



Engineering Education
for a Sustainable Future

Embedding Sustainability in
Engineering Education

EESF Integration Guide for Heads of Department and Programme leaders

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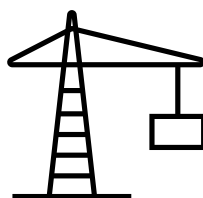
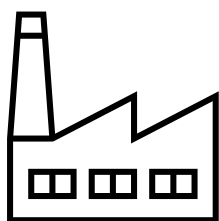
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Motivation

EESF is a teaching framework aligned and embed with SDG for teaching institutions' core activity. Teaching institutions and their communities are an important driver for change in society since they prepare future professionals. Engineering education is increasingly expected to prepare graduates capable of addressing environmental, social and economic sustainability challenges. EESF supports institutions in embedding sustainability competences into engineering programmes through flexible teaching frameworks, open educational resources and practical implementation tools aligned with the Sustainable Development Goals and evolving industry expectations.

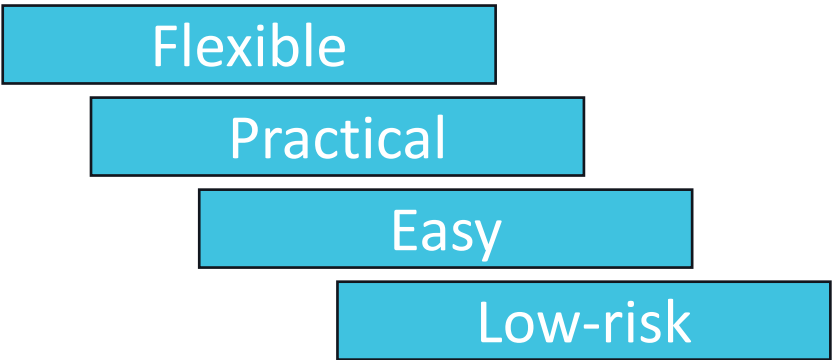


Key issues

This guide is for Heads of Department and programme leaders. EESF (Engineering Education for Sustainable Futures) will help the development of embed sustainability competences aligned with the SDG by using the learning resources in a cost-effective way.

EESF developed a Teaching Framework for SDG-aligned engineering education, with open educational resources (OER), lesson plans and activities.

EESF framework is flexible, it allows a practical, easy and low-risk implementation.



EESF supports gradual and low-risk curriculum enhancement without major restructuring which can be a key feature for most institutions.

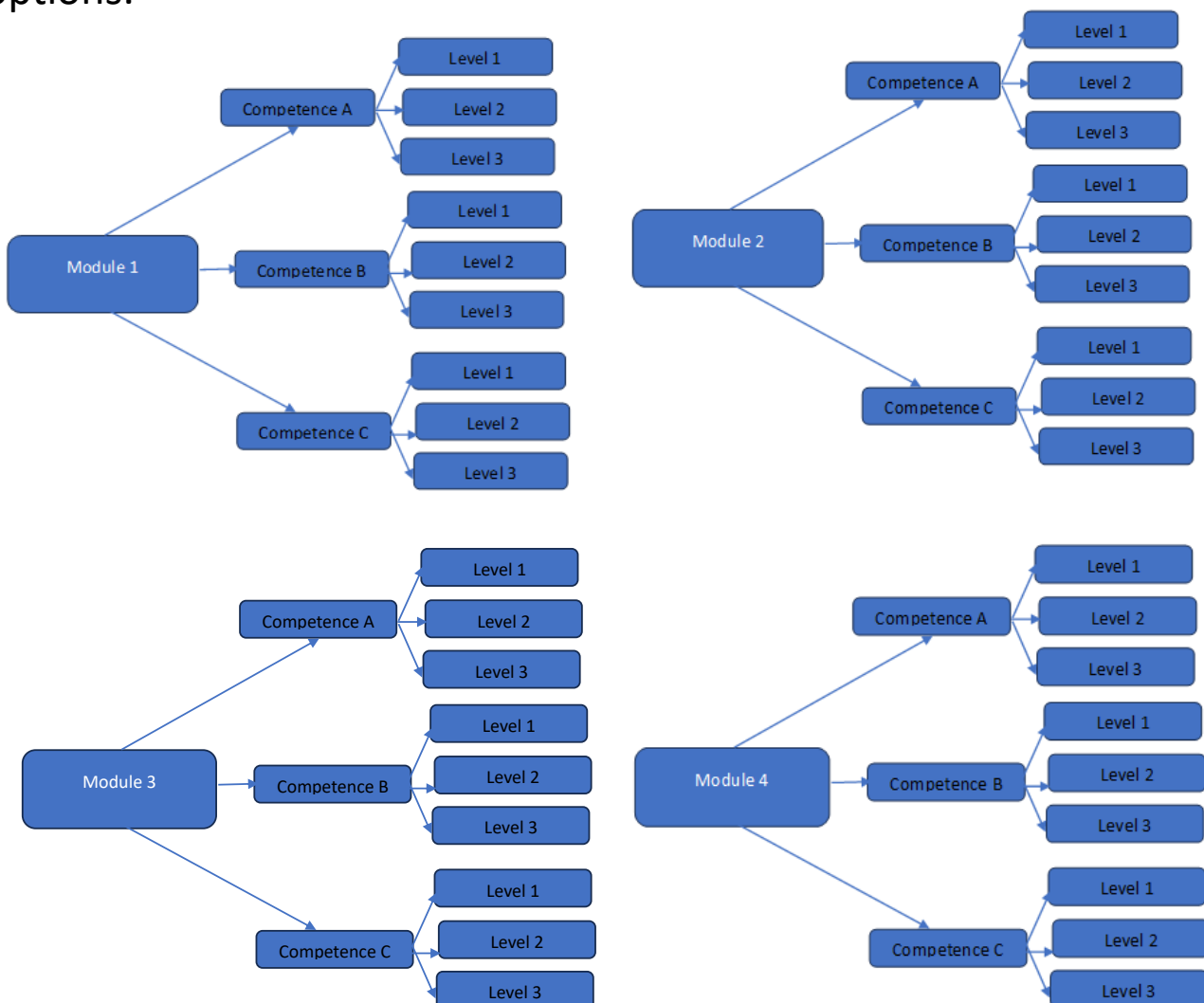
Resources are available for educators and students and includes resources such as planned activities, PowerPoint presentations and videos.

