

Welcome



to the energy village of Wildpoldsried
欢迎来到能源之乡维尔德波尔茨里德



Allgäu

Thomas Pfluger

Electronic engineer 电子工程师

30 years director and owner of a software company

经营软件公司长达30年

Since 2015 engineering office, consultant

2015年以来经营工程办公室、顾问工作



The energy village of Wildpoldsried





The community of Wildpoldsried
 维尔德波尔茨里德

Bavaria - County Oberallgäu
 巴伐利亚州 - 上阿尔高地区

Citizens 居民	2600
Municipal territory: 市域面积	2134 ha
Agricultural land 农用地	1413 ha
Forest 森林	555 ha
Altitude 海拔	722 – 922 m
Mayor 市长	
Arno Zengerle	1996-2020
Renate Deniffel	since 2020
Municipal councils: 市议会	7 CSU/ 7 FW

The energy village of Wildpoldsried



- 1996 New mayor and village council 新市长和议会
- 1998 Brainstorming weekend 头脑风暴周末
- 1999 Public survey 公众调查
- 2000 Development of a village concept 制定村庄规划
- 2000 first “EEG” law in Germany 德国第一部“可再生能源法”



A village cut's his own path
村镇开辟自己的道路



Climate protection mission statement

气候保护任务申明



Unanimous decision
of the local council
13.01.2000
2000年1月13日地方议会的一致决定

WE我们

- generate more renewable energy than we consume 生产大于能耗
- reduce more CO₂ than we produce 二氧化碳减排量大于生产量
- shape the future 塑造未来
- preserve the quality of life for our children 保护孩子的生活质量
- focus on efficient technologies 注重高效技术
- use the gifts of the creation wind-sun-water-wood-biogas 巧用造物主的恩赐

WILDPOLDSRIED 100 % renewable by 2020

到2020年，维尔德波尔茨里德实现100%可再生
mission statement

任务申明

We did it!



Today: 。

Wildpoldsried generates
from renewable energy sources

Wind – Sun – Water - Wood – Biogas

维尔德波尔茨里德利用可再生能源风、太阳、水、木材、沼气生产

759% Electricity 供电

60% Heat 供暖



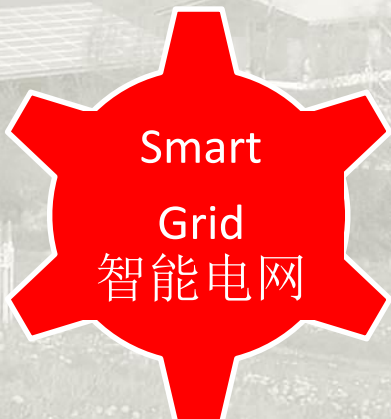
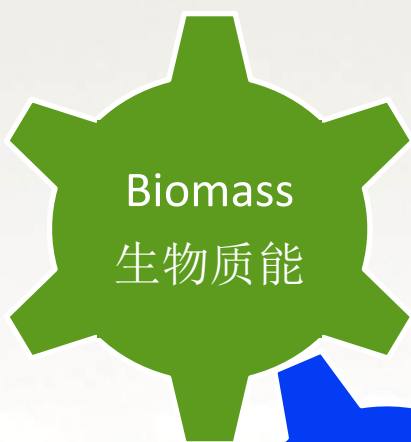
Actual situation
现状





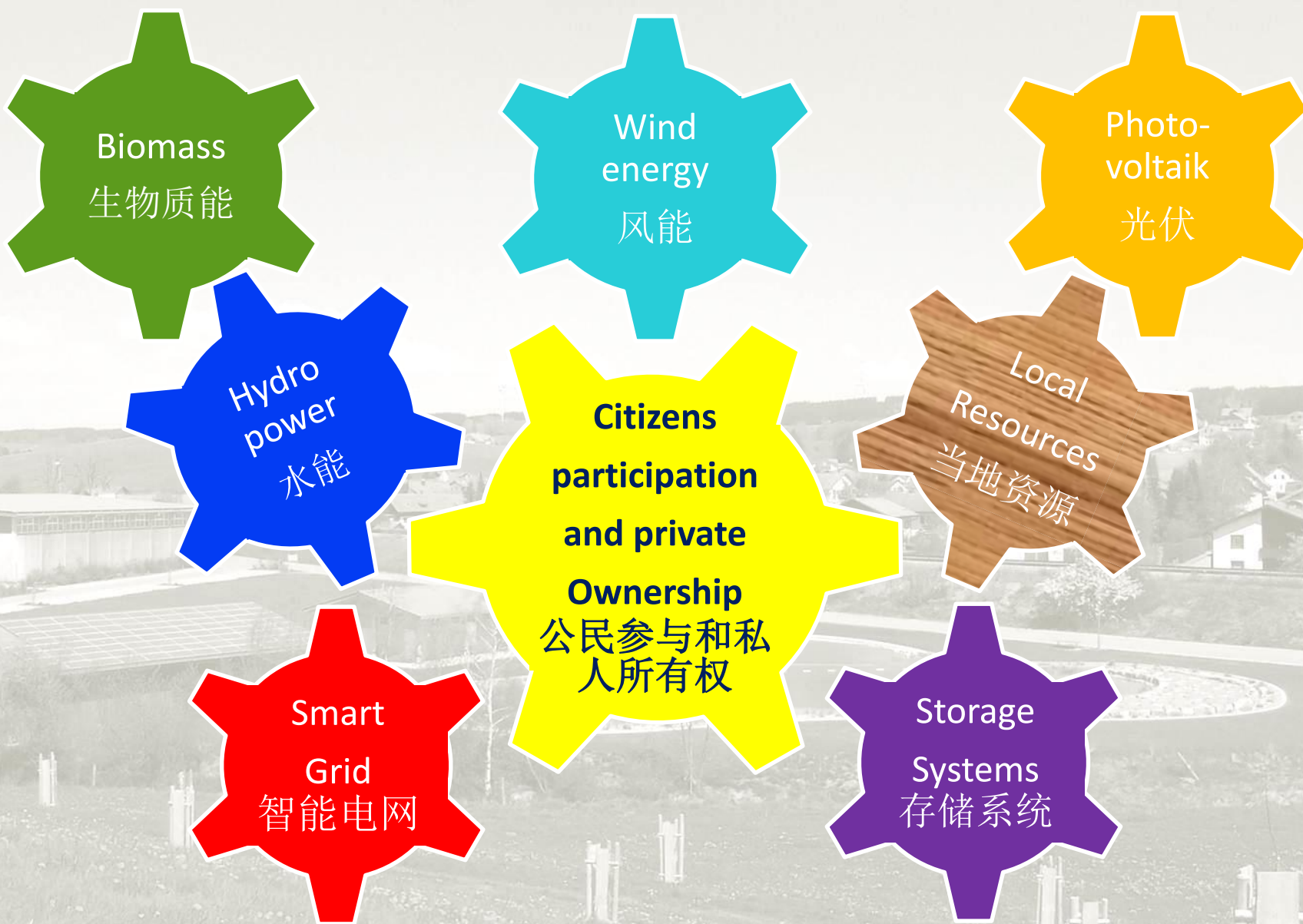
The combination of renewable energy 可再生能源组合





