Co-funded by the
European Union

EIT InnoEnergy **Career Services**

Career Impact Challenges

Team Toolkit

About EIT InnoEnergy

EIT InnoEnergy operates at the centre of the energy transition and is the leading innovation engine in sustainable energy. It brings the technology, business model innovation and skills required to accelerate the green deal, progress towards Europe's decarbonisation and re-industrialisation goals, whilst also improving energy security.

Ranked as the most active investor in the energy sector in 2022 by Pitchbook, named in 2023 as one of Europe's top 10 most active deeptech investors by Sifted, and recognised in 2022 as Europe's leading impact investor in cleantech by Startup Genome, InnoEnergy backs innovations across a range of areas. These include energy storage, transport and mobility, renewables, energy efficiency, hard to abate industries, smart grids and sustainable buildings and cities, amongst others.

InnoEnergy is the driving force behind three strategic European initiatives which include the European Battery Alliance (EBA), the European Green Hydrogen Acceleration Center (EGHAC) and the European Solar Photovoltaic Industry Alliance (ESIA).

InnoEnergy was established in 2010 and is supported by the European Institute of Innovation and Technology (EIT), an independent EU body set up in 2008 to drive innovation and entrepreneurship across Europe. Since its inception, EIT InnoEnergy has screened more than 7,000 start-ups, launched more than 300 products to market and overseen its portfolio companies filing 370+ patents. Today, EIT InnoEnergy has a 200+ strong team with offices across Europe and in Boston, US.

www.innoenergy.com

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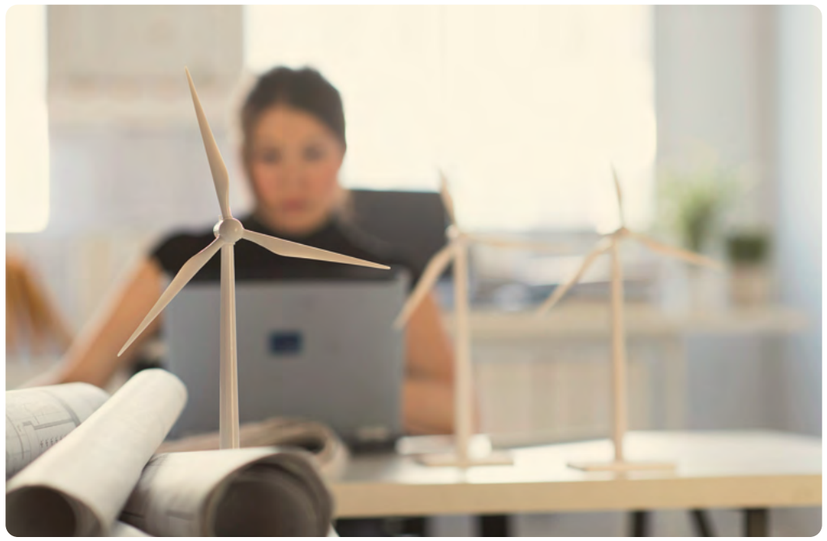
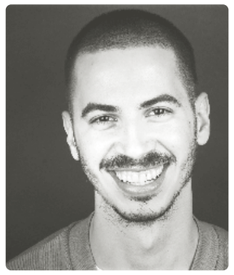


Welcome to the EIT InnoEnergy Career Impact Challenges!



This is an event of the EIT InnoEnergy Career Services organized for second year students of the EIT InnoEnergy Master School. The challenges allow you to increase your knowledge, broaden your network and lead to interesting future career opportunities.

This year, we will welcome teams and challenge partners in Paris, France. All teams will be tasked to develop a suitable campaign response to a specific challenge set by one of our Industry Challenge Partners: ABB, Galp, Engie, Siemens Energy, Schneider Electric and Northvolt.

Before meeting in Paris, you will have the opportunity to meet your team, discuss your GC Index Team Snapshot and get familiar with your challenge. Teams will use the eight-stages process to deliver a campaign response from problem diagnostics to full solution.

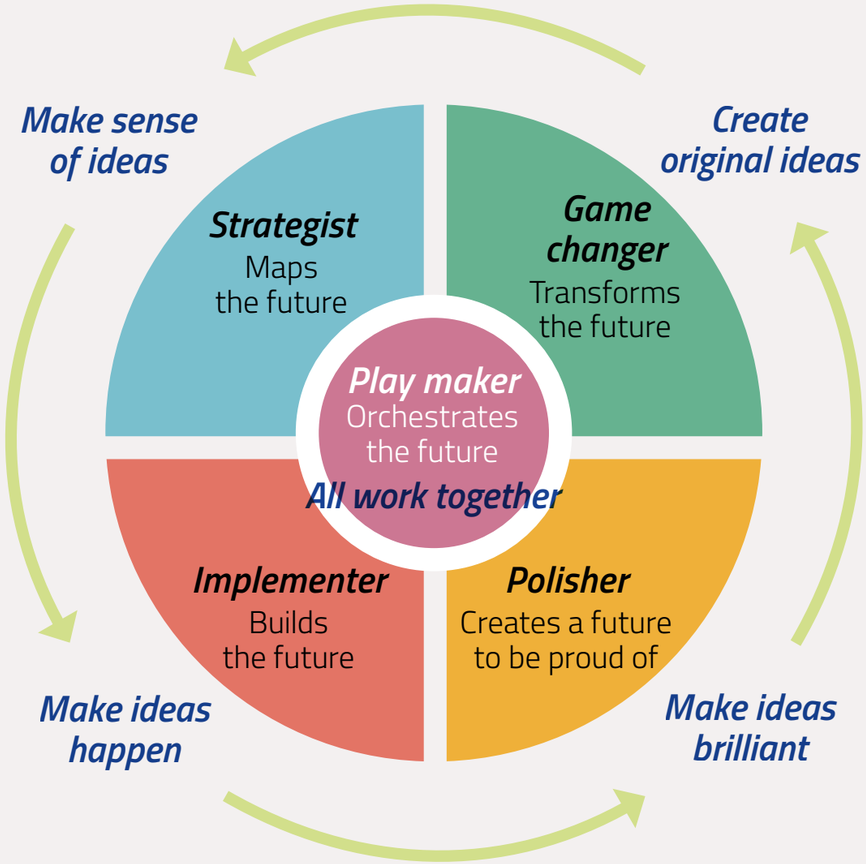
Once in Paris, you will have access to mentors from the challenge partners who will observe your progress and answer any questions you may have. Learn from their expertise! You will also have challenge facilitators from the EIT InnoEnergy Career Services and City CV. They will work with the teams to ensure that you perform at your best, utilise your team's assets, and contribute to a truly game-changing response.

