Erasmus Centre for Data Analytics

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Expert Practice *Smart Energy & Sustainability*

Smart Cities & Smart Energy - Purpose

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Smart Energy & Sustainability

Dr. Yashar Ghiassi-Farrokhfal:

“We develop the business foundation for tomorrow’s smart cities and energy markets . We guide and shape the transformation of cities and the energy sector with our network of partners in the private and public sector, and at top research institutions worldwide”

founded by:

Erasmus Centre for Future Energy Business

FOUNDED BY

ROTTERDAM SCHOOL OF MANAGEMENT
ERASMUS UNIVERSITY

RSM

Prof. Wolf Ketter:

“Our research is highly interdisciplinary, drawing from data analytics, decision science, computer science, economics, behavioral science, and AI / machine learning to advance society towards a sustainable future.”

Areas of expertise and portfolio of research

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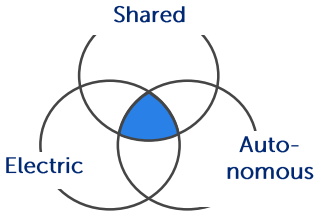
Sustainable and smart energy market design

- Effect of large-scale renewables on energy markets & conventional energy producers
- The role of storage / batteries and hydrogen in electricity markets

Electric vehicles (Evs), smart charging and electric autonomous mobility

- EV adoption & behaviour of drivers
- Optimizing planning of electric cars and electric busses
- Impact of shared, autonomous, electric vehicles on fleets and (smart) charging infrastructure
- New business & market models



Microgrids & energy cooperatives

- Energy cooperative tariff designs

The role of block chain as an enabler for efficient energy transactions

- Designing and incentifying flex, using blockchain - collaboration with Berkeley University Lab

Smart Energy in Cities & Communities

- Modelling heat and electricity demand in commercial buildings and using these models for anomaly detection and energy managements
- Smart sector coupling based on data and AI in industrial and Port communities
- Urban data platforms and Digital Twins

Methodologies

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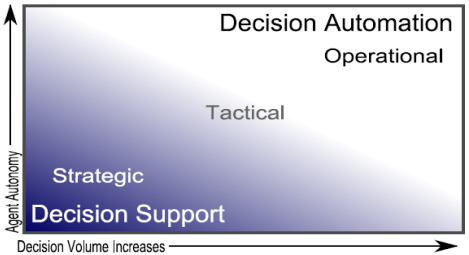
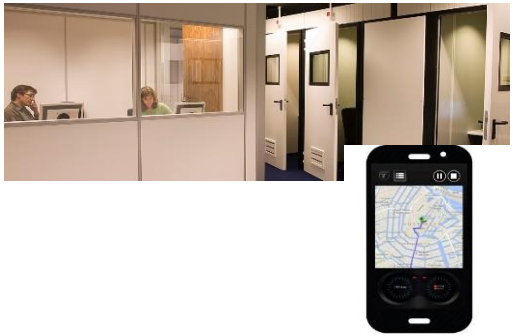
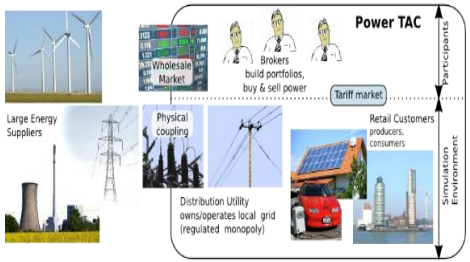


Data analytics and
software agents modelling



Lab Experiments and
Prototyping Experiments



Simulation Studies
(e.g. PowerTAC Energy Market
Simulation Platform)

Field Studies

Projects:
RUGGEDISED (2016-2021)

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PhD research in collaboration with RET on
- Scheduling electric buses and smart charging
- Energy management for electric buses

Lead research partner on
- business models for bancable smart solutions,
- governance and business models for (urban) open data platforms

Student research projects, such as
- Data management and GDPR
- Architecture of urban data platforms
- Business & governance models for smart city platforms and solutions
- Predicting energy use in buildings based on big data and AI
- Stakeholder engagement strategies / citizen engagement in smart city projects and platforms

Capacity building
- Developing teaching cases and teaching programme on smart city development

Projects
FLEXSUS – Flexibility for Smart Urban Energy System (2019-2022)

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Smart Energy Systems ERA-Net

Funded by **ERA-Net**

Sept 2019 - **June 2022**

“The project supports city planners & decision-makers by giving them an array of options in planning & designing low-carbon heating solutions for different sub-districts in local municipalities”

FlexSUS
Flexibility for Smart Urban Energy Systems

Flexsus.org

Projects:
City Drive (2018-2019)

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To gain insights into PHEV driving behaviour;

specifically the effect of nudges and incentives on charging and electric driving

Project Setup:

- Joint BMW and city of Rotterdam field experiment with 35 PHEV BMW drivers
- 6 phases of 2 weeks testing different interventions / nudges
- Use of BMW app for gamification purpose and to track behavior in Rotterdam urban geofenced zone

Gemeente Rotterdam

Projects:
Electric Vehicle Fleets as virtual powerplant (2013-2017)

