

# ACTIVITY REPORT

# 2021



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## SPECIAL THANKS

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*The Centre for Systems Solutions would like to express great appreciation to Jan Sendzimir. Our organization wouldn't be the same without his support and creativity. Not only was he one of its main ideators but has also offered assistance in implementing its mission.*

# 8 SIMULATIONS DEVELOPED AND APPLIED WITH AROUND 300 STAKEHOLDERS

Raw Materials Challenge

COP26 Cascading Climate Impacts - single player

REBOOST Social Simulation

Recreate Policy Simulation

PHUSICOS NBS Simulation

Deep Sea Mining Simulation

ABM2Policy Simulation

Community Organizing Game

# 6 INTERNATIONAL PROJECTS

CASCADES: Cascading climate risks: towards adaptive and resilient european societies

RURITAGE: Rural regeneration through systemic heritage-led strategies

Ocean Management Game (also known as Deep Sea Mining)

The World's Future Game Online for the African context

REBOOST: A Boost for Rural Lignite Regions

Long-termism 2021

# 2 NEW MEMBERS IN OUR TEAM

PAOLO  
SENIOR GAME  
DESIGNER



KAROLINA  
VIRTUAL  
ASSISTANT



FROM MORE THAN  
25 COUNTRIES FROM AROUND THE WORLD

TEMS SOLUTIONS

# IN NUMBERS



> 500  
PARTICIPANTS

IN OUR ONLINE  
WORKSHOPS  
AND WEBINARS

~ 200  
PARTICIPANTS

IN WORKSHOPS  
FACILITATED BY  
MODERATORS  
TRAINED BY US



# PROJECTS

*We participated in 6 international projects this year, and worked with more than 75 partners from more than 22 countries from around the world.*





## REAL-WORLD PROBLEM SITUATION



## CRS TEAM MEETINGS

To keep everyone updated on the projects' progress, and to communicate our needs, and announce upcoming events, we introduced Monday online meetings. Every Monday at 10.00 AM, our team gathers on the Zoom platform. Every week a different member of the team runs the meeting and introduces any changes on a virtual projects' board. We also update the Google calendar and set up any new goals for the upcoming days. Moreover, since many of us still work remotely and thus live meetings are rare, we keep two team retreats a year - one in the summer, and the other in winter. Each time we select a new venue and enrich working sessions with hiking or sight-seeing tours.

# RURITAGE

## RURAL REGENERATION THROUGH SYSTEMIC HERITAGE-LED STRATEGIES

Duration: **June 2018 - May 2022**

Contact: **Anna Koch**

e-mail: **[anna.koch@systemssolutions.org](mailto:anna.koch@systemssolutions.org)**



*RURITAGE* is a 4-year project funded under the EU Horizon 2020 programme. Its main goal is the creation of an innovative rural regeneration paradigm, based on Cultural and Natural Heritage. In this way, the project aims to consolidate the role of culture as the fourth pillar of sustainable development and a contributing factor to economic growth, social inclusion and environmental sustainability in rural areas. By establishing a new heritage-led rural regeneration approach, *RURITAGE* aims to utilize the unique heritage potential of the selected rural areas and turn them into sustainable development demonstration laboratories. Based on past research and experiences, *RURITAGE* has identified 6 Systemic Innovation Areas, namely: Pilgrimage, Resilience, Sustainable Local Food Production, Integrated Landscape Management, Migration, and Art & Festival, as well as 11 Cross-cutting Themes that represent the ways in which cultural heritage acts as a driver for the regeneration of rural areas and their economic, social and environmental development.

Through the analysis of 13 selected Role Models (i.e. rural communities that have demonstrably and successfully pursued a heritage-led regeneration within one of the 6 Systemic Innovation Areas), *RURITAGE* supports the co-creation and implementation of heritage-led regeneration strategies in 6 Replicators (i.e. rural communities that replicate the heritage-led regeneration strategies of the Role Models to fit their particular contexts).

We've been chosen for the design and development of social simulations within the project. The project partnership is planned to last until 2022.

The project received funding from the European Union's *Horizon 2020* research and innovation programme, under the grant agreement No 776465.



# CASCADES

## CASCADING CLIMATE RISKS: TOWARDS ADAPTIVE AND RESILIENT EUROPEAN SOCIETIES

Duration: **September 2019 - December 2022**

Contact: **Łukasz Jarzabek**

e-mail: **lukasz.jarzabek@systemssolutions.org**



CASCADES identifies how the risks of climate change to countries, economies, and peoples outside Europe might cascade into Europe. It does so by analyzing how these risks interact with major challenges facing European societies. We are working with a diverse range of stakeholders – both within and outside Europe – to address these risks from a multitude of approaches.

The main objective of CASCADES is, within four years, to analyze the trade, political and financial channels through which climate change impacts might cascade into Europe from the outside, significantly altering Europe's risk exposure; and to support the design of a coherent European policy framework to address these risks.

We lead the stakeholder involvement process and are responsible for developing the Policy Simulation and the CASCADES multiplayer Social Simulation.

Stakeholders will be actively involved in the research process and co-develop the Policy Simulation. The goal of the series of workshops with Policy Simulation is to integrate research generated by partners, present results to stakeholders, gather their input about cascading risks and their recommendations on approach and results – and ultimately to develop an effective and efficient science-policy interface.

An online multiplayer serious game will also be developed to secure the project's impact beyond its lifetime. This serious game's main topics will be policy learning, education and awareness rising. The setting of the game will be stylized, i.e. it will work as a metaphor of given problems.

The project received funding from the European Union's *Horizon 2020* research and innovation programme under grant agreement No 821010.

MAY

## 360° VIEW OF CLIMATE IMPACTS: EXPERIENCING THE FUTURE TO PLAN ADAPTATION

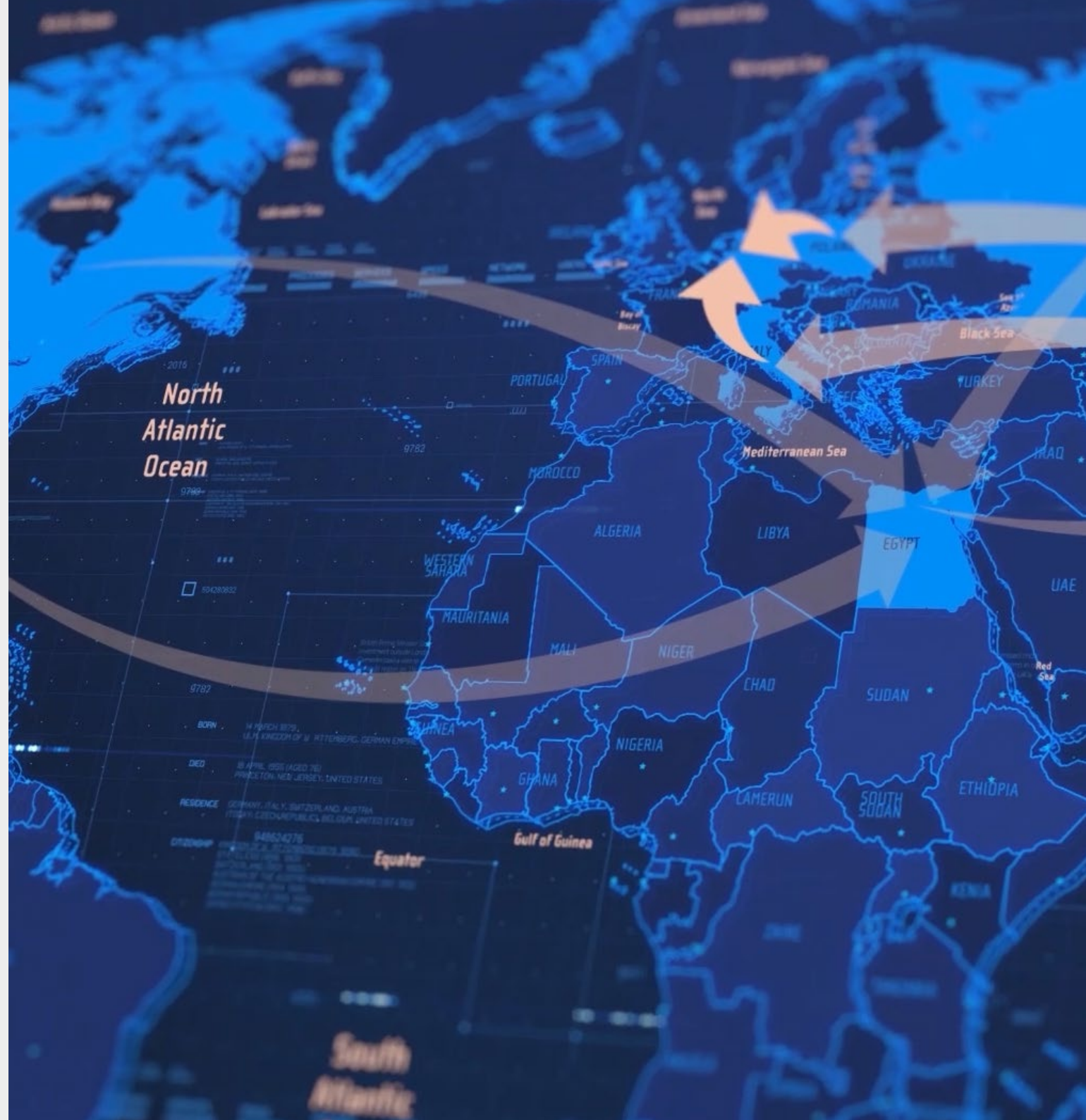
Together with the CASCADES project, the European Centre for Development Policy Management, PIK Potsdam Institute for Climate Impact Research, Climate Analytics and IIA-SA, we organized the session *360° view of climate impacts: experiencing the future to plan adaptation* at the ECCA 2021 online conference.

