



SUCCeSS

Annual report
2022



Stockholms
universitet

Stockholm University Center for Sustainable and Circular Systems (SUCCeSS) is a center for interdisciplinary research in sustainable and circular systems. The center has now been operational for a little over a year.



Circular processing



Sustainable food and
water systems



Data Driven Circular and
Sustainable Design

Department of Materials and
Environmental Chemistry
www.su.se/success

Note from our Director professor Aji Mathew



2022 has been a very busy year for the center. From visits and strategy talks with Nobel Laureates and our Senior Advisors, to handing in two major applications for external funding. We have built the foundation of the SUCCeSS community, and funded our first three post doc fellows. We have continued our efforts in spreading the news about SUCCeSS by hosting webinars on topics related to the center.

We would like to thank our Senior Advisors, professors Tanja Zimmerman and Paul Anastas for their invaluable contribution to the center over the past year. We look forward to continue our collaboration in 2023.

We have a very busy 2023 ahead of us, with new post doc fellows, exciting projects and new collaborations. We are ready to take on new challenges!

SUCCeSS Vision

Establish SUCCeSS as a leader in the research on circular and sustainable systems at the national and international level, driving the transformation into a sustainable society.

SUCCeSS Mission

- To establish a stimulating and leading environment for transdisciplinary and transformative research in the field of circular and sustainable systems
- Identify and address needs for circular and sustainable systems in collaboration with policy makers, industries and civil society
- To promote interdisciplinary training in the field of circular and sustainable systems

Research Focus Areas

The focus areas of the center remain unchanged and we continue to focus on:



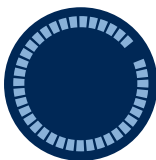
Circular processing

Circular processing - research will focus on methodologies that enable circular and sustainable processing of chemicals, materials and products. We aim to impact the production and consumption by reducing resource-use and waste-generation.



Sustainable food and water systems

Sustainable food and water systems - transdisciplinary research integrating system understanding, development and validation of circular solutions for sustainable food and water, including blue economy.



Data driven circular and sustainable design

Data driven circular and sustainable design - Transdisciplinary research on development of circular systems through design optimization and decision making using digital tools. Using artificial intelligence as machine learning tools for hazard evaluation and screening as well as validation of performance. We also aim to establish processes for data management, data curation, data storage and data sharing and contribute to the development of standards.

The ongoing activities at SUCCeSS are designed to establish the center as interdisciplinary and interactive environment for promoting sustainable and circular systems, and to identify collaborations with industries, policymakers and civil society.



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Webinars

Over the year SUCCeSS has conducted monthly webinars on different topics related to the center's expertise. The webinars have been well attended with 30-150 participants depending on the subject. We have found a format that works well, and will continue our efforts to reach new audiences in 2023, in order to establish the center as a place of expertise sustainable and circular systems.



Jan 24th

“A circular economy? Yes, but what about the hazardous chemicals?”

– Christina Rudén, Professor in Regulatory ecotoxicology, Department of Environmental Science, SU and Dr. Lina Wendt-Rasch, Research Coordinator, Development of Legislation and Other Instruments and Dr Robin Vestergren, Research Coordinator, Chemicals in a Circular Economy, Swedish Chemicals Agency.

Feb 15th

“The global threat from plastic pollution”

– Matthew MacLeod, Professor at the Department of Environmental Science, SU, and Dr. Peng Lui, Standardization engineer for non-metallic materials & plastics recycling at Volvo Group.



Mar 17th

“Voluntary initiatives for sustainability in global supply chain”

– Tim Bartley, Senior Lecturer, Department of Sociology, SU.



Apr 22nd

“Untapped power of by-products for the food system - transforming the blue food sector”

– Max Troell, Program Director, The Beijer Institute of Ecological Economics, Associate Professor Stockholm Resilience Centre and Dr. Madeline Linis Mörner, Program Director Future Food, Axfoundation.



Sept 27th

“Green chemistry for a sustainable world”

– Professor Paul Anastas, Yale University.



