

An aerial photograph showing a wind farm with several large white wind turbines. In the center, there is a cluster of buildings, including a large industrial-style building with a blue roof and several smaller residential or community buildings. The surrounding landscape is a mix of green fields, forests, and a winding road. The text "Climate Neutral Communities: The Case of Climate Community Saerbeck" is overlaid in white on the image.

# Climate Neutral Communities: The Case of Climate Community Saerbeck

Future of energy systems on local and regional level • Prag, November 26, 2019

# Saerbeck

- small village in rural environment
- 7.200 inhabitants
- increasing population till 2030
- very good infrastructure (schools, education, active community living)
- 2.400 jobs in local industries



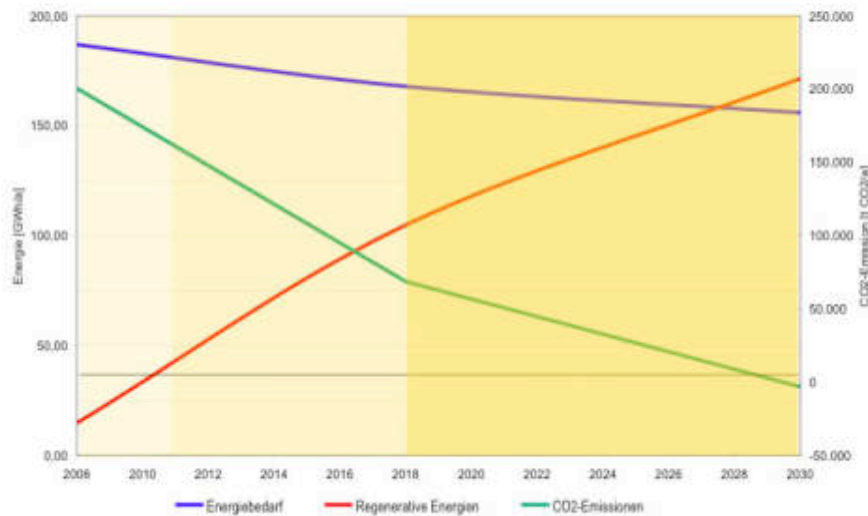
## Climate Community of Saerbeck

### GOAL

#### Climate Municipality Saerbeck

Supply of the Whole Power with Renewable Energies  
till 2030

Energiebedarf, Anteil regenerativer Energien und CO<sub>2</sub>-Emissionen 2008 - 2030



3 charts:

energy demand (blue)

renewable energies (red)

CO<sub>2</sub>-emissions (green)

- 10 years of work on local sustainability
- 2009: Integrated Concept for Climate Protection and Climate Adaptation
- 150 different projects from pv arrays to waste management to renewable energies
- target: to reduce the CO<sub>2</sub>- emissions to a zero level the latest in 2030
- **embedding the people of Saerbeck (=7.200) since the beginning:**
  - by raising awareness (= education)
  - by doing own projects (e.g. PV)
  - by earning money (e.g. Bioenergyparc)





# Lead Project 1: Sunny Side of Saerbeck

Akteure des Fragebogens

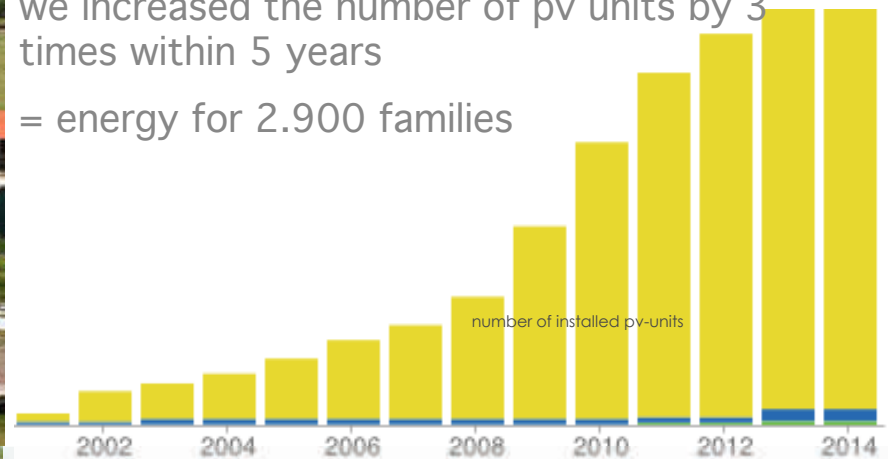
Agenda 21  
in der Schule

## ■ Lead Project 1:

- 2018: nearly 500 PV units of about 12,0  $Mw_{peak}$  are installed  
(only in the village on the roofs of privat buildings, farm houses and schools)