During our sessions on the 31st of May, participants experienced the latest climate impact science in the innovative format of a Policy Simulation led by our team.

We confronted players with a scenario of dramatic events caused by the climate crisis in regions surrounding Europe. Using an online simulation environment portal participants had to discuss how to counteract the emerging crises.

More than 200 people with backgrounds in science policy, climate dynamics and public administration joined morning and afternoon workshops to take on the roles of the most important decision makers.

The ECCA2021 online event was organized by the European Commission, RECEIPT, JPI Climate, SINCERE, CASCADES.





# KEY EVENTS

## SEPTEMBER

### RAW MATERIALS CHALLENGE SIMULATION AT THE INGSA2021 CONFERENCE

We ran a workshop with our *Raw Materials Challenge* simulation as a satellite event during the 4th International Conference on Science Advice to Governments (INGSA 2021). The event took place online, on the 8th of September 2021. We organized this workshop together with the International Institute for Applied Systems Analysis (IIASA), in partnership with the Fonds de Recherche du Québec (FRQ) and the International Network for Government Science Advice (INGSA).

The simulation took place entirely online in a custom-made, interactive environment accessible via browser. The main theme of the event was the challenges of interactions between science and policy. We explored that issue using the case of critical minerals that are necessary for an energy transition from fossil fuels to renewables.

### CASCADES: SECOND CORE WORKSHOP WITH PROJECT STAKEHOLDERS

The second Core Workshop with Stakeholders took place online on the 21st September 2021. The workshop was organized together with Potsdam Institute for Climate Impact Research and in collaboration with the project partners.

In the morning, we led a Policy Simulation session, based on a new, custom-made interactive platform. Participants met in a virtual environment, where they explored climate impact cascades and analyzed resilient pathways (policies to build European resilience.) During the afternoon session, participants reflected on the simulation experience and discussed how to better respond to cascading climate impacts with policy/business solutions.

## NOVEMBER

### OUR SIMULATIONS WERE PART OF COP26 - CASCADING CLIMATE IMPACTS: POLICY SIMULATION

During the COP26, our team in collaboration with partners from the CASCADES project ran several interactive events via Chatham House Climate Risk and Security Virtual Pavilion. Throughout the COP26, anyone could explore an interactive and immersive single-player simulation about cascading climate risks.

Towards the end of the COP26, we also organized a facilitated session using *Cascading Climate Impacts Policy Simulation*. During the session, players could directly interact with other participants within the simulation. Participants could explore not only the climate impacts but also possible solutions to the crisis at hand. After the simulation, participants could take part in a debriefing session to share their reflections.

We based both simulations on the CASCADES - *Cascading climate risks: toward adaptive and resilient European Societies* project's results.

You can still access single-player simulation: <https://engage.socialsimulations.org/COP26>

# REBOOST

## A BOOST FOR RURAL LIGNITE REGIONS

Duration: **September 2019 - December 2022**

Contact: **Jakub Damurski**

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*A Boost for Rural Lignite Regions* aims to support stakeholders in three European lignite regions (Lusatia in Germany, East Greater Poland Voivodeship in Poland, and Gorj in Romania) in the transition from the current high economic dependence on lignite to a low-carbon future. The three regions share some characteristics that make the transition process difficult, including the economic downturn, aging populations, lack of job opportunities, and weak stakeholder cooperation. However, the regions differ with respect to the availability of political support from governments and funding for the transition process.

Where possible, the project supports the actual implementation of promising alternatives to lignite-fired power generation with the potential to feed into a Deep Demonstration Just Transformations.

Within the project, we designed a policy simulation for each case study. The main goal of the simulations was to involve and empower local stakeholders in the design and exploration of alternative future pathways. Players explored an interactive environment that reflected the main socio-economic and geographical characteristics of the actual regions. The results of the simulations were shared to stimulate mutual learning and innovation diffusion across the three regions. At the end of the project we will also develop a multiplayer online game for dissemination purposes.

The project has been implemented within the EIT Climate-KIC, funded by the European Commission. EIT Climate-KIC (Climate Knowledge and Innovation Community) is Europe's largest public-private innovation partnership focused on climate change, consisting of dynamic companies, the best academic institutions, and the public sector.





# KEY EVENTS

## SEPTEMBER

### REBOOST MULTIPLAYER SIMULATION TEST

On the 15th of September, we invited partners and colleagues interested in the topics of regional transformation and „just transitions” to participate in a workshop with *REBOOST* simulation. During the workshop we introduced a prototype of an online multiplayer game and then discussed stakeholders perceptions and visions of possible future development.

Last year, we introduced stakeholders from Lusatia, East Geater Poland, and Gorj to the *REBOOST* Policy Simulations. Now, with the *REBOOST* simulation, we took the next step in disseminating *REBOOST* findings and supporting stakeholders from European mining regions beyond the project.

## OCTOBER

### REBOOST SIMULATION WORKSHOP WITH ADVANCED PROTOTYPE

At the beginning of October, we organized a remote workshop with the advanced prototype of a new simulation dedicated to the *REBOOST* project. This time, *REBOOST* partners and representatives of a few Wrocław-based academic institutions, including the University of Economy, joined our session.

Our main aim was to test a completely new online simulation based on the outcomes of the previous *REBOOST* workshops from 2020.

The *REBOOST* simulation was co-created with our colleagues from partners’ institutions, who used their expert knowledge to support the design. But this particular workshop was the first opportunity for them to see the simulation in action.

In addition to the usual debriefing session, we asked participants to share their comments on the interface and contents of the *REBOOST* simulation. We will use the feedback to further develop the tool before the next series of local workshops in Gorj, Lusatia, and Easter Greater Poland.

### REBOOST TRAIN-THE-TRAINER MEETING

As the next *REBOOST*, local workshops in Gorj, Lusatia, and Eastern Greater Poland are on the horizon, we invited our partners from Timis Chamber of Commerce, Industry and Agriculture (CCIAT), Romania, to a short moderation training.

During the meeting led by Michalina Kułakowska, our partners learned how to navigate the *REBOOST* simulation moderator’s interface and moderator’s materials. On top of this, they could practice the workshop scenario step by step. At the end, we also dedicated some time to the topic of facilitation and workshop organization and addressed any remaining questions or doubts.

We expect to organize similar meetings for our partners from Germany and Poland in 2022.

# LONG TERMISM 2021

Duration: **January 2021 - December 2021**

Contact: **Jakub Damurski**

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Many of the investments needed for mitigating future impacts of climate change, such as those in infrastructure and energy, will require long-term orientation as well as a financial system that is able to produce financial flows for remedial and preventive climate action.

Rethinking notions of value and shifting towards long-term thinking are necessary to create the ecosystems that collaboratively can change our economy from an extractive to a regenerative one. The *Long-Termism* project is focused on the transformation of mindsets and the establishment of mechanisms to enable shifting towards long-term thinking to facilitate sustainable behaviours and investments into sustainability. The *Deep Demonstration* process is co-creative and evidence-based, engaging international and academic institutions, private enterprises and the financial sector, and grass-roots movements, and civil initiatives.

The Centre for Systems Solutions is responsible for developing an online Policy Simulation prototype as a platform for creative experimentation around systemic levers. The simulation will be tested as a collaborative tool for testing alternative policies and institutions that can be then combined into a more sustainable and long-term oriented financial system.

The project is supported by the *EIT Climate-Kic Deep Demonstrations* program and co-funded by EIT.

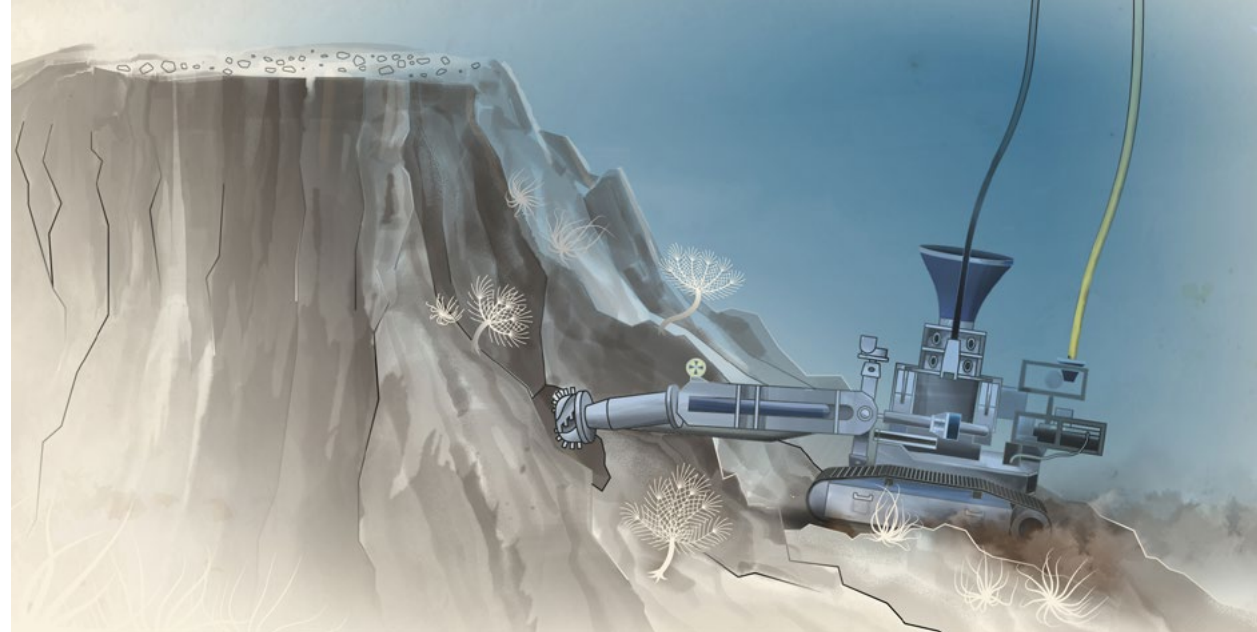


# DEEP SEA MINING SIMULATION

Duration: **January 2020 - December 2022**

Contact: **Piotr Magnuszewski**

e-mail: **piotr.magnuszewski@crs.org.pl**



The *Deep Sea Mining Simulation* aims to explore the trade-offs of deep sea mining. It is especially focused on conflicting motivations, such as providing resources for the clean energy transition versus biodiversity protection. The simulation was created by our team in collaboration with Olga Mironenko and with the support of the Balaton Group and Sustainable Ocean Alliance.

