



University of St.Gallen

Center for Mobility



Center for Mobility

# Annual Report 2023

# Welcome to the Center for Mobility

Dear Readers

This is the third annual report of the Center for Mobility at the University of St.Gallen (CfM-HSG).

The CfM-HSG was established on January 1, 2020, with the aim of coordinating research on topics related to the field of “management of personal mobility” and its related value creation systems and effects. The center provides a cooperation platform, showcase and interface for this field beyond the various institutes, chairs, and researchers at the University of St.Gallen. It differs from similar centers, for instance at ETHZ and EPFL, primarily in disciplinary terms by adopting a clear social science perspective.

Various challenges and associated opportunities shape this field, such as digitalization, climate change, and future land use and related mobility systems.

- The topic of digitization is particularly concerned with the future development of our work-based economy (stationary vs. online), the associated way of life, new work and related system and business models (including the use of space or the provision of mobility).
- The topic of climate change is primarily concerned with questions of future energy supply for mobility purposes (with a shift from fossil fuels to renewable energy) and the allocation of these energy sources to different forms of mobility and the associated economies.
- The topic of land use and mobility systems primarily concerns questions about models of future use as well as allocation and distribution of the limited resource “land” as well as existing and possibly newly created means of transport.

Four institutes at the University of St.Gallen are currently part of this center:

- Institute for Systemic Management and Public Governance (IMP-HSG) and herein in particular the SBB Lab and the Research Center for Tourism and Transport.
- Institute for Mobility (IMO-HSG)
- Institute for Technology Management (ITEM-HSG)
- Institute for Economy and the Environment (IWÖ-HSG)

Administratively and financially, the Center is supported by the SBB Lab, which is also located at the IMP-HSG.

We are pleased to report briefly on our activities in 2023.



Prof. Dr. Thomas Bieger  
President of the Academic Advisory Board



Prof. Dr. Christian Laesser  
Managing Director

# Institute for Systemic Management and Public Governance

This year, the topic of mobility occupied us not only within the framework of our ongoing activities but also, and especially, because of the remaining pandemic's impact on this domain, along with tourism. The Institute hosts the SBB-Lab. Thanks to this significant support, we could pursue several research projects (see below).

## Projects

Three projects were in the foreground in 2023.

The project *Option Values in Public Transport*, aiming to determine the perceived value of transport options, considering personal characteristics and travel context, has been completed. Theoretical considerations, explorative studies, and market-based instruments such as season tickets and insurance suggest that significant option value also exists in Swiss passenger transport.

Further, we started work within the framework of the Innosuisse Flagship *Resilient Tourism*. In the scope of the CfM, we are developing alternative business models at the interface between tourism and mobility together with various practical partners. For instance, we are in the midst of developing business models that aim to integrate the arrival and return journey by public transport into the overnight stay.

## Publications

Among other publications (mostly project related) we have continued to publish the Yearbook of Swiss Transportation. A larger publication concerned the topic of Option Values in Public Transport; an electronic dissertation is available on this topic.

## Education and training

The course *Transportation Systems* at Master level was held for the 13th time this year. 10 students familiarized themselves with various aspects and perspectives on the topic of "Transportation Systems", such as demand, supply, impact, policy, governance or management. The institute also is responsible for the course *Aviation Systems* of our colleagues of the Center of Aviation Competence and the introductory course in Management and the Integration Seminar for first year students. Both use several case studies related to transport (e.g., case for Integration Seminar Airport Zurich).

## Various

Our management of the [SBB Research Fund](#) continues to play an important role. This fund supports research on current issues concerning the Swiss transport network that have been neglected in the Swiss or international context. Within the framework of the current funding period (2020–2024), a total of 14 projects could be processed so far. Over the already 14 years of its existence, 42 projects were supported. The SBB Research Fund therefore also plays an important role as a cooperation platform for Swiss research in (rail) transport.