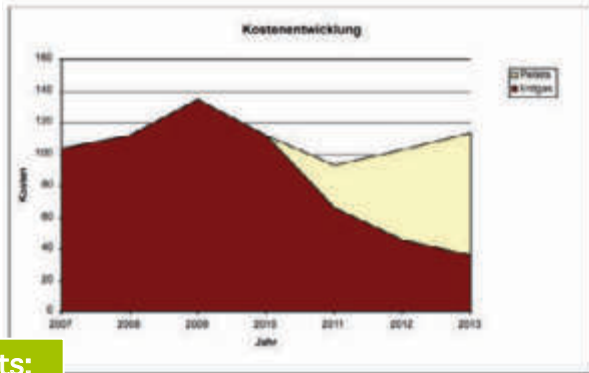
- we increased the number of pv units by 3 times within 5 years  
= energy for 2.900 families



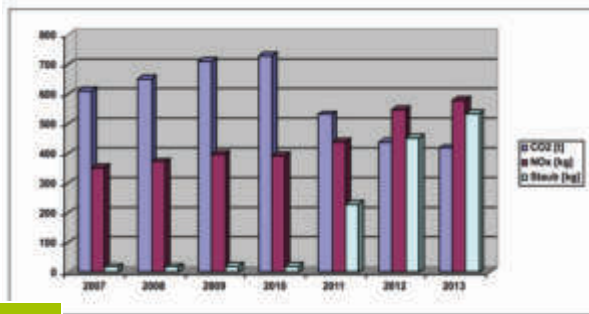
Lead Project 2:  
Saerbecker Insight  
Making future energies transparent!



# ■ Making Future Energies Transparent



energy costs:  
-16 %



CO<sub>2</sub>-emissions:  
- 42 %

- central heating feeded with wood (pellets) in 2010
- substitution of the former gas maintenance
- supply of 2 schools, several sport facilities, a kindergarden
- 2020: all street lights with LED

## We save:

- energy (from 1.650 to 850 kW)
- money (50.000 €)
- CO<sub>2</sub> (420 tons/y)





# The Energy-Experience-Path

- to explain the global climate change
- 10 POI's (glassy sidewalk, e-power station for pedelecs, poster of lots of paintings of all the pupils of the elementary school)
- to give exemples for everyone to participate in saving energy, in using renewable energies for heating and lighting
- presentation for non-experts (to inform, to make think about)
- embedding all acting people along the path



# It's All About Education



Making Renewable Energies Transparent:  
Explaining how it works!  
This is very simply done !  
Everybody is able to do it!



