

Industrial and Digital Innovations Research Group

EDUCATION
Empowering Minds, Advancing Research

INNOVATION
Translating Knowledge into Value

ENTREPRENEURSHIP
Driving Markets, Shaping Skills

EXTROVERSION
Sharing Knowledge, Building Networks

Welcome to **indigo**.

where we...
collaborate,
question,
and create solutions that
matter.

team: noun [C, + sing/pl verb]
a number of people who do something together as a group

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Introduction

The indigo Ecosystem

industrial and digital innovations research group

About Us

The interdisciplinary indigo team consists of academic members and researchers involved in research and academic activities under the guidance of Associate Professor Georgios Arampatzis. The team operates at the Technical University of Crete and is hosted by the School of Production Engineering and Management.

Our Research

Responding to continuous challenges for innovation and new technologies, the indigo team conducts high-level research focused on the Twin Digital and Green Transition toward a Resilient Economy.

The core research axis of indigo is the application of new and emerging Information and Communication Technologies (ICT) in the development of innovative solutions for various production and distribution systems for goods and services, such as Industry, Agriculture, and Energy and Water systems.

The team participates in and coordinates numerous European and National Research Projects and is a member of international collaborative networks.

Our Team

indigo is based at the Department of Production Engineering and Management of the Technical University of Crete, a space that fosters research, innovation, and collaboration. It is composed of researchers as well as students working on theses and research projects, covering a wide range of topics related to sustainable development, the circular economy, and cutting-edge technologies.

The facility functions as a hub for coordinating and developing innovative projects, strengthening the collaboration between students, professors, and external partners. Its presence at the Technical University of Crete highlights the link between education and applied research, preparing the engineers of tomorrow.

Meet our Team!



George TSINARAKIS

Laboratory Teaching Staff

George is a faculty member of the Technical University of Crete. He received the Diploma, M.Sc., and Ph.D. degrees in production engineering and management from the Technical University of Crete, in 2000, 2002, and 2007, respectively. Since 2009, he has been a Laboratory Teaching Staff with the Production Engineering and Management School, Technical University of Crete. Since December 2019, he has been a part of the indigo Team, at the Technical University of Crete, working on European projects. He is currently an Adjunct Professor with the University of the Aegean. His current research interests include discrete event systems, mathematical modelling, Petri nets and extensions, digital twins, renewable energy sources, and project management.

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Maria ARYBLIA

PhD Candidate

Maria is a researcher at indigo that focuses on sustainable mobility and energy management, planning towards resilient and smart cities, and the sustainable assessment of urban policies, with specific research into the phenomenon of mobility poverty. She contributes to process industry digitalisation, circular-economy modelling, and energy-aware system design within EU-funded research projects. Her research portfolio bridges circular economy, process engineering, and sustainability assessment, enabling the development of hybrid empirical–mechanistic models and digital-shadow systems for industrial operations.

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Nikolaos SIFAKIS

Post-Doctoral Researcher

Nikolaos is a senior postdoctoral researcher at indigo, holding a Ph.D. in Chemical and Environmental Engineering. His research activity is strongly oriented toward the conception, structuring, and execution of large-scale European research initiatives, with a particular focus on Horizon Europe and Interreg programmes. Building on his doctoral work on sustainability assessment frameworks for nearly zero-energy ports, he contributes to the development of coherent research methodologies, impact pathways, and replication strategies for climate-neutral and energy-efficient infrastructures. His role spans proposal ideation, scientific narrative design, work-package architecture, and cross-partner coordination, ensuring methodological rigor, alignment with call objectives, and delivery of scalable, high-impact research outcomes, supported by advanced energy system modelling and data-driven analysis.

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Thalia KARKOU

PhD Candidate

Thalia is a Chemical Engineer, having received her Diploma from the National Technical University of Athens in 2020, completing her thesis on developing fruits with extended shelf-life using mild heat treatment. Since 2022, she has been a PhD Candidate at the School of Production Engineering & Management at the Technical University of Crete. Her research interests lie in Process Engineering, Environmental Engineering and Water Recycle & Management Systems. She is active as a researcher in EU-funded projects, such as AquaSPICE and CSSBoost.

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Nikos SKARAKIS

PhD Candidate

Nikos is involved in indigo's EU-funded and national projects focusing on circular value chains and systemic solutions, as an experienced researcher in applied methodologies that operationalise circularity and support the twin transition across multiple industries. Originally trained as a physicist, he holds an MSc in Environmental Engineering with a specialisation in management, sustainable energy and climate change. He is currently a PhD candidate at the School of Production Engineering and Management of TUC.

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Stelios MANOUDAKIS

Researcher

Stelios is a graduate of the School of Mineral Resources Engineering. He specialises in remote sensing data analysis and the development of Geoinformatics applications. His research interests focus on the analysis and visualisation of geodata, the development and management of environmental applications, image processing, and machine learning. He has extensive experience working on both National and European research projects.

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Antonia PAPADAKI

Researcher

Antonia holds an Integrated Master's Degree in Production Engineering and Management from the Technical University of Crete and a Master's degree in Business Administration (MBA), specialising in Marketing, from the same institution. Since 2022, she has been serving as a researcher and Social Media Manager at indigo. Her professional interests focus on market analysis, project management, Life Cycle Assessment (LCA), sustainability assessment, and digital marketing.

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Vasilis SKEVAKIS

Developer

Vasilis is a senior software engineer and graduate of the School of Electrical and Computer Engineering at the Technical University of Crete, specialising in microservices architecture and cloud orchestration. He bridges DevOps infrastructure with high-level application logic, focusing on database design and Decision Support Systems featuring multi-criteria analysis. His portfolio includes the technical delivery of major National and European projects (ParkIn, Greece 4.0, Robinson, CSSBoost, AquaSPICE), spanning platforms for urban pollutant visualisation and evidence-based tools for operationalising project outcomes. His expertise covers .NET, Python, and NodeJS, supported by strong command of GCP, Oracle Cloud, and Proxmox environments.

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Manolis NTAMADAKIS

Developer

Manolis is a software engineer, having graduated from the Mediterranean University of Crete in 2024. He currently serves as a software developer for indigo. In his current role, he specialises in implementing applications for research purposes, utilising technologies such as ASP.NET MVC, C#, and Microsoft SQL. Prior to joining the lab, he worked as a Web Developer for several years, where he gained extensive experience in Full Stack development (ReactJS, Next.js, Node.js) and CMS management (WordPress, Strapi). His technical expertise spans both front-end and back-end development, including SQL and NoSQL database management and REST API integration.

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Michalis LAMPRAKIS

Developer

Michalis is an Electrical and Computer Engineering (ECE) graduate with a deep passion for software engineering and systems security. His background covers core fundamentals like data structures, algorithms, and object-oriented programming, as well as advanced fields including distributed systems, cloud computing, databases, computer networks, AI, and Reinforcement Learning. He genuinely enjoys tackling complex technical challenges, breaking them down, and building efficient, secure solutions.

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Chrysostomos GALANOS

Researcher

Chrysostomos holds a Bachelor's in Business Administration from the University of Patras (2004) and two Master's degrees: one in Geoinformation in Environmental Management from the Mediterranean Agronomic Institute of Chania (2019) and another in Social and Solidarity Economy from the Hellenic Open University (2021). Since September 2024, he has served as a Researcher at indigo, focusing on the monitoring and management of EU-funded programmes. His professional background is diverse, including roles as a consultant for cooperative enterprises, an assistant accountant, and a project manager for various social and environmental initiatives. His research interests lie at the intersection of Social and Solidarity Economy, Environmental Citizen Science, and Geoinformation.

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Alexandros KRITIKOS

Researcher

Alexandros is a multi-faceted engineer. Holder of a Diploma in Chemical Engineering (NTUA, Greece) and a double-degree Master's in Renewable Energies and Sustainable Development (KTH, Sweden & IST, Portugal), along with a Master in Business Administration (Quantic, Washington DC), he is equipped with a diverse knowledge background and a versatile skillset. Past experience reflects that, having worked for public authorities, consultancies and research projects in Greece, Europe and beyond. Methodologically focused and intellectually curious, makes him a competent communicator, planner and implementer. Currently he is a manager-researcher for EU projects.

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Elpida VANGELOGLOU

Researcher

Elpida is a Chartered Engineer (CEng MCIBSE, UK) with 12 years of experience in industry and academia, specialising in environmental sustainability and building physics. She has run her London-based consultancy, Etheras Ltd, since 2018, after working in major London engineering firms, and was a Research Associate at London South Bank University on the award-winning AIRBODS project on airborne-infection resilience (2023 CIBSE Building Performance Award). She holds MScs from the Technical University of Denmark and the Technical University of Crete. In 2026 she joined indigo as a researcher, expanding her expertise into industrial processes; her interests include circular economy, energy and environmental sustainability, indoor climate and ventilation.

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Thaleia CHASAPIDI

Researcher

Thaleia is an experienced project manager and environmental professional with a strong background in research administration, technology consultancy, and applied engineering projects. Since 2019, she has served as Project Manager at the Athens University of Economics and Business, supporting the management and implementation of research and educational funding programmes. Previously, she worked as a Project Manager at Vision Business Consultants, contributing to technology transfer, innovation management, R&D projects, and industrial and software development initiatives across Greece and Europe. Her earlier experience includes consulting roles at the National Technical University of Athens, environmental project work in the private sector, and positions within public authorities and the energy industry.

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Dimitris CHOLIDIS

Researcher

Dimitris holds an Integrated Master's Degree in Production Engineering and Management from the Technical University of Crete (2025), where his thesis focused on "Harnessing Wave Energy for the Sustainable Port Development". He serves as a researcher at indigo, specialising in Renewable Energy Systems (wave, solar, wind) and Energy Management Systems. His work focuses on advancing decarbonisation strategies through data-driven design, techno-economic analysis, and the development of Digital Shadows for environmental management. Currently, he is actively involved in the "AIMPRESS" project (Adriatic-Ionian Maritime oPeRational Efficiency and Sustainable Scheme), contributing to research on energy transition frameworks and port energy autonomy.

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Elina MANOLI

External Associate

Elina holds a PhD from the School of Chemical Engineering of the National Technical University of Athens, Greece. She has extensive experience in the management of research projects, particularly in the fields of water resources management and climate change adaptation. She has also worked as Policy Officer at the European Commission, DG Research and Innovation (2012-2015), and in the Hellenic Ministry of Environment and Energy (2017-2019) and the Hellenic Parliament (2019-2024) as Scientific Advisor on energy, climate change mitigation and adaptation, and waste management.

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Kostas KALABOUKAS

External Associate

Kostas is a Production and Management Engineer, holding a Diploma from the Technical University of Crete (1996) , an MSc in Total Quality Management from the University of Piraeus (2000) and a PhD from the Production Engineering and Management of the Technical University of Crete. He currently serves as the Technology Transfer and New Business Development Manager at Gruppo Maggioli. His research focuses on Digital Supply Chains, Smart Cities, and Circular Manufacturing. With extensive experience in business analysis and the management of complex software projects, he actively participates in major European research initiatives.

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Former Members



Dr. Nikolaos SARANTINOUDIS



Dr. Nikolaos SAVVAKIS



Stathis GERAMPINIS



Athanasios ANASTASIOU



Alexandros CHACHALIS



Anastasia PHYLLIS

Principal Investigator

George ARAMPATZIS

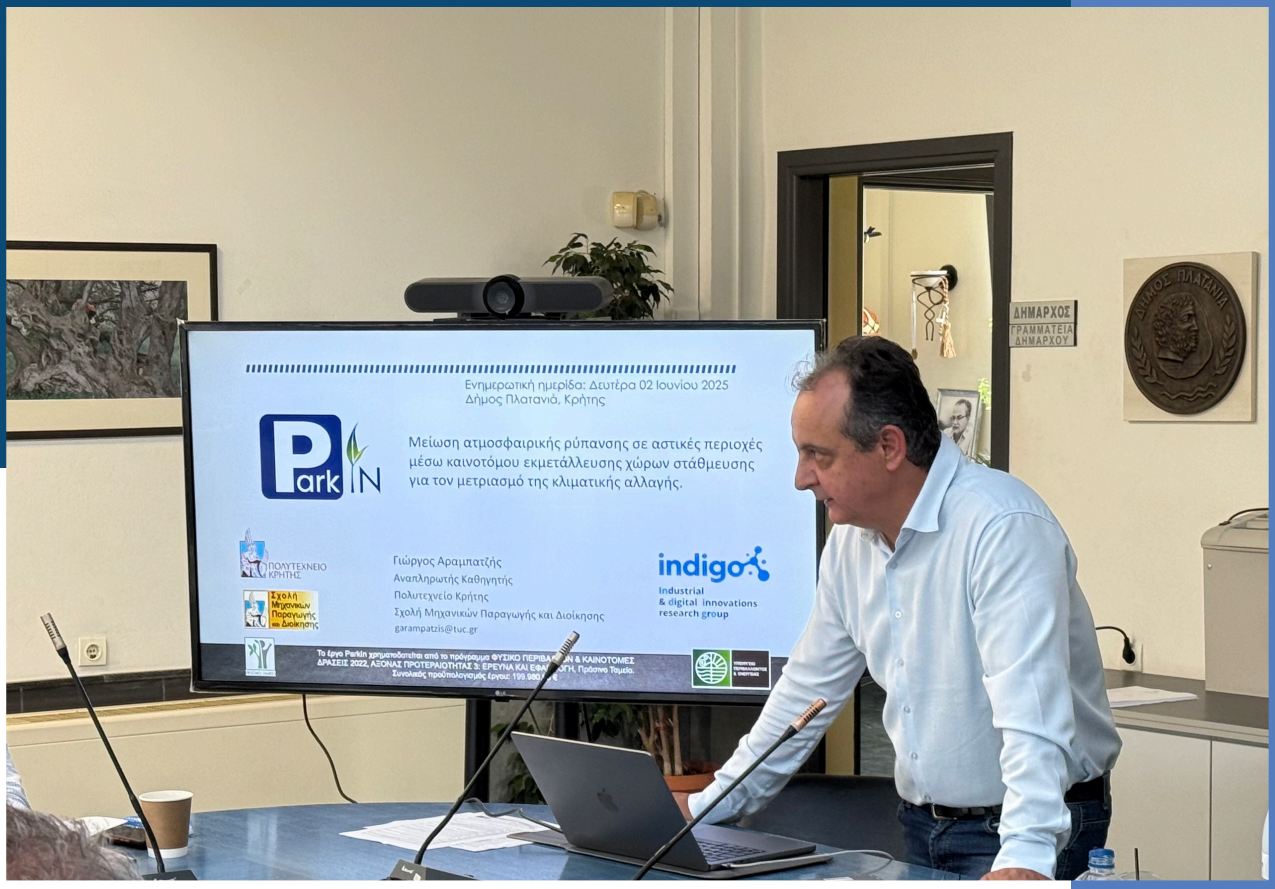
Professor
School of Production Engineering and Management, Technical University of Crete



