



European Institute for Energy Research EIFER



Ute Karl

3. Treffen der Arbeitsgremien von Oberrheinkonferenz und Großregion
Landau, 8. Dezember 2017



EIFER ist eine Europäische Wirtschaftliche Interessenvereinigung EWIV

- Zwei gleichberechtigte Mitglieder: EDF und KIT
- Gegründet im September 2001



www.eifer.org

105 Beschäftigte,
81 Wissenschaftler
(40% weiblich)

40% deutsch,
41% französisch
19 % weitere Nationalitäten

multi-disziplinär: Ingenieure, Architekten,
Stadtplaner, Soziologen, Ökonomen,
Geologen, IT Spezialisten...



2 100 employees
including :
370 PhD
150 PhD students
200 researchers teaching
at universities and advanced
engineering schools

More than 553 million
budget in 2014

70 % activity to support
performance of Group businesses

30 % activity to anticipate and
prepare for the future

15 departments
(expertise, partnerships
and project management)

**14 joint research
laboratories**

**Partnering with 6 venture
capital funds**
in the field of clean technologies

**10 international
Centres**
including
3 France
7 Germany, United
Kingdom, Poland, China,
Italy, USA, Singapore

<https://www.edf.fr/sites/default/files/Lot%203/CHERCHEURS/Actualites/cataloguertd-en.pdf>



“At the heart of the key energy transition trends in Europe, we are committed to our clients in providing research-based innovative energy solutions for the sustainable development of cities, local communities and industries”





Smart & Sustainable City

- Multi-sectorial analysis of cities and territories based on **geo-spatial data analytics and modelling**
- **Innovation** in the field of smart cities
- Development of **decision-making tools and apps**



Local Energy Concepts and Low Carbon Solutions

- Multi-energy design and optimisation, integrating **Renewable Energy, Distributed Generation and Storage systems** and low carbon **Mobility concepts**
- **Hydrogen** as a low Carbon energy vector
- Techno-economical and environmental expertise in **biomass, CHP** and **geothermal systems** and **district heating**



Trends and Interactions within Energy Systems

- Analyses and projections of **German Energiewende**, from regulations to new business models through **system dynamics** and **agent based simulation**
- Impact assessment of energy systems taking into account **biodiversity, external costs** and **value creation methods**
- Market studies on local energy systems on **European and International levels**



Systemic and integrated approach
(incl. technical, sociological, economic, environmental and political aspects)





Karlsruhe Institute of Technology (KIT)

- Geosciences laboratories
- Biomass characterization and combustion labs
- Micro-combined Heat and Power systems testing
- High temperature materials development



Fraunhofer Institut für Chemische Technologie (ICT)

- Gasification lab
- Solid oxide fuel cells (SOFC)
- High Temperature electrolysis (HTE)



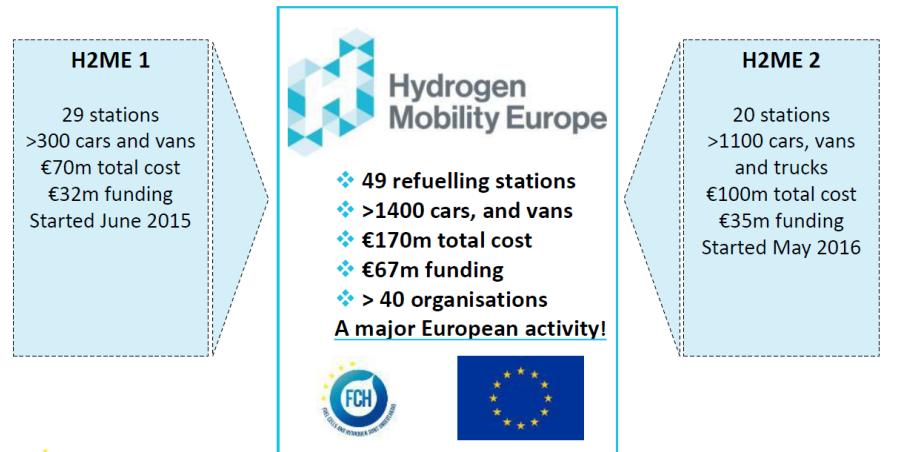
Landwirtschaftliches Technologiezentrum (LTZ)

