



SMAGRINET

POWERING SMART GRID
EXPERTISE IN EUROPE



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CONTACT US
info@smagrinet.eu

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TECH**



Univerza v Ljubljani



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DELIVERABLE 5.3.

TRAIN THE TRAINERS WORKSHOP

DELIVERABLE TYPE
Report

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WP 5

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AUTHORS
Janja Dolenc
Boštjan Blažič

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Contributors

Name	Organisation
Janja Dolenc	ULJUB
Boštjan Blažič	ULJUB

Peer Review

Name	Organisation
Christine Michalek	TUB
Karl Kull	Tal Tech

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1. Summary

SMAGRINET operational objective is to update, develop and implement a capacity building programme (CBP) for boosting the research, innovation, and education for energy transition. This report is part of the Work Package 5 “Deployment, replication and exploitation” of the SMAGRINET project. It describes the work carried out under T5.3 Implementation of train-the-trainers’ pilot.

To support the capacity building of the trainers and uptake of the modules, the concept foresees rotating of leading experts from the consortium between universities in first year, and the local teaching staff has the opportunity to observe the classes.

To reach the multiplier effect and support the uptake of the short-term programs and modules, 4 online manuals will be prepared. The manuals both for the programs and the modules be developed under task T5.2. Following, a joint training of new trainers will be organized under task T5.3, with 30 participants from the consortium and 20 beyond. Second piloting year the local teaching staff will take over the teaching under the supervision of the leading experts.

2. Introduction

The main aim of the WP 5 Deployment, Replication and Exploitation, is to reach the multiplier effect through the replication activities. The aim will be reached with finding 4 organizations outside consortium, interested in taking up the short-term programmes and modules during the lifetime of the Smagrinet project. Also, Train the Trainers Workshop have been organized to support the teaching stuff from consortium and beyond.

2.1. Context of WP 5

Deliverable 5.3 is focusing on Train the Trainers Workshop. To provide better understanding of the Work Package, also other activities are briefly described.

2.1.1. T5.1 Deployment plan and roadmap for Replication

Main aim of the task is the Deployment plan for roadmap and replication. It relies on the experiences gained from the operation of Competence hub (WP 2) and the ones, gained from the Capacity building programs (WP 3 and WP 4). The plan and roadmap include concrete actions to achieve the multiplier effect.

2.1.2. T5.2 Development of the deployment package

Under the task T5.2, four Online manuals for the trainers are prepared. Manuals are based on the teaching materials used within Capacity building programs (T3.1, T4.1) and experiences with the first round of piloting of the programs. There will be three manuals prepared for the modules and one manual for short-term programs.

2.1.3. T5.3 Implementation of Train the Trainers pilot

Implementation of Train the Trainers pilot is important with aim of ensuring the training of new teachers. The education of local experts will enable for them to perform the teaching in the frame of modules in the second phase. Another aim of the workshop is to present the modules to the universities beyond consortium and enable the implementation in the second phase at 10 universities over the Europe, 6 within and 4 outside the consortium.

2.1.4. T5.4 Exploitation plan

The last task of the Work Package 5 is providing the Exploitation plan. The plan consists of:

- assessment of the replicability of the project
- the analysis of the costs and benefits and
- identification of sources for financing.

Importantly, the plan will ensure the exploitation of the project results after the project end.

2.2. Mission

The EU aims to reduce its greenhouse gas emissions by 20 % by the year 2020 and significantly more in the coming decades. Achieving such reductions in emissions, implementing a wider adoption of smart grids across the globe is necessary. Smart grid implementation requires not only significant amount of investments for replacing the current electrical grids with smart grids, but also for the training of a next generation of electrical engineers. The new engineers must be knowledgeable to implement the new smart grid technologies and manage them effectively in the future.

Train the Trainers Workshop's mission is to assure the training of a next generation of teaching stuff to enable implementation of the three case-based modules locally within 10 universities over Europe.

2.3. Objectives of the WP

The main aim of the Work Package is achieving the multiplier effect of the project. To put it another way, the aim is to package the Smagrinet results for use by other institutions and enable replicability and scalability of the project activities.

The outputs of the Work Package to assure achieving the objects are:

- A deployment plan (T5.1),
- A deployment package (manuals for the trainers) (T5.2),
- Train the trainers Workshop (T5.2) and
- Exploitation plan (T5.4).

3. Train the Trainers Workshop

Train the Trainers Workshop was a two-day event dedicated to the presentation of modules and short-term programs, structured and implemented within the project Smagrinet. The purpose of the presentations, led by teaching experts from consortium universities, was to outline each university's learning program and implementation into the courses.



PRESENTATION
Train-the-Trainers Workshop

The **SMAGRINET's Train the Trainers Workshop** is a two-day event dedicated to the presentation of modules and lectures structured and implemented within the **EU-funded project SMAGRINET**. The purpose of the presentations, led by teaching experts from consortium universities, is to outline each university's learning program and implementation into the courses.