The project started in 2020 and at that time we planned to test the simulation prototype with the students of the Cairo Institute of Liberal Arts and Sciences in Alexandria. Our plans, however, had to be changed due to the coronavirus lockdown. We thus focused our efforts on transforming the original face-to-face experience into an online simulation.

So far, we have managed to conduct two online test sessions: one with the Balaton Group members (during the BG meeting), and the other one with a general audience. We have received very positive feedback as well as suggestions for improvements. Based on these suggestions and on our internal discussions, we are going to improve the simulation by the end of 2022.

The *Deep Sea Mining Simulation* allows participants to dive into the subject of underwater mining of minerals, such as cobalt and nickel, that are indispensable for the clean energy transition. They become members of the Stakeholder Advisory Board for the International Seabed Authority and jointly decide on recommendations on the future of deep sea mining. Even though the Board is a fictional entity created for the purpose of the simulation, both the International Seabed Authority itself and the issues to be discussed are very real. Through a process of analyzing background facts, debating, and voting, the participants will need to arrive at a final decision: should deep sea mining take place or should there be a moratorium on it?

# THE WORLD'S FUTURE GAME ONLINE FOR THE AFRICAN CONTEXT

Duration: **October 2020 - April 2021**

Contact: **Paolo Campo**

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The Centre for System Solutions (CRS) and The Institute of Leadership and Development (ILDPAfrique), with the support of the Balaton Group, are developing a French version of *The World's Future Online* and its accompanying training material for facilitators. The new language version of the simulation will be used alongside the existing one to support capacity building in sustainable development in French- and English-speaking African countries.

*The World's Future* is an interactive online social simulation in which players adopt high-level leadership roles within a world much like ours. As the simulation progresses, they experience the pressures of making tradeoffs and the thrills of finding synergies involved in pursuing sustainable development.

As the participants engage in the topic, make decisions and watch their impacts, the learning experience becomes more real. The emotions associated with visualizing the results make it easier to retain information and understand the tradeoffs and synergies necessary to achieve the 2030 Sustainable Development Goals. Players often mention feeling a distinct mind shift after playing *The World's Future*, as they are able to understand the interconnectivity of the global goals more deeply.

Adapting *The World's Future* will be the first step of a long term partnership between ILDP-Afrique, GAIA and CRS to develop and apply a number of policy simulations supporting the policy development and direct actions aimed at sustainability transformation of Africa.



# GAMES4SUSTAINABILITY

Contact: **Michalina Kułakowska**  
e-mail: **contact@games4sustainability.org**  
**michalina.kulakowska@systemssolutions.org**

The [Games4Sustainability \(G4S\)](#) platform is a guide to games and social simulations that can be used in the sustainability education and transition planning contexts.

The G4S blog collects a variety of success stories on how sustainability professionals, academics and organizations make use of social simulations and games in their areas of activity.

The [Gamepedia](#), a subsection/subpage of G4S, meanwhile, enables users to find a perfect match for their needs from among 100+ games and simulations, which are categorized by The Sustainable Development Goals they address.

## DEVELOPMENT OF THE CENTRE FOR SYSTEMS SOLUTIONS IN POLAND

Project coordinator/contact: **Magdalena Liszka**  
e-mail: **magdalena.liszka@systemssolutions.org**

The project, implemented thanks to the financial support from The Sendzimir Foundation, includes the following activities: Development of social and strategic simulations and other systems thinking tools to improve sustainable development education; workshops to facilitate dialogue on the management of adaptive social and ecological systems; data collection and analysis; financial and administrative management; and IT services.

The team involved in the project includes Magdalena Liszka, Jakub Damurski, Piotr Magnuszewski, and Łukasz Jarząbek.

### AFTER ACTION REVIEWS - WHAT WE GAINED FROM THEM

In 2021 most of our team members worked remotely; therefore, the After Action Reviews became more important than ever. Not able to see each other in person, we took every opportunity to meet via Zoom or Google Meet with our cameras on. All projects, events and simulations were reviewed by the participating members after the fact. The coordinators or organizers were tasked with gathering feedback on all aspects, including the preparation, development and implementation of the processes.

### SHARING COMPETENCES WITH OTHERS

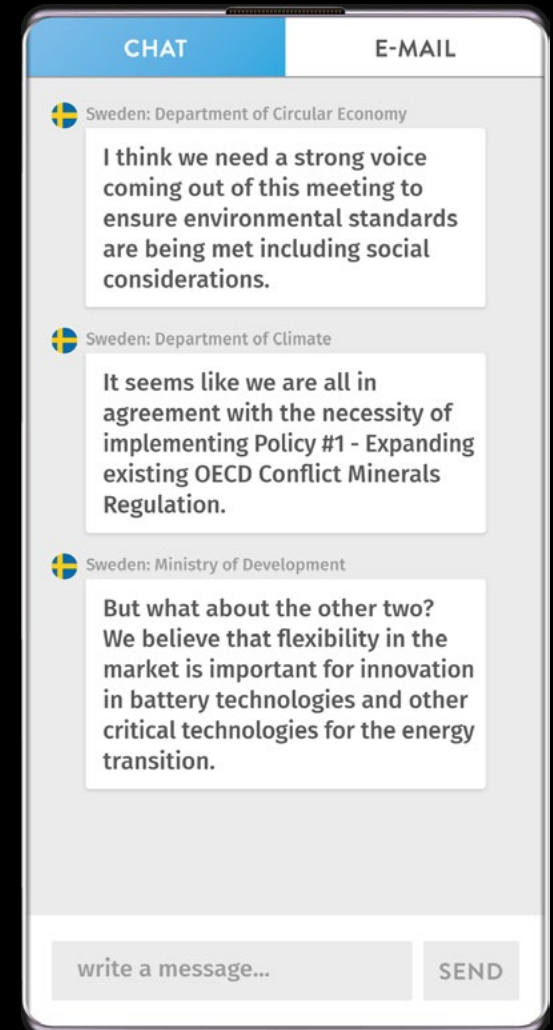
In 2021 we organized a lot of internal online workshops and webinars. Our team members facilitated occasional *Share your competences* workshops on using wordpress, Miro and Zoom, or facilitating one of our simulations. Occasionally we also met during internal webinars about different methodologies used for our projects, for example about Policy Simulations.

# SOCIAL AND STRATEGIC SIMULATIONS

*In COP26 Cascading Climate Impacts - single player simulation, participants are confronted with a scenario of dramatic events caused by and connected to climate crisis.  
More on the page 21.*







Participants assume the roles of representatives of various countries and organizations responsible for global safety and well-being. They gather in a virtual conference center and engage in a series of collective decisions preceded by several meetings and discussions.



# RAW MATERIALS CHALLENGE

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Number of players: **30-150**

Duration: **1,5-3h**

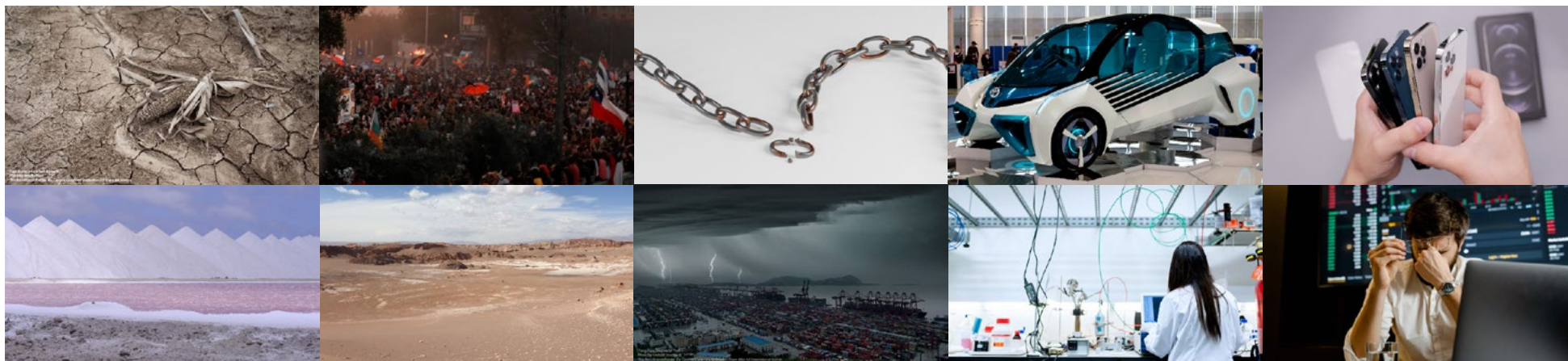
Requirements: **computer with an internet connection and headset for every participant**

*The Raw Materials Challenge Simulation* aims to bridge the gap between science and science users and to create an environment for navigating complexity in a meaningful way. Participants of the simulation assume the roles of organizations responsible for global safety and well-being. They gather at the virtual conference center and engage in a series of meetings, discussions and decision-making. The simulation provides several interactive storylines, enabling its participants to take on diverse perspectives. They experience plausible scenarios of a possible critical minerals crisis. Reacting to that unfolding chain of events, they engage in bilateral and multilateral negotiations, at the same time being pushed in different directions by media and private interests.

