



CERE

2021

2021

dissertation
theses

3

journal articles

26

book chapters

2

reports &
working papers

20

seminars

13

unique visitors on web each month

538

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photos: Mona Bonta Bergman

Research Directors' Welcome

Another pandemic year has passed, however, despite predominantly practicing social distancing, we managed to uphold CERE activities a bit more than previous year. Although mostly digital, some events were actually in person, and we have been working hard trying to maintain our usual activities such as seminars and research meetings. Considering the challenges posed we think CERE has been successful in adapting to the new times. Here are some of the important events from the year 2021:

We welcomed new members this year; Sofia Lundberg (chairman of the CERE board and Dean of USBE), Hanna Lindström (Economics, UmU) and Mattias Näsman (Economic History Unit, UmU) who joined just after defending his thesis. Their expertise is a great addition to the CERE research environment. Sandra Schusser (June) and Hanna Lindström (October), **defended their theses**, and both did an excellent job. We wish them all luck in their future career! Hanna we will be able to follow more closely as she is doing her post-doc at CERE.

The annual **Ammarnäs meeting** was organized digitally with special guests from Ghana, including CERE alumni Amin Karimu, and also Christoffer Boman, Department of Applied Physics, Umeå University. Focus was on energy issues related to Sub-Saharan Africa.

The 27th Ulvön Conference on Environmental Economics took place in August and in a digital format. We had two afternoons of presentations and a panel discussion on how to use our forest including

scholars from both economics and natural sciences. Although it was not like the IRL meeting, we were still quite happy with the result.

CERE has been active in the **public debate** on numerous subjects including use of forests, emission policy, tax on plastic bags, sustainability of Swedish cement production, intermittent electricity production. These public debate interjections are chronicled on the CERE webpage under News for those who are interested in the details.

Sadly, we lost a dear member of CERE, **Karl-Gustaf (Kalle) Löfgren**. He was vital in building a vibrant environmental and resource economics research environment in Umeå, which eventually developed into what today is CERE. He will be sorely missed.

Finally, 2021 saw a **new leadership of CERE**. Tommy Lundgren took over the helm from Runar Brännlund as Director of CERE, and Göran Bostedt serve as co-Director of CERE. An informal ceremony took place at a Workshop in October where Runar Brännlund and Bengt Kriström, former Directors and founders of CERE, were thanked and the "leadership torch" was officially handed over. We believe we have big shoes to fill but our goal is to bring CERE forward into the future in the same spirit as Runar and Bengt. That is, a Centre with its research agenda firmly rooted in environmental and resource economics with the aim to be policy relevant.

Tommy Lundgren
Director

Göran Bostedt
Co-director



Runar Brännlund and Bengt Kriström
photo: Mona Bonta Bergman



Tommy Lundgren and Göran Bostedt
photo: Mona Bonta Bergman



Sandra Shusser
photo: Mona Bonta Bergman



Karl-Gustaf Löfgren
photo: Jenny Svénnäs-Gillner



Hanna Lindström
photo: Mattias Pettersson

Personnel and Visitors

Professors

Runar Brännlund
Peichen Gong
Bengt Kriström
Magnus Lindmark
Sofia Lundberg
Tommy Lundgren
Bo Ranneby

Associate Professors

Ann-Kristin Bergquist
Göran Bostedt
Jūratė Jaraite
Lars Persson
Camilla Widmark

Other Researchers

Ola Carlén
Amare Teklay Hailu
Chandra Kiran B Krishnamurthy
Hanna Lindström
Aemiro Melkamu Daniel
Adan L. Martinez-Cruz
Mattias Näsman
Marco Persichina
Mattias Vesterberg
Wenchao Zhou

Graduate Students

Victoria S Ayubu
Sef Meens-Eriksson
Xiao Hu
Stina Kalén
Sandra Schusser
Anders Vesterberg

Communication

Mona Bonta Bergman

Associates

Maria Arvaniti, Doctor
ETH Zürich, Switzerland
Moriah Bostian, Associate Professor
Lewis & Clark College, United States of America
Shawna Grosskopf, Professor Emerita
Oregon State University, USA
Per-Olov Johansson, Professor Emeritus
Stockholm School of Economics, Sweden
Amin Karimu, Doctor
University of Ghana Business School, Ghana
Andrius Kazukauskas, Doctor
Vilnius University, Lithuania
Anton Knutsson,
Swedish University of Agricultural Sciences, Sweden
Klarizze Puzon, Research Associates
United Nations University, Finland
Erlend Dancke Sandorf, Doctor
Norwegian University of Life Sciences, Norway

Visitors (online)