During the event you will also have the chance to network, talk to representatives of the other attending companies and build meaningful connections.

At ENLIT, you'll have the chance to meet and connect with industry leaders, so make sure you take advantage of that!
Be curious, ask questions, and don't be shy to show the world how passionate you are about the energy transition.
Be brilliant!

Elvis Gherghinescu
Career Services Coordinator

Aligning everyone with the process of innovation...



POWERED BY THE GC INDEX®

What is The GC Index®?

The GC Index (a.k.a. The Game-Changing Index) is the organimetric that empowers organisations to drive performance and achieve innovation by creating game-changing teams and cultures. The GC Index is a radical re-think of how organisations identify and nurture key talent; identifying how people at all levels in organisations make their best impact.

The Career Impact Challenges teams have been built based on the results of the GC Index. You will have many decisions to make as a team. The GC Index language and framework will help you make those decisions along each step of your challenge journey so that you individually and collectively make your best impact and contribution. When every team member is making their best impact and their contribution is valued by others, then the team can be truly Game-Changing!

The game changer. *Transforms the future*
Driven by original ideas – They find new ways of doing things. Game Changers can generate original ideas and possibilities that are transformational.

The strategist. *Sees the future*
Why are we doing it? And how are we doing it?
Strategist read their environments in a way that shapes and sets direction in terms of strategic outcomes.

The implementer. *Builds the future*
It's about getting the job done.
Convert ideas into plans for action – 'the power house'.

The polisher. *Creates a future to be proud of*
If a job is worth doing, it is worth doing properly.
Polishers are the guardians of learning, continuous improvement and the 'pursuit of excellence'.

The play maker. *Orchestrates the future*
It's all about empowering others.
Play Makers get the very best from others individually and collectively in support of agreed objectives and goals.

Design Thinking

Build through design

Design Thinking is a methodology used by designers & engineers to solve complex problems and find desirable solutions. A design mindset is not problem-focused, it's solution focused and action oriented towards creating a preferred future. Design Thinking draws upon imagination, intuition, logic and systemic reasoning, to explore possibilities of what could be and to create desired outcomes that benefit the end use.

Human-centred innovation begins with developing an understanding of the customer's or user's unmet or un-articulated needs. Design thinking minimises the uncertainty and risk of innovation by engaging people through a series of prototypes to learn, test and refine concepts. Design thinkers rely on insights gained from real-world experiments, not just historical data or research.

Understand the Challenge

Define the Challenge

Ideation Response

Ideation Validation

Concept to Prototype

Prototype Validation & Re-Iteration

Finalisation

Launch

> *«Most people make the mistake of thinking design is what it looks like, people think it's this veneer - that the designers are handed this boc and told 'make it look good!' That's not what we think design is. It's not just what it looks like and feels like... Design is how it works!»*
>
> **— Steve Jobs**

There are eight core stages of the design thinking process of innovation...

Traditionally, challenges would undertake the Design Sprint process. This year's challenges will be using the Design Sprint process in combination with the G.C. Index to increase the capacity of innovation. So, we are introducing eight phases (compared to the traditional five). These phases have some overlap but are fundamental in the process of innovation.

Phase One
Understand the Challenge

This is all about empathy. Also, it is fundamentally the most important part of the process. Without a clear understanding of the challenge innovation will pivot and the results/outputs will be significantly distanced from the original challenge or problem. Spend the time getting under the skin of the challenge, understand fully what is the root problem and cause of the challenge.

Phase Two
Define the Challenge

Empathising will bring you closer to the roots of the challenge, but without framing the challenge or creating a definition; you can end up drifting away from the original brief. By creating a definition, you instil a nucleus to your innovation something that you can consistently go back and align with. This part of the process solidifies what you will work on.

Phase Three
Ideation Response

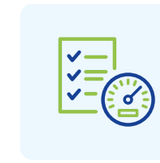
Quickfire ideas (not total solutions) need to be brought to the surface here. Once you have a challenge brief and definition, ideation will bring together radical, sequential and realistic thoughts. It doesn't matter if these ideas don't make sense right now but as a team make sure you are thinking outside the box and also considering simple iterations of concepts.

Phase Four
Ideation Validation

Now is the time to start putting more method into the madness of your ideas. Start to evolve the concepts and align to your challenge. Is there a fit?, How does the idea work? Does it answer the questions the challenge is bringing? These are some of the questions you need to be asking as you blueprint the concept and start to validate it.

Phase Five
Concept to Prototype

Theory to action now, start to build your concept into something tangible; ideas that remain theoretical do not have the opportunity of being critiqued fully which means that often these innovations will either miss the mark or fail. By building a prototype you increase the tangibility and allow the idea validation to move towards concept validation.



Phase Six
Prototype Validation & Re-Iteration

This part of the process is all about sculpting and refining; the more you test your prototyping the more you will come up with things that need to be added or stripped away – eventually your rapid reiterations will lead you to the final version.

Phase Seven
Finalisation

Start to close off all loops, make sure your reiterations are now finalised and that the concept/prototype is polished and to the standard that you had set. Furthermore, make sure that the concept is aligned with the expectations of the challenge definition.

Phase Eight
Launch

This is the phase where you start to develop the presentation, strategy and path to launching your concept/ prototype and ultimately pitch it to the judges.