Professor at the Technical University of Crete (TUC), within the School of Production Engineering and Management. He is the founder and coordinator of the Digital and Industrial Innovations Research Group ("indigo"), leading a team of more than 20 researchers, including faculty members, postdoctoral researchers, and PhD candidates. His academic leadership extends internationally as a Visiting Professor at Imperial College London's Department of Civil and Environmental Engineering. Furthermore, he serves as a Collaborating Faculty Member at the Institute of Geoenergy of the Foundation for Research and Technology - Hellas (FORTH).

Research Excellence & Innovation

Professor Arampatzis's research is deeply focused on the Twin Green and Digital Transition. His work centres on process engineering, circular economy, and the utilisation of Artificial Intelligence for creating Digital Twins and Cyber-Physical Systems. As a Principal Investigator, he currently manages 22 research projects. Under his leadership, the indigo research group has secured a total budget of €8.2 million to date



Professor Arampatzis acts as the Coordinator for 4 major European projects and serves as the Technical and Scientific Manager for 2 additional projects. Expanding his impact beyond academia, he founded and serves as the General Manager of Viridiance Insights. This enterprise is notably the first spin-off company established at the Technical University of Crete under the legislative framework of Law 4864/2021. Demonstrating his commitment to fostering new talent, he also founded and mentors "InnoGo," a student group at TUC that actively and successfully participates in national and European competitions.

Regional Impact & International Recognition

He maintains a strong regional presence by coordinating the "In Crete" innovation alliance, which unites academic and research institutions across Crete to promote circular economy initiatives. He also serves as the Scientific Coordinator and TUC representative at the Vangelis Grigoroudis Idea Incubator for the Region of Crete.

His scientific contributions are widely recognised, featuring 65 articles in peer-reviewed international journals and 96 conference proceedings papers. His published work has garnered 2,828 citations and achieved an h-index of 24. In addition to his extensive research output, he has authored 6 educational textbooks. Internationally, he represents the Technical University of Crete for the EURECA-PRO Lighthouse Mission on "Process Automation and Industry 4.0".

Full CV

The InnoGo Team



InnoGo is the student research team of the indigo lab, created to give undergraduates at the Technical University of Crete a first, hands-on experience of research. Working alongside academics and industry professionals, its members co-create projects on the circular economy, sustainable development and digitisation, and carry their own concepts through to international competitions. Within its first year the team took 3rd place in the POPRI competition for tertiary education, held during the 10th EUSAIR Forum.

3rd place
POPRI competition, tertiary education, 10th EUSAIR Forum

3rd place
Smart City HACK, international hackathon

17 student Members

Co-founders



Christos PAPANASTASIOU

Founder · Undergraduate student

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Christos studies at the School of Production Engineering and Management, TUC, and founded InnoGo in 2024. He previously coordinated chassis and aerodynamics in the TUC Formula Racing team. His interests span the automotive industry, autonomous vehicles and digital technologies; his autonomous vehicle for forest-fire prevention took 3rd place at POPRI.



Stergios CHAITOGLOU

Co-founder · Undergraduate student

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Stergios studies at the School of Production Engineering and Management, TUC, and co-founded InnoGo in 2024. His smart heat-recovery concept for building HVAC systems won 3rd place and the "most out-of-the-box idea" award at Smart City HACK. His interests include water treatment, lab-scale experimental setups and digital technologies for process industries.

Books

Textbooks authored by members of the group, used in engineering curricula across Greece.



Renewable Energy Sources: Potential and Technologies

Ανανεώσιμες Πηγές Ενέργειας · D. Assimacopoulos, **G. Arampatzis**, A. Angelis-Dimakis, A. Kartalidis, G. Tsiligiridis
Sofia, Thessaloniki · 2nd edition, 2023 · ISBN 978-960-633-044-5

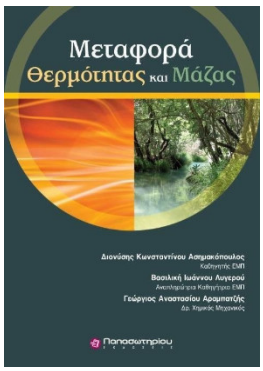
A comprehensive overview of sustainable energy systems along two axes: assessing the natural resources available, such as solar radiation and wind, and analysing the technologies that harness them. It covers photovoltaics, wind turbines and solar thermal collectors, and the latest edition extends to hydrogen, fuel cells and ocean energy. Written for undergraduate and postgraduate engineering students and for professionals in the green energy sector.



Heat and Mass Transfer

Μεταφορά Θερμότητας και Μάζας · **G. Arampatzis**, D. Assimacopoulos, V. Lygerou
Tziolas · 2020 · ISBN 978-960-418-840-6

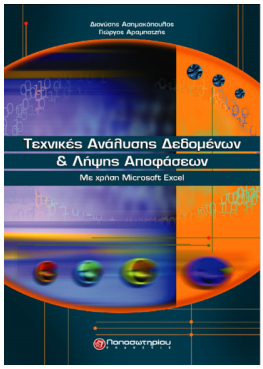
A textbook for engineering and physics students that balances rigorous theory with practical problem-solving. Seven sections cover heat transfer by conduction, convection and radiation and the principles of mass transfer by diffusion and convection, from steady-state systems to phase change, supported by mathematical models and detailed physical property tables.



Heat and Mass Transfer

Μεταφορά Θερμότητας και Μάζας · D. Assimacopoulos, V. Lygerou, **G. Arampatzis**
Papasotiriou, Athens · 2012 · ISBN 978-960-491-064-9

Developed for Chemical Engineering students at the National Technical University of Athens, this volume lays a rigorous foundation in mass transfer: transfer mechanisms, Fick's law and diffusion in binary mixtures, in steady and unsteady systems including those with chemical reactions. Its analogies with heat and momentum transfer make it a reference for designing modern industrial processes.



Data Analysis and Decision Making Methods

Τεχνικές Ανάλυσης Δεδομένων και Λήψης Αποφάσεων · D. Assimacopoulos, **G. Arampatzis**
Papasotiriou, Athens · 2002 · ISBN 960-7530-25-X

A practical guide to data analysis and decision-making with Microsoft Excel. Rather than dwelling on theory, it bridges quantitative methods and real-world business applications through hands-on examples and case studies, using specialised Excel tools to solve organisational problems in industrial management, energy systems and business administration.

Courses

indigo actively participates in various undergraduate and postgraduate courses at the School of Production Engineering and Management of the Technical University of Crete and collaborates on educational projects with other academic institutions.

Undergraduate

Heat Transfer
7th semester

Heat transfer modes, steady-state and transient conduction, fin cooling, heat generation, numerical methods and the fundamentals of thermal radiation.

Fluid Mechanics
6th semester

Fluid properties, hydrostatics, Eulerian and Lagrangian descriptions, the Bernoulli, Euler and Navier-Stokes equations, laminar and turbulent pipe flow and losses in pipe networks.

Transport Phenomena II
5th semester

Advanced heat and mass transfer: conduction, convection and radiation and their analogies, internal and external flows, condensation, boiling and heat exchanger analysis.

Postgraduate

Rational Energy Management in Production Systems
School of Production Engineering and Management, TUC

The modern energy problem and energy analysis: efficiency of production systems, combined heat and power, and the rational use of energy in industry, transport and buildings.

Informatics for Agriculture and Water Resources Management
Mediterranean Agronomic Institute of Chania

Industry 4.0 in agriculture and water management: robotics, GNSS, UAVs, the Internet of Things, farm management information systems, AI and big data analytics for optimising the food chain.

6 textbooks authored

5 courses taught

2 institutions: TUC and MAICh



from Education to Innovation

The CSSBoost project

Boosting Circular Systemic Solutions through Virtual Regional Circular Economy Spaces

Rethinking **Circular** Economy: From **Concept** to Systemic **Impact**
Across Europe and beyond, regions are striving to transition from linear production models to circular ones reducing waste, preserving resources, and strengthening sustainability. Yet, scaling up **circular solutions** remains a challenge.

CSSBoost was created to address exactly this gap.

Funded by the **European Union** under the programme Food, Bioeconomy, Natural Resources, Agriculture and Environment, **CSSBoost** brings together leading institutions to maximise the deployment and **real impact** of Circular Systemic Solutions (CSS) — **not as isolated initiatives,** but as integrated, interconnected ecosystems.

Project Snapshot

Grant agreement: 101135275
Start date: 1 June 2024
End date: 30 November 2027
Status: Ongoing
Funded under: Food, Bioeconomy Natural Resources, Agriculture and Environment
Overall budget: 11,267,312.50 €
Contribution to indigo: 1,196,250.00 €
Coordinator: indigo-TUC

CSS BOOST

Circular Cities & Regions Initiative



CSSBoost aims to design and demonstrate a series of exemplary **circular systemic solutions** that can serve as **transitional pathways** for **regional sustainability**. Beyond individual pilots, the project seeks to strengthen **interregional** and **cross-border cooperation** by linking regional value chains and supporting the wider uptake of **circular practices**. In **CSSBoost**, **indigo** research group is responsible for the project's overall **strategic management** and **coordination,** while also contributing strongly to its technical direction. Also, **indigo** team leads **a broad set** of activities that connect **sustainability assessment**, **digital modelling**, education, and **regional innovation**. Its role spans the development of **dynamic LCA** and **Sustainability Balanced Scorecards**, **advanced scenario assessment services**, training and lifelong learning tools, and the implementation of community-based **circular solutions** in **Crete** through the **Transformable Intelligent Environments action (TIE lab)**.

CSSBoost unfolds through five pilot cases, each reflecting a different pathway towards circular systemic innovation.
In **Crete**, the pilot focuses on the **valorisation** of **agricultural, livestock,** and **food-processing by-products,** aiming to recover and repurpose diverse biomass streams within a regional circular framework. In **Italy,** the emphasis is placed on **water reuse** and **nutrient recovery,** linking urban, agricultural, and industrial sectors to improve **resource efficiency** and support the production of biofertilisers from organic waste.

In **Germany**, the project addresses the **recycling** of conventional **plastics and bioplastics**, supporting the development of a regional **closed-loop** supply chain and promoting **transparency** through the use of a **Digital Product Passport.**
In **Portugal,** the pilot explores the **recycling** and **valorisation** of **public transport vehicles**, ,with a focus on **reclaiming materials** and components from maintenance and end-of-life phases in order to **reduce waste** and **strengthen circularity** in **urban mobility systems.**
Bringing these experiences together, the fifth pilot takes an **interregional perspective**, linking value chains, methods, and regional ecosystems into a broader **multinational model.**

From local resources to European cooperation, **CSSBoost** shows how circular systemic solutions can reshape **regional economies.**

In this way, CSSBoost **moves beyond** isolated demonstration cases and towards a shared European **vision** of **circular systemic innovation.**
From biomass and water to plastics, transport, and interregional value chains, CSSBoost demonstrates that circularity can take many forms, but relies on one shared principle: **connected regional ecosystems.**



The AquaSPICE project

What if your process industry could make smarter water decisions in real time?

20% of all fresh water consumption globally is used by industry and this share is increased to **50%** in industrialised countries. The industrial sector is also a major water polluter, as only up to **60%** of industrial wastewater receives treatment before being disposed of into the environment.
Water scarcity is no longer a distant risk, it is an operational reality for industries across **Europe.** Ensuring future water availability demands a rapid transition toward **sustainable water management frameworks** and resource-efficient practices.





The EU-funded **AquaSPICE** project was designed to respond to this challenge. Its **mission** was to increase awareness of water resource efficiency while delivering compact, **scalable solutions** tailored **to industrial applications.**

AquaSPICE solutions were demonstrated and validated in **major industrial regions** across Europe:

- Boehlen (Germany)
- Terneuzen (Netherlands)
- Rosignano Solvay (Italy)
- Antwerp (Belgium)
- Bacau (Romania)
- Izmit (Türkiye)

How?