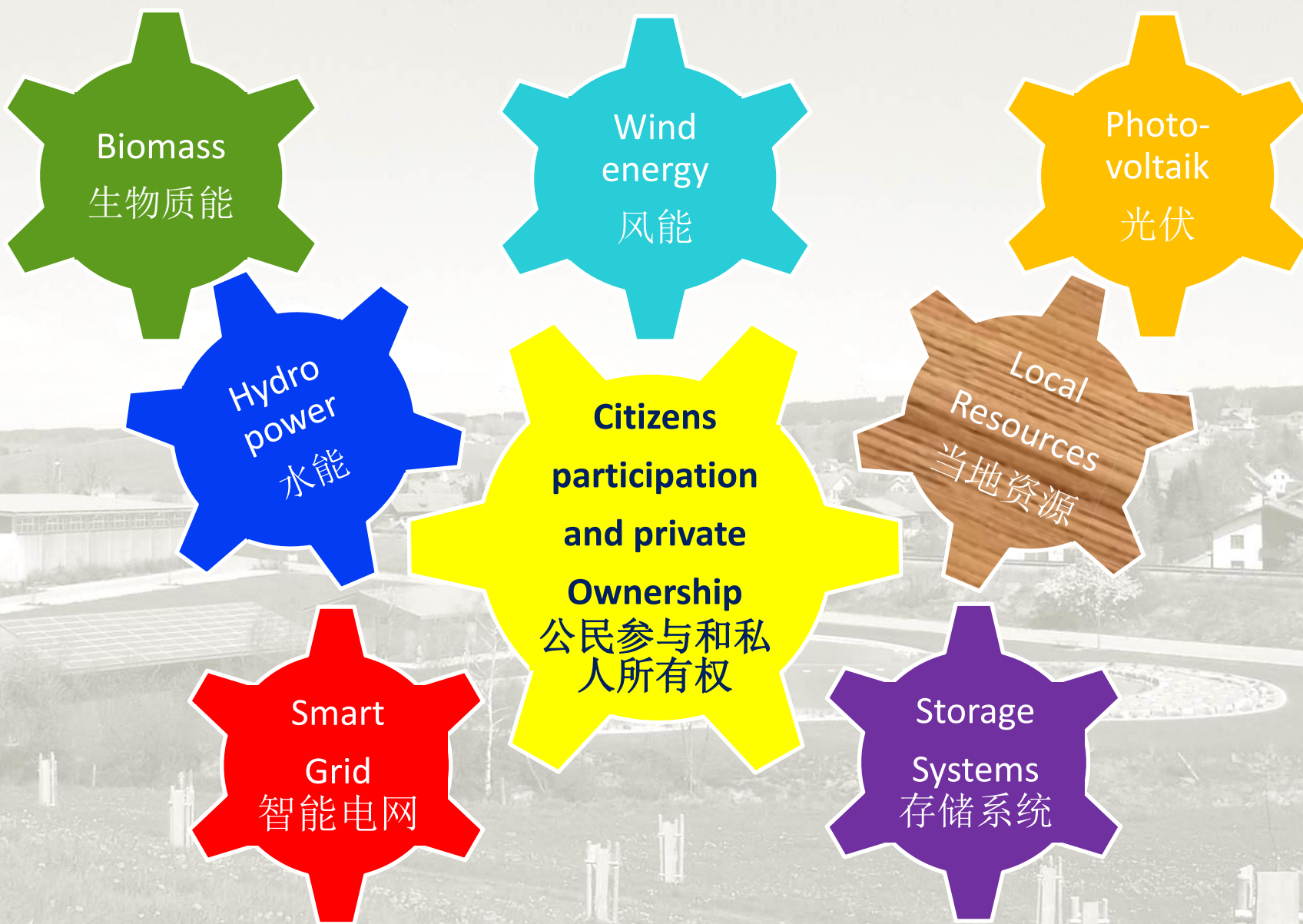
combined with a smart grid and storage
与智能电网和存储相结合