The simulation takes place in the near future and focuses on the social and environmental challenges connected with the increasing demand for rare earth minerals needed for a clean energy transition. To address these challenges, an international group of committed countries, organizations, universities, and research institutes form a working group to develop a proposition for a new regulation - the Charter on Raw Materials for Energy Transition.

The simulation was developed in the Horizon 2020 project *CASCADES – Cascading climate risks: Towards adaptive and resilient European Societies*, in collaboration with project partners. The *CASCADES* project has been funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 821010.





# COP26 CASCADING CLIMATE IMPACTS - SINGLE PLAYER

Number of players: **30 - 150**

Duration: **1,5 - 3h**

Requirements: **computer with an internet connection and headset for every participant**

*The Cascading Climate Impacts Policy Simulation* is an online, narrative-oriented experience that takes the participants to the near future. They gather in a virtual conference center and engage in a series of collective decisions preceded by several meetings and discussions. Participants assume the roles of representatives of various countries and organizations responsible for global safety and well-being. In these roles, they explore several interactive storylines offering diverse perspectives. They are confronted with a scenario of dramatic events caused by and connected to the climate crisis. The participants are invited to work together to decide on policy propositions for counteracting the emerging crises. The immersive character of their experience stimulates imagination, invokes emotions, encourages learning and knowledge sharing, and motivates action.

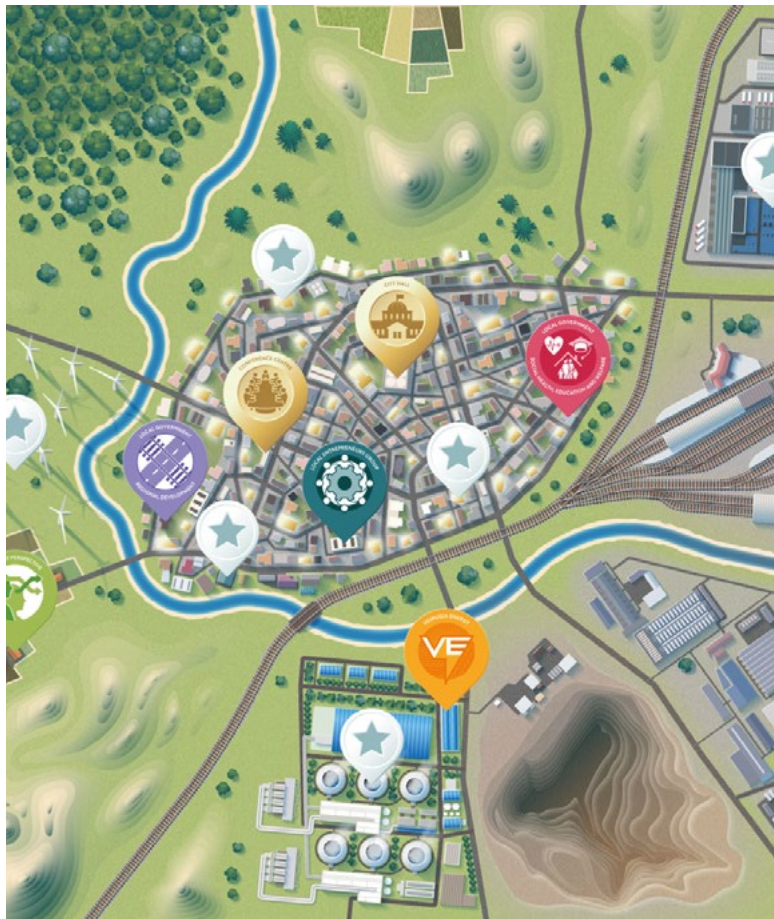
*The Cascading Climate Impacts Policy Simulation* was created as part of the *CASCADES – Cascading climate risks: Towards adaptive and resilient European Societies* project, which was funded through the EU *Horizon 2020* programme. It was one of the events we were running during the *COP26* together with our partners from the *CASCADES* project via Chatham House Climate Risk and Security Virtual Pavilion.

# REBOOST SOCIAL SIMULATION

Number of players: **10 - 30+**

Duration: **2 - 2,5h**

Requirements: **computer with an internet connection and headset for every participant**



The *REBOOST Simulation* is a facilitator-led multiplayer game, where participants are given the opportunity to develop their own visions of a low-carbon future. They test solutions and carve their pathway towards a just transition and a revitalization of a fictional region. This fictional region's characteristics is based on the case studies researched in the EIT Climate-KIC *REBOOST: A Boost for Rural Lignite Regions* project. The project consortium, led by University of Graz - Wegener Center for Climate and Global Change, includes: Brandenburg University of Technology Cottbus-Senftenberg, Climate-KIC Holding BV, Climate-KIC GmbH, E3G, Potsdam Institute for Climate Impact Research, Stowarzyszenie Centrum Rozwiązań Systemowych, Timis Chamber of Commerce, Industry and Agriculture (CCIAT).

In the simulation, players take on the roles of key actors involved in the regional energy transition process (in municipalities, energy sectors, services sectors, small businesses, NGOs...). Their task is thus to conduct high stakes negotiations and fund projects that would ensure a smooth energy transition and

address most pressing matters of the region. Because of the limited budget assigned to the participants, projects must be funded from diverse sources. The actors are thus forced to initiate discussion and take some collaborative effort. Only a certain number of projects will be funded and so players need to choose a common goal. Each organization will have competing agendas with a focus on different themes (social, business, energy, innovation, environment, tourism, etc...) which clash in direct confrontation.

The simulation feedback (in the form of news articles) will provide information about the social, economic and environmental consequences of the participants' choices.

The simulation is available in English and Romanian. The Polish version is slated to be released in 2022.

The simulation was developed in the *REBOOST: A Boost for Rural Lignite Regions* project. The project is supported by the EIT Climate-Kic INNOVATION ECOSYSTEMS – Cross European Ecosystems program and co-funded by EIT.



# RECREATE POLICY SIMULATION

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Number of players: **20**

Duration: **2,5 - 3h**

Requirements: **computer with an internet connection and headset for every participant**



The city of Vienna, as well as Austria and the whole European Union, aim to dramatically decrease their transport-related emissions to fight the climate crisis. The future of Vienna's transportation is closely connected with an ongoing discussion about the role of public space in the city, and how it should be managed. These issues create a complex landscape that involves multiple decision-makers, organizations, and concerned citizens.

The Policy Simulation engages the participants in discussion about different visions they have for addressing decreasing emissions and public space management in Vienna. The participants debate and decide on fictional yet plausible policy propositions that aim to respond to real problems that the city faces.

The negotiation process, which is the main part of the simulation, takes place in a virtual "conference center". The participants are able to communicate verbally, as well as to use special chat rooms for private negotiations. Using this kind of setting, creates a familiar environment for the participants, similar to what they know from real conference and consultation events.

The *Vienna Transport Policy Simulation* was developed as part of the project *Resource nexus for transformation to circular, resilient, and liveable cities in the context of climate change (RECREATE)* together with the International Institute for Applied Systems Analysis (IIASA).

# PHUSICOS NBS SIMULATION

Number of players: **8 - 32+**

Duration: **1 - 3h**

Requirements: **computer with an internet connection and headset for every participant**



*PHUSICOS Simulation* is a multiplayer browser-based simulation that focuses on the challenges related to the implementation of nature-based solutions (NBS) for disaster risk reduction. It focuses on the negotiations between stakeholders in their attempts to implement available nature-based solutions (i.e. retention basins, buffer strips along rivers, riverbed widening, natural paving of riverbeds, terracing of slopes). The role-playing aspect of the game enables stakeholders to experience a situation where various, often opposing, worldviews and goals are represented. The simulation can be played either face-to-face or online.

For the time being the game is available in English. In the near future, we will develop several language versions of the simulation to reach a wider audience and spur broader stakeholder engagement.

The *PHUSICOS* project received funding from the European Union's *Horizon 2020 Research and Innovation Programme* under Grant Agreement No 776681. The consortium of partners consists of Norwegian Geotechnical Institute (NGI), University of Napoli Federico II (UNINA), French Geological Survey (BRGM), University of Vienna (UNIVIE), University of Salzburg (PLUS), Risques & Développement (RD) in France, Centre for GeoTechnologies at the University of Siena (UNISI), Université de Genève (UNIGE), International Institute for Applied Systems Analysis (IIASA), Chair for Strategic Landscape Planning and Management at the Technical University of Munich (TUM), CREAM, Agenceter, Oppland County Authority, Serchio River Basin Authority and The Consorcio de la Comunidad de Trabajo de los Pirineos (CTP).



