EUROPEAN HEAT PUMP SUMMIT

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SYMPOSIUM + EXPO
NUREMBERG, 20–21.10.2015

Industrial | Commercial | Residential
Heating & Cooling | Components & Equipment

hp-summit.de

NÜRNBERG MESSE

Sven Staudt, Training Manager - Glen Dimplex Deutschland

Power to Heat
Smart Energy Management

Glen Dimplex DEUTSCHLAND

+ Einfach mehr

Glen Dimplex Deutschland – part of the Glen Dimplex Group.

Operating throughout the world, a family-owned business – and 100% financed with shareholders' equity.

Facts and figures

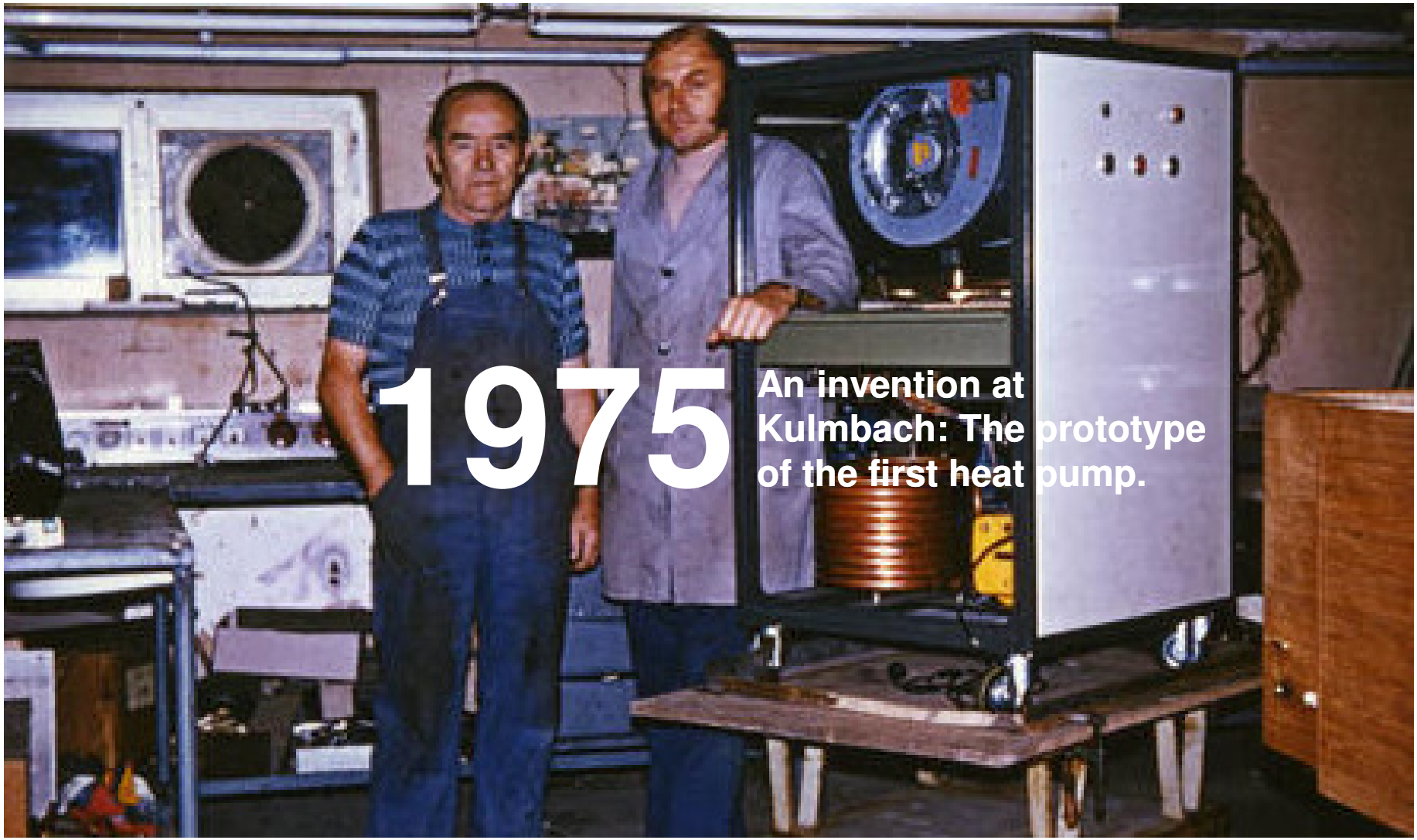
- Head Office in Dublin, Ireland
- Owned and managed by the founding family
- more than 10,000 employees throughout the world
- 2 billion € turnover p.a.
- 33 subsidiaries on 4 continents

4 areas of core competence.

