

Smart Energy Solutions for a Sustainable Future S3SF

VET Handbook

Issue Date: 17th February 2025
Version 1

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Revision History

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The S3SF Project

The Smart Energy Solutions for a Sustainable Future (S3SF) project aims to develop a transnational vocational education and training program. It will equip professionals with smart energy system skills and provide a methodology and digital platform for simulating energy savings.

The training will focus on energy efficiency, user-centric systems, entrepreneurial attitudes, and digital skills. It also promotes a decentralized training approach and smart energy system adoption through simulations.

The project will develop an innovative curriculum and implement a digital platform for energy savings simulation. Pilot training sessions across partner countries will assess and refine the project. Additionally, S3SF seeks to build a network of VET providers, engage stakeholders, and disseminate results. S3SF targets digital skills, energy & resources, and green skills, addressing the demand for a skilled green energy workforce and enhancing the Smart Energy Systems (SES) workforce across the value chain. It involves analysing current training programs and engaging stakeholders to identify gaps and opportunities. This analysis will inform the development of training and SES strategies.

The project also includes skills mapping in the construction industry, identifying existing gaps and informing future training development.

The program aims to foster collaboration, and encourage diversity, business attitudes, and digital skill development, contributing to upskilling in Smart Energy Solutions.

This document provides the VET providers with the following key information and seeks to act as a comprehensive resource for VET providers delivering the S3SF programme.

- 1 The S3SF training programme: overview (click to move to this section)
- [2 Accessing the S3SF Moodle Platform](#)– our on-line training platform (click to move to this section)
- [3 Evaluation Summary Table](#) (click to move to this section) – guidance on how to gather evaluation data following training provision.
- 4 Simulation Tool (click to move to this section) – The S3SF selected simulation tool where learners can experiment with different energy solutions.

Smart Energy Solutions for a Sustainable Future S3SF

VET Handbook - Curriculum Overview

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1 The S3SF training programme: overview

The S3SF transnational vocational education and training (VET) curriculum in smart energy systems is designed to be comprehensive, adaptable, and aligned with the identified needs and best practices identified in different EU regions.

The S3SF training programme is composed of 6 training modules. Each module is divided into several learning units. The notional learning time (also known as workload) is the estimated learning time taken by the 'average' student to achieve the specified learning outcomes. A total of 78 hours of learning time is required to complete the full S3SF training programme.

The full programme document is available at https://www.s3sf.eu/wp-content/uploads/2024/11/S3SF_VET-curriculum_Final.pdf

	Learning unit	Notional learning time
Module 1 - Energy Generation and System Integration with Commissioning	Unit 1 - Introduction to smart renewable energy technology	12h
	Unit 2 - System Commissioning and Communication	
	Unit 3 - Training and Maintenance of Smart Renewable Energy Systems	
Module 2 - Energy Economics: Understanding and Managing Costs	Unit 1 - Introduction to Energy Economics	15h
	Unit 2 - Analyzing Electricity bills	
	Unit 3 - Selecting Electricity Contracts	
	Unit 4 - Optimizing energy Costs	
Module 3 - Operational Security and Compliance	Unit 1 - Introduction to operational security	12h
	Unit 2 - Regulatory compliance in the energy sector	
	Unit 3 - Cybersecurity for smart energy systems: case studies and best practices	
Module 4 - Energy Systems Management	Unit 1 - Building Management Systems (BMS)	12h
	Unit 2 - Energy Storage System (ESS)	
	Unit 3 - Internet of Things (IoT) Devices Optimizing Energy Consumption	
Module 5 - Project Execution and Professional Skills	Unit 1 - Project Planning and Stakeholder Management	12h
	Unit 2 - Communication and Teamwork in Project Execution	
Module 6 - Technology Application and Innovation	Unit 1 - Innovative Energy Technologies and System Performance	15h
	Unit 2 - Commissioning and Integration of Advanced Energy Systems	

An overview of the S3SF training programme consisting of its 6 training modules, related units and learning outcomes is presented below:

Module title	Learning unit title	Learning outcomes The learner is expected to...
<p>Module 1 – Energy Generation and System Integration with Commissioning</p>	<p>Unit 1 – Introduction to smart renewable energy technology</p>	<ul style="list-style-type: none"> • Define key components and characteristics of smart renewable energy technologies. • Identify the role of these technologies in the broader context of sustainable energy. • Explain the significance of integrating smart renewable energy systems into modern power grids. • Analyse the benefits and challenges associated with the integration process. • Stay informed about current trends in smart renewable energy technologies. • Identify innovative developments shaping the future of the industry.
	<p>Unit 2 – System Commissioning and Communication</p>	<ul style="list-style-type: none"> • Explain the steps involved in the commissioning process for smart renewable energy systems, including pre-commissioning checks, initialization, testing, and validation. • Demonstrate the ability to set up and troubleshoot communication between smart energy systems, the power grid, and other relevant entities. • Stay informed about current trends in smart renewable energy technologies.

