KREISVERWALTUNG
RHEIN-HUNSRÜCK-KREIS

Rhein-Hunsrück District - from energy importer to energy exporter!

Local and regional Zero Emission Strategies








Introduction Rhein-Hunsrück District

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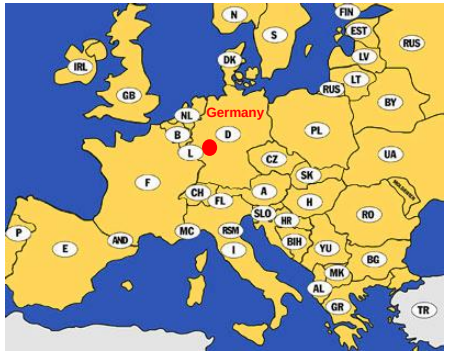
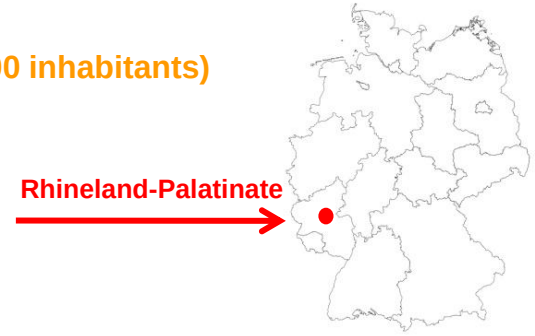
Rhein-Hunsrück地域の事例



- 100.500 inhabitants
- Area: 963 km²
- 134 settlements
  (75% with less than 500 inhabitants)



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- Bertram Fleck地域長
- 人口10万人 （4.5万世帯）
- 1969年に地域行政機関として発足
- 134市町村
- 96万平方Km （森林46%、農地42%）
- 弱い経済的な構造 （農業、林業、観光中心）

Head of the District – Mr. Bertram Fleck
Kreisverwaltung Rhein-Hunsrück Kreis
Ludwigstraße 3-5, 55469 Simmern / Germany
Tel: 00 49 (06761) 82 101
Email: landrat@rheinhunsrueck.de

Overview

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1. Keeping up the same old energy politics?
2. 290 million € currently spent on energy imports
3. Examples of renewable energy
4. Share of electricity from renewable energy
5. Promotion of acceptance for wind turbines
6. Land development plan – area for wind power
7. Regional creation of value
8. Climate protection concept

1. Keeping up the same old energy politics?

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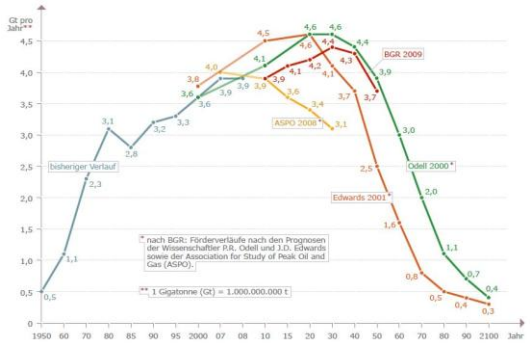
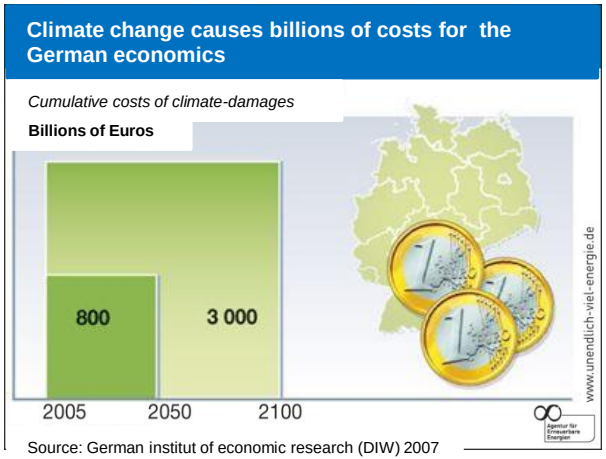
finite nature of fossil fuels

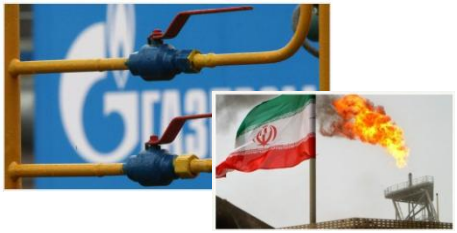


effects of carbon dioxide on the climate



Source: German institut of economic research (DIW) 2007

dependence from energy-exporting-states



Explosive development of energy costs (in Euro)

Year	1 liter of fuel oil	1 kWh power	1 liter of gasoline
1967	4,6 Cent	7 Cent	30 Cent
2000	30 Cent	15 Cent	70 Cent
2013	**95 Cent**	**26 Cent**	**155 Cent**
Estimation 2020	140 Cent	35 Cent	210 Cent

Goals of the German Federal Government

	Effici-ency	Share of renewables in electricity	CO_2
Goal of German Federal Government **2020:**	**20 %**	**35 %**	**40 %**
Goal of German Federal Government **2050:**	**50 %**	**80 %**	**80 %**

2. Goal: to transform 290 million € currently spent on energy imports into regional value added

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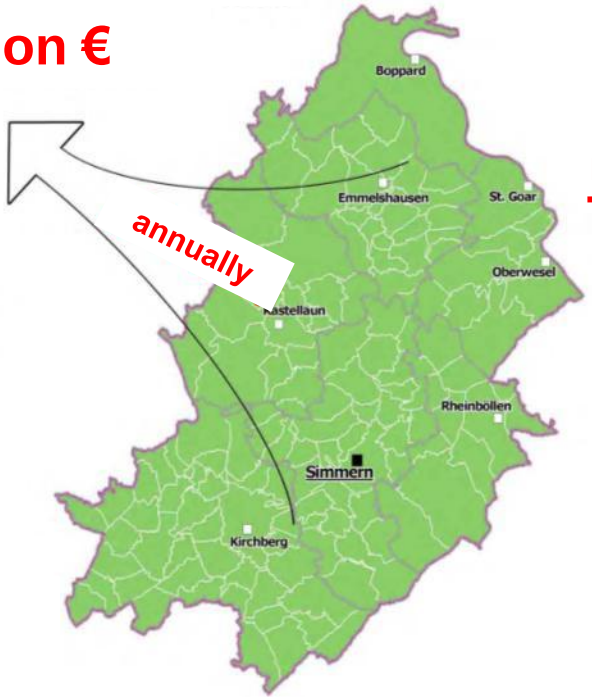
Total expenditure on energy imports in Rhein-Hunsrück

approx. 290 Million €



Rhineland-Palatinate

Total expenditure on energy imports in the Federal Republic of Germany in **2012: about 92 Billion €**
40% more than in 2010

Goal of our Climate Protection Concept:

We aim at localizing the use of 250 Million € currently annually spent on energy imports!