Claudia Aravena, Assistant Professor
Department of Economics, Edinburgh Heriot-Watt University
Sangeeta Bansal, Professor
Jawaharlal Nehru University
Julia Blasch, Professor
Vrije Universiteit
Davide Cerruti, Doctor
CEPE, ETH-Zurich
Dorothee Charlier, Assistant Professor
Universite Savoie Mont-Blanc
Dennis Guignet, Assistant Professor
Department of Economics, Appalachian State University
Andrew A King, Professor
Boston University
Lucija Muehlenbachs, Associate Professor
Department of Economics, University of Calgary, NBER
Hector Nuñez, Associate Professor
Department of Economics, CIDE
Nathaly Rivera, Doctor
Department of Economics, University of Sao Paulo
Katya Vasilaky, Assistant Professor
Department of Economics, Orfalea College of Business, California
Polytechnic State University



photo: Mona Bonta Bergman

Board Members 2021

Board of Directors

The Board of Directors oversees the Centre's activities and review the Strategic Plan. It consists of researchers from across the environmental science and economic disciplines in Umeå.

Chair: Sofia Lundberg - Professor, and Dean at Umeå School of Business and Economics and Statistics (USBE), Umeå University

Vice Chair: Camilla Widmark - Associate Professor, and Head of Department of Forest Economics, SLU Umeå

Göran Ericsson - Professor, and Head of Dept. of Wildlife, Fish and Environmental Studies, SLU Umeå

Johan Fransson - Associate Professor, Dept. of Forest Resource Management, SLU Umeå

Carina Keskitalo - Professor, Dept. of Geography, Umeå University

Ove Nilsson - Professor, Dept. of Forest Genetics and Plant Physiology, Swedish University of Agricultural Sciences (SLU) Umeå and Director of Umeå Plant Science Centre

Research Directors' of CERE:

Runar Brännlund - Professor, USBE, Umeå University, Adjunct board member

Tommy Lundgren - Professor, Dept. of Forest Economics, SLU Umeå, Adjunct board member

Deputy Research Director of CERE:

Göran Bostedt - Associate Professor, USBE, Umeå University and Dept. of Forest Economics, SLU Umeå

Scientific Secretaries of CERE:

Adan L. Martinez-Cruz - University lector, Dept. of Forest Economics, SLU, Adjunct board member

Mattias Vesterberg - Doctor, USBE, Umeå University, Adjunct board member

Our Advisory Board for Strategic Issues

The Advisory Board hibernated 2020 and 2021 due to Covid. In 2022 it will be reconstructed so we take this opportunity to thank all of you that provided us with invaluable knowledge, experience and advice from your respective industries and areas of expertise.

Lars Bergman - Professor, Former President, Stockholm School of Economics

Torbjörn Fagerström - Professor, Former CEO, Swedish Foundation for Strategic Research

Yvonne Fredriksson - Former Director General, Swedish Energy Markets Inspectorate, Founder of WHYWE consulting AB

Kjell Jansson - Former CEO, Swedenergy

Anders Kristoffersson - Former Senior Advisor, Ministry of Finance

Mårten Larsson - Former Head of Industrial Policy Department, Swedish Forest Industries Federation

Top from left:

Sofia Lundberg. Photo: Umeå University.

Ove Nilsson. Photo: Julio Gonzalez.

Camilla Widmark. Photo: Mona Bonta Bergman

Bottom from left:

Carina Keskitalo. Photo: Umeå University.

Göran Ericsson. Photo: Jenny Svénnås-Gillner.

Johan Fransson. Photo: Mona Bonta Bergman.



A Journal Article

Social comparisons in real time: A field experiment of residential electricity and water use.

The study provides evidence that information-based measures can be effective in helping to reduce energy use in the residential sector.

By using a randomized experiment, the study finds that the availability of hourly information about electricity use in the form of social comparisons provided via in-house real-time displays reduces electricity consumption by about 6.7%. This effect is equivalent to an annual energy saving of 110 kWh per household, meaning that the average household in the treatment group took electricity saving actions equivalent to turning off one standard 60-watt light bulb for about five hours each day.

In addition, the results revealed that the electricity savings are impersistent as the treatment effect lasted for the last five months of our experiment. This finding has concrete policy implications as it suggests that non-pecuniary measures, such as social comparisons communicated through real-time displays, may not be sufficient to encourage continuous electricity savings alone.

On the other hand, social comparison had no effect on residential water use suggesting that households might have different motives for conserving water. The study provides some support for the view that in Sweden, the environmental impacts of water use are less of a concern than those of electricity use, suggesting that social norms might influence water use less than electricity use.

Kažukauskas, A., Broberg, T., & Jaraitė, J. (2021)
The Scandinavian Journal of Economics, 123(2),
558-592

A CERE Working Paper

Time vs money metrics for contingent valuation surveys: Theory and application to rural data.