driven by the most important gear
由最重要的齿轮驱动





makes the ultimate energy system
使之成为最终的能源系统





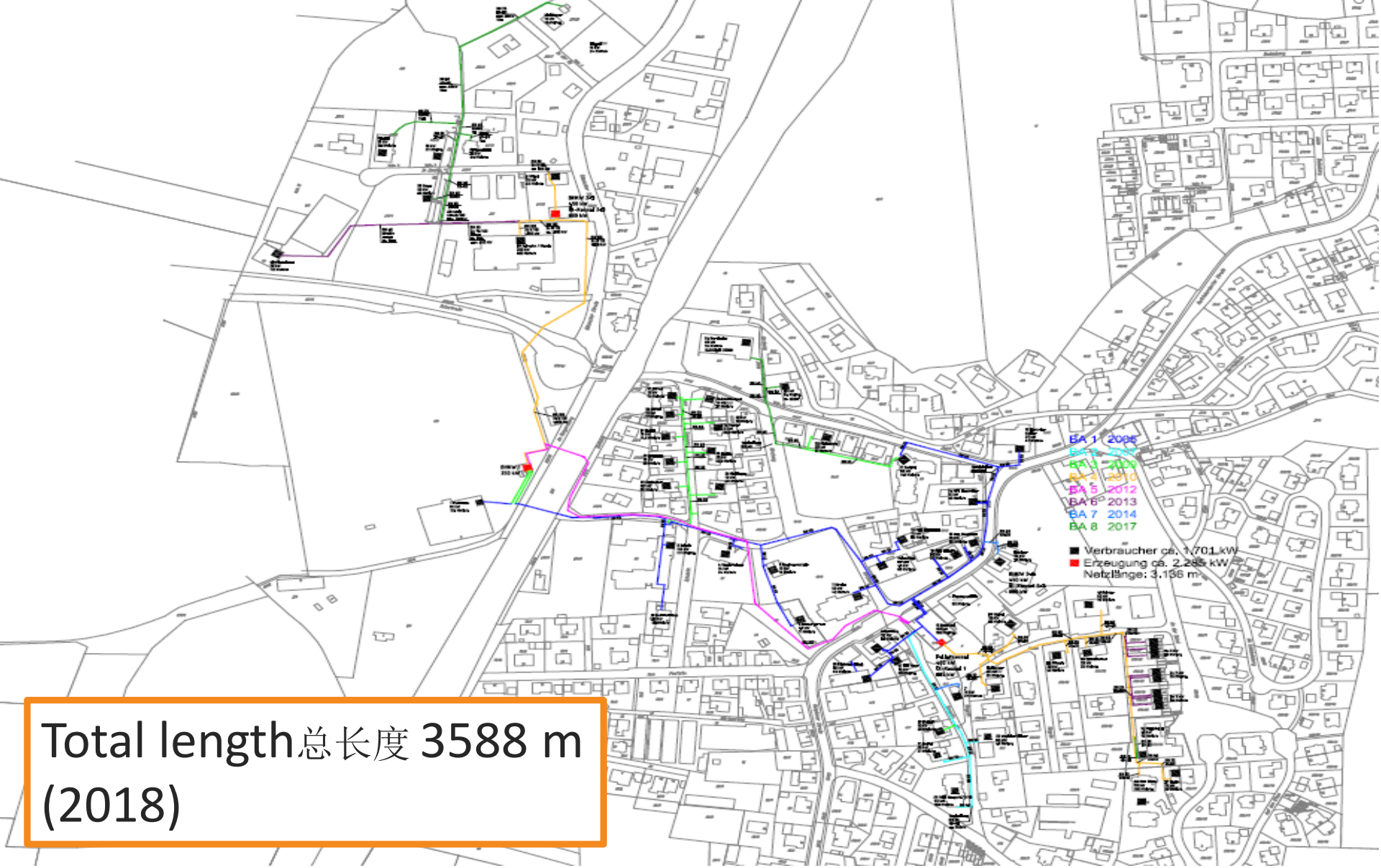
- Operating since 2005
自2005年开始运作
- Enlargements 扩容:
- 2007, 2009, 2010, 2013, 2017, 2018
- All public buildings
所有公共建筑
- 10 companies 10家公司
- 170 private flats 170个私人单位
- Total length总长度: 3588 m

Heat

Village heating system 村庄供暖系统



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Total length 总长度 3588 m
(2018)

Heat

District heating network
地区供暖网络



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Village heating 村庄供热

CHP 热电联供

Biogas plant 沼气厂



Heat

4,2 km of gas network
4.2公里的天然气网络



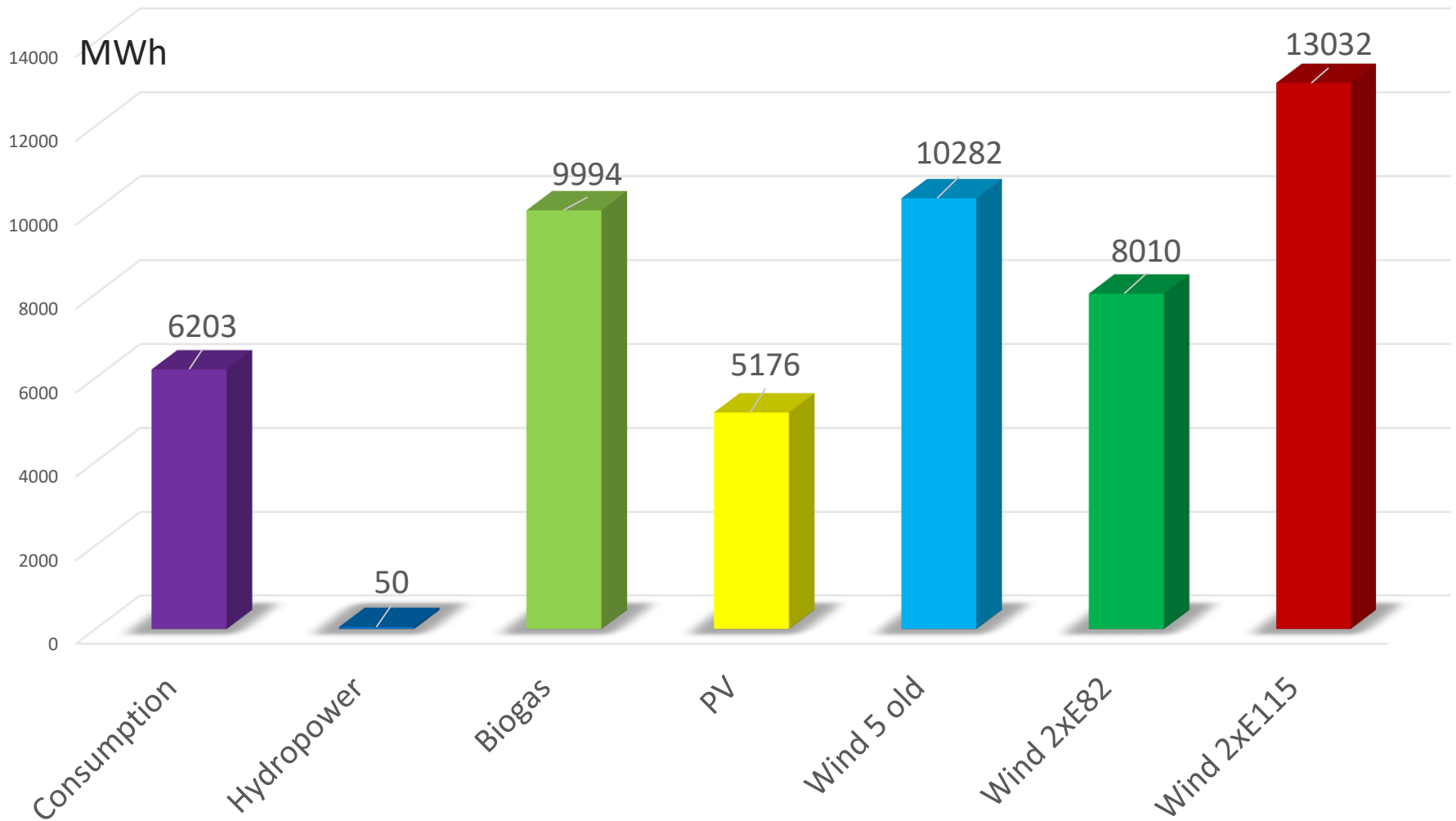
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Savings of oil for heating
节约的供暖用油