# DEEP SEA MINING SIMULATION

Number of players: **5 - 60+**

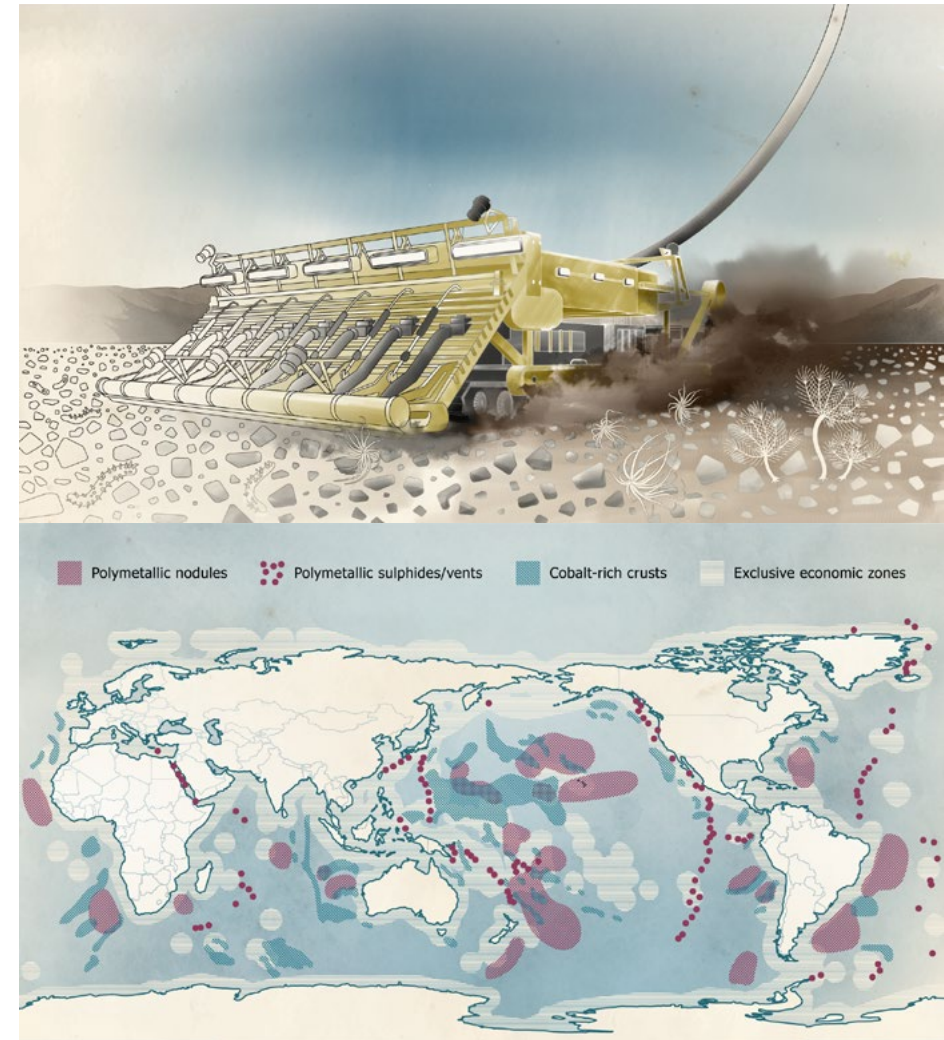
Duration: **2 - 2,5h**

Requirements: **computer with an internet connection and headset for every participant**

In the *Deep Sea Mining Simulation* participants become members of the Stakeholder Advisory Board for the International Seabed Authority and dive into the topic of underwater resource extraction. Some of the roles also include the representatives of underwater nature to give them a platform for adding their perspectives. The participants take part in the Board meeting and jointly decide on recommendations about the future of deep sea mining. Even though the Board is a fictional entity created for the purpose of the simulation, both the International Seabed Authority itself, and the issues to be discussed are very real. Analyzing background facts, debating, and voting, the participants strive to settle whether deep sea mining should continue or be suspended. The question of a potential moratorium is rooted in real-world dilemmas - mining companies or scientific and environmentalist communities have been lobbying for or against it for some time.

Throughout the simulation, participants are prompted to keep in mind and consider the pros and cons of both options. How to reconcile the need for energy transition and global decarbonization with the interests of deep-sea ecosystems, which are closely interconnected with other processes in the ocean and beyond? The workshop ends in a debriefing session, which creates a space to reflect on the events in the simulation and the choices the participants made.

*Deep Sea Mining Simulation* was created by our team in collaboration with Olga Mironenko. The development of the simulation was supported by the Balaton Group and Sustainable Ocean Alliance.





# ABM2POLICY SIMULATION

Number of players: **30-150**

Duration: **1,5-3h**

Requirements: **computer with an internet connection and headset for every participant**

A stakeholder simulation game combined with data obtained from agent-based modelling is used to explore stakeholder dynamics, in particular, how parties may weigh different trade-offs associated with alternative migration policies. Such an exercise can also be used to understand how a potential conflict may arise among diverse stakeholders. We will develop a role-playing simulation game, in which potential players will assume 'simulated roles' of national-level policy makers and stakeholders, who are engaged in the evaluation of alternative migration policy. A role-playing simulation includes relevant storylines, policy questions and roles, together with perspectives or worldviews that inform the preferences of plural stakeholders. The discourses stem from different social contexts, which, in turn, are shaped by the ways in which people organize, perceive and justify their social relations. The simulation can be played either face-to-face or online. The main version of the game will be available in English.

The simulation was developed in the *Agent-based models to inform economic policies on migration (ABM2Policy)* project. The project's main aim is to advance the methodology of formal mathematical agent-based models (ABMs) applied to migration processes that affect Austrian and Russian national economies.

Consortium of partners consists of the International Institute for Applied Systems Analysis (IIASA) and Central Economics and Mathematics Institute of Russian Academy of Sciences (CEMI RAS).



# LET'S ORGANISE!

## A QUEST FOR SOCIAL JUSTICE

Number of players: **11 - 16**

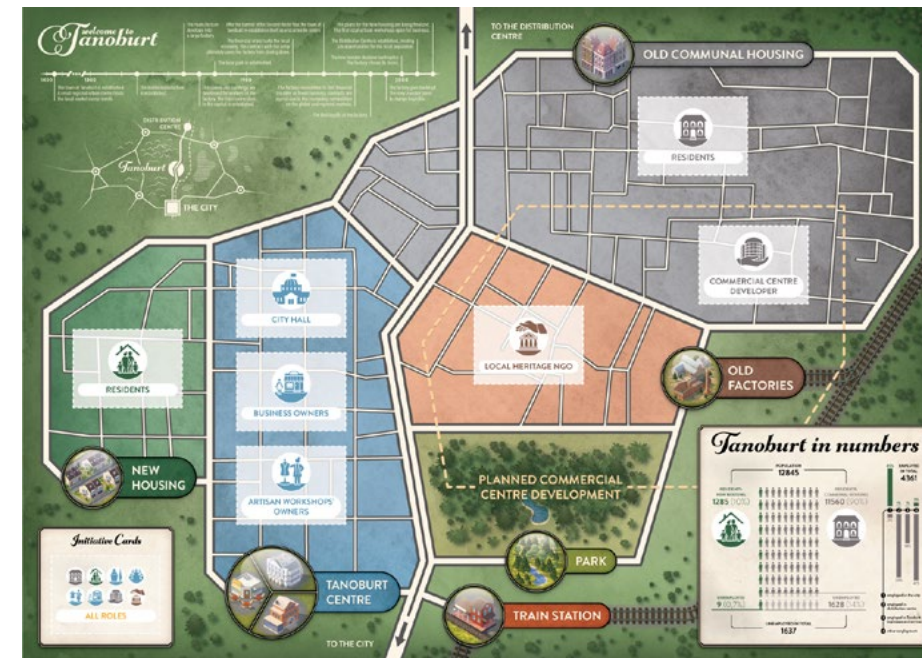
Duration: **2 - 2,5h**

Requirements: **Let's Organise! game set, a few tables and a chair for every participant**

*Let's Organise! a Quest for Social Justice* is a facilitator-led multiplayer game, where participants are given the opportunity to deal with the complex issues in the fictional town of Tanoburt. Participants have to create solutions that will address the interest of each stakeholder. This means that the community organizers first have to discuss the emerging topics with the residents and other important roles in the area. Only then they can organize actions or design solutions that will address the issues.