When conducting surveys about valuing public goods the Contingent Valuation Method (CVM), one conventionally uses a monetary metric. The respondent is asked to provide the subjective valuation in terms of money.

There are cases when other metrics appear useful. For example, will unemployed respondents express willingness to pay if they do not have a source of income (or wealth) even if the good has value to them?

We propose a measure of willingness to pay (WTP) in two different metrics, time and money. We show theoretically that WTP, for a small environmental improvement, in the money metric is approximately equal to the wage in the time metric.

This theoretical prediction is supported empirically using a field survey on the valuation of mangrove and seagrass conservation in rural Philippines.

Results indicate the effectiveness and suitability of both time and money metrics for the WTP among developing country respondents.

Bengt Kriström & Klarizze A. Puzon
CERE WP#2021-16



photo: Mona Bonta Bergman

Publications 2020-2021

Books and book chapters

Abord-Hugon Nonet, G., Aggestam Pontoppidan, C., Dale Ditlev-Simonsen, C., Hermes, J., Lankoski, L., Lundberg, S., Maheshwari, S., Perrotta Berlin, M., Petro Sebhatu, S., Solitander, N. & Sundemo, M. (2022). PRME Nordic Chapter, In: Morsing, M. (Ed.). (2022). *Responsible Management Education: The PRME Global Movement*. Routledge, pp. 182-197.

Bansal, S., Grover, C., & Martinez-Cruz, A. L. (2021). Towards Sustainable Consumption Practices: Evidence from India. In: Swain, R.B. & Sweet, S. (Eds.) *Sustainable Consumption and Production, Volume I* (pp. 343-367). Palgrave Macmillan, Cham.

Bergquist, A. K., Ducoing, C., & Ranestad, K. (2021). Different Drivers Behind Corporate Environmental Policies: The Case of the Swedish and Chilean Copper Industry. In: Ducoing, C. & Peres-Cajías, J. (Eds.) *Natural Resources and Divergence* (pp. 279-303). Palgrave Macmillan, Cham.

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Kander, A., & Lindmark, M. (2020). Ekonomi och miljö-om miljöhistorien och framtiden. In: Andersson-Skog, L., Broberg, O., Edvinsson, R., Enflo, K. & Lilja, K. (Eds.) *Vad är ekonomisk historia?* Studentlitteratur, Lund

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Vesterberg, M. (2020). *Den svenska elmarknaden: är hushållen en kraft att räkna med?*. SNS förlag.

Doctoral dissertations

Amjadi, G. (2020). *Essays on energy efficiency, environmental regulation and labor demand in Swedish industry*. Doctoral thesis, Umeå: Umeå University, Department of Economics

Daniel, A. M. (2020). *Towards sustainable energy consumption: Electricity demand flexibility and household fuel choice*. Doctoral thesis, Umeå: Umeå University, Department of Economics

Egüez, A. (2020). *Energy efficiency, district heating and waste management: essays on environmental economics*. Doctoral thesis, Umeå: Umeå University, Department of Economics

Lindström, H. (2021). *Food for Thought: Essays on Green Public Procurement and the Market for Organic Food*. Doctoral thesis, Umeå: Umeå University, Department of Economics

Näsman, M. (2021). *The political economy of emission standards: politics, business and the making of vehicle emission regulations in Sweden and Europe, 1960-1980s*. Doctoral thesis, Umeå: Umeå University, Unit of Economic History

Schusser, S. (2021). *Moving towards a More Sustainable World. Four Essays on Renewable Energy, Emissions Trading, and Environmental Behaviour*. Doctoral thesis, Umeå: SLU, Acta Universitatis Agriculturae Sueciae 2021:24, 1652-6880.

Journal articles

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Asmare, F., Jaraitė, J., & Kažukauskas, A. (2021). The effect of descriptive information provision on electricity consumption: Experimental evidence from Lithuania. *Energy Economics*, 104, 105687.

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Reports

Amjadi, G. (2020). *Environment versus Jobs: An Industry-level Analysis of Sweden*. Working Paper 2020:13, Centre for Environmental and Resource Economics, Umeå, Sweden.

Amjadi, G. (2020). *Is Industrial Energy Inefficiency Transient or Persistent? Evidence from Swedish Manufacturing*. Working Paper 2020:15, Centre for Environmental and Resource Economics, Umeå, Sweden.

Amjadi, G., Lundgren, T., & Zhou, W. (2020). *A Dynamic Analysis of Industrial Energy Efficiency and the Rebound Effect*. Working Paper 2020:1, Centre for Environmental and Resource Economics, Umeå, Sweden.

Bergquist, A. K., & Lindmark, M. (2020). *Förutsättningar och hinder för att nå nollutsläpp: Empirisk kartläggning av koldioxidutvecklingen inom olika sektorer och betydelsen av ekonomiska och politiska drivkrafter 2009–2019 samt en forskningsöversikt om betydelsen av populism och högerextrema värderingar för klimatpolitiken ur ett längre tidsperspektiv*. Umeå Papers in Economic History No 49.

