

# Sustainable Institute & Forum

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**Annual Report:** January 2023  
**Academic Seasons:** 2021-2022  
**Prepared for:** Public Distribution  
**Prepared by:** Sustainable Institute and Forum





# Mission Statement

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The objective of SIF is to foster research and education in sustainable development focusing on the 17 UN Sustainable Development Goals (SDGs). To this purpose, SIF will be inclusive and open to external ideas in order to account for the interdisciplinary nature of the SDGs.

## Events

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The Sustainable Institute and Forum's events provide a platform for leaders, experts, and scholars in sustainability to come together, exchange ideas, and drive progress toward a more sustainable future. It is this drive towards progress that is our commitment. This year, we took our commitment to the next level by launching a new lecture series aimed at fostering a dialogue about sustainability. These lectures provide a platform for experts in the field to share their research and insights with members of the community. With a wide range of topics related to sustainability, this series offers an opportunity for all members of the community to learn, grow, and engage in thought-provoking discussions. We hope that our events continue to inspire and educate individuals to work towards a more sustainable future.



### Silvana Loayza Leon

On February 17th, the Sustainability Institute & Forum (SIF) held its first lecture of the new lunchtime series, featuring the research of MSc candidate Silvana Loayza Leon. Silvana's

study focuses on the environmental impacts of producing two Blue Lagoon skincare products through a Life Cycle Assessment (LCA).

During her talk, Silvana spoke about the motivation behind her study, the scope and objectives of her research, and her LCA methodology. She also detailed the ingredients used in each product and the data sources used to quantify the energy, water, raw materials, and CO2 equivalent impact of production processes.

Silvana's research, conducted in collaboration with Reykjavik University and Blue Lagoon, aims to assess and potentially improve the sustainability of specific skincare products. By identifying key performance factors or "hotspots," the study will help support decision-making with regard to optimizing production processes.

Silvana graduated in the spring of 2022 from the Iceland School of Energy at Reykjavik University and is now working at the United Nations Environmental Programme as an Environmental Affairs Intern in Paris.



### **Magnus de Witt**

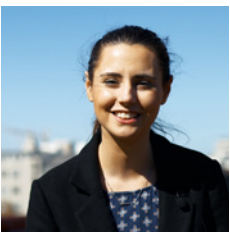
Doctoral Candidate Magnus de Witt. Magnus, a student at the Department of Engineering at Reykjavík University, shared his research on the energy transition in remote Arctic

communities and the potential impact of renewable energy sources in these regions.

In his lecture, Magnus highlighted the challenges faced by remote Arctic communities, where 80% of the population relies on fossil fuels as their primary energy source. The high cost of fuel and electricity in these areas, combined with high levels of poverty and unemployment, has led Magnus to investigate the feasibility of renewable energy sources in the Arctic. He emphasized the importance of incorporating the local community's perspectives and needs into the energy transition process.

Through his fieldwork, Magnus has gained valuable insights into the social acceptance of renewable energy sources in the Arctic, and has analyzed the potential of hydropower, wind, and photovoltaics in reducing the cost burden faced by remote communities. The results of his research have shed light on the feasibility of renewables in the Arctic and whether they can be a cost-competitive alternative to the currently predominant use of diesel.

Magnus successfully completed his PhD and defense in January of 2023 at Reykjavik University.



### **Rachel Brophy**

Rachel Brophy, a PhD candidate in the Department of Applied Science and Engineering at Reykjavik University and a PhD funding recipient of the Sustainable Institute & Forum

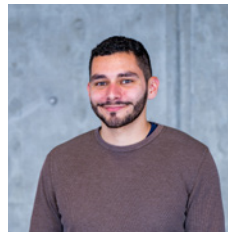
(SIF) provided a lecture on “Atomistic studies of organo-halide materials for photovoltaics (ATOMAP).” Rachel’s research delves into the Molecular Dynamics of the perovskite material with the ultimate goal of increasing the material’s lifespan.



### **Albert Alonso**

Albert Alonso, a PhD candidate funded by SIF, presented his research on transitioning Iceland’s heavy-duty vehicle fleet to 100% electric. His study explores the feasibility and

potential impact on the power grid. He discussed the benefits and challenges of this transition and aims to estimate electrification potential, investigate alternative fuels, and model power system requirements.



### **Brandon Velasquez**

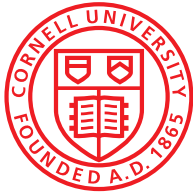
PhD Candidate Brandon Velasquez, a recipient of a PhD grant of the Sustainable Institute & Forum (SIF), shared his research on the “Adaptation of aluminum reduction cell

for carbon capture and sequestration – a modeling approach.” During his presentation, Brandon discussed the potential of modifying the aluminum reduction cell operating parameters and design. With these changes, the use of carbon capture and sequestration technologies could be integrated into the aluminum production process. He also discussed the development of a CFD modeling approach to optimize the process.