Through improvements in energy efficiency and introduction of renewable energies we convert energy import costs into regional jobs and value added!

2. Goal: to transform 290 million € currently spent on energy imports into regional value added

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Percentage of Renewable Energies

1999
Energy controlling
District owned properties

2003
Optimization
Of Building- and
Redevelopment measures

2006
Resolution of a
Energy Concept
for the District

2009
Energy Concept I

2010
Commission of IfaS
(College of technology)
Climate Protection
Concept

2011
Submission of the
Concept by IfaS

2012 - 2015
Realization of the Concept Part I
- Manager for Climate Protection
- Expansion of Local Concepts
- Public Services through RE
- Civic Partizipation

2020
Zero-Emission
(incl. Traffic a.
Refuse)

2050
Reference Area
for Sustainability

time

3. Example
Energy Efficient Construction

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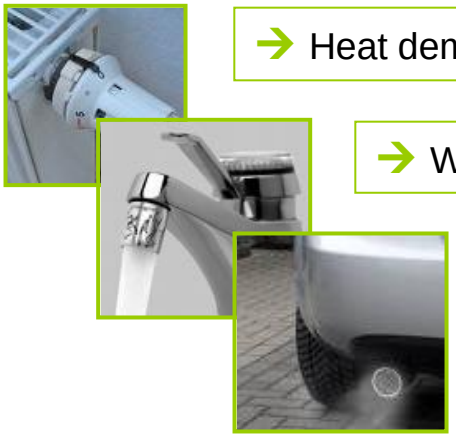
Achievements of the energy controlling operating since 1999

Jahr	C / KWh
1996	1,79
1997	2,21
1998	2,14
1999	1,92
2000	3,71
2001	4,65
2002	3,56
2003	3,74
2004	3,55
2005	4,43
2006	5,91
2007	6,21
2008	7,61
2009	7,10

+ 400 %

Reduction of:



→ Heat demand by **26 %**

→ Water demand by **34 %**

→ CO_2 emissions **9.500 tons**
→ Cost savings **2.000.000 €**

During the same period, however, heating energy costs have quadrupled!

Increase of:

→ Electricity demand about only **1 %**

Despite doubling number of PC's, introduction of air-conditioned server, introduction of catering and of all-day-school.

Without additional measures of energy controlling the increase would have amounted to 30%.

2005
Certified with the
Energy Seal of the State
of Rhineland-Palatinate

of District's buildings by 2012

3. Example
Zero Emission Buildings

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2010: The first Zero Emission School in the District

2011: Sports Halls in Simmern and Kirchberg
Zero emission sports halls

2006 : Connection to the **local district heating grid** (wood chips and plant oil CHP with native rapeseed)

2008: Conversion of **swimming pool pump**, **Savings of electricity: 10,000 kWh per year**

2007+2010: PV systems (electricity 93 kWp), Yield: **86.500 kWh / year**
Surplus electricity: 33% for **consumption**
CO_2 credits: **14.5 t / year**

3. Example
Construction of energy generating buildings

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Energy generating administration buildings

2009
awarded a national-wide
Energy Efficiency Prize

Building‘s orientation to the South

The mound of the Northern side constructed according to the **Passive House Standard**

Brine heat pump connected with ground heat collectors

Innovative control technology

PV installations (20,7 kWp) generate more electricity than needed for heating and ventilation:
Energy generating building

3. Example
Local heat supply systems in communities

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Community of Ober Kostenz 2013
256 inhabitants

source: Cooperative „Energy for Mannebach eG“

72 houses from 91 houses
Wood chips,
Operating since January 2014

„Energy Cooperative Ober Kostenz eG“

Status in June 2014:
10 biomass-heating networks in operation,
7 biomass-heating networks in development

3. Example
Material Flow Management: Bio-heating network

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Public building complexes are merged to district heating networks and heated with **tree and shrub cuttings** **(120 collecting points, central treatment place)**

The first step: Fuel preparation in the central processing place

Startscreen

High quality compost: approx. 50% of the total material

2009
Awarded **Environmental Prize** of the State of Rhineland-Palatinate

Fuel:
approx. 50% of the total material

The second step:

Thermal processing in the central heating station with burning capacity of 500 to 850 kW

Central heating station

Fuel storage facility

3. Example
Material Flow Management: Bio-heating network

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Public building complexes are merged to district heating networks and heated with **tree and shrub cuttings** **(120 collecting points, central treatment place)**

Three biomass-heating networks in schoolcenters:

22 school buildings,
8 sports halls,
1 indoor / outdoor swimmingpool,
1 libary

→ Total investment
7.1 Million € clear

→ Annual savings
673.500 Liters
Fuel oil equivalent

→ In the course of the next 20 years at least **20 Million € of energy delivery costs** will stay within the region