Oct 25th

“Textiles, what’s hiding in our used clothes and is there value in the waste?”

– Ulrika Nilsson, Professor in Analytical Chemistry, SU and Caroline von Post, M Sc. Stormiepoodle/Beskow von Post.



Nov 18th

“Machine learning and analytical chemistry guide transition to green energy”

– Anneli Kruve, Associate Professor in Analytical Chemistry, Stockholm University, Daniil Salionov, Paul Scherrer Institut and Karl Kaupmees, Gridio.

Dec 15th

“Future use and reuse of water in Sweden”

– Malte Posselt Post Doc, Department of Environmental Science, SU, Elias Broman, Post doc, Department of Ecology, Environment and Plant Science, SU. David Gustavsson from Sweden Water Research, Uzair Akbar Khan, Post Doc, Department of Aquatic Sciences and Assessment, SLU.

Jun 14th

Kick off

As SUCCeSS was founded during covid, no kick off could be held then. A full day kick-off to expand the SUCCeSS community was hence held in June 2022. The itinerary included

- A brain storming session on a Perspective article: “Current and Future Perspectives for Circularity and Sustainability”
- Information on external funding opportunities.
- External stakeholder presentations from EasyMining, Stockholms Stad, Volvo, Stora Enso and Region Stockholm
- Speed-talks
- Introduction to WISE – Wallenberg Initiative Materials Science for Sustainability.

Around thirty people attended the day, where we also announced the post doc projects that were awarded funding from SUCCeSS.



Dec 6th

25 years of Green Chemistry

SUCCeSS had the honour of hosting an event to celebrate the 25th anniversary of the publishing of the ground breaking book “Green Chemistry – Theory and Practice” by professors Paul Anastas and John Warner. Professor Anastas is also one of SUCCeSS’ senior advisors.

The seminar was followed by a question and answer session where students and PhD-students could get input from Paul and John. Some 60 people attended the lively event.





Dec 7th

Strategy Discussions with Nobel Laureates

The Nobel Laureates from 2021, Professors David McMillan and Benjamin List, were invited to SU on December 7th, in order to meet PhD students and have strategic discussions with SUCCeSS.

The SUCCeSS community were all invited to take part in the meeting, and we had senior advisors Prof. Paul Anastas and Prof. Tanja Zimmerman with us, as well as professor John Warner, one of the founders of the area of green chemistry.

It was an animated and interesting discussion about how to build a larger cross-disciplinary research community and how to think outside the box. The importance for fundamental research was underlined. Defining and identifying the big questions for future research is one of the keys and great challenges for sustainable development, the Laureates concluded.



SUCCeSS funding of post doc projects

Postdoc positions to promote interdisciplinary research were announced in early 2022. The call was aimed towards early-career PIs (<12 years since PhD), and applicants were expected to propose new collaborative projects, where the inclusion of external stakeholders was highly encouraged.

All applications were reviewed by an external panel of experts. The reviewing board consisted of Professor Tanja Zimmerman, EMPA Switzerland, Professor Karin Wiberg, Professor in Environmental Organic Chemistry at SLU and Mikael Karlsson, Docent in Environmental Science at UU.

The top three proposals were awarded funding and are as follows:

“Design of chemical reagents for fast and sensitive detection of pesticides in water and food”



Applicants: Anneli Kruve, Analytical Chemistry and Niklas Selander, Organic Chemistry. Niklas left SU during 2022 and Anneli will find another collaborator.

This proposal addresses two focus areas of SUCCeSS: Sustainable food and water systems and Data driven circular and sustainable design. The focus of this project is on sustainable development of chemical reagents for detection of glyphosate.

“Forest materials: opportunities and obstacles for a circular economy in Sweden – FORCES”

Mika Sipponen MMK, Marlene Ågerstrand ACES, Tiina Häyhä, SRC

FORCES aim to assess opportunities and obstacles for forest materials as enablers of a circular economy. The team will



use their combined expertise in to explore and initiate new interdisciplinary research directions to support the continued development of sustainable and circular forest materials.

