





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”



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.”

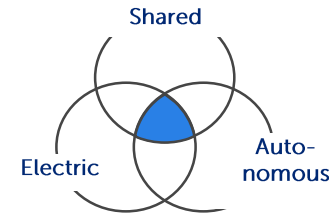
Areas of expertise and portfolio of research

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

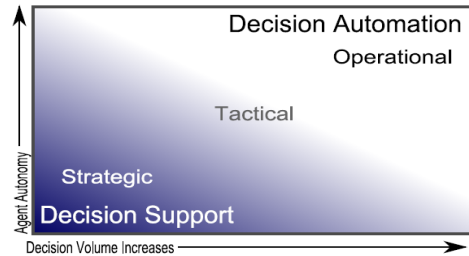
- Energy cooperative tariff designs

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

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

Smart Energy in Cities & Communities

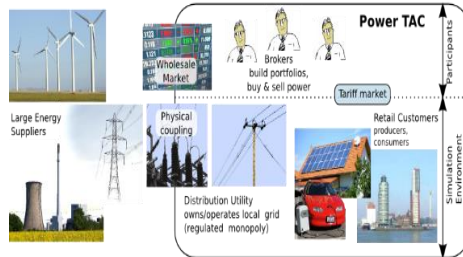
- Modelling heat and electricity demand in commercial buildings and using these models for anomaly detection and energy managements
- Smart sector coupling based on data and AI in industrial and Port communities
- Urban data platforms and Digital Twins



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)



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)



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.org](https://flexsus.org)



Project partners

FlexSUS is a research development and demonstration project built on a unique collaboration between municipalities and an international research team dedicated to supporting them in their low carbon transition effort!

- 1 Lyngby-Taarbæk Kommune
- 2 Holbæk Kommune
- 3 Danmarks Tekniske Universitet
- 4 Erasmus University Rotterdam
- 5 Linköping University
- 6 Chalmers Tekniska Högskola



Projects: City Drive (2018-2019)

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



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



Mining Electric Vehicle Charging Patterns for Competitive Benchmarking Simulations

Thomas Y. Lee, University of California, Berkeley
Wolfgang Ketter, Erasmus University

Micha Kahler, Erasmus University

Objectives

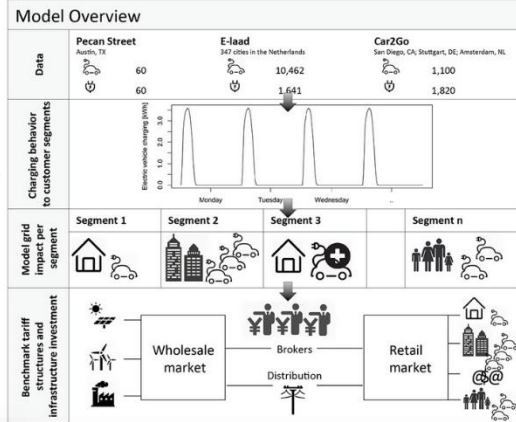
The goal of this project is to create a data driven model to predict the impact of electric vehicle charging on the distribution grid under different tariff structures. We explicitly account for changes in charging behavior due to usage maturity as well as price.

[Objective 1] Model the impact of EV adoption and diffusion on the distribution grid.

[Objective 2] Policy guidance on electric vehicle charging to minimize the infrastructure cost of achieving a desired service level.

The problem to solve

The existing distribution grid was not constructed with electric vehicles in mind. Neither was the grid constructed for decentralized, renewable energy sources. We aim to develop policy solutions for sustainable, personal transportation based upon a combination of tariffs to shift EV charging behavior and infrastructure investments to support EV charging.



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)

SIEBEL
ENERGY INSTITUTE


CAR2GO

STEDIN.NET




German-Dutch Collaboration

Long Energy Challenge
Combined Heat Deep Dive 2019



Modular Energy Concept
White paper report



12-5-2019

Presented by:
Johannes van den (Part of Rotterdam)


Workshop:
Port of Rotterdam (Port of Rotterdam)

Report Authors:
Dr. Frank van den (Port of Rotterdam)
Prof. Dr. Wolfgang Fichter (E.ON Energy Research Center)
Prof. Dr. Frank van den (Port of Rotterdam)

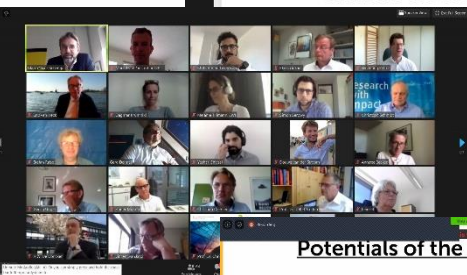
Please note: This white paper report is an outcome of the Modularity and Energy Efficiency Challenge. It is a collaborative effort of the Port of Rotterdam, E.ON Energy Research Center, and the Erasmus Centre for Data Analytics. The report is available for download at: <https://www.portofrotterdam.com/en/activities/modularity-and-energy-efficiency-challenge>

**NRW-Dutch Online Workshop
Combined Energy – Deep Dive**

**Future Mobility and
Smart Sector Coupling**



**Annual Summit
Collaborative research**



Potentials of the Port

Port of Rotterdam
Erasmus Centre for Data Analytics
Large CO2 emission reduction targets

