IGNITE

Inspiring the Next Generation of Innovators
through Technology and Empathy

INNOVATION MARATHON

SCRAPBOOK OF SUSTAINABLE STUDENT INNOVATION PROJECTS



UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

UNIVERSITÉ DE LORRAINE

UNIVERSITEIT GENT

Innovation Hive

MEDNARODNA PODIPLOMSKA ŠOLA JOŽEFA STEFANA

NTNU

MIITR



FROM KNOWLEDGE TO ACTION

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



ABOUT IGNITE

IGNITE (Inspiring the Next Generation of Innovators through Technology and Empathy) is an Erasmus+ project that brings together European higher education institutions and innovation partners to develop and test innovative approaches for sustainability-oriented education.

The project combines empathy-based learning, nano-learning, gamification and challenge-based learning to help students develop sustainability, innovation and transversal competencies. Through international collaboration, students move from acquiring knowledge to practising new skills and finally applying them to real-world sustainability challenges.

FROM LEARNING TO ACTION



Short, empathy-based learning content introducing sustainability concepts and competencies.

Interactive and gamified activities that reinforce knowledge and encourage active, self-directed learning.

Interdisciplinary student teams apply their knowledge and competencies to develop innovative solutions for real sustainability challenges.



INNOVATION MARATHON

A 4-month challenge-based programme where students turn knowledge into innovative solutions for a sustainable future.



REAL SUSTAINABILITY CHALLENGES

Students work on real-world problems with impact.

INTERDISCIPLINARY TEAMS

Students from different fields collaborate, combine perspectives and create together.

ACADEMIC & INDUSTRY MENTORS

Guidance and support from experts in academia and industry.

THE INNOVATION MARATHON PROCESS

01 PREPARATION & GUIDELINES
Setting the framework, guidelines and timeline

02 STUDENT RECRUITMENT
Students form teams and select project topics

03 PROJECT DEVELOPMENT
Research, analyze and develop innovative solutions

USING WORD TEMPLATE

04 MENTORING & CHECK-INS
Guidance from mentors and progress tracking

05 FINAL EVENT – UPC BARCELONA
Teams present their projects to the jury and audience

USING PPT TEMPLATE

06 EVALUATION & SELECTION
Projects are evaluated and the best are selected

07 SCRAPBOOK OF PROJECTS
Selected projects are included in the Scrapbook of Sustainable Projects

Collaborate. Innovate. Make an Impact.
Together for a more sustainable future.

FROM PROJECTS TO COMPETENCES

Through the Innovation Marathon, students transformed ideas into sustainable solutions and developed future-ready competences.

STUDENTS DEVELOPED

SUSTAINABILITY
Understanding environmental challenges and creating impact

INNOVATION
Generating creative ideas and novel solutions

ENTREPRENEURSHIP
Turning ideas into value and exploring real-world potential

TEAMWORK
Working effectively in diverse and dynamic teams

PROBLEM SOLVING
Analyzing complex problems and designing effective solutions

INTERDISCIPLINARY COLLABORATION
Integrating knowledge from multiple disciplines

COMMUNICATION
Presenting ideas clearly and engaging with different audiences



> **The Innovation Marathon brought students together to share ideas, learn from each other and strengthen interdisciplinary skills while developing solutions for a more sustainable future.**

Innovation Marathon participant feedback

STUDENT INNOVATION PROJECTS

01

AgriNova

Smart Nano-Fertilizers for Sustainable Agriculture

PROJECT FOCUS

Smart nano-fertilisers for controlled nutrient release, improving nutrient-use efficiency while reducing fertiliser losses, water pollution and greenhouse gas emissions.

AUTHORS Muhammad Sufyan Nasar, Yumna Hajjar, Jermaine Nicole Abalon Barce, Abdul Hadi, MD Shoeb

MENTOR Prof. Dr. Aleksander Zidanšek *Jožef Stefan International Postgraduate School (IPS)*

IGNITE NANOMODULE Sustainable Innovations from Farm to Fork

02

MagNetZero

Magnetic MOFs for Energy-Efficient Carbon Capture

PROJECT FOCUS

Next-generation Direct Air Capture using magnetic nanoparticle-integrated MOFs to reduce the energy required for CO_2 capture and regeneration, enabling more efficient and scalable carbon removal.

AUTHORS Muhammad Waqas Afridi, Nyamtsetseg Tungaatsetseg, Raj Samnani, Thuy Huong Nguyen, Himangshu Goswami

MENTOR Prof. Dr. Aleksander Zidanšek *Jožef Stefan International Postgraduate School (IPS)*

IGNITE NANOMODULE Sustainable materials for green and digital transitions



STUDENT INNOVATION PROJECTS

03

TerraTrace

Biodegradable Soil pH Monitoring

PROJECT FOCUS

Biodegradable nanomaterial-based sensors for continuous soil pH monitoring, reducing electronic waste while supporting soil health.

AUTHORS Yaseen Shafayet, Milica Pena, Maria Daniela Serrano Larrea, Karina Nicole Enriquez Maruri, Letizia Bianchi

MENTOR Prof. Dr. Alexandre Nomine
Université de Lorraine (UL)

IGNITE NANOMODULE Sustainable materials for green and digital transitions

04

ChromoHeal

Smart, Sustainable Wound Healing

PROJECT FOCUS

A biodegradable smart wound dressing with pH-responsive monitoring that enables non-invasive tracking of wound healing while reducing medical waste.