- Heating & Ventilating
- Supplier of renewable energy systems
- Commercial & industrial cooling
- Household appliances

Glen Dimplex at the Kulmbach site.

Over 40 years of experience in energy efficiency –
as one of the pioneers of heat pumps in Germany.



Glen Dimplex Deutschland.
Today: a success story.

200

million Euro turnover

21,000

sq m production area

890

Employees

10%

in Research & Development

The Energy Revolution.
Government Objectives for 2020.

20

percent less greenhouse gas emissions in the EU compared to 1990

20

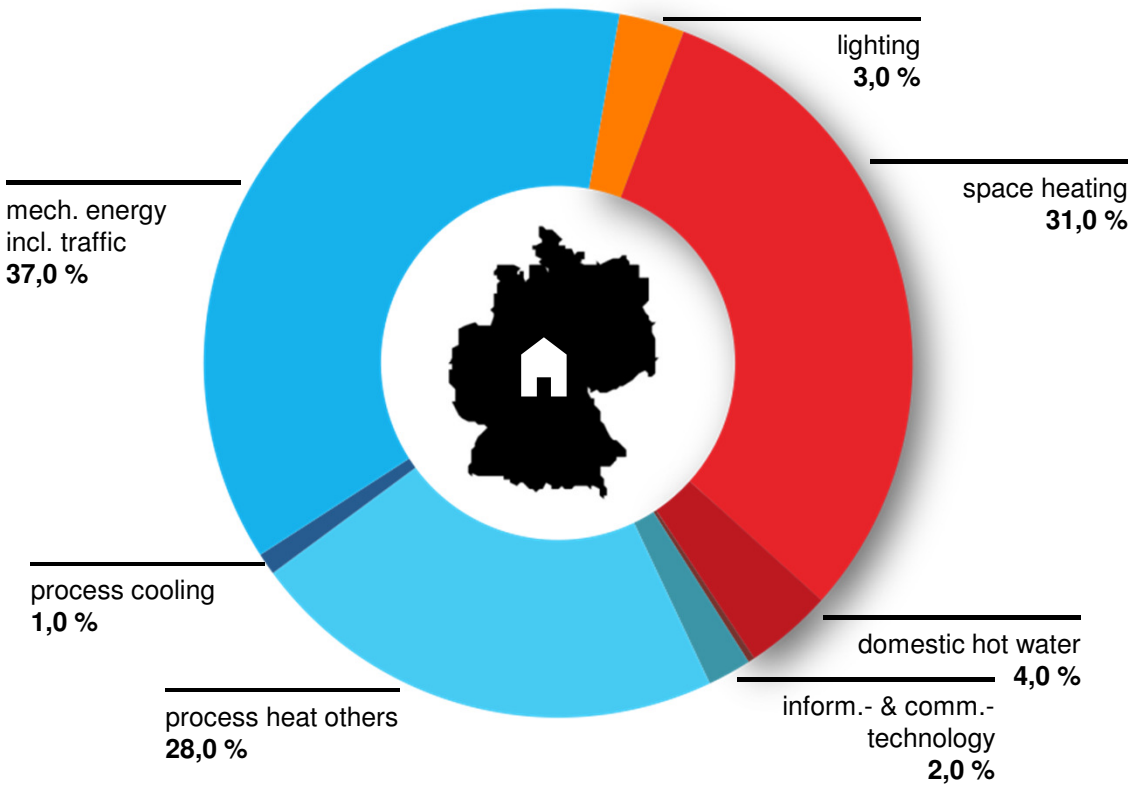
procent more energy efficiency in the EU