Key decisions

Heads of Department and programme leaders **can** choose a pathway that fits the department.

Build your own learning pathway by using EESF for embedding sustainability competences into engineering programmes according to your institution needs and reality.

EESF has four modules each of them with three competences with different levels of difficulty, which allows to build a variety of learning options.



Key decisions

Departments need to implement sustainability in all their activities and increase competences in their areas, without redesigning whole programmes at once.

Graduates' sustainability competences will potentially increase and also their employability with EESF framework.

Employers will have professionals aware of the consequences of their sustainability performance and environmental, social and economic results may improve.

In what concerns society, less negative impacts will be expected in the three pillars of sustainability.

To achieve this EESF has four main components ready to use: teaching framework, OER activities and worksheets, educator guide and integration checklists and templates.

Nevertheless, there is opportunity for adaption in OER activities by selecting examples and adjust scenarios to local activities and industry. In addition, specific data can be added such as contact hours in the educator guide.

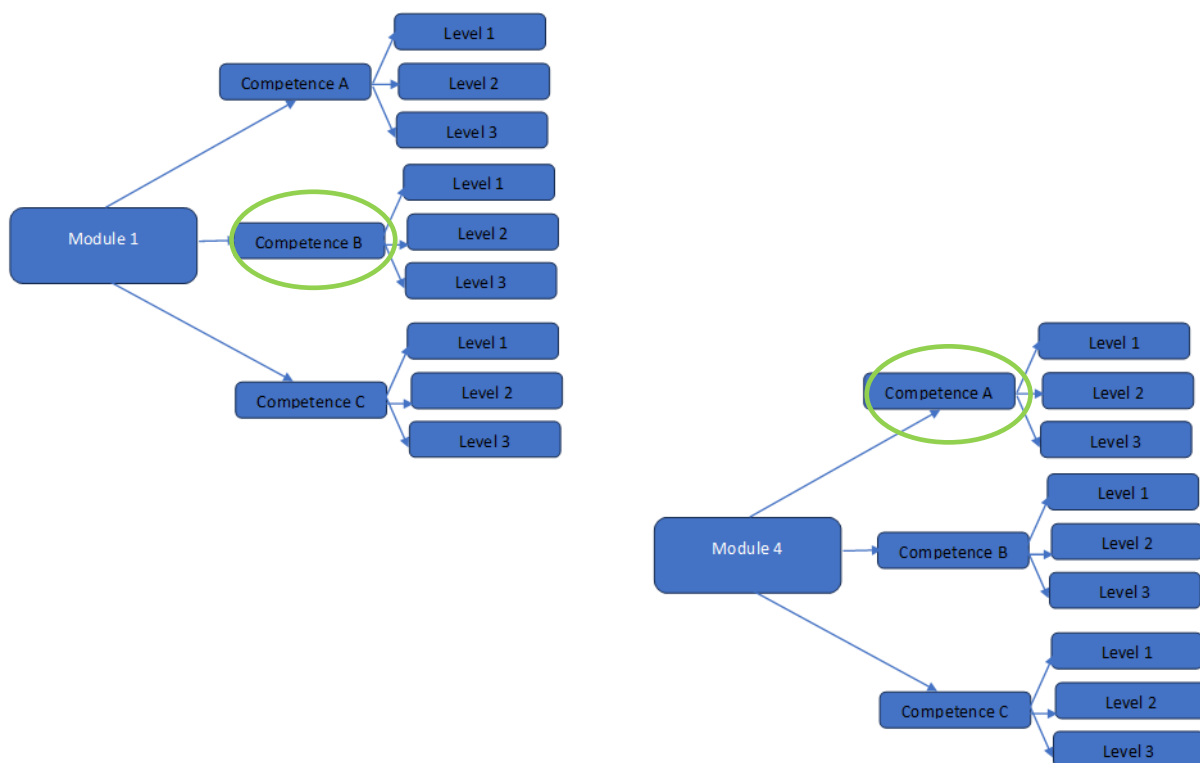
Pilot implementation of EESF across Ireland, Spain, Portugal and France involved over 400 students and demonstrated very positive student perceptions regarding usability, sustainability awareness and relevance to engineering practice.