The workshop aims to give the insight of the lectures taught within the three modules of the Smagrinet project:

MODULE 1	MODULE 2	MODULE 3
Artificial Intelligence in a Smart Grid with Prosumers (KTU, TUD)	Economic Operation and Societal Challenges (ULOR, TalTech)	Connection Planning in Smart Grids (TUB, ULJUB)

Each module was implemented within two universities learning programs in the first phase. **Module 1** was structured and implemented by Kaunas University of Technology (KTU) and The Dresden University of Technology (TUD); **Module 2** by University of Lorraine (ULOR) and Tallinn University of Technology (TalTech) and **Module 3** by Technical University of Berlin (TUB) and University of Ljubljana (ULJUB).

The second phase aspires to implement modules locally within 10 European universities, 6 consortium universities and 4 universities beyond consortium.

New teachers will find out what topics have been lectured, what is the most appropriate order of lectures with aim to make the subject as comprehensible as possible and what way of teaching has proved to be the most appropriate for the experts and students.

The workshop is structured in an instructive and interesting way. The participation of all consortium universities will ensure implementation at the expert level of knowledge.

Smart grid implementation requires training of next generation of engineers, who must be skilled to implement new technologies. The workshop will train new teaching stuff to ensure the training of next generation all over the Europe.

More information about each Module can be found on our website:
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Logos of partner institutions: TALTECH, ULOR, TUD, EIT, ULJUB, CIVITA

Figure 1: Presentation of Train the Trainers Workshop, provided by ULJUB and designed by LOBA

3.1. Structure of the workshop

Providing a good insight into the lectures taught by consortium universities, the workshop needed to be structured in meaningful way. First, the Smagrinet project was presented shortly, to provide an understanding of why the implementation of the modules is so important. The General Introductions of three case-base modules and short-term programs followed. Second part of the event was dedicated to the consortium universities presentations. The aim of the presentations was outlining ways of implementation of the module into the study program and teaching methods used.



AGENDA
Train-the-Trainers Workshop

The SMAGRINET's Train-the-trainers workshop aims to create a common understanding on the modules and programmes developed within the SMAGRINET project to support their uptake.

Module 1 Artificial Intelligence in a Smart Grid with Prosumers
Module 2 Economic Operation and Societal Challenges
Module 3 Connection Planning in Smart Grids

DAY 1 | 24 November 2020

9:00 – 9:15	Welcome speech	12:00 – 13:00	<u>Module 1</u> : Presentation KTU
9:15 – 9:30	Project SMAGRINET Introduction	13:00 – 13:20	<u>Module 1</u> : Presentation KTU – Questions and Discussion
9:30 – 10:00	<u>Module 1</u> : General Introduction	13:20 – 14:20	Lunch Break
10:00 – 10:30	<u>Module 2</u> : General Introduction	14:20 – 15:20	<u>Module 1</u> : Presentation TUD
10:30 – 11:00	Coffee Break	15:20 – 15:40	<u>Module 1</u> : Presentation TUD – Questions and Discussion
11:00 – 11:30	<u>Module 3</u> : General Introduction	15:40 – 16:40	<u>Module 2</u> : Presentation ULOR
11:30 – 12:00	Short-term programmes: General Introduction	16:40 – 17:00	<u>Module 2</u> : Presentation ULOR – Questions and Discussion

DAY 2 | 25 November 2020

9:00 – 10:00	<u>Module 2</u> : Presentation TalTech	12:10 – 13:00	Lunch break
10:00 – 10:20	<u>Module 2</u> : Presentation TalTech – Questions and Discussion	13:00 – 14:00	<u>Module 3</u> : Presentation ULJUB
10:20 – 10:50	Coffee break	14:00 – 14:20	<u>Module 3</u> : Presentation ULJUB – Questions and Discussion
10:50 – 11:50	<u>Module 3</u> : Presentation TUB	14:20 – 14:30	Closure
11:50 – 12:10	<u>Module 3</u> : Presentation TUB – Questions and Discussion		

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Figure 2: Workshop agenda, provided by ULJUB and designed by LOBA