20

procent share of renewable energies on the total energy demand in the EU

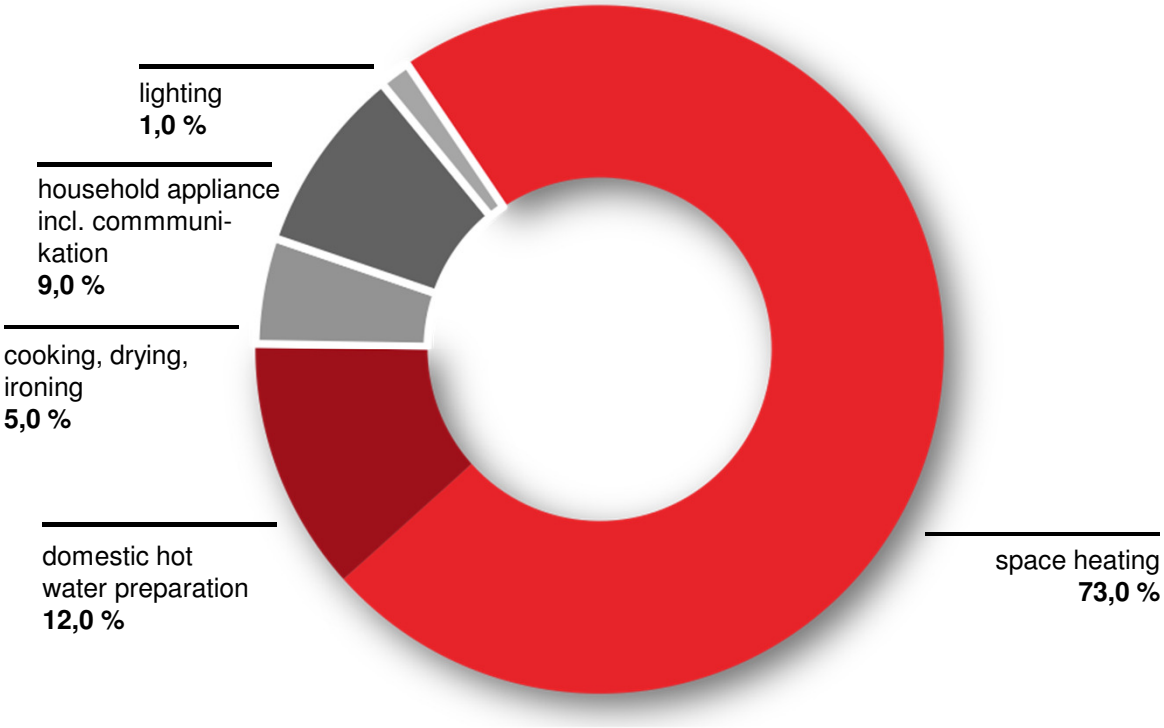
Energy consumption in Germany.

Almost 40 percent of the total final energy consumption are for buildings.



Source.
BMWi Energiedaten 2012

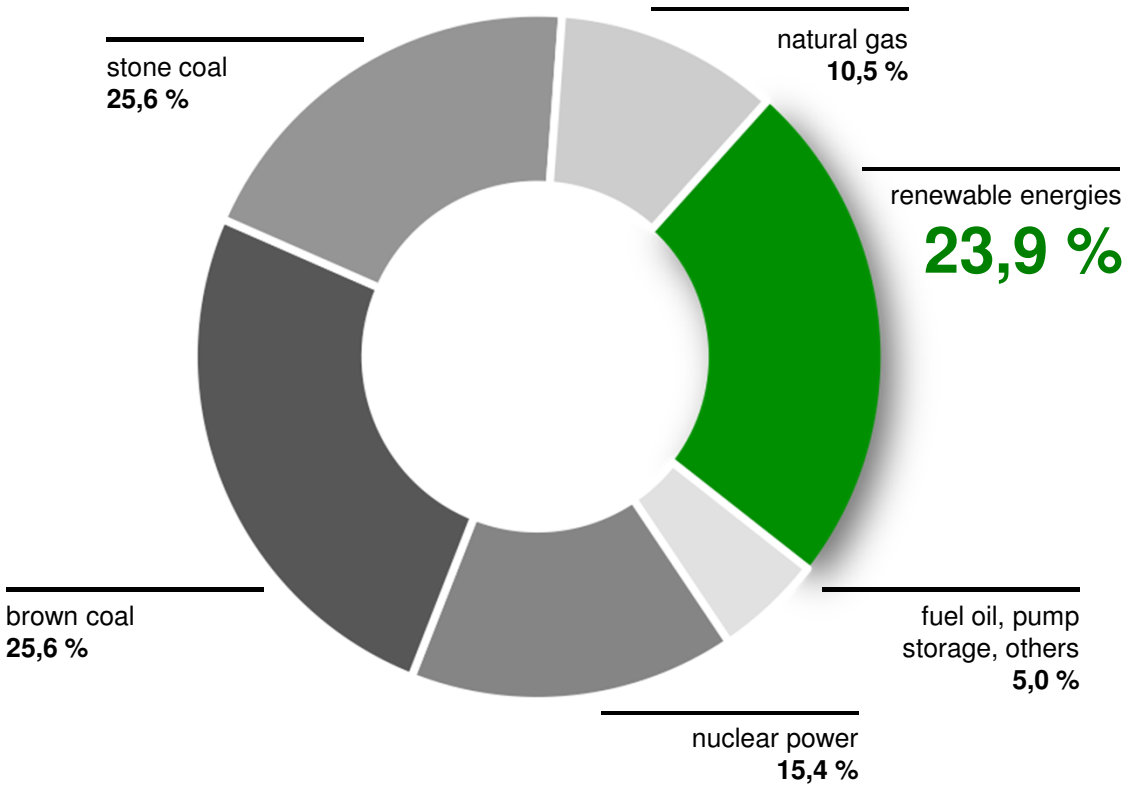
Energy consumption in domestic households.
85 percent of the energy is used for heating.