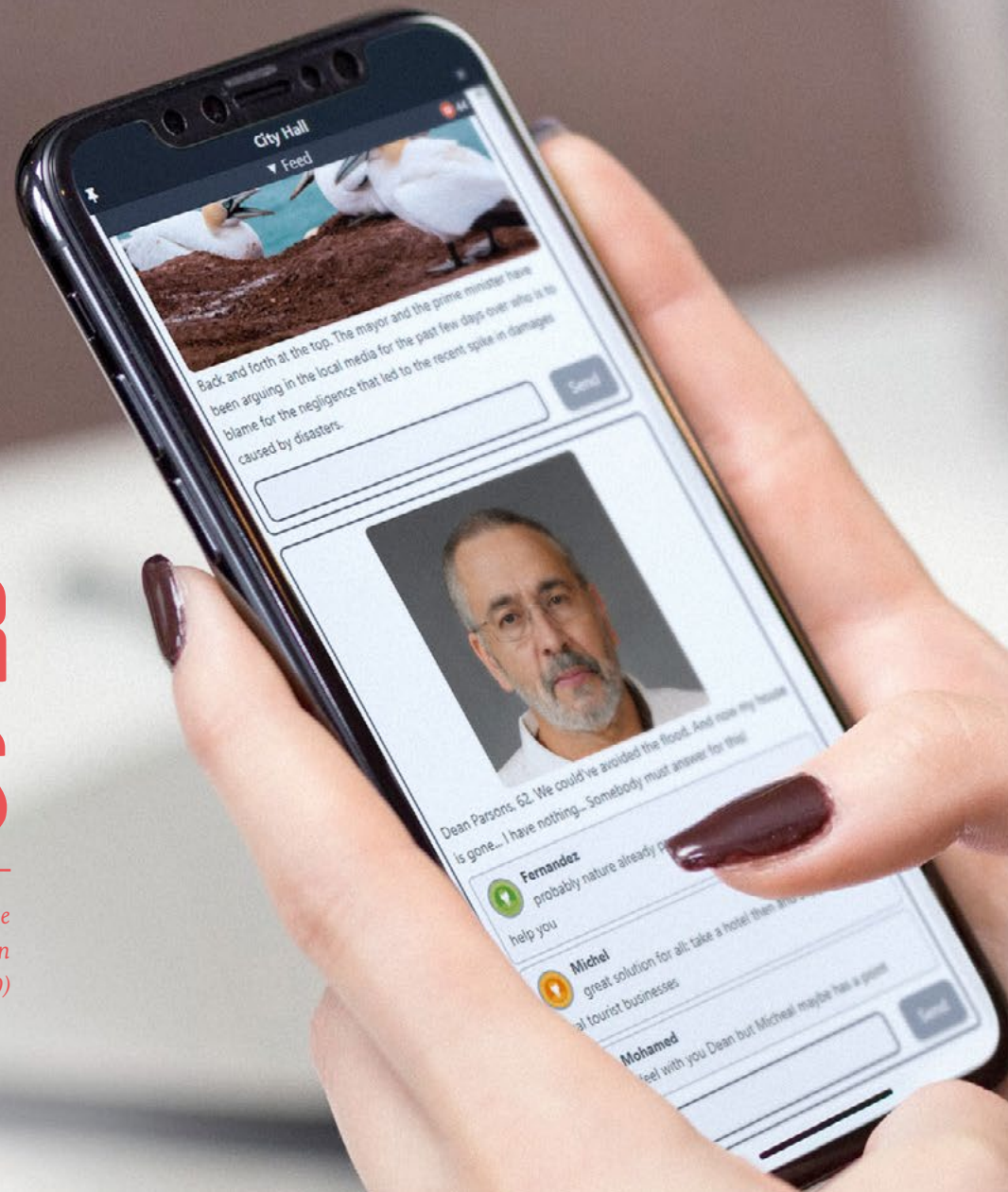
In the simulation, players engage in discussions and negotiations, taking on roles of key actors involved in the area (residents,

representatives of businesses, local authorities, local heritage NGO and commercial centre developer). Participants must collaborate to come up with projects and actions that would be beneficial to the local community. The main goals are to present the participants with the idea behind the community organizing, let them experience some of the real-life challenges connected with implementing community organizing and show specific challenges that are faced by community organizers, such as finding common issues, building coalitions, analyzing and dealing with power structure, etc.



# OTHER EVENTS

*Due to COVID-19 related reasons, we had to reshape the idea and turned the PHUSICOS simulation into an online application... (see page 29)*





# OTHER EVENTS

## JANUARY

### HOW TO MAXIMIZE CLIMATE & SDG SYNERGIES USING SOCIAL SIMULATIONS?

On the 19th of January, we participated in a webinar organized by the United Nations under the title: *How To Maximize Climate & SDG Synergies? Identifying Opportunities and Navigating Trade-offs*.

As one of the speakers, our science director Piotr Magnuszewski delivered a presentation on social simulations as a tool that can help decision-makers act on climate.

You can view the presentation here and watch the webinar under the link below:

<https://sustainabledevelopment.un.org/index.php?page=view&type=20000&nr=7149&menu=2993>

## FEBRUARY

### PHUSICOS SIMULATION WORKSHOP

At the beginning of February, we participated in the *PHUSICOS* consortium meeting to get together with the *PHUSICOS* project partners and test the newest prototype of the *PHUSICOS Simulation*. At the beginning of the project, we had envisioned this simulation as a board game tool for face-to-face workshops that could be used during the project and beyond. Due to COVID-19 related reasons, we had to reshape the idea and turned the simulation into an online application. This test, to some extent, served as another stepping stone for our future endeavors in the online gaming world.

The participating group was big, peaking at around 40 players who, in their day-to-day work, are involved in the research and implementation of NBSs.

### DEBATE: THE INTERNET AS A SOURCE OF SECURITY

On the 8th of February, we took part in an online debate organized by Wrocławskie Centrum Rozwoju Społecznego (WCRS). The purpose was to look at the topic of Internet safety from a broader perspective that embraces more than just technology or emotions. Krzysztof Grynienko, our expert and trainer, represented us by providing insights on how the Internet and our games can be used to learn about sustainability.

The event was part of a 4-day series aimed at people of all ages. It was hosted by Malwina Wilk from the WCRS. Other speakers included psychologist and trainer Magdalena Duszyńska, Aleksandra Klimczyk from Punkt Informacyjny Unii Europejskiej and Katarzyna Sokołowska from Biuro Rozwoju Gospodarczego.

## SAFE INTERNET DAYS 2021: NEW SHORES ONLINE WORKSHOP

On the 10th of February, we celebrated the *Day of the Safe Internet* by organizing a short, 2-hour online workshop using the *New Shores* game. The event was organized in cooperation with Wrocławskie Centrum Rozwoju Społecznego,

We invited around 20 students from primary schools in Wrocław. Under the guidance of our moderator Michalina Kułakowska, they landed on a beautiful virtual island, where they explored various pathways for development, weighing the future costs and benefits for society and nature. At the same time, our goal was to demonstrate to the participants that the Internet may serve as a safe learning environment.

The workshop was part of a *Day of the Safe Internet* celebrations that included a series of diverse events. The *Day of the Safe Internet* was organized by Wrocławskie Centrum Rozwoju Społecznego, Wrocławska Koncepcja Edukacja and Stowarzyszenie Żółty Parasol.

## SOCIAL SIMULATIONS & GAMES4SUSTAINABILITY WEBINAR FOR SAGANET

Answering the invitation from the Dutch serious games association SAGANET, we prepared a presentation about serious games for sustainability for the webinar focused on this topic.

SAGANET regularly organizes such webinars for the members of the association. During the meeting, Piotr Magnuszewski introduced our organization, mission and philosophy. Michalina Kułakowska introduced our platform *Games4Sustainability* and shed some light on the biggest sustainability challenges in Poland.

After the presentations, participants of the webinar could play the *New Shores* simulation and test how our ideas and values work in simulations.

Other games introduced during the webinar included *We Energy* and *The President's Speech*.

## MARCH

## PRESENTATION FOR ITC FACULTY GEO-INFORMATION SCIENCE AND EARTH OBSERVATION, UNIVERSITY OF TWENTE

On the 19th of January, we delivered a presentation about social simulation to the students of the Faculty of Geo-Information Science and Earth Observation at the University of Twente. The presentation took about an hour and explored the themes of cascading impacts of climate, the tension between complexity, uncertainty and ambiguity, as well as different modes of learning. We discussed the relationship between social simulations and social drama. After that, we moved on to how we design our simulations, especially with respect to the real-life situations that inform them. To that end, we presented examples of our productions alongside their design flowcharts and real-life backgrounds.

The simulations we discussed included *The World's Future*, *Energy Transition Game*, *Flood Resilience Game*, *Arctic Future Simulation*, *Bengaluru Quest* and *The Prince*.

Finally, we presented after-game survey results that indicated that our simulations may have an impact on the real world.

The presentation was delivered by our science director Piotr Magnuszewski and senior game designer Łukasz Jarząbek.



# OTHER EVENTS

## MAY

### **SDGS IN ACTION! THE WORLD'S FUTURE ONLINE SIMULATION WORKSHOP**

As part of the *World Conference on Education for Sustainable Development* that was held virtually from 17 to 19 May, we organized a special online workshop using *The World's Future Online*. During the workshop, players made choices about energy and industrial investments, social development, environmental management, and other matters. These choices, in turn, affected the players' in-game countries. At the end of the workshop, the participants discussed the results and potential ways of bringing awareness of the SDGs to a wider audience.

### **SOCIAL SIMULATION AS A TOOL FOR EDUCATORS AND POLICYMAKERS SESSION AT UNESCO WORLD CONFERENCE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT**

On the 17th and 18th May, we took part in the SDGs Market Place at the UNESCO (United Nations Educational, Scientific and Cultural Organization) *World Conference on Education for Sustainable Development*. The SDGs Market Place is a virtual exhibition that features online booths and live sessions, with the aim to showcase innovative ESD (Education for Sustainable Development) projects and highlight ESD as a key enabler of all SDGs. Live sessions were addressed to educators, policymakers, and researchers. During the session prepared by CRS, our science director Piotr Magnuszewski talked about Social Simulations, a type of game-based learning that offers participants an innovative and immersive way of exploring solutions to complex problems and testing future pathways.

