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Bavarian Center for Applied Research  
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Technische Hochschule  
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November 11th – 14th, 2024

## Building Tomorrow: Sustainability through Technologies and Key Skills

*Current Trends in Germany and Latin America*

*Online Sessions (à 90 min):*

▶ *Session 1*

**Connected for Change: Exploring IoT Technologies  
and Essential Skills for a Sustainable Future**

*November 11th, 3 p.m. (CET)*

▶ *Session 2*

**AI Revolution: Pioneering Technologies and  
Vital Skills for Sustainability**

*November 12th, 4 p.m. (CET)*

▶ *Session 3*

**Journey to Tomorrow: Mobility Technologies  
and Essential Skills for Sustainability**

*November 13th, 4 p.m. (CET)*

▶ *Session 4*

**Powering Tomorrow: Energy Technologies  
and Essential Skills for Sustainability**

*November 14th, 4 p.m. (CET)*

*Participation  
certificate  
available!  
Write to  
aware@thi.de*

Please register for your **free online participation**  
to receive the link to the session(s):

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▶ Session 1

# Connected for Change: Exploring IoT Technologies and Essential Skills for a Sustainable Future

November 11th, 3 – 4.30 p.m. (CET)



### Digital Production



**Prof. Dr. Daniel Großmann**  
Vice President for Knowledge and Technology Transfer and Professor for Digital Production at Technische Hochschule Ingolstadt

### Building a bridge between IoT and the Sustainable Future



**Prof. Dr. Gian Berkenbrock**   
Professor at UFSC (Universidade Federal de Santa Catarina), Brazil

The confluence of the Internet of Things (IoT) and essential skills is a requirement for sustainable development, with a focus on systems thinking, collaboration, and adaptability. Some case studies illustrate the integration of IoT in smart energy management, smart cities, and sustainable transport systems. The discourse highlights the importance of interdisciplinary approaches in unlocking the potential of the IoT for sustainable development, using technologies such as sensor networks, data analytics, and machine learning to optimize the use of resources and reduce the impact on the environment.

### Sustainable Technologies between Hype and Reality



**Torsten Jung**  
Leading Expert at Pixida GmbH

Sustainable technologies are crucial for shaping our future. Gaining insights requires exploring the technology hype cycle and identifying factors that define sustainability. By examining the evolution from hype to reality and assessing current trends, we'll also look ahead to possible developments, focusing on the aspects influencing their evolution.

Moderator



**Prof. Dr. Harald Göllinger**  
Scientific Director of the AWARE Center and Professor at Technische Hochschule Ingolstadt

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▶ Session 2

# AI Revolution: Pioneering Technologies and Vital Skills for Sustainability

November 12th, 4 – 5.30 p.m. (CET)



Additional: Short input by talentos

### Control Strategies for Autonomous Aerial Swarms: AI Solutions




**Prof. Dr. Gerhard Elsbacher**  
Professor for AI aided Aeronautical Engineering and Product Development at Technische Hochschule Ingolstadt

The integration of artificial intelligence in autonomous aerial systems holds immense potential for addressing sustainability challenges. This presentation will explore the role of swarming intelligence and autonomous flying technologies in revolutionizing sectors such as environmental monitoring, agriculture, and logistics. By leveraging collective behavior in drone swarms, we can enhance efficiency, reduce resource consumption, and minimize environmental impact. The talk will highlight key AI-driven innovations and algorithms in swarming dynamics, coordination, flocking, and autonomy, demonstrating how these technologies can contribute to a more sustainable and resilient future.

### AI: Improving Safety in Intelligent Vehicles and Robots



**Prof. Dr. Fernando Osório**   
Professor and Researcher at USP (Universidade de São Paulo), Brazil

This presentation will focus on AI Perception, Decision and Action in a physical and real world (3D, spatial-temporal data, fusion of sensors, multimodal data and AI KRR). We will discuss about AI research and development trends, challenges, and solutions, that can be adopted to improve the safety and effectiveness of Intelligent Vehicles and Mobile Robots in Smart Cities and Environments.

### Sustainability and AI at AIRBUS



**Dr. Andreas Schweiger**  
AIRBUS

Moderator



**Prof. Dr. Alessandro Zimmer**  
Researcher at AIMotion Institute and Professor at Technische Hochschule Ingolstadt

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▶ Session 3

# Journey to Tomorrow: Mobility Technologies and Essential Skills for Sustainability

November 13th, 4 – 5.30 p.m. (CET)



### Road Safety and Vision Zero - Still a global Challenge.



**Prof. Dr. Werner Huber**  
Head of CARISSMA Institute of Automated Driving (C-IAD) and Research Professor at Technische Hochschule Ingolstadt

The presentation addresses the global challenges and measures to improve road safety. Every year, around 1.3 million people die in road traffic accidents worldwide and around 50 million are injured (according to WHO 2022). In view of these alarming figures, the WHO and the European Union are pursuing the goal of 'Vision Zero'. This vision aims to halve the number of road fatalities by 2030 and reduce them to zero by 2050. Developments in recent decades have shown positive effects from the implementation of various road safety measures, particularly in Europe and Germany. The CARISSMA Institute for Automated Driving is also making an important contribution to improving road safety through various research projects. Vision Zero provides an important framework for future measures and strategies.