For many years, the general secretariat of the Swiss Society of Transportation Sciences (SVWG; [www.svwg.ch](http://www.svwg.ch)) has been domiciled at our institute. On behalf of this society, we again have organized two forums of Swiss transport. Furthermore, we are, together with ETHZ, EPFL and USI Lugano, member of the organizing committee of the annual Swiss Transport Research Conference (STRC; [www.strc.ch](http://www.strc.ch)).

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## Contact



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# Institute for Mobility

The Institute for Mobility (IMO-HSG) aims to contribute to a future of mobility that is environmentally, socially, and economically sustainable. The institute is run by a passionate team of researchers who engage in diverse topics such as mobility platforms, shared autonomous vehicles, car sharing, micro-mobility, corporate mobility, and many more.

## **The IMO Research Labs**

*The Future Mobility Lab.* The Future Mobility Lab is a consortium which intends to research and foster sustainable mobility behavior. The lab brings together a multitude of renowned partners from Germany and Switzerland, united in the aim to shape consumer- and future-oriented mobility solutions.

*PwC Lab for Smart Mobility.* The think tank in cooperation with PwC studies connected and sustainable future mobility models and their effect on people's mobility behavior. Among other topics, the Lab is currently studying Shared Autonomous Vehicles (SAVs) and preparing for their integration in cities.

*AMAG x IMO Lab.* Through collaboration with one of the largest providers of individual mobility solutions in Switzerland, we develop holistic concepts that reduce CO<sub>2</sub> emissions in transport. In doing so, we address research topics, such as electromobility, smart infrastructure, and mobility-as-a-service systems.

*Porsche Consulting Lab.* What will the future of mobility look like? Our Porsche Consulting Lab is committed to addressing this question and, consequently, to bringing innovative visions for the mobility sector to life. Through close cooperation between research and practice, we aim to facilitate the transformation of the mobility industry in alignment with business, social, and ecological considerations.

## **Education & Training**

*Smart Mobility Marketing.* For the second time, the seminar “Smart Mobility Marketing” at bachelor level was held in the fall semester of 2023. Around 30 students, organized into groups of four to five, had the chance to develop a smart mobility solution for a product launch in one of six different mobility market segments (e.g., ride-pooling, e-bike-sharing, or bus).

*CAS Smart Mobility Management.* The IMO-HSG launched the executive program Smart Mobility Management in September 2020. Since then, 124 alumni graduated as certified Smart Mobility Manager (HSG). In May 2024 a new class will start along with the first Smart Mobility Homecoming Celebration. In October 2024 the movement will set off towards China

with the first Smart Mobility Expedition to Shanghai. All activities are organized in a tailor-made online platform which serves as home base for the growing Smart Mobility Movement with more than 200 alumni, lecturers, and partners.

### **The Smart Mobility Summit**

On September 15th, 2023, the IMO-HSG successfully carried out its “2nd Smart Mobility Summit”. For one day, up to 150 executives from the international and national mobility industry met in Munich to discuss and shape the future of mobility in lectures, panel discussions, and breakout sessions with high-ranking speakers. Special attention was given to the development of new mobility markets and players in a radically changing economic and political global landscape. Among the speakers were Dr. Herbert Diess (Chairman of the Supervisory Board of Infineon Technologies) and Joschka Fischer (Former Foreign Minister and Vice-Chancellor of the Federal Republic of Germany). The “3rd Smart Mobility Summit” is scheduled to take place in October 2024 in Berlin.

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## Contact



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# Institute of Technology Management

In the research area of Prof. Dr. Oliver Gassmann at the Institute of Technology Management we had several mobility projects in 2023. Our leading research questions are mostly around the perspective of new business models. We are interested in the question of how to create and capture value around mobility.

Mobility continues to play a major role in the work of our Sustainability Innovation Lab, headed by Prof. Dr. Maximilian Palmié. The activities of this lab revolve around three core questions: How can organizations progress towards social, environmental, and economic sustainability? How can they utilize digital technologies to do so? And how can they scale sustainable technologies? The Sustainability Innovation Lab frequently deals with mobility issues as a constituting element of energy systems (e.g., Smart Cities, Positive Energy Districts). In addition to executing its tasks in the NRP 77 project on the replication and upscaling of Smart City solutions (funded by the Swiss National Science Foundation) and in the project on sustainable, multi-modal mobility in rural areas (funded by the Swiss Federal Office of Energy), the Sustainability Innovation Lab was able to initiate several long-term projects around these questions. It began its work on the “Horizon Europe” project ASCEND (funded by the European Commission) and the 10-year project SWEET CoSi (funded by the Swiss Federal Office of Energy). In 2023, mobility-related research results of the Sustainability Innovation Lab appeared in the Journal of Business Research and Technovation.