3. Example
Roofs – Source of revenue

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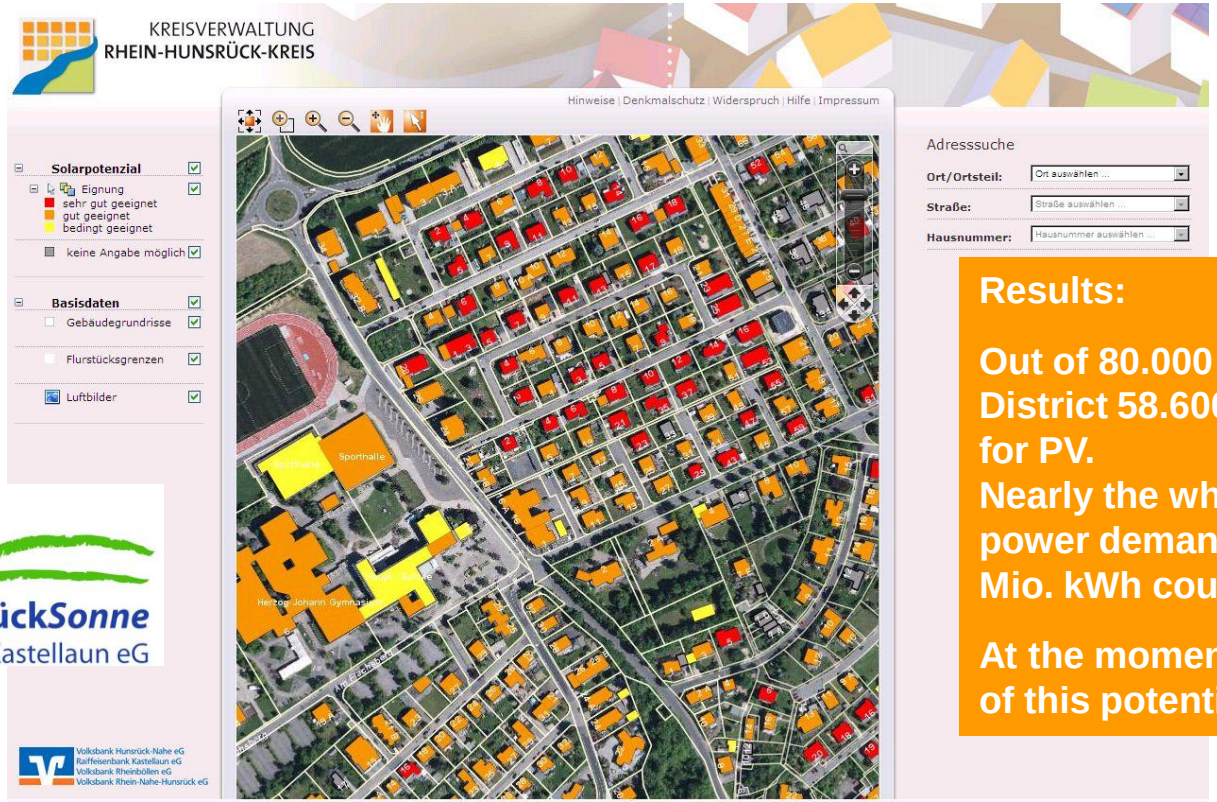
1000-Roofs-Photovoltaic-Program

Rhein-Hunsrück District; Volksbank and Raiffeisen Bank Institutes in the District; Smart Geomatics; Stae agency for measuring



Results:

Out of 80.000 roofs in the District 58.600 are suitable for PV.
Nearly the whole annual power demand of about 473 Mio. kWh could be covered.

At the moment already 12 % of this potential is used.

www.solarkataster-rhein-hunsrueck.de

4. Share of electricity from renewable energy sources in the District in 2012 - already 149 %

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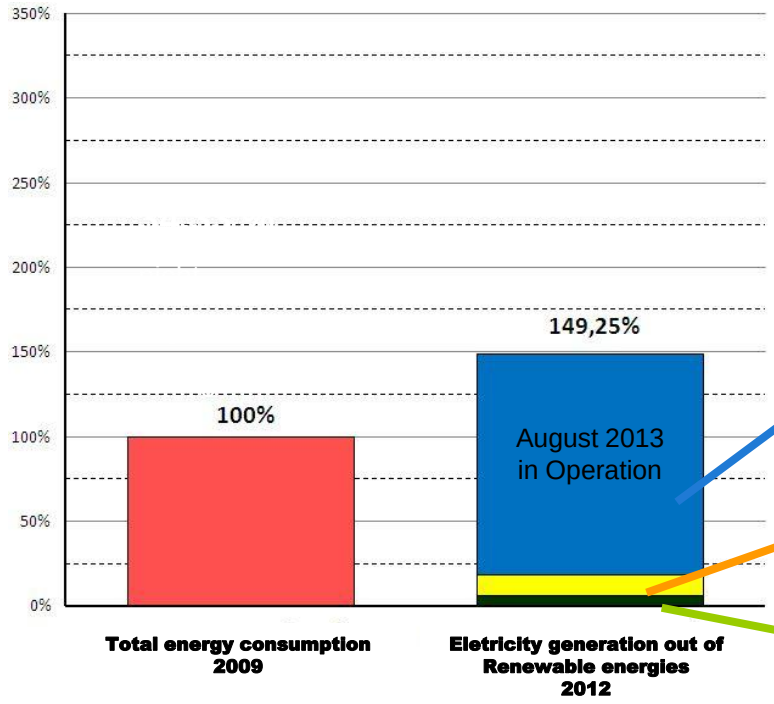
Total electricity demand 473 Million kWh in 2009



Hydropower

Ø national 3,6 %

Pilot project in the River Rhine close to St. Goar (picture: Niederheimbach)

169 turbines
399 MW power

Wind energy
August 2013
130,98 %
Ø national 7,7%

3.092 plants
64 MW power

Photovoltaics
12,10 %
Ø national 4,7 %

16 plants
4,7 MW power

Biomass
6,17 %
Ø national 6,9 %

Percentage of Renewable Energies: 149%
Ø Whole of Germany 22,9 %

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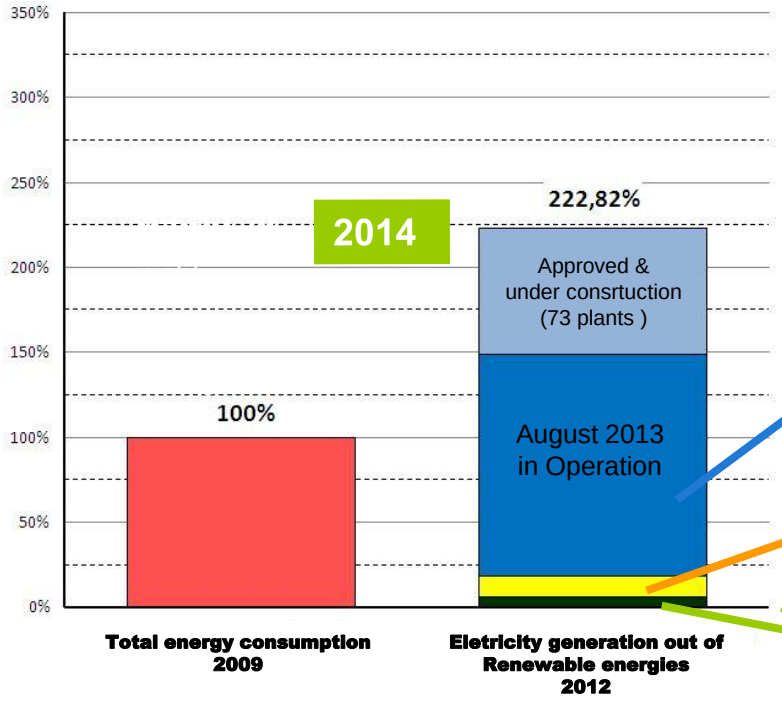