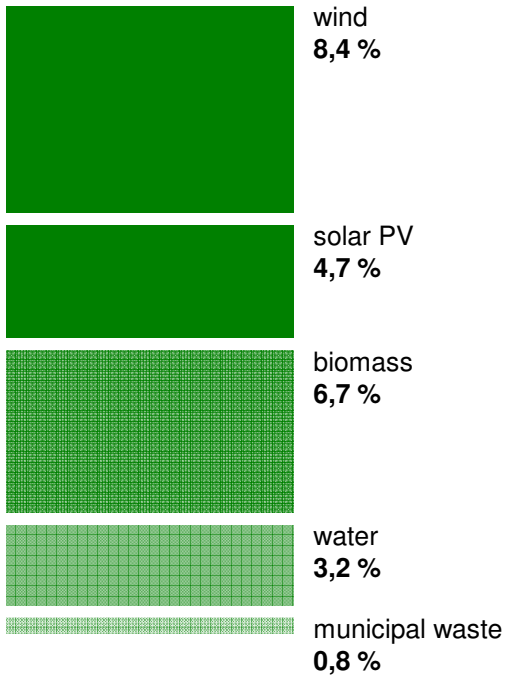


Source.
BDEW – Bundesverband der Energie- und Wasserwirtschaft

Gross energy production 2013 in Germany.

Appr. 25 percent of the 643 billion kilowatt hours are covered by renewable energies.