Headed by Dr. Wolfgang Bronner (Executive Director Bosch) and Prof. Dr. Felix Wortmann (Scientific Director), the Bosch IoT Lab investigates business model innovation on the Internet of Things (IoT). In addition, the Bosch IoT Lab explores disruptive IoT products and services. The lab operates in three research streams. The first research stream investigates ecosystems and platform business models that disrupt existing industries. The second research stream is geared towards novel go-to-market strategies and disruptive channel architectures for established product companies. Finally, the lab investigates new opportunities in the realm of safe mobility (in-vehicle hypoglycemia and drunk driving detection) and sustainable energy (heat pump optimization).

In 2023, the lab published the books “Produkte als Dienstleistung verstehen: Wie das Internet der Dinge die produzierende Industrie verändert” and “The Platform Business Navigator” in Financial Times/Pearson. The interdisciplinary research results were published in outlets such as Electronic Markets, Business Horizons, Diabetes Care, and the 2023 CHI Conference on Human Factors in Computing Systems.

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## Contact



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# Institute for Economy and the Environment

The Chair of Renewable Energy Management at the Institute for Economy and the Environment (IWÖ-HSG) has continued to extend its activities at the intersection of renewable energy and electric mobility in 2023.

The focus of our activities is to explore consumer preferences of “Early Electrifiers” –households that co-adopt electric vehicles, solar photovoltaics and other clean energy technologies (especially heat pumps and battery storage) – and to investigate innovative business models to leverage the opportunities emerging from the convergence of those low-carbon technologies.

Three PhD students and one postdoctoral researcher are currently focusing on different aspects of this theme. Dr. Cristian Pons-Seres de Brauer investigates the potential for “rolling solar storage” – a new business model built around employers incentivizing their employees to charge their car with solar power generated during the day on the company's premises. This would allow to overcome the temporal mismatch of solar supply and charging demand. With bilateral charging, the business model could be further extended to also cover employees' electricity demand at home. Julia Loder investigates the role of emotions in explaining co-adoption of various technologies in the home electrification ecosystem, including EVs. Juliane Seika analyses circular economy business models for second-life EV batteries, and Sabrina Mili's research is exploring the electrification of agricultural transport.

The convergence of solar PV, electric vehicles and storage is also one of our focus themes in the SWEET EDGE project, a large nationwide consortium exploring fully renewable energy futures for Switzerland, and funded by the Swiss Federal Office of Energy. Our work on circular economy solutions for automotive batteries is funded by Innosuisse as part of the CircuBAT project.

Mobility is also one of the focus topics in the continuing education program CAS Renewable Energy Management, including a jointly organized panel discussion on EV-PV-convergence with the Swiss Embassy in Berlin, and two workshops at the annual St. Gallen Forum for Management of Renewable Energies ([www.remforum.ch](http://www.remforum.ch)).

Furthermore, many IWÖ-HSG courses at bachelor and master levels touch upon mobility. The second edition of the highly popular MIA Consultancy Project on Climate-friendly European travel was held in cooperation with ÖBB ([www.nightjet.com](http://www.nightjet.com)), the leading operator of international night trains across Europe. This was also an elective course for the certificate program Managing Climate Solutions (MaCS-HSG, [www.macs.unisg.ch](http://www.macs.unisg.ch)). The MaCS students implemented a variety of climate- and transport-related projects. The climate stairs ([www.klimatreppe.ch](http://www.klimatreppe.ch)) are an innovative

project raising pedestrians' awareness of temperature changes in Switzerland since the 1860s, as they walk up to the University campus. TRIPSTER is an initiative to promote low-carbon travel to students and young people. Finally, the 2nd edition of the climate career night, hosted by the MaCS student board at SQUARE in November 2023, featured both established companies as well as promising entrepreneurial ventures, such as the Swiss-based electric cargo vehicle supplier Flux Mobility ([www.fluxmobility.ch](http://www.fluxmobility.ch)).