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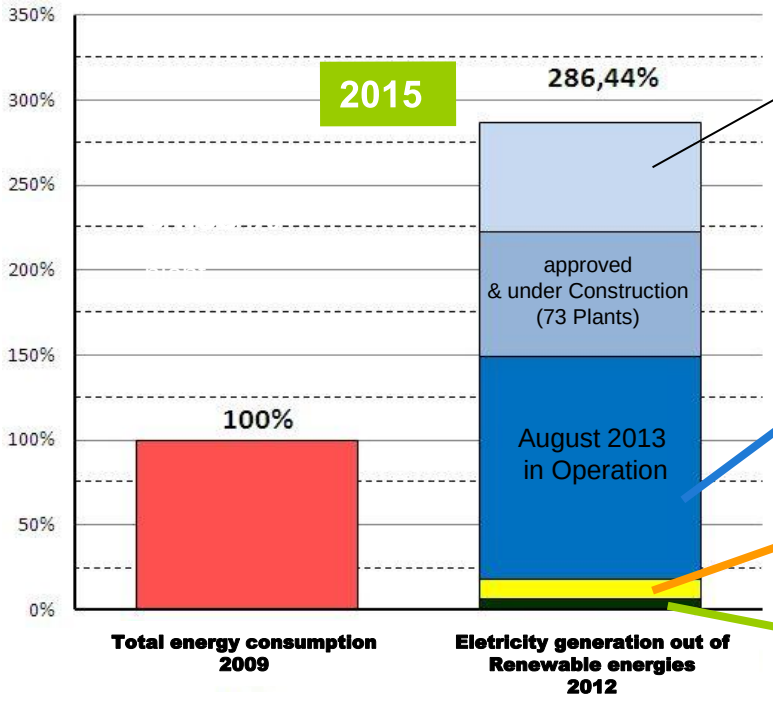

Wind Energy
Applied for & Approveable
(66 Plants)

169 turbines
399 MW power

3.092 plants
64 MW power

16 plants
4,7 MW power

Hydropower
Ø national 3,6 %

Pilot project in the River Rhine close to St. Goar (picture: Niederheimbach)

Wind energy
August 2013
130,98 %
Ø national 7,7%

Photovoltaics
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Ø national 4,7 %

Biomass
6,17 %
Ø national 6,9 %

Percentage of Renewable Energies: 286 %
Ø Whole of Germany 22,9 %

5. Promotion of acceptance of renewable energy

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From today‘s 169 to 308 wind turbines - this changes the landscape

5. Energy gets visible – promotion of acceptance of renewable energy

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thesis : any generation modifies its landscape / familiarity is deciding

railway territory

for example Frankfurt central station :

72 ha

best area in the city center

marked area:
2.880 meter length
250 meter width

overhead line

in the district of Rhein-Hunsrück:

394 km overhead circuit

28 km maximum voltage (380 kV und 220 kV)
86 km high voltage (110 kV)
280 km middle voltage

road system

in the district of Rhein-Hunsrück:

993 km

42 km highways
158 km national highways
368 km state roads
425 km district roads

5. Energy gets visible – promotion of acceptance for renewable energy

KREISVERWALTUNG
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thesis : any generation modifies its landscape / familiarity is deciding

example: railway area in the district (middle rhine valley)

5. Energy gets visible – promotion of acceptance for renewable energy

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thesis : any generation modifies its landscape / familiarity is deciding

example: overhead circuit in the district

5. Energy gets visible – promotion of acceptance for renewable energy

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acceptance for citizens through:

- designation predominantly on public own areas (concentration of preference areas), leasing receipts !
- early and comprehensive public information before the formal process of planned designation of wind power areas (for example distances to localities).
- financial participation of the citizens (citizens cooperative / foundations)
- cheaper electricity through direct marketing
- regional value for the region/ services for the public in the municipality

acceptance for neighbouring municipalities through:

- communal solidarity pact

6. In the land development plan the preference areas for wind power are declared

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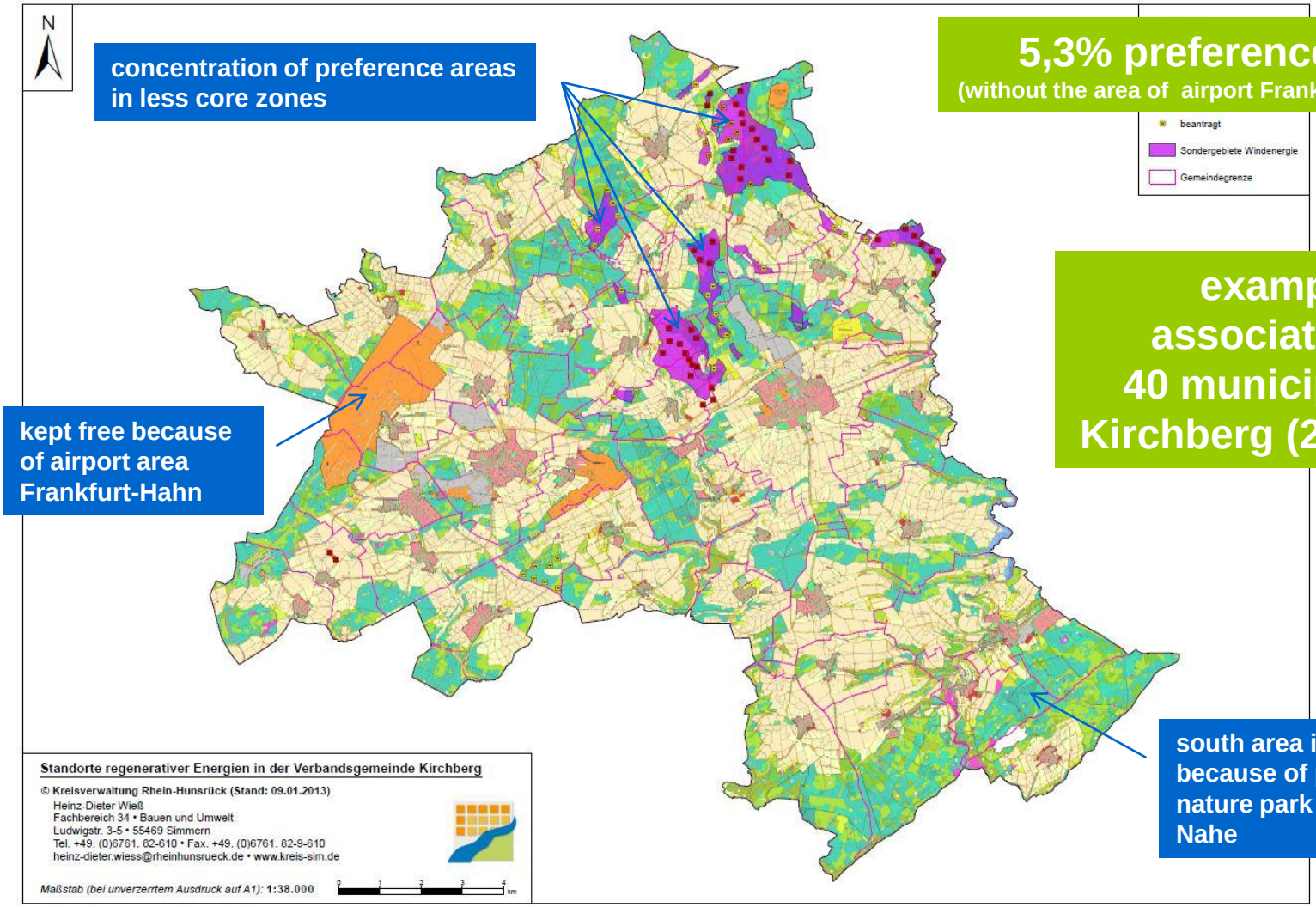

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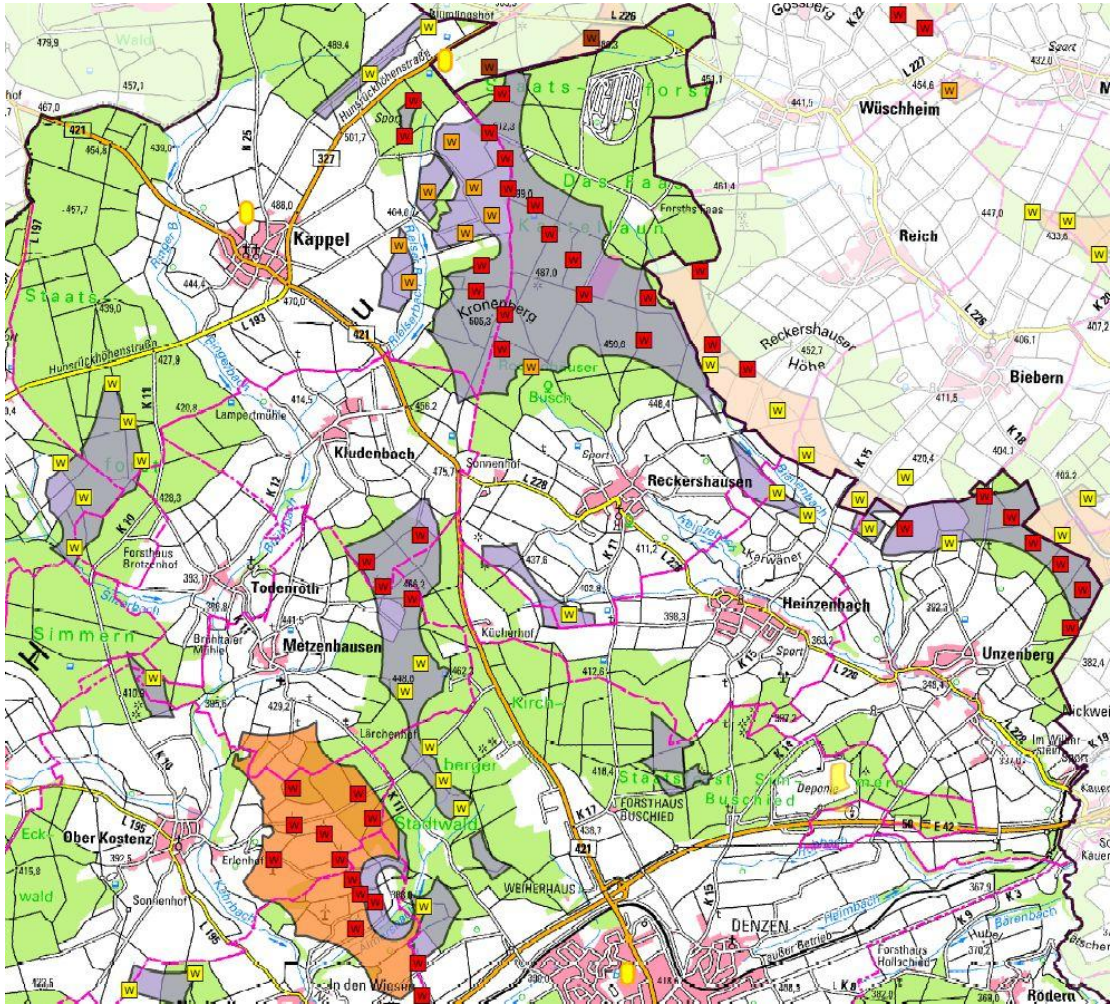

example:
Association of
40 municipalities
Kirchberg (22.782 ha)

cutout of plan
preference areas

assessments:

- wind speed at least 5 – 6 meters per second

- **distance** to localities is not regulated in law of nation or state
  - regards from state: 800 meters
  - Kirchberg: 750 meters

- The requirements of noise prevention must be observed

- Expertise for landscape protection and nature protection

7. Regional value added: conservative calculation of the District administration

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Regional value added from renewable energies (business volume)