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together about 46544 MWh = 750%
合计约46544兆瓦时=750%

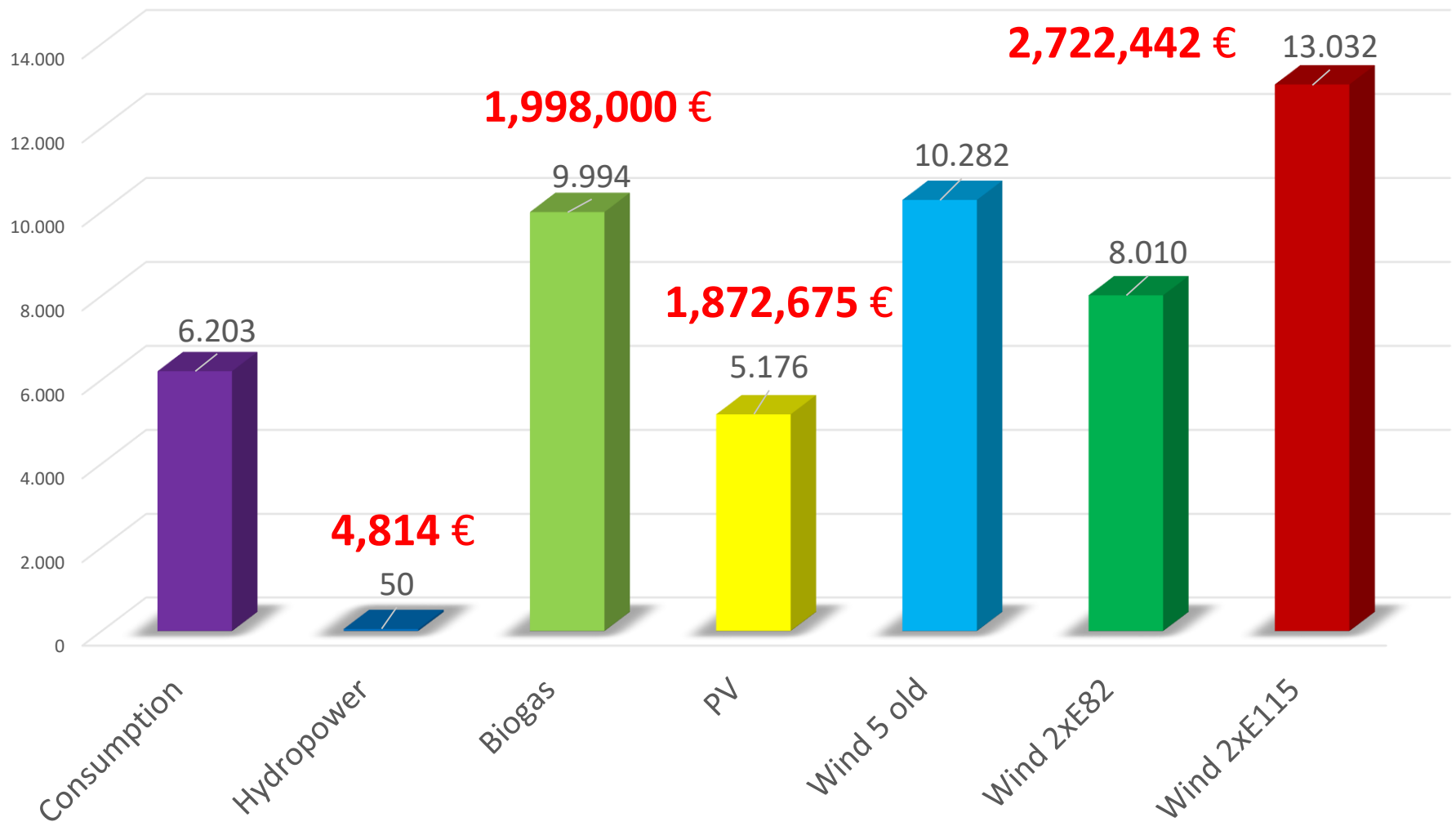
Electricity

Balance of electric energy 2018

2018年电力能源余量



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total revenues 6.6 Mio Euro p.y.
总收入 660万欧元

Electricity

revenues 2018
2018年收入



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More than 350 private owners of photovoltaic (5.073 kWp) and 150 thermal solar plants (2.100 m²)
350多个私人业主拥有光伏电站（5.073千瓦p）和150个太阳能热电站（2.100平方米）

Electricity

Participation of citizens
公民参与



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More than 400 private participators in wind turbines,
only citizens of Wildpoldsried
400多家私人参与风力发电机，只有维尔德波兹德的公民

Electricity

Participation of citizens
公民参与



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11 wind turbines 2014 minus/plus two 2015
2014年11台风机，2015年减/加2台



Wind power 风能





Next day





Some weeks later





Smart Grid pilot project from 2011 to 2013

2011年至2013年智能电网试点项目



Mit „Irene“ in die Zukunft der Stromversorgung
Pilotprojekt In Wildpoldsried wird getestet, wie sich Energie intelligent steuern lässt

Gefördert durch:
 Bundesministerium für Wirtschaft und Technologie
aufgrund eines Beschlusses des Deutschen Bundestages



Project „IRENE“ 2011 – 2013

可再生能源和电动汽车整合项目





- Smart Grid Software „So easy“ 智能电网软件
- 200 households with smart meters
200户家庭安装智能电表
- 2 intelligent transformer stations 2个智能变电站
- battery storage system 储电系统
- testing of 34 e-cars 测试34辆电动车
- adjustable CHPs 可调整的热电联供

Smart Grids

IRENE – components
项目组成部分



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- total investment of ca. 8 Mio Euro 总投资约800万欧元
- two years of testing and metering 两年的测试和计量
- lots of valuable data 大量有价值的数据
- **up to 40% of savings in grid extensions**
电网扩建可节省多达**40%**的费用
- absolutely necessary for the success of the „Energiewende“
是“能源转型”成功的绝对必要条件