# School Projects: e.g. muffins cooked by the Sun



# School Projects: PV Array



# Students coming from Fukushima



# and Minnesota



# Adult Education



# From Ammunition Camp to Bioenergyparc

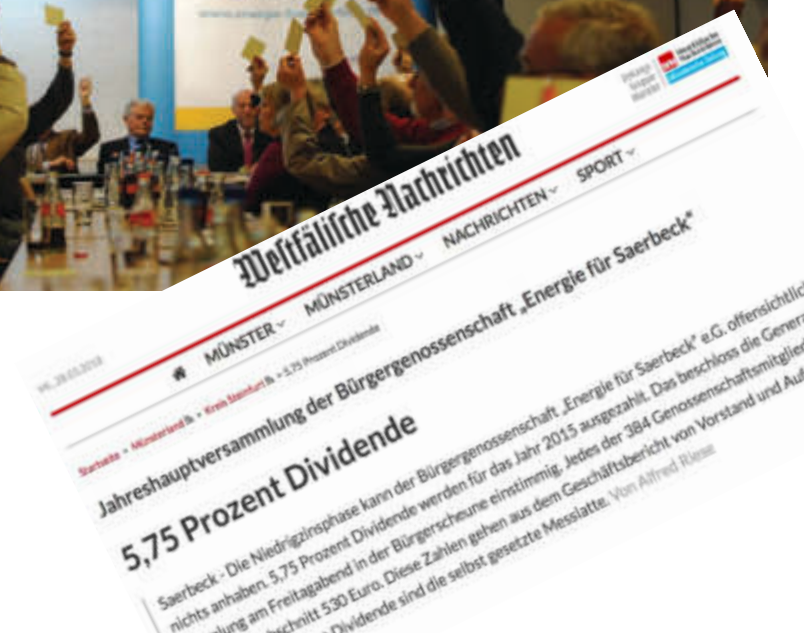
## 2009

- a former ammunition camp of the army
- 1,5 km away from the village
- rd. 900.000 square meters
- in ownership of the community since 01.01.2011
- price: 1,25 Mio \$

## 2013

# The Role of Local Investments

- total invest of more than 70 Mio. € in the bioenergy parc
- the returns will be reinvested in local projects (social, educational, climate)
- e.g. the cooperation „Energy for Saerbeck“
  - one of the most powerful investors in the bioenergy pac
  - 400 inhabitants with a total investment of 15 Mio \$ in the bioenergy parc (pv, wind)
  - rate of return 3.5 – 5.5%





# SolarPowerParc

- using the bunker walls for the installation of PV (2012)
- capacity of 5,7 Mw<sub>peak</sub> (= energy need of 1700 households)
- owner/investment by the local Cooperative

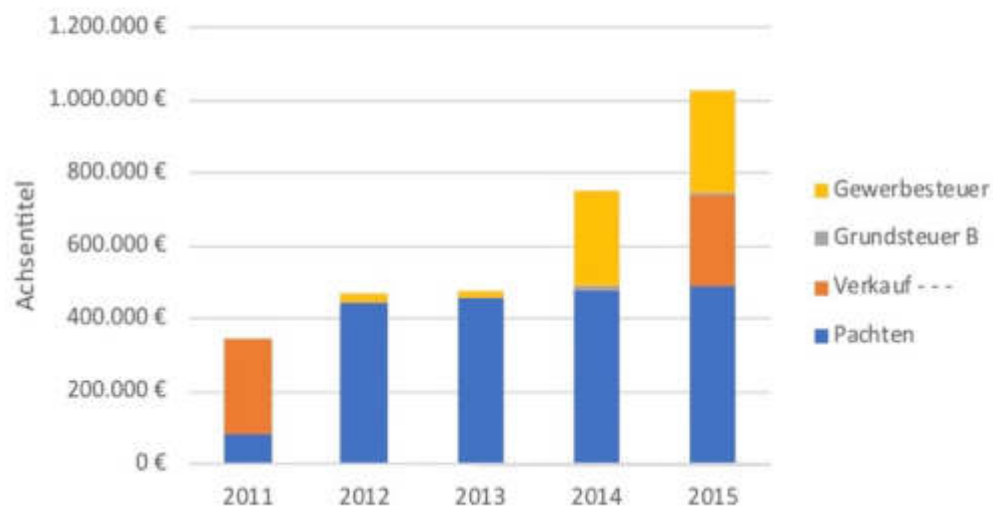




## ■ The Role of Investments by the City

- income by the own wind turbine, rent and leasing revenues, taxes:  
= 6 - 8% of the yearly budget of the city of Saerbeck (without secondary effects)

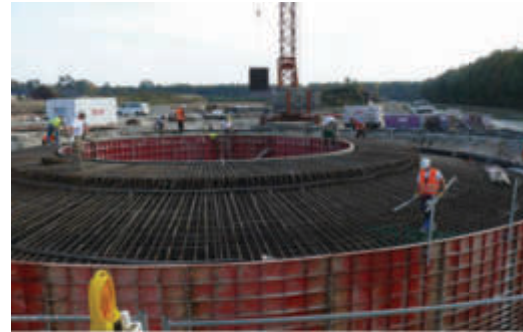
Einnahmen Bioenergiepark absolut  
2011-2015



Development of Rental and Leasing Income 2010 - 2015

# 7 Wind Turbines

- 3 Megawatt each (3.000.000 kW)
- height: 199,5 meters  
hub height: 149 meters  
diameter of the rotor: 101 meters
- 7 turbines 5 investors, all locals
- Windpool Saerbeck