Form of Energy for Electricity generation	*Total Investment*	Regional value added: Share of Regional Amount of Investment (only one time)	Regional value added: Annual regional value added	Comment
Biomass (16 plants)	22.495.000 €	2.249.000 €	2.673.000 € 5.629.500 €	Purchase of Corn Compensation from Renewable Energies Act 2012 regional
Solar Energy (3.092 plants)	154.607.000 €	30.921.000 €	2.319.000 € 15.864.000 €	Operation Compensation from Renewable Energies Act 2012 regional
Wind power feeding in the grid (169 turbines)	592.300.000 €	29.800.000 €	680.000 € 4.117.500 € 1.198.000 €	Operation Rent 33.922.000 € Compensation from Renewable Energies Act 2012 (not regional)
Sum 2012	**769.402.000 €**	**62.970.000 €**	**32.481.000 €**	
Wind power increase till 2015 (139 turbines)	597.100.000 €	39.750.000 €	560.000 € 4.302.000 €	Operation Rent
Sum 2015 only with increase of wind power	**1.366.502.000 €**	**102.720.000 €**	**37.343.000 €**	

8. Climate protection concept: Zero Emission Rhein-Hunsrück district

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Development of the Concept 2010-2011 by the Institute for applied Material Flow Management (IfaS)

- Set up of an energy and pollutant opening balance sheet
- Determination of renewable energy and energy efficiency potentials
- Holding 9 workshops with different topics and more than 300 participants
- Set up of an energy and pollutant closing balance sheet, scenarios 2020 and 2050

The District will on the balance sheet become a zero emission District in electricity, heat and transport sectors already in 2020.

- Set up of a catalogue with 92 individual measures
  First Activity: Measure Modernization of Heating systems and Exchange of Pumps
- Appointment of a Climate Protection Manager 2012-2015 for the implementation of individual measures

By using all potentials, annual energy delivery costs amounting to 250 Million € can be saved in 2050.

8. Opening Balance 2011 of the Climate protection concept

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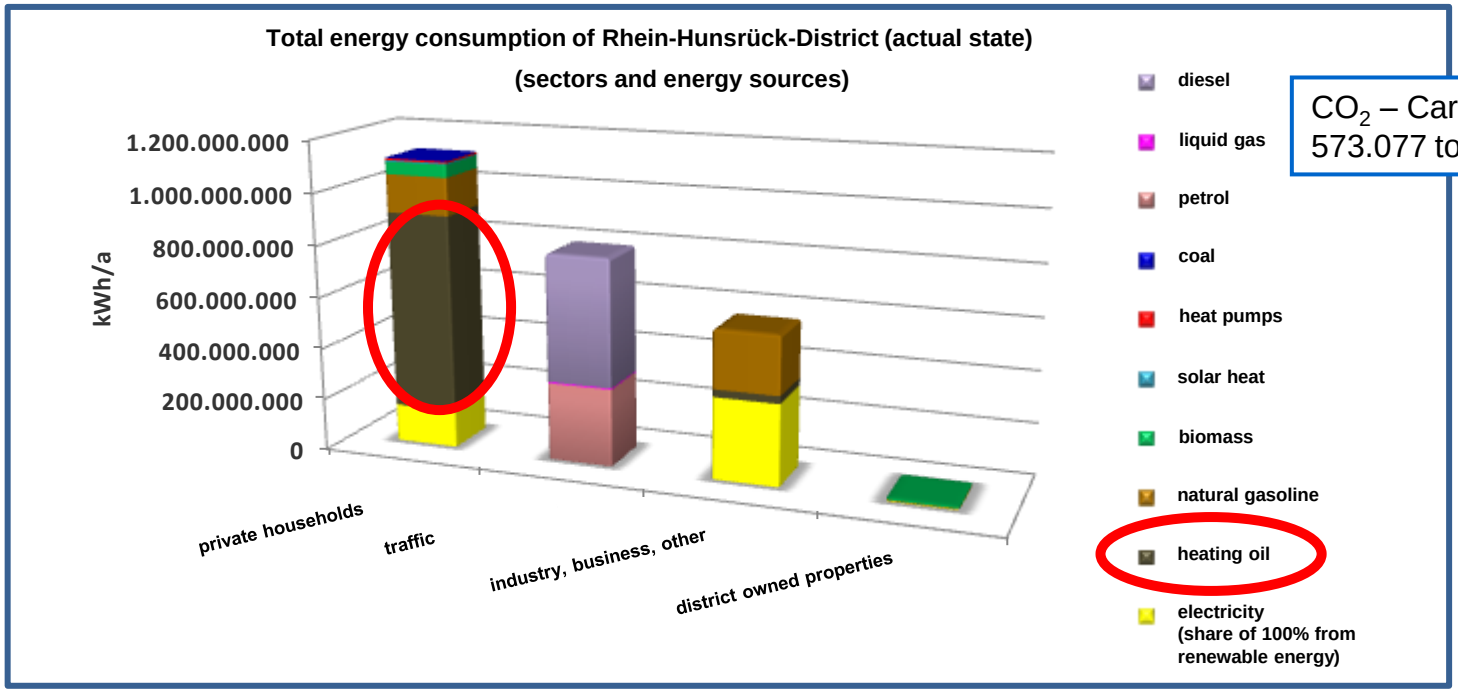
Energy-and Greenhouse Gas Opening Balance 2011 of the District



CO_2 – Carbon footprint: 573.077 tons per year

Heating: ca. 1,2 Mio. MWh/a (49,5%)

Transport ca. 799.533 MWh/a (32%)

Electricity: ca. 463.040 MWh/a (18,5%)

Total energy expenditure ca. 2.5 Mio. MWh per year
This is the equivalent of 250 million liters of heating oil!

