible by the extension of the project.

The initial contacts and project concept was introduced to the industry already before the programme and during the first Period of the project. Yet, as the companies of electricity industry are offering vital services and must guarantee the continuous supply of energy even in the turbulent times, the caution held back the start of actions. However, the interest to involve young talent was confirmed fully.

Finally, in 2021 spring we saw the decline in COVID-19, increasing readiness for some companies to open up and the opportunity to move forward with the a set of internships during summer 2021. There was a limited timeframe for companies opening and students available for the longer internships. But first SMAGRINET Mobility activity - internships were successfully launched.

To adapt the activities to the cautious attitude of businesses and upcoming academic calendar, SMAGRINET roadshows were developed. This allowed companies to host small groups in limited timeframe, making it more flexible and easier to apply all the rules. And students were able to take time from studies for only 2-3 days but gather insights of several industry players.

In the autumn of 2021, two Roadshows were successfully held, and 2 planned. Unfortunately, the COVID-19 cases in the EU began to rise again. New strains together with unstable geopolitical situation in Europe caused uncertainty, and we saw no other option than to hold last event online and leave unused opportunities gathered to be used in future.

Although the global pandemic situation caused several postponements, challenges in planning and adaptions made on the way, we were able to offer participants a variety of activities that reflected well the challenges in the industry in different countries.

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1.2. Results of SMAGRINET Mobility

As a result, 64 students from all the consortium universities participated in four different kinds of Mobility Programme activities, which were carried out from July 2021 until March 2022.

Firstly, SMAGRINET International Mobility Programme facilitated internships in selected companies with matched students from Germany, Lithuania, and Slovenia during the summer of 2021.

Two SMAGRINET International Mobility Programme Roadshows took place during autumn 2021 – one in Brussels and Paris, involving students from Estonia and France; and one in Estonia, involving students from Germany, Lithuania, and Slovenia.

The activities were wrapped up with a SMAGRINET International Mobility Programme Online Session - virtual visit to Norway and United Kingdom in Spring 2022, open to all universities.

Table 1. SMAGRINET International Mobility Programme Activities

Activity	Time	Duration	Participants	Universities involved	Background of participants
Internships	July – September 2021	3-8 weeks	6	ULJUB, KTU, TUD, TUB	Module 1 and 3
Roadshow in Brussels/ Paris	18-19 (20) October 2021	3 days	22	ULOR and TALTECH	Module 2
Roadshow in Estonia	14-18 November 2021	5 days	15	ULJUB, KTU, TUD, TUB	Module 1 and 3
Online Session with UK & Norway	23 March 2022	2 hours	21	all	all
TOTAL PARTICIPANTS			64	106% of the goal60	

Students brought the learnings to wider audience at their university and activities were also shared on SMAGRINET website[1] and in social media by participating universities.

Several planned opportunities, brought out in Section 5, could not be implemented during the project due to the situation described in previous chapter, but can be carried out in future.

[1] https://www.smagrinet.eu/newsflash/blog/smagrinet-mobility-program-going-to-the-road- / https://www.smagrinet.eu/newsflash/blog/smagrinet-mobility-program-continued-this-month-with-the-first-smagrinet-roadshow/ / https://www.smagrinet.eu/newsflash/blog/smagrinet-roadshow-took-students-to-estonia /

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2. SMAGRINET Mobility Internships

After being on hold due to pandemic situation, concrete negotiations with companies with the best fit were launched in December 2020. While different online options were considered, we did not see the opportunity for a full-fledged experience in online internships. Hence, the target was to bring students on spot during the summer of 2021.

Based on the companies' needs, and offered positions, we focused on Module 1 and 3 students and launched open calls to join the mobility programme at 4 universities in spring 2021 – TU Berlin, TU Dresden, Technical University of Kaunas, and University of Ljubljana.

Interns from mentioned universities from Germany, Lithuania and Slovenia were joining the companies in Estonia to put the knowledge gathered in their studies and in the SMAGRINET Modules into practice.

The hosts included the largest network operator in Estonia, international energy and automation technology group, a platform for managing and trading of electrical flexibility for the balancing of electricity grids, and one of the largest producers of renewable energy in the Baltics.

2.1. Companies and positions

More than 30 companies were in the initial contact list (full list is brought out in Appendix 1) to secure the internship positions for SMAGRINET students. All the contacted companies indicated their interest to involve students, but many were held back by the ongoing situation and uncertainties. Eventually, five companies were able to make concrete offers and were confident that they are able to host students during the proposed period. 15 positions, brought out in the following table, were launched during the spring of 2021 to have the interns joining in summer of 2021.

Table 2. Internship posititions offered.

Company	Content of the intenship position
ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels.	Internship at Electrification Business with **Focus** areas: 1. Power system Study in distribution network; 2. Grid side parameter study, 2. Energy storage products, 3. Energy storage applications, 4. Control techniques behind Energy storage systems **Objective**: To get familiarized with the product, control approach, study and propose most suitable control strategy in the project.
Enefit Green is one of the largest producers of renewable energy in Estonia and the Baltic countries. Part of the international energy group Eesti Energia, Enefit Green's production portfolio is the most diverse of its kind in the Baltic region. Enefit Green produces electricity and heat from wind, water, solar energy and biomass, as well as municipal waste burned in the Iru waste-to-energy power unit that would otherwise be delivered to landfills. In addition, Enefit Green owns a pellet factory in Latvia.	Goal: Figure out a model for a renewable energy (solar park + battery bank) break-even point. The model should work as follows: Input: maximized revenue achieved through the use of energy solutions against price changes in the electricity market Output: solar park and storage device capacities Simply put, the model must give a result that, in terms of size / capacity, pays off to install an energy solution.
	Use of flexibility services in the distribution network

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Elektrilevi - Estonia's largest network operator, with a role to ensure the constant supply of electricity to our customers. We maintain and repair almost 61,000 kilometres of power lines and more than 24,000 substations. We have almost 500,000 customers across Estonia. Elektrilevi develops solutions for tomorrow's sustainable energy grid and leads the way in smart energy solutions in Estonia, such as first nationwide EV fast charging network, first nationwide full roll-out of smart metering project, small size off-grid solutions for rural areas, large scale off-grid solutions for energy island, Smart City solutions; renewable energy challenges for different energy sector groups and VPP and storage simulation and testing	Starting point: In order to ensure the long-term efficiency of the network, it is necessary to invest in the network at an optimal level, but the network will be built with a perspective of the next 40 years and changes in the environment will be significantly faster. Therefore, it is important to increase the flexibility of the network, and one of the options for optimizing investments is the implementation of consumption / production management, i. e. the introduction of flexibility services. The main goal is to solve network congestion and voltage problems in a more economically optimal way, i. e. either by physically building the network or, for example, by controlling consumption / production.
	-"-
	Fault prevention / preventive maintenance Starting point: More than 10 thousand failures occur in the Elektrilevi network every year, which cause interruptions to customers and require liquidation. At the same time, it is possible to obtain various measurements and data from the network through fault statistics, faults in the network, meter measurements and events, as well as automation measurements. The aim is to use this amount of data and, if necessary, additional data to predict faults and perform preventive maintenance.
	-"-
	Network topology analysis Starting point: Elektrilevi today applies a trunk line-based solution for network planning, where the medium voltage network is built radially as a single fast scheme and the network has reduced triple power options to simplify management and reduce network capacity. When implementing new network management systems, the problem of operational network management is eliminated (the system simplifies the execution of power supply in networks with complex schemes). Therefore, the question of the optimal network configuration remains.
	-"-
	Network concurrency factor analysis Starting point: Electrification and the general increase in electricity consumption are taking place in Europe. This will lead to a change in consumption patterns, including the replacement of alternative heat sources with heat pumps, the use of electric heaters, the use of electric cars, etc. On the other hand, distributed generation is developing rapidly and new solar power plants have been installed in Estonia on a very large scale in the last two years. These changes potentially lead to changes in the simultaneity factor of the loads in the network and may lead to a situation where the capacity of the lines or transformers is not suitable for the actual load profile of the network as a result of planning.

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VKG - a private large-scale industrial enterprise in Estonia, focussing on oil shale mining, shale oil, combined heat and power production and production and marketing of fine chemical products. The electricity production company VKG Energia includes the Põhja CHP co-generation plant, power distribution networks, 20 substations, steam and compressed air networks as well as groundwater and lake water networks.	Challenges in thermal engineering and energy efficiency to be specified once profile is matched.
	-"-
Fusebox is a startup integrating consumers and energy systems to enable better integration of renewables and reduce CO2.	AI usage in the process of engaging and motivating electricity consumers, implementation of lessons learnt in the demand response area. Fusebox is active in Lithuania, collaborating with Ignitis and the portfolio is growing rapidly. Students can be involved in integrating and testing new customers, performing follow-up measurements and analysing different customers.
	Demand response business development in general, Usage of batteries with maximum benefits in combination with consumers and the grid, Forecasting of DER and flexibility, Demand response and EV combination, Predicting balancing need in the electricity system, Automation of balancing need prediction, including urgent market messages (UMM).
	-"-

2.2. Participants and feedback

Based on the offers for the positions, the internships were targeted at students from universities teaching SMAGRINET Module 1 “Artificial Intelligence in a Smart Grid with Prosumers” and Module 3 “Connection Planning in Smart Grids”. Campaigns (see examples in Appendix 1) for students were launched at Kaunas University of Technology (KTU), Technische Universität Berlin (TUB), Technische Universität Dresden (TUD) and University of Ljubljana (ULJUB).