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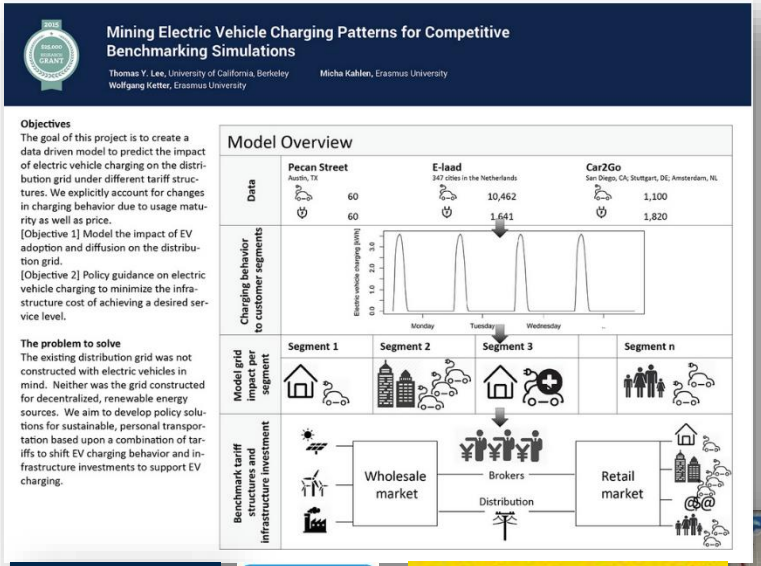

Predict impact of electric vehicle charging on distribution grid

Managing fleets of electric vehicles and optimizing revenues (renting out cars vs using fleet of cars as virtual powerplant for grid balancing)

German-Dutch Collaboration

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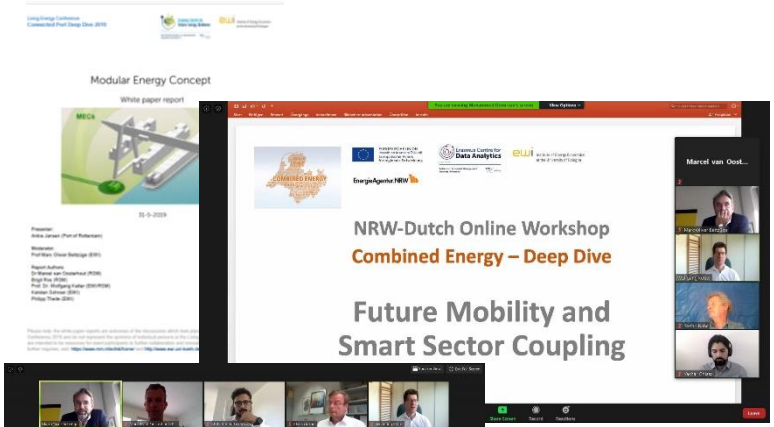
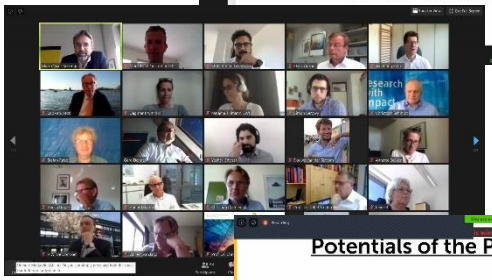
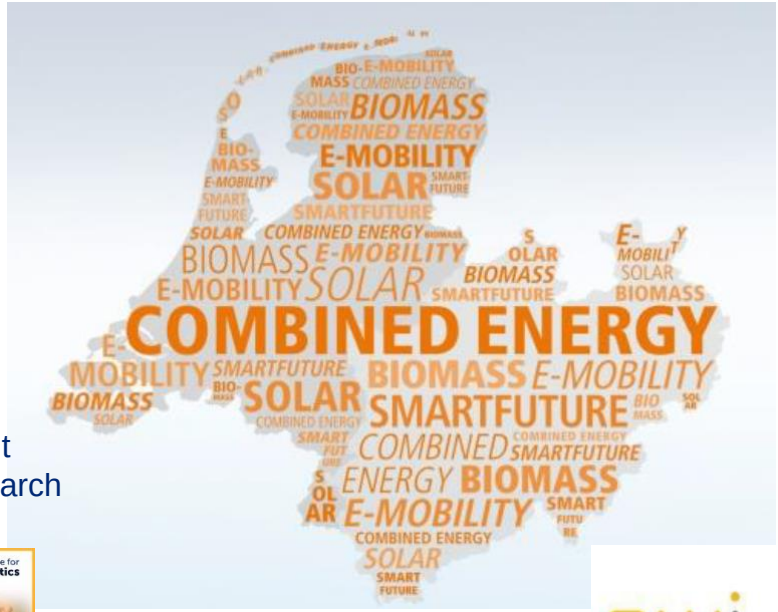




Annual Summit
Collaborative research



ewi Institute of Energy Economics at the University of Cologne

Expert Practice ecosystem of partners (selection)

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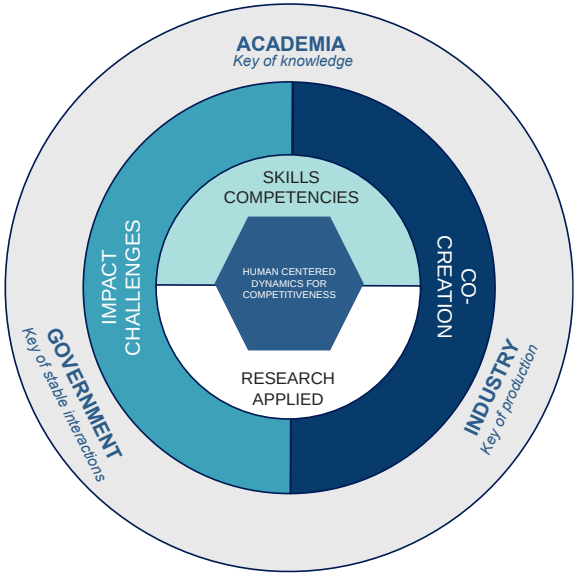

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Passion provides purpose, but data drives decisions

Andy Dunn