

Powering Progress: Transform the Energy Economy Toward Decarbonization and Digitalization!

The energy sector is at a pivotal moment in its evolution, facing the urgent need to transition towards sustainability to combat the escalating impacts of climate change. As the world seeks more sustainable solutions, we need to fundamentally transform how we supply, distribute, and consume energy. The digitalization of energy systems is essential for managing and coordinating resources efficiently and securely, driving the shift to a greener and more resilient energy economy.

This master's thesis offers a unique opportunity to dive into the intricate challenges and opportunities associated with the transformation of the energy economy toward decarbonization and digitalization. Students will explore innovative ways to integrate digital solutions into energy systems, optimizing operations and enhancing connectivity, e.g., by focusing on end-to-end digitalization, registry modernization, or decentralized asset registration. Therefore, students will be equipped with the toolkit to drive the transition towards a more sustainable, digitally empowered energy economy.

Selected topics related to the sustainable and digital transformation of the energy economy include:

- **End-to-End Digitalization:** Learn how to seamlessly implement and integrate digital processes across the energy value chain, improving efficiency and performance.
- **Modernization of Registries:** Discover methods to upgrade and connect energy registries, ensuring secure and transparent data management.
- **Integration of Decentralized Assets:** Explore innovative approaches to managing decentralized energy assets, promoting sustainability and resilience.
- **Enhanced Connectivity:** Develop strategies for improving connectivity and data exchange between stakeholders and assets in energy systems.

In collaboration with our expert faculty, you will define the scope and mission of your thesis, ensuring a personalized and impactful research experience. Together, we will select suitable research methods tailored to your interests and goals.

Are you ready to maximize the impact of your master's thesis? We provide comprehensive and individualized support to publish your findings in a scientific journal, allowing you to contribute to the academic community and enhance your professional profile. Join us in our mission to pioneer the future of digital innovation and make a lasting difference in the field!

Organizational Scope

- Start date: **anytime**
- Duration: **6 months**
- Supervision: **Prof. Dr. Sebastian Schwenen**
- Co-supervision: **Fraunhofer FIT**

Your Profile

- Strong interest in the energy sector, focusing on digital innovation and sustainable solutions
- Drive and passion for engaging in research
- Analytical problem-solving capabilities
- Open-minded attitude with a proactive and collaborative working style
- Excellent written and verbal communication skills

Who we are & what we offer

- **Fraunhofer FIT is part of the world's leading applied research organization** | Fraunhofer FIT is a trailblazer in innovation and research excellence with a key focus on actively shaping the future of our energy system
- **Impact** | Accelerate the energy transition firsthand by working on topics that are timely and most relevant for achieving our energy and climate policy goals in Germany and Europe
- **Interdisciplinary teamwork** | Work in an interdisciplinary team with experienced research experts (doctoral candidates, post-doctoral researchers and/or professors)
- **Feedback** | Open feedback culture to advance your hard and soft skills in Information Systems Research, project management, and related fields

Sounds Great?

We are happy to receive your application: **Short motivation letter, resume, and transcript of records** via mail to moritz.rindermann@fit.fraunhofer.de



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Prof. Dr. Sebastian Schwenen

Co-Supervision | Fraunhofer FIT
Prof. Dr. Jens Strüker



Co-Supervision | Fraunhofer FIT
Dr. Marc-Fabian Körner



Sustainability Meets Innovation: Shape the Future of Digital Sustainability Management!

As global awareness of environmental, social, and governance (ESG) issues grows, organizations face increasing pressure to adopt sustainable practices. Digital sustainability management combines technological innovation with strategic thinking to tackle these challenges, ensuring compliance with regulations and driving transformation to gain a competitive edge.

This master's thesis addresses the critical role of information systems in accelerating the transition toward decarbonization. Through this project, you will explore how cutting-edge digital technologies and tools can amplify sustainability initiatives. You will gain the skills to design, implement, and monitor robust sustainability solutions that drive measurable impact. This research empowers you to be at the forefront of digital transformation, equipping you with the knowledge to influence organizational strategies and promote a sustainable future.

Selected topics in the field of digital sustainability management include:

- **Drive Twin Transformation:** Explore the integration of digital and sustainable practices, achieving positive transformative impacts for organizations.
- **Advance Digital ESG Reporting:** Design approaches for effective digital ESG reporting and compliance management.
- **Develop Data Strategies:** Craft holistic data strategies and concepts to support sustainable decision-making and reporting.
- **Design Next Level Digital Measurement, Reporting, and Verification:** Conceptualize, evaluate, and refine approaches for precise and verifiable digital measurement, reporting, and verification (e.g., including digital product passports).

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Your Profile

- Strong interest in leveraging information systems for sustainable business transformations
- Drive and passion for engaging in research
- Analytical and problem-solving capabilities
- Open-minded attitude with a proactive and collaborative working style
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Enabling AI and Web3-Technologies to Pioneer a Digital Sustainable Future!

As the world increasingly turns to digital solutions for environmental sustainability, the potential for innovation and significant impact is immense. This master's thesis offers a unique opportunity for students passionate about information systems, informatics, and emerging technologies to address the urgent need for decarbonization.

You will explore how cutting-edge digital technologies and concepts can drive this transformation. This may include the use of Web3 technologies to enhance transparency and trust, the development of secure data spaces for seamless data exchange and collaboration, or the application of artificial intelligence to optimize energy efficiency and reduce carbon emissions. Engage with these transformative technologies and contribute to meaningful solutions that combat climate change and advance sustainability.

Selected technological approaches contributing to decarbonization include :

- **Explore Web3-Technologies:** Learn about the concept and the capabilities of Web3-Technologies (e.g., Blockchain and underlying zero-knowledge proofs or self-sovereign identities, etc.) to unlock new possibilities in decentralized energy systems.
- **Leverage Data Spaces:** Create novel business opportunities through the conceptualization of data spaces, enhancing data interoperability and collaboration between stakeholders.
- **Advance Business Operations with AI:** Leverage AI-driven solutions to predict and optimize energy consumption as well as improve the integration of renewable energy sources. Create intelligent solutions for the operation of energy systems that advance decarbonization, pushing the boundaries of innovation in the energy sector.

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Your Profile

- Strong interest in emerging digital technologies, affinity to programming and developing architectures
- Drive and passion for engaging in research
- Analytical and problem-solving capabilities
- Open-minded attitude with a proactive and collaborative working style
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