The limited time when the effects of the pandemic diminished and the uncertainty about the student candidacy also had an effect. **11 students from 3 universities applied** for the internship positions. Through matchmaking the right profile, motivation, needs and skills, **6 positions in 4 companies were a matched.** 3-sided (ETL-Company hosting-Student) agreements were signed with all the interns, daily allowance, accommodation and travel arrangements taken care of by ETL.

After the internship, all the interns were provided with a feedback form (see example in Appendix 3), asking them to:

- Describe the main tasks performed
- Bring out main outcomes and learnings
- Assess the relevance for studies and SMAGRINET module - to what extent they managed to use the theoretical knowledge from the studies and SMAGRINET module in practice during the mobility
- Give feedback regarding organisation of the mobility

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Selected insights from the reports are brought out in the following sections.

Students from Kaunas University of Technology and Technische Universität Dresden, who had passed the "Artificial Intelligence in a Smart Grid with Prosumers'' module in SMAGRINET, applied their knowledge in Elektrilevi. Saule from Kaunas worked on the NetFix project-smart meter integration into the electrical grid. She analysed the differences between the smart meters with the goal to improve the AI model and admitted that the knowledge from SMAGRINET Module was useful: "The understanding of AI and its workings as well as different issues arising in the probability models absolutely helped to better understand the task and having that prior knowledge served well when trying to find answers to different problems that arose while working on my tasks."

Lorenz from TU Dresden was working on analysing flexibility use-cases to understand basic calculations related to connection of generation to distribution networks and cost-benefit regarding flexibility usage. In addition, he acquired the basics of SQL and experience of working in a very international team.

SMAGRINET "Connection Planning in Smart Grids" module students from Univerza v Ljubljani and Technische Universität Berlin found challenges in Elektrilevi, ABB, Enefit Green and Fusebox.

Jovica from Ljubljana joined Elektrilevi to analyse the effects that charging electric vehicles has on the distribution network. As EVs are a crucial part of Smart grids and the transition from conventional to renewable energy systems, he found the theoretical knowledge from the studies and the SMAGRINET module more than helpful when conducting the mobility.

Matevž, Power Engineering and Mechatronics student from Ljubljana, joined ABB Electrification Business and got himself familiarised with BESS (Battery Energy Storage System), its control strategy, gained a better understanding of communication protocols, and new PLC programming approaches. "Theoretical knowledge from the SMAGRINET module was useful in my tasks. Especially the courses Electrical Vehicle Impact on Distribution Network, Multi-energy system including PV, Smart Grid Technologies" he brought out.

Another student from the University of Ljubljana,Karin dug herself into renewable energy in Enefit Green: "With Renewable energy it is important to have a storage solution. One of my tasks was looking into available storage solutions and I got to use the knowledge I got in the 'Integration of Energy Storage Technologies'."

Bahman, from TU Berlin, took up the challenge in the start-up world and joined Fusebox helping them in integrating consumers and energy systems to enable better integration of renewables and reduce CO2. He learned a lot about different industries and their potential in flexible energy consumption, and how energy market works.

Table 3. Students on internships

Student	University	Company	Challenge
Jovica Prerevski	ULJUB	Elektrilevi	Detecting the effects of charging electric vehicles on the distribution network.

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Karin Marin	ULJUB	Enefit Green	Research on solar energy (operation and maintenance cost, new solutions for operation and maintenance), new innovative solutions (inverters, panels, mounting), security solutions, solar theft, energy storage, inverters). Inverter data correction (for Solar parks) and Iru CPU fuel analysis.
Matevž Lavtar	ULJUB	ABB	BESS (Battery Energy Storage System), control strategy, communication protocols, and new PLC programming approaches.
Bahman Sadeqi	TUB	Fusebox	Integrating consumers and energy systems to enable better integration of renewables and reduce CO2
Saule Gudziute	KTU	Elektrilevi	NetFix project- smart meter integration into the electrical grid. Analysing the differences between the smart meters with the goal to improve the AI model.
Lorenz Jessel	TUD	ABB/ Elektrilevi	Solution to analyse the available capacity in the network for distributed generation connections and assessing the use of flexibility services and their costs compared to traditional network investments.

Feedback was positive from both sides. Students received practical knowledge of day-to-day work and faced solving several actual challenges in the industry. We did start with some hesitation regarding opening and international travel. But taking all the safety measures into account, we have managed to kick off the Mobility Programme with success.

The feedback from companies was gathered via discussions and was also positive. They saw the value of the knowledge that students had gathered. Several of them were interested to involve more interns. The demand of companies regarding interns and future employees with dedicated knowledge on smart grids is clearly exceeding the supply. However, it is positive that we can help reduce this gap with the SMAGRINET project.

3. SMAGRINET Mobility Roadshows

Autumn was bringing the students back to university and lectures, SMAGRINET Mobility Programme had to adapt and find concentrated solutions to offer students a glimpse of industry and institutions in the field.

Two SMAGRINET International Mobility Roadshows were developed and carried out. In addition to coordinating the content, logistics (international flights and local bus transportation), accommodation and catering were taken care of.

As the autumn also brought the restrictions back on the table, we were using different hybrid solutions to be flexible, but still provide the full experience and glimpses of the

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most relevant industry challenges for the students. In addition, 2 initially planned Roadshow options were left on hold, and, with the resources found, can be executed in the future (See Section 5).

3.1. Brussels-Paris Roadshow

In October 2021, students from Tallinn University of Technology and Université de Lorraine who had passed the SMAGRINET Module 2 - Economic Operation and Societal Challenges had the chance to join the first SMAGRINET hybrid roadshow.

Students got some real-world insights in Brussels and Paris. Several discussions on European Energy policy and the Green Deal were held with European Commission representatives, and EURELECTRIC introduced their activities, which shape the future of the industry.

After wrapping up with Brussels, EDF Power Networks Lab, near Paris, opened its doors for the SMARGRINET Roadshow. EDF Power Networks Lab consists of 75 experts, research test engineers and technicians operating the R&D testing facilities of the first European electric utility.

The activities of several laboratories and the company's testing capabilities were examined. The visit took us to learn about battery testing capabilities and a high-power testing station dedicated to high voltage & high current electrical equipment.

On top of that we were introduced to a Concept Grid - a unique testing facility dedicated to smart equipment and solutions. This real "smart" distribution represents a real electric system from the primary substations to residential appliances. It offers the possibility to create and conduct complex testing campaigns, in full safety, which would be impossible to perform on a real network.

The visit sparked several discussions on both the future of the energy sector, and students' opportunities in it. Also, the the importance of involving people with technical knowledge in policymaking was highlighted.

Image 1. TALTECH Students participating in Online Session with EC before heading to Paris

Image 2. Students visiting EDF Lab Renardies.

3.1.1. Participants

The content of the roadshow was designed and targeted to students who had gone through the SMAGRINET Module 2 "Economic Operation and Societal Challenges" at University of Lorraine and Tallinn University of Technology. The participation opportunity was offered through both universities, providing them the opportunity to select the students.

All together 22 Module 2 students (10 from ULOR and 12 from TALTECH) took part in the roadshow (full list in Appendix 5).

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Image 3. Group Photo of the Roadshow participants

3.1.2. Agenda

The Roadshow was held in hybrid format. Online discussions with European Commission and EURELECTRIC were held simultaneously in Tallinn and Nancy. After that, students were organised to meet in Paris to visit EDF Innovation Laboratory near the capital city next day.