Contribution and *impact* during challenge phases

	1 *Understanding the Challenge*	2 *Define the Challenge*	3 *Ideation Response*	4 *Ideation Validation*	5 *Concept to Prototype*	6 *Prototype Validation and Reiteration*	7 *Finalisation*	8 *Launch*	
Game Changer	Contribute with creative ways to focus on understanding the challenge ahead	Ensure all possibilities are being considered	This is the time to be free and expressive – bring possibilities to the group	Keep testing the idea validation process	Keep an open mind for other possibilities or creative solutions to challenges	Is there anything we can/ should do differently?	Start thinking about how the solution will be presented	What are the possibilities and the creative approach to launch – be radical	Contribution
	Refrain from inputting ways to solve the challenge – be patient	Recognise that this phase is about defining not for free association	Remember other people can have ideas too	Know when to let go of an idea or possibility	But remember this is the acting phase of the process – find your anchors for implementing	Now it is more about problem solving than radical redesign (if its radical you will need a very good reason)	Be supportive of any actions that need delivering	Remember others will not necessarily see what you see in the first instance	Impact
Strategist	Take time to look at all the data points available to you	Is the group aligned to what needs to be done?	Help frame some of the more radical ideas in a strategic context	Listen to all possibilities, but start to frame them ready for action	Ensure the group are aligned on what needs to be done; any pivots is quickly realigned	Does the prototype deliver what we want to achieve?	Support the Implementers in achieving the finalisation process	Start to process radical thinking into pragmatic steps	Contribution
	Recognise that not everyone will see the big picture like you (so quickly)	Consider that others will have opinions and inputs too	Do not shut down ideas that you do not understand too quickly – give them a chance	Do not jump to what you think is the right conclusion too quickly	Things will change, do not be so rigid… stay flexible… stay focussed	Make sure you are a voice of reason and reality for Game Changers and Polishers	Thinking and analysis has been done… it is all about delivery now	Remember others may not understand the process immediately, be patient	Impact
Implementer	Know when to move the group from theory to action – example scribing/ key point analysis	Consider the milestones needed to achieve the challenge definition	Help frame radical ideas into practical realities	Start moving the group to action (when it feels appropriate)	Get moving on developing from concept to prototype	Does this prototype deliver what we need it to?	Set deadline for finalisation and deliver	Show how the launch will be operationalised	Contribution
	Be patient and allow everyone in the group to understand the challenge	Be open minded and do not rush into tangible outputs	Try not to overvalue the tried and tested at this stage	Avoid premature action/ action without thinking	Do not rush and think you must do this all by yourself	Do not get frustrated with any last-minute changes – these can happen	Be mindful that others may not share your task focussed/ deadline centred approach	Be open to new ideas or opinions from others	Impact
Polisher	Make sure that that all points are considered before moving forward	Ensure the definition is well thought through and stress-tested	Build upon the new ideas and make them better	Push the idea validation to be the best it can be	Keep an eye on the quality of output and raise where things can quickly be improved	Does the prototype reach the agreed standards/ does it meet our expectations?	If there are any rapid iterations, now is the time to announce	Look that all details of the launch are covered and meet expectations & standards	Contribution
	Do not get stuck in irrelevant micro details at this stage	Be conscious with being over critical to the detriment of the process	Be constructive with your criticism – inspire not inhibit	Do not let perfect get in the way of good enough	At this stage do not let perfect get in the way of good enough	Do not do let go if you think it is not good enough, now is the time to Polish	Be mindful of the law of diminishing returns at this stage	Now is the time to be detail orientated but not overly stubborn, present the potential result that can come with the extra effort	Impact
Play Maker	Ensure that everyone is contributing to the process and fully understands the challenge ahead	Has this been an inclusive process?	Focus on establishing a possibility centred environment	There will be a lot of debate and it will need moderation	Ensure that the group knows it is time for action	Create the environment for debate and be the bridge between pragmatists and the obsessive	Get consensus that we have reached the finalisation and that all individuals approve	Get consensus form all that the launch meets the group's expectation	Contribution
	Do speak up if you see individuals or specific proclivities dominating which could be detrimental to group progress	Does everyone feel like they have contributed?	Ensure all new and creative ideas are being listened to	Do not try and please every individual, do what is best for the group	Keep the group focussed on acting	Do not let individual agendas influence the best interests of the group	Identify now any conflict and/ or disapproval and resolve	Help individuals that do not understand or object to see the bigger picture	Impact

The Pitch

Towards the end of the challenge your team will be pitching their solution campaign response to a select panel of judges made up of the challenge partner, EIT InnoEnergy Career Services and City CV.

5 MINUTES PRESENTATION

3 MINUTES QUESTIONS & ANSWERS

Some useful tips on pitching

Remember you only have 5 minutes so get to the point quickly.
Try not letting your powerpoint or presentation lead the pitch.
Storify your pitch - it makes it more engaging.
If you are using videos, animations or sound - check, check, check!
Think about non-verbal communication - it makes up 93% of the impact.
Make eye contact with your judges and audience.
Have fun and enjoy the process.

Each pitch will be scored on specific criteria with a ranking of 1 to 5

1	2	3	4	5
VERY POOR	POOR	MODERATE	GOOD	EXCELLENT!

Judging and Jury

The judging starts as soon as the challenges start.
The winners will not be decided just based on their pitch, each team will be assessed throughout the whole challenge.

Here is what judges will be assessing

1. The Challenge Approach

How well has the team understood the challenge or / and how well does the team follow and use the phases of the innovation process

2. Game Changing ideas / innovation

Has the team demonstrated an original / out-of-box thinking

3. Impactful collaboration

Has the team demonstrated a strong collaboration and their individual strengths

4. Solution oriented

Has the team developed a commercial and feasible solution

5. Pitch Production and Presentation

How interesting and effective was this pitch and presentation

Remember, you have workshops, clinics and mentoring rounds; all of these are opportunities for judges to review and assess your contribution to the challenges.