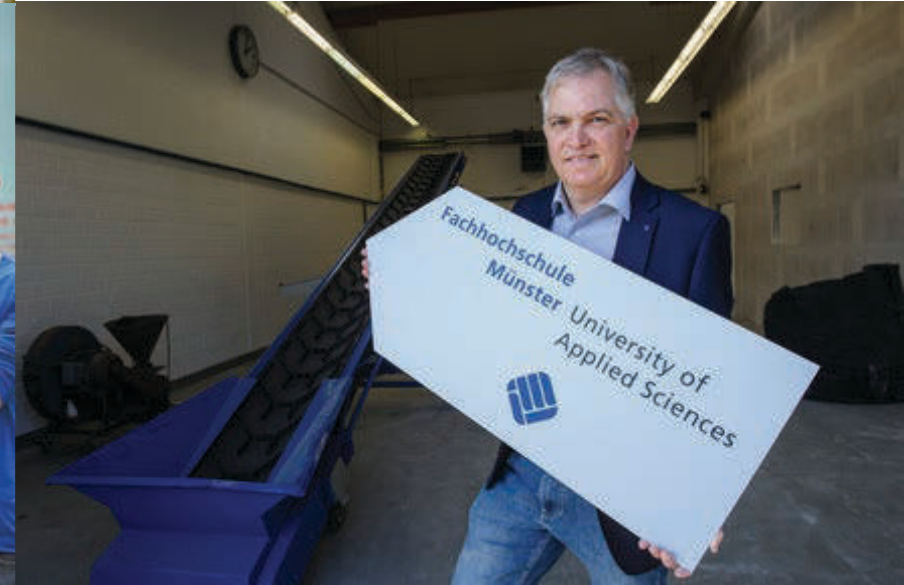
# Energy from Biomass

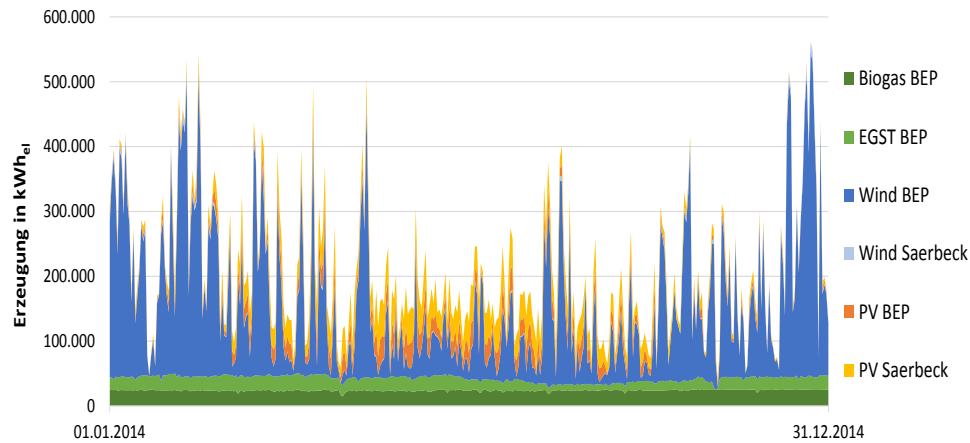
- energetic use and material utilisation (mass flow management of biomass input and output)
- 1 biogas plant in 2011/18 (SaerGAS, 4MW<sub>el</sub>)
- owned by local farmers
- 1 composting plant (EGST, 1MW<sub>el</sub>)
- digestion of all organic waste of the County of Steinfurt, 45.000 tons /year



## ■ Cooperation with Universities

- research projects (e.g. Storage)
- internships for students
- international workshops
- history and education projects