“Safe water reuse in a changing environment, microbial degradation of contaminants in European rivers”

Malte Posselt ACES, Elias Broman DEEP, Florian Roth, BSC. Florian has since left SU and has been replaced by Benoît Dessirier, BSC

Increasing water reuse is at the heart of Europe’s climate change adaptation strategy to counter water scarcity. Sustainable and safe reuse is hampered by a complex mixture of contaminants that reach recipient waters due to their incomplete elimination in wastewater treatment plants (WWTPs).

The post doc fellows were recruited during the fall 2022 and are expected to join SUCCeSS in 2023.

“I’m happy that I could support as scientific advisor the activities of the Center of Circular and Sustainable Systems...

I especially like the interdisciplinary approaches and the envisaged collaborations with the stakeholders from Industry and policy makers. Highlights for me were the support of young talents and their research projects as well as the exchange with Nobel Laureates in sustainable Chemistry...”

– *Tanja Zimmerman, title*

Applications for External Funding

2022 was the year that SUCCeSS got into the competition of finding external funding. We submitted three major, collaborative research proposals:

- Budget: 6 MSEK
- Applicants: SRC and MMK

FORMAS, Indo-Swedish Joint Call for Proposals within Circular Economy 2022

Sustainable circularity and fashion: Opportunities and challenges of textile production and recycling for an inclusive and fair circular economy in India and the European Union.

Decision on funding will be announced at the end of March 2023.

- Budget: 30M SEK for 5 years
- Applicants: MMK, ACES, OC, SRC, DEEP
- Collaborators: Wargon Innovation, Stormie-poodle, Didima AB, CelluCircle AB, Houdini, Peak Innovations, Dramaten-Stockholm

Kamprad Foundation

“Circular and Sustainable Textiles (CircleTex)”

The overarching aim of CircleTEX is to generate and share new scientific know-how required to ensure a transition from the linear textile industry of today to a circular and sustainable one. We propose to establish a multidisciplinary environment involving materials chemists, toxicologists, sustainability scientists, industries and governing bodies to evaluate and provide industrially and socially viable solutions to address this challenging task.

Decision on funding will be announced at the end of March 2023.



- Budget: 50 MSEK for five years, 20 MSEK co-founding from Stockholm University
- Applicants: MMK, ACES, OC, SRC, Physics

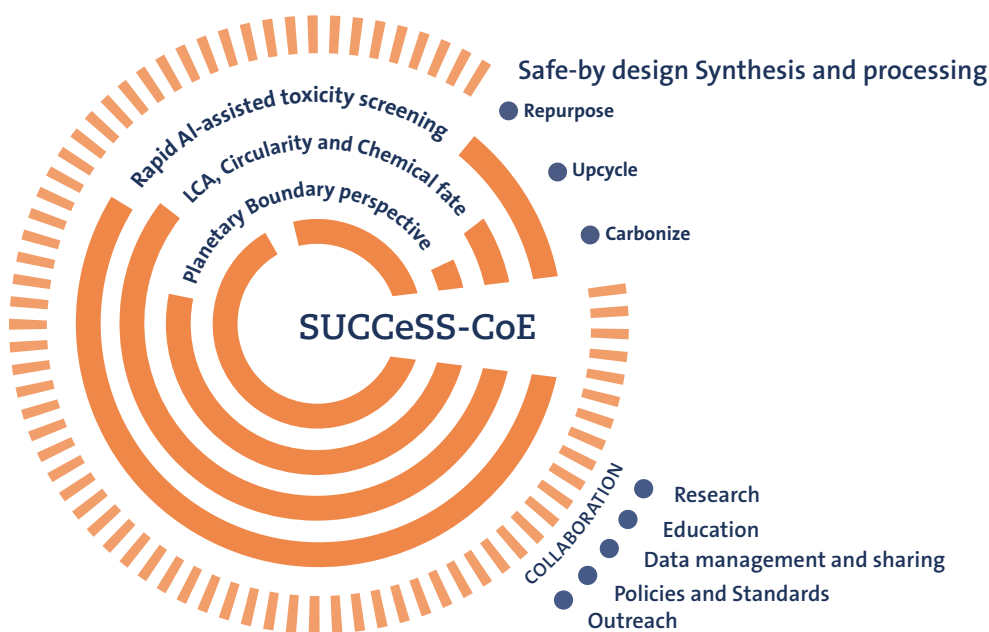
The Swedish Research Council (VR) Center of Excellence