- Pretreatment and pelletisation labs
- Batch fermentation lab

Europäische Projekte zur Wasserstoff-Mobilität



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EIFER Beitrag:

- Unterstützung von H₂-Tankstellen bei Elektrolyseuren vor Ort (einschl. Anlagendesign)
- Monitoring und Bewertung von H₂-Technologien nach Leistungsfähigkeit und Lebensdauer



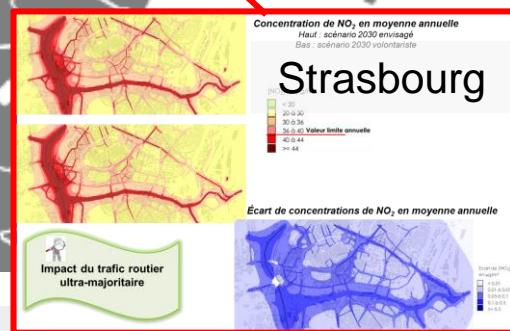
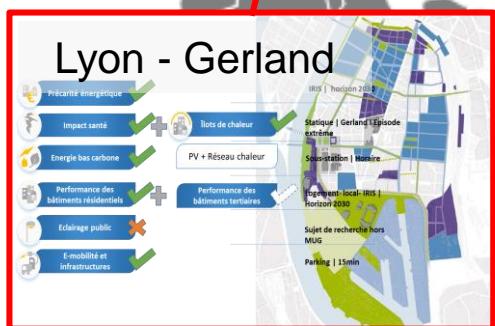
Foto: D. Colomar (EIFER) FaHyence Tankstelle

<http://www.fch.europa.eu/project/hydrogen-mobility-europe>
<http://www.fch.europa.eu/project/hydrogen-mobility-europe-2>

Energieplanung für Städte und Quartiere



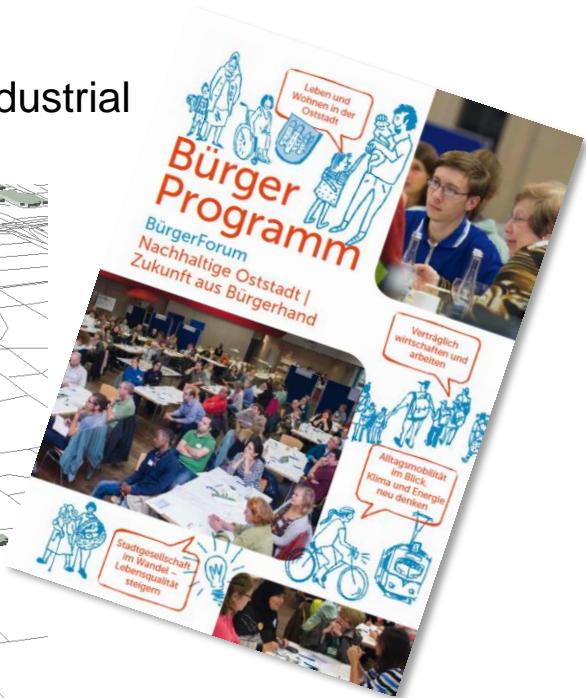
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Reallabor 131: KIT findet Stadt, Urban Laboratory, Karlsruhe (8/2015 – 9/2017)

- Quartiersentwicklung im Bestand gemeinsam mit Bürgern („Quartier Zukunft“ des KIT)
- 3D Geosimulation zur Analyse des Energiebedarfs
- Partner: KIT Building Science Group (fbta), Institute for Industrial Production (IIP), Institute for Fluid Mechanics (FSM)



Energieplanung in frühen Projektphasen - Beispiel Berlin-Tegel



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Berlin TXL : Simulation - AnyLogic Professional