Reusing generated heat
Potentials in mobility
Hydrogen hub


Wärmerückkopplung Zuidoost Rotterdam


Project Hy3

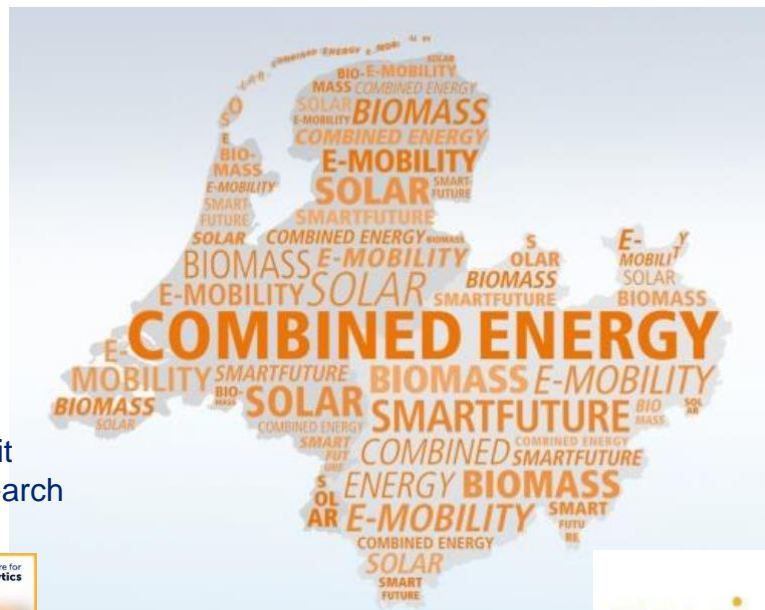

Large Wind Power

Circular economy
Potentials for CCUS
Diversity


Circular economy

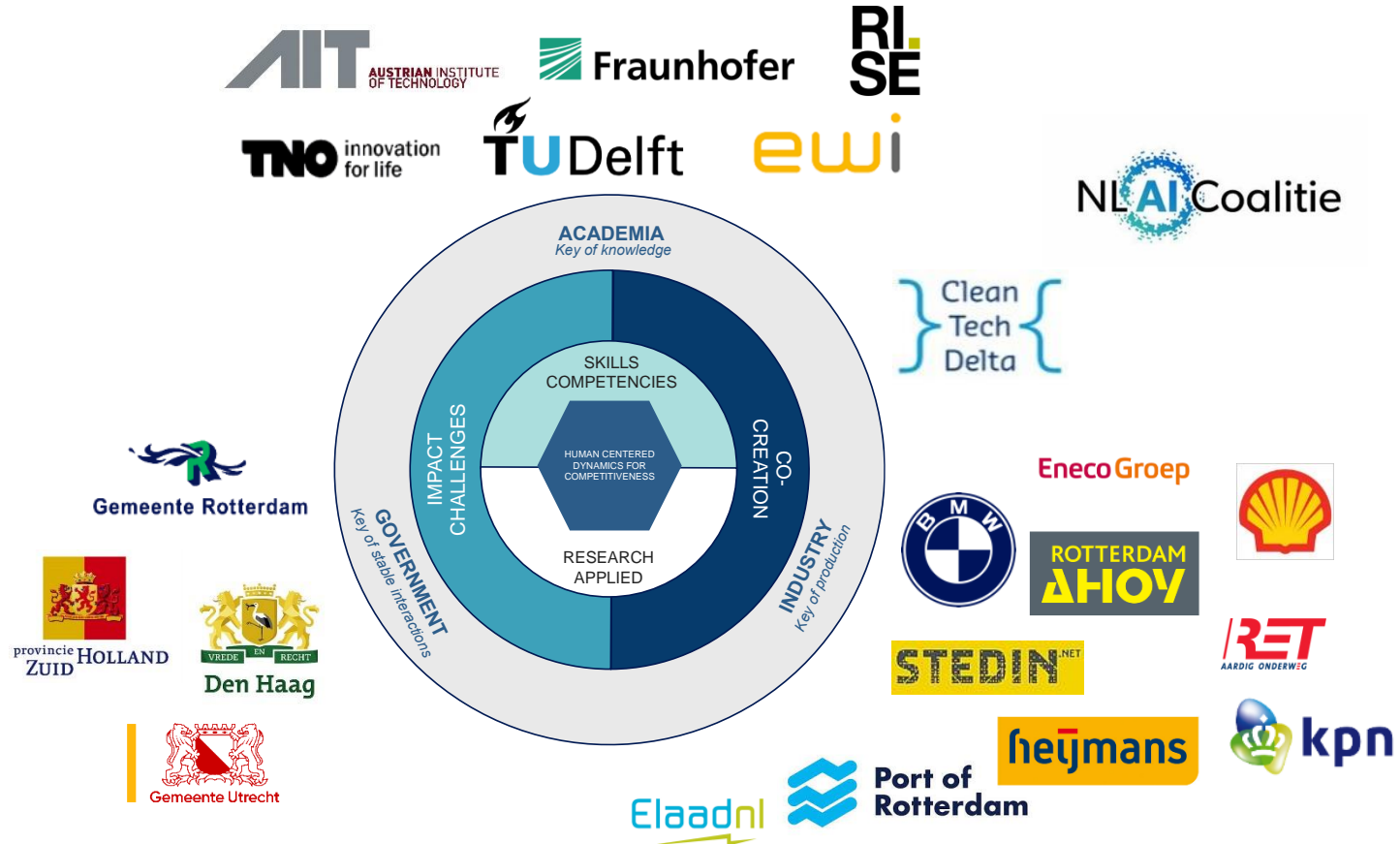

Potentials for CCUS


Diversity



ewi Institute of Energy Economics
at the University of Cologne

Expert Practice ecosystem of partners (selection)



Passion provides purpose, but data drives decisions

Andy Dunn

Dr. Yashar Ghiassi-Farrokhfal



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