“Stockholm University Excellence Centre for Circular and Sustainable Chemistry (SUCCeSS-CoE) - Safe-by-Design Recycling of Organic Materials”

The centre intends to develop new and pioneering approaches, concepts and

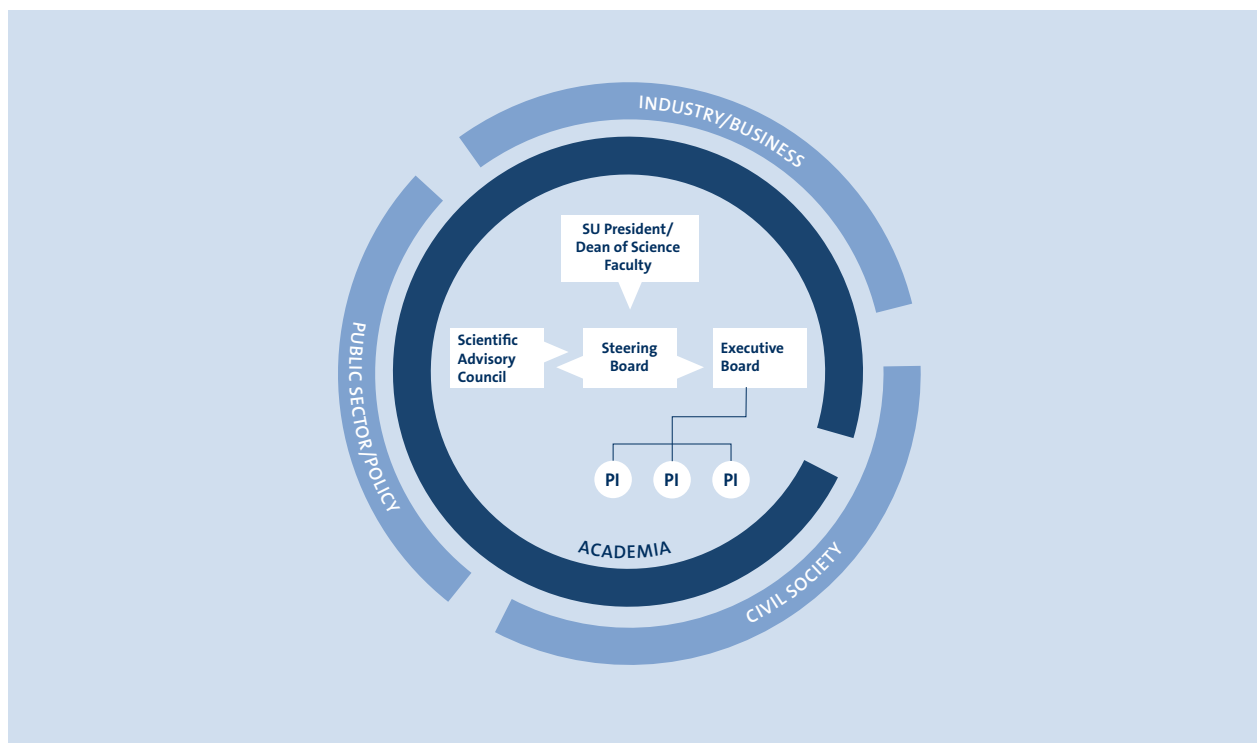
processes to recycle organic materials and chemicals by utilizing and combining the principles of green and sustainable chemistry, toxicity screening supported by machine learning, and life cycle, circularity and planetary boundary evaluations.