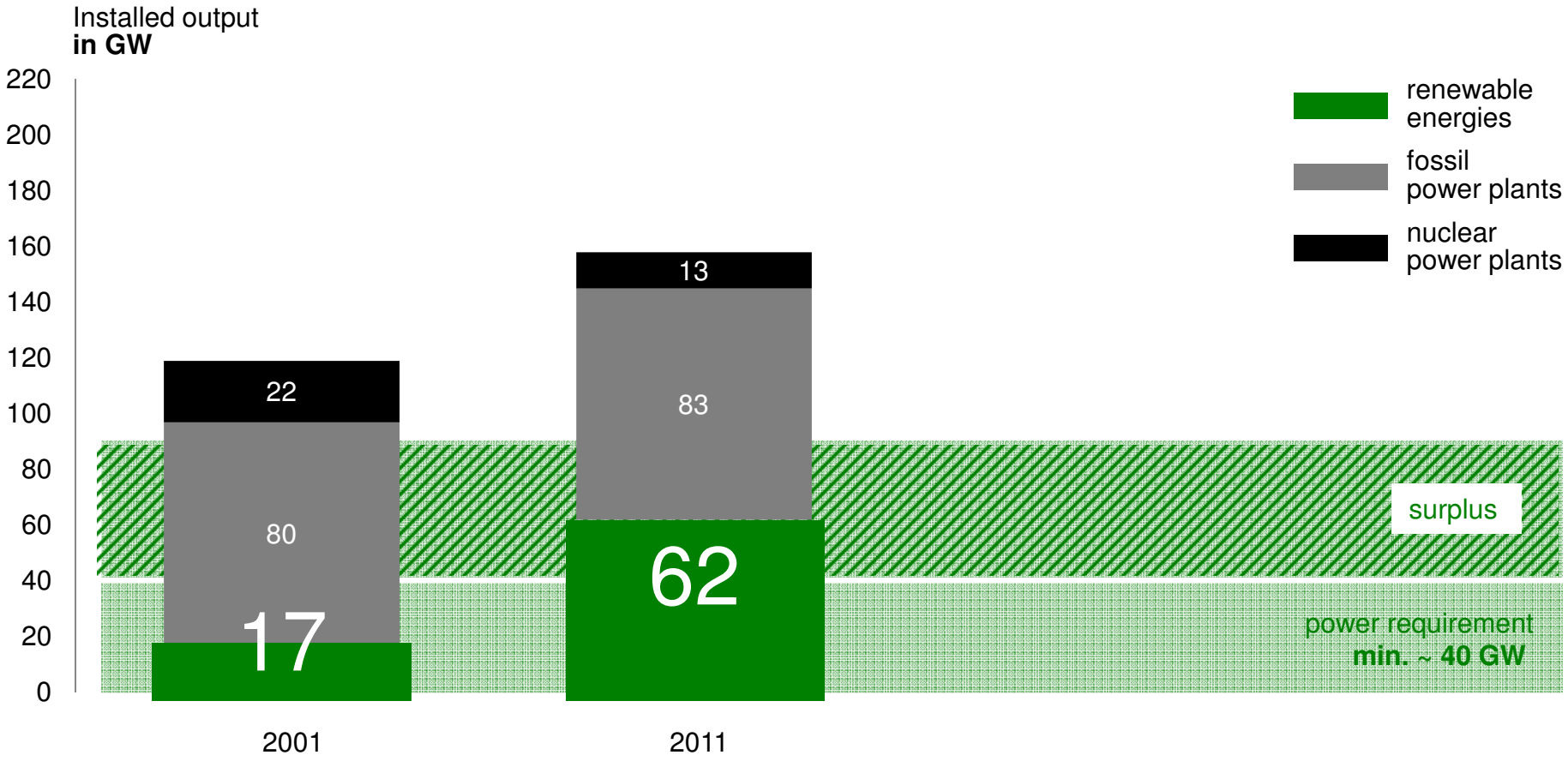




Source.
BDEW – Bundesverband der Energie- und Wasserwirtschaft 02/2014

Installed power plant output.

At this stage renewable energies produce a surplus of useful, electric power.