By combining advanced treatment and reuse technologies with **cyber-physical tools**, the project introduced **real-time monitoring** and optimisation of water flows across interconnected industrial processes.
indigo played a key role as **technical coordinator** and by leading WP4, contributing to industrial use case development (T1.3), and coordinating training and **educational activitie**s under T8.3.



Project Snapshot

Grant agreement: 958396
Start date: 1 December 2020
End date: 31 May 2025
Status: Completed
Funded under: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and process
Overall budget: 12,157,849.02 €
Contribution to indigo: 570,000.00 €
Coordinator: RWTH Aachen University

AquaSPICE

The AIMPRESS project

AIMPRESS - Adriatic-Ionian Maritime oPeRational Efficiency and Sustainable Scheme

How can **ports** reduce emissions and energy consumption without rebuilding their entire infrastructure? This is the challenge that **AIMPRESS** sets out to address in the Adriatic-Ionian region.

As maritime transport continues to grow, ports face increasing pressure to **decarbonise**, improve operational efficiency, and remain competitive. **AIMPRESS** transforms this challenge into opportunity by guiding the **transition** from conventional ports **to Green Smart Ports.**

By integrating **Artificial Intelligence** (AI), Digital Shadow technology, and renewable energy solutions, the project introduces **intelligent Energy Management Systems** capable of optimising port operations in real time.

The result is a **digital-driven**, energy-efficient port ecosystem, **reducing greenhouse gas emissions** while maximising performance, without requiring costly new infrastructure.

Project Snapshot

Project ID: IPA-ADRION00527
Start date: 1 September 2024
End date: 31 August 2027
Status: Ongoing
Overall budget: 1,586,864.40 €
Contribution to indigo: 316,625.00 €
Coordinator: indigo-TUC

Interreg Co-funded by the European Union

IPA ADRION

AIMPRESS



As **project coordinator**, indigo ensures the strategic direction and effective **management** of the **AIMPRESS** consortium, supporting smooth implementation, partner coordination, and the timely delivery of project activities. Beyond coordination, indigo plays a **central technical role** in shaping the project's **digital backbone**. It leads the development of the **analytical framework** behind AIMPRESS, contributing to AI-based energy management systems, the **Digital Shadow architecture**, and **intelligent optimisation tools** designed to improve port operations.
Through this **dual role, indigo** connects project management with technological development, helping translate **research knowledge** into **practical solutions** for **greener and smarter ports.**

AIMPRESS addresses the urgent need for **decarbonisation** and **operational efficiency** in the Adriatic-Ionian maritime sector. Its ambition is to **transform** conventional ports into **Green Smart Ports** by integrating advanced digital technologies and renewable energy solutions, **without relying** on costly new infrastructure.
The project will deliver a comprehensive **Green Smart Ports Roadmap** to support the transition of the **maritime sector** towards lower-carbon and more efficient operations. In parallel, it is expected to **reduce** environmental **pollution** and noise in pilot ports such as **Ancona, Split, and Bar,** while strengthening their **economic competitiveness. AIMPRESS** will also establish a transnational knowledge network and provide targeted training activities, equipping port authorities and stakeholders with the skills needed for more sustainable and intelligent port management.
At the core of the project's technical framework, indigo contributes to the development of the **AIMPRESS Digital Shadow**, a virtual representation of port operations designed to support real-time monitoring, performance management, and forward-looking decision-making.
This work is complemented by indigo's contribution to frameworks for **cold-ironing and photovoltaic energy generation** and storage, as well as to the integration and fine-tuning of the technologies required for the specific needs of **Adriatic ports.**

AIMPRESS brings together digital intelligence, clean energy, and strategic coordination to support the transition towards smarter, quieter, and lower-carbon ports.

ACT 2 FLEX

How can e**nergy-intensive** industries become more flexible, resilient, and ready for a renewable energy future? **ACT2Flex** supports European process industries in **reducing energy dependency and emissions**, while maintaining competitiveness and production stability.
The project treats industrial flexibility as a key asset for the **green and digital transition,** helping industries respond better to renewable energy availability, market volatility and operational needs.

The project develops a **Generic Systemic Flexibility Solution**, combining process redesign, hybrid energy integration, storage, decarbonisation technologies and advanced digital tools.
As coordinator, **indigo** leads a consortium of **16** partners from **6** countries, guiding the project's technical integration, validation and replication pathway.



The Objective

ACT2Flex aims to deliver a step change in industrial flexibility and efficiency by redesigning rigid production processes and adapting them to volatile renewable energy supply.

The Offering

The project is structured around **five core offerings:** Flexibility Technologies and Practices, Flexibility Intelligence Toolbox, Certification and Valorisation Package, Skills & Governance Blueprint, and Replication & Exploitation Funnel.

What will be tested?

Demo Case 1 | Chemical Industry
KRONOS EUROPE NV | Titanium dioxide production
The Belgian demonstrator will test five main interventions: material buffering, hybrid and flexible steam generation, integrated energy storage, flexible water treatment and advanced digital orchestration. The aim is to shift from rigid continuous operation to a more flexible industrial process that can better follow renewable energy availability.

Demo Case 2 | Metallurgical Industry
ElvalHalcor S.A. | Copper manufacturing
The Greek demonstrator will test four main interventions: grade-aware scrap management, hybrid heating, electrification and efficiency improvements, and intelligent digital control. The aim is to optimise copper production according to scrap quality, energy availability and carbon intensity.



Project Snapshot

Grant agreement: 101294465
Start date: 1 June 2026
End date: 31 May 2030
Status: Ongoing
Funded under: Digital, Industry and Space
Overall budget: 9,772,671.25 €
Contribution to indigo: 1,171,250.00 €
Coordinator: indigo-TUC

https://act2flex.eu/

The Robinson project

Smart integRation Of local energy sources and innovative storage for flexiBle, secure and cost-efficIent eNergy Supply ON industrialized islands

Islands often find it challenging to ensure a clean, secure and cost-effective supply of energy. The key was to decrease dependency on fossil fuels and become energy self-sufficient through a mix of renewable energy generation and storage infrastructure. **ROBINSON's** main mission was to develop an integrated energy system to help decarbonise islands.
The system, which was demonstrated on the island of **Eigerøy, Norway**, coupled locally available energy sources, electrical and thermal networks and storage technologies, using hydrogen as energy carrier.

The role of indigo in ROBINSON
In ROBINSON, indigo helped connect technical innovation with real-world deployment, business planning, and replication. Its work ranged from developing a web-based **Evidence Base tool** for decision-makers to supporting market analysis, business model development, and the replication of solutions across follower islands. TUC also contributed to the **assessment of socio-economic impacts** and to the broader communication and exploitation of project results.

In order to achieve the **decarbonisation targets**, innovative technologies were developed, integrated on the island and managed by a novel energy management system that includes non-electrical resources such as biomass gasification, wastewater valorisation and industrial symbiosis.

Project Snapshot

Grant agreement: 957752
Status: Completed
Start date: 1 October 2020
End date: 30 June 2025
Funded under: SOCIETAL CHALLENGES - Secure, clean and efficient energy
Overall budget: 8,369,532.50 €
Contribution to indigo: 194,375.00 €
Coordinator: ENERGY AND TURBOMACHINERY NETWORK (ETN)

https://www.robinson-h2020.eu/

StreamStep

Streamlining the optimisation of Sustainable Thermal Energy systems and Prototype technologies in process industries

Can **industrial waste heat** become a strategic **energy asset** instead of a lost resource?

European process industries operate under increasing **pressure** from climate change, rising energy costs, and global competition. Achieving **climate neutrality** requires practical, scalable solutions that **enhance resilience** without disrupting industrial productivity. **StreamSTEP** brings together **31 organisations** across Europe to rethink how heating energy is managed in industrial processes. The project focuses on **recovering and upgrading** waste heat across a wide temperature range through five innovative heat exchanger **prototypes** and advanced high- temperature heat pumps.

StreamSTEP will be demonstrated in five **key industrial sectors:** Non-ferrous metals, Ceramics, Minerals, Plastics, Refining.
The project aims to recover **50–90%** of industrial waste heat, achieving payback periods below three years while increasing energy flexibility and productivity.
indigo leads the development of a Virtual Spatial Optimisation **(VSO)** model, generating high-level "what-if" scenarios within industrial plant layouts.
This **digital approach** evaluates alternative equipment configurations, analyses **thermal flow efficiency**, and supports data-driven decision-making directly at demonstration sites.

Project Snapshot

Grant agreement: 101178351
Status: Ongoing
Start date: 1 October 2024
End date: 30 September 2028
Funded under: Digital, Industry and Space
Overall budget: 17,536,675.74 €
Contribution to indigo: 410,000.00 €
Coordinator: SINTEF AS



https://www.streamstep-project.eu/

Product Passport through Twinning of Circular Value Chains

Project Snapshot

Grant agreement: 101092008
Status: Completed
Start date: 1 January 2023
End date: 31 December 2025
Funded under: Digital, Industry and Space
Overall budget: 7,652,750.00 €
Contribution to indigo: 571, 875.00 €
Coordinator: MAGGIOLI SPA

The transition to a **circular economy** is no longer optional — it is **essential**. Ensuring sustainable access to **critical raw materials** requires more than recycling; it demands smarter systems, **digital intelligence**, and strategic coordination across entire value chains. This is where PLOOTO comes in.

In the **PLOOTO** project, **indigo** played a pivotal role in shaping a digital circular value chain framework. Rather than treating waste as an endpoint, the project reimagined it as a resource: **traceable, measurable, and reintegrated into production systems.**

indigo led the development of reference processes and digital traceability strategies that allowed value chains and waste deposit flows to be **modelled dynamically.** Production lines were analysed to create **digital models,** capable of supporting **real-time monitoring** and **optimisation.**

By developing **process modelling and simulation services**, alongside a **Balanced Scorecard** and Sustainability Assessment Service, **TUC** enabled decision-makers to visualise circularity, economic performance, and environmental impact in an integrated way. **Life Cycle Assessment** (LCA) data was no longer isolated — it became embedded in strategic decision-making.

The result was the creation of the **Circular and Resilient Information System** (CRIS): a digital ecosystem designed to support manufacturers in their green and digital transition. CRIS enables end-to-end traceability of secondary raw materials, supports waste reduction, and connects stakeholders through interoperable digital services. Tested across three different circular supply chains, the system demonstrated how digitalisation can accelerate **circular transformation,** turning data into insight, and insight into **sustainable**

From Circular Vision to Digital Action: The PLOOTO Story



FACTLOG

Energy-aware factory analytics for process industries



Project Snapshot

Grant agreement: 869951
Status: Completed
Start date: 1 November 2019
End date: 30 April 2023
Funded under: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing
Overall budget: 9,199,249.50 €
Contribution to indigo: 347,499.50 €
Coordinator: MAGGIOLI SPA

Imagine a factory that does not simply operate, but understands. **Digital Twins** are virtual **representations** of **real-world** systems, designed to monitor and **simulate** industrial behaviour in real time. The EU-funded **FACTLOG** project moved beyond simulation, introducing a **cognitive layer** where data, knowledge, and operational experience interact to support intelligent **decision-making.** Within the project, indigo led the development of advanced industrial dynamic **process modelling** methodologies. indigo developed the **Process Simulation Modelling** (PSM) Tool and a dedicated **API**, enabling seamless **integration** into the Digital Twins platform. Using **Material Flow Networks** and Timed Petri Nets, detailed multi-level models were created across diverse industrial pilots, forming real-time **"Digital Shadows."**

FACTLOG ultimately delivered a network of interconnected, self-learning systems: **the Cognitive Factory.**
Through integrated **machine learning** and **AI-driven optimisation**, the system could:

- Detect anomalies automatically
- Respond autonomously to disruptions
- Simulate alternative operational scenarios
- Identify efficiency improvements and new production opportunities

Reasoning capabilities were implemented at different temporal levels — short-, mid-, and long-term — allowing factories **not only to react, but to anticipate.**
Validated through real-world industrial pilots, **FACTLOG** demonstrated how digital twins can evolve into intelligent, adaptive ecosystems.

Building the Cognitive Factory

Dynamic Information Management Approach For The Implementation Of Climate Resilient Adaptation Packages In European Regions

Building resilience

IMPETUS turned climate adaptation from a strategic ambition into a practical pathway for more resilient European regions.