Smart Grids

Results
成果



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FOR THE POWER GRID OF THE FUTURE

Main goals of IREN2项目二期主要目标:

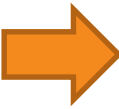
- proof of the feasibility of micro-grids
证明微电网的可行性
- micro-grids as topological power plants
作为拓扑发电厂的微电网
- integration of operational management
and market 业务管理和市场一体化



- **Development of a local platform for energy tradings, based on blockchain technology** 基于区块链技术，开发本地能源交易平台
- **Development of business models for the local energy market of the future** 为未来的地方能源市场开发商业模式
- **More efficient use of the energy grid through motivation to “grid friendly behaviour” of the participants** 通过激励参与者的“电网友好行为”，提高能源网的使用效率
- **Savings in the energy grid through active identification of prosumer activities...** 通过消耗活动的积极认证，节约能源网



<http://iren2.ifht.rwth-aachen.de/?lang=en>



Smart Grids



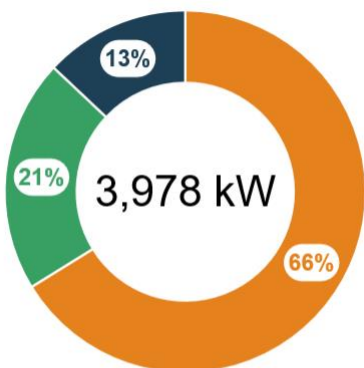
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LIVE Monday, 9 September, 16:15:15

Wildpoldsried currently supplies itself **6.1-times** renewable

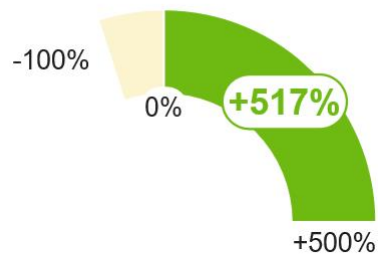
Temperature: **12°C** Wind: **0 m/s**

Generation



■ Photovoltaic
 ■ Biogas
 ■ Wind

Power Balance



+3,333 kW

This power balance corresponds to

55,550 

or

37,033 

or

16,665 

This is as much as

66,304 

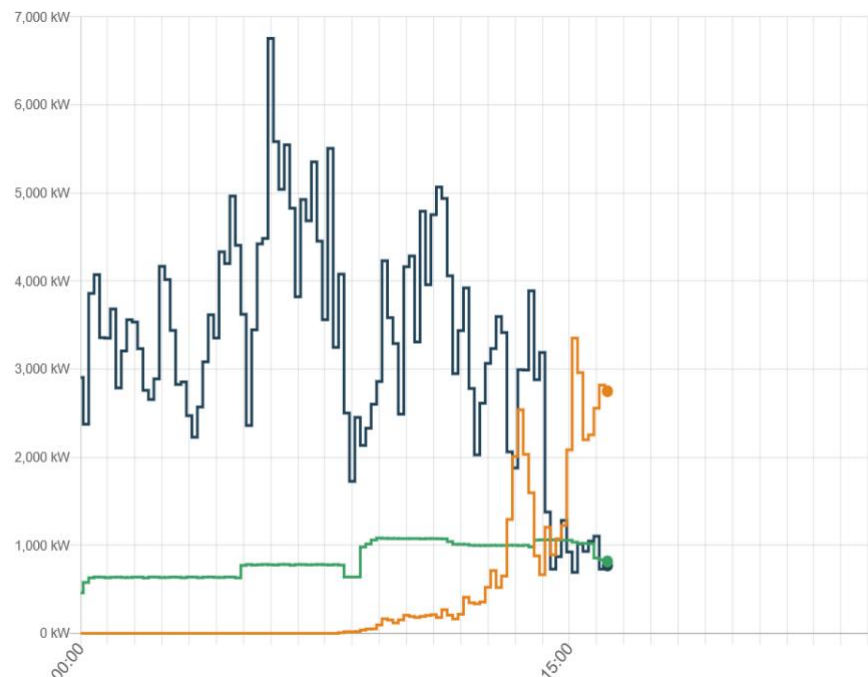
or

44,202 

or

19,891 

Renewable generation for today



■ Photovoltaic
 ■ Biogas
 ■ Wind

● ○ ○ ○





- Made in „Wildpoldsried“
- lithium ion battery storage system 锂离子电池存储系统
- fully integrated and smart 全集成和智能
- automatically maximises self-consumption 自动实现自我消耗的最大化
- from 2 – 16 kWh
- 10000 charge cycles 10000次充电循环
- 10 years warranty 10年质保
- starts at 3500€ 起价3500欧元



Storage

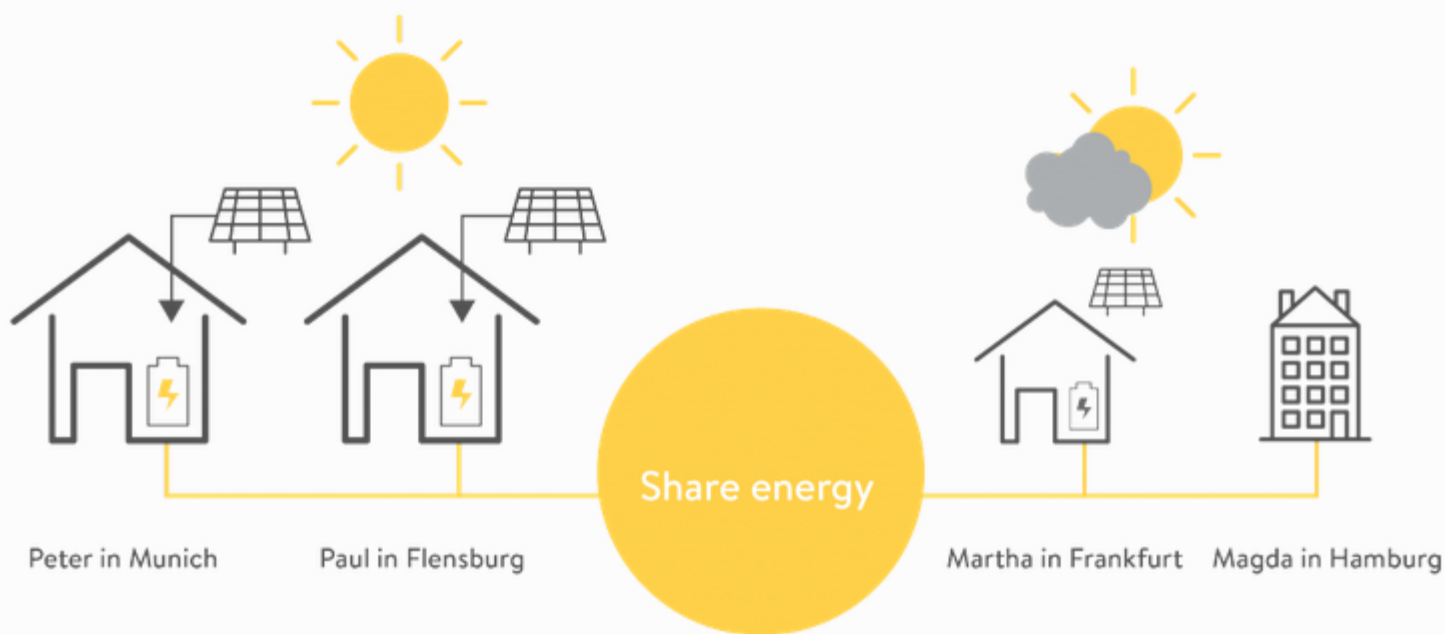
The “sonnen battery”