3.1.1. General Introduction of Modules and Short-Term Programs

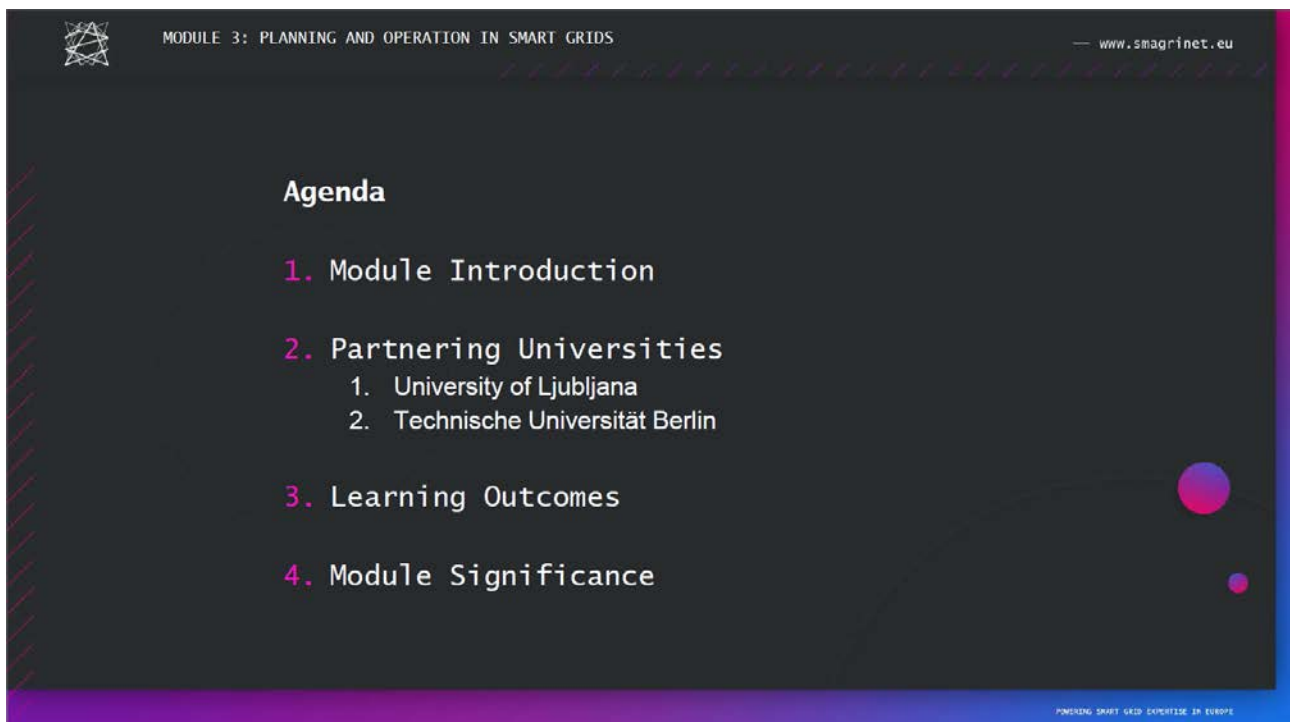
The General introductions of modules and short-term programs were necessary to provide an insight into the topics and structure of each module and short-term program. Furthermore, they were crucial for understanding the universities presentations followed later.

The synchronous presentations were achieved with unified structure. Each General Introduction presentation included:

- brief description of the title (topic),
- description of why is the university 1 specialized to teach those topics (where does the knowledge comes from, previous experiences and efforts regarding the topic),
- description of why is the university 2 specialized to teach those topics (where your knowledge comes from, previous experiences and efforts regarding the topic),
- an explanation of why is that topic an important part of smart grids and
- what knowledges should the module provide.

The universities 1 and 2 are the two implementing the module in the first phase of implementation:

- Module 1: Kaunas University of Technology and Dresden University of Technology,
- Module 2: University of Lorraine and Tallin University of Technology,
- Module 3: Technical University of Berlin and University of Ljubljana.



MODULE 3: PLANNING AND OPERATION IN SMART GRIDS www.smagrinet.eu

Agenda

1. Module Introduction
2. Partnering Universities
 1. University of Ljubljana
 2. Technische Universität Berlin
3. Learning Outcomes
4. Module Significance

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Figure 3: Module 3 General Introduction agenda, TUB

3.1.2. Presentations of consortium universities

Presentations of consortium universities were the main part of Train the Trainers Workshop. The detailed presentation of lectures, tutorial and lab exercises was given.

With the purpose of synchronous presentations of universities and understandable presentation of the content an outline was given. That provided, each lecture presentation consisted of:

- **MODULE TITLE:** the title of the module the lecture was presented within,
- **LECTURE TITLE:** the title of the lecture, used in the module description,
- **CONTENT:** short description of the lecture content, the main things that should be mentioned within the presentation and are important for the topic understanding,
- **INTENDED LEARNING OUTCOMES:** short description of what will the students be able to do after the lecture and tutorial and/or lab work,
- **LEARNING AND TEACHING METHODS:** list of teaching methods (lectures, tutorial work and lab work) and which one should get most focused on,
- **ASSESSMENT:** short description of the independent student work (project work) and what are the expected outcomes (seminar work, simulations, calculations, ...),
- **READINGS:** materials that will help the new teachers to prepare for the lectures even better.

The Smagrinet project's Power Point template was used for the presentations.