EIT InnoEnergy Career Impact Challenges
Schedule 2023

Day 1: Tuesday 28 November: InnoEnergy Masters student lounge in Hall 7.3

09.30 - 10.00	**Arrival to Venue & Registration students and mentors – meet at Democratisation Hub Theatre in Hall 7.2**
10.00 - 11.00	**Welcome to CIC (Democratisation Hub Theatre in Hall 7.2)** Introduction to CIC Short presentation from Challenge Partners ABB, Galp, Engie, Siemens Energy, Schneider Electric and Northvolt
11.00 - 13.00	**Students gather in teams and start working on challenges at the InnoEnergy Masters student lounge in Hall 7.3**
13.00 - 14.00	**Lunch**
14.00 - 16.30	**Individual team mentor session (30 min per team)** Exact timing/meetup point to be agreed between mentors and teams
16.30 - 18.30	**Reception with EIT InnoEnergy shareholders, portfolio companies and partners** Students and mentors are invited to join – networking opportunity!

Day 2: Wednesday 29 November: InnoEnergy Masters student lounge in Hall 7.3

09.30 - 13.00	**Individual team mentor session (30 min per team)** Exact timing/meetup point to be agreed between mentors and teams
13.00 - 14.00	**Lunch**
14.00 - 18.00	**Networking** Time for students to enjoy the event and network with the other exhibitors
19.00	**Deadline to submit pitch presentation to:** *elvis.gherghinescu@innoenergy.com*

Day 3: Thursday 30 November: Democratisation Hub Theatre in Hall 7.2

09.00 - 09.10	**Intro / Opening - be on time!**
09.10 - 09.50	**ABB** – Team Pitches, mentors in jury
09.55 - 10.35	**Galp** – Team Pitches, mentors in jury
10.35 - 10.50	**Break**
10.50 - 11.30	**Engie** – Team Pitches, mentors in jury
11.35 - 12.15	**Siemens Energy** – Team Pitches, mentors in jury
12.20 - 13.00	**Lunch**
13.00 - 13.40	**Schneider Electric** – Team Pitches, mentors in jury
13.45 - 14.25	**Northvolt** – Team Pitches, mentors in jury
14.25 - 15.30	**Award winning ceremony –** each company announces the winning team

*Central European Time (CET)

EIT InnoEnergy Career Impact Challenges

Challenge Partners

ABB

northvolt

ENGIE

Schneider Electric

galp

SIEMENS energy

Challenge 1

Overview

ABB Electrification Smart Power (ELSP) is a division focused on technologies to enable buildings, factories, and transportation to make energy management smarter, renewables more productive and operations more resilient. Smart Power | ABB

In the Digital Innovation Team of ABB ELSP, we oversee the definition and the management of strategic trajectories to onboard new technologies and business models to leverage advanced ecosystems to boost digital innovation within the Digital portfolio. Smart Power Digital Solutions | ABB

Context

Considering the unpredictable and rapidly changing nature of the modern business and geopolitical landscape (VUCA – volatility uncertainty complexity ambiguity), a data-driven approach allows industries to base their short-/long-term strategies and actions on solid information, rather than on risky intuition and assumptions. This approach applies to the energy field as well; especially to energy management, which is digital-centered by definition.

A data-driven decision-making process can positively affect many areas:

- Efficiency and productivity
- Awareness and knowledge
- Risk mitigation
- Competitive advantage
- Innovation and research
- Measurement of KPIs
- Resources allocation
- Predictive analysis and forecasting
- Continuous improvement
- Regulatory compliances (including energy/environmental reports)
- Others

"It is likely to be characterised by advancements in technology, increased focus on ethics and privacy, more sophisticated analytics, and greater integration of data into various aspects of business operations."

This is OpenAI ChatGPT answer to the question:
"What is the future data-driven approach for industries?"

Challenge

In the Digital Innovation of ABB ELSP, we are interested in exploring the potential of integrating different data types in a creative way to push decarbonisation and generate value for our internal and external (read "customers") stakeholders.

In general, we refer to data types that can be directly measured through any type of sensors: for example, Voltage, Current, Power, Energy, Temperature, air quality.

Input

Each team receives an excel file with:

- Plausible description of a customer profile,
- Plausible energy data (24 hours timespan)
  - DEP (decentralised energy production)
  - Loads (electrical, thermal)
- Additional data (24 hours timespan)
  - Production / energy platform additional inputs / …

Analysis

Each team works, following the eight-stages process, to respond to 3 research questions:

- How to use this data (+ additional data you think of) to generate value for the customer?
- How to use this data (+ additional data you think of) to propose a decarbonisation strategy for the customer?
- How to use this data (+ additional data you think of) to generate value for ABB Electrification Smart Power?

Be creative to think about what the value in the three questions is. It can be monetary/market, technological, product development related, strategic, future-technology related, innovation related, …

It is possible to interlink these 3 research questions: a value generated for the customer may become also value for ABB Electrification Smart power if bundled in a feasible Business Model.

One important thinking should be carried about the data granularity. For the sake of easiness, only 24h span is given. However, it is possible to make assumptions about monthly, yearly, multi-yearly data series if needed.

Output

Minimum delivery – present qualitative answers to the research questions: explain which data types have been used and describe the value generated.

Advanced delivery – a simple Proof of Concept (PoC): play around with the data in the input file, assume your own additional data, and show simple and practical examples of your concept about decarbonisation and value generation.

Evaluation criteria

- Data utilisation and integration
- Additional data types proposition (not present in the input excel file)
- Proposition of KPIs related to the 3 research questions
- Technologies (e.g., database usage, AI, Machine Learning, simulation tools, …) proposition
- Creativity – think out of the box
- Business strategy and models – use the data to generate value
- Viability of the proposition
- Consideration on how to use the same data types collected from different locations/buildings/plants for benchmarking and comparison

It is very interesting addition to propose and use some data types missing in the input excel; whatever data type you may regard relevant for the value generation.