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Table 4. SMAGRINET Brussels-Paris Roadshow Schedule DAY 1

SMAGRINET ROADSHOW - OCTOBER 18-19(20) - BRUSSELS /PARIS					
DAY	Date	Time Estonia	France		Details
DAY 1	MONDAY	18.10.2021		**Virtual visit to BRUSSELS**	
		9:30	8:30	Gathering - TalTech@ airport Järv room/ ULOR @ uni	ULOR students gathering at: Faculty of Sciences and Technology Campus (Aiguillettes, 54500 Vandoeuvre les Nancy) The room for the meeting will be: "Salle de réunion 701 au 7ème étage du bâtiment Henri Poincaré"
		9:45	8:45	Testing the connection from Tallinn and Nancy	Click here to join the meeting
		10:00-10:15	**9:00-9:15**	Welcome	**Connection** to the virtual visit via WebEx link **and welcome by Fabienne Timmermans from EC**
		10:15-11:15	**9:15-10:15**	**EUROPEAN COMMISSION**	General introdoction and regarding the role of the European Commission, and the priorities of the Von der Leyen Commission and State of the Union by Mr Dirk VOLCKAERTS
		11:15-11:30	***10:15-10:30***	*Break*	
		11:30-12:30	**10:30-11:30**	**EUROPEAN COMMISSION**	Insights of the EU's Energy policy by Mr Michal TRATKOWSKI Policy Officer; ENER.A.2 - Communication and Outreach, Directorate-General for Energy
		12:30-13:30	**11:30-12:30**	**EUROPEAN COMMISSION**	The EU's Climate package by Ms Carla BENAUGES - Policy Analyst - Climate Change and Energy, CLIMA.C.1 - Strategy and Economic Assessment, Directorate-General for Climate Action
		13:30-13:45	***12:30-12:45***	*Break*	switch to Microsoft Teams meeting
		13:45-14:30	**12:45-13:30**	**EURELECTRIC**	12:45 : 12:48 General introduction (3 mins)- Giuseppina Rondinelli, HR Manager: intro and welcome 12:48 – 12:55 Energy/Climate - Michelangelo Aveta, Advisor - Electromobility & Energy Efficiency - Electrification Lead 12:56: 13:00 Market &Customers – Stella Benfatto , Advisor – Wholesale Markets - Investment Lead and Ronan Haas, Advisor Wholesale Markets - Sector Integration Lead 13:00-13:05 DMF - Louise Rullaud - Senior Advisor - Distribution & Market Facilitation - Infrastructure & Flexibility Lead 13:05-13:10 Strategic Comms – Ioana Petcu - Advisor - Press & Media Relations 13:10- 13:15 Events/Memberships - Marianne Karu - Senior Advisor - BD & Membership 13:15:13:30 Q&A - All advisors will answer questions according to the relevance.
		14:30-14:45		Wrap up in Tallinn	To be filled, ON PAPER: https://www.interieur.gouv.fr/Actualites/L-actu-du-Ministere/Certificate-of-international-travel
		14:45		Getting on to plane @Tallinn	
		15:55		Departure of the flight @Tallinn	
			13:30-14:30	Lunch @ULOR	For the catering, it will be the room just in front room 701 called "Salle des professeurs"
			14:30-18:00	Bus from ULOR to PAR hotel	Pick up from: Faculty of Sciences and Technology Campus (Aiguillettes, 54500 Vandoeuvre les Nancy) BCS, a minibus with 18 seats. 12 pax Sprinter **driver: Mr. Uldis**
			18:00	Taltech arrives to Paris	
			18:30-19:15	Airport to Hotel	BCS, Driver Mr. Artis
			18:00-19:30	Check-in at the hotel	**Hotel:** https://www.meininger-hotels.com/en/hotels/paris/hotel-paris-porte-de-vincennes/
			19:30-20:30	Dinner	at the hotel

Table 5. SMAGRINET Brussels-Paris Roadshow Schedule DAY 2 and 3

SMAGRINET ROADSHOW - OCTOBER 18-19(20) - BRUSSELS /PARIS					
DAY	Date	Time Estonia	France		Details
DAY 2	TUESDAY	19.10.2021		**Visit to EDF Lab - Les Renardières**	
			8:00-9:00	Breakfast	
			9:00-9:45	Check out for ULOR	
			9:45-10:00	Gathering at the hotel lobby	
			10:00-11:30	Drive from Paris to Moret Sur Loing	at 10:00 Paris - Paris MB Sprinter MD7417 Mr. Ilgonis, MB Sprinter Mr. Artis and Mr. Uldis https://www.lejardindeslys.fr/ direction: https://goo.gl/maps/XnS8FiEV4bzQNoYUA
			11:30-13:00	Lunch	
			13:00-13:10	Drive from Le Jardin to EDF	
			1:20 PM	Gathering at the EDF lobby	The group will be divided to 2 for the sanitary measures, but both will be able to visit the same spots. The guides will be · Mr Bruno Prestat · Mrs Anne-Catherine Hehl
			13:30-16:30	**Tour in EDF Facilities**	13h30 - 14h - Intro by Bruno Presta (Plenary Room Building w1) 14h10 - 14h40 - Batteries (group 2) 14h10 - 14h40 - Concept Grid (group 1) 14h50 - 15h20 - Concept Grid (group 2) 14h50 - 15h20 - High Tension Labs (group 1) 15h30 - 16h - High Tension Labs (group 2) 15h30 - 16h- Batteries (group 1)
			16:30	Departure to Hotel	
			16:30	Departure to ULOR	Drop-off to: Faculty of Sciences and Technology Campus (Aiguillettes, 54500 Vandoeuvre les Nancy)
			18:00	Arrival at the hotel	
			18:30-19:30	Dinner	
DAY 3	WEDNESDAY	20.10.2021		**DEPARTURE**	
			8:00-9:00	Breakfast	
			Free time	Free time	Possible to take part of lecture if needed/or work at the hotel
			16:00	Transfer to airport	
			18:55	Departure to Tallinn	

3.2. Estonian Roadshow

SMAGRINET Mobility Programme continued with another hybrid roadshow. On November 15-17, 2021, students visited Estonia to get familiar with the local electrical system and the challenges that the industry is facing. While some of the students were able to join the site visits on spot, others enjoyed the virtual visits and joined the discussions online.

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Future electrical engineers, who have passed the SMAGRINET modules at Technical Universities of Berlin, Dresden and Kaunas and the University of Ljubljana received insights from presentations by the national transmission system operator Elering and Estonia's largest network operator Elektrilevi.

Visits took us to important sites for Estonian electricity production: Auvere and Iru Power Plants and Paldiski facilities. We acknowledged that many of the challenges are similar in different countries, but the biggest discussion was caused by the challenges of energy production specific to Estonia and how the country is managing to cope with the Green Deal initiatives.

The 3-day visit ended with an introduction to the NATO Cyber Defense Competence Center of Excellence and hands-on simulation - attacking the electrical grid of fictional country Berylia. The students formed two opposing teams - one to protect the electricity grid and keep all 24 areas running, while the others were attacking the grid intending to cause a full blackout. The tension was in the air until the last moment, and only 3 regions with electricity kept us from the complete darkness- another proof of the importance of cyber defence in the energy sector. We are glad that SMAGRINET can bring such real-life challenges closer to our future engineers and provide them with practical experience.

Image 4. Elektrilevi presentation together with online participants

Image 5. NATO CDCCOE simulation introduction

Image 7. Enefit Power introduction in Auvere

Image 6. Iru co-generation powerplant visit

3.2.1. Participants

The content of the roadshow was designed and targeted to students who had gone through the SMAGRINET Module 1 “Artificial Intelligence in a Smart Grid with Prosumers” and Module 3 “Connection Planning in Smart Grids”. Campaigns for students were launched at Kaunas

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University of Technology (KTU), Technische Universität Berlin (TUB), Technische Universität Dresden (TUD) and University of Ljubljana (ULJUB).

All together 30 interested participants were gathered, but as the COVID-19 pandemic situation got worse, we decided to split the group and limit it with 15 people. Full list of participants is brought out in Appendix 7. All the other participants were invited to join the SMAGRINET Mobility Online session.

Image 8. Group photo of Estonian Roadshow participants in Auvere Power plant.

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3.2.2. Agenda

SMAGRINET Estonian Roadshow was a hybrid event that involved 9 students participating on spot and offered 6 students the opportunity to join via online solutions. This required developing separate agendas, which are brought out below.