8. Opening Balance 2011 of the Climate protection concept

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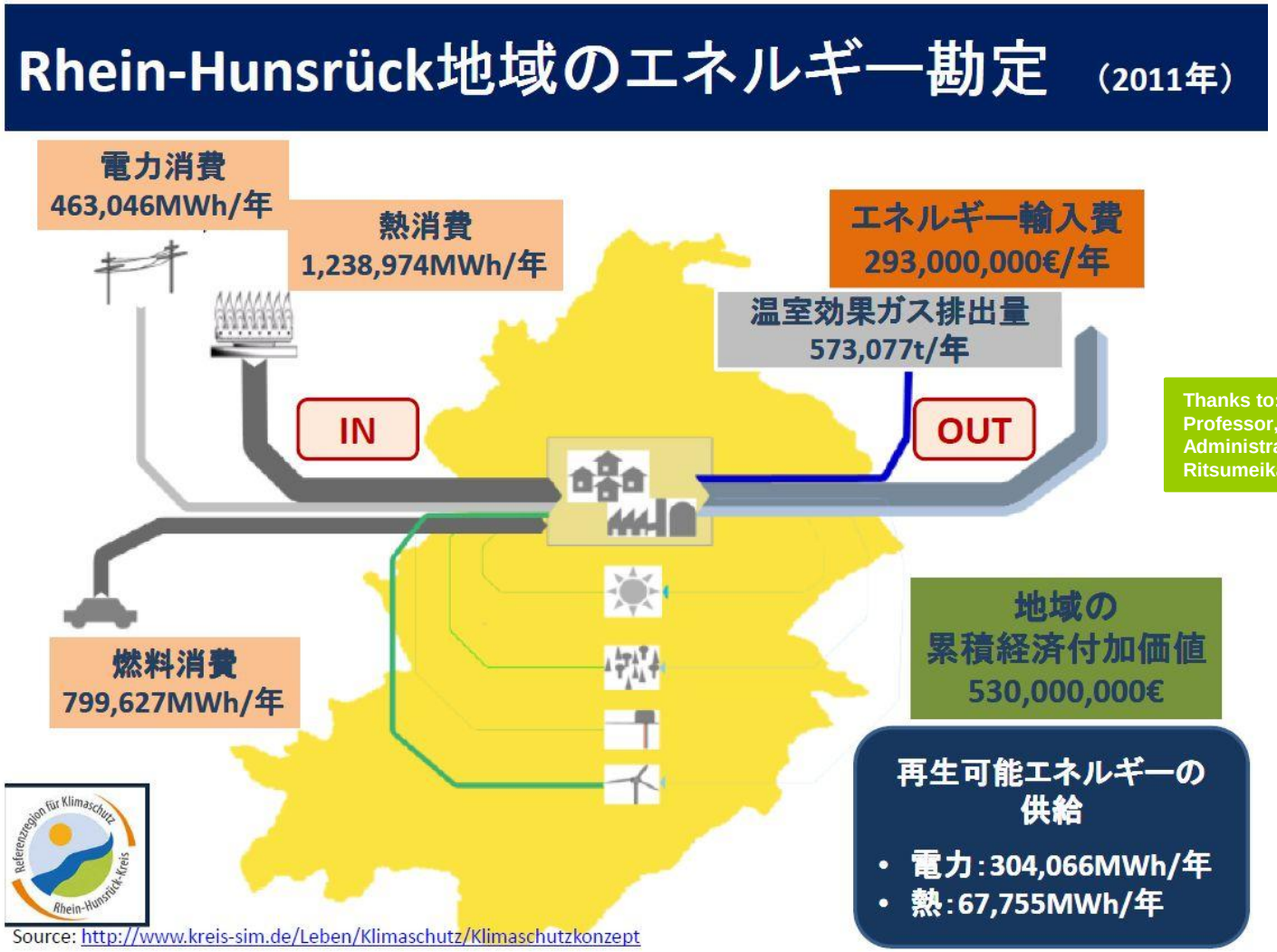

Thanks to: Dr. Jörg Raupach-Sumiya, Professor, Collage of Business Administration, Ritsumeikan University

8. Closing Balance 2050 of the Climate protection concept

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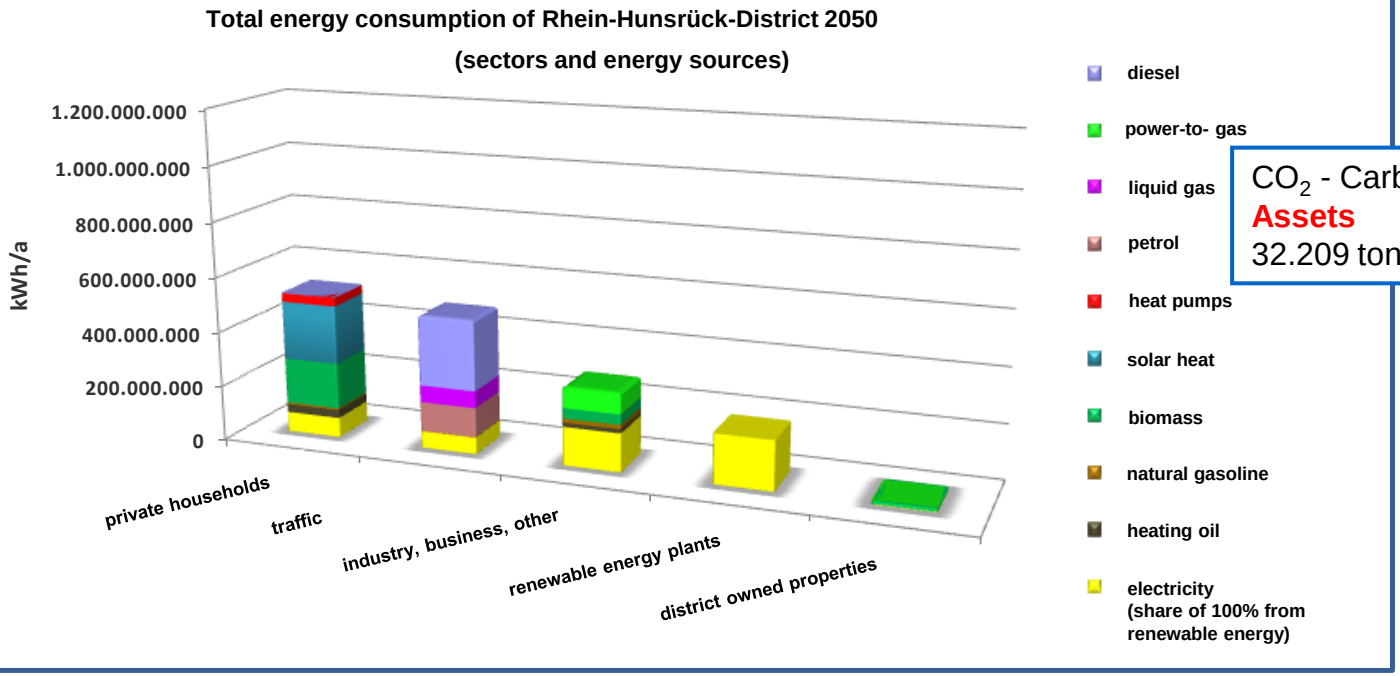
Energy-and Greenhouse Gas – Closing Balance 2050 of the District



CO_2 - Carbon footprint :
Assets
32.209 tons per year

Reduction of total expenditure about 40% to1,5 mio. MWh per year

Halving of energy expenditure as to the building stock

Utilization of the potentials from biomass, sun and wind

Replacement of fossil fuels with energy saving and utilization of renewable energies equates to 210 million liters of heating oil per year.!