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Broberg, T., Brännlund, R., Lundgren, T., & Persson, L. (2021). *The value of lost load in Swedish industry*. Energiforsk, Report 2021:787, ISBN 978-91-7673-787-3.

Broberg, T., Dijkgraaf, E. & Meens-Eriksson, S. (2021). *Burn it or let them bury it? The net social cost of producing district heating from imported waste*. Working Paper 2021:13, Centre for Environmental and Resource Economics, Umeå, Sweden

de Bruin, K. C., & Krishnamurthy, C. K. (2021). *Optimal climate policy with fat-tailed uncertainty: What the models can tell us* (No. 697). ESRI Working Paper.

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Daniel, A. M. (2020). *Household heterogeneity in valuing electricity demand flexibility services*. Working Paper 2020:2, Centre for Environmental and Resource Economics, Umeå, Sweden.

Egüez, A. (2020). *Compliance with the EU Waste Hierarchy: It is a matter of stringency, enforcement ... and time!* Working Paper 2020:8, Centre for Environmental and Resource Economics, Umeå, Sweden.

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- Grytten, O. H., Lindmark, M., & Minde, K. B. (2020). *Energy Intensity and the Environmental Kuznets Curve* (No. 11/2020). Norwegian School of Economics, Department of Economics.
- Hu, X., Jaraite, J. & Kažukauskas, A. (2020). *The Effects of Wind Power on Electricity Markets: An Evaluation Using the Swedish Electricity Market Data*. Working Paper 2020:12, Centre for Environmental and Resource Economics, Umeå, Sweden
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Conference presentations

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Lindström, H. (2021). The Swedish consumer market for organic and conventional milk: A demand system analysis. Presented at the 26th *Annual Conference of the European Association of Environmental and Resource Economists*, 23 Jun - 25 Jun 2021

Lundgren, T. *EAERE 2020*, Berlin, (presenter M. Bostian), Prevention or cure? Optimal abatement.

Lundgren, T. *ECOS workshop on sustainable renewable energy*, April 2021. Presentation on sustainable bioenergy use from forests.

Lundgren, T. *27th Ulvön Meeting on Environmental Economics* (digital), August 2021. Main Organizer.

Martinez Cruz, A. (2021). *Noveno Congreso de Economía Agrícola y de los Recursos Naturales*, Universidad Autónoma de Chapingo, Mexico. Virtual presentation.

Martinez Cruz, A. (2021). *VI Coloquio Nacional y IV Coloquio Internacional en Administración Estratégica y Políticas Públicas: "Innovación y Competitividad"*, Universidad Autónoma de Baja California Sur, Mexico. Virtual presentation.

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Martinez Cruz, A. (2021). *Ciudades del futuro: ciudades verdes. Reflexiones en el marco de la Agenda 2030 de los ODS*, Webinar *Iberoamericano RED IBERODS- DGAPA PAPIIT*, virtual presentation.

Martinez Cruz, A. (2021). *Department of Economics*, Swedish University of Agricultural Sciences (SLU), virtual presentation.

Martinez Cruz, A. (2021). *Charles Darwin Foundation*, Galapagos Islands, virtual presentation.

Martinez Cruz, A. (2021). *Department of Economics*, University of Calgary, virtual presentation.

Martinez Cruz, A. (2021). *Facultad de Economía*, Universidad de San Francisco de Quito (USFQ), virtual presentation.

Martinez Cruz, A. (2020). *Centre for Energy Policy and Economics (CEPE)*, ETH-Zurich, virtual presentation.

Martinez Cruz, A. (2020). *Seminar on Urban Sustainability in the Global South*, SLU, virtual presentation.

Martinez Cruz, A. (2021). *Society for Benefit-Cost Analysis Annual Conference*, virtual presentation.

Martinez Cruz, A. (2021). *Online International Conference on "Future Challenges and Sustainable Development Goals"*, virtual presentation. 2020

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Widmark, C. (2021, September). Forest Ecosystem Services in policy. In *European Bioeconomy Universities Scientific Forum*.

Widmark, C. (2021, September). Innovative bioeconomy and forest ecosystem services. In *European Bioeconomy Universities Scientific Forum*.

Widmark, C. (2020, May). Digital processes in the forest-based bioeconomy. *Workshop on Digitalisation, SLU & LUKE*.

Widmark, C. (2020, September). Forest ecosystem services in policy and in practice – an example of Swedish forest policy. *Scandinavian Society for Forest Economics*.

Widmark, C. (2020, November). Skog och skogsägare i Sverige. *Skogsträff för kvinnor*. Populärvetenskaplig presentation.

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