Table 6. SMAGRINET EST Roadshow schedule for onsite participants

SMAGRINET International Mobility Program
Roadshow in Estonia, November 14-18, 2021

DAY		Date	Activity	Time EET	Details
DAY 1	SUNDAY	14.11.2021	**Arrival**		
			Transfers (organised) from the Airport to Hotel	*according to flights*	Hotel: ibis Tallinn Center
			Check-in to single rooms		
			Dinner available		
DAY 2	MONDAY	15.11.2021	**Tallinn - Intro by TSO and DSO / East-Estonia - Power production**		
			Breakfast	8:00-9:00	@hotel
			COVID antigen rapid tests	8:30-9:30	@hotel
			Welcome and introduction by SMAGRINET coordinator Karl Kull	**9:30-10:00**	**online / conference room Raba @ibis**
			Presentation by Märt Allika (Director of Control Centre at Elering)	**10:00-11:00**	**online / conference room Raba @ibis**
			Elektrilevi presentation	**11:00-12:00**	**online / conference room Raba @ibis**
			Lunch 2 go	12:00	
			Drive to Auvere	12:00-14:30	
			Auvere power plant visit	**15:00-17:00**	On site. ID cards, masks, valid EU COVID certificate necessary!
			Dinner	17:30-19:00	@Muna
			Drive to Tallinn and back to hotel	19:00-21:30	
DAY 3	TUESDAY	16.11.2021	**Iru co-generation power plant and Paldiski wind and solar farms**		
			Breakfast	8:00-9:00	
			COVID antigen rapid tests	8:30-9:30	
			Drive to Iru	9:30-10:00	
			Iru co-generation power plant visit	**10:00-11:30**	On site. ID cards, masks, valid EU COVID certificate necessary!
			Lunch and drive to Paldiski	11:30-14:00	Lunch@Mimosa
			Paldiski production facilities	**14:00-16:00**	On site. ID cards, masks, valid EU COVID certificate necessary!
			Drive to Tallinn and back to hotel	16:00-17:00	
			Dinner	18:00-20:00	@hotel
DAY 4	WEDNESDAY	17.11.2021	**Tallinn, Simulation - Cyber Security in Energy**		
			Breakfast	8:00-9:30	
			Simulation on Cyber Security in Energy by NATO Cooperative Cyber Defence Centre of Excellence (Enn Kukk)	**10:00-12:00**	**online / conference room Raba @ibis**
			Lunch	13:00-14:00	@hotel
			Walking tour@Tallinn	15:00-17:00	
			Dinner		
DAY 5	THURSDAY	18.11.2021	**Departure**		
			Breakfast		
			Departure (transfers from hotel to airport organised)	*according to flights*	

NB! Organizer reserves the right to make changes to the plan if necessary

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 837626

Table 7. SMAGRINET EST Roadshow schedule for online participants

SMAGRINET International Mobility Program Roadshow in Estonia (online), November 15-17, 2021						
			Activity	Tallinn Time (EEST)	**Berlin Time (CET)**	**Details**
DAY 1	**MONDAY**	**15.11.2021**	**Intro, presentations by TSO and DSO (virtual visits)**			
			Welcome and introduction by SMAGRINET coordinator Karl Kull	9:30-10:00	**8:30-9:00**	Join here
			Presentation by Märt Allika (Director of Control Centre at Elering)	10:00-11:00	**9:00-10:00**	
			Elektrilevi presentation by Rasmus Armas (Head of Asset Management)	11:00-12:00	**10:00-11:00**	
			Virtual visits to Iru Power Plant and Paldiski Production facilities	whenever suitable		Links are provided via email
DAY 2	**TUESDAY**	**16.11.2021**	**Virtual visits and teamworks session preparing for the simulation**			
			Virtual visits to Iru Power Plant and Paldiski Production facilities	whenever suitable		Links are provided via email
			Online teamwork session		**10:00-11:00**	Emails with more information will follow.
DAY 3	**WEDNESDAY**	**17.11.2021**	**Simulation - Cyber Security in Energy**			
			Simulation on Cyber Security in Energy System by NATO Cooperative Cyber Defence Centre of Excellence (Enn Kukk)	10:00-12:00	**9:00-11:00**	Click here to join the meeting
NB! Organizer reserves the right to make changes to the plan if necessary						

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 837626

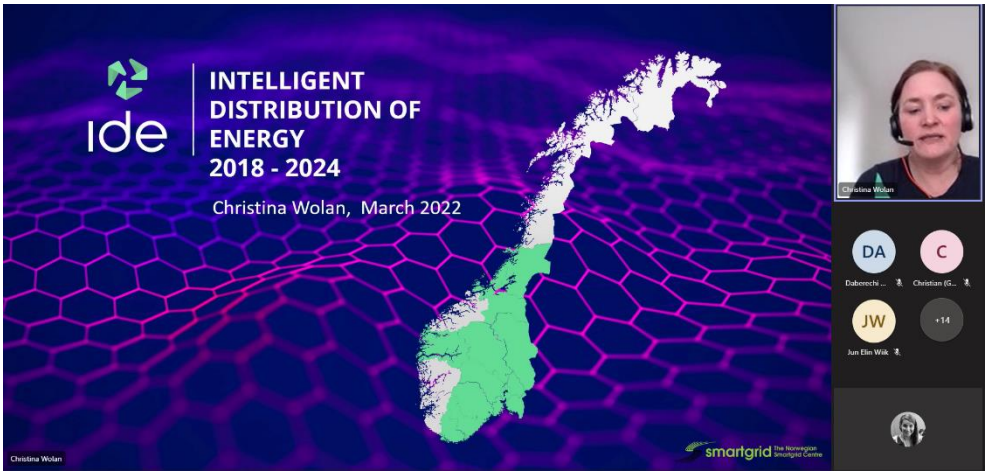
4. SMAGRINET Mobility Online Session

The initial plan to have a second group participating in the Estonian roadshow was not possible due to again high and raising number of COVID infections. However, alternatives were considered in countries where situation was better at the end of 2021 – such as Finland, Portugal, and Spain (see details next in paragraph). The discussion, ongoing until February, concluded that the physical options must be postponed. As the roadshows would have been mostly visiting innovation labs and premises on spot, the companies did not see the value in online sessions.

Looking into alternatives, we used the chance and reached out to contacts from the neighbouring countries of the EU to showcase more examples of innovation projects and initiatives related to smart grid.

Online Session took place on March 23, 2022. The 2-hour event included a showcase of the Norwegian Smartgrid Center activities and an in-depth look into IDE "Intelligent Distribution of Electricity" - a large-scale demonstration project, which brought together six grid companies in Norway for a joint development through new technology. In addition, a look into UK National Grid activities - showcase of NG Electrical Transmission and ESO activities, and deeper insights of the Deeside Centre for Innovation that is catapulting innovative solutions for the grid and ESO digitalization projects was given.

Participating in Online Session was offered to all the students who could not participate in prior Mobility activities and had already been part of some of the previous activities. It was also open to other universities and industry. In total 35 people participated, including 21 new students from SMAGRINET Modules.



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5. Opportunities for the future

The held Mobility activities are easily replicable to involve further groups of students. Also, the interest of **companies in the demand for interns** did exceed the supply we could offer during a limited time, global pandemic, and a difficult geopolitical situation. This means, once the situation allows, the ETL is happy to provide the database of contacts which can be used to promote additional opportunities for student internships abroad.

In addition, there are several activities that were planned, but not implemented during the project, such as:

- **Roadshow to Portugal and Spain**[2]

  Involving visiting the Basque region in Spain and Basque Energy Cluster, which is made up of more than 100 members, including leading companies in the energy sector located in the Basque Country (energy operators, component, and equipment manufacturers), agents of the Basque Science, Technology and Innovation Network and public administration bodies involved in the energy field. In addition, Iberdrola Global Innovation Hub in Larraskitu has agreed to open its doors and introduce the premises and opportunities for students.

  In Portugal, EDP – Portuguese electric utilities company with a global reach is ready to showcase its capabilities and introduce green energy production opportunities by one of the renewable industry leaders in the world.

- **Roadshow to Finland**[3]

  In collaboration with Finnish Energy – a branch organisation for the industrial and labour market policy of the energy sector, we have also developed and made contacts with main players of Finnish Energy market. Companies ready to host the students once the COVID-19 related restrictions allow include Fingrid, Okiluoto Power plant, VTT and Helen.

- **Virtual visit to the Oracle utilities Innovation Lab in United States.**

  Oracle Utilities, which is a part of the Oracle Industries Innovation Lab (Oracle IIL), is welcoming students for a virtual visit since May 2021. It is a hands-on space, which offers interactive exhibitions (such as Connected Hub, the smart studio, or the utility simulator); role play; hands-on opportunities with augmented & virtual reality, 5G & Internet of Things (IoT); and examples of cross-industry innovation – how new elements in adjunct industries from construction to communication can be leveraged within our utilities industry[4].

ETL is ready to provide the contact and support the visits and internships in the future, in case of interest and resources available.

[2] Potential schedule is brough out in Appendix 9

[3] Potential schedule is brough out in Appendix 9

[4] https://www.oracle.com/industries/utilities/innovation-lab.html

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Conclusion

For a successful implementation of the energy transition, which is one of the most important challenges of the future, new skills and qualifications among electrical engineers are of utmost importance. Technical development in smart grids needs to go hand in hand with innovative educational methods, hands-on approaches and tight collaboration between academy and industry.

In WP3, this issue was addressed by developing three challenge and case-based master's level modules, and the SMAGRINET International Mobility Programme supporting the learnings with practical opportunities at the industry. Activities carried out included internships in different companies, hybrid Roadshows including simulation and online session, introducing innovative solutions to challenges.

In total, 64 students participated in SMAGRINET International Mobility Programme and gathered feedback was positive from participants and industry.

Overall, there was a good symbiosis with the Modules that were a prerequisite for participating in Mobility. Knowledge acquittanced from the Modules, together with the pre-existing basis from the studies was a great basis to gain the most out of internships and visits. The imparted mind-set and wider look at the international level support solving ongoing and emerging challenges of the energy transition.