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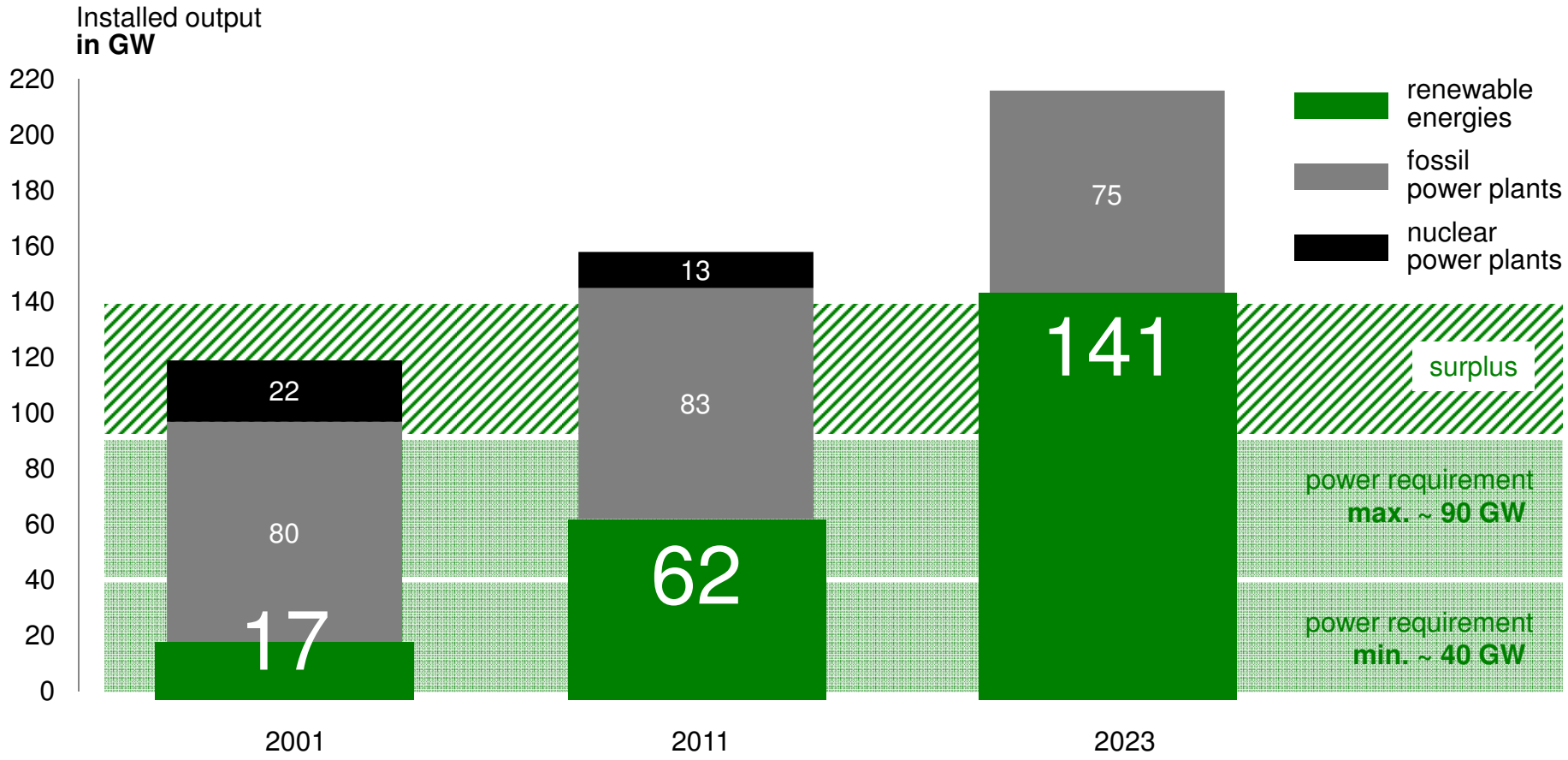
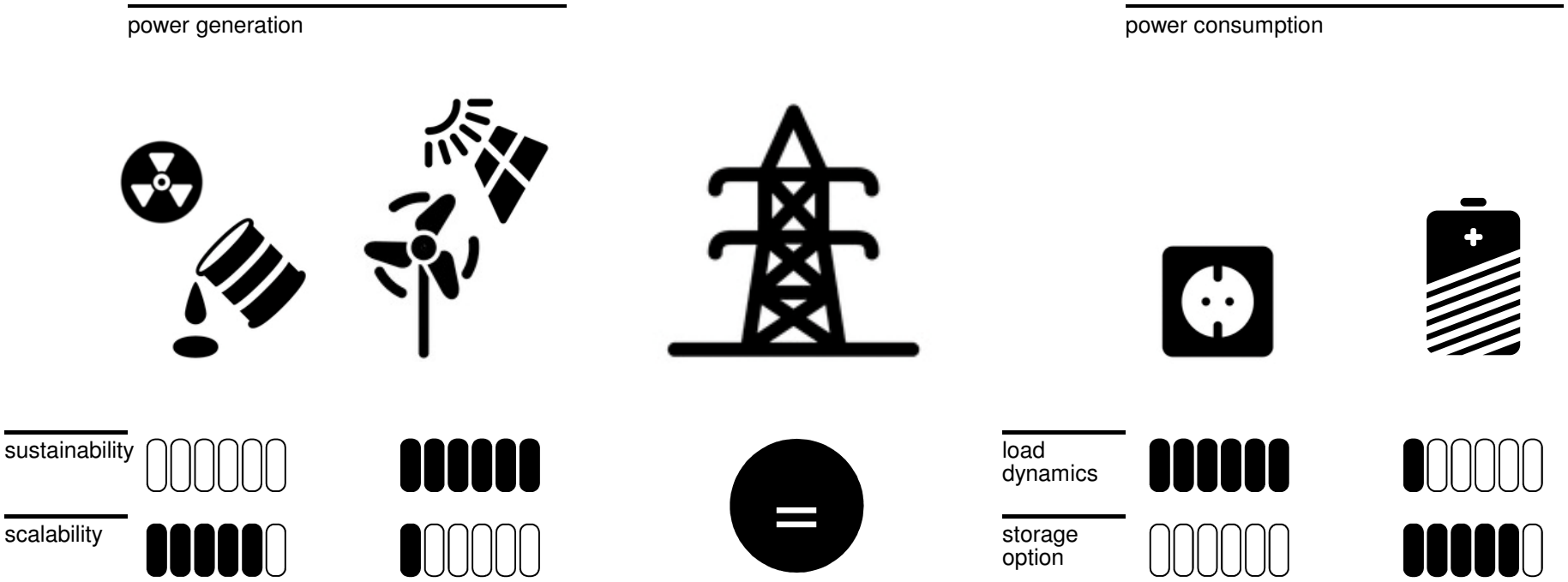