### Smart Cities & Urban Mobility



**Prof. Dr. Marcio Netto**  
Professor for Electrical Engineering of University of São Paulo

This presentation on Smart Cities will focus on the impact of Digital Twins and Artificial Intelligence on urban mobility, particularly emphasizing cities' infrastructure and the rise of (semi) autonomous vehicles. We will delve into the development and deployment of tools supporting the design of advanced assistance for urban mobility, including topics on traffic monitoring and control from the city traffic authority's perspective, as well as environmental perception for (semi) autonomous vehicles from the vehicles' perspective. Furthermore, the presentation highlights the significance of utilizing open data and AI for all in achieving Sustainable Development Goals related to smart cities and infrastructure. The integration of these paradigms and technologies presents a promising future for urban development.

### Embraer Initiatives for Sustainable Future



**Vincius Di Nucci**  
Head of Zero Emissions at EMBRAER



The presentation will give a quick introduction about Embraer, covering our main scopes and how we are prepared for future challenges. It will bring the main initiatives as well for our zero-emission roadmap, showing our current projects and concepts for the future.

Moderator



**Prof. Dr. Juan Pablo Dri**  
Regional Material Laboratory Manager, Shanghai Volkswagen

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▶ Session 4

# Powering Tomorrow: Energy Technologies and Essential Skills for Sustainability

November 14th, 4 – 5.30 p.m. (CET)



### Second-Life Batteries for Stationary Applications



**Prof. Dr.-Ing. Sergej Diel**  
Professor at Technische Hochschule Ingolstadt

The presentation highlights the promising potential of reusing batteries from electric vehicles for use in stationary applications. With the increasing growth of the electric vehicle market, considerable quantities of used batteries are being produced that still have considerable capacity. These second-life batteries offer a cost-effective way to realize stationary energy storage solutions and extend the lifetime of battery technology. Apart from economic and environmental benefits, also technical challenges associated with integrating second-life batteries into stationary systems covering aspects such as battery management, degradation and safety will be mentioned. The presentation thus presents a comprehensive perspective on the use of second-life batteries in stationary applications and offers insights into current research aimed at overcoming the technological hurdles and realizing the full potential of this sustainable energy storage option.

### Solar photovoltaics, energy storage, electrical mobility and green hydrogen



**Prof. Dr. Ricardo R  ther**   
Director of the Solar Energy Laboratory  
Fotovoltaica/UFSC

Solar photovoltaics is the cheapest and fastest-growing energy generation technology worldwide. Since 2016 it has added more installed capacity than any other electricity production technology. By the end of this decade, there will be more solar photovoltaic installations operating, than the sum of all (conventional and renewable) the others combined, followed by wind energy generation. Energy storage in electrochemical batteries is an important backbone of this energy transition, and electric vehicles are an important vector for Li-ion battery development and demand (economies of scale). Electric vehicles demand new energy generation, that can be fully met by solar energy. For the complete energy transition, green hydrogen is a fundamental component, and in order to produce this energy vector at affordable prices, both solar photovoltaics and electrochemical energy storage will be necessary.

### Challenges and opportunities in Smarter Grids



**Prof. Dr. Rodrigo Jardim Riella**   
Coordinator of the Competence Centre of Lactec –Future Grid

The new technologies introduced by the deployment of smart grid technologies also bring the need for new professional skills to deal with the new challenges of smart grids. In this presentation, we'll take a look at the new technologies and new skills needed to work with the electrical networks of the present and the future.

Moderator



**Prof. Dr. Harald G  llinger**  
Scientific Director of the AWARE Center and  
Professor at Technische Hochschule Ingolstadt

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▶ *Session 1*

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*Vice President for Knowledge and Technology Transfer and  
Professor for Digital Production at TH Ingolstadt*



## **Building a bridge between IoT and the Sustainable Future**

*Prof. Dr. Gian Berkenbrock*

*Professor at UFSC, Brazil*



## **Sustainable Technologies between Hype and Reality**

*Torsten Jung*

*Leading Expert at Pixida GmbH*

*Moderator*



## **Prof. Dr. Harald Göllinger**

*Scientific Director of the AWARE Center and  
Professor at TH Ingolstadt*

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▶ *Session 2*

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*AIRBUS*

*Moderator*



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▶ *Session 3*

# *Journey to Tomorrow: Mobility Technologies and Essential Skills for Sustainability*

*November 13th, 4 – 5.30 p.m. (CET)*



## *Road Safety and Vision Zero - Still a global Challenge.*

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