Project Snapshot

Grant agreement: 101037084
Status: Completed
Start date: 1 October 2021
End date: 30 September 2025
Funded under: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials
Overall budget: 16,224,768.85 €
Contribution to indigo: 231,750.00 €
Coordinator: FUNDACIO EURECAT

As **climate change** intensifies, European regions are under growing pressure to move from long-term commitments to practical adaptation on the ground. In this context, the EU-funded **IMPETUS** project was created to help translate climate resilience into concrete action. Its ambition was to support Europe's adaptation strategy and contribute to the transition towards a climate-neutral continent by **equipping regions** and **communities** with tools, knowledge, and **pathways** for more **effective response.**

In this effort, indigo contributed expertise at the **intersection of agriculture**, **climate adaptation**, and **natural resource management.** The research team supported the project's work on **climate risk assessment**, **adaptation planning**, **water conservation, biodiversity,** and **agricultural water reuse**. Its contribution helped **connect** environmental knowledge with practical solutions that can support more **resilient territories** and **production systems.**
IMPETUS worked towards a **multi-scale** and **cross-sectoral adaptation framework** capable of supporting Europe's transition to a **climate-resilient future**. Tested across **seven** different **European** biogeographical **regions,** the project aimed to provide tools, methods, and knowledge that could help regions better anticipate risks, respond to change, and plan for long-term sustainability.

https://climate-impetus.eu





Wildfires are becoming one of the most **pressing environmental and societal challenges** across Europe, threatening ecosystems, communities, and local economies. In this context, the EU-funded **TREEADS** project set out to strengthen wildfire prevention, preparedness, and response through a holistic fire management approach. By combining advanced technologies with socio-technical innovation, the project aims to support more resilient landscapes and communities in fire-prone areas. In TREEADS, **indigo** played a **key role** across both the strategic and technical dimensions of the project. Its contribution ranged from **shaping** the project's **socio-technical approach** and stakeholder engagement methodology to leading advanced technical work in **soil assessment** and **environmental restoration.** TUC also played a central role in the **Greek pilot** activities, supporting **field demonstrations** in high-risk wildfire scenarios and contributing expertise in sensing infrastructure, **AI-enabled monitoring,** and operational coordination. In parallel, **indigo** contributed to the development of solutions that combine drones, **agroforestry approaches**, and restoration-oriented assessment tools to support post-fire recovery and **long-term resilience**. Through its involvement in pilot implementation and emergency-oriented scenarios, indigo helped connect innovation with real operational needs on the ground. As a matter of fact, **TREEADS** aimed to deliver a new generation of tools for real-time wildfire risk assessment, incident management, and post-fire adaptation. These include **AI-supported monitoring approaches, innovative risk indicators**, and the use of **post-wildfire materials** to promote more fire-adapted communities. Overall, the project seeks to improve **prevention, preparedness, response, and recovery** across the wildfire management cycle.

TREEADS

Project Snapshot

Grant agreement: 101036926
Status: Completed
Start date: 1 December 2021
End date: 31 May 2025
Funded under: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials
Overall budget: 22,720,545.43 €
Contribution to indigo: 545,625.00 €
Coordinator: RISE FIRE RESEARCH AS

From prevention to recovery, TREEADS rethinks wildfire management as a connected cycle of resilience, technology, and community action.



Project Snapshot

Grant agreement: 101138432
Start date: 1 December 2023
End date: 30 November 2026
Status: Ongoing
Overall budget: 4,995,636.59 €
Contribution to indigo: 331,375.00 €
Coordinator: TECHNISCHE UNIVERSITAET BERGAKADEMIE FREIBERG (TUBAF)



Mining is essential to modern life, providing the **raw materials** needed for energy, infrastructure, and everyday technologies. However, conventional mining often leads to high **carbon emissions**, large amounts of **waste**, and long-term **environmental impacts**. These challenges become even greater at remote or hard-to-reach sites, where **monitoring** and **remediation** are more difficult. As demand for **critical raw materials** grows, the need for cleaner and more **sustainable mining solutions** becomes increasingly urgent.

This is where **XTRACT** comes in. The project sets out an ambitious vision for the Zero Emission Mine of the Future, bringing together innovative technologies that aim to **reduce emissions, improve resource efficiency, and transform the way mining activities are monitored and managed.**
Within this effort, indigo contributes through complementary teams with distinct but interconnected roles. **indigo** holds a central position, leading WP5 and carrying out the project's Life Cycle Assessment (**LCA**) and Social Life Cycle Assessment (**S-LCA**) activities.

Its contribution supports the evaluation of the environmental and social performance of XTRACT's solutions, while also addressing socio-economic sustainability indicators, carbon footprint estimation, and circularity-related aspects.In parallel, the **Laboratory of Environmental Engineering & Management** contributes to XTRACT's technical activities, with a particular focus on **phytoremediation**. By advancing **nature-based solutions** for mine waste remediation and resource recovery, the laboratory complements TUC's broader contribution and supports the project's sustainability-oriented innovation framework.

KINETIKA
CULTURAL HERITAGE OBJECTS
INCORPORATING MECHANICAL PARTS

Preserving the past

Advancing the Digitization and Analysis of Dynamic Cultural Heritage Objects

Cultural heritage objects are essential to understanding history, identity, and traditions across time. However, their preservation and study can be challenging, especially when they include complex structures, internal features, or **moving mechanical parts.**

The EU-funded **KINETIKA** project addresses this challenge by developing an **advanced 4D digital twin framework** for cultural heritage objects with dynamic or mechanical components, including masonry structures and movable industrial heritage assets.

In **KINETIKA**, indigo plays a **leading technical role** by supporting the **conceptualisation and system architecture** of the platform. This includes defining the reference architecture, core system components, and key requirements related to performance, scalability, interoperability, and security.

The project combines laser scanning, muography, photogrammetry, advanced imaging technologies, and **IoT-based sensor networks** to capture both visible and internal aspects of heritage objects. This integrated approach enables **continuous monitoring,** improved understanding, and more effective preservation of cultural heritage assets over time.

Project Snapshot

Grant agreement: 101233379
Start date: 1 January 2026
End date: 31 December 2028
Status: Ongoing
Funded under: Culture, creativity and inclusive society
Overall budget: 5,858,073.11 €
Contribution to indigo: 201,250.00 €
Coordinator: UNIVERSIDAD DE SALAMANCA (USAL)



A First of a kind Hub for circularity demonstrator for Attica and peripheral regions

Project Snapshot

Grant agreement: 101178059
Status: Ongoing
Start date: 1 December 2024
End date: 30 November 2029
Funded under: Digital, Industry and Space
Overall budget: 21,777,067.50 €
Contribution to indigo: 428,750.00 €
Coordinator: EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLOGISTON (ICCS)

As cities and industries search for more sustainable ways to grow, **industrial-urban symbiosis** offers a new model of collaboration, one in which **resources, energy, and waste** are **managed** more intelligently across **connected systems**. At the heart of this transition is the idea of the **Hub4Circularity**: a space where **circular solutions** can be tested, scaled, and embedded into real **regional ecosystems**. In this context, the EU-funded **THESEUS project** is working to establish the first **Hub4Circularity** in **Greece**, starting from **Athens**, and to demonstrate how digital innovation and circular thinking can come together to support **climate-neutral** development.

As part of THESEUS, **indigo** contributes to this vision by connecting **circular economy goals** with **digital intelligence**, **process optimisation**, and **pilot implementation**. A central part of its work focuses on **textile sorting**, where artificial intelligence is used to **link recycling parameters** with **waste characteristics** and improve the recovery of high-value materials. **indigo** also leads the **Textiles pilot** on Symbiotic Flows, bringing together data from automated, multi-sensor robotic sorting systems to enhance **textile recovery** and **material efficiency**.

At the same time, **indigo** applies its expertise in **Material Flow Analysis** through its **Process Simulation Modelling tool** and Material Flow Networks framework, mapping material, water, and energy flows to support long-term **strategic planning** for Attica and Greece. This work is complemented by the development of a **Replication Roadmap Tool**, designed to help stakeholders assess local conditions and explore how **circular industrial-urban solutions** can be transferred and scaled in other regions.



https://www.theseus-h4c.eu

Network of Excellence for the Development, Dissemination and Application of Digital Transformation Technologies in the Greek Manufacturing Industry

Project Snapshot

Grant agreement: 869951
Status: Completed
Start date: 1 July 2023
End date: 31 August 2025
Funded under: General Secretariat for Research and Innovation, Greece
Overall budget: 2,452,985.00 €
Contribution to indigo: 259,986.74 €
Coordinator: Koutsoudis Anestis



Shaping the future of smart manufacturing

Greece 4.0 was created to help accelerate the **digital transformation** of Greek manufacturing. By bringing together **Industry 4.0** technologies such as **Digital Twins, robotics, Big Data**, and the Industrial Internet of Things, the project **aimed to support** smarter, more connected, and more efficient production systems.
In the project, indigo contributed by **developing** a **modelling and simulation approach** tailored to digital manufacturing. At the heart of this work was the **Process Simulation Modelling** (PSM) **Tool**, which supported the creation of cognitive **Digital Twins** for industrial production lines.

By **combining** data on energy, materials, and operations, indigo helped create **real-time digital representations** that could support **performance monitoring**, **scenario testing**, and **process optimisation**. Through this approach, Greece 4.0 aimed to **modernise** production lines, **improve** industrial efficiency, and **strengthen** data-driven decision-making. In doing so, the project contributed to a more competitive and **resilient future** for Greek manufacturing.


Παρατηρητήριο Περιβαλοντικών Δεικτών
Αρχική
Στατιστικά Στόλου
Μεθοδολογία
Κατηγοριοποίηση Οχημάτων
Πραγματικά Στοιχεία Κατανάλωσης Καυσίμου και Εκπομπών Ρύπων
Δεδομένα απο 1/9/2024 εώς 5/1/2025
01/09/2024
Εξοικονόμηση CO2
0,6172 g
↑ 0,00%
Εξοικονόμηση CO
2,6691 g
↑ 0,00%
Εξοικονόμηση NOx
0,3414 g
↑ 0,00%
9,8955 MJ
Εξοικονόμηση Ενέργειας
0,2893 L
Εξοικονόμηση Καυσίμου
7
Συνολικές Διαδρομές
Tuesday
Wednesday
Thursday
Saturday
Παρκάρω γρήγορα, εύκολα και οικονομικά
Βρες θέσεις γύρω σου
Ψάξε στον Άγιο Δημήτριο
Ψάξε στον Πλατανιά Χανίων
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https://parkin



ParkIn - Air-Pollution Alleviation in urban areas through parking spaces Innovative exploitation towards climate change mitigation

Project Snapshot

Status: Completed
Start date: 1 October 2022
End date: 30 September 2024
Funded under: Natural Environment & Innovative Actions 2022
Overall budget: 199,980.00 €
Contribution to indigo: 120,000.00 €
Coordinator: indigo-TUC

Urban transport remains one of the key challenges in the transition to **cleaner** and healthier **cities.** Among the hidden drivers of congestion and emissions is the **time** spent searching for **parking**, which contributes significantly to **inner-city traffic**. This unnecessary circulation increases CO2, NOx, and particulate matter emissions, while also leading to **wasted fuel**, **lost time**, and **added stress** for citizens. Addressing this issue calls for smarter, data-driven **mobility solutions** that can reduce inefficiencies and **improve** urban quality of life. As part of the ParkIn project, indigo leads the development of the Environmental Indicators Observatory, the project's technological core for monitoring impact. The team designed a three-tier **architecture** that processes data from the "Park Your Car Around" **(PYCA)** application to calculate key environmental, economic, and social indicators. Using technologies such as ASP.NET Core and Piranha CMS, and ensuring full GDPR compliance, indigo provides a framework that supports **transparency** and helps both public authorities and citizens better understand the value of **smarter parking solutions.**

ParkIn's main **outputs** include the PYCA application and the Environmental Indicators Observatory platform. The **PYCA** app supports the sharing of private parking spaces, helping reduce unnecessary vehicle circulation while improving land-use efficiency and user awareness of time and fuel savings. At the same time, the **Observatory** captures changes in air quality and pollution levels in the intervention areas. Together, these tools aim to support more **sustainable urban mobility**, **lower** environmental **impacts,** and **improve** everyday **life** in cities.

AMOCEAB

At its core, AMOCEAB invested in people, equipping a new generation of professionals with the knowledge needed to advance circular and bio-based transformation across the region.

Project Snapshot

Status: Completed
Start date: 2 January 2023
End date: 30 September 2023
Funded under: Extraordinary Fifth Call for Proposal – Priority Axes 1 and 2
Overall budget: 647,863.00 €
Contribution to indigo: 94,117.65 €
Coordinator: Polytechnic University of Marche (UNIVPM)

Adrion Master On Circular Economy And Bioeconomy

AMOCEAB was created to help bridge the gap between the **Circular Economy** and **Bioeconomy** sectors in the ADRION area by strengthening professional skills, academic cooperation, and transnational knowledge exchange. Bringing together **research institutions** and **business support centres,** the project set out to build a **collaborative educational framework** focused on areas such as **food waste, biomass**, and **bio-based products.**

Within **AMOCEAB**, indigo contributed as a key partner in the **co-development** of a **Transnational Joint Master's Degree**, drawing on its expertise in **circular economy** and **digital innovation**. Its role focused on specialised research on circular value chains and digitalisation, while also supporting stakeholder engagement through roundtables and market-oriented questionnaires. Through these activities, indigo helped connect **academic design** with **regional needs** and **practical transition challenges.**

indigo also played an important role in **shaping** the academic profile of the programme. By analysing accreditation frameworks and helping shape **specialised course modules** in environmental and **process engineering**, it supported the development of a practical and transnational **learning pathway**. This contribution was further reflected in the project's Winter School, where future professionals were introduced to the knowledge and skills needed to drive **sustainable transformation** across the ADRION region.