In conclusion, the Mobility Programme, regardless of the challenges of the last years, has fulfilled its goal– to prepare a generation of researchers and engineers to meet the challenges of the energy transition in close collaboration with industry. Students found the programme inspiring, and useful for their aspired profession and developed activities and connections are made for future collaborations.

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Appendix

Appendix 1. List of companies contacted for Mobility Opportunities[5]

#	Institution	Country	#	Institution	Country
1	ABB	Estonia	26	FUSEBOX	Estonia
2	Elektrilevi	Estonia	27	Hepta Airborn	Estonia
3	Elering	Estonia	28	DATEL	Estonia
4	Estonian Cell	Estonia	29	Skeleton	Estonia/Germany
5	VKG	Estonia	30	Lemonade stand fund	Baltics
6	W.EG Eesti (Würth)	Estonia	31	R8 Technologies	Estonia
7	Empower	Estonia	32	Milrem	Estonia
8	Eesti Energia	Estonia	33	Enel	Italy
9	Enefit Green	Estonia	34	EDP	Portugal
10	Enefit Power	Estonia	35	Iberdrola	Spain
11	Finest Twins	Estonia	36	Oracle	US/International
12	Enefit Connect	Estonia	37	National Grid	UK
13	Ignitis	Lithuania	38	Norwegian Smart Grid Centre	Norway
14	Solitek	Lithuania	39	Basque Energy Cluster	Spain
15	EURELECTRIC	International	40	Finish Energy	Finland
16	EDF	France			
17	Finnish Energy	Finland			
18	PSE SA Polskie Sieci Elektroenergetyczne	Poland			
19	Boston Consulting Group (BCG)	International			
20	Nord Energi	Scandinavia			
21	CSZE Czech Association of Energy Sector Employers	Czech Republic			
22	PKEE Polish Electricity Association	Poland			
23	NLEA Lithuania	Lithuania			
24	LEEA Latvia	Latvia			
25	NATO Cooperative Cyber Defence Centre of Excellence	International			

[5] Contacts are available for further collaboration

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Appendix 2. Call for participants example – Internships

SMAGRINET www.smagrinet.eu

INTERNATIONAL MOBILITY OPPORTUNITY

SMAGRINET project offers an international mobility opportunity at enterprises for selected students who have completed the SMAGRINET modules.

The program enables the students to experience the real working environment, gain practical international experience and creates broader understanding on the challenges Industry is facing.

Travel costs to destination and accommodation during the period is covered by the project.

Opportunities for TUB students in Estonia

Company	Challenge	Student profile	Duration
ABB (Estonia) a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation, and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels.	Internship at Electrification Business Focus areas: - Power system Study in the distribution network - Grid side parameter study - Energy storage products - Energy storage applications - Control techniques behind Energy storage systems Objective: To get familiarized with the product, control approach, study and propose the most suitable control strategy in the project.	Students who have passed Module 3, some automation knowledge needed.	8 weeks*
Elektrilevi - Estonia's largest network operator. Leading the way in smart energy solutions: - first nationwide EV fast-charging network - first nationwide full roll-out of the smart metering project - small size off-grid solutions for rural areas - large scale off-grid solutions for energy island - Smart City solutions: smart street lighting and parking - Renewable energy challenges for different energy sector groups - VPP and storage simulation and testing	**Network topology analysis** Starting point: Elektrilevi today applies a trunk line-based solution for network planning, where the medium voltage network is built radially as a single fast scheme and the network has reduced triple power options to simplify management and reduce network capacity. When implementing new network management systems, the problem of operational network management is eliminated (the system simplifies the execution of power supply in networks with complex schemes). Therefore, the question of the optimal network configuration remains. Question/tasks: To analyse the optimality of different alternatives of the network topology, including the effects on the costs of network construction and reconstruction, the effects on the customer's downtime in case of failures and scheduled works. Find the optimal network topology for urban and rural areas.	Students who have passed Module 3	3-4 weeks*
Fusebox is a startup integrating consumers and energy systems to enable better integration of renewables and reduce CO2.	emand response business development n general, sage of batteries with maximum enefits in combination with consumers nd the grid, orecasting of DER and flexibility, emand response and EV combination, redicting balancing need in the lectricity system, utomation of balancing need rediction, including urgent market essages (UMM).	Students who have passed Module 3	3-4 weeks*

**Starting date in second half of summer or early autumn will be confirmed together with the selected student and host organisation.*

Let us know about your interest and in case of any questions by May 21, 2021 via sandra.metsis@elektriliit.ee

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Appendix 3. Example of an intern feedback report

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SMAGRINET MOBILITY PROGRAM

Participant Report

Participant:	Bahman Sadeghi
Host Organisation:	Fusebox
Time of mobility:	September 6 – September 24, 2021

Description of main tasks performed

Describe shortly the main tasks that you were dealing during the mobility

1. Calculation the parameters of flexibility. In this task I have searched among all the customers that were participating in demand response during one week in summer and one week in winter for the flexibility parameters such as energy consumption reduction during down regulation, response time, the percentage of energy consumption reduction and the average of all these parameters for one week. I have also visualized all these data to see which clients more flexible are and during what time of day.

2. Research for potential flexibility in new industries. I have researched in many sientific papers for the flexibility in new industries such as oil refinery industry and pulp and paper industry which Fusebox will have two potential clients and they have meeting for presentation in upcoming weeks. I have prepared a report for the colleagues who will attend in this meeting.

3. Finding solutions for the battery project. Fusebox has two batteries in its portfolio with a Norwegian company and they are looking to use these batteries in Scandinavian countries. The task was to find potential applications and calculate the payback time in each case. I have used the lessons that I have learned in university and researched for similar battery projects around the world. I have prepared a report for different use cases, but I didn't calculate the payback time because they didn't have enough information about prices.

4. Attending in many meetings with other colleagues and other companies. I have attended in many business meetings between Fusebox colleagues and in many meetings between Fusebox and other international partners.

5. Finding solution for cooperation with an EV charging station company in Lithuania. I had a lot of lectures about EVs, their batteries, charging methods and charging stations and I also did research for finding solutions to integrate EV charging stations in demand response service. I prepared a report about it and its potential in Lithuania and Estonia.

Main outcomes and learnings

What were the outcomes of tasks performed and main learning points?

1. Excel and Word for reporting. I have used Excel and Word before in university for projects and term papers, I also took a course about Excel, and I was using these two Microsoft applications every day during my internship and learning by asking other colleagues or searching, especially for Excel.

2. Getting to know about other industries. I have read many papers about different industries and I have earned a lot of information about them and how they work and their potential flexibility in energy consumption.

3. Research in papers. With reading a lot of research papers, in addition to learning about different topics, I can now better and more efficient research in internet and scientific magazines.

4. Getting to know how the meeting between international companies work. Before this internship, I had no idea how the international meetings between companies are and how they talk there, what they say, how is the language, the atmosphere etc. Thanks to many meetings with different companies and individuals from all over Europe, I have now very much better understanding about these meetings.

5. Getting to know about project managing and how it is working out. They had a new project manager which started his work a week before my internship and he was trying to design the structure of project management for the company, using a project management software and I have attended in the meetings that he had with other colleagues, and I have learned a lot by asking questions about the fundamental of project managing.

6. Getting to know how the energy market works. It was always not very clear for me how the energy market works, though we have some lectures about it in university. First days of internship I was asking and doing research about this topic and now I have deep knowledge about it which is very important I believe.

7. Maybe the most important outcome is that, now I am sure that I like my major of study a lot and I can't wait to start working.

Relevance for studies and SMAGRINET module

Let us know if and to what extent you managed to use the theoretical knowledge from the studies and SMAGRINET module in practice during the mobility

It was very relevant, because I chose Fusebox which concentrates on the topics that I have learned about them in university. For instance, about EVs and charging stations I had several lectures in university and I have reviewed them in the first days of internship after I got home in the evenings. I had also lectures about energy trading and energy market in the Planning and Security of Smart Grids, which is one of the Smagrinet program modules.
The calculation of payback time of battery project, which was one of my tasks, was very similar to one project that I did in one of my modules in the last semester.

Feedback regarding organisation of the mobility

Let us know how smooth the operational side of the whole mobility was and what we could do better?

I should say that everything was perfect in this program, and I am very happy and grateful that I had this opportunity to attend in this internship and got to know more about your beautiful country and also, I have met very nice and friendly people in Tallinn during my stay.
Thank you so much for all you have done.

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Appendix 4. Call for participants - Brussels/Paris Road-show

SMAGRINET — www.smagrinet.eu

CALL FOR PARTICIPANTS!

SMAGRINET ROADSHOW TO BRUSSELS & PARIS

OCTOBER 18-19, 2021

SMAGRINET roadshow takes you on an educational adventure – virtually to Brussels and on spot to EDF Lab Renardières.

We are meeting with European Commission representatives and EURELECTRIC to learn all about European Energy policy. On top of that, looking into how real innovation is born in the field. EDF Power Networks Lab consists of 75 experts, research test engineers and technicians operating the R&D testing facilities of the first European electric utility.