The traditional approach to education tends to be siloed and linear, and this is reflected in how policymakers work and act. Our aim was thus to show researchers, policymakers, and students how to take a systems approach to problem solving and practice collaboration in a safe environment that encourages experimentation. In this way, we wanted to help them come away with solutions that are more viable and sustainable. Our session included examples of target groups and contexts in which the tool had been used (from policymakers at the OECD through stakeholders involvement in the *RURITAGE* project to students at the Swiss Business School). We also presented the key elements of Social Simulation and demonstrated how it can be used.

## JUNE

### CWETLAND DATA PROJECT KICK-OFF MEETING

Together with the partners from the *CWetland Data* project, we organized a 3-day online kick-off meeting between the 19th and 21st of May.

The kick-off started with our workshop on simulation design. First, Michalina Kulakowska introduced *CWetland* partners to the idea of Social Simulation and its potential. Participants also had an opportunity to explore one of the social simulations - *PHUSICOS* that is now being developed in the *PHUSICOS* project. The key part of the workshop was idea sharing exercises and discussion on the target group, context and content of the simulation we would be designing for the *CWetland* project.

The remaining two days were devoted to laying the foundation for the future work in the project. The partner organization discussed next steps, identified relevant stakeholders and consolidated their ideas on future activities in the project.

### SOCIAL SIMULATIONS AT THE SUSTAINABILITY FORUM EXCHANGE

On the 6th of June, we took part in the *IFC Sustainability Forum Exchange*, an online conference organized by the International Finance Corporation and focused on the themes of technology, trust, and transformation. The attendees included people involved in the topics of climate change and energy transition; local community impacts and development; urban transit and smart mobility; transparency, connectivity, voice, and responsible leadership; gender equality and youth inclusion.

As part of the conference, we held a two-hour online workshop with two of our social simulations: a modified version of *Save the Future*, and the award-winning *New Shores*. Interested attendees joined and played the simulations under the guidance of our facilitators: Piotr Magnuszewski and Krzysztof Grynienko; as well as moderators: Władysław Zołoto, Łukasz Jarzabek, Bartosz Naprawa, Timothy Giger, Hubert Brychczyński, Michalina Kulakowska, and Aleksandra Solińska-Nowak.

### SAPEA PODCAST ON SOCIAL SIMULATIONS FOR THE SCIENCE-POLICY INTERFACE

Piotr Magnuszewski (science director at CRS) and Nicole Arbour (Belmont Forum, IIASA) were invited to join the Science Advice for Policy by European Academies (SAPEA) podcast and talk about the usefulness of Policy Simulations in enriching science policy.

The two speakers had already worked together during the *Canadian Science Policy Conference*, where they demonstrated an interactive Policy Simulation experience - *Arctic Future Simulation* based on the outcomes from the *CASCADES* project.

In the podcast, Piotr and Nicole analyzed how serious games and simulations can help reveal the causal connections between players' decisions. They also highlighted the role of the debriefing session, which constitutes a moment of deep reflection and understanding of what happened during the simulation. There is no need to indicate a clear loser and winner. This is, as explained by Piotr, the biggest difference between social and policy simulations, and games.

The podcast is available on the SAPEA website: <https://www.sapea.info/piotr-magnusewski-nicole-arbour/>



# OTHER EVENTS

## JULY

### NEW SHORES WORKSHOPS DURING THE ONE YOUNG WORLD SUMMIT

This year we were invited to host two workshop sessions using the *New Shores* simulation during the *One Young World* conference, held on the 22nd and 25th of July. The conference gathered many inspiring and experienced figures, including Sir Bob Geldof, Angela Merkel, Hilde Hardeman, María Juliana Ruiz Sandoval, and organizations – The Fairtrade Foundation, The Google News Lab, who hosted their panels or workshops during the event.

*One Young World Summit* invites young delegates from all around the world to participate in workshops and listen to keynotes and speeches by influential political, business, and social leaders. This year the Summit included events of mixed formats, including face-to-face sessions in Munich and various online meetings.

Michalina Kulakowska facilitated two 1-hour workshops, where young delegates from Thailand, South Africa, and Turkey could test and experience life on the *New Shores* island.

### SOCIAL SIMULATION DURING CASCADING RESOURCE SCARCITY: SCIENCE DIPLOMACY AT THE INTERSECTION OF CLIMATE CHANGE

On the 22nd of July, we ran an online workshop using our Policy Simulation exploring themes related to cascading climate impacts. The event was organized in cooperation with IIASA, National Research Council Canada, ISSP (uOttawa), and Mitacs.

The simulation took place entirely online in a custom-made, interactive environment accessible via the browser. The theme of the event was metal scarcity, which is set to become a challenge in the planned energy transition from fossil fuels to renewables. Participants were mainly Canadian and included policy scientists, diplomats, as well as young researchers interested in climate policies.

For the purpose of the simulation, players assumed the roles of various decision makers in the near future, each with their own stakes in the energy transition and, consequently, in the metal market. A few rounds of discussion resulted in a set of policy propositions that were further put up for a vote. Video stories and news were presented between

rounds to challenge the participants' preconceptions and encourage them to rethink their positions. The vote could always be changed, which made the simulation even more dynamic. Afterward, there was a lively debriefing session. The participants discussed the events in the simulation, as well as their choices and perspectives.

The workshop was part of the event *Cascading Resource Scarcity: Science Diplomacy at the Intersection of Climate Change* organized by Science & Policy Exchange – Dialogue sciences et politiques. Our team of moderators consisted of Piotr Magnuszewski (the main facilitator); Łukasz Jarząbek (the main technical facilitator); and support: Timothy Giger, Hubert Brychczyński, and Michalina Kulakowska.

## AUGUST

### LET'S ORGANISE! GAME WORKSHOP IN WROCŁAW

On the 3rd of August, we organized a face-to-face workshop using a new simulation about community organizing. This was the first face-to-face workshop we organized since March 2020.

We invited our partners from Fundacja Rzecz Społeczna - FRS (Common Thing Foundation), to play *Let's Organise!* with a larger group of participants. During the activity, participants from different backgrounds and age groups could engage in intensive negotiations about the future investments in a small fictitious town. After the simulation, we discussed the design of the game itself and how it can be improved to better fit the goals of the partners.

The game is being developed with support from the *Story of Change* project.



### TRANSLATING MODELS INTO A GAME DESIGN CHAPTER, IN URBAN SUSTAINABILITY BOOK PUBLISHED BY SPRINGER

An article written by Michalina Kułakowska and Aleksandra Solińska-Nowak found its way to the *Urban Sustainability* book. The *Urban Sustainability* published by Springer is a book that offers an innovative pedagogy to students who will be the policymakers of tomorrow. It guides students through experience, processes of complex decision making, and sharpens their clarity of thought, to enhance their communication abilities and help them develop critical thinking. It delivers key competencies to address the complexities of sustainable development. In their chapter, *Translating Models into a Game Design*, Michalina and Aleksandra aim at showing how abstract notions can be translated

into game elements without losing their meaning. The chapter offers detailed explanations of the process of translating models of real-life systems into rules and elements of a board game. Furthermore, the authors provide a state-of-the-art overview of board games that deal with sustainability issues, focusing on their advantages and disadvantages identified based on past research on serious games.

Text developed in the EU's *Erasmus+* program for education and training, *SUSTAIN* project. You can read the entire book on [https://link.springer.com/chapter/10.1007/978-3-030-67016-0\\_5](https://link.springer.com/chapter/10.1007/978-3-030-67016-0_5)



# OTHER EVENTS

## SEPTEMBER

### PHUSICOS NBS SIMULATION WEBINAR

On the 16th of September, we co-organized, together with IIASA, a webinar about the *PHUSICOS NBS Simulation*. The attendees consisted of NBS practitioners and governance experts from the key institutions across Europe, including Ecologic Institute, the Euro-Mediterranean Center on Climate Change (CMCC), Euromontana, and *PHUSICOS* project's practitioners and site owners.

The main goal for the webinar was to bring the topic of using simulations in the context of nature-based solutions and disaster risk management.

First, our science director Piotr Magnuszewski briefly introduced participants to the ideas behind serious games and social simulations. Michalina Kułakowska followed Piotr with a demonstration of the *PHUSICOS NBS Simulation* and info pack. The whole session was closed with a Q&A conducted by Michalina and Juliette Martin from International Institute for Applied Systems Analysis.

The *PHUSICOS NBS Simulation* was designed by IIASA in cooperation with our team. The simulation was funded by the *Horizon 2020 PHUSICOS* project.

### SDG PATHFINDING TOOLS WORKSHOP

The *SDG Pathfinding Tools* workshop was intended to demonstrate our social simulations and tools developed by the French National Research Institute for Agriculture, Food and the Environment (IRSTEA) in the *Pathfinder* project.

In the first part of the workshop, Nils Ferland presented the approach *CoOPLAaGE* and its suite of online tools. This was followed by a demonstration of the Online Policy Simulation using *MIRO* and our tool extension *Drag & Drop* by Piotr Magnuszewski. After the presentations, the participants commented on the prospects and challenges of using the tools in the context of the pandemic. The details of how these tools would be used are still to be discussed with the partners and stakeholders.

### AUDIO/VIDEO WALK - WORKSHOP WITH ZOFIA SMOLARSKA

On the 28th of September, our team took part in a workshop led by Dr. Zofia Smolarska about linkages between theatre and research and the method of audio/video walk.