The project's main outcomes included the creation of an AMOCEAB **Transnational Network** for scientific exchange and the joint development of a Master's Degree programme with specialised modules and compulsory internships. In this way, AMOCEAB aimed to support not only **education** and **mobility,** but also the emergence of highly skilled **"agents of change"** capable of helping public and private organisations adopt **greener** and more **sustainable** business models.

https://amoceab.adrioninterreg.eu

Interreg

Co-funded by the European Union

IPA ADRION

CITYMOVE

Communities Innovating Traffic Yielding a Multimodal Optimized Vicinal Environment

CITYMOVE brings together nine partners from eight Adriatic-Ionian countries to **reduce car dependency** in small and medium-sized cities and to promote walking, cycling and other eco-mobility options. Funded by the **Interreg IPA ADRION** programme and led by the **Municipality of Bar**, the project combines infrastructure improvements, mobility planning and awareness-raising so that residents and visitors can move around their cities in a cleaner, safer and healthier way.

Within CITYMOVE, indigo takes part as a **subcontractor** with two clearly defined responsibilities. The first is the project's **social media dissemination**: indigo plans and runs the project's presence on social media, producing content, campaigns and visual material that communicate its activities and results to citizens, stakeholders and the wider Adriatic-Ionian community.

The second responsibility is a key deliverable: the **Sustainable Transnational Mobility Plan**. Each partner city is developing its own **Sustainable Urban Mobility Plan (SUMP)**, and indigo is responsible for merging these local plans into a **single intercity plan** that identifies shared challenges, aligns measures and indicators, and sets out a common roadmap for sustainable multimodal mobility across the participating cities.

Alongside these activities, the project is installing urban mobility equipment and software in eight cities, producing safe walking and cycling maps, establishing the **CITYMOVE urban mobility city network**, and engaging citizens through **Car-Free Days**, local cycle races and three **Urban Mobility Days** with dedicated workshops. Together, these actions support the programme's objective of promoting sustainable multimodal urban mobility as part of the transition to a net zero carbon economy.

Project Snapshot

Status: Ongoing
Start date: 1 September 2024
End date: 28 February 2027
Funded under: Interreg IPA ADRION 2021–2027 – Priority 2, SO2.4 Sustainable multimodal urban mobility
Overall budget: 1,584,047.96 €
Interreg funding: 1,346,440.74 €
Role of indigo: Subcontractor
Coordinator: Municipality of Bar (Montenegro)

From social media to a shared intercity mobility plan, indigo helps CITYMOVE turn local action into a common vision for sustainable mobility across the Adriatic-Ionian region.



Empowering Higher Education Institutions for Water and Maritime Innovation and Entrepreneurship

What does it take to turn a bold idea into a successful **Blue Economy venture**? AquaSphere, an **EIT HEI Initiative** project coordinated by the **Technical University of Crete**, sets out to answer that question by empowering Higher Education Institutions to drive innovation and entrepreneurship in the water and maritime sectors. Bringing together universities and entrepreneurship organisations from Greece, Türkiye, the United Kingdom, France and Bulgaria, the project addresses challenges such as marine renewable energy, sustainable aquaculture, ocean plastics and smart water management. Within AquaSphere, the industrial and digital innovations research group **(indigo)** brings **innovation and entrepreneurship together**, empowering students and young entrepreneurs to transform ideas into real-world opportunities.

At the heart of this journey, the **AiDeas Workshop** provides an interactive space where creativity meets entrepreneurial thinking, helping participants identify real-world challenges, develop innovative solutions and explore their business potential.

Complementing this experience, the **Blue Economy Market Analysis** training, delivered within the **Navigating Blue Innovation** programme, equips participants with practical skills to identify emerging market opportunities, understand customer needs, assess competition and evaluate the commercial viability of sustainable maritime and water-related innovations.

Together, these activities bridge the gap between education, innovation and entrepreneurship, fostering a new generation of **blue innovators** ready to turn promising concepts into sustainable businesses and meaningful impact.

Project Snapshot

Status: Ongoing
Start date: May 2025
Duration: 24 months
Funded under: EIT HEI Initiative – Call for Proposals 2024, HEI Capacity Building
Role of indigo: Entrepreneurship training (AiDeas Workshop, Blue Economy Market Analysis)
Coordinator: Technical University of Crete (TUC)

The future of the Blue Economy starts with an idea, but grows through innovation, ambition and action.

https://aquaspherepproject.eu

Smart agriculture in action

How CHAMELEON used drone intelligence to support livestock monitoring

Agriculture remains central to Europe's economy, but farmers increasingly need **smarter tools** to monitor animals, reduce risks, and respond quickly to problems in the field. In this context, the EU-funded **CHAMELEON** project developed a new generation of **configurable and interoperable drones** for agriculture.

Project Snapshot

Grant agreement: 101060529
Status: Completed
Start date: 1 July 2022
End date: 30 June 2025
Funded under: Food, Bioeconomy Natural Resources, Agriculture and Environment
Overall budget: 5,949,746.25 €
Contribution to indigo: 283,750.00 €
Coordinator: ACCELIGENCE LTD





The Concept

CHAMELEON brought together partners from nine European countries to design and deploy a new **reconfigurable drone system** tailored to agricultural needs. The project focused on **flexibility, interoperability**, and **modular deployment** across different use cases and environments.

Team's role

Our team led **Pilot 2** in Western Crete, focusing on livestock monitoring and management. By combining **UAV path-planning expertise** with hyperspectral and thermal sensing, the team developed tools for **real-time animal tracking**, **health assessment**, and **anomaly detection**, helping breeders **manage large grazing areas** more effectively.

Expected Outcomes

The project delivered an **innovative drone platform** capable of adapting its configuration and sizing on demand. Designed to operate in both **homogeneous** and **heterogeneous** systems, it supported complex agricultural scenarios and contributed to more **precise, data-driven,** and **resilient** farming practices.

AGRARIAN
FARMING ON THE EDGE

Smart digital tools for livestock management

The EU-funded AGRARIAN project aims to support a more **sustainable** and **competitive agricultural sector** by developing **open-source digital solutions** based on tools, reuse, composability, and orchestration. Within this vision, the project focuses on **strengthening rural agriculture** through smarter connectivity, data-driven monitoring, and **adaptable digital services** tailored to real field conditions.

Project Snapshot

Grant agreement: 101134128
Status: Ongoing
Start date: 1 January 2024
End date: 31 December 2026
Funded under: Food, Bioeconomy Natural Resources, Agriculture and Environment
Overall budget: 4,997,726.25 €
Contribution to indigo: 153,750.00 €
Coordinator: NCSR





The concept

AGRARIAN is designed to create an **open and dynamic environment** for the **digital transformation** of agriculture. By combining open-source technologies with interoperable services and distributed infrastructure, the project aims to **enhance sustainability performance** while improving the competitiveness of rural farming systems.

Team's Role

As Pilot Leader, our team **leads the livestock management** activities in Crete. Its work focuses on **drone-based hyperspectral imaging** and AI-driven behavioural analysis for the real-time monitoring of free-grazing herds. By **integrating data** from satellites, sensors, and drones through a hybrid 5G-satellite infrastructure, TUC **supports the detection of anomalies** such as illness, reduced mobility, and environmental risks.

Expected Outcomes

By combining data from satellites, sensors, and drones, AGRARIAN aims to provide farmers with **actionable insights** that improve animal welfare, increase operational efficiency, and support more sustainable livestock practices. A dedicated **Agricultural Decision Support System** will help translate this intelligence into better decisions for **rural users** and stakeholders.



innovation starts where curiosity meets purpose.



from Innovation to Entrepreneurship

Entrepreneurship

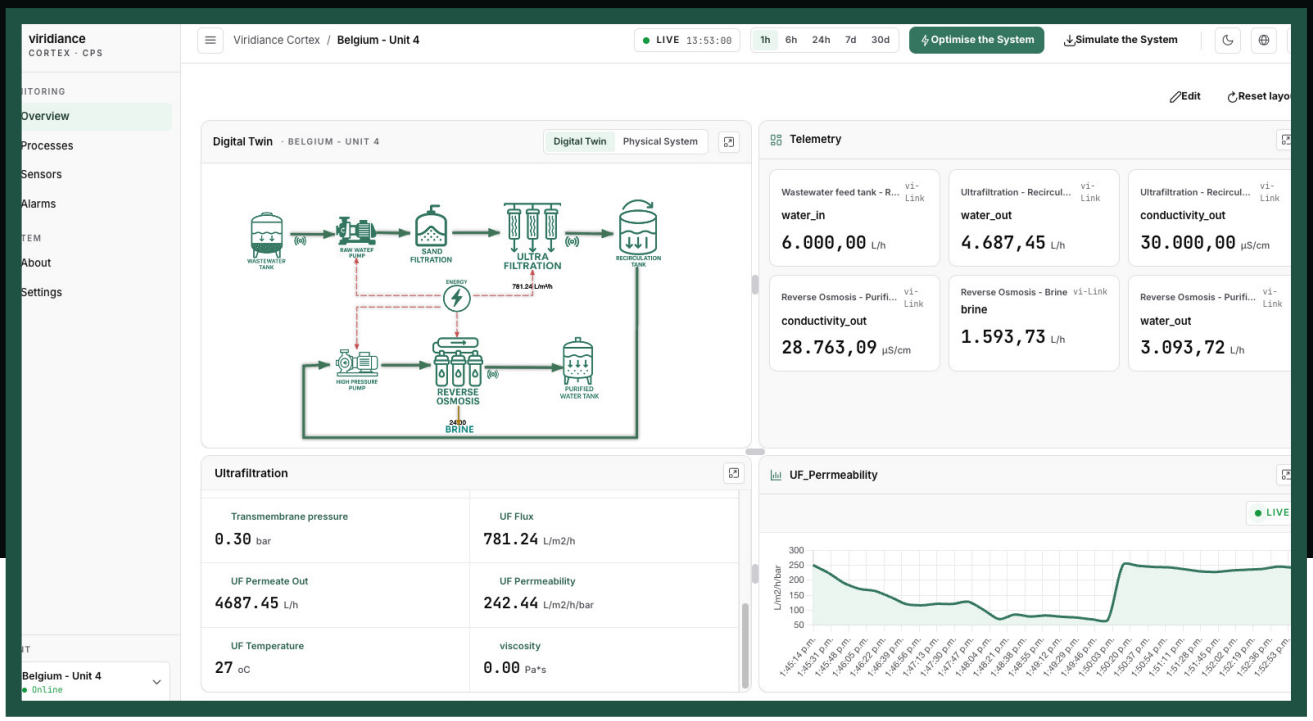
Viridiance Insights P.C.

Viridiance Insights is a university spin-off company founded by Prof. George Arampatzis and researcher Maria Aryblia.

This venture holds the distinction of being the first spin-off company established at the Technical University of Crete under the legislative framework of Law 4864/2021. Its mission is to leverage the expertise of the Indigo research group and facilitate the transfer of its innovative technologies to the market.

The company focuses on the commercial exploitation of key research outcomes, including:

- **Modelling and Simulation Software**: Advanced tools for complex discrete industrial processes and value chains, derived from the FACTLOG and AquaSPICE research projects.
- **Sustainability Balanced Scorecards:** A specialised methodology for sustainability assessment, developed through the PLOOTO and Greece 4.0 research projects.



Digital Solutions for a Green Future

Viridiance Insights supports the industrial green transition through a suite of four interconnected digital tools.

- **vi-Sim:** A robust desktop engine for modelling and simulating complex industrial processes and value chains, with optional LCA, SBSC, and Optimisation modules.
- **vi-Twin:** A cloud platform that transforms vi-Sim models into dynamic Digital Twins, enabling remote access, real-time updates, scenario simulation through ephemeral instances, and API integration.
- **vi-Cortex:** Acting as the "central nervous system," this IoT and AI tool visualises real-time data to detect anomalies, predict outcomes, and optimise physical assets.
- **vi-Trace:** A blockchain-enabled platform that secures product transparency from raw material to end-of-life, automatically issuing EU-compliant Digital Product Passports (DPP).