AUTHORS Ali Eralp Birer, Ram Prasanth Ramesh, Gabriel Reily Lempang, Omnia Omar, Abdulkareem Kamil Dolapo

MENTOR Prof. Dr. Anton Nikiforov
Ghent University (UGent)

IGNITE NANOMODULE Natural materials and biomaterials



STUDENT INNOVATION PROJECTS

05

Waste2Cup

Transforming Food Waste into Home Compostable Cups

PROJECT FOCUS

Home-compostable single-use cups made from spent coffee grounds and bio-based materials, transforming waste into a circular packaging solution.

AUTHORS Pilar Alexia Castillo Camacho, Amaka Mgboh, John Lloyd Gildo, Julia Agata Czyż, Shakila Sanduni

MENTOR Prof. Dr. Aleksander Zidanšek
Jožef Stefan International Postgraduate School (IPS)

IGNITE NANOMODULE Natural materials and biomaterials

06

ReRoute

Smarter E-Scooter Mobility

PROJECT FOCUS

AI-driven route optimization for battery swaps and scooter relocation based on user demand, improving e-scooter availability and urban mobility.

AUTHORS Henrik Nysether, Helene Lyslo Kristiansen, Truls Myran, Oskar Karlberg, Silje Ekrheim Haugen

MENTOR Prof. Dr. Alenka Temeljotov Salaj, Mara Diaconu, Aashish Adhikari
Norwegian University of Science and Technology (NTNU)

IGNITE NANOMODULE Social innovation for sustainable futures



STUDENT INNOVATION PROJECTS

07

INNOVATION MARATHON WINNER

PlasmaCure

Plasma-Based Biomaterials for Localized Therapy

PROJECT FOCUS
A sustainable biomaterial-based approach exploring cold atmospheric plasma for localized and minimally invasive therapy.

AUTHORS Vittoria Rogge

MENTOR Dr. Francesco Tampieri, Prof. Dr. Cristina Canal Barnils
Universitat Politècnica de Catalunya (UPC)

IGNITE NANOMODULE Plasma technology

08

PlasmaDiffuse

Plasma Reactive Species in Biomaterials

PROJECT FOCUS
Understanding how plasma-generated reactive species move through biomaterials to support safer, more effective and personalized plasma therapies.

AUTHORS Alejandro Chacón Ginella

MENTOR Dr. Francesco Tampieri, Prof. Dr. Cristina Canal Barnils
Universitat Politècnica de Catalunya (UPC)

IGNITE NANOMODULE Plasma technology



PROJECT EVALUATION

The Innovation Marathon concluded with an international final event hosted by Universitat Politècnica de Catalunya (UPC) in Barcelona, where student teams presented their projects to mentors, professors and other experts.
Following the presentations and discussions, the projects were assessed by an international panel using a transparent and fair evaluation rubric.

1 RELEVANCE OF THE ENVIRONMENTAL CHALLENGE (0–20)

Does the project address a clear and important real-world environmental problem?

2 QUALITY OF METHODOLOGY (0–20)

Is the approach well-structured, justified and appropriate (research, tools, analysis)?

3 LEVEL OF INNOVATION (0–20)

How original, creative and innovative is the solution?

4 FEASIBILITY AND POTENTIAL IMPACT (0–20)

Is the solution realistic and does it demonstrate measurable environmental, social or economic impact?

5 QUALITY OF PRESENTATION AND REPORT (0–10)

Clarity, structure, visual support and professionalism

6 TEAMWORK AND COMMUNICATION (0–10)

Collaboration, clarity of delivery and engagement of team members



IGNITE Innovation Marathon Final Event | UPC Barcelona

“We value solutions that are relevant, innovative, feasible and impactful — and teams that collaborate and communicate effectively.

Innovation Marathon participant feedback

IGNITE THE FUTURE.

INNOVATE FOR A BETTER WORLD.

Explore how IGNITE is inspiring the next generation of innovators through technology, empathy and sustainability.

Through international collaboration, partners from across Europe bring together diverse expertise, perspectives and ideas to create innovative learning approaches for a more sustainable future.

Discover our learning tools, innovative approaches and student projects – and see how ideas are transformed into action.

EMPOWERING STUDENTS. SHAPING SUSTAINABLE SOLUTIONS.

DISCOVER OUR PROJECT RESULTS

NANOMODULES
Flexible nano-learning modules to build knowledge and future skills.

VIRTUAL LEARNING GARDEN
An interactive digital environment for practice, exploration and collaboration.

INNOVATION MARATHON
Student challenges that turn ideas into innovative solutions for real-world impact.

IGNITE WEB APP
Your gateway to resources, tools, competences and learning pathways.

GUIDELINES & TOOLS
Practical resources to support teaching, learning and innovation.

RESEARCH & INSIGHTS
Studies and findings on competences, empathy and innovation.

IGNITE

EXPLORE. LEARN. GET INSPIRED.

Visit our website and discover all results, stories and updates from the IGNITE project.

www.ignite-project.eu

SCAN ME

FOLLOW US

Facebook: Ignite Project
Instagram: ignite.euproject2025
YouTube: IgniteProject_eu

© 2026 IGNITE Project Consortium. This work is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).