

## ABOUT RLI

The Reiner Lemoine Institute is an independent non-profit research institution that contributes to a transformation towards a sustainable energy supply based on 100 % renewable energy. Our three Research Units are "Transformation of Energy Systems", "Mobility with Renewable Energy", and "Off-Grid Systems". We conduct applied research to scientifically support the long-term transition of the energy supply system towards renewable energy.

## REINER LEMOINE



Reiner Lemoine was a pioneer of renewable energy. While others were thinking and talking about alternative forms of power generation, he took the lead and founded the solar companies SOLON and Q-Cells, amongst others. It was in this spirit that the RLI was established. The institute is funded by Reiner Lemoine-Stiftung.

## OUR TOPICS

FUTURE SCENARIOS BATTERY SMART GRID  
WIND POWER SOLAR E-CAR GRIDS  
TRANSFORMATION  
**RENEWABLE  
ENERGIES**  
OFF-GRID MOBILITY  
HYDROGEN ELECTRIFICATION HEAT  
ISLAND GRID CHARGING STATION EFFICIENCY GREEN

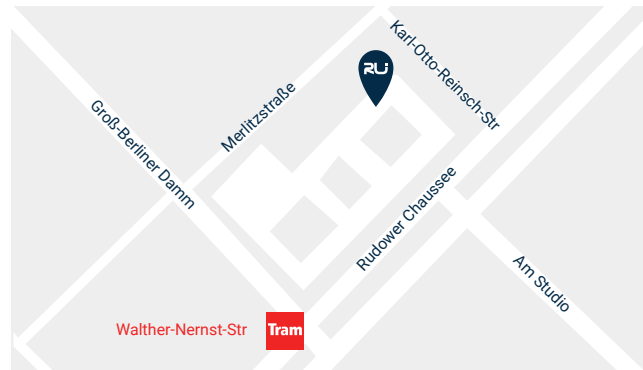
## CONTACT US




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## HOW TO FIND US



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 Linien 162, 163, 164, 260

Stand: Juni 2017

## Research Unit **Mobility with Renewable Energy**



Applied Research for  
100 % Renewable Energy

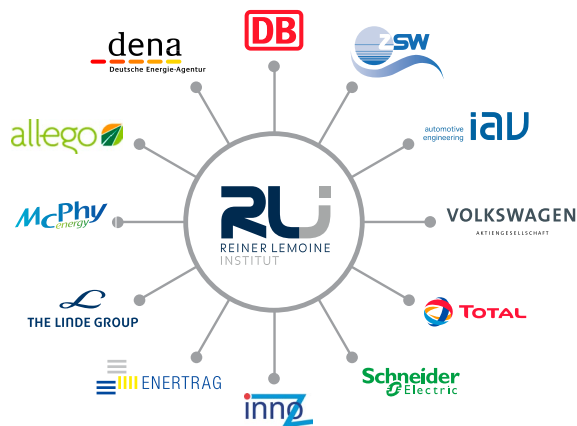
# Mobility with Renewable Energy

In the transport sector, the German Energy Transition is still in its infancy. Possible concepts range from battery-electric and fuel-cell-electric vehicles to synthetic fuels. We analyze how these mobility concepts can be integrated into renewable energy systems in an ecologically and economically functional way.

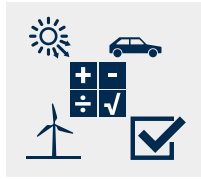
Our research answers the following questions:

- How can we switch entire fleets to green energy? What would the business models look like?
- What demand is there for sustainable mobility concepts?
- What is the future of transport technology?
- How should charging and fueling infrastructure be planned and positioned ideally?

## OUR CLIENTS AND PARTNERS INCLUDE

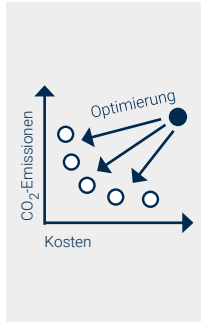


## OUR TOOLS



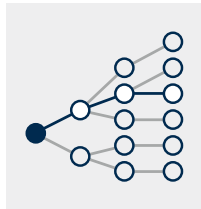
### ⚙️ SMOOTH | Simulation of sustainable energy and mobility systems

- How does a Smart Grid perform during the course of one year?
- How much CO<sub>2</sub> can be saved/avoided?



### ⚙️ MOEA | Optimization of energy systems

- How can components be arranged and operated in an optimal way in order to reduce cost and emissions?
- What is the best trade-off between different optimization goals, such as minimal CO<sub>2</sub> emissions and costs?



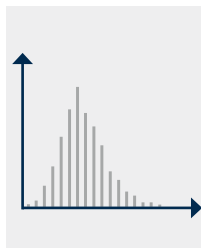
### ⚙️ FORESIGHT | Strategic control of energy systems

- Which operating strategies are optimal for which systems?
- What impact do forecasts have?
- Which energy markets are suitable?



### ⚙️ GIS | Spatial Analysis

- Where can a system be used?
- How should charging infrastructure be distributed?
- Which users can be reached?



### ⚙️ MCS | Transferability and resilience analysis

- How does the system react to changing site conditions?
- How do changing consumption patterns affect cost-effectiveness?

## SELECTED REFERENCE PROJECTS



Train Station Berlin Südkreuz

### Intelligent mobility station

»connecting mobility and energy«

- Research supervision
- Installation and operation of a small wind energy plant and a Smart Grid Demonstrator
- Modeling of power flows between renewable energy sources, storage, charging infrastructure, and electric vehicles
- Optimization of operation and design of future Smart Grids for train stations, vehicle fleets, filling stations, and other sites



Hydrogen refueling station at BER Airport

### Development, testing and assessment of intelligent operating strategies for H<sub>2</sub> refueling stations

- Simulation of electrolysis, H<sub>2</sub> storage, and H<sub>2</sub> compression
- Development of intelligent operating strategies for renewable energy electrolysis
- Analysis of connection to ancillary services markets and wind farms
- Design optimization for future refueling stations on highways and for municipal transit