Adoption pathway

Pilot phase

Just for illustrating, start by chose 1 – 2 competences, assign a coordinator and establish a timeline.

A personalized staged pathway can be achieved to implement EESF and SDG in a course, programme or at institutional level.



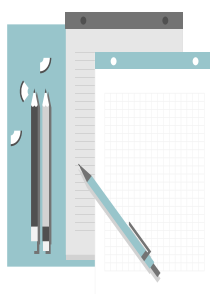
A personalized staged pathway can be more appropriate to reach out institution goals and learnings achievements.

Adoption pathway

Pilot phase – low duration and low risk

This is an example of EESF pilot activity that could have a time of three months applied to a small and visible area, such as a module, a project, etc. A leader should be appointed and feedback collected. There will be at least three persons that will have an important role in the implementation, namely leader, department leader and educators each of them with different but complementary roles.

Leader	Choose 1 or 2 competences from EESF (from 1 or modules) Confirm basic support Communicate the goal and learning outcomes
Programme or department leader	Agree with module/competences and confirm learning outcomes Create shared folder and simple feedback approach Register what was used and what changed
Educators	Choose EESF activities that fits existing topic Deliver the activity and collect feedback Share with colleagues and refine materials

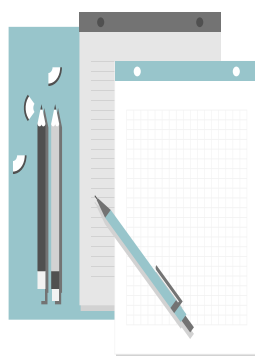


Adoption pathway

Expansion phase

The expansion phase can be done in several possible pathways as illustrated in table below. Firstly expand the number of activities within the modules from pilot phase; secondly expand the number of modules for the same course; thirdly expand the number of courses involved for the pilot activities; and fourthly increase the number of courses and the number of modules applied.

Option 1	Expansion of the number of activities for the same modules for the same course
Option 2	Expansion of the number of modules/activities for the same course
Option 3	Expansion of the number of courses involved for the pilot activities
Option 4	Expansion the number of courses and the number of modules applied.



Adoption pathway

Institutional integration phase

The institutional integration phase implies the involvement of Institutional top management such as Dean, Scientific and Pedagogic Council; leaders (EESF); Head Department leaders; and educators in a very thoroughly implementation covering all courses and EESF modules in a commitment for embedding sustainability competences in students.

Dean involvement Scientific Council Pedagogic Council	Commitment with the goals of EESF Enable necessary resources
Leaders (EESF)	Confirm basic support Communicate the goal and learning outcomes
Head Department leaders	Provide necessary resources Agree with modules/competences Confirm learning outcomes Create shared folder Create feedback approach Register what was used and what changed
Educators	Deliver the activities and collect feedback Share with colleagues and refine materials
Students	Be involved in EESF activities including in non academic tasks



Roles and responsibilities

Suggested local roles

Head of Department
Define the scope, timeline, goals and expectations. Ensure alignment with programme review and quality processes. Provide resources (human and material)
Local leader for EESF
The local EESF leader coordinates the pilot and gives support to teaching staff and keeps materials, templates and examples organised in one place.
Teaching team
Teaching team selects, adapts and implements activities and make reflections on what worked and what changed.
Students
Participate actively in the proposed EESF activities
Quality leader
Quality leader reviews and gather information about pilot. They analyse decisions on scaling and consistency across modules.

EESF implementation can support programme review processes, sustainability reporting and accreditation expectations related to ethics, sustainability and responsible engineering practice.

What can we learn from piloting

Adoption is strongest when roles are clear and workload reasonable. Expansion of sustainability implementation is easier when there is experience.

Monitoring plan and outcomes

For each EESF activity should be register the name of the activity and if possible, the area of studies and the year.

It is desirable to get some feedback from activities to analyse the learning outcomes. Illustrating this, works, reports and thesis should include at least the link between SDG and theirs works and the corresponding explanation. Surveys can be another option of getting feedback.

Short reflections should be made by teaching staff and improvements measures discussed if applicable. Next table shows the some recommend metrics.

Recommend metrics
Number of modules using EESF
Number of students involved
Educators' participation
SDG competences embedded
Feedback results
Examples of curriculum changes

- Links that can be available:
- Local folder location: (insert local link)
 - Short videos and examples: (insert local link)



UN; The Sustainable Development Goals Report 2025



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