More supporting documents can be found here

Mentors

Matteo Varisco
Global Product Manager Digital Innovation – Energy Engineer

After completing a Trainee Program among different areas and division of ABB Sweden, Matteo is now leading the Digital Innovation Team of the division Electrification Smart Power as a Product Owner. He graduated from EIT InnoEnergy Master's in Renewable Energy in 2019.

Lorenzo Fenili
Software engineer

Lorenzo has worked on various projects within the ABB Energy Manager platform, focusing on innovation and data-driven activities for the division Electrification Smart Power. He is currently a member of the Digital Innovation Team as a software and data engineer. He graduated in Computer Science from the University of Milan Bicocca.

Challenge 2

Part 1 – Tertiary Building & consumer

Buildings play a crucial role in both providing flexibility to the energy network and CO_2 emissions. Here's an overview of their role in these aspects:

CO_2 Emissions

Energy Consumption: Buildings are major consumers of energy, and a significant portion of this energy comes from fossil fuel-based sources like natural gas for heating or traditional electricity for cooling. This reliance contributes to CO_2 emissions, as these fossil fuels release carbon dioxide and other greenhouse gases when burned.

Inefficient Systems: Older or poorly designed buildings may have inefficient heating, ventilation, and air conditioning

(HVAC) systems, resulting in higher energy consumption and subsequently higher CO_2 emissions.

Material Use and Construction: The materials used in constructing buildings, as well as the energy-intensive construction process, can also contribute to the embodied carbon emissions associated with the building.

Flexibility for the Network

Demand Response: Buildings can be equipped with smart technologies that allow for demand response. This means that during peak demand periods, the building's heating and cooling systems can be temporarily adjusted or optimised to reduce the load on the network, enhancing its flexibility.

Thermal Storage: Buildings can act as thermal energy storage units. Excess heat or cold can be stored in the building's structure or using specific technologies (e.g., Phase Change Materials) during off-peak periods and then utilised during peak times when demand on the network is high.

Distributed Energy Resources (DERs): Buildings can host distributed energy resources like solar panels, geothermal systems and combined heat and power (CHP) systems. These resources can provide additional energy to the network, improve overall system resilience, and reduce the reliance on centralised power plants.

By optimising energy use, adopting renewable energy sources, implementing energy-efficient building designs and technologies, and participating in demand response programs, buildings can play a pivotal role in reducing CO_2 emissions associated with energy consumption and enhancing the flexibility and sustainability of heating and cooling networks.

Challenge

How can we get customers to take an active role in reducing energy consumption, in particular by providing flexibility to the network?

Potential customers: building owners and inhabitants/users, buildings

Expected - deliverables: pragmatic approach, new business model

Mentors

Valerie Beaudichon
Marketing Director – Engie solutions BIL

Nora Guemar
Head of Research and innovation

Julien Roques
Sustainable Manager – Engie Impact

Part 2 – New business use cases/approaches for DHC customers

Context and Key Indicators

DHC systems are generally more energy-efficient than individual heating and cooling systems. They allow for centralised heat production, efficient distribution, and utilisation of waste heat, leading to energy savings and reduced losses during energy transmission compared to decentralised systems.

However, they are being developed in disparate ways around the world, particularly in regions with extreme climatic conditions (Mongolia, Siberia, etc.). However, Europe has succeeded in developing some 6,000 district heating networks, which heat around 60 million people and account for 11 to 12% of the heating market.

The scale of heating networks varies greatly from one country to another. The UK, Switzerland and the Netherlands serve less than 4% of homes. Conversely, district heating is the dominant form of heating in Denmark, Finland, Lithuania, and Sweden, with rates of around 50%. In Iceland, 95% of heating needs are met by district heating networks, thanks to the natural abundance of geothermal energy. The case of Denmark is also exemplary, with heating networks accounting for 50% of the heating market, and even 98% in Copenhagen*.

The energy crisis that Europe has experienced in recent years and the European ambition to achieve climate neutrality by 2050 are driving heating networks towards new energy production solutions.

These energy production solutions for district heating networks are becoming green, decentralised, and varied: geothermal, solar thermal, thermal storage, electric heat pumps, solar PV, etc.

The heating network therefore must optimise these decentralised solutions, while continuing to seek energy efficiency, the best possible economics and quality of service for users.

This massive shift towards new production sources is also accompanied by the electrification of uses and the replacement of traditional gas by gas heat pump solutions.

So, the heating network is faced with a very strong decentralisation of its production resources and a strong increase in consumption demand. How will the heating network be able to cope with these peaks in demand?

One of the solutions could be for the heating network to motivate customers to make their energy available to the network, which would make it possible to manage peak demand and shift consumption when necessary.

Challenge

How to engage customers who own decentralized solutions to participate in grid flexibility and increase the % of Green Energy consumed. Customers can be PV, electric heat pumps, solar thermal, waste heat, etc.

Potential customers: industrial companies, public authorities, buildings, and BtoC.

Expected - deliverables: ready-to-use technical solutions, sales pitches, regulation upgrades, etc.

*Sources: CEREMA

Mentors

Alexis Goldberg
Directeur De Marche Réseaux de chaleur

Olivier Racle
Head of Business platform District Heating & Network

Challenge 3

Introduction

Buildings constitute a significant portion of Europe's energy consumption, accounting for 40% of total usage, and contribute to 36% of emissions, underlining the urgency of sustainable solutions. In this context, electrification and building renovation emerge as two strong avenues to fortify the European economy and bolster energy security.

According to the summary report by the European Climate Foundation (ECF) and the European Alliance to Save Energy (EU-ASE) titled Building Europe's Net-Zero Future - Why the transition to energy efficient and electrified buildings strengthens Europe's economy, heat pumps, are an exceptionally efficient technology, offering a swifter pathway to decarbonise Europe's building stock. Furthermore, the synergistic integration of heat pumps with building renovation holds the potential not only to curtail energy expenses but also to realise energy savings equivalent to 25% of current Russian gas imports by 2030.