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## Contact



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# CfM-HSG Academic Advisory Board and Management

The governance of the CfM-HSG consists of a Advisory Board and the Management.  
For the term of office 2020–2023 the following persons hold these positions.

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## Academic Advisory Board



Prof. Dr.  
Thomas Bieger,  
President



Prof. Dr.  
Oliver Gassmann,  
Member



Prof. Dr.  
Andreas Herrmann,  
Member



Prof. Dr.  
Rolf Wüstenhagen,  
Member

## Management



Prof. Dr.  
Christian Laesser,  
Managing Director

## Collaborators



Dr. Daniel Bazzi,  
Project Manager



Simon Kuster, M.A.,  
Research Associate



Barbara Bieger,  
Secretariat

# Projects

(In parentheses: funding and principal investigators; list in alphabetical order of titles)

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“New Mobility Buddys” Study by the Future Mobility Lab (Research consortium with various partners; PI: Jürgen Stackmann, Philipp Scharfenberger, Jannis Linke)

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AMAG x IMO Lab (Research cooperation with AMAG; PI: Tamara Wisser, Philipp Scharfenberger, Andreas Herrmann)

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ASCEND (accelerate positive clean energy districts) (EU Horizon Europe; PI: Maximilian Palmié)

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CircuBAT: Swiss circular economy model for automotive lithium batteries (Innosuisse Flagship project; PI: Merla Kubli)

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Connected Business and IoT Performance Management (Bosch, PI: Felix Wortmann)

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Integration of public transport and accommodation in Swiss tourism (Innosuisse; PI: Christian Laesser)

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IoT Platform Economy (Bosch; PI: Felix Wortmann)

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Mobility in Urban Quarters (Research cooperation with Toyota Financial Services & KINTO and the London School of Economics; PI: Michael Semmer, Andreas Herrmann)

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Option Values in Public Transport (SBB Lab; PI: Simon Kuster, Christian Laesser)

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Perception and Evaluation of Mobility-Apps (Research cooperation with various public transport providers and associations in Germany; PI: Jannis Linke, Andreas Herrmann)

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Porsche Consulting Lab (Research cooperation with Porsche Consulting; PI: Andreas Herrmann)

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PwC Lab for Smart Mobility (Research cooperation with PwC; PI: Marvin Greifenstein, Luisa Stöhr, Philipp Scharfenberger, Andreas Herrmann)

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Successfully Intertwining Public Transport and Micromobility (Research cooperation with Ostwind, TIER, SBB, Agglo St. Gallen-Bodensee, and the City of St. Gallen, PI: Matthias Brüning, Philipp Scharfenberger)

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SWEET CoSi (Co-Evolution and Coordinated Simulation of the Swiss Energy System and Swiss society) (Bundesamt für Energie; PI: Maximilian Palmié)

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SWEET EDGE: Integration of decentralized supply of renewable energy into the Swiss energy system (Swiss Federal Office of Energy (SFOE); PI: Rolf Wüstenhagen)

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The Ecological Impact of Owned and Shared Mobility (Research cooperation with Sixt SE; PI: Andreas Collet, Philipp Scharfenberger, Andreas Herrmann)

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The Future Mobility Lab (Research consortium with various partners; PI: Jürgen Stackmann, Philipp Scharfenberger, Jannis Linke, Luisa Stöhr)

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The Perception of Alternatives to Motorized Individual Transport and the Perceived Fairness of Mobility Restrictions (Research cooperation with the London School of Economics; PI: Jannis Linke, Andreas Herrmann)

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The role of emotions in shaping cost perceptions and accelerating the adoption of multiple clean energy solutions, Stiftung Nagelschneider (2023–2024). (PI: Julia Loder)