Schedule*

DAY 1 18 October	Day 2 19 October
8:30 Gathering at ULOR & getting ready to take off to virtual trip to Brussels **9:00-13:30** Welcome to SMAGRINET road trip and meeting with European Commission and EURELECTRIC **14:30** departure to Paris **19:00** Check in to hotel and dinner	Breakfast **9:30** – Departure to EDF **11:00-16:00** Tour in EDF Lab Renardières-Concept Grid, Battery Laboratory, High power Laboratory, Dielectric laboratory etc **16:00** Departure to ULOR

Confirmed participants are provided with the transportation, accommodation, and meals during the roadshow. **Valid COVID-19 certificate is necessary!**

Spots are limited!

Register latest by September 22, 2021 here:
https://forms.gle/4Azn3ZA3ZTTsDZn88

Any questions are welcome: sandra.metsis@elektriliit.ee
*Schedule may be subject to change

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CALL FOR PARTICIPANTS!

SMAGRINET ROADSHOW TO BRUSSELS & PARIS

OCTOBER 18-19, 2021

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We are meeting with European Commission representatives and EURELECTRIC to learn all about European Energy policy. On top of that, looking into how real innovation is born in the field. EDF Power Networks Lab consists of 75 experts, research test engineers and technicians operating the R&D testing facilities of the first European electric utility.

Schedule*

DAY 1 18 October	Day 2 19 October	DAY 3 20 October
9:30 Gathering at Tallinn Airport & getting ready to take off to virtual trip to Brussels **10:00-14:30** Welcome to SMAGRINET roadshow, meeting with European Commission and EURELECTRIC **15:55** departure to Paris **18:00** Arrival to Paris **19:00** Check-in to hotel and dinner	Breakfast **9:30** – Departure to EDF **11:00-16:00** Tour in EDF Lab Renardières- Concept Grid, Battery Laboratory, High power Laboratory, Dielectric laboratory etc **18:00** Dinner	Free time & departure to Tallinn ca **16:00**

Confirmed participants are provided flight tickets, local transportation, accommodation, and meals. Participants need to cover their travel insurance.
A valid COVID-19 certificate is necessary!

Spots are limited! Register latest by September 16, 2021 here: https://forms.gle/4Azn3ZA3ZTTsDZn88

Any questions are welcome: sandra.metsis@elektriliit.ee
* Schedule may be subject to change

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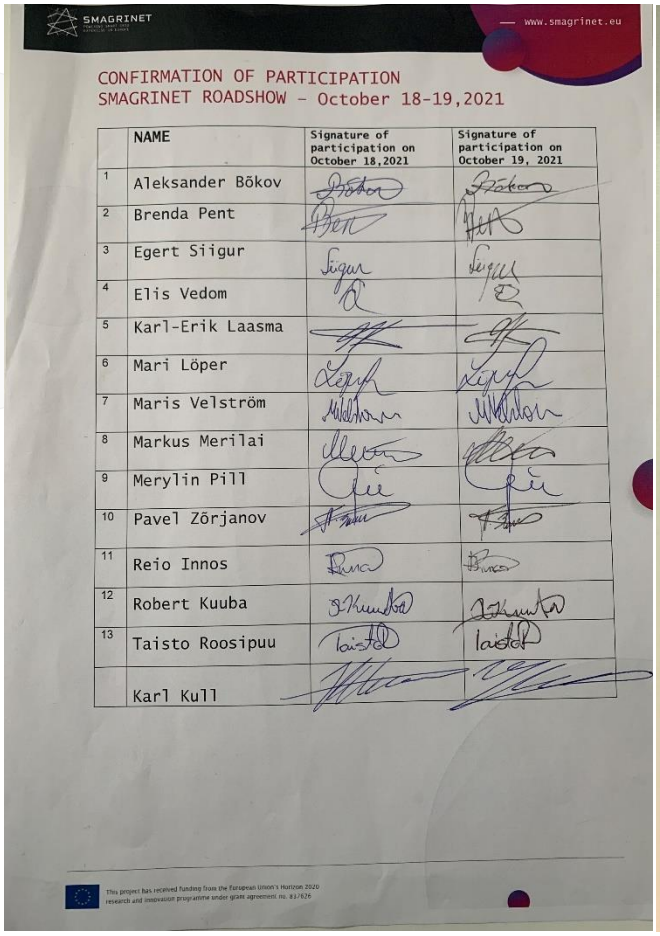
Appendix 5. List of participants – Brussels/Paris Roadshow



SMAGRINET — www.smagrinet.eu

CONFIRMATION OF PARTICIPATION
SMAGRINET ROADSHOW – October 18-19,2021

	NAME	Signature of participation on October 18,2021	Signature of participation on October 19, 2021
1	Aleksander Bõkov		
2	Brenda Pent		
3	Egert Siigur		
4	Elis Vedom		
5	Karl-Erik Laasma		
6	Mari Löper		
7	Maris Velström		
8	Markus Merilai		
9	Merylin Pill		
10	Pavel Zõrjanov		
11	Reio Innos		
12	Robert Kuuba		
13	Taisto Roosipuu		
	Karl Kull		

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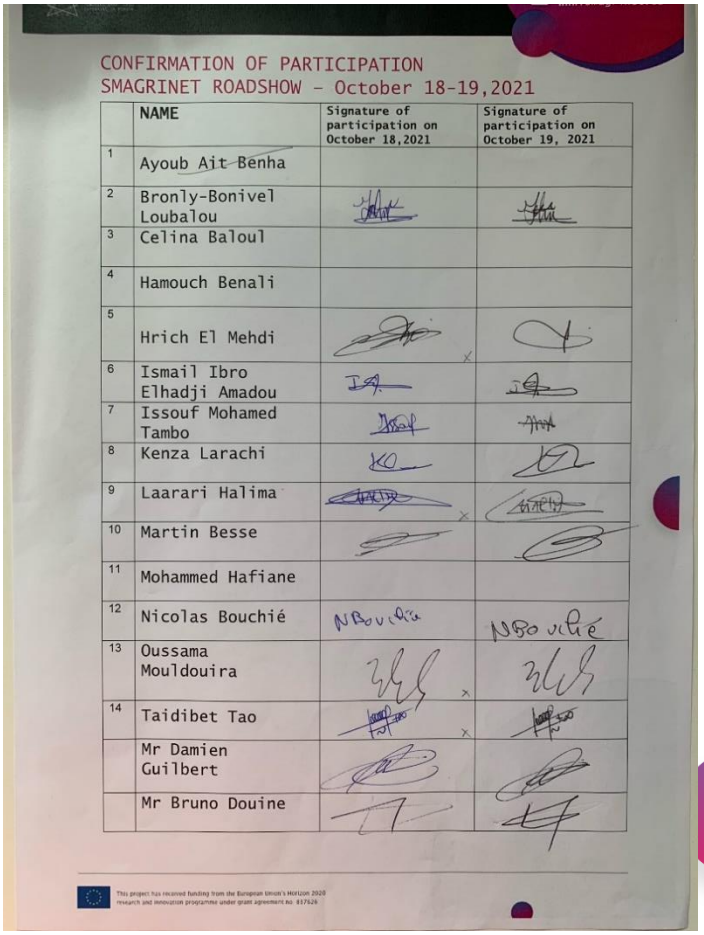

CONFIRMATION OF PARTICIPATION
SMAGRINET ROADSHOW – October 18-19,2021

	NAME	Signature of participation on October 18,2021	Signature of participation on October 19, 2021
1	Ayoub Ait Benha		
2	Bronly-Bonivel Loubalou		
3	Celina Baloul		
4	Hamouch Benali		
5	Hrich El Mehdi		
6	Ismail Ibro Elhadji Amadou		
7	Issouf Mohamed Tambo		
8	Kenza Larachi		
9	Laarari Halima		
10	Martin Besse		
11	Mohammed Hafiane		
12	Nicolas Bouchié	NBouché	NBouché
13	Oussama Mouldouira		
14	Taidibet Tao		
	Mr Damien Guilbert		
	Mr Bruno Douine		

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Appendix 6. Call for participants-Estonian Roadshow/Online Session

Call for participants

SMAGRINET ROAD-SHOW IN ESTONIA

NOVEMBER 14-18, 2021

SMAGRINET roadshow takes you on an **educational adventure to Estonia in November**. We will investigate how this tiny country operates its energy system and manages the challenges. The visits will help you to put the learnings from your studies & SMAGRINET modules into practice.

What exactly is happening?

- We are learning about the backbone of the Estonian energy system, and how digitalization and smart grid development have been carried out there.
- Visiting different production facilities near the capital area and next to the eastern border of the European Union.
- Getting in action in NATO Cooperative Cyber Defence Centre of Excellence to understand the security perspectives of Energy.