The challenge context

Within buildings in the tertiary sector, Galp is exploring the integration of electric heat pumps to foster heat generation through sustainable decarbonisation and repurposing waste heat. Collaborative endeavors, including potential pilot initiatives with different hotel chains, are actively being considered. However, Galp's Innovation team recognises the value of external insights in meticulously identifying the sector/typology and strategic building locations across Iberia (comprising Portugal and Spain) that are ideally poised for heat pump implementation.

The challenge

Galp's aspiration is to augment its proficiency in this realm by undertaking one or more pilot projects encompassing diverse building typologies such as shopping centers, hotels, offices, airports, and hospitals.

To guide Galp on this transformative journey, the following steps are crucial:

- Precisely pinpointing the typology of building throughout Iberia that offer favorable conditions for seamless heat pump integration.
- Characterise the type of existing thermal systems most suitable for replacement by heat pumps.
- Emphasising the recommended power capacity as a pivotal benchmark in all proposed recommendations or outcomes. For instance, sites exceeding, or under, XXkW of thermal power capacity might prove impractical (technically or economically), while installations in regions exceeding specific temperature thresholds could pose economic viability concerns.

Your guidance in addressing these aspects is highly appreciated as Galp endeavors to develop new business models that encompass the strategic deployment of heat pump technology.

Mentors

Joana Larsen
Open Innovation Lead

Joana Larsen is an Open Innovation Lead at Galp, in charge of the "Startup Engagement & External Ecosystems" area. She works with Upcoming Energies, an open innovation platform that links Galp to startups and other potential partners, increasing the pipeline of innovation opportunities for Galp's portfolio.

Alexandre Chaves
Project Manager

Alexandre Chaves is a Project Manager from the Renewables & Commercial Innovation Center at Galp. He works mainly in the area of "Smart Energy Solutions", targeting the decarbonisation and electrification of B2B and B2C clients. He also works in several other innovation areas, such as solutions for Electric Mobility, Retail, Industry Decarbonisation, or large-scale Renewable Energy projects. Alexandre has a Master's degree in Business Administration at ISCTE-IUL, where he focused his thesis on Peer-to-Peer power trading and the usage of Artificial Intelligence for the management of Smart Grids.

northvolt

Challenge 4

Northvolt is a European supplier of sustainable, high-quality battery cells and systems. Founded in 2016 to enable the European transition to a decarbonised future, the company has made swift progress on its mission to deliver the world's greenest battery. The company is now a European leader within battery production, engaged in partnerships with some of Europe's premium automotive manufacturers and industry players.

Europe's first homegrown battery gigafactory, Northvolt Ett in northern Sweden, has been operational since 2021 and is currently ramping up to 60 GWh/year cell production.
The company has a presence in several locations across Europe and North America, with over 5,000 employees working to enable the future of energy.

The Challenge Context

As analysed in the joint report by McKinsey and the Global Battery Alliance: "Battery 2030", the global demand for Li-ion batteries is expected to soar in the next decade largely through mobility applications, but also stationary storage and consumer electronics. Earlier this year, a regulatory shift towards sustainability in the form of the US Inflation Reduction Act, Europe's "Fit for 55" program, the 2035 ban of internal combustion engine vehicles in the EU, and India's Faster Adoption and Manufacture of Hybrid and Electric Vehicles pushed this market projection even further.

On the other hand, China hosts the majority of the battery supply chain from refining, active materials, and cell and pack production, resulting in a large dependency on ties to China.

The challenge

Considering the current market setup and widespread trend of electrification, define the business case for a new player in the battery industry.

- Which customer segment would you focus the business on?
- Which is your targeted product and battery technology?
- What would differentiate you from other players in the market?
- What would be your strengths, weaknesses, opportunities, threats (SWOT Analysis)?

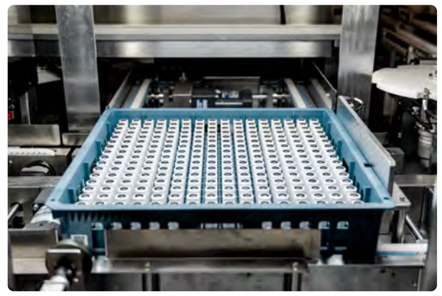
Mentors

Raghav Sharma
Production Engineer
InnoEnergy alumnus

Jamil Ismayilzada
Process Engineer
InnoEnergy alumnus

Svenja Krimm
Energy Specialist
InnoEnergy alumna

Mirela Wasztyl
Talent Acquisition Specialist



Schneider Electric

Challenge 5

AI for Climate Change

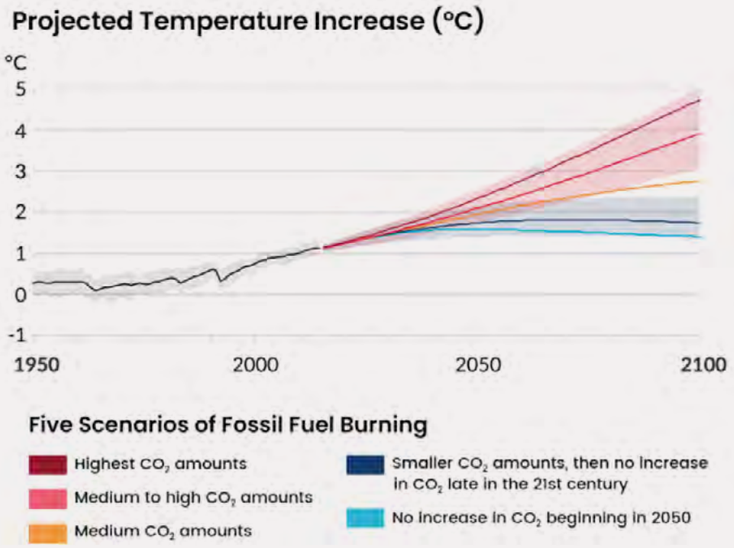
Schneider Open Innovation Business challenge- Energy Management

Legend/introduction: Welcome to the AI for Climate Change - Open Innovation Challenge! We invite you to embark on a journey of innovation and environmental impact as we harness the power of artificial intelligence to combat one of the most pressing global issues of our time: climate change. Join us in this exciting endeavour to make a positive difference for our planet.