		<ul style="list-style-type: none"> • Identify innovative developments shaping the future of the industry. • Comply with relevant regulations governing the integration of smart renewable energy systems into the grid.
	<p>Unit 3 – Training and Maintenance of Smart Renewable Energy Systems</p>	<ul style="list-style-type: none"> • Demonstrate Proficiency in System Installation, Maintenance, and Commissioning • Ensure Proper Communication Setup with the Grid and Other Entities • Train Operators on Smart System Adjustments & emphasize the Importance of Maintaining correct Settings and Operations
<p>Module 2 - Energy Economics: Understanding and Managing Costs</p>	<p>Unit 1 – Introduction to Energy Economics</p>	<ul style="list-style-type: none"> • Define energy economics and its relevance to daily life and the broader economy. • Explore how energy drives economic activities, impacts prices, and contributes to overall economic growth. • Demonstrate an understanding of the basic principles of energy supply, demand, and pricing. • Grasp the basics of energy economics. • Understand the role of energy in the economy. • Recognize the impact of energy pricing and policy on economic activities.
	<p>Unit 2 – Analyzing Electricity bills</p>	<ul style="list-style-type: none"> • Identify the different sections of an electricity bill. • Understand the role of each component in the overall cost. • Observe usage patterns as reflected in billing statements.

		<ul style="list-style-type: none"> Utilize this information in practical contexts, potentially leading to more informed choices regarding energy consumption and cost management
	Unit 3 – Selecting Electricity Contracts	<ul style="list-style-type: none"> Understand the variety of electricity contracts, Interpret terms and conditions and Develop the ability to select the most appropriate contract based on specific needs and usage patterns.
	Unit 4 – Optimizing energy Costs	<ul style="list-style-type: none"> Understand how to evaluate energy usage, Identify inefficiencies, and Apply cost-optimization strategies for better energy management
Module 3 - Operational Security and Compliance	Unit 1 - Introduction to operational security	<ul style="list-style-type: none"> Define operational security and its significance for the energy sector. Identify common cyber threats and vulnerabilities in operational security in the energy sector considering OT/IT convergence Explain the importance of operational security in protecting critical infrastructure to facilitate cybersecurity risk management in the energy sector
	Unit 2 - Regulatory compliance in the energy sector	<ul style="list-style-type: none"> Identify and define key terms related to regulatory compliance in the energy sector. Describe the purpose and significance of regulatory compliance in ensuring safety, environmental protection, and fair competition in the energy industry. Adapt to the regulatory environment and maintain secure and compliant energy operations

	Unit 3 - Cybersecurity for smart energy systems: case studies and best practices	<ul style="list-style-type: none"> • Identify and explain key operational security practices in the energy sector • Analyze real-life examples to illustrate the consequences of cyber-attacks to critical infrastructures • Evaluate and propose strategies for achieving operational security and regulatory compliance to ensure cybersecurity preparedness in the energy sector
Module 4 -Energy Systems Management	Unit 1 – Building Management Systems (BMS)	<ul style="list-style-type: none"> • Concept and knowledge about BMS and ESS • Operate and manage BMS and ESS effectively • Utilize IoT devices for energy monitoring and optimization • Train building operators on the effective use and maintenance of energy management systems • Apply strategies for energy efficiency and optimization in building operations
	Unit 2 – Energy Storage System (ESS)	<ul style="list-style-type: none"> • Concept and knowledge about ESS • Operate and manage ESS effectively • Train building operators on the effective use and maintenance of energy storage systems
	Unit 3 – Internet of Things (IoT) Devices Optimizing Energy Consumption	<ul style="list-style-type: none"> • Define the Internet of Things • Define key concept about energy optimization by Internet of Things • Apply energy consumption detection and assessment based on Internet of Things

Module 5 - Project Execution and Professional Skills	Unit 1 – Project Planning and Stakeholder Management	<ul style="list-style-type: none"> • Define key project planning methodologies. • Explore stakeholder identification and engagement strategies. • Demonstrate the development of a project charter and stakeholder management plan
	Unit 2 - Communication and Teamwork in Project Execution	<ul style="list-style-type: none"> • Understand the importance and methods of efficient communication within project teams. • Recognize the elements of successful teamwork and how to foster them in project settings. • Apply conflict resolution strategies to maintain project momentum. • Employ techniques for consensus building to align project goals with team and stakeholder interests.
Module 6 – Technology Application and Innovation	Unit 1 - Innovative Energy Technologies and System Performance	<ul style="list-style-type: none"> • Understand cutting-edge energy technologies and their operational principles. • Apply advanced solutions to improve the performance of energy systems. • Assess the impact of innovative technologies on system efficiency
	Unit 2 – Commissioning and Integration of Advanced Energy Systems	<ul style="list-style-type: none"> • Commission new energy technologies while ensuring their compatibility and integration with existing systems. • Communicate effectively the advantages and operational protocols of new energy technologies to building owners and operators. • Choose suitable technologies based on specific project goals and energy management needs.