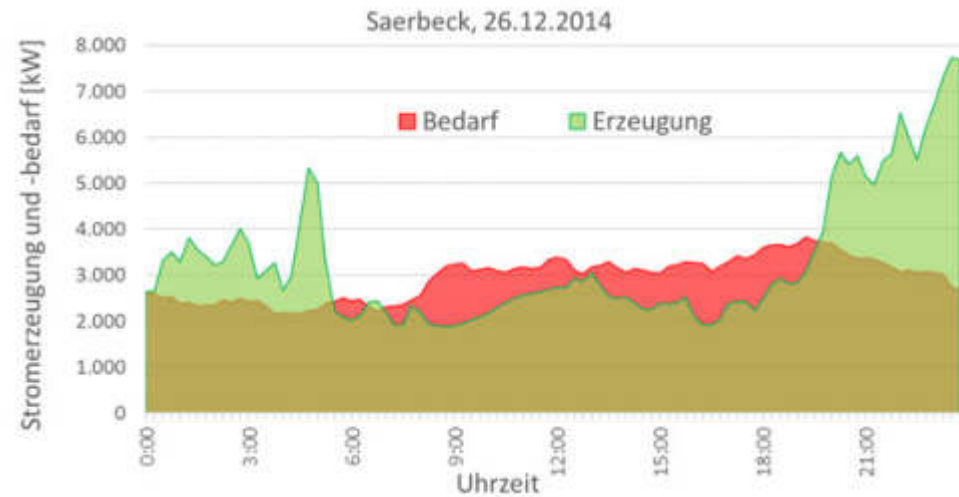




Tagessummen der Stromerzeugung in Saerbeck im Jahr 2014 als gestapeltes Flächendiagramm. Dargestellt ist die Stromerzeugung aus Biogas, Wind und Photovoltaik (PV) im Bioenergiepark (BEP) und dem restlichen Saerbeck.

## ■ EnerPrax 2017

- difference between the time of production and using renewables
- storage technologies have to cover this gap
- modelling the Bioenergiepark and Saerbeck by a scale of 1:200
- what are the best storage technologies concerning the special Saerbeck input and output conditions
- research project FH Münster, GWI, Gelsenwasser



## ■ Facing Climate Change



all spruce trees (needle tree)  
died in 2019 (bark beetle)

drouhgt is the biggest  
challenge:

nature

drinking water (quantity and  
quality)

agriculture

40-50% less harvest in 2019



## ■ Preserving Nature and Biodiversity



30% of the Bioenergyparc Area is Nature Protection Area





## ■ Climate Adaptation



Space for New Nature in the Bioenergyparc - New Trees (oaks) for the Bioenergyparc

## Special Climate Education Classes



# Energy Summercamp 2020: USA – Japan – Germany

## 2020 INTERNATIONAL ENERGY CAMP

in Saerbeck, Germany

July 25 to August 8



The Morris Model is looking for 10 enthusiastic high school students to join 10 students from Fukushima, Japan and 10 from Saerbeck, Germany at the first ever International Energy Summer Camp.

For two weeks, students from 3 cultures will live, learn, and work together on projects focusing on climate protection and sustainability. All instruction will be in



**\*\*\* Apply by Dec. 1<sup>st</sup> \*\*\***

Fill out the application at:

<https://z.umn.edu/energycamp> or QR code above.

We will select the 10 participants based on your application essay. Most costs will be covered by a German grant—this will cost you no more than \$300!!

Contact Eric Buchanan with questions: 589-1711



Morris Model

## ドイツ・ザーベック町2020夏 国際エネルギーキャンプへの参加者募集 (新地町の高校生の皆様へ)



ドイツ・ザーベック町が、2020年夏に開催される国際エネルギーキャンプに参加する。環境問題、エネルギー問題に高い関心を持つ新地町の高校生10人を募集します。参加者は、ドイツ・ザーベック町の10人の高校生、アメリカ・モリス市の10人の高校生と一緒に、初めて開催される国際エネルギーサマーキャンプに参加します。

3つの異なる文化を持つ学生たちが、2週間一緒に生活し、学び、気候保護と持続可能性に関するプロジェクトに取り組みます。



**\*\* 応募締切：12月20日 \*\***

(予定)



参加希望者には環境、エネルギーについての400字-800字のエッセイ(小論文)を提出してもらいます。国立環境研究所と新地町等の環境、エネルギーの専門家が審査して10人の参加者を決定します。費用の大部分はドイツ政府の補助金が負担します。参加者の個人負担は日本国内の移動等、最大で40000程度です。

ご質問は問い合わせは「UDCしんち」平野(国立環境研究所)まで(yhirano@nies.go.jp)。

# National and International Know-How-Transfer



more than 100.000 visitors = turisme



coming from ...