Context

The Earth's climate is changing, and the global climate is projected to continue to change over this century and beyond. The magnitude of climate change beyond the next few decades will depend primarily on the amount of greenhouse (heat-trapping) gases emitted globally and on the remaining uncertainty in the sensitivity of the Earth's climate to those emissions.

With significant reductions in the emissions of greenhouse gases (GHGs), global annual averaged temperature rise could be limited to 2°C or less. However, without major reductions in these emissions, the increase in annual average global temperatures, relative to preindustrial times, could reach 5°C or more by the end of this century.



The amount of climate change by the end of the century depends on decisions we make today. If we reduce CO_2 amounts to stop increasing after 2050, global average temperature will increase from 1-1.5°C, and this is considered a best-case scenario (blue line in graph). If we don't reduce CO_2 and the amounts continue to increase, the worst-case scenario warming will be 4.5-5°C (red line in graph). Source, IPCC Working Group I, 2021.

Impacts related to climate change are evident across regions and in many sectors important to society, such as human health, agriculture and food security, water supply, transportation, energy, and biodiversity and ecosystems; impacts are expected to become increasingly disruptive in the coming decades. There is very high confidence that the frequency and intensity of extreme heat and heavy precipitation events are increasing in most continental regions of the world. These trends are consistent with expected physical responses to a warming climate.

On August 9, 2021, the Intergovernmental Panel on Climate Change issued the first chapter of the highly anticipated 6th assessment report, fully due in 2022. The conclusions are clearer than ever: global warming is man-made and the window of opportunity to change the course on which the world appears to be set on is closing rapidly. The UN Secretary General Antonio Guterres called this report a "Code Red for Humanity". The target is clear. To keep global warming limited to 1.5 degree (compared to preindustrial levels), carbon dioxide emissions must be zeroed by 2050, and reduced by 30-50 percent by 2030 (while other greenhouse gas emissions must also be significantly abated).

Once said, there is no needed arbitrage between human progress and climate change mitigation. In fact, there will be no climate change mitigation if it does not build on human progress. As the planet faces unprecedented challenges, it's crucial for us to support our community, partner, and government to adapt and mitigate these risks effectively. Embracing the challenge of climate change is our way to unlock a world of opportunities, where sustainability becomes the driving force for innovation, growth, and a brighter future.

In Schneider Electric Energy Management, we are promoting impacting strategies delivering efficiency and sustainability with innovation and we want you to focus on of this topic:

Physical assets - Physical assets like buildings could be damaged or destroyed by extreme precipitation, tidal flooding, forest fires, and other hazards. Can coastal building turn the tide on rising flood risk? Will infrastructure bend or break under climate risk? Could climate become the weak link in our Supply Chain?

Natural capital - Climate change is shifting ecosystems and destroying forms of natural capital such as glaciers, forests, and ocean ecosystems, which provide important services to human communities. This in turn imperils the human habitat and economic activity. Will there be reduced dividends on natural capital?

Food systems - Food production could be disrupted as drought conditions, extreme temperatures, or floods affect land and crops, though a changing climate could improve food system performance in some regions. Will the world's breadbaskets become less reliable? How will African farmers adjust changing patterns of precipitation?

Livability and workability - Hazards like heat stress could affect the ability of human beings to work outdoors or, in extreme cases, could put human lives at risk. Increased temperatures could also shift disease vectors and thus affect human health. Will India get too hot to work? Will there be a Mediterranean basin without Mediterranean climate?

Think opportunity not risk!

Objectives

Companies are facing immense pressure from investors and customers to improve their transparency and performance on **ESG issues (environmental, social and governance issues)**. Chief executives who align their sustainability strategy with their digital transformation reported revenue growth of up to **41%** higher than those who did not align their efforts. Yet while 95% of companies have operational ESG goals, only 10% have made significant progress toward meeting them.

AI can help move the needle in the right direction by providing **comprehensive ESG management solutions**, reporting capabilities, and actionable emissions insights for even the biggest enterprise. In fact, data sources are complex and divided, leading to insufficient analyses, inconsistent reporting, and unfulfilled promises. This is where artificial intelligence (AI) can be a game changer for managing ESG efforts and, ultimately, addressing climate change.

Be able to **use AI machine learning and advanced AI techniques** to model energy use, anomalies, forecast trends and GHG (Greenhouse Gas Emission) and identify savings on emissions. Be able to use data from equipment, plant floor, BMS (Building Management Systems), historian, utility bills, satellite data, ERP (Enterprise Resource Planning), weather services, emissions libraries, distributed energy resources.

Leverage machine learning to identify high-value emissions reduction opportunities and recommend actions to achieve sustainability goals and fulfil SDGs goals. Create customised goals to lower energy, water, waste, and GHG emissions and identify gaps versus targets and current savings versus forecasts.

Objective: A solution where AI could bring help to companies to really reduce emissions wand avoid climate risks, improve adaptation, and achieve Net Zero goals.
You can for example lever one of the decarbonisation area below or suggest a new one:

Adopting Renewable Energy: Transition to renewable energy sources to reduce carbon emissions and dependence on fossil fuels.

Implementing Energy Efficiency Measures: Improve energy efficiency across operations to minimise waste and lower costs.

Developing Sustainable Supply Chains: Collaborate with suppliers to ensure sustainable practices, reduce emissions, and promote ethical sourcing.

Fostering Employee Engagement: Educate and involve employees in sustainability initiatives, encouraging their active participation and ideas.

Establishing Climate Risk Assessments: Conduct comprehensive assessments to identify and address vulnerabilities and develop adaptation strategies.

Promoting Sustainable Transportation: Encourage the use of electric vehicles, promote public transportation, and support remote work options to reduce carbon footprint.