Schedule

DAY 01 | arrival

DAY 02 | Capital area, digitalization, smart grids

DAY 03 | East Estonia & electricity production

DAY 04 | Simulation at NATO Cooperative Cyber Defence Centre of Excellence

DAY 05 | departure

- Changes in schedule are possible. In the event of a sudden change to worse in the COVID-19 situation, we will make the visits virtual and shorten them to one to two days.

Confirmed participants are provided flight tickets, local transportation, accommodation, and meals during the trip. Participants need to cover their travel insurance & have a valid COVID-19 certificate.

Spots are limited.
Register by October 10,2021

Any questionsare welcome:
sandra.metsis@elektriliit.ee

HERE

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SMAGRINET Mobility Programme Online Session

MARCH 23, 2022

SMAGRINET is taking you on a virtual visit to UK and Norway!
We are getting to know UK National Grid one of the largest investor-owned energy companies in the world - their innovation activities and challenges and look into the Norwegian electrical system and its future with the Norwegian Smartgid Center.

SIGN UP TO JOIN

PROGRAMME

15:00 CET
The Norwegian Smartgrid Center

Showcase of the Center activities and an in-depth look into IDE 'Intelligent Distribution of Electricity' - a large-scale demonstration project, which brought together six grid companies in Norway for a joint development through new technology. And has many interesting results already. Q&A.

Jun Elin Wiik is a leader of the Norwegian Smartgrid Centre. She has more than 13 years of experience in government energy management and expertise in energy systems, smart grids, smart energy systems, digitalisation of energy systems, and renewable energy. PhD in experimental and theoretical solar physics.

Christina Nolan is a project manager of project IDE. She has a long experience in Innovation processes, strategic -, operational- and project management in companies that have complete value chains with strong brands as technology, quality, HSE, and sustainability as critical factors.

16:00 CET
UK National Grid

Showcase of NG Electrical Transmission and ESO activities, and deeper insights of the Deeside Centre for Innovation that is catapulting innovative solutions for the grid and ESO digitalization projects. Q&A.

Alexander Yanushkevich Innovation Manager, has a background in energy systems design and emerging technology applications. He has led several international R&D projects focused on the development of new products and services for smart grids, renewables integration, energy storage, and future transmission systems.

Let's keep this energy flowing

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 837626

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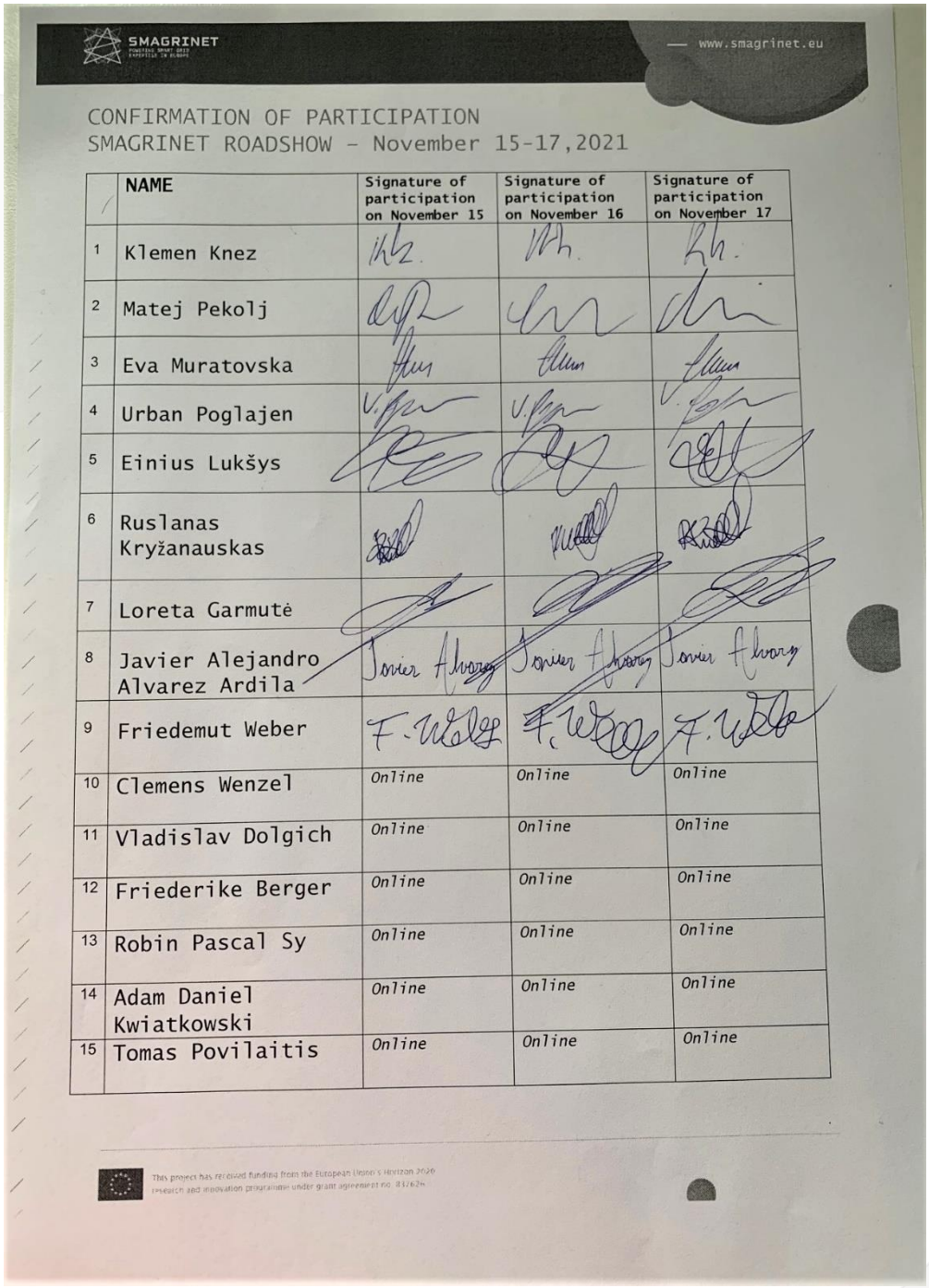
Appendix 7. List of participants–Estonian Roadshow



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CONFIRMATION OF PARTICIPATION
SMAGRINET ROADSHOW – November 15-17,2021

	NAME	Signature of participation on November 15	Signature of participation on November 16	Signature of participation on November 17
1	Klemen Knez			
2	Matej Pekolj			
3	Eva Muratovska			
4	Urban Poglajen			
5	Einius Lukšys			
6	Ruslanas Kryžanauskas			
7	Loreta Garmutė			
8	Javier Alejandro Alvarez Ardila	Javier Alvarez	Javier Alvarez	Javier Alvarez
9	Friedemut Weber	F. Weber	F. Weber	F. Weber
10	Clemens Wenzel	Online	Online	Online
11	Vladislav Dolgich	Online	Online	Online
12	Friederike Berger	Online	Online	Online
13	Robin Pascal Sy	Online	Online	Online
14	Adam Daniel Kwiatkowski	Online	Online	Online
15	Tomas Povilaitis	Online	Online	Online

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Appendix 8. Online Session – signups