## The Sustainability Collaboration between Cornell University and Reykjavik University

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In April 2022, Reykjavik University hosted a symposium on sustainability collaboration between Cornell University and Reykjavik University. The event brought together experts from both institutions to present their latest research and findings in the field of sustainability.

The symposium was introduced by Dr. Gísli Hjálmtýsson, Dean of the School of Engineering at RU, and was attended by representatives from the Cornell Energy Institute, Sustainability Institute and Forum, Iceland School of Energy, and Iceland Energy Cluster. The aim of the symposium was to promote the knowledge, data and skills exchange necessary to facilitate the energy transition in the United States of America and Iceland.

The symposium included presentations from Cornell University on various topics such as Earth Source Heat Project, use of agricultural and food wastes for peak

heating, modeling fluid mechanics across multiple scales in fractures, nanomaterials for applications in sustainability, and electrical energy storage in advanced battery systems. Reykjavik University also presented on their research in industrial engineering, geothermal utilization, operations research in sustainable heavy transport, and carbon capture with blue-green algae and photovoltaic.

The event was concluded with a presentation from Dr. Egill Júlíusson, Business Innovation Manager at Landsvirkjun, who discussed the overview of the sustainability project at the National Power Company of Iceland. The symposium was a successful platform for the exchange of ideas and knowledge between Cornell University and Reykjavik University and served as a testament to the ongoing commitment to sustainability and collaboration between the two institutions.

# Joint Training School on Circular Economy and Resilience in Iceland

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In February 2022, the Sustainability Institute & Forum (SIF) at Reykjavik University (RU) launched a new joint training school focused on circular economy and resilience in Iceland. The initiative was a collaboration between the Agricultural University of Iceland, the SIF, and the Energy Institute at Johannes Kepler University Linz, with Dr. David Christian Finger serving as the lead. The training school took place in May 2022 and provided students with an in-depth look at nature-based solutions and sustainable circular management in Iceland.

The five-day course included both lectures and site visits, giving participants the opportunity to interact with experts in various fields and see different circular systems in action. The main topics of the course

included water management and energy production, and how these factors impact circularity. The course concluded with a final presentation by the participants, where they presented a hypothetical “Circular Economy project” for a self-sustained agricultural university campus in Hvanneyri.

The training school was held at the Agricultural University Campus in Hvanneyri, Iceland, providing participants with a unique and immersive experience in the field of circular economy and resilience.

This joint training school was a major milestone for the SIF, as it demonstrated the continued commitment to promoting sustainability and advancing knowledge in the field.







## Geysir Model Project

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Reykjavik University's third-year Applied Energy/ Mechanical Engineering students took on an exciting project this semester in the Practical Project course, building a model of the famous Geysir under the guidance of Associate Professor Michael S. Moorhead. The students presented their project, showcasing the plume created by the model, outside of the university.

The students praised the practical aspect of the project and how it has helped them improve their group work and project-based learning skills. "We feel that we

learn the most from these practical projects," said Bjarni Sævar Sveinsson and his classmates.

The Geysir project was initiated by the Director of the Iceland School of Energy, Juliet Newson, who applied for funding through SIF to use the geyser in teaching and research. The project was then provided to Professor Moorhead as a possible project for his students to build. The Geysir model project was a success and a testament to the impact of practical projects on student learning and development.





## Meetings

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### Strategy Meeting

The annual strategy meeting held in March 2022 covered the restatement of SIF's objectives, an examination of the system for research fund allocations, and the development of a 12-month plan. The restatement of SIF's objective was made to include the interdisciplinary nature of the 17 United Nations Sustainable Development Goals (SDGs). The examination of research fund allocation determined that Ph.D. grants would be increased from 5M to 6M ISK to provide supporting funds that are in line with rates set by Reykjavik University. It was agreed that excess funding from the previous year would be reused in the coming year, temporarily increasing the funding pool and opportunities.

### Annual Meeting

The annual meeting of the Sustainable Institute and Forum saw a review of the previous years' activities and a review of the groups membership. SIF expanded to 37 members and 3 PhD fellows with a large gathering of members in attendance of the meeting. The following 2022 grants and awards were given: PhD Research and Fellow's Grant, Project Grant, and the Student Award in Sustainability.



# Grants

## PhD Research and Fellows Grants

The 2022 SIF PhD Grant call had six applicants, three were selected for funding. Recipients are funded for one year and required to apply to RANNIS for the following year. The application form followed the RANNIS Research Fund format and all applications were reviewed by an external evaluation committee.

