<table>
<tr><th>Aspect 1</th><th colspan="2">Toolkit on “Smart Energy Management” – Training Modules Piloting</th></tr>
<tr><td>Specific Modules</td><td colspan="2">M : Energy mapping</td></tr>
<tr><td>Piloting group’s qualification</td><td colspan="2">Higher education in Electric and VVS engineering</td></tr>
<tr><td>SQF level</td><td colspan="2">5</td></tr>
<tr><td>SEM qualification : Aggregated Unit of LOs (Learning Outcomes)</td><td>U1 – Energy management</td><td>LO1. Identify a buildings use, heating-, cooling-, and ventilation systems
LO2. Write an energy policy for a building/company
LO3. Create an energy mapping of a building
LO4. Suggest energy improvements and make calculations on them.</td></tr>
<tr><th>Aspect 2</th><th colspan="2">Definition of the Project Task</th></tr>
<tr><td>General task</td><td colspan="2">Make an energy mapping on a certain facility

Energy management

266 kWh/m2

<table>
<tr><th>Small houses <120m2</th><th>Average kWh/m2</th><th>New houses kWh/m2</th></tr>
<tr><td>2001</td><td>150-190</td><td>105-150</td></tr>
<tr><td>2005</td><td>160</td><td>90</td></tr>
<tr><td>2025</td><td>110</td><td>50</td></tr>
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</td></tr>
<tr><td>Specific tasks which cover LOs of Training Modules</td><td colspan="2">Analyze of what kind building does your organization have?
- What kind of building does your organization have?
- How is the building heated?
- Is there any cooling system?
- What type of ventilation does it use?
- What can be the main users of electricity?
- What kind of lighting is there?
- Is there any specific runtimes?</td></tr>
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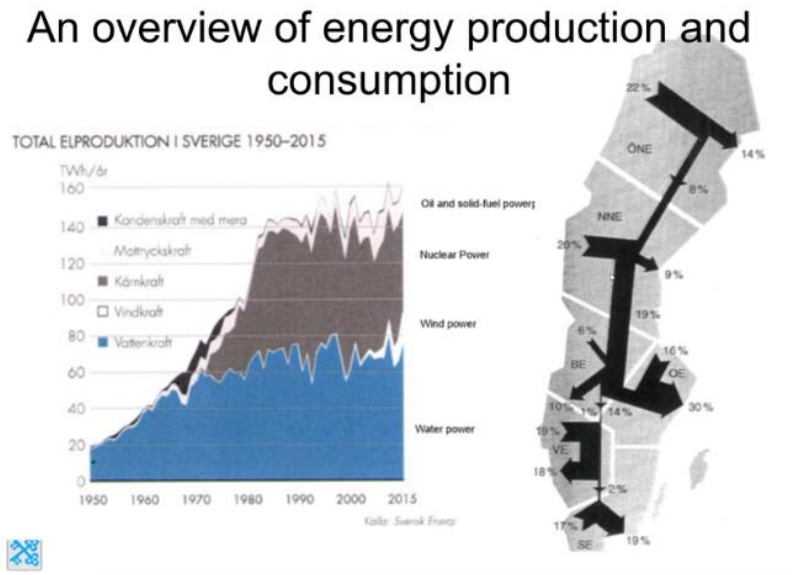
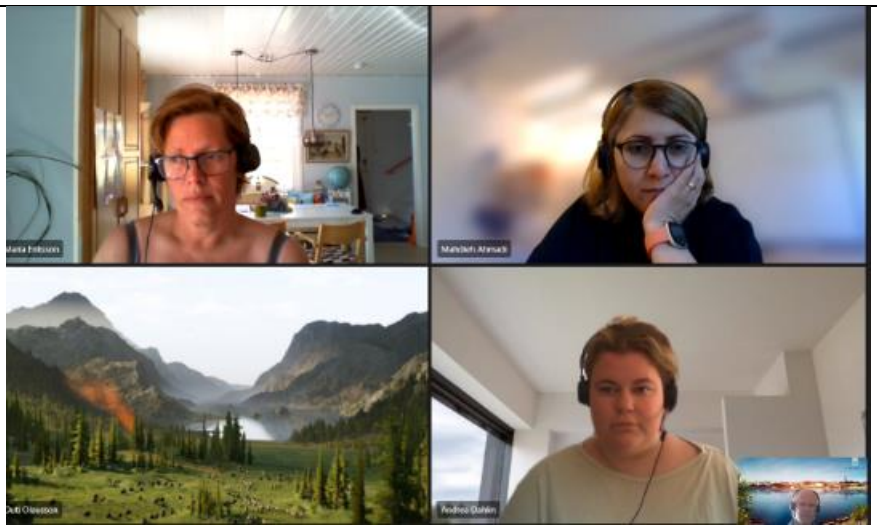
	
Aspect 3	**Time arrangements**
Teachers	The teaching team (teachers who deliver classes to the group) has been set up so as to have their workload concentrated, as much as possible, with the same group. That way there is the possibility to be flexible in terms of the specialist teacher taking charge of the group as the Project progresses and the need for guidance changes (in terms of subject covered by Project that time) for students. The team did work as a self-managed one.
Students	The student's timetable changes radically while they are carrying out the Project so there is no división in terms of subject taught but a continuous time during the day devoted to the Project.
Aspect 4	**Adaptation of spaces and infrastructure**
Furniture	Due to Corona, all lessons were available through Teams and the students were divided into study groups. In every group there discussed and answered the questions