Timestamp	Email Address	Full name	University
3/1/2022 19:59:42	r02921100@ntu.edu.tw	Shang-Che Li	TU Berlin
3/1/2022 22:07:44	d.agwu@campus.tu-berli	Daberechi David Agwu	TU Berlin
3/2/2022 11:01:29	gulasalkhon.musinova@	Gulasalkhon Musinova	TU Dresden
3/2/2022 11:06:31	ulkernihat@gmail.com	Nihat Ulker	Istanbul technical university
3/2/2022 11:06:43	milosz.krysik@gmail.com	Milosz Krysik	I am not from a university
3/2/2022 11:14:41	bahman.sadeqi@gmail.c	Bahman Sadeghi	TU Berlin
3/2/2022 11:58:03	j.tousi367@gmail.com	Javad Tousi	TU Kaiserslautern
3/2/2022 12:04:32	jiawen.chen@tu-berlin.de	Chen Jiawen	TU Berlin
3/2/2022 12:20:36	lipeilinee@gmail.com	Peilin Li	TU Berlin
3/2/2022 15:08:14	chan.jk22@gmail.com	Jinkai Chan	University of Exeter
3/2/2022 23:06:03	xmican08@vutbr.cz	Jiri Micanek	Brno University of Technology
3/4/2022 10:52:36	ms8057@student.uni-lj.s	Matjaž Škrlec	University of Ljubljana
3/4/2022 14:29:24	anika.vogel@mailbox.tu-	Anika Vogel	TU Dresden
3/4/2022 16:21:01	tasevska_natalija@hotm	Natalija Tasevska	University of Ljubljana
3/5/2022 14:02:13	baloul.celina06@gmail.c	Baloul celina	University of Lorraine
3/5/2022 16:13:12	n.kolibacz@gmail.com	Nadja Kolibacz	TU Berlin
3/6/2022 9:54:36	bronlylouba@gmail.com	Bronly-Bonivel LOUBAL	University of Lorraine
3/6/2022 21:17:45	jeet.banerjee@campus.t	JEET BANERJEE	TU Berlin
3/7/2022 11:04:42	matevz.bokalic@fe.uni-lj.	Matevz Bokalic	University of Ljubljana
3/8/2022 11:03:59	toluallendarl@yahoo.com	TOLULOPE OGUNKOLA	I am not from a university
3/9/2022 15:08:40	sadia.riaz7@etu.univ-lor	Sadia Riaz	University of Lorraine
3/10/2022 11:27:57	leban94@gmail.com	Gregor Leban	I am not from a university
3/10/2022 23:16:00	ks2399@student.uni-lj.si	Klemen Stanič	University of Ljubljana
3/11/2022 20:17:04	slachiewicz@gmail.com	Sylwester Lachiewicz	University of Lorraine
3/12/2022 10:19:54	ricardo.gallo.caicedo@gr	Ricardo Gallo	Ku Leuven
3/14/2022 23:17:53	nikshanpaudel@gmail.cc	Nikshan Paudel	University of Lorraine
3/16/2022 16:46:52	robertas.lukocius@ktu.lt	Robertas Lukočius	Kaunas University of Technology
3/16/2022 17:06:31	dalia.nizeviciene@ktu.lt	Dalia Nizevičienė	Kaunas University of Technology
3/16/2022 17:53:36	arturas.baronas@ktu.lt	Arturas Baronas	Kaunas University of Technology
3/16/2022 18:01:33	audrius.jonaitis@ktu.lt	Audrius Jonaitis	Kaunas University of Technology
3/16/2022 19:48:01	saule.gudziute@ktu.edu	Saule Gudziute	Kaunas University of Technology
3/17/2022 9:35:59	tautvydas102@gmail.cor	Tautvydas Šikšnys	Kaunas University of Technology
3/17/2022 10:59:49	roma.rackiene@ktu.lt	Roma Račkienė	Kaunas University of Technology
3/18/2022 12:29:50	aistija.vaisnoriene@vert.	Mrs AISTIJA VAISNORIE	I am not from a university
3/20/2022 15:56:39	a.czerwinska@tu-berlin.c	Anna Czerwinska	TU Berlin
3/21/2022 9:45:37	renaldas.raisutis@ktu.lt	Renaldas Raišutis	Kaunas University of Technology
3/21/2022 16:53:16	domantas.dobrovolskas@	Domantas Dobrovolskas	Kaunas University of Technology
3/21/2022 17:34:04	julvil1@ktu.lt	Julius	Kaunas University of Technology

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Appendix 9. Online session – participants

	Full Name	User Action	Timestamp
1	Sandra Metsis	Joined	3/23/2022, 3:43:10 PM
2	Anika	Joined	3/23/2022, 3:44:05 PM
3	Anna Czerwinska (TUB) (Gość) (Gue	Joined	3/23/2022, 3:46:30 PM
4	Daberechi David Agwu (Guest)	Joined	3/23/2022, 3:51:39 PM
5	Christina Wolan	Joined	3/23/2022, 3:54:25 PM
6	ŠKRLEC, MATJAŽ	Joined	3/23/2022, 3:55:46 PM
7	Jun Elin Wiik	Joined	3/23/2022, 3:57:05 PM
8	Aistija Vaišnorienė	Joined	3/23/2022, 3:57:22 PM
9	Micanek, Jiri	Joined	3/23/2022, 3:58:05 PM
10	Nihat Ülker	Joined	3/23/2022, 3:58:42 PM
11	Račkienė Roma	Joined	3/23/2022, 4:00:36 PM
12	Gudžiūtė Saulė	Joined	3/23/2022, 4:01:04 PM
13	Shang-Che Li (來賓) (Guest)	Joined	3/23/2022, 4:01:20 PM
14	Jiawen Chen	Joined	3/23/2022, 4:03:40 PM
15	Bokalič, Matevž	Joined	3/23/2022, 4:06:47 PM
16	Peilin Li (來賓) (Guest)	Joined	3/23/2022, 4:07:29 PM
17	Omoh.Imoobe	Joined	3/23/2022, 4:12:06 PM
18	Nadja (Guest)	Joined	3/23/2022, 4:15:30 PM
19	Lachiewicz, Sylwester	Joined	3/23/2022, 4:17:43 PM
20	Camillus (Guest)	Joined	3/23/2022, 4:18:07 PM
21	Arturas Baronas	Joined	3/23/2022, 4:20:10 PM
22	Karl Kull	Joined	3/23/2022, 4:23:49 PM
23	Ott Pukk	Joined	3/23/2022, 4:23:49 PM
24	Marko Anger	Joined	3/23/2022, 4:23:49 PM
25	Kaspar Hordo	Joined	3/23/2022, 4:23:49 PM
26	Tanel Pihlak	Joined	3/23/2022, 4:23:49 PM
27	Gert Kitsing	Joined	3/23/2022, 4:23:49 PM
28	Vaido Sooäär	Joined	3/23/2022, 4:23:49 PM
29	Reimo Pallaste	Joined	3/23/2022, 4:23:49 PM
30	Andres Pukka	Joined	3/23/2022, 4:23:49 PM
31	Yan Xu	Joined	3/23/2022, 4:23:49 PM
32	Tuber, Erica	Joined	3/23/2022, 4:23:49 PM
33	Tarmo Trummal	Joined	3/23/2022, 4:53:49 PM
34	Olafemi Olaniyan	Joined	3/23/2022, 4:56:48 PM
35	Yanushkevic, Alexander	Joined	3/23/2022, 5:01:56 PM
36	Audrius Jonatis	Joined	3/23/2022, 5:16:12 PM
37	Hurley(ESO), Alexander	Joined	3/23/2022, 5:24:10 PM
38	Otas Konstatinas	Joined	3/23/2022, 5:39:40 PM

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Appendix 10. Potential schedules for Roadshows in Finland and Spain/Portugal

SMAGRINET International Mobility Program Roadshow in Finland, proposal for 2022

PARTICIPANTS: 10-15 Electrical Engineering Master's students from University of Ljubljana, Kaunas Technical University, Tallinn University of Technology, TU Berlin, TU Dresden

			Activity	Time (EET)	Details
DAY 0	SUNDAY	2022	Arrivals		
DAY 1	MONDAY	2022	Helsinki		
			Finish Energy	9:00-11:30	Introduction to Finish Energy System
				11:30-13:00	Lunch
			Fingrid	13:00-14:30	Online introduction possible
			Helen	15:00-17:00	https://www.helen.fi/en/company/energy/energy-production/energy-production2 https://www.helen.fi/en/company/energy/energy-production/energy-for-the-future
DAY 2	TUESDAY	2022	Espoo & Olkiluoto		
			VTT	10:00-11:30	https://www.vttresearch.com/en/research-expertise/energy https://smartotaniemi.fi/focus-area/energy/
					Lunch
			Olkiluoto Power Plant	14:00-15:30	Virtual: https://www.tvo.fi/en/index/company/comeandvisitus/digitalvisit.html https://www.tvo.fi/en/index/company/comeandvisitus/groupvisit.html 3 h ride from HLS (Turku for lunch stop inbetween)
DAY 3	WEDNESDAY	2022	Departures		

NB! The schedule is initiial proposal and open for changes — * all times are approximate

SMAGRINET International Mobility Program Roadshow in Spain/Portugal, March 2022

PARTICIPANTS: 10-15 Electrical Engineering Master's students from University of Ljubljana, Kaunas Technical University, Tallinn University of Technology, TU Berlin, TU Dresden

DAY 0	SUNDAY	Arrivals		
DAY 1	MONDAY	Bilboa, Spain		
		Basque Energy Cluster	9:00-10:00	Introduction of the Basque region and different industry players operating there.
		Iberdrola Smart Grid Global Innovation Hub	11:00-14:00	Insights of the bud mission, capabilities and opportunities.
		Lunch and drive to airport	15:00-16:30	
		Flight to Lisbon	17:30-18:30	
		Check in to hotel		
DAY 2	TUESDAY	Lisbon		
		EDP HQ	9:00-11:00	Introduction of EDP and different facilities in Lisbon HQ.
		Lunch and drive to powerplant	11:00-15:00	
		Visiting hydroelectric power plant near Porto	15:00-17:00	
		Drive back to Lisbon	17:00-20:00	
DAY 3	WEDNESDAY	Departures		

NB! The schedule is initiial proposal and open for changes — * all times are approximate

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www.ttu.ee

SLOVENIA
www.fe.uni-lj.si

GERMANY
www.tu-dresden.de

PORTUGAL
www.loba.cx

ESTONIA
www.civitta.com

LITHUANIA
www.ktu.edu

GERMANY
www.sense.tu-berlin.de

ESTONIA
www.elektriliit.ee

FRANCE
www.welcome.univ-lorraine.fr

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