> Enhancing Industrial Sustainability Through Digital Innovation.
>
> — Viridiance Insights

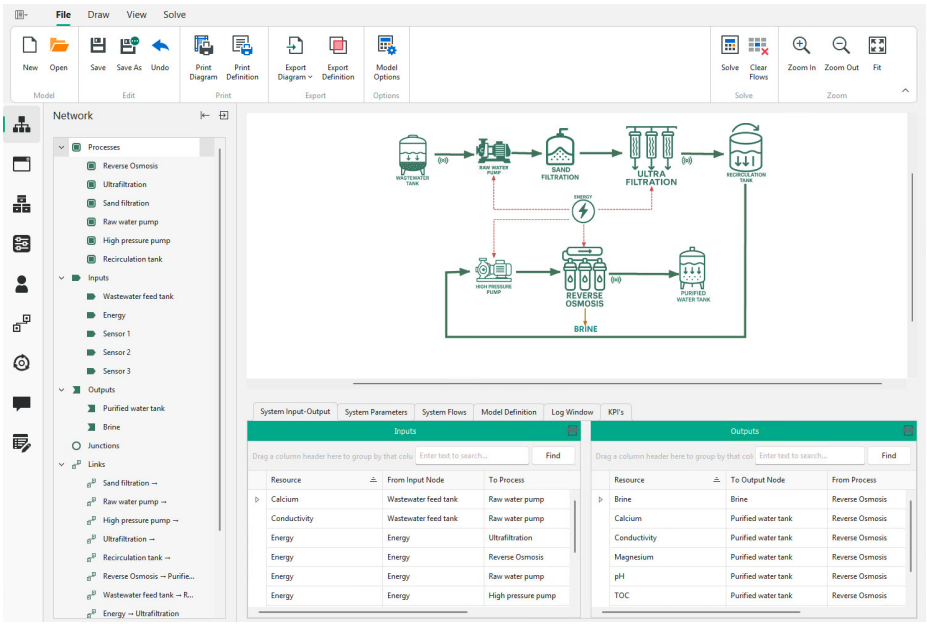
Our Software

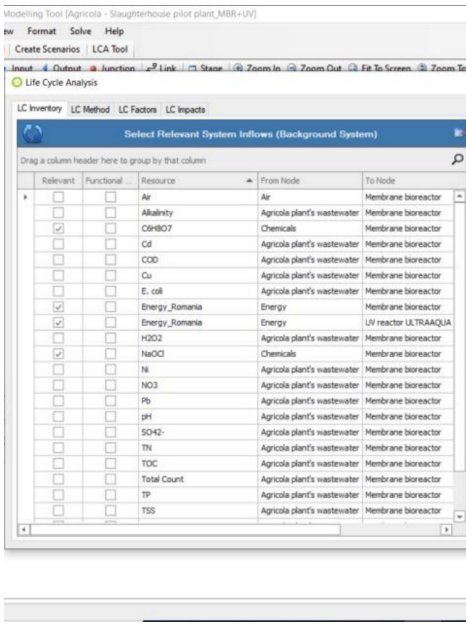
Solutions

Software Solutions

vi-Sim: Process Simulation and Modelling

viridiance Simulator (vi-Sim) is a robust desktop engine designed for modelling complex industrial processes and value chains. The tool allows users to create detailed process network models that capture the entire lifecycle of a product, from raw material extraction or cultivation through production, distribution, use, and disposal or recycling. By graphically representing stages and processes within these value chains, vi-Sim enables comprehensive monitoring and analysis of resource flows, helping stakeholders understand the environmental impacts at each stage.





Core Capabilities

01. KPIs

Key Performance Indicators (KPIs) are critical for assessing the performance of a process network or value chain. vi-Sim enables users to define custom KPIs that can be calculated based on various metrics within the system, such as throughput, energy consumption, or yield. These KPIs can be visualised and analysed, providing valuable insights into the efficiency and sustainability of the modelled processes.

02. Custom Scripts

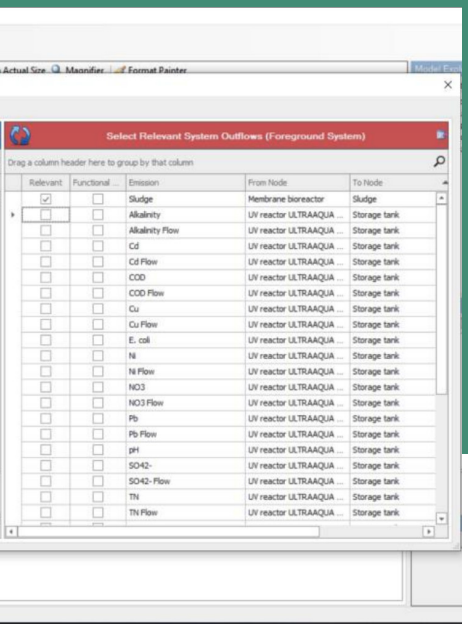
vi-Sim supports VB.NET scripting, allowing users to write custom scripts for more advanced calculations that go beyond standard functionalities. This feature is particularly useful for complex models where specific algorithms or proprietary methods are required. These scripts can be integrated into the model to perform detailed analyses and simulations.

03. AI Assistant

vi-Sim integrates indigo AI, a powerful assistant that helps users build, debug, and understand their process models. indigo AI can explain complex model behaviours, suggest fixes for simulation errors, and guide users through building value chains step by step. Whether you're a beginner learning the tool or an expert working on intricate models, Indigo accelerates your workflow and reduces the learning curve.

Features

vi-Sim offers a user-friendly environment for designing complex industrial models without requiring any programming expertise. Users can visually construct value chains using a comprehensive library of processes, junctions, and links. This intuitive graphical interface enables the rapid development of digital representations that capture the interactions between resources, energy, and pollutants





Modules

04. LCA Module

vi-Sim's Life Cycle Assessment feature quantifies the environmental impacts of process networks or value chains throughout their entire lifecycle. It helps users evaluate material and energy flows, select impact categories like climate change and resource depletion, and review characterisation factors to understand overall environmental performance.

05. SBSC Module

Designed for informed decision-making, the SBSC module allows for a rigorous assessment of process network alternatives. It evaluates scenarios using a combination of KPIs and environmental impact metrics to highlight the most sustainable choices. By visualising the trade-offs between different value chain configurations, users can confidently select the approach that best meets their sustainability targets.

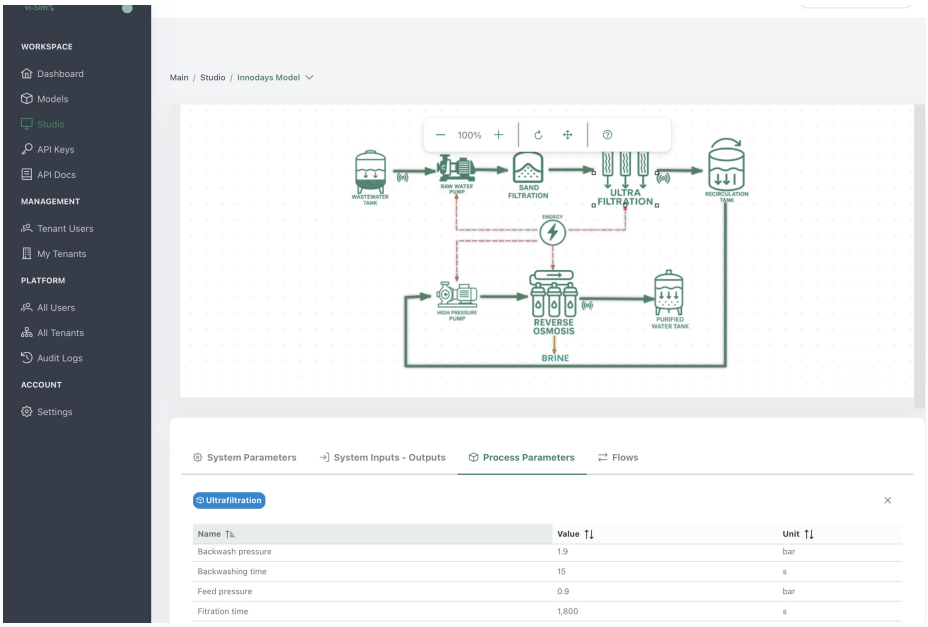
06. Optimisation

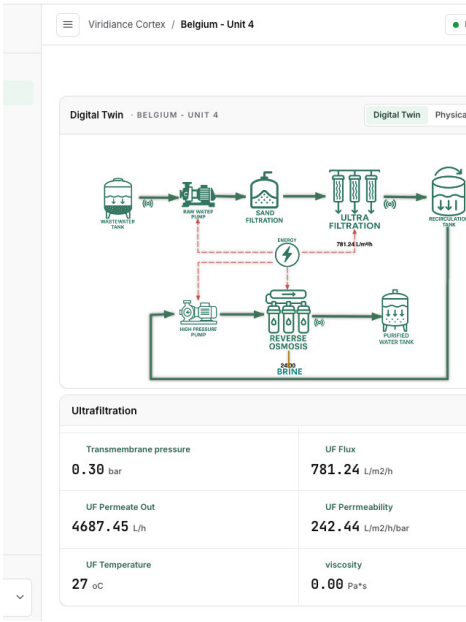
vi-Sim's Optimisation module enables users to find the best configuration of their process network based on defined constraints and objectives. Similar to solver-based optimisation, it evaluates multiple variables across the model to minimise costs, reduce emissions, or maximise yield. By automating the search for optimal parameters, users can make data-driven decisions that align with both operational and sustainability goals.

Software Solutions

vi-Cloud: Cloud-Powered Digital Twins

vi-Cloud brings your vi-Sim models to life in the cloud. It transforms static process simulations into dynamic Digital Twins that stay synchronised with real-world operations, accessible to your entire team from any browser.





Core Capabilities

01. Cloud Studio

Explore, **modify**, and **simulate** process models directly in the browser — no desktop installation needed.

02. Model Repository

Secure, tenant-based storage with **role-based access** for all your vi-Sim models.

03. Instances

Create **instances of the model** to run what-if scenarios and validate changes without affecting the live Digital Twin.

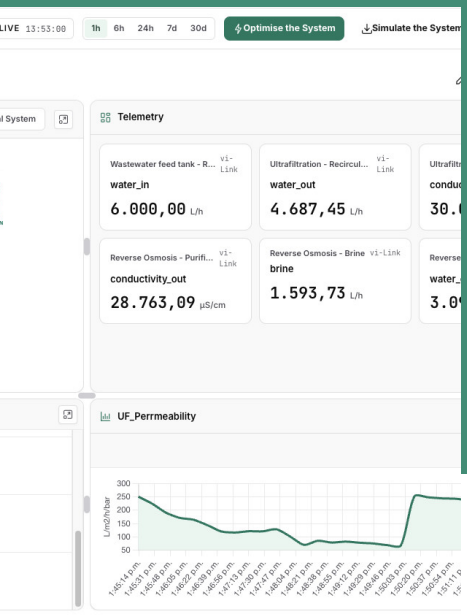
04. API Integration

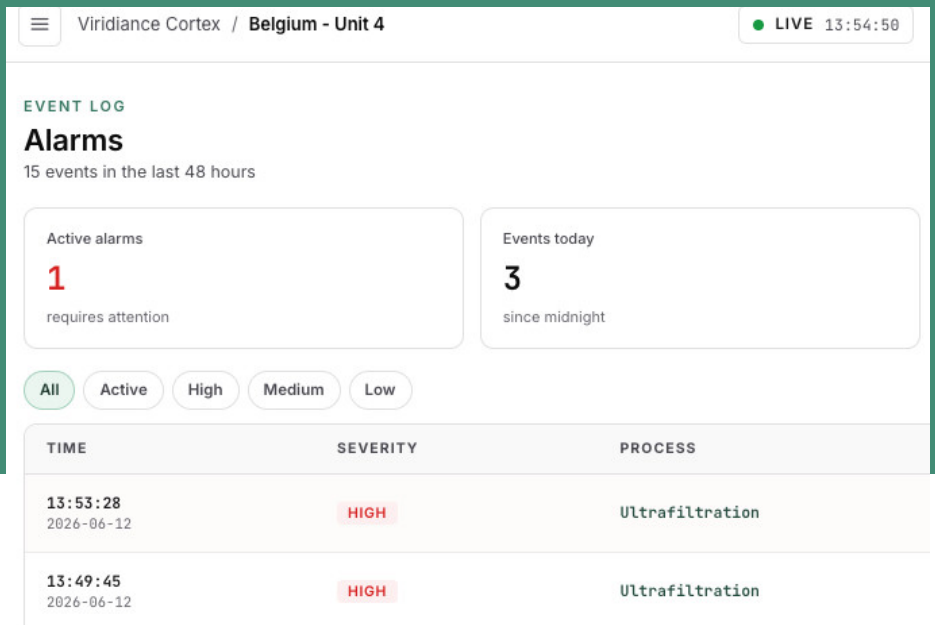
Expose model outputs to external tools or feed in data from IoT sensors, ERP systems, and ML services.

Software Solutions

vi-Cortex: The Central Nervous System of Your Operations

vi-Cortex connects your physical assets to a unified intelligence layer. Built on ThingsBoard and MQTT, it captures real-time sensor data and transforms it into actionable insights — monitoring, predicting, and optimising operations around the clock.





Core Capabilities

01. Real-Time Monitoring

Ingest data from physical sensors and AI-powered soft sensors via MQTT and standard IoT protocols, visualised through customisable live dashboards.

02. Anomaly Detection

AI-powered algorithms distinguish temporary spikes from genuine performance issues, avoiding unnecessary alerts and downtime.

03. Automated Mitigation

When genuine issues are detected, vi-Cortex automatically triggers corrective actions on the physical system without human intervention.

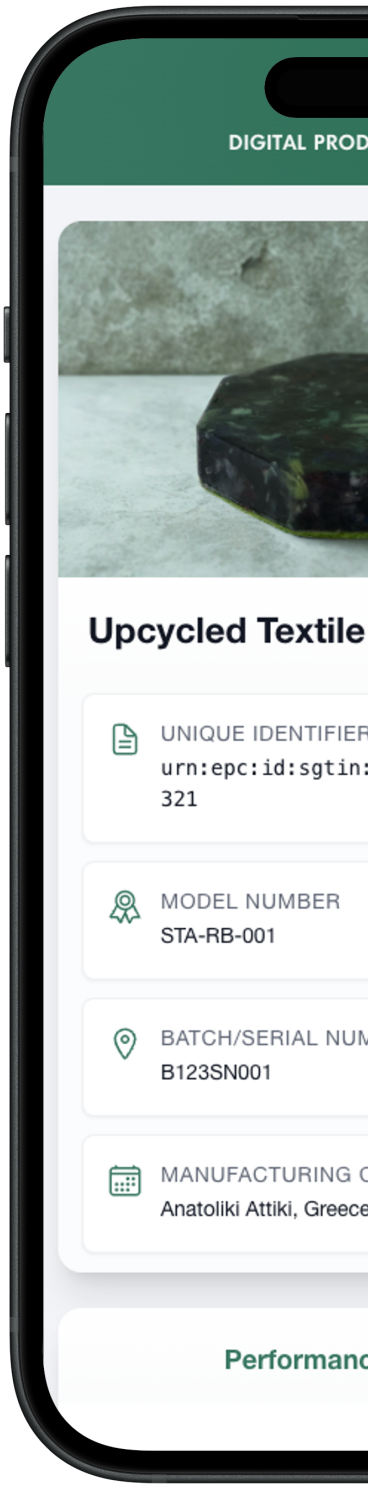
04. Optimisation

Run optimisation algorithms on isolated shadow copies of your Digital Twin, then apply optimal configurations automatically to both the digital and physical systems.