We've started with a warm-up session, during which we introduced our organization and explained our mission. Then, we smoothly moved to the main topic - introducing audio and video walks, analyzing their construction and ways in which their key elements interact. We also tried to understand what makes them such a popular tool and how their potential may be used to enrich our tools.

After the theoretical part, we put the knowledge into practice creating our examples of video walks. Finally, we discussed how to overcome potential difficulties related to video walks.

## OCTOBER

### COMMUNITY ORGANIZING GAME WORKSHOP FOR FUTURE MODERATORS

On the 15th of October, we conducted a remote workshop with the *Story of Change* project partners. Its aim was to help our partners prepare tests of the *Community Organizing Game*.

The workshop gathered representatives of the partners appointed to be moderators during their respective tests.

During the training, we discussed the technical aspects of running the simulation and the basics of the workshop facilitation and debriefing. Participants also learned how to gather the necessary feedback to contribute to the development and improvements of the *Community Organizing Game*.

### DEEP SEA MINING SIMULATION SESSION AT THE BALATON GROUP MEETING



We conducted *Deep Sea Mining Simulation* during the Balaton Group meeting on the 12th of October. In this 2-hour event, 7 meeting participants joined our breakout session and engaged in the simulation.

The main facilitator this time was Piotr Magnuszewski. Due to the small number of participants, the discussion took place in the plenary room. The participants expressed their appreciation of and excitement with the simulation. They praised the videos and how detailed the news and arguments presented about deep-sea mining were. In the end, several participants expressed their desire to join future simulation sessions and offered to share *Deep Sea Mining* via their networks.

## NOVEMBER

### SOCIAL SIMULATIONS IN THE CONTEXT OF SUSTAINABILITY TRANSFORMATIONS PRESENTATION AT BERN UNIVERSITY

On the 2nd of November, Piotr Magnuszewski was invited to Bern University to present how Social Simulations can be used for sustainability transformation. The talk was part of the *Game changers for change agents? Gamification as a pathway to transformation knowledge* course. The one-day event, organized by the Centre for Development and Environment and IGS North-South, was held in a hybrid format, both physically at the University of Bern and online.

Besides Piotr's presentation, the course offered a learning space to reflect on games and their contribution to transformative learning. By combining expert inputs and the gaming experience of the participants, the course led to the discussion on the challenges of the gaming approach to translating complex scientific results into an intelligible format of actionable transformation knowledge.



## LET'S ORGANISE! IN ACTION: STORY OF CHANGE WORKSHOP IN KATOWICE



Michał Pająk participated in a workshop organized by the Fundacja Rzecz Społeczna - FRS (Common Thing Foundation) in Katowice, Poland, to test our new simulation. The activity was a part of the *Story of Change* project headed by the foundation.

The organizers opened up the event with the *Let's Organise! a Quest for Social Justice* game, which we developed this year. The simulation was used to introduce the problems with organizing communities and „break the ice” between the participants. From our perspective, it was also another test of the simulation. This time, our colleagues from FRS took it upon themselves to moderate *Let's Organise!*, and Michał could focus on observing and gathering feedback from the participants.

The overall goal of the *Story of Change* workshop was to introduce to the participants the basics of the community organizing framework.

## RECREATE SIMULATION WORKSHOP



Members of our team in collaboration with IIASA organized a Policy Simulation workshop about mobility in Vienna. The target group included stakeholders professionally interested in the transport and public space management in Vienna: city officials, NGO activists, mobility experts. To make the transport in Vienna greener and more citizen-friendly, participants discussed, designed, and negotiated policy propositions.

The simulation and workshop were developed within the project *RECREATE: Resource nexus for transformation to circular, resilient, and liveable cities* in the context of climate change. The project's objective is to identify pathways for cities to foster a circular economy by reducing significantly the energy, water, and material

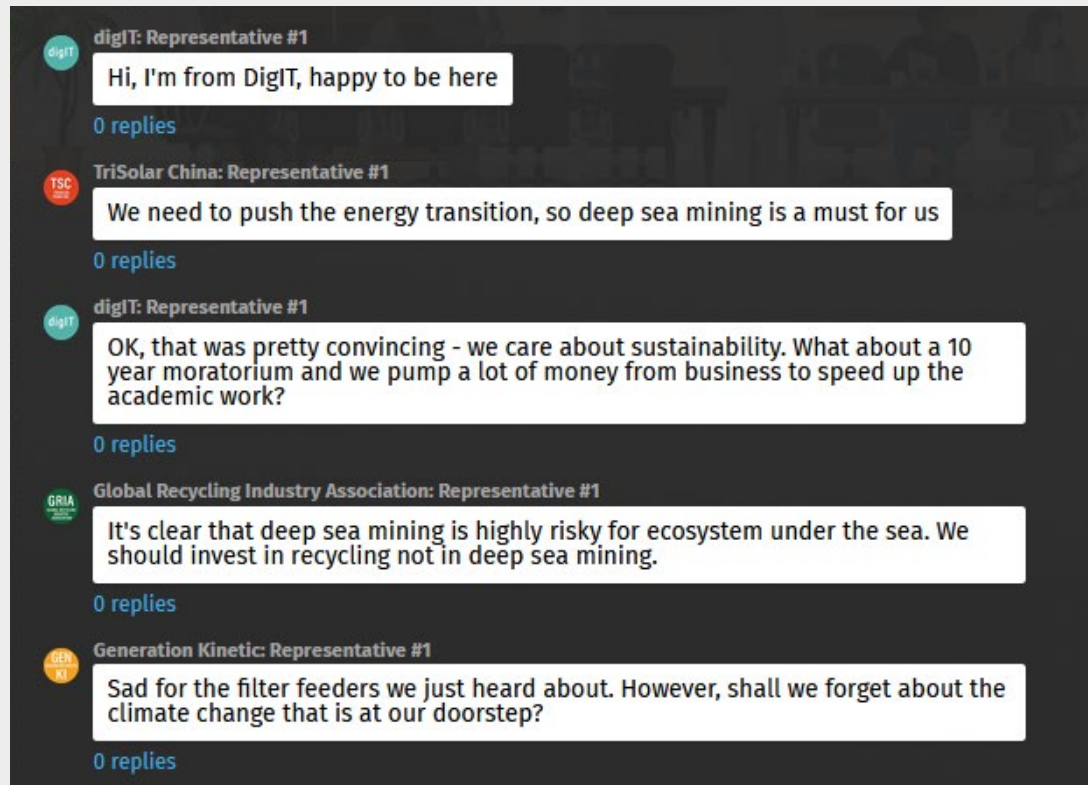
resource uses, and related environmental impacts; building resilience to ever-increasing uncertainties from globalization and climate changes; and becoming more livable for growing populations in different urbanization contexts in China and Europe. The project involves working with the cities of Vienna, Shanghai, Malmö, and Beijing. Project partners are IVL Swedish Environmental Research Institute, International Institute for Applied Systems Analysis, Beijing Normal University, Fudan University, and Jinan University.

The project is funded by the pilot call *Sustainable and Liveable Cities and Urban Areas* organized by JPI Urban Europe and the National Natural Science Foundation of China (NSFC).

# OTHER EVENTS

## DEEP SEA MINING SIMULATION WORKSHOP

Reboost Simulation test,  
15th of September.



On the 26th of November, we invited contributors to the *Deep Sea Mining Simulation* (e.g. voice-over actors) and the general public to join us for the *Deep Sea Mining Simulation* workshop. The event was moderated online by Piotr Magnuszewski, together with Paolo Campo, Olga Mironenko, and Karolina Gajęcka. The aim for the workshop was to decide by voting whether deep-sea mining should

continue or be limited, and if so - how? Most of the participants were already familiar with the concept of deep-sea mining and had some previous experience with social simulations and serious games. As a result, they were very active during the debriefing session - we were able to deep dive into the topics and received a lot of feedback about the simulation itself.

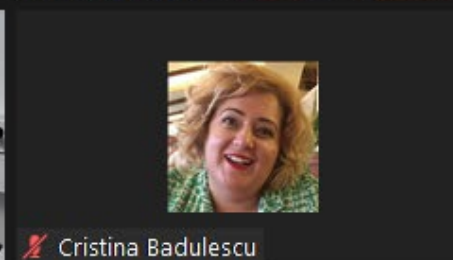
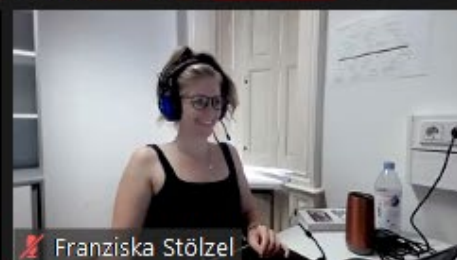
### **“EUROPE’S CROSS-BORDER TRADE, HUMAN SECURITY AND FINANCIAL CONNECTIONS: A CLIMATE RISK PERSPECTIVE” ARTICLE PUBLISHED**

The applications of our *Cascading Climate Impacts* were described in the new article created by the CASCADES consortium. The article explores the potential impact transmission pathways of cross-border climate impacts between the EU and other world regions and countries. It was published in the *Climate Risk Management* journal. Among the authors are Piotr Magnuszewski and Łukasz Jarząbek from our team.

CASCADES project and the *Cascading Climate Impacts Simulation* have been funded by the European Union’s *Horizon 2020* research and innovation programme.

You can read the article on <https://www.sciencedirect.com/science/article/pii/S221209632100111X?via%3Dihub>







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