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The Swiss Mobility Monitor (Research consortium with various partners; PI: Marvin Greifenstein, Andreas Herrmann, Reto Hofstetter and his team at the University of Lucerne)

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## Contact



To get in touch with any of the above investigators, contact them by e-mail at [firstname.lastname@unisg.ch](mailto:firstname.lastname@unisg.ch)

# Consecutive and executive education at UNISG

(List in alphabetical order of titles)

## Consecutive education

### *Master Level*

#### **Aviation Systems**

Andreas Wittmer

#### **Business Innovation I: Geschäftsmodelle entwickeln**

Oliver Gassmann

#### **Clean Energy Marketing**

Rolf Wüstenhagen

#### **Climate Change and the Psychology of Decision-Making**

Karoline Gamma

#### **Climate Solutions 101**

Rolf Wüstenhagen and Merla Kubli

#### **Grand Challenge: Climate Solutions als Wettbewerbsvorteil**

Moritz Looch

#### **Innovationsmanagement für Smart Cities**

Maximilian Palmié

#### **MIA Consultancy Project: Climate Friendly European Travel**

Rolf Wüstenhagen and Nina Hampl

#### **Social acceptance of sustainability innovations**

Merla Kubli and Emmanuelle Reuter from the University of Neuchatel

#### **Transportation Systems**

Christian Laesser

### *Bachelor Level*

#### **Businesspläne entwickeln und analysieren**

Thomas Bieger and Christian Laesser

#### **Capstone Project: Operations and Innovation Management**

Maximilian Palmié

#### **Smart Mobility Marketing**

Andreas Herrmann and Torsten Tomczak

#### **Ökonomie der CO2 neutralen Stadt**

Moritz Looch

## Executive education

#### **CAS Renewable Energy Management (REM-HSG)**

<https://es.unisg.ch/en/executive-programme/renewable-energy-management-rem-hsg/>

Rolf Wüstenhagen et al.

#### **CAS Smart Mobility Management**

<https://www.es.unisg.ch/de/programme/cas-smart-mobility-management>

Andreas Herrmann, Karolin Frankenberger, Oliver Gassmann, Marco Leimeister  
(Program Director: Hans-Peter Kleebinder)

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executive education  
at UNISG

# Conferences

(List in alphabetical order of titles and first authors)

## #REMforum 12th St. Gallen Forum for Management of Renewable Energies

22nd –23rd June 2023. Further info: [www.remforum.ch](http://www.remforum.ch).

## Kubli, M. (2023). Konvergenz von E-Mobilität und erneuerbaren Energien. 3. Nationale Mobilitätskonferenz: Widerstandsfähiges Verkehrssystem,

Bern, 29. August 2023.

## Loder, J. (2023): Feels like a bargain? The role of emotions in shaping renewable energy technology cost perceptions and adoption. International Association for Energy Economics, 18th IAEE European Conference 2023,

Milano, 26th July 2023, [https://www.iaee.it/iaee\\_2023/](https://www.iaee.it/iaee_2023/).

## Seika, J. & Kubli, M. (2023). Towards a circular economy for EV batteries: Repurpose or recycle? Deutsche Gesellschaft für System Dynamics (DGSD) Jahrestagung,

Hagen, 28th April 2023.

## Seika, J. & Kubli, M. (2023). Towards a circular economy for lithium-ion batteries: Repurpose or recycle end-of-(first)-life materials? International System Dynamics Conference,

Chicago, 23rd – 27th July 2023, <https://proceedings.systemdynamics.org/2023/papers/PI232.pdf>.

## The “Zukunft Nahverkehr” Conference (4.-9.9.2023 in Berlin) Presentations and panel sessions by Andreas Herrmann, Philipp Scharfenberger, and Jannis Linke.

## The IAA Mobility Conference (5.–10.9.2023 in Munich) Various presentations and panel sessions by Andreas Herrmann, Philipp Scharfenberger, Jannis Linke, and Marvin Greifenstein.

## The National Mobility Conference of Switzerland (29.8.2023 in Bern) Presentation and panel session by Philipp Scharfenberger and Jannis Linke.