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What is the sonnenCommunity?

The sonnenCommunity is a community of sonnenBatterie owners who are committed to a cleaner and fairer energy future. As a member you can share your self-produced energy with other members of the sonnenCommunity. Since you are exclusively using energy from the community, there is no need for a conventional energy provider anymore.



Storage

The „sonnen – community“



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14,746,807 kWh

Feed-in (last 12 months)

8,240,783 kWh

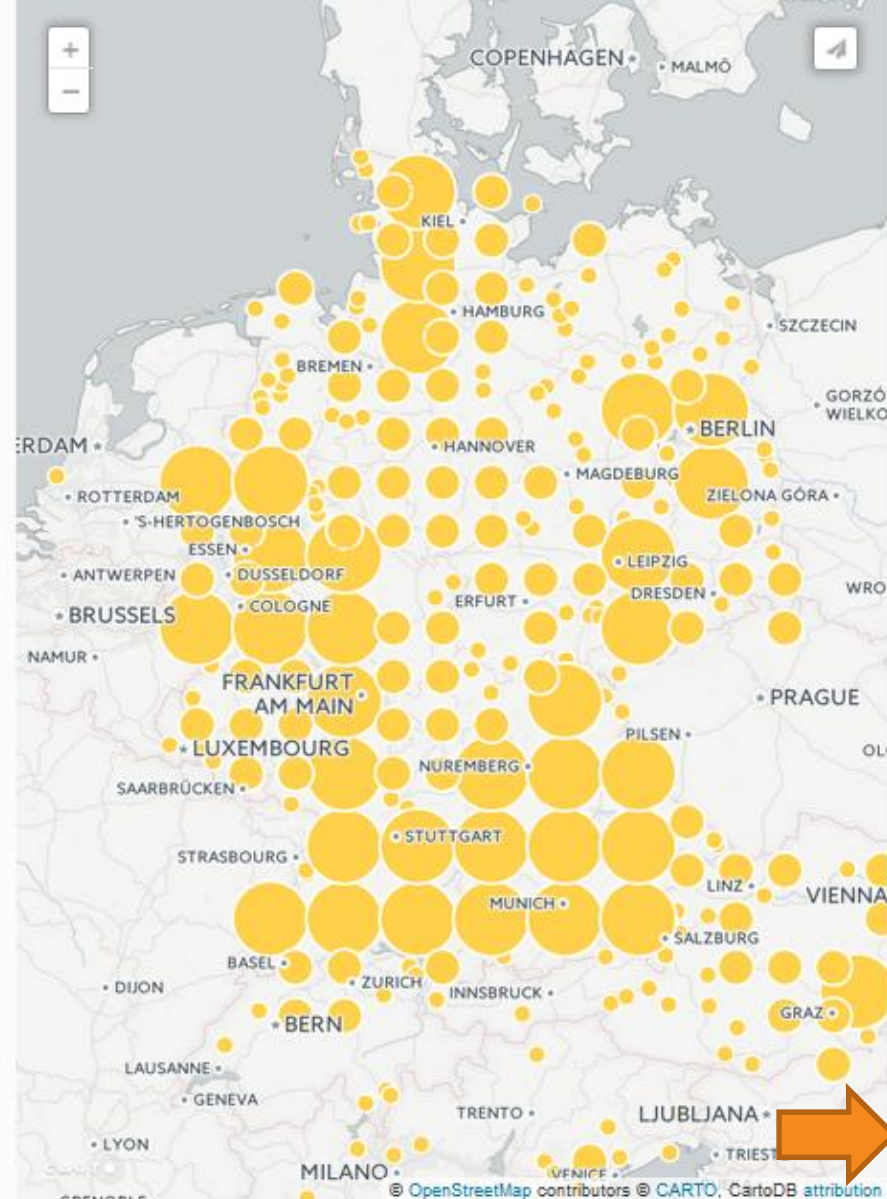
Grid consumption (last 12 months)