## National and international Networks



Gv. Uchibori - Mayor Roos - Mayor Kato

## National and international Networks



Mayor Roos

City Manager Blaine Hill



## National and international Networks



Mayors of Al Ayoun - Deir Alla - Busaira

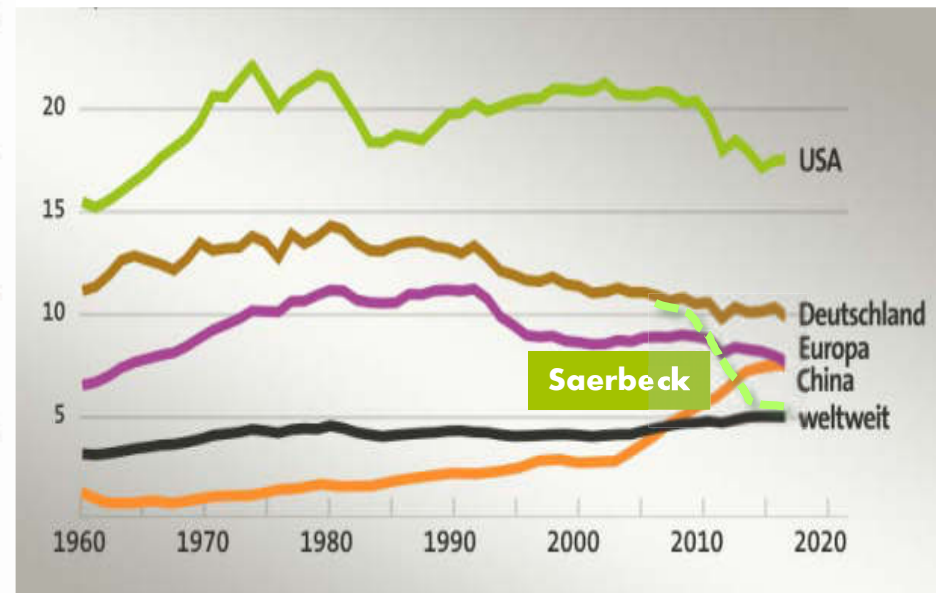
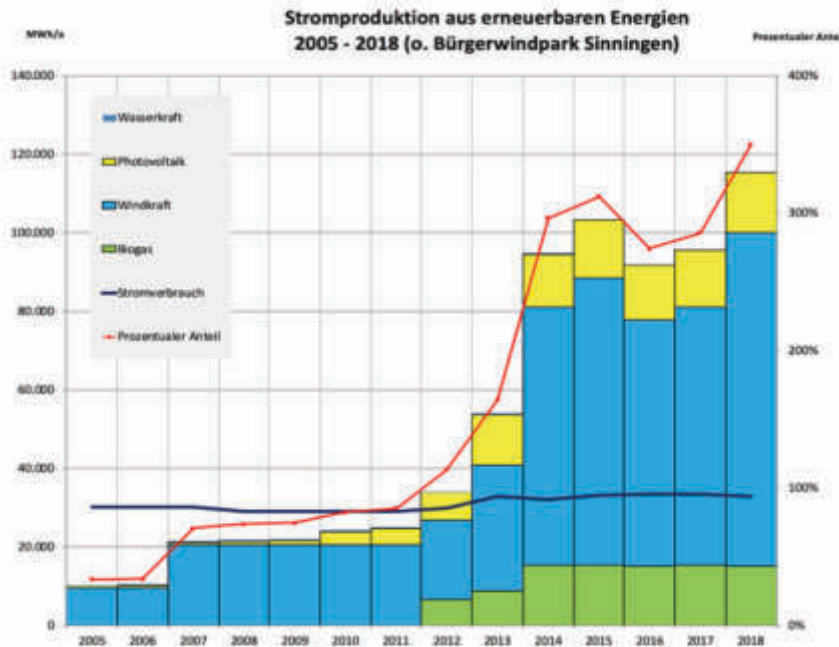
# ■ Awards & Recognitions

- Emirates Energy Award
- European Energy Award
- EU-Sustainable Energy Award
- German Sustainability Price
- Sustainability Price for Energy and Efficiency
- Energy Capital of the Decade
- German Solar Price
- MidWest Emmy Award