Table 2: S3SF training programme

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2 Accessing the S3SF Moodle Platform

Step 1: Access the S3SF website: [Training – S3SF](#)

Step 2: Click on Training Platform tab



The screenshot shows the S3SF website homepage. The logo is on the left, and the tagline "Smart Energy Solutions for a Sustainable Future" is on the right. A navigation menu includes Home, Project, Training, News and events, and Contact. The "Training" section is highlighted, with a red box around the "Training platform" button and a red arrow pointing to it from a text box that says "Access the Moodle platform here." Below the navigation menu, there are social media icons, a "Training platform" button, and a disclaimer. The footer includes the S3SF logo, a navigation menu, and the text "Available courses".

Step 3: Click the Login option (top right hand corner)



The screenshot shows the S3SF Moodle platform interface. The top right corner has a red box around the text "You are not logged in. (Log in)". A red arrow points from this box to the right. The main content area features the S3SF logo and the text "Available courses".

Step 4: Choose 'create new account'

SMART ENERGY SOLUTIONS FOR A SUSTAINABLE FUTURE

Username or email

Password

Log in

Lost password?

Is this your first time here?

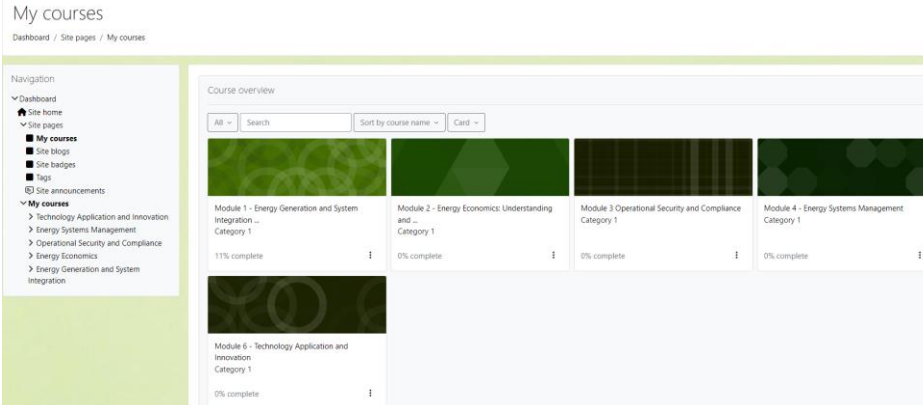
Register

Create new account

Some courses may allow guest access

Access as a guest

Cookies notice

Step 5: Choose a module and start the course.

My courses

Dashboard / Site pages / My courses

Navigation

- Dashboard
- Site home
- Site pages
- My courses
- Site blogs
- Site badges
- Tags
- Site announcements
- My courses
 - Technology Application and Innovation
 - Energy Systems Management
 - Operational Security and Compliance
 - Energy Economics
 - Energy Generation and System Integration

Course overview

All - Search Sort by course name - Card -

Module	Completion
Module 1 - Energy Generation and System Integration ... Category 1	11% complete
Module 2 - Energy Economics: Understanding and ... Category 1	0% complete
Module 3 Operational Security and Compliance Category 1	0% complete
Module 4 - Energy Systems Management Category 1	0% complete
Module 6 - Technology Application and Innovation Category 1	0% complete

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3 Evaluation Summary Table

The S3SF partners have identified that there may be difficulty with tracking the learner evaluations using a Google Form with some VET providers / learner groups. The VET tutors will share an evaluation link to the Google Form along with a QR code with the learners upon completion of the desired learning module, however there may be a lack of engagement from some learners.

To accurately gather the learner evaluations, the S3SF partners suggest that VET Trainers use the following table to also summarise the learner experience of the delivered training modules. This table can be completed at the end of each training event, or monthly, and this can be agreed between the project partner and VET Provider.

VET Provider			
Country			
No of people trained:			
Profile of learners:	Student / Trainer / SES professional / Construction Professional		
Mode of delivery:	Online live	Self-Directed	Tutor led
List modules delivered:			
Issues identified:			
Feedback from participants:			

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4 Simulation Tool

The S3SF project has the ambition to encourage learners, trainers and other stakeholders to investigate the impact of smart energy solutions. The project has investigated existing tools which users can access freely to consider various energy impacts.

The S3SF Consortium focuses on incorporating the latest advancement in smart energy systems and a comprehensive and standardized methodology for simulating energy savings that will ensure consistent and accurate recommendations for consumers.

We have selected on Tool – EnergyPlan which is available for users to consider the impact of different energy solutions on the energy system. Check Out the Simulation Tool here <https://energyplan.eu/>

- An introduction to the tool is available here [About EnergyPLAN - EnergyPLAN](#)
- A detailed Guide to using the plan is available here [FIDE Guide - EnergyPLAN](#)
- Models for different countries have also been developed which you can explore and use for exercises [Existing Country Models - EnergyPLAN](#) (you need to create an account prior to accessing)

Users are encouraged to use the tool and submit reports they generate to the respective S3SF project partner.