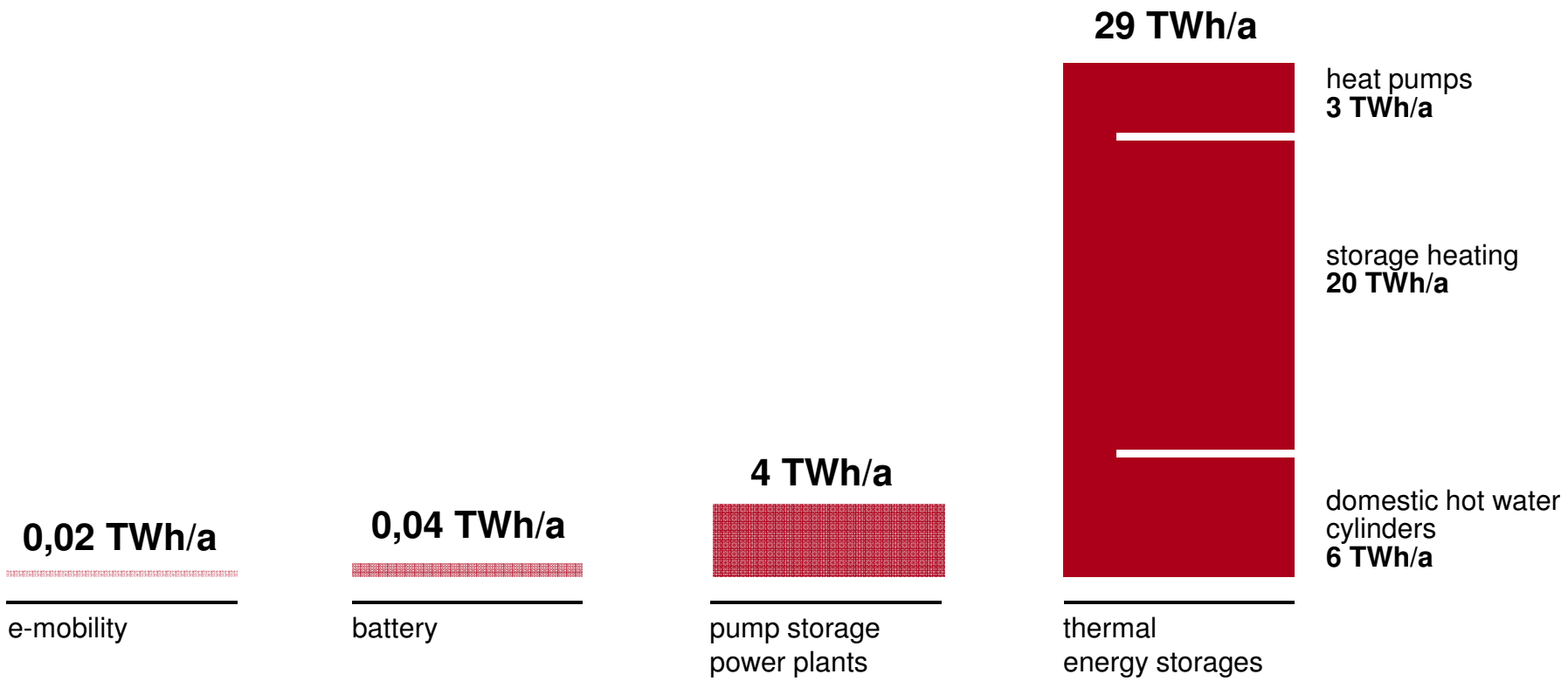
The challenge of distribution.