8,980,805 t 

prevented CO2

718,464 

to produce this
amount of CO2



Storage

The „sonnen – community“

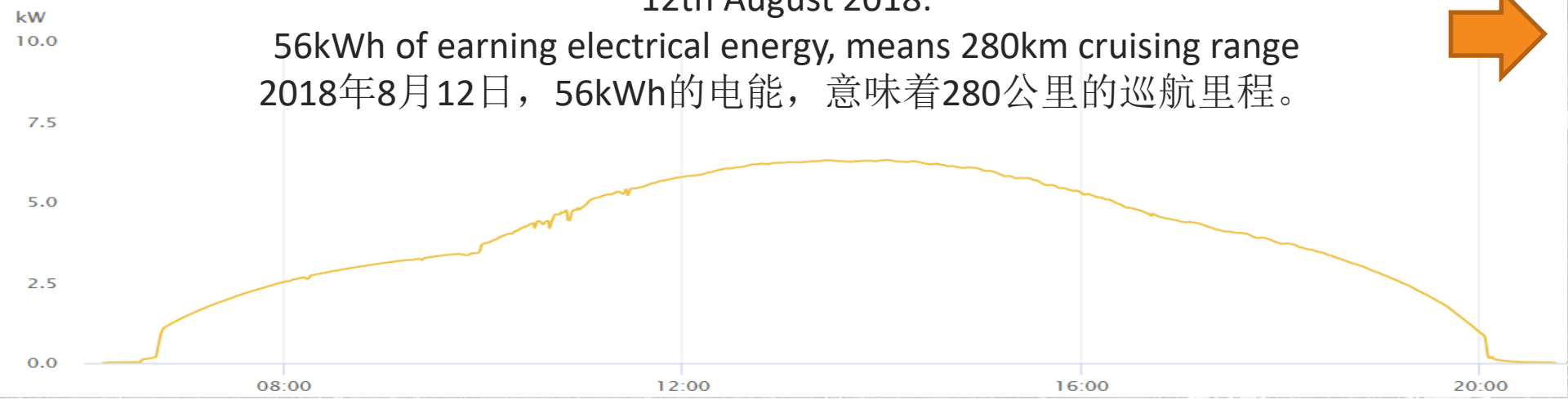


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12th August 2018:

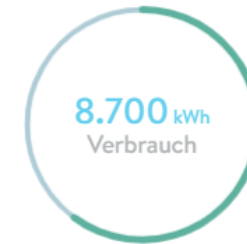
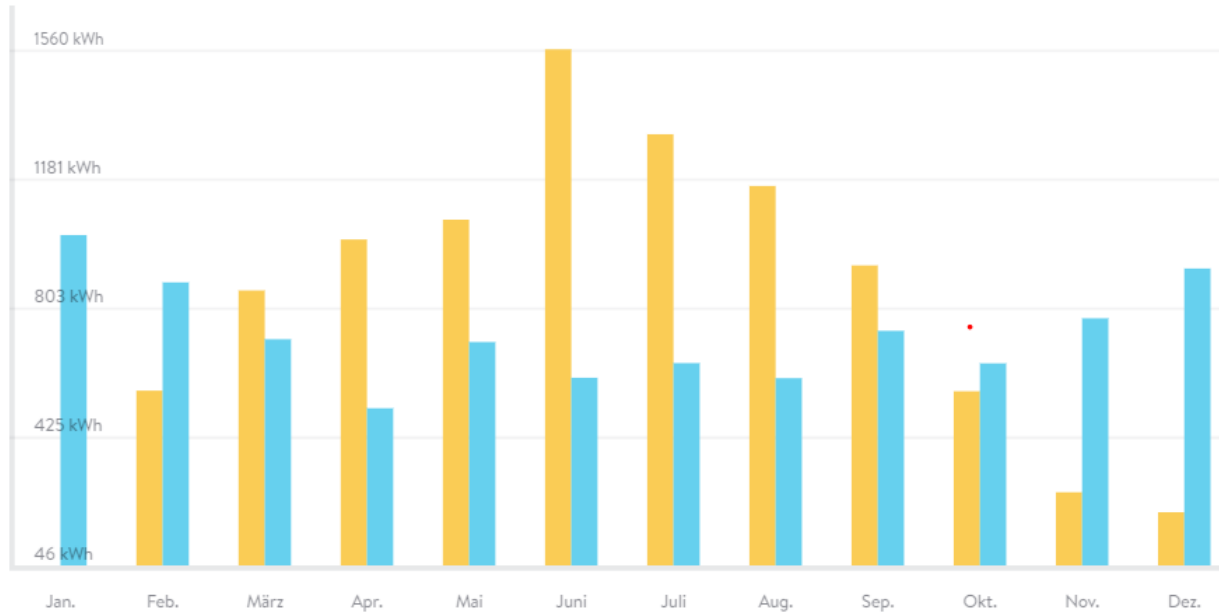
56kWh of earning electrical energy, means 280km cruising range
2018年8月12日，56kWh的电能，意味着280公里的续航里程。



Private PV, Battery and car charging 私人光伏、电池和汽车充电



2019



- 60% Autarkie
- 40% Netzbezug



- 59% Eigenverbrauch
- 41% Netzeinspeisung

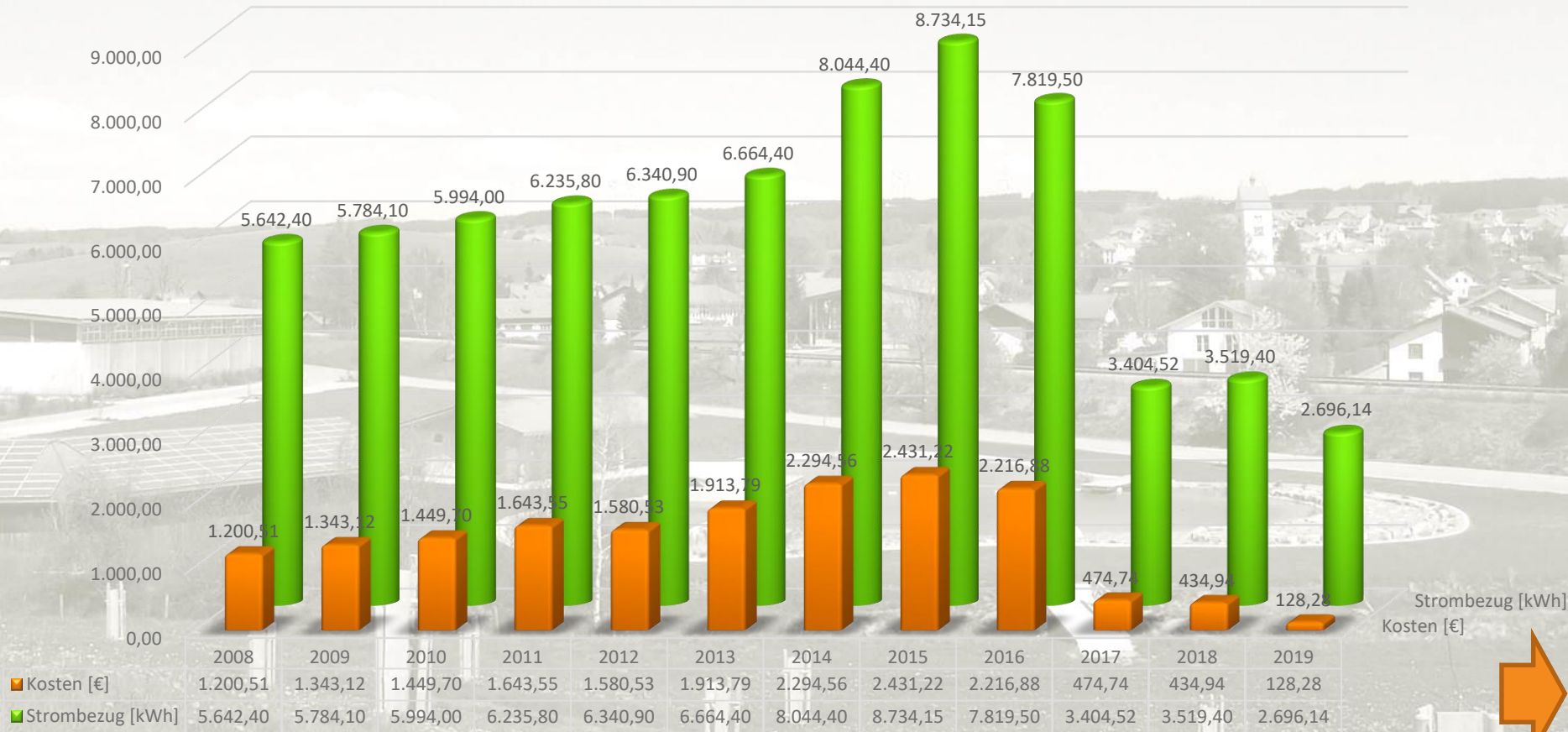
Private PV, Battery and car charging 私人光伏、电池和汽车充电