## The Smart Mobility Summit (15.9.2023 in Munich) Summit for mobility executives carried out by the Institute for Mobility.

# Publications

(List in alphabetical order of first authors)

Bencsik, B., Palmié, M., Parida, V., Wincent, J., & Gassmann, O. (2023). Business models for digital sustainability: Framework, microfoundations of value capture, and empirical evidence from 130 smart city services. *Journal of Business Research*, 160, 113757.

Collet, A. & Scharfenberger, P. (2023). Carsharing – Utopia or Real Gamechanger? Conceptualising the Potential of Carsharing for Tackling Carbon Emissions. *Marketing Review St.Gallen*, 4, 32–41.

Greifenstein, M. (2024). Factors Influencing the User Behaviour of Shared Autonomous Vehicles (SAVs): A Systematic Literature Review. *Transportation Research Part F: Traffic Psychology and Behaviour*, 100, 323–345.

Greifenstein, M., Schakols, F., Finken, D. & Hofstetter, R. (2023). Who Would Subscribe for a Car? The Influence of Car Ownership, Environmental Consciousness, Age, and Place of Living. *Marketing Review St.Gallen*, 4), 42–49.

Herrmann, A., Jungwirth, J., & Han, Z. (2023). *Inventing Mobility for All: Mastering Mobility-As-A-Service With Self-Driving Vehicles*. CSP Books (Chinese Edition).

Herrmann, A., Scharfenberger, P., & Linke J. (2023). Nachhaltige Mobilität. *Markenartikel – das Magazin für Markenführung*, 8, 26–27.

Kuster, S. (2023). Optionswert im Schweizer Personenverkehr: Relevante Grösse für wirtschaftliche und politische Entscheide, in: Laesser, Ch.; Axhausen, K.; Bieger, Th. (Eds; 2023). *Jahrbuch der Schweizerischen Verkehrswirtschaft*. St. Gallen: IMP-HSG und SVWG.

Kuster, S. (2023). *Optionswerte im Personenverkehr : Erforschung des wahrgenommenen Werts von Transport-Optionen*. St. Gallen: E-Diss.

Laesser, Ch.; Axhausen, K.; Bieger, Th. (Eds; 2023). *Jahrbuch der Schweizerischen Verkehrswirtschaft*. St. Gallen: IMP-HSG und SVWG.

Linke, J., Scharfenberger, P., & Stackmann, J. (2023). Nachhaltige Mobilität in den Alltag integrieren – Eine wissenschaftliche Begleitung von 20 Haushalten über vier Monate. *The Future Mobility Lab*, White Paper.

Linke, J., Scharfenberger, P., & Stackmann, J. (2023). New Mobility in Everyday Life – Perspectives From 20 Households Examined over Four Months. *Marketing Review St.Gallen*, 4, 12–20.

Loder J. & Rinscheid A. & Wüstenhagen R. (2023). Why do (some) German car manufacturers go electric? The role of dynamic capabilities and cognitive frames. *Business Strategy and the Environment*, 1–15.

Miehé, L., Palmié, M., & Oghazi, P. (2023). Connection successfully established: How complementors use connectivity technologies to join existing ecosystems—Four archetype strategies from the mobility sector. *Technovation*, 122, 102660.

Müller, A. (2023). Decarbonizing business travel: A qualitative exploration of the (mis-) alignment between knowledge organizations' climate strategies and travel practices. *Journal of Sustainable Tourism*, 1–27.

Plananska, J., Wüstenhagen, R., de Bellis, E. (2023). Perceived lack of masculinity as a barrier to adoption of electric cars? An empirical investigation of gender associations with low-carbon vehicles. *Travel Behaviour and Society*, 32, 100593.

Schakols, F., Hofstetter, R., Greifenstein, M., Finken, D., Herger, P., de Carvalho, D., & Herrmann, A. (2023). *Swiss Mobility Monitor 2023*, University of Lucerne.

## Accreditation



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# From insight to impact.



CFM-HSG: Managing personal mobility  
from a social science perspective.