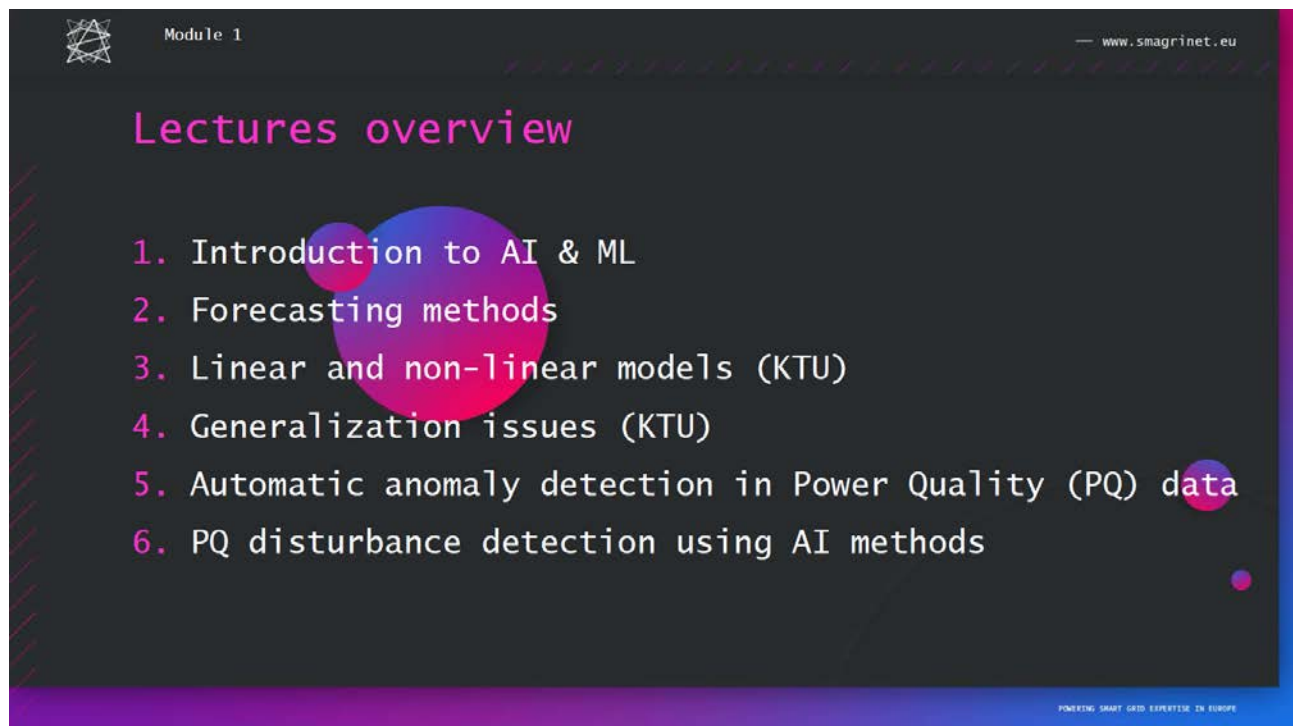


Figure 4: Part of the Dresden University of Technology's presentation, TUD

3.2. Workshop Implementation

Train the Trainers Workshop was a 2-day event, implemented in November 24 and 25, 2020. University of Ljubljana, as the leader of WP 5 and the one responsible for T5.3 Implementation of Train the Trainers' pilot, organized the event.

Due to the current situation regarding the Coronavirus, the event was executed on-line. MS Teams video conference tool was used.