Software Solutions

vi-Trace: Blockchain-Enabled Digital Product Passports

vi-Trace is a platform for issuing Digital Product Passports (DPPs) that capture a product's full journey — from raw materials to end of life. By combining value chain data collection, vi-Sim model integration, and blockchain security, vi-Trace delivers transparent, verifiable, and regulation-ready product passports.



Value Chain Data Collection

Capture product information at every stage of the value chain or industrial process — either through manual entry or automated integration with existing infrastructure and external APIs.

vi-Sim Integration

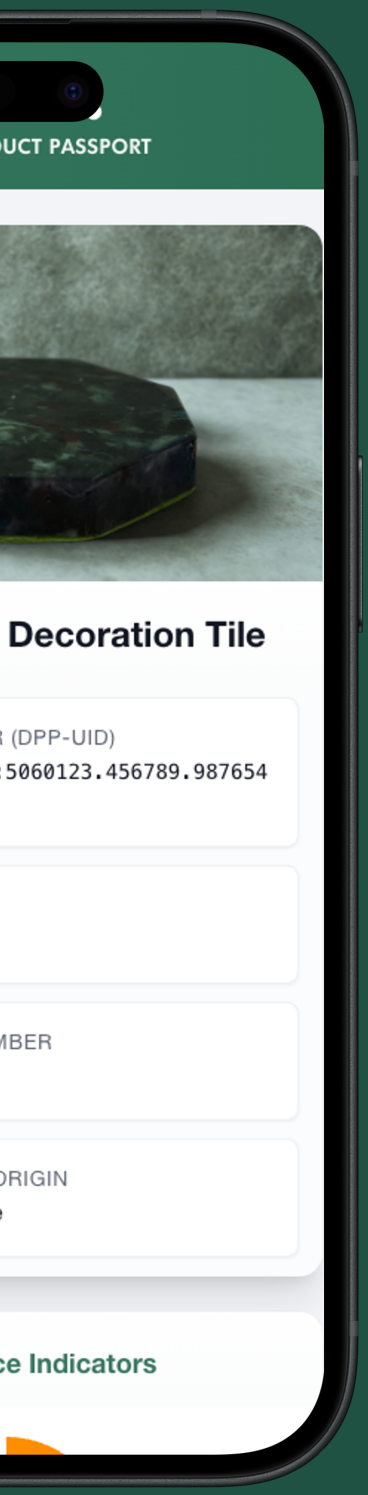
Connect directly to vi-Sim models to auto-calculate KPIs and Sustainability-Based Scenario Comparisons (SBSC), ensuring your DPP reflects accurate, model-driven environmental and performance metrics.

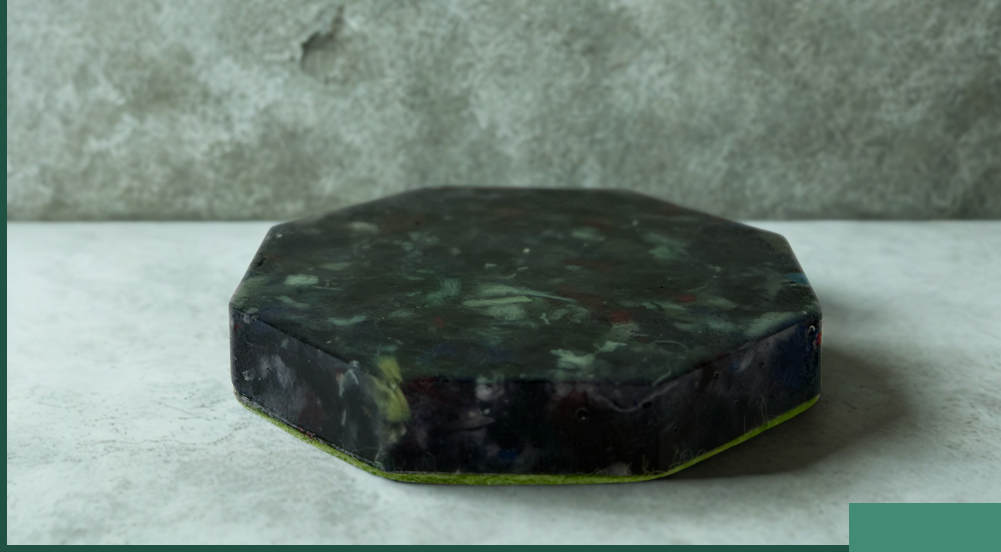
Blockchain Security

All DPP data is recorded on a distributed blockchain database shared across all stages of the process, ensuring data integrity, consistency, and trust through smart contract validation.

DPP Export & Display

Publish each DPP as an accessible, informative web page — displaying the process or value chain model, KPIs, SBSC results, certificates, and all required regulatory information in one place.





Circular Products

What if waste textiles could build the future?

Every year, millions of tonnes of clothing and fabric end up in landfill. We turned them into something beautiful — and tracked every step with a Digital Product Passport.

Discarded clothes, shoes, and fabrics represent one of the fastest-growing waste streams in the world. Rather than letting these materials reach landfill, we developed a circular manufacturing process that transforms post-consumer textiles into decorative bricks — a durable, versatile building material for interior design, architecture, and art installations.

The process is simple and scalable: textiles are collected, mechanically shredded, then compressed and moulded under controlled heat and pressure. Designed for industrial-scale production, we can supply projects of any size — from boutique interiors to large-scale commercial developments. Each batch is unique in colour and texture, shaped by the garments it was made from.

Every product comes with a **Digital Product Passport issued through vi-Trace**, our blockchain-enabled traceability platform. The passport captures the full value chain — from textile collection through to the finished product — with environmental metrics auto-calculated through vi-Sim integration.

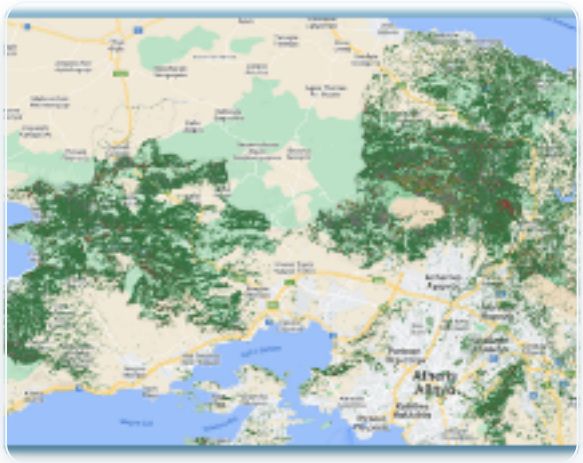
All DPP data is secured on a distributed blockchain ledger, ensuring tamper-proof traceability across the entire supply chain. As the EU prepares to mandate Digital Product Passports under the Ecodesign for Sustainable Products Regulation, this product demonstrates that circularity and compliance go hand in hand.

Scan Here

Software Solutions

Soil & Biodiversity Services

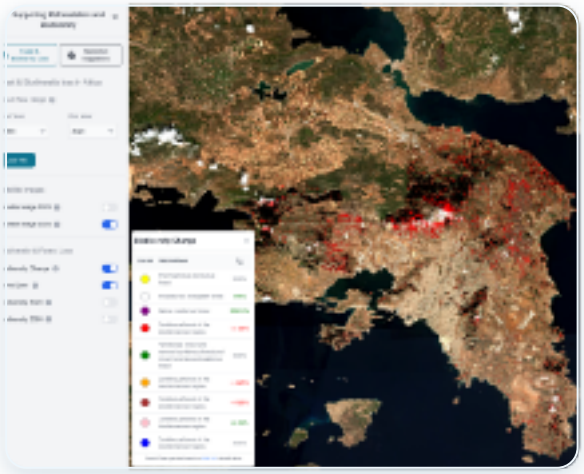
Decision-support services that turn satellite and aerial data into restoration guidance for land managers.



SOIL-AI: Soil Assessment and Restoration DSS

Uses aerial and remote-sensing data to assess soil quality and evaluate physical and chemical indicators such as pH and soil organic carbon. The results feed a decision-support service that proposes agroforestry restoration techniques tailored to each area.

REMOTE SENSING | SOIL INDICATORS | AGROFORESTRY



BIODIV-AI: Biodiversity Monitoring and Reforestation

A web-based service whose machine-learning models, trained on satellite imagery, monitor plant biodiversity over time. Where degradation is detected, it provides guidelines for successful restoration practices.

SATELLITE IMAGERY | MACHINE LEARNING | RESTORATION

https://services.indigo.tuc.gr/impetus-tool

Software Solutions

Educational Services

Learning platforms built by the group for students and young engineers.

indigo AI: Student Companion

An AI-powered study companion that gives students context-aware help. It is built on a Retrieval-Augmented Generation architecture with open-source models running locally, so every answer is grounded in the course materials stored in its vector database.

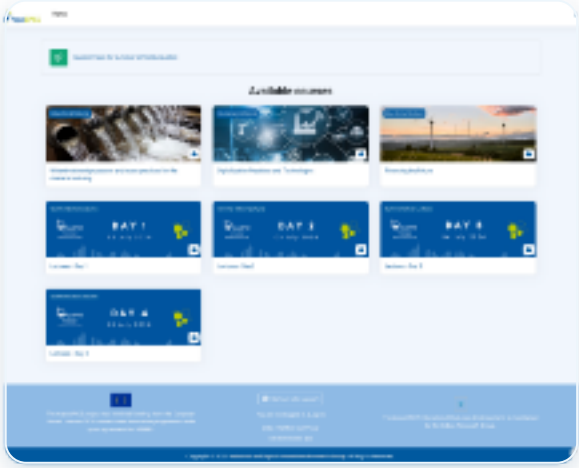


RAG | OPEN-SOURCE MODELS | RUNS LOCALLY

https://indigo.tuc.gr

AquaSPICE Educational Hub

An educational portal on a customised learning-management platform, designed to train young engineers. Its electronic modules on water efficiency and industrial sustainability are selected to meet the demands of industrial partners and current industry trends.



E-LEARNING | WATER EFFICIENCY | INDUSTRIAL SUSTAINABILITY

https://edu.indigo.tuc.gr

Software Solutions

Environmental & Circular Economy Services

Web tools that help cities and industries measure their impact and choose circular solutions.



CSSBoost Application Planning Toolkit

A three-part framework for analysing and selecting circular-economy solutions: a public Knowledge Inventory of existing practices, a login-based Evaluation Toolkit for multi-criteria assessment of feasibility and sustainability, and a Strategic Planning module for roadmapping and risk assessment.

KNOWLEDGE INVENTORY

MULTI-CRITERIA ASSESSMENT

ROADMAPPING

https://services.indigo.tuc.gr/cssboost-apt



Environmental Indicators Observatory

The monitoring core of the ParkIn project. A three-tier platform processes data from the Park Your Car Around application to calculate environmental, economic and social indicators, from CO2 and particulate savings to time and fuel saved, and publishes them on a public, GDPR-compliant dashboard.

URBAN MOBILITY

EMISSION INDICATORS

PUBLIC DASHBOARD

https://observatory.parkingr.eu

Software Solutions

Project Replication Services

Platforms that carry proven solutions from one region or industry to the next.

Interactive Replication Roadmap Tool

A web portal of data and knowledge for up-scaling sustainable energy solutions. It serves external decision-makers with replication plans and a Replication Roadmap Tool that guides them through a six-stage analysis of technology, legal frameworks and lessons learnt.

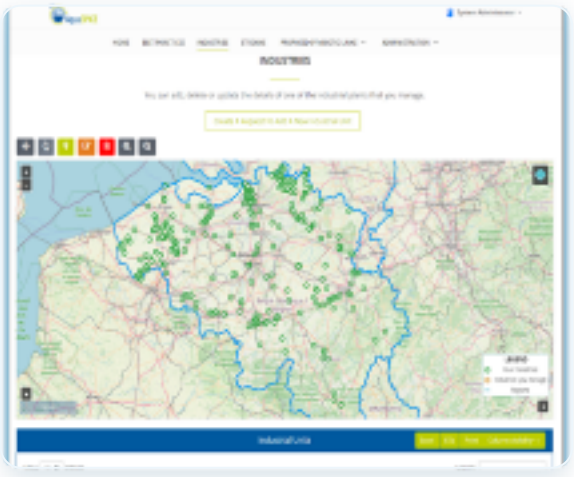


SUSTAINABLE ENERGY | SIX-STAGE ANALYSIS | DECISION MAKERS

https://robinson-eb.eu

Industrial Symbiosis Platform

An integrated suite of resources for assessing industrial-symbiosis opportunities based on waste reuse. The platform matches industrial waste producers with potential consumers using spatial and technical data, surfacing new business models and best practices for specific regions.



