# Barriers for a energetic system transition in transport

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# Some challenges, discussions, confusions….

- Energy systems transition
  - Decarbonization of electrical power generation

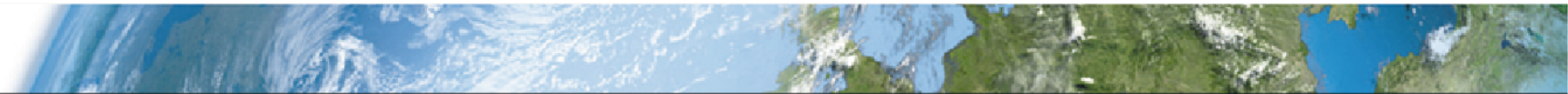
- Transport System Transition
  - Energy efficiency: modal shift, technology
  - Other: livable cities

- Energy system transition in transport
  - Coupling of energy and transport sectors
  - E-mobility (batteries, catenary trucks)
  - Hydrogen-cells, synthetic fuels

„Agora Verkehrswende will zusammen mit zentralen Akteuren aus Politik, Wirtschaft, Wissenschaft und Zivilgesellschaft die Grundlagen dafür legen, dass der Verkehrssektor bis 2050 vollständig dekarbonisiert ist.“

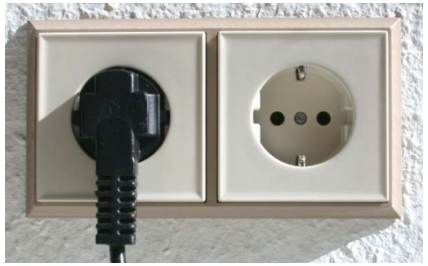
Die *Verkehrswende* setzt einen Strukturwandel in Gang, der den Alltag von Millionen Menschen verändert. Diesen Strukturwandel sollte das ...

There is an effective process towards an energy system transition (in Germany). Why not in transport?



# The “German Energiewende” as a good example for transport sector?

- Energy system transition
  - Production method changed
  - Prices stable / increase over time
  - Product remains the same
  - Dynamics in the production system through designed mechanisms



- Electromobility
  - Higher cost of the vehicles
  - Limited driving range
  - Problematic at high speed
  - Charging station network


Mobility pattern „Electric Car“


Mobility pattern „learned in the past“

# The “German Energiewende” as a good example for transport sector?

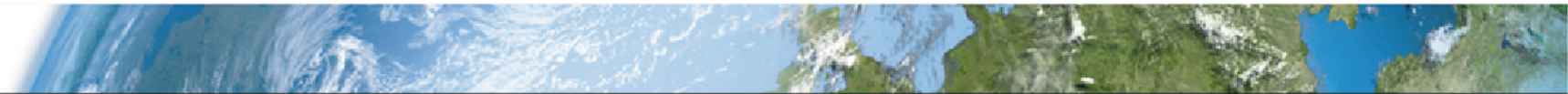
- The Energiewende was not strategically pursued by the established player
  - EON funded Agile to incoporate startups and new ideas (late in the transition process)
  - Vattenfall funded green:field to incoporate startups and new ideas (late in the transition process)

- Elektromobilty was not strategically pursued by the established player

  - BMW funded BMWi for electric mobilty products (reaction to TESLA)
  - Mercedes funded EQ for electric mobilty products (late)
  - ….

⇨ The incumbent companies were pushed though new players on the markets



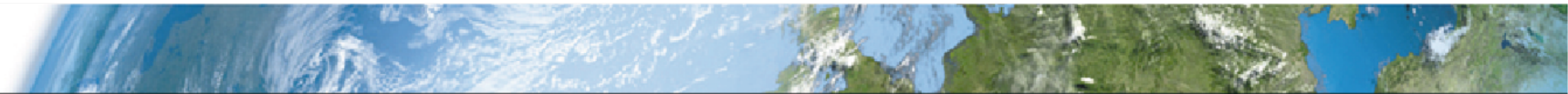


# External cost and resulting innovation dilemma

- External cost are an inherent phenomenon of transport activities
- No incentives for companies for developing solutions reducing external cost – disruptions are needed
  - From „coal and atomic energy to wind power and solar“
  - From „internal combustion engine to electric drive“
- Disruption devalues Knowledge, patents, power structure, production methods, markets (rules, shares)…
- Disruption needs high investment at high risk (failing, learning costs, image, capital, infrastructure, … )
- Free Rider Problem: it is more efficient to imitate a successful disruption than failing by own investments

⇨ Time lag, investment lag, power struggles…





# Learnings from the Energiewende for the Verkehrswende

- Major differences in the transition processes
- Not primarily a problem that can be solved by pricing instruments;
- systemic problem: comparative advantages and disadvantages for a variety of stakeholders
- Strong state interventions: influence on industry, users, infrastructure, media, ….
- Making use of market mechanisms: support of outsiders and startups, design of mechanisms