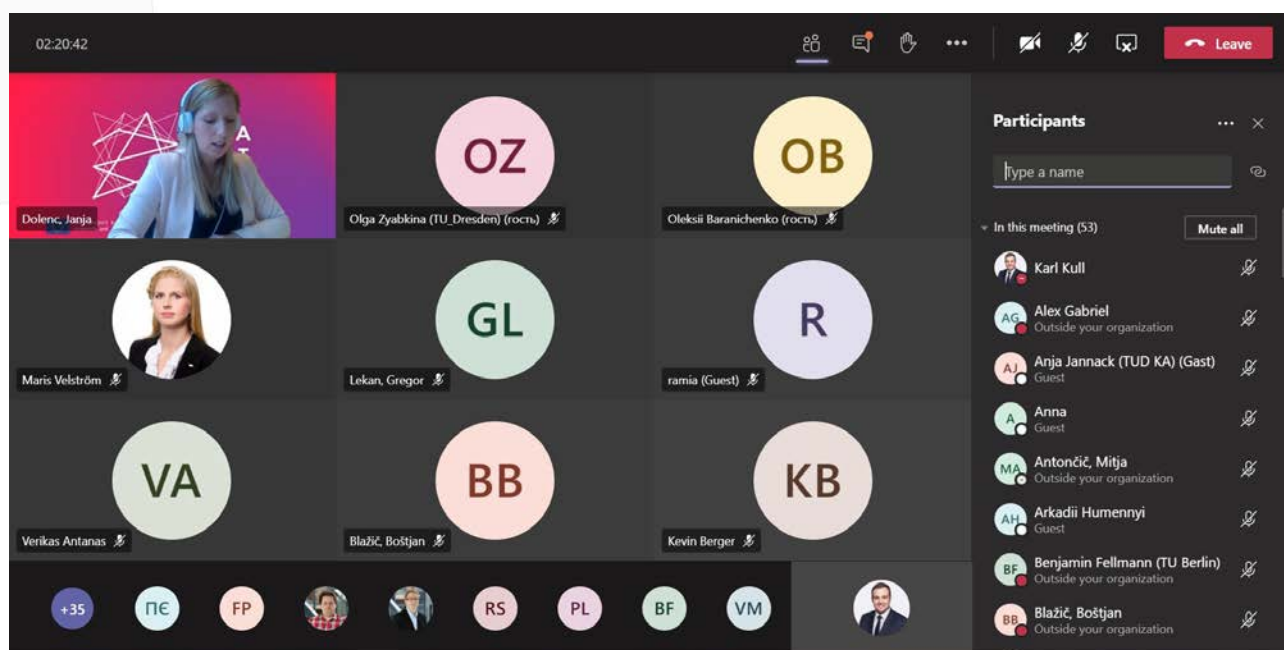


Figure 5: The beginning of the workshop, MS Teams video conference tool

The workshop started on Tuesday, November 24, with the short presentation of the Smagrinet project, presented by Karl Kull from Tallin University of Technology. Importantly, a brief overview of the activities and main objectives of the project was given at the beginning. With that, understanding of the workshop importance was provided.

After the official start, consortium universities presented the content of three case-based modules and short-term programs. General Introductions were presented by:

- Module 1: Artificial Intelligence in a Smart Grid with Prosumers – Antanas Verikas (KTU) and Olga Zyabkina (TUD)
- Module 2: Economic Operation and Societal Challenges – Karl Kull (TalTech)
- Module 3: Connection Planning in Smart Grids – Kai Strunz (TUB)
- Short-term Programs – Alex Gabriel (ULOR)

The rest of the workshop was devoted to the detailed presentations of consortium universities. Each university presented lectures they have structured and prepared. In first phase, each module was implemented by two universities and that is why each university presented half of the module content.

The presenters were:

- Module 1: Antanas Verikas (KTU) and Sascha Müller (TUD)

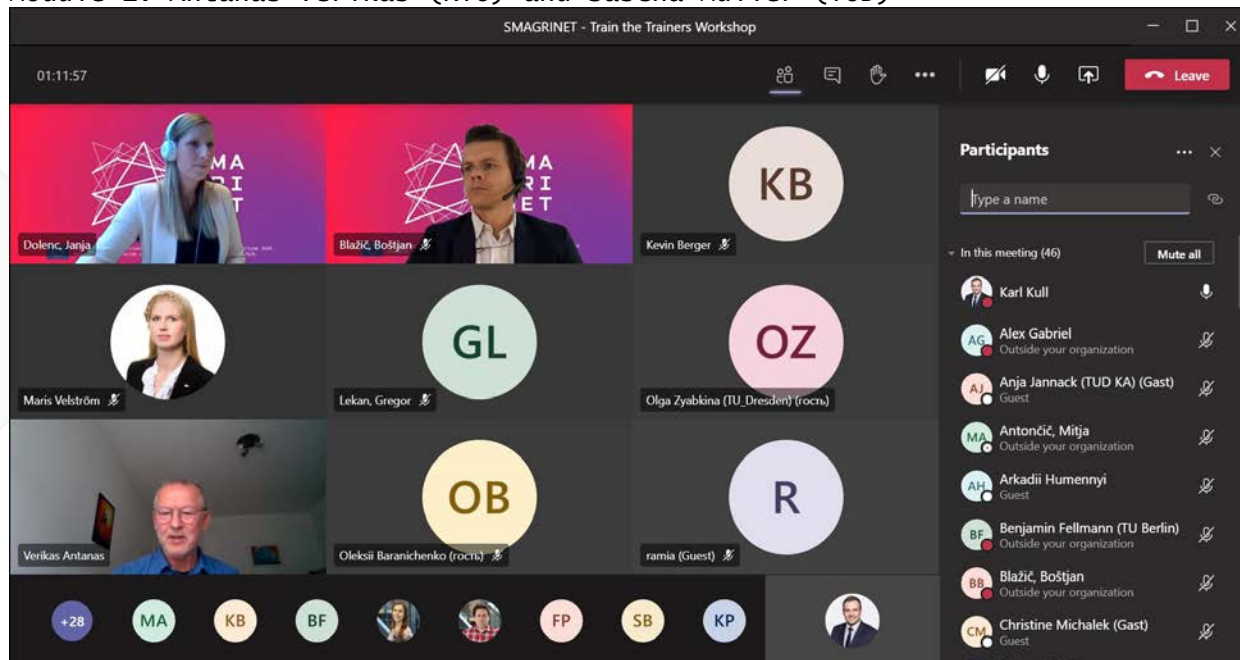


Figure 6: End of the KTU's presentation (Antanas Verikas)