WASTE REUSE | SPATIAL MATCHING | BUSINESS MODELS

https://services.indigo.tuc.gr/SWAN

Research Infrastructure

State-of-the-art facilities for massive-scale computation & AI

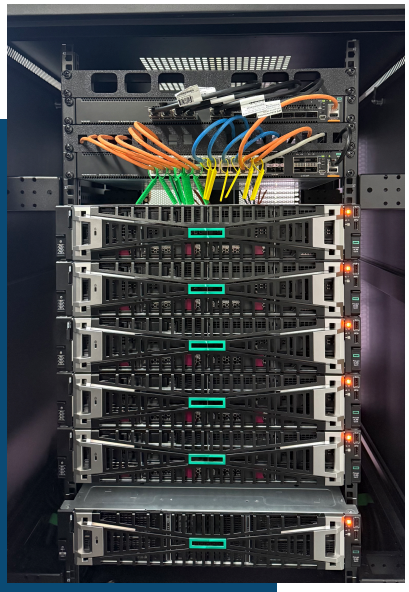
Our research group operates a multi-tiered infrastructure designed to support the entire scientific workflow—from environmental data acquisition and rapid prototyping to massive-scale computational analysis.

1. High-Performance Computing (HPC) Cluster
At the pinnacle of our computational capabilities is a cutting-edge HPE ProLiant Gen11 cluster, purpose-built for massive parallel processing.

Computational Powerhouse:
The cluster features 5 Compute Nodes, each powered by **dual AMD EPYC™ 9654** processors. With 96 cores per processor, this provides a staggering 960 physical cores combined with **3.8 TB of RAM** for memory-intensive simulations.

AI & Acceleration Node:
A dedicated GPU node drives our AI research, equipped with **four NVIDIA L40S 48GB** Accelerators and **dual AMD EPYC™ 9124** processors. This node is optimised for generative AI, deep learning inference, and complex rendering.

High-Speed Interconnect:
All nodes are linked via 100Gb Infini-Band/Ethernet adapters, ensuring ultra-low latency communication required for high-throughput scientific workloads.



960 Physical Cores, 3.8 TB RAM and End-to-End 100Gb Connectivity.







Supporting Infrastructure & Laboratories

2. Virtualisation & Development Cluster

Supporting our HPC is a flexible, heterogeneous virtualisation environment running **Proxmox VE**. This serves as our development sandbox, hosting workloads ranging from database management to GPU-accelerated testing.

Multi-Core Workstations: Threadripper Node: AMD Ryzen

- Threadripper PRO 5955WX (16-Cores/32-Threads) with 128 GB RAM and NVMe storage.
- **GPU Development Node:** Intel Core i9-10920X with 128 GB RAM and 3x NVIDIA RTX 3080 GPUs for local CUDA development.
- **General Purpose Node:** Intel Core i7-7800X (64 GB RAM) for standard tasks.

Resilience & Connectivity:
The system includes a **Proxmox Backup Server with 8 TB storage** for disaster recovery and a specialised Proxy Gateway to secure all virtual environments.

3. Cyber-Physical DAS

We operate an end-to-end IoT platform monitoring environmental and industrial parameters via **LoRaWAN Gateways** and **ThingsBoard Analytics**.

- **Weather & Air:** Meteorological stations, solar radiation sensors, and CO2 monitoring.
- **Smart Agriculture:** Real-time profiling of soil moisture, temperature, EC, and salinity. **Water Resources:** Ultrasonic flow meters, water quality (pH/ORP) probes, and level sensors.
- **Energy Analytics:** Monitoring via I-V curve tracers and smart power sockets.

4. Prototyping & Energy Lab

Our physical lab space allows for the rapid fabrication of custom sensor housings and renewable energy system testing.

- **Advanced 3D Printing:** Features a **Bambu Lab P1S** for high-speed structural parts and an **Anycubic Photon Mono X 6K** for high-resolution resin prints. **Photovoltaic Testbed:** An experimental PV setup featuring 4**x 100W panels,** MPPT charge controllers, and specialised data loggers for energy efficiency research.
- **Lab-scale Autonomous Vehicle Testbed:** Used for **digital twining** and sensory testing.

Partnerships

Members of Associations

indigo participates actively in the following associations

Participation in the following international networks:

- SUSAN Sustainability Academic Network (susanhub.com)
- ECOSYSTEX The European Community of Practice for a Sustainable Textile Ecosystem (ecosystex.eu)
- CCRI Circular Cities and Regions Initiative (circular-cities-and-regions.ec.europa.eu)
- LIAISE COST Action CA22110 / Cooperation, development and cross-border transfer of Industrial Symbiosis among industry and stakeholders (cost.eu/actions/CA22110)
- Hubs4Circularity Community of Practice (h4c-community.eu)
- ICT4Water Cluster for EU-funded research projects on ICT and Water Management (ict4water.eu)
- BRIDGE European Commission initiative which unites Horizon 2020 and Horizon Europe Smart Grid, Energy Storage, Islands, and Digitalisation Projects (bridge-smart-grid-storage-systems-digital-projects.ec.europa.eu)



Events

Scientific Workshops Hosted

- **Towards Circular Solutions for Textile Waste Management**, Special Workshop in the 8th International Scientific Conference CRETE 2025 conference, Chania, Greece. (2025)

- **Circular Systemic Solutions in Action: Transforming Crete into a Circular Region**, Special Workshop in the 8th International Scientific Conference CRETE 2025 conference, Chania, Greece. (2025)

- **Innovative Pathways to Nearly Zero-Energy Ports: Advancing Sustainability and Smart Mobility in Maritime Systems**, Special Workshop in the 20th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES), Dubrovnik, Croatia. (2025)

- AquaSPICE Summer School **Achieving Water-Smart Management in the Process Industry – An Educational Perspective**, Chania, Crete, Greece (2024)

- BEST (Board of European Students of Technology) Course Summer 2023 - **Industry 4.0: The path to digital (R)evolution**, Chania, Crete, Greece (2023)

- **Twin Digital and Green Transition to a Resilient Economy**, Hybrid Workshop, Chania, Greece. Organised by the Industrial and Digital Innovations Research Group of Technical University of Crete. (2022)



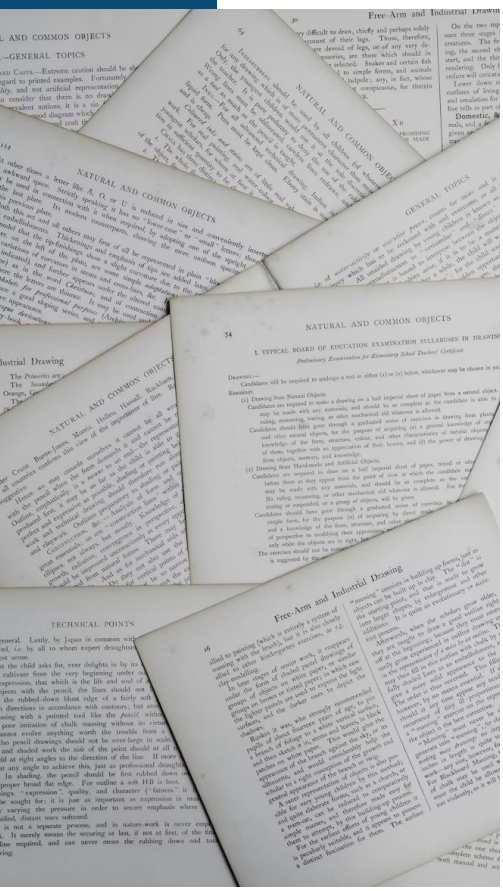
Events

Scientific Workshops Participated In

- G. Arampatzis. Social Innovation for and acceptance of circular systemic solutions. EU Green Week 2025, online event, June 2025.
- G. Arampatzis. From demonstration to deployment of circular solutions: First lessons learnt from CCRI pilot cases. CCRI Workshop. Online event, January 2025.
- F. Fatone, and G. Arampatzis. Materializing circular water use, fostering awareness in resource efficiency, and delivering innovative solutions for a Water-Smart Society. Ecomondo the Green Technology Expo. Rimini, Italy. November 2024.
- F. Fatone, A. Cherubini and G. Arampatzis. Boosting Circular Systemic Solutions through Virtual Regional Circular Economy Space: Project Overview and Water Reuse & Nutrient Recovery CSS. AquaSPICE Info-Day Event, Chania, Greece, July 2024. G. Arampatzis. AquaSPICE – Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovation. Knowledge Exchange Event. Organised by Water Reuse Europe. Brussels, Belgium, October 2023.
- G.Arampatzis. Challenges and prospects for the Circular Economy in the context of the Twin Green & Digital Transition. Workshop "The circular economy in just transition areas". Organised by Technical University of Crete, Chania, October 2023 (in Greek).
- G. Arampatzis. Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovation – focus on Terneuzen and Rosignano petrochemical areas. WATER PROJECTS EUROPE @ ECOMONDO: clusters, synergies and interface with market players and problem owners Event. Ecomondo the Green Technology Expo. Rimini, Italy. November 2023.
- G. Arampatzis. Challenges and Prospects towards the Green & Digital Transition and Adaptation to the Climate Crisis. Workshop "Seeking Green and Fertile Answers for the New Generation". Organised by Orthodox Academy of Crete, Chania, May 2023 (in Greek).
- G. Arampatzis. Innovation Alliance for the Circular Economy in Crete and the Mediterranean. 1st "In-Crete" Initiative Meeting "Empowering the Circular Economy in Crete and the Mediterranean", Chania, December 2022 (in Greek).
- G. Arampatzis. Digitalization and cyber-physical systems for water-smart cities and industries: demos and showcase. Digitalization and cyber-physical systems for water-smart cities and industries: demos and showcase Event. Ecomondo the Green Technology Expo. Rimini Italy. November 2022.
- G. Arampatzis. Process Modelling and Simulation for Industrial Cognitive Digital Twins. Hybrid Workshop “Twin Digital and Green Transition” to a Resilient Economy, Chania, Crete, June 2022.
- G. Arampatzis. Digital Technologies and the Digital Industry: Research opportunities towards the digital transformation of the Greek Industry. Online event “Horizon Europe: Opportunities for the Future of Smart Industry & Digital Technologies”, Organised by National Documentation Center, March 2022.
- G. Arampatzis. Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovations. Clustering event on preserving water- Integrated water-smart strategies for industrial processes. Organised by Water Europe, December 2021.
- G. Arampatzis. Challenges and Prospects towards the Energy Transition and Adaptation to Climate Change. Energy Day of the "Anavathmizo" Action, Workshop in the context of European Sustainable Energy Week. Organised by Hellenic Mediterranean University, Heraklion, October 2021 (in Greek).

Published

Papers



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- A. Vyrkou, M. Aryblia, N. Savvakis, I. Nicacio, O. Siddique, G. Arampatzis and A. Angelis Dimakis. Dynamic vs real time life cycle assessment. Cleaner Environmental Systems, 18, 2025. DOI: 10.1016/j.cesys.2025.100296
- E. Karkou, A. Papadaki, A. Angelis-Dimakis, A. Naves Arnaldos and G. Arampatzis. Water efficiency solutions for the oil refinery industry. Journal of Environmental Management, 391, 2025. DOI: 10.1016/j.jenvman.2025.126343 A Papadaki, N. Savvakis, N. Sifakis and G. Arampatzis. Analysis of Hybrid Renewable Energy Systems for European Islands: Market Dynamics, Opportunities and Challenges. Sustainable Futures, 2025. DOI: 10.1016/j.sftr.2025.100601
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- E. Karkou, A. Angelis-Dimakis, M. Parlapiano, N. Savvakis, O. Siddique, A. Vyrkou, M. Sgroi, F. Fatone and G. Arampatzis. Process innovations and circular strategies for closing the water loop in a process industry. Journal of Environmental Management 370, 2024. DOI: 10.1016/j.jenvman.2024.122748 T. Terlouw, N. Savvakis, C. Bauer, R. McKenna and G. Arampatzis. Designing multi-energy systems in Mediterranean regions. Applied Energy, 377, 2024. DOI: 10.1016/j.apenergy.2024.124458
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- J. Lua, G. Tsinarakis, N. Sarantinoudis, G. Arampatzis, X. Zheng and D. Kiritsis. A Semantic Model-based Systems Engineering Approach for Assessing the Operational Performance of Metal Forming Process. Computers & Industrial Engineering, 190, 110042, 2024. DOI: 10.1016/j.cie.2024.110042
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- C.J. Teo, E. Karkou,N. Savvakis, O. Vlad, A. Vyrkou, G. Arampatzis and A. Angelis Dimakis. Life cycle environmental impact assessment of slaughterhouse wastewater treatment. Chemical Engineering Research and Design, 200, 2023. DOI: 10.1016/j.cherd.2023.11.016
- N. Sarantinoudis, G. Tsinarakis, P. Dedousis and G. Arampatzis. Model-Based Simulation Framework for Digital Twins in the Process Industry. IEEE Access, 11, 2023. DOI: 10.1109/ACCESS.2023.3322926
- N. Savvakis, N. Sifakis, X. Kotakidis and G. Arampatzis. **Multiple energy resources integration in the food industry: A Technoeconomic analysis**. Journal of Cleaner Production, 426, 2023. DOI: 10.1016/j.jclepro.2023.139055
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