x5

AnyLogic

BERLIN TXL
THE URBAN TECH REPUBLIC

Entwicklung des Flughafengeländes

BERLIN TXL
Spatial Energy Simulation

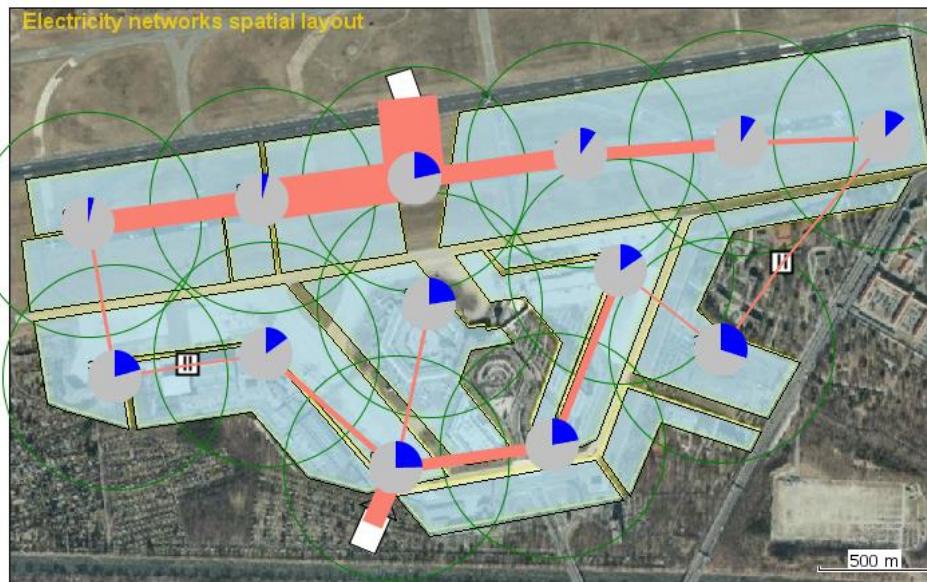
Prototype of an integrated spatial energy system simulation for connecting the urban and energy planning of the future redevelopment of the Berlin Tegel airport site. The prototype enables the visualization of different simulation scenarios which illustrate the interrelation between different technologies, land uses and planning decisions. It aims to promote the future urban technologies which are at the heart of the Berlin TXL - The Urban Tech Republic concept. It was developed within the framework of the Urban Lab collaborative process in order to integrate relevant actors at an early stage and to include their views and requirements in the future planning process.

Run: 0 Idle | Time: - | Simulation: Stop time not set | Date: - | Memory: 96M of 3,641M

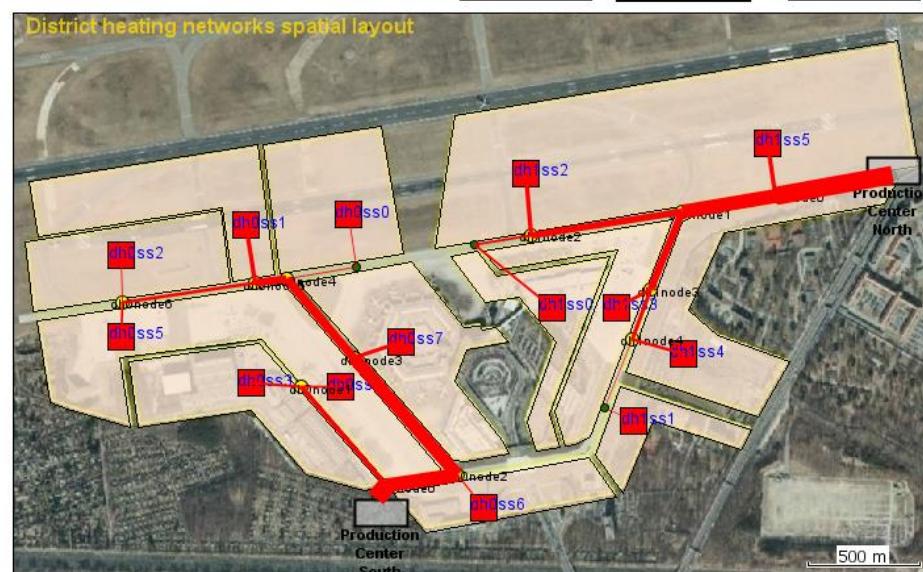
<http://www.berlintxl.de/service/studien.html>



- Energieplanung und Planung der baulichen Entwicklung für die Umnutzung des Flughafengeländes
- Interaktive Unterstützung von Planungsworkshops durch Simulation
- Kernkomponenten: Nahwärmenetz, KWK, Wärmespeicher, Batterien, Windenergie, PV