- Module 2: Remi Dorget (ULOR) and Karl Kul (TalTech)

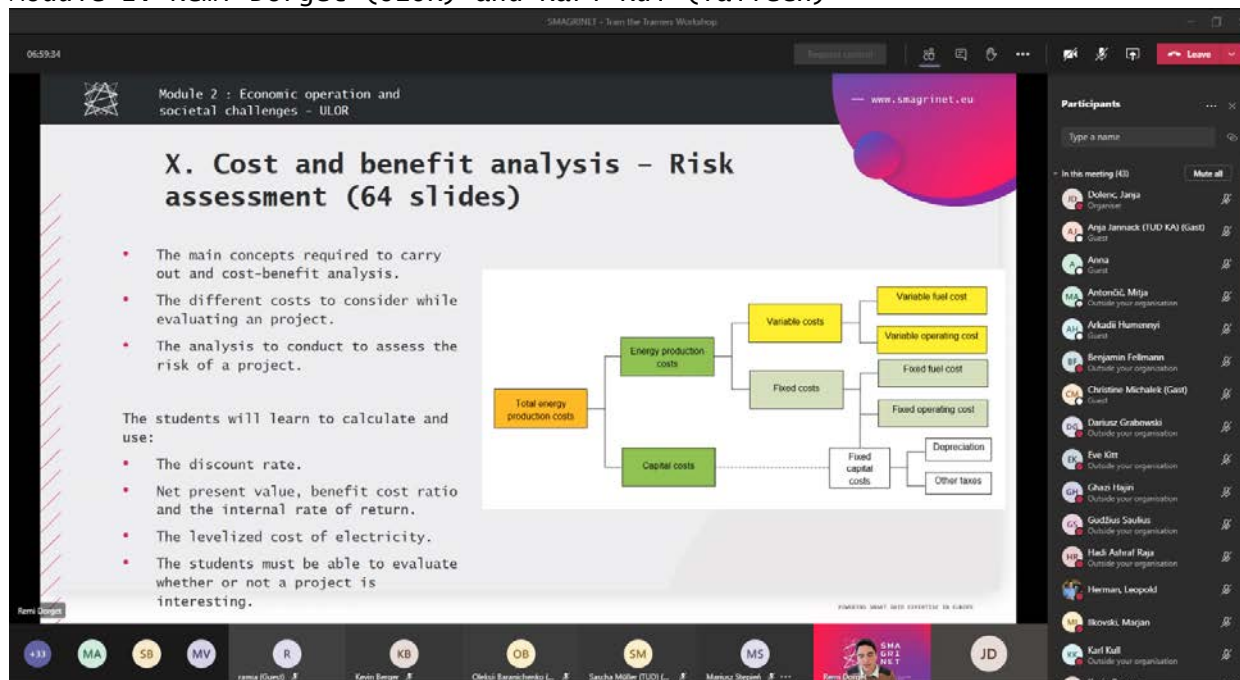


Figure 7: ULOR's presentation (Remi Dorget)

- Module 3: Christine Michalek (TUB) and Boštjan Blažič (ULJUB)

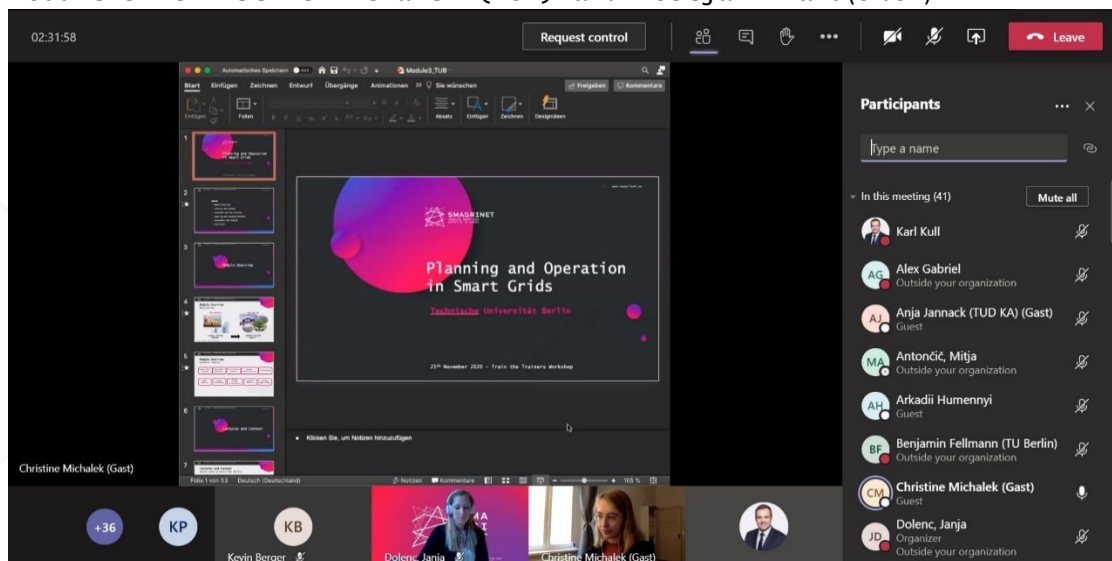


Figure 8: TUB's presentation (Christine Michalek)

After each presentation there was a 20-minutes time slot, intended for questions and discussion. At least one question was asked regarding each presentation, what was very satisfying to see. The most frequently discussed topic was the evaluation of the course at an individual university (ECTS points). In conclusion, each module/course is, in terms of scope of work, worth 6 ECTS points.