ICT connections	 The students worked together to discuss the issues WORK INSTRUCTIONS Discuss and answer the following questions in your energy group - What kind of building does your organization have? - How is the building heated? - Is there any cooling system? - What type of ventilation does it use? - What can be the main users of electricity? - What kind of lighting is there? - Is there any specific runtimes? Compare with other gropus
Aspect 5	**Process management: Teacher role/Student role**
Teacher role	At the beginning the role of the teacher has been more guiding students through complexities of the Project rather than delivering just contents. It has been very important to establish some check-points through the Project development so students don't lose the objective and cope with such a long work without getting lost or really depressed. This new role is not easy at first and pedagogically requires a change for the teacher who sometimes feels more comfortable delivering content and not forcing students to get the results on their own. During the lockdown the role of the teacher became even more that of an organiser, supporter and facilitator.
Student role	Especially during the lockdown the Toolkit was a really helpful tool for them as it enabled them to have the knowledge related to the Learning Outcomes in a way (online) much more flexible. This means each group could have Access to the different concepts needed throughout the development of the Project in their own time. The teacher was online, of course, to give support while doing the tasks and for any query related to the online course itself. But it was a shame that the practical tasks could not be carried out. Students told us they learned a lot but are not sure if they can apply the lessons learned. They were happy with the

	online content in an uncertain time but they missed the execution of the tasks.
Aspect 6	**Team building**
Techniques	In our piloting experience, we did not use any technique for building up the teams since our group was a second year group so we knew how each student was in terms of character and profile. We did try to mix up people in groups of 2-3 people in which their characters (creative, manager, hard worker…) did have a balanced structure so as to have a better experience. Nevertheless, sometimes it is better to mix up homogeneous character students so as to force them to take up roles they are not used to. Nevertheless, the use of any technique or dynamic should be envisaged in case students from the group are new and there is not any experience with them by the group of teachers.
Aspect 7	**Assessment / Qualitative experience**
Assessment	Students were assessed both in technical and transversal skills. Technical aspects were corrected by each corresponding teacher and the transversal skills were assessed by the group of teachers together. These late ones were based on evidence taken about initiative and responsibility, team working and communication skills. Implementation was not assessed due to modifications done in lockdown.

Technical competences (%60)	Transversal competences(%40)			
Energy mapping (%100)	**Report and presentation (%10)**	**Team Work (%10)**	**Individual work (implication and autonomy) (%10)**	**Advisory skills (%10)**

U04: DESIGN AND ANALYSIS OF SMART ENERGY MEASUREMENT SYSTEMS

Assessment criteria	1	2	3	4

Learning Outcome-1. Identify a buildings use, heating-, cooling-, and ventilation systems				
He/She is not able to identify a buildings use, heating-, cooling-, and ventilation systems	**1**			
He/She is able to identify a rough overview of a buildings use, heating-, cooling-, and ventilation systems		**2**		
He/She is able to identify a overview of a buildings use, heating-, cooling-, and ventilation systems			**3**	
He/She is able to identify a detailed analysis of a buildings use, heating-, cooling-, and ventilation systems				**4**
Average				
Learning Outcome-2. Write an energy policy for a building/company				
He/She is not able to write an energy policy for a building/company	**1**			
He/She is able to write an energy policy for a building/company		**2**		
He/She is able to write an energy policy for a building/company and relate it to other companies energy policies			**3**	
He/She is able to independantly find similar representative buildings their energy consumption.				**4**
Average				
Learning Outcome-3. Create an energy mapping of a building				
He/She does not know which are the key parameters of an energy mapping	1			
He/She does know which are the key parameters to analyse energy mapping		2		
He/She knows which are the ket parameters to analyse and, is able to calculate a basic energy mapping			3	
He/she knows which the key parameters are to analyse and is able to calculate an energy mapping.				4
Average				
Learning Outcome-4. Suggest energy improvements and make calculations on them.				
He/She can not use the data to reduce energy consumption and influence the users	**1**			
He/She can use data thereby he/she can gather datas but can not reduce the energy consumption		**2**		
He/She can use data to reduce energy consumption but he/she can not influence the users			**3**	
He/She can use the data to reduce energy consumption and influence the users				**4**
Average				

- The transversal competences to assess in this challenge will be teamwork, communication (in written support), individual performance and advisory skills and they will be assessed individually.
- The ponderation of the transversal competences will be as shown below.
- The way to assess these will be done in different ways: teachers, auto-assessment by students and coevaluation among them. Finally, we will do an average of all the marks.

COMPETENCE	Who will assess			
	Teachers (google forms)	Teammate	Auto-assessment	**AVERAGE**
Teamwork (%10)				
Report, presentation (%10)				
Individual work and autonomy (implication) (%10)				
Advisory skills (%10)				

Qualitative experience	The experience was really interesting for both students and teachers since after lockdown it was a real piloting of distance learning. Students judged the implemented material very useful for the Project development since it was possible for them to access the needed knowledge in a moment of their choosing within limits. Because teachers choose to give weekly deadlines to retain some control in these first weeks of online learning. The last three weeks of the project students only got the last deadline and a weekly progress interview.

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