ENERGYDUCATION

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NEWSLETTER

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The Smart Energy Manager

Defining skills, knowledge and responsibilities

Paul Koldehoff (Koldehoff Effiziente Energietechnik, Germany):"A Smart Energy Management expert in EQF level 4 should understand the relationships in the energy supply of an object (electricity, heat, cold, compressed air). He should be familiar with electrical quantities (current, power). He should be able to interpret current and heat load paths."

Context

The new-generation information technologies such as the Internet of Things, robotics and smart connected objects open new horizons for the industry and the energy markets. VET (Vocational Education and Training) schools have to get in line with the new technical competencies required by the smart energy sector. But how can we update these skills and competencies?

Goals

This question lead to a strategic partnership of VET schools in the Basque Country (Spain), Sweden and The Netherlands, the Münster School of Vocational Education in Germany, a training company in Norway and a Swiss OGN involved in climate projects. Co-funded by the Erasmus+ Programme of the European Union, the partnerships' goal is to enhance the technological skills of vocational students and their teachers whilst using digital tools in SMART ENERGY MANAGEMENT. Furthermore, all schools wish to follow the recommendations to implement ECVET (EU Vocational Credit) principles to enhance student mobilities. ECVET is a technical framework for the transfer, recognition and (where appropriate) accumulation of individuals' learning outcomes with a view to achieving a qualification recoginzed in all European couuntries.

According to Haritz Mendizibal (Veolia, Basque country) a SEM expert level 4 should, among other things, have knowledge about:
- concepts, magnitudes and basic formulas related to energy (Watt, kiloWatt.hour, performance, thermal energy formula etc).
- energy measuring tools and sensor types (water flow meters, polymeters, clamp meters etc.).
- basic thermal and electric schemas.
- different types of energy sources (renewable or not: biomass, gas, photovoltaic, heat pump, i.o.). Basic rules of installation and dimensioning.

Robert Dekker, (Strukton, the Netherlands): "A SEM expert level 4 should be able to gather data, analyse the data and give and implement technical advice. Therefore he should be able to communicate with the users of the building and interview them about the usage. He should have knowledge about the triangle between human, technic and organisation."

Output

- ECVET (EU Vocational Credit) online training guide for vocational teachers
- Toolkit for Smart Energy Management for vocational students
- EU student competition focused on innovative solutions for enhancing energy efficiency
- Teacher's handbook for the implementation of project-based learning based upon ECVET principles

First phase

The first phase is where teachers and trainers had to learn, themselves, about the new course content they want to introduce to the students. A project website was launched to later on share content with all interested parties: http://www.energyducation.eu/
In the Basque Country, Germany, Sweden and the Netherlands interviews were conducted with companies and experts in the energy sector. The aim was to achieve a common understanding of the learning outcomes in an educational programme for a Smart Energy Manager, EQF level 4. The experts and companies supplied insights about the knowledge, skills and responsibilities of a Smart Energy Manager.
We appreciate the time and insights contributed by these companies and experts:

Companies and experts interviewed		
Country	**Organisation**	**Name**
Germany	University of Applied Science Münster	Prof.Dr. Falk Salewski
	NZR Ing. Aug. Knemeyer GmbH & Co. KG	Jochen Grebing
	Koldehoff Effiziente Energietechnik	Paul Koldehoff
	Photovoltaikanlagen Weiterhaus	Stephan Weiterhaus
The Netherlands	Signify	Frank Bisschop
	Strukton worksphere BV	Robert Dekker
Basque Country	Veolia	Haritz Mendizabal
	Ondoan	Jon Zubiria

Common definition of a Smart Energy Manager level 4

As a conclusion to all the interviews; all partners agreed on a common definition for the skillset, knowledge and responsibilities of a Smart Energy Manager level 4:

Knowledge: A SEM expert has basic knowledge about;

- electrical and thermal energy generation and consumption in buildings.
- control technology of energy systems used in buildings.

Prof. Dr. Falk Salewski (University of Applied Sciences Münster, Germany): "The SEM must be able to advise a customer when he likes to reduce his energy consumption " the smart way". Furthermore he must be able to mount smart devices, net them together, and figure out technical problems. For simple buildings maybe he is able to do the programming of the controlling unit."

Frank Bisschop (Signify, the Netherlands): "Smart light fittings can be equipped with sensors and connected with a router to the internet to form an Internet Of Things environment. Since the light network exists throughout a building or even a city, you can gather a lot of data. With this data it is possible to compute predictive analytics and insights and then automate lighting and operational actions (such as cleaning schedules) in order to save energy and costs."

- regulations for sensors, actuators, controller, data communication and user interfaces used in buildings.
- basics on digital energy monitoring systems (hardware/software)
- historic data analysis
- creation of energy saving measures quantifying feasibility of required investment
- energy and sustainability regulations for buildings, including both envelope and its installations (at regional, national, European and international level)

Skills: A SEM expert is able to;

- identify energy consumption units using electrical and hydraulic schemas and on-site visits and interviews
- identify energy system control using electrical and hydraulic schemas and on-site visits and interviews
- identify regulation strategy using electrical and hydraulic schemas and on-site visits and interviews
- define technical energy saving proposals using electrical and hydraulic schemas and on-site visits and interviews
- determine parameters that should be the most interesting ones to monitor
- design, implement and, maintain a digital monitoring system
- design, implement and, maintain a complete energy saving solution
- communicate with building users and carry out registered data analysis to create consumption profiles
- communicate with maintenance personnel so as to gain understanding in energy system and its control and regulation basics

Responsibility & Autonomy: A SEM expert;

- is able to document tasks assigned to him depending on the complexity of the energy system.
- is able to work autonomously or independently on the tasks assigned to him depending on the complexity of the energy system.
- is able to work in a SEM team under the direction of a highly qualified person in an analytical, planning and operational manner.

The following phases

In the next developmental stages teachers and trainers will transfer the acquired knowledge to each other via online tutorials. Local Action Groups of companies will be formed to check on the course material that shall be developed in the coming months.

Project based learning course material will be developed on an extended open online course platform and will be made available to all.

In the Course year 2019/2020 the first classes will start with the new material and there will be an international competition for students.

Interested?

If you are interested in Smart Energy Management and want to become a member of one of our Local Action Groups; or are you interested in the course material or in the ECVET principles? Please contact our project manager, Engineer Imanol Gabellanes at: irigabellanes@lhusurbil.eus or check our website which will be updated with every new outcome.

http://www.energyducation.eu/