The workshop was concluded on Wednesday, November 25, with the presentation of 4 Online manuals for the trainers, interested in implementation of Smagrinet courses into their curriculum. Manuals were presented by Karl Kull (TalTech), together with the possibilities of implementation of Modules and Short-Term Programs at universities beyond consortium.

3.3. Participants

Train the Trainers Workshop targeted at least 50 participants, 30 from the consortium universities and 20 from the universities beyond consortium. Significantly, the KPI was not only achieved but also overproved, as altogether 70 participants attended the workshop.

The targeted universities beyond consortium were defined by TUD and invited by TUD, ULOR and TalTech. The meeting with interested universities (NOVA School of Science and Technology FCT NOVA (Portugal), The Silesian University of Technology (Poland) and O. M. Beketov National University of Urban Economy in Kharkiv (Ukraine)) and partners from TalTech (Karl Kull), ULOR (Kevin Berger), TUD (Olga Kyselova), TUB (Christine Michalek) and ULJUB (Janja Dolenc) was on November 05, 2020. Partners presented the parts of the Smagrinet project, led by them. The presentations were prepared in an interesting way, aiming to ensure the participation of invited universities. The aim of the meeting was the implementation of the modules on the universities beyond consortium and participation of those universities at the Train the Trainers Workshop.

At the end, participants from 7 partnering institutions of the Smagrinet project and participants from 7 institutions beyond consortium attended (Appendix 1).

The partnering universities and institutions are:

- University of Ljubljana (7 participants)
- Tallin University of Technology (15 participants)
- Technical University of Berlin (5 participants)
- Dresden University of technology (7 participants)
- Kaunas University of Technology (7 participants)
- University of Lorraine (8 participants)
- LOBA (1 participant)

Institutions beyond consortium participating are:

- O.M. Beketov National University of Urban Economy in Kharkiv (3 participants)
- National Technical University of Ukraine "Kyiv Polytechnic Institute" (6 participants)
- Kyiv National University of Technology and Design (1 participant)
- Silesian University of Technology (5 participants)
- Universidade NOVA de Lisboa (3 participants)
- EIT InnoEnergy (1 participants)
- Managing Director at Union of Electricity Industry of Estonia (1 participant)

All participants were invited to implement the Modules at their University, if interested.

4. Conclusion

Developing generation of researchers and engineers, equipped to develop, improve, and deploy new energy technologies, is the strategic objective of SMAGRINET. The next generation of engineers needs to be prepared for the transition to smart grids.

Within WP 3, three case-based modules have been prepared and implemented at six consortium universities in the first phase. Two universities cooperated and each presented half of the lectures within the module.

The second phase aspires to implement modules locally within 10 European universities, 6 consortium universities and 4 universities beyond consortium.

Encouraging the implementation of modules locally at the universities requires training of local teaching staff. Training was provided at Train the Trainers Workshop, where experts from consortium universities passed on knowledge and experiences gathered during the first implementation of modules.

Train the Trainer Workshop overproved KPIs with altogether 70 attendees. 50 participants from Smagrinet partnering institutions and 20 participants from 7 institutions beyond consortium joined. There were participants from 5 different universities beyond consortium who showed interest in the presented topics and might implement one of the modules locally. Participants received materials, used during the workshop, and a certificate, after the workshop end.

The workshop was prepared within two months of work and with contribution of all partners. Without tight cooperation of all consortium universities, the workshop would not be prepared on such expert level of knowledge.

5. Appendix 1

Appendix 1 provides a final attendee list for Train the Trainers Workshop.