Project Name	Applicant(s)	PhD Student	Award
GIS-Enabled Real-Time Power Flow Considering Multi-layered Electric Vehicle Load Models on Distribution and Transmission Systems in Iceland	Guðmundur Kristjánsson, Ragnar Kristjánsson	Laurentiu Anton	6.000.000
The Price of Transparency in Predictive ESG Ratings	Eyjólfur Ingi Ásgeirsson, Hlynur Stefánsson, Sverrir Ólafsson, Ralph Rudd	Hugo Cazaux	6.000.000
Atmospheric Transport of Microplastics to Vatnajökull Ice Cap	Einar Jón Ásbjörnsson	In support of a PhD Student	6.000.000

## Project Grants

Project Name	Applicant(s)	Status
Environmental Humidity Sensor Based on Silicon Nanowires	Andrei Manolescu, Halldór Guðfinnur Svavarsson	Ongoing
GeoEjector	María Sigríður Guðjónsdóttir, Ximena Guardia Muguruza	Ongoing
Atmospheric Fallout of Microplastics	Hlynur Stefánsson, Einar Jón Ásbjörnsson	Ongoing
Drone-based Water Sampler for Microplastics Research	Joseph Timothy Foley	Ongoing
Energy Communities - Mapping	Ewa Lazarczyk Carlson	Ongoing





## Student Award in Sustainability

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### Criteria

The SIF Student Award in Sustainability is an award that recognizes outstanding sustainability projects and initiatives at Reykjavik University. Students from all levels of study are eligible for nomination by a faculty member who supports their work. This year, seven nominations were received, both for individual students and groups.

The projects are evaluated based on three main criteria: the novelty of the research, the potential impact of the project, and the environmental impact of the project. Additionally, the projects must be connected to enhancing the United Nations' Sustainable Development Goals.

The review committee is composed of SIF members who are not tied to any of the nominations and represent various departments within the university. This ensures a fair and impartial evaluation of the projects.

Reykjavik University students Daníel Logi Matthíasson, Eva María Hönnudóttir, Sigurthórsdóttir, Kjartan Freyr Hafthórssson, Ólafur Gunnar Daníelsson, and Unnar Freyr Arnthórssson have been named the winners of the Sustainable Institute and Forum's (SIF) Student Award in Sustainability for their innovative project, the Epoch Smart Bin.

The team recognized the difficulty of determining which items are recyclable in a short amount of time and designed an automatic recycling bin to help solve this issue. The Epoch Smart Bin uses sensors and AI to sort waste into various recycling categories with 89% accuracy. The team is excited to bring their invention to public spaces in the future.

The Epoch Smart Bin project was chosen for the award based on its novelty, potential impact, and environmental impact. The use of AI and sensors to sort waste into various recycling categories is an innovative solution that addresses the problem of inefficient recycling choices. The team's commitment to sustainability aligns with the United Nations' Sustainable Development Goals and promotes efficient and effective recycling practices.

The SIF's review committee, composed of members not tied to any of the nominations and representing various departments, ensured a fair and impartial evaluation of the projects. The Epoch Smart Bin team's hard work and dedication have earned them the SIF Student Award in Sustainability and they are looking forward to continue their work in the future.



# Members

Hlynur Stefánsson	Engineering	Associate Professor and Director of Sustainable Institute and Forum
SIF Members	Department	Position
Ágúst Valfells	Engineering	Dean
Andrei Manolescu	Engineering	Professor
Anna Sigríður Islind	Computer Science	Assistant Professor
Ármann Gylfason	Engineering	Associate Professor
Birna Baldursdóttir	Psychology	Assistant Professor
David Christian Finger	Engineering	Assistant Professor
Einar Jón Ásbjörnsson	Engineering	Assistant Professor
Einar Torfi Einarsson Reynis	Engineering	General Employee
Eliáhu August	Engineering	Lecturer
Ewa L. Carlson	Business Administration	Assistant Professor
Eyjólfur Ingi Ásgeirsson	Engineering	Associate Professor
Guðrún Arnbjörg Sævarsdóttir	Engineering	Associate Professor
Halldór Guðfinnur Svavarsson	Engineering	Professor
Hannes Högni Vilhjálmsson	Computer Science	Professor
Haraldur Auðunsson	Engineering	Associate Professor
Haukur Ingi Jónasson	Engineering	Assistant Professor
Jacob Ristagno Kaminski	Engineering	Project Manager
Jónas Þór Snæbjörnsson	Engineering	Professor
Joseph Timothy Foley	Engineering	Assistant Professor
Juliet Ann Newson	Iceland School of Energy	Executive Director
Marcel Kyas	Computer Science	Assistant Professor
María Kristín Jónsdóttir	Psychology	Professor
María Óskarsdóttir	Computer Science	Assistant Professor
María Sigríður Guðjónsdóttir	Engineering	Assistant Professor
Mohamed Abdelfattah	Engineering	Associate Professor
Mohammad Adnan Hamdaqa	Computer Science	Lecturer
Páll Jensson	Engineering	Professor
Ragnar Kristjánsson	Engineering	Assistant Professor
Ragnhildur Helgadóttir	President's Office	Rektor / President
Randall Morgan Greene	Engineering	Development Director
Þorgeir Pálsson	Engineering	Professor Emeritus
Þorgerður Edda Hall	Engineering	Project Manager





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