8. Closing Balance 2050 of the Climate protection concept

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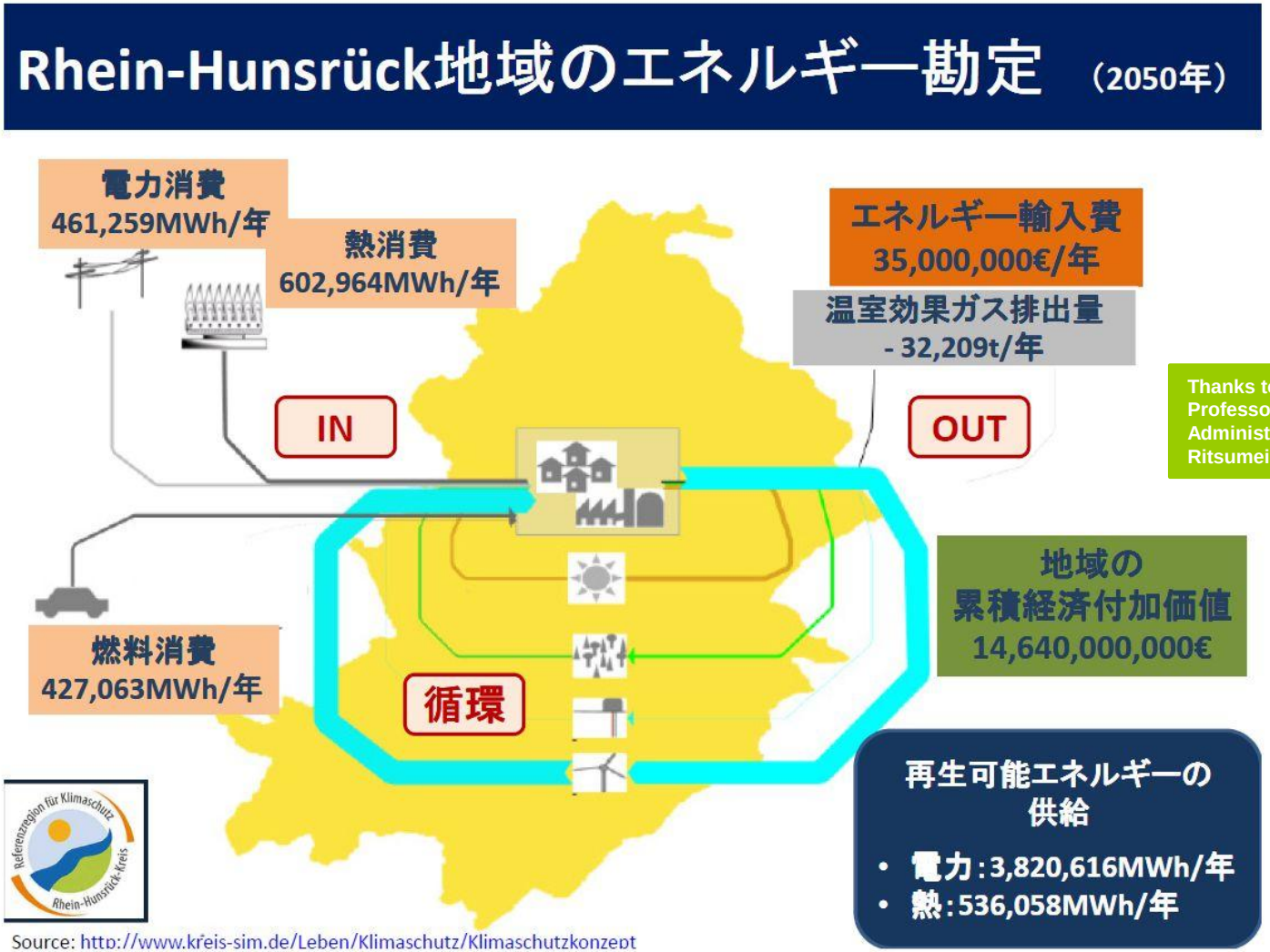

Thanks to: Dr. Jörg Raupach-Sumiya, Professor, Collage of Business Administration, Ritsumeikan University

A lot of energy is hidden in Rhein-Hunsrück District - we are making use of it!

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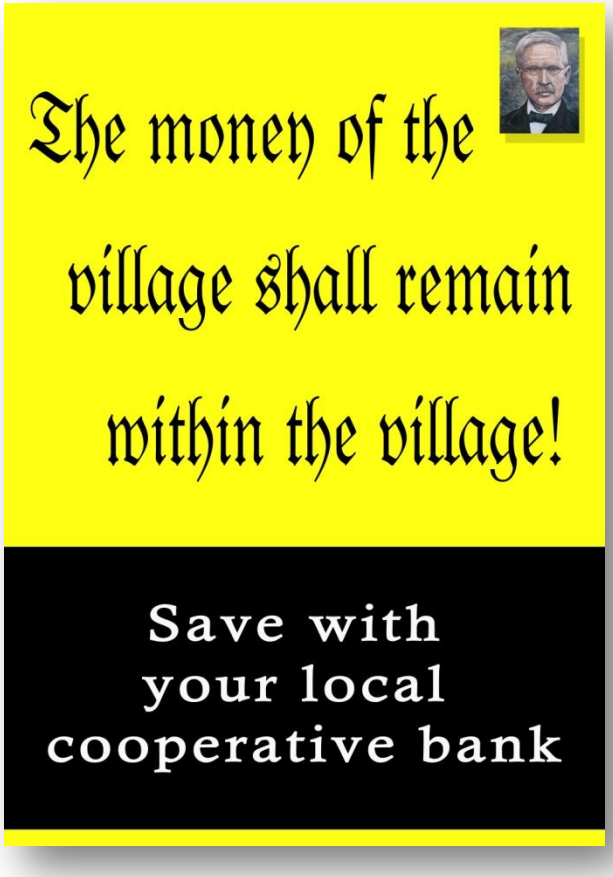

Thank you very much for your attention !