Table 5-1: Train the Trainers workshop attendee list

Nr.	Name, Surname	Institution
1	Marjan Ilkovski	ULJUB - University of Ljubljana
2	Tarmo Trummal	TalTech - Tallin University of Technology
3	Mitja Antončič	ULJUB - University of Ljubljana
4	Madis Leinakse	TalTech - Tallin University of Technology
5	Stefan Bschorer	TUB - Berlin University of Technology
6	Leopold Herman	ULJUB - University of Ljubljana
7	Audrius Jonaitis	KTU - Kaunas University of Technology
8	Christine Michalek	TUB - Berlin University of Technology
9	Benjamin Fellmann	TUB - Berlin University of Technology
10	Vladyslav Pliuhin	O.M. Beketov National University of Urban Economy in Kharkiv
11	Vadym Yaremenko	National Technical University of Ukraine "Kyiv Polytechnic Institute"
12	Kevin Berger	ULOR - University of Lorraine
13	Roman Shaptala	National Technical University of Ukraine "Kyiv Polytechnic Institute"
14	Yuliia Kovalova	O.M. Beketov National University of Urban Economy in Kharkiv
15	Remi Dorget	ULOR - University of Lorraine
16	Zhihui Li	TUB - Berlin University of Technology
17	Laurent DUPONT	ULOR - University of Lorraine
18	Ramia Skaf	TUD - Dresden University of Technology
19	Kai Strunz	TUB - Berlin University of Technology
20	Olga Kyselova	TUD - Dresden University of Technology
21	Arkadii Humennyi	National Technical University of Ukraine "Kyiv Polytechnic Institute"
22	Oleksii Horbenko	National Technical University of Ukraine "Kyiv Polytechnic Institute"
23	Oleksii Baranichenko	National Technical University of Ukraine "Kyiv Polytechnic Institute"
24	Aljaž Špelko	ULJUB - University of Ljubljana
25	Karl Kull	TalTech - Tallin University of Technology
26	Vahur Maask	TalTech - Tallin University of Technology
27	Marko Tealane	TalTech - Tallin University of Technology
28	Pawel Lasek	SUT - Silesian University of Technology
29	Volodymyr Nochvai	National Technical University of Ukraine "Kyiv Polytechnic Institute"
30	Ghazi Hajiri	ULOR - University of Lorraine
31	Jean Leveque	ULOR - University of Lorraine
32	Melika Hinaje	ULOR - University of Lorraine
33	Tonis Vare	Managing Director at Union of Electricity Industry of Estonia
34	Ehsan Jamshidpour	ULOR - University of Lorraine
35	Anja Jannack	TUD - Dresden University of Technology

Nr.	Name, Surname	Institution
36	Eve Kitt	TalTech - Tallin University of Technology
37	Freddy Plaum	TalTech - Tallin University of Technology
38	Dmytro Kaliuzhnyi	O.M. Beketov National University of Urban Economy in Kharkiv
39	Virginijus Vasylius	KTU - Kaunas University of Technology
40	Jonas Vaicys	KTU - Kaunas University of Technology
41	Catarina Pereira	LOBA
42	Boštjan Blažič	ULJUB - University of Ljubljana
43	Gregor Lekan	ULJUB - University of Ljubljana
44	Mari Loper	TalTech - Tallin University of Technology
45	Olga Zyabkina	TUD - Dresden University of Technology
46	Janja Dolenc	ULJUB - University of Ljubljana
47	Anna Kyselova	TUK - Kyiv National University of Technology and Design
48	Dariusz Grabowski	SUT - Silesian University of Technology
49	Merylin Pill	TalTech - Tallin University of Technology
50	Robert Stielker	TUD - Dresden University of Technology
51	Sascha Muller	TUD - Dresden University of Technology
52	Kristjan Pütsep	TalTech - Tallin University of Technology
53	Maris Velström	TalTech - Tallin University of Technology
54	Gudžius Saulius	KTU - Kaunas University of Technology
55	Alex Gabriel	ULOR - University of Lorraine
56	Mariusz Stepień	SUT - Silesian University of Technology
57	Sameetb Mishra	TalTech - Tallin University of Technology
58	Joao Pina	Universidade NOVA de Lisboa
59	Anabela Pronto	Universidade NOVA de Lisboa
60	Hadi Ashraf Raja	TalTech - Tallin University of Technology
61	Antanas Verikas	KTU - Kaunas University of Technology
62	Pedro Miguel Negrao Malo	Universidade NOVA de Lisboa
63	Marcus Kreutziger	TUD - Dresden University of Technology
64	Gytis Svinkunas	KTU - Kaunas University of Technology
65	Slivikas Aivaras	KTU - Kaunas University of Technology
66	Krzysztof Kubiczek	SUT - Silesian University of Technology
67	Krzyszto Bodzek	SUT - Silesian University of Technology
68	Mahdiyyeh Najafzadeh	TalTech - Tallin University of Technology
69	Reeli Kuhi-Thalfeldt	TalTech - Tallin University of Technology
70	Andrey Glikman	EIT InnoEnergy



Table 5-2: Number of participants from individual institution

Consortium Universities and project partners	
ULJUB	7
TalTech	15
TUB	5
TUD	7
KTU	7
ULOR	8
LOBA	1

Other universities / institutions	
O.M. Beketov National University of Urban Economy in Kharkiv	3
National Technical University of Ukraine "Kyiv Polytechnic Institute"	6
TUK - Kyiv National University of Technology and Design	1
SUT - Silesian University of Technology	5
Universidade NOVA de Lisboa	3
EIT InnoEnergy	1
Managing Director at Union of Electricity Industry of Estonia	1



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