Decision on funding will be announced at the end of June 2023.



MISSION

Lead and promote research and education on circular and sustainable chemistry



SUCCeSS Organization

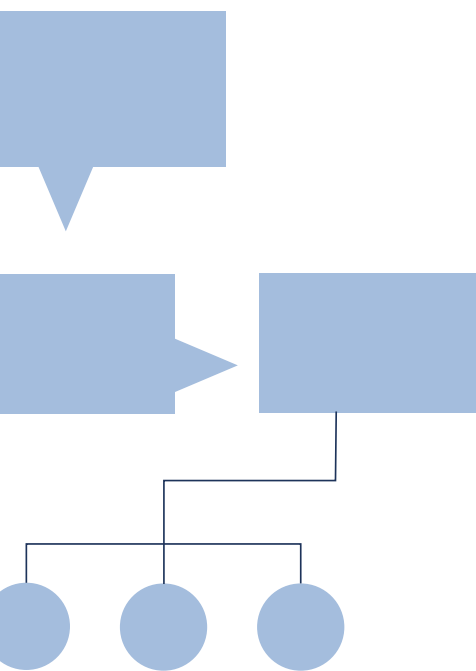
The organization remained unchanged over the year 2022.

The Executive Board

- Aji P Mathew, Director, Professor in Materials Chemistry at Stockholm University (SU). Research focus on sustainable and biobased functional materials processing, characterisation and applications.
- Anna Sobek, Deputy Director, Professor in Environmental Chemistry at SU. Research focus on environmental fate and risk of synthetic chemicals.
- Charlotte Boegård, Coordinator, MSc Analytical Chemistry

The Steering Board

- Berit Olofsson, Chair, Dean of Chemistry and Professor of Organic Chemistry at SU. Research focus on sustainable organic synthesis using hypervalent iodine chemistry.
- Line Gordon, Vice Chair, Curt Bergfors Professor in Sustainability Science, Director Stockholm Resilience Centre (SRC) at SU. Research focus on the sustainability and resilience of the biosphere through food and water.



- Andreas Duit, Professor of Political Science at SU. Research focus on environmental politics and policy.
- Jonathan Martin, Professor of Environmental Analytical Chemistry at SU, SciLifeLab Faculty and Director of National Facility for Exposomics. Research focus on nontarget mass spectrometry for studies of the exposome.
- Lennart Bergström, Professor of Materials Chemistry at SU. Research focus on materials chemistry directed towards applied surface and colloid science related to sustainable materials.
- Magnus Boman, owner and executive director at Goodpoint, a consulting firm focused on sustainability.
- Regina Lindborg, professor of Geography, especially Natural Resource Management at SU. Research focus on sustainable agricultural, including ecosystem services and biodiversity conservation.

Senior Advisors

The senior advisors of SUCCeSS support the center through active discussions, providing seminars and teaching on master level courses.

- Professor Paul Anastas, Director of the Center for Green Chemistry and Green Engineering at Yale University, USA, and is world renowned as one of the founders of Green Chemistry.
- Professor Tanja Zimmermann, director at EMPA, the Swiss Federal Laboratories for Materials Science and Technology, research focus on applied wood materials and nanocomposites.

In addition, Johan Kuylenstierna, senior advisor to the SU president in sustainable development and adjunct professor in international water resources issues at the Department of Physical Geography and Quaternary Sciences at SU, has had an informal role as an Advisor to SUCCeSS.

He became the Director General of FORMAS, a government funded research council for sustainable development, in 2022 and left SU and stepped down from his role in SUCCeSS. We thank him for his contribution to the center.



Thanks for your contribution, professor Anna Sobek

At the end of 2022 we also said goodbye to our deputy director, professor Anna Sobek who became Head of the Department of Environmental Science from the 1st of January 2023. Anna's engagement, competence and personality will be missed by all of us at the center. Her contribution to our work has been invaluable and we wish her the best of luck in her new role.



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