Elektrizitätsflüsse

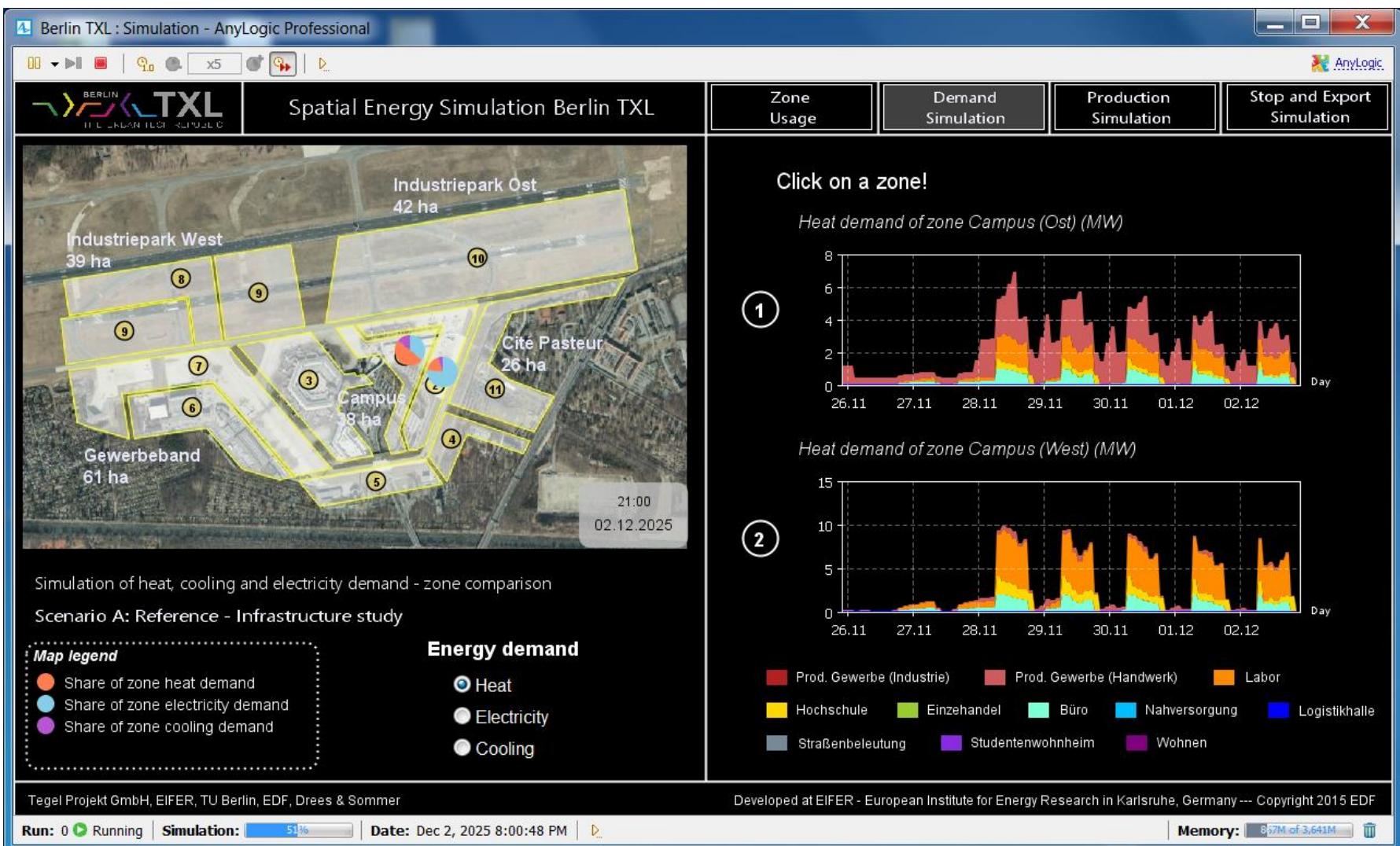


Wärme flüsse

Berlin-Tegel: Simulation der Wärmennachfrage



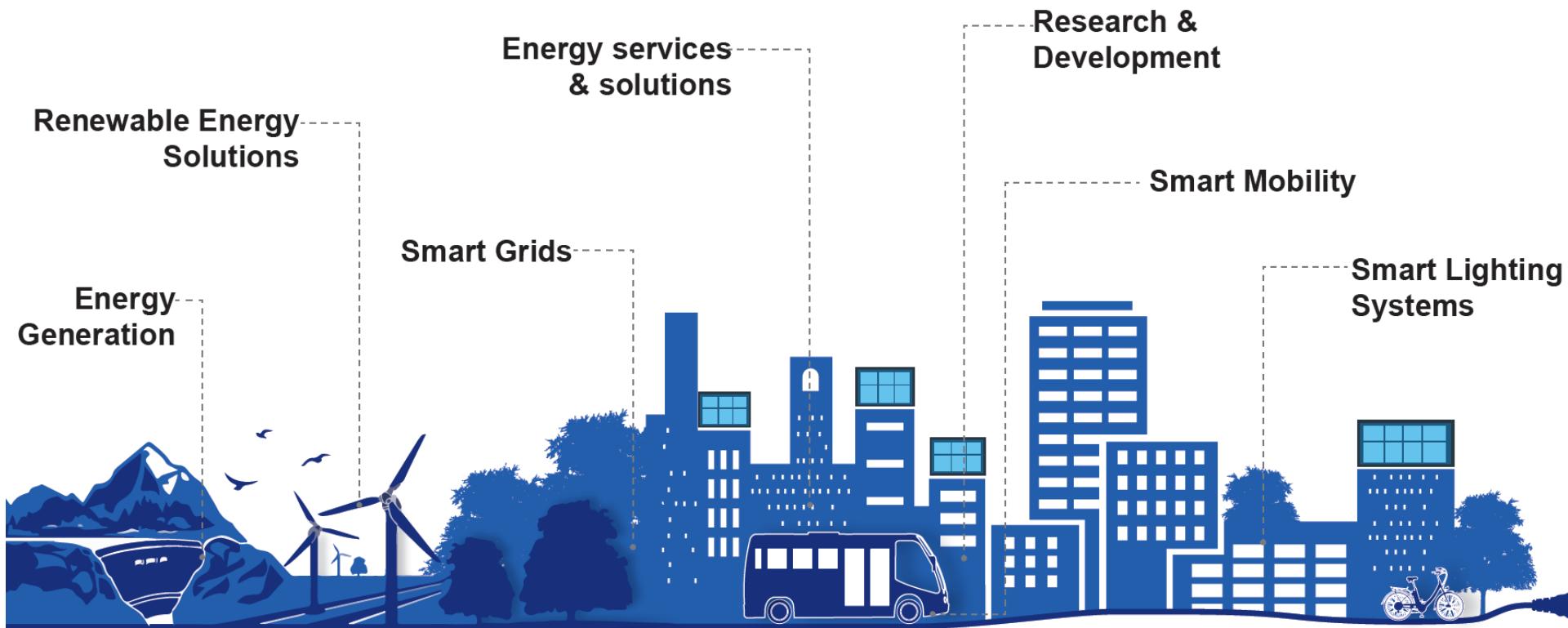
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INTEGRATED PLATFORM

3D decision making platform to evaluate the impacts of investments & policies in cities