## ■ ..... Ten Years After

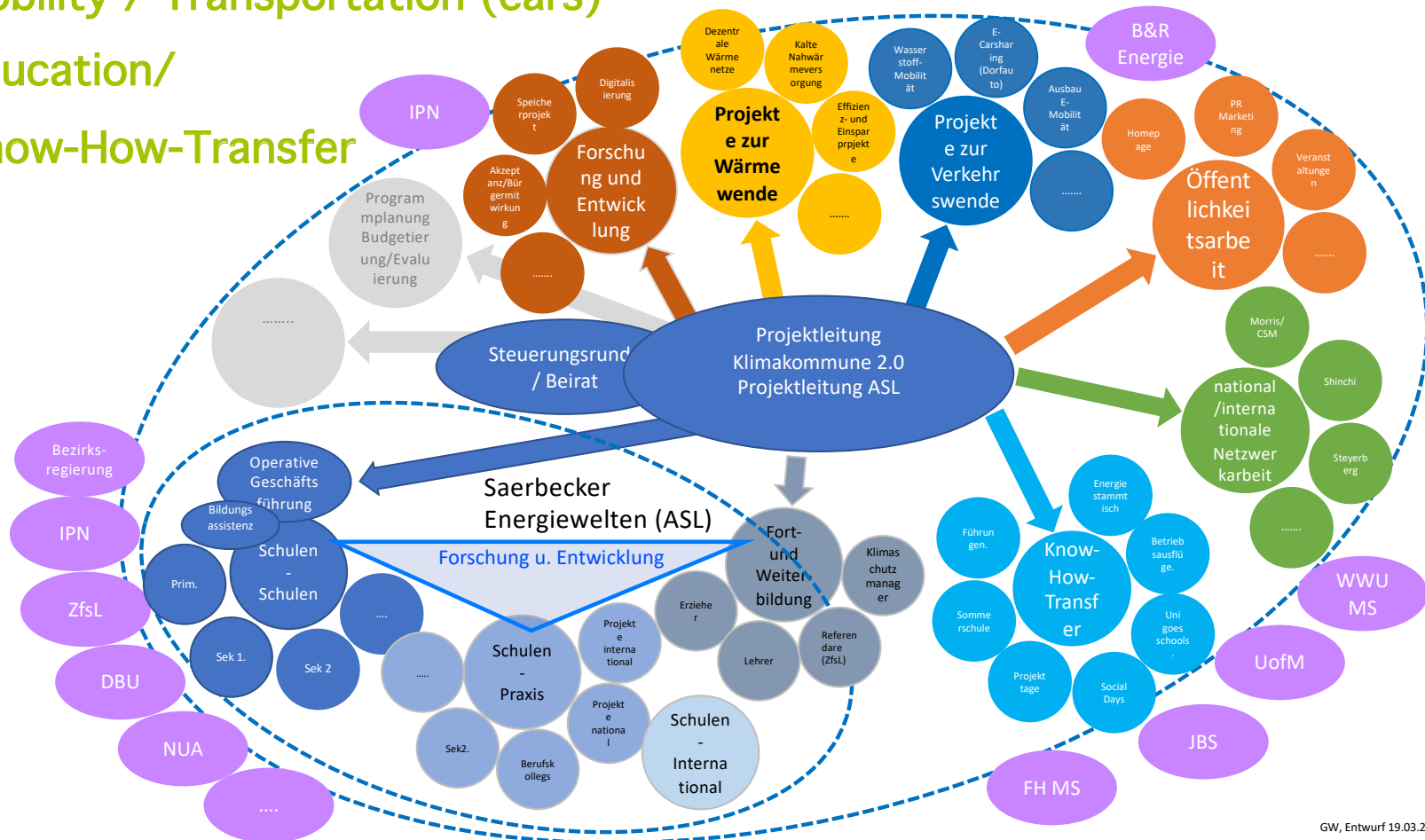
- we reached our aim of self-producing our energy on base of renewable energies already in 2013 and not in 2030
- the production of renewable energies in the biornenergyparc reaches more than the double of the local need (210%)
- we reduced the level of GHG-emission from 9,6 to per capita (2010) to 5,5 to (2014)



# ■ Klimakommune 2.0

3 main tasks till 2030:

- Energy Efficiency (Buildings)
- Mobility / Transportation (cars)
- Education/  
Know-How-Transfer



Thank You  
Very Much  
For Your  
Attention!