Enabling data-driven decision-making: Collect, analyse, and interpret large volumes of data, enabling informed and data-driven decision-making across the organisation.

IMPORTANT: Participants will be evaluated on their ability to imagine a concrete solution to a concrete challenge, back-up your ideas on qualitative and quantitative information, we want facts, no assumptions.
Think out of the box and connect on topics, ideas, backgrounds, challenge…
Get inspired by the people around yourself!

Resources

Stacks Suggestion

- Climate-ADAPT – Data Set Library
- Amazon Sustainability Data Initiative
- ISIMIP Repository
- CLIMADA

Additional Resources

- Resource Advisor
- Microgrid Advisor
- Autonomous Production Advisor
- Digital Video Series | Establishing a Culture of Innovation & Critical Thinking
- Optimizing Your Outcomes: AI-Enabled Energy & Sustainability Programs
- The Role of Artificial Intelligence in Energy & Sustainability

Submission

Your solution must be submitted digitally prior to presentation to the jury.
The choice of the support for the presentation is yours.

Evaluation criteria

Block	Criteria	Description
BUSINESS PLAN	Impact on Sustainability	Evaluation of the project's potential to address sustainability challenges. Both materialities, topic and impact are clearly identified.
	Understanding User Needs	Evaluation of the project's potential to address users needs. Problem, user-case and segment quantitatively defined
	Innovation	Evaluation of the project's potential to be innovative in its competitive landscape. It's easy to understand what the solution is and there is a compelling description of the innovation, e.g. comparison to existing solution. The outcomes for users, citizen, companies are fully described.
	Strategy	Evaluation of the project's potential to be scalable. You propose a feasibility plan (technical complexity, resource requirements, and timeline) and assess whether the market has an increased demand and growth.
TECHNICAL REALISATION	Documentation & Code	Evaluation of the clarity and quality of project documentation and code. The project's documentation, code structure, and comments are uploaded on the repository. Both Technical Realization and Business Plan are linked together.
	Data Collection, Quality & Ethic	Evaluation of the data sources, data quality, and data collection methods. The database used is comprehensive, reliable and relevant for the solution proposed. You start thinking on a Data Quality Assurance Process. In addition, you address potential biases, privacy concerns, or collection challenge.
	Integration and Deployment	Evaluation of the project's potential to be integrated into real-world systems. Both integration and infrastructure have been considered.
	Machine Learning/AI Models	Evaluation of the project's potential to be run through AI. One or more of the following topics have been explored with reliability, relevance and clarity: model selection, training methodology, performance metrics, and optimization techniques.

Mentors

Alexandre Achache
Sustainability Consultant

Julian Tharsis
Global Sustainability Reporting, Compliance & Analytics Director

Silvia Polverini
Energy Management Expert Consultant

SIEMENS energy

Challenge 6

Topic: Smart Grid and Cybersecurity

"Securing the Future: Tackling Cybersecurity Challenges in the Smart Grid Era"

Scope

The urgent need for decarbonization to combat climate change has led to a higher integration of renewable energy sources into the grid. This transition, while essential, brings with it increased complexity and difficulty in managing the grid efficiently. As a result, digital solutions are becoming increasingly important to ensure the smooth operation and stability of the power system.

With the growing reliance on digital systems and interconnectivity, it is crucial to address potential vulnerabilities and protect the grid from cyber threats, which can compromise the confidentiality, integrity, and availability of critical grid infrastructure and data, potentially leading to service disruptions or even large-scale blackouts. This highlights the importance of continuous investment in cybersecurity measures to safeguard the future of renewable energy integration and maintain the resilience of power networks.

Challenge

Identify the main cybersecurity risks and threats associated with the digital transition of the grid to a smarter grid. Provide an overview of the existing solutions in the market designed to address these cybersecurity challenges and identify potential gaps.

- Provide an overview of the main types of cyber security threats from the grid perspective and identify the main pinpoints.
- Do a market research and identify the solutions currently offered by main actors (e.g., Hitachi Energy, Schneider, GE, etc.).
- Identify the potential gaps.

Mentors

Nicolás Turrillas Voboril
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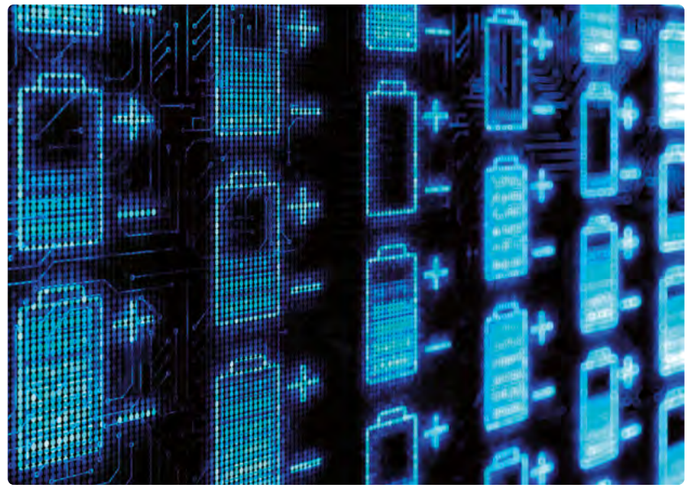
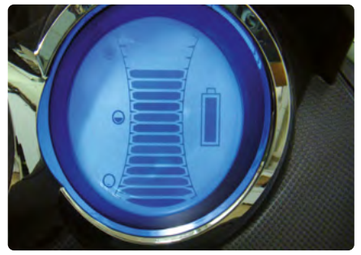
Jyothi Balachandra
Cyber Security Engineer

Stefanie Pfahlmann Schafhauser
Team L eader for Portfolio Delivery & Operation

Nina Jabłońska
Sales Application Expert





Contact

The EIT InnoEnergy Career Impact Challenges is brought to you by EIT InnoEnergy Career Services in partnership with ENLIT Europe.
Please find below your contact during the challenge.

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