

Luxembourg - Technician's programme: "Smart Technologies"

Title of inspiring practice	Technician's programme: "Smart technologies" (5 Luxembourg high schools)
Geographical area	The initiative is implemented at national level in Luxembourg.
Period of implementation	The project started in September 2019. The first 4T classes opened their doors at the start of the academic year 2019/2020. Specialisations are offered from the 2019/2020 academic year. No end date is foreseen.
Rationale	The initiative proposes IVET programmes in the field of "Smart Technologies: Smart Energy" and "Smart Technologies: Renewable Energy". Students in Smart Technologies are required to understand the link between IT and the various technical fields in order to be able, at the end of their training, to plan, carry out and document projects; make different devices and computer systems communicate; operate and maintain complex electrical installations; recognise and repair faults in technical installations; advise clients. "Smart Technologies" is good example on the way to integrate solution-oriented learning programmes into the schooling system. Indeed, these training programmes prepare learners to adjust to future skill demand in the labour market and cutting-edge technologies. Furthermore, they support students in their future career choice, guiding them towards jobs in the technical fields that are increasingly demanded by the market.
Scope of the practice	Vocational Education and Training
Educational level	In order to enter the programme, participants are required to hold a "5G" qualification level (lower secondary education). Upon successful completion, the students reach an EQF 4 level.
Introduction and context	The key stakeholders involved in the initiative are schools and national agencies. Indeed, the programmes were developed in partnership with five Luxembourgish high schools, the Luxembourg Chamber of Commerce and the Luxembourg Chamber of Employees. The technician training course was developed as a part of the diversification process of the school offer and is linked to the autonomy granted to the high schools to best meet the needs of their pupils. Five Luxembourgish secondary schools, which stand out for their extensive experience in the technology sector and in vocational training, launched in September 2019 a new technician training course in "Smart Technologies: Smart Energy" and "Smart Technologies: Renewable Energy". These high schools are the Lycée technique d'Ettelbruck (Ettelbruck), the Lënster Lycée International School (Junglinster), the Lycée des Arts et Métiers (Luxembourg), The Lycée privé Emile Metz (Luxembourg) and the French-speaking Lycée Guillaume Kroll (Luxembourg). The main driver of this initiative is linked to the considerable evolution of the electrical engineering sector in recent years. Digitisation, automation, networking of devices and

	<p>the focus on sustainability require new skills. The sector, always in demand for qualified personnel, offers real chances of hiring.</p> <p>The main objective of the practice is to prepare young students who have accomplished the lower secondary education to gain the optimal skills for jobs in smart technologies.</p>
<p>Key activities and outcomes</p>	<p>Since its start in 2019, the IVET programme is popular, with 365 learners currently enrolled. The programme is available in German and French. As the first cohort of graduates is forthcoming in 2023, there is no data on effects on the target group available yet. Students in Smart Technologies are required to understand and get familiar with the link between IT and the various technical fields. Technician training extends from the 4T class to the 1T. This training leaves a large place to practice, independent work and creativity. In the courses, students work a lot on projects. The training's orientation towards a lot practice and experimentation, combined with independent work and a focus on creativity, were all key factors behind the success of the initiative.</p> <p>The four years of training are divided into two years of common core – in 4T and 3T – and two years of specialisation – in 2T and 1T.</p> <p>In 2T and 1T, students can deepen a specific area, with two specialisations in the area of "Green Skills".</p> <p>The first specialisation focuses on the field of renewable energy and is available at the Lycée technique d'Ettelbruck (www.ltett.lu). This specialisation has an emphasis on production (wind turbines, solar panels, hydraulic installations) as well as on its storage, which is one of the major challenges for the future of the energy sector.</p> <p>As an activity example, different classes worked on a project consisting in helping with the installation of a 150kWp photovoltaic system on the roof of the Lycée's sports hall. As part of this installation, aluminium profiles were mounted on the flat roof. After that, the PV modules were installed and rotated with an inclination of 10° in east and west orientation. Greenpeace provided safety materials as part of the "Jugendsolar" project.</p> <p>The aim of this project was to bring the topic of renewable energy closer to the students. Theory and practice were linked, so that in addition to the great experience of working together with people from the field, it was also a unique opportunity to get a glimpse of real professional life.</p> <p>The second specialisation focuses on smart energy and is offered at the Lënster Lycée International School (LLIS) in Junglinster (www.llis.lu). The training offers a main understanding of the planning, connection and operation of "intelligent" networks (Smart Grids) or storage systems (Energy Clouds), as well as courses in economics and management to prepare for advice and support for clients.</p> <p>At the LLIS, a specific "sustainable group" was set up, where the teachers have set themselves the task of learning sustainability together with the students, be it in the form of projects, discussion rounds, in extracurricular places of learning and in everyday situations, crucial for the implementation of sustainable development.</p> <p>The three other participating high schools in the "Smart Technologies" programme also offer each a different specialisation in the following fields:</p> <p>"Infotronics" is offered at the Lycée des Arts et Métiers in Luxembourg (www.ltam.lu), with a cross-disciplinary training in electronics, automation, programming and communication techniques, which will enable students to adapt easily to the company that will employ them.</p> <p>The Lycée Guillaume Kroll in Esch-sur-Alzette (www.lgk.lu) is proposing a training in "robotics and automation", with the programming and operation of industrial robots, as well as home automation (smart home), and applications in industry, medicine, etc., in close cooperation with high-tech companies.</p>

	<p>The training “E-Controls” is offered at the Lycée privé Emile Metz in Luxembourg-Dommeldange (www.lpem.lu), with the control of energy production, distribution and system maintenance, at the industrial level or in building technology, based on solid knowledge of electrical engineering and computer science.</p>
Other information	<p>The Technician’s diploma qualification belongs to comprehensive vocational trainings allowing students to enter the profession directly or to continue their studies at a technical university, in the field of study corresponding to their degree. However, it is a condition that the student had successfully completed the preparatory modules for higher education studies. The technician, in contrast to the CCP and DAP graduate, has more profound and varied knowledge as well as better general knowledge.</p> <p>In principle, the training lasts four years. Work-based learning is organised in the form of internships (with an internship contract for a total of at least twelve weeks).</p>
Contacts and sources	<p>Lycée Technique Ettelbruck (LEtt) secretariat@ltett.lu</p> <p>Lënster Lycée International School (LLIS) secretariat.direction@llis.lu</p> <p>https://men.public.lu/de/grands-dossiers/formation-professionnelle/smart-technologies.html</p> <p>https://www.alr.lu/alr/118-departements/autres/technicien-energetique/566-technicien-en-equipement-energetique-et-technique-des-batiments</p> <p>https://www.youtube.com/watch?v=DeRuPhTmwsQ</p> <p>https://men.public.lu/fr/grands-dossiers/formation-professionnelle/smart-future.html</p> <p>https://www.artsetmetiers.lu/</p> <p>https://www.lgk.lu/</p> <p>https://lpem.lu/</p>
Date of update	26 August 2022