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Stromverbrauch

■ Kosten [€]
■ Strombezug [kWh]



Private PV, Battery and car charging





- vocational training for instructors from Africa 非洲教员的职业培训
- and returnees 和回国人员
- started in june 2018 2018年6月起
- Courses for 2 weeks 两周课程
- 2-3 per year 每年2-3次
- assistance through mentors 师徒制
- first modul:第一个模块
- „Solar work case“ 太阳能工作箱



ToT for african countries

非洲国家的培训者培训





■ Basic training of:基本培训

- electro-technics
电工技术
- energy-technics
能源技术
- pv-technics
光伏技术
- storage technics
存储技术

■ Principle of:原理

- small energy islands 小能源岛
- own businesses 个人经营
- „snow ball effect“ 雪球效应



ToT for african countries

非洲国家的培训者培训



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More than 100 international groups p.y.
每年超过100个国际团组

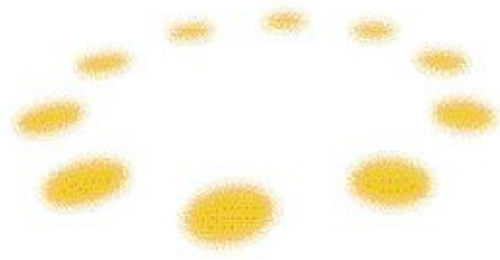




Awards 奖项



europaean
energy award **GOLD**

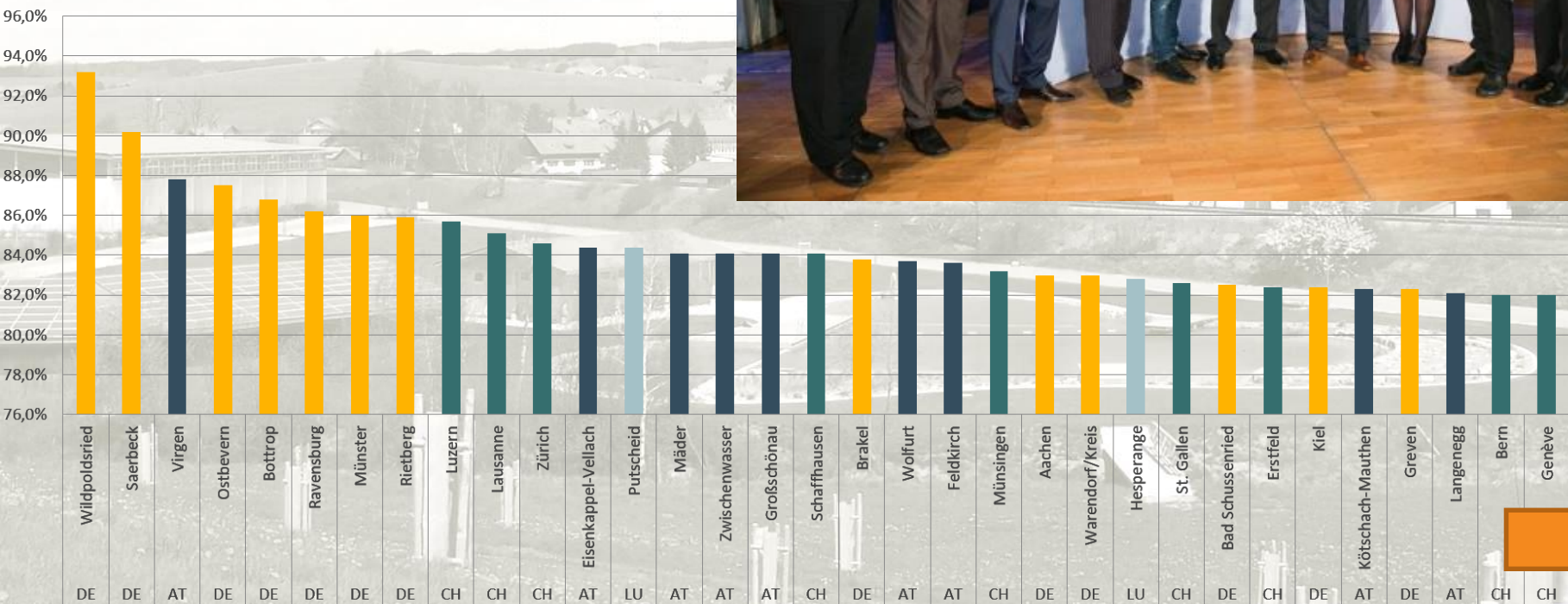


Awards
奖项



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Top results of European Energy Award



best energy community in Europe
 欧洲最佳能源乡镇





Thanks for your attention
感谢您的聆听



W-I-R – for a healthy, sustainable environment
为了健康、可持续的环境



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