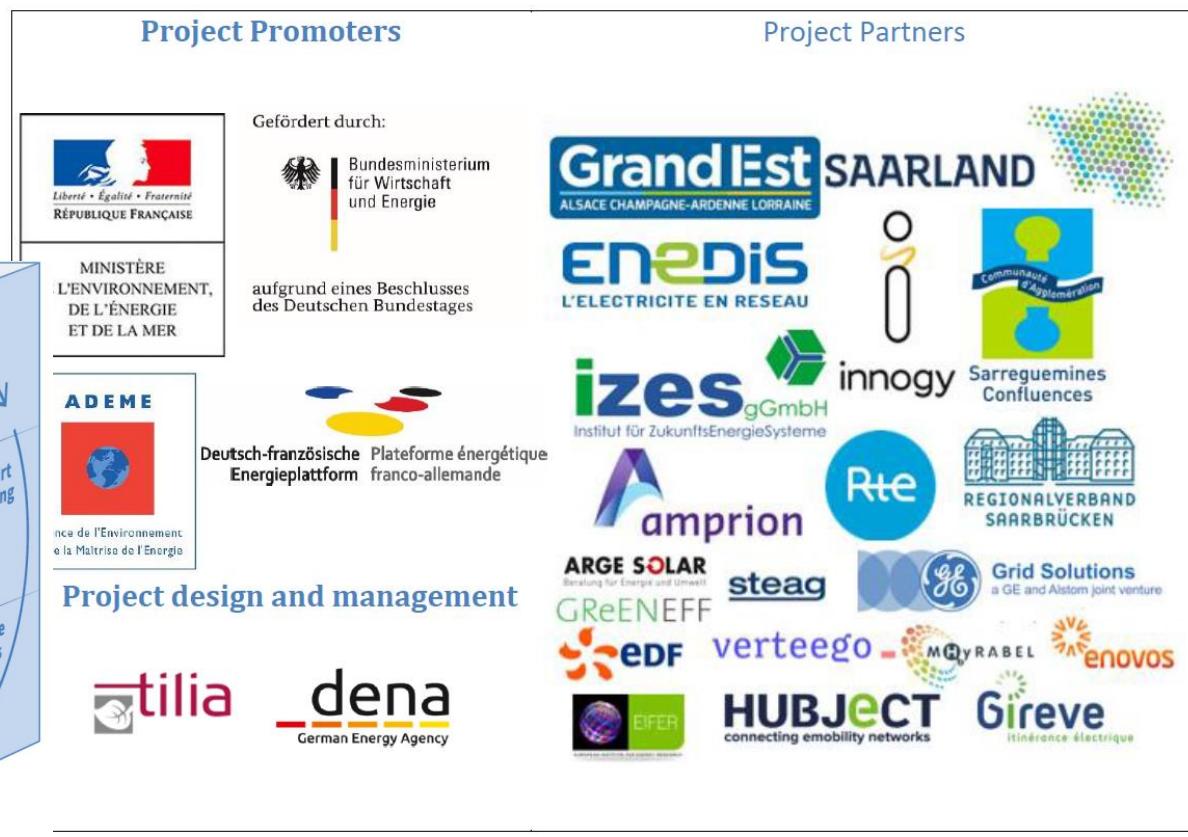
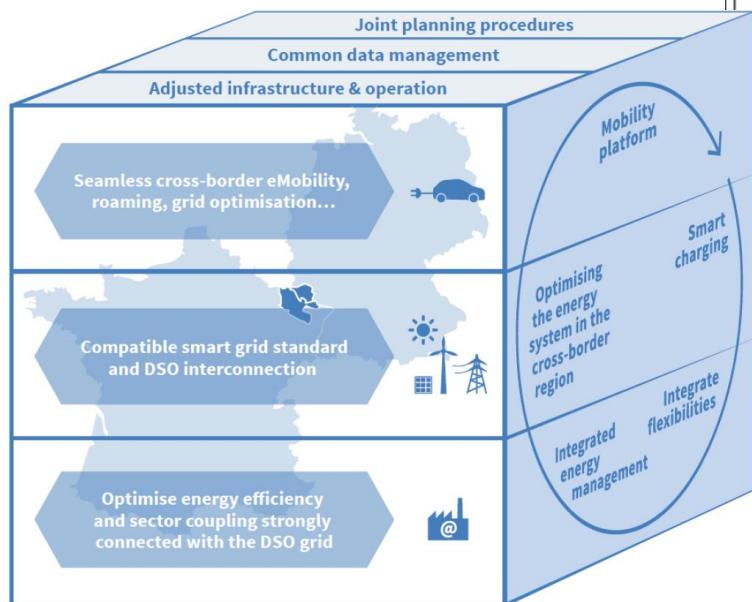


https://www.ura.gov.sg/uol/-/media/User%20Defined/URA%20Online/urban-lab/Past-events/energy/Fiche_Singapore_BAT_Edited%2020151006.pdf?la=en



SMART BORDER INITIATIVE: A FRANCO-GERMAN CROSS-BORDER ENERGY OPTIMISATION PROJECT

Pilotprojekt in der Region
Saarland - Lothringen





EIFER – Lokale Energielösungen im multi-nationalen Kontext

- Energie als zentrales Planungselement auf lokaler Ebene
- EIFER unterstützt Entscheidungen mit Planungswerkzeugen
- Integration von Umweltfragen (u.a. Luftqualität, Wärmeinseln)
- Integration neuer Möglichkeiten der Digitalisierung (IoT)
- Direkte Tests in Feldversuchen und Reallaboren (Living Labs)



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Vielen Dank!

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