To balance production and consumption intelligent energy storages are essential.



Storage capacity in comparison.

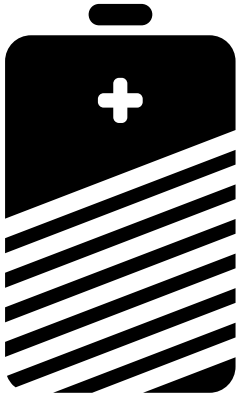
Thermal storages offer the highest currently available storage capacity.



Quelle.
E-Mobilität: Wikipedia, Batterie: Wikipedia,Thermische Speicher: Fraunhofer IBP, Bericht ES-342 01/2012 und BWP-Branchenstudie

Energy storage.

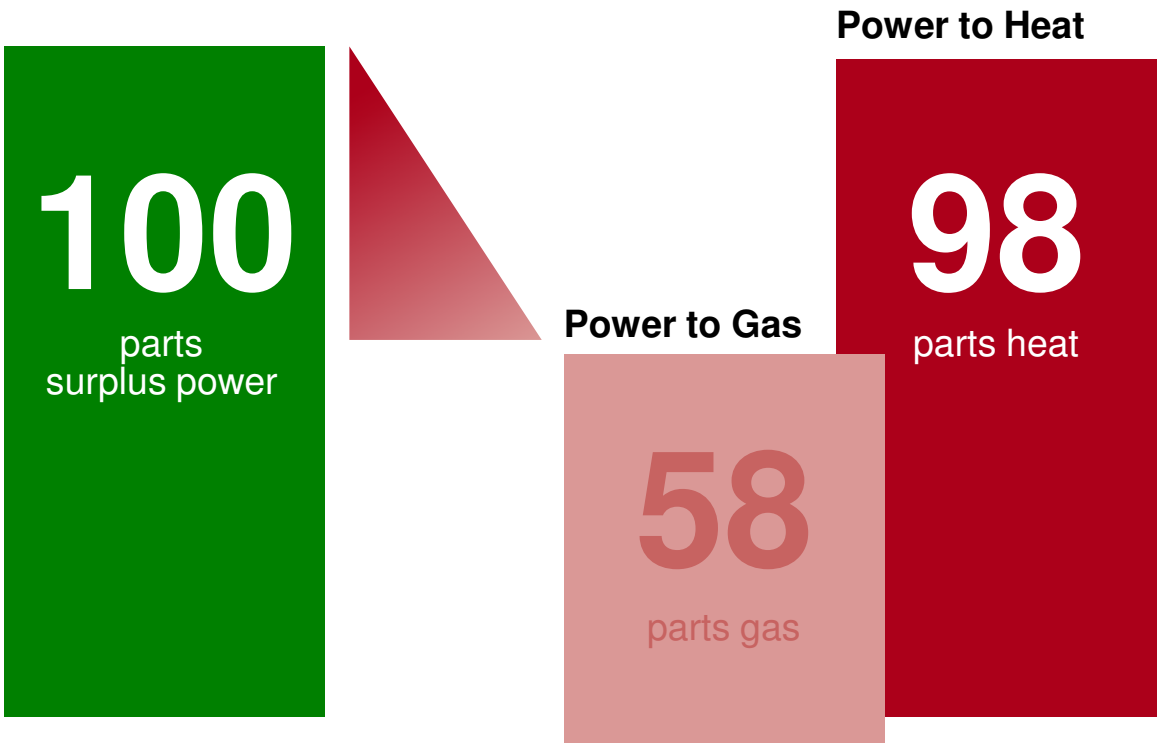
Today only thermal storages offer a sustainable and at the same time economical solution.



assessment criteria	thermal storages	lithium ion battery
energy effciency	●●●●●○	●●●○○○
sustainability	●●●●●●	●●●○○○
Smart Grid capability	●●●●●●	●●●●●●
cost/performance ratio	●●●●●●	●○○○○○
capacity	●●●●●○	●●○○○○
availability	●●●●●●	●●●○○○

Power to Gas vs. Power to Heat.

The conversion from power to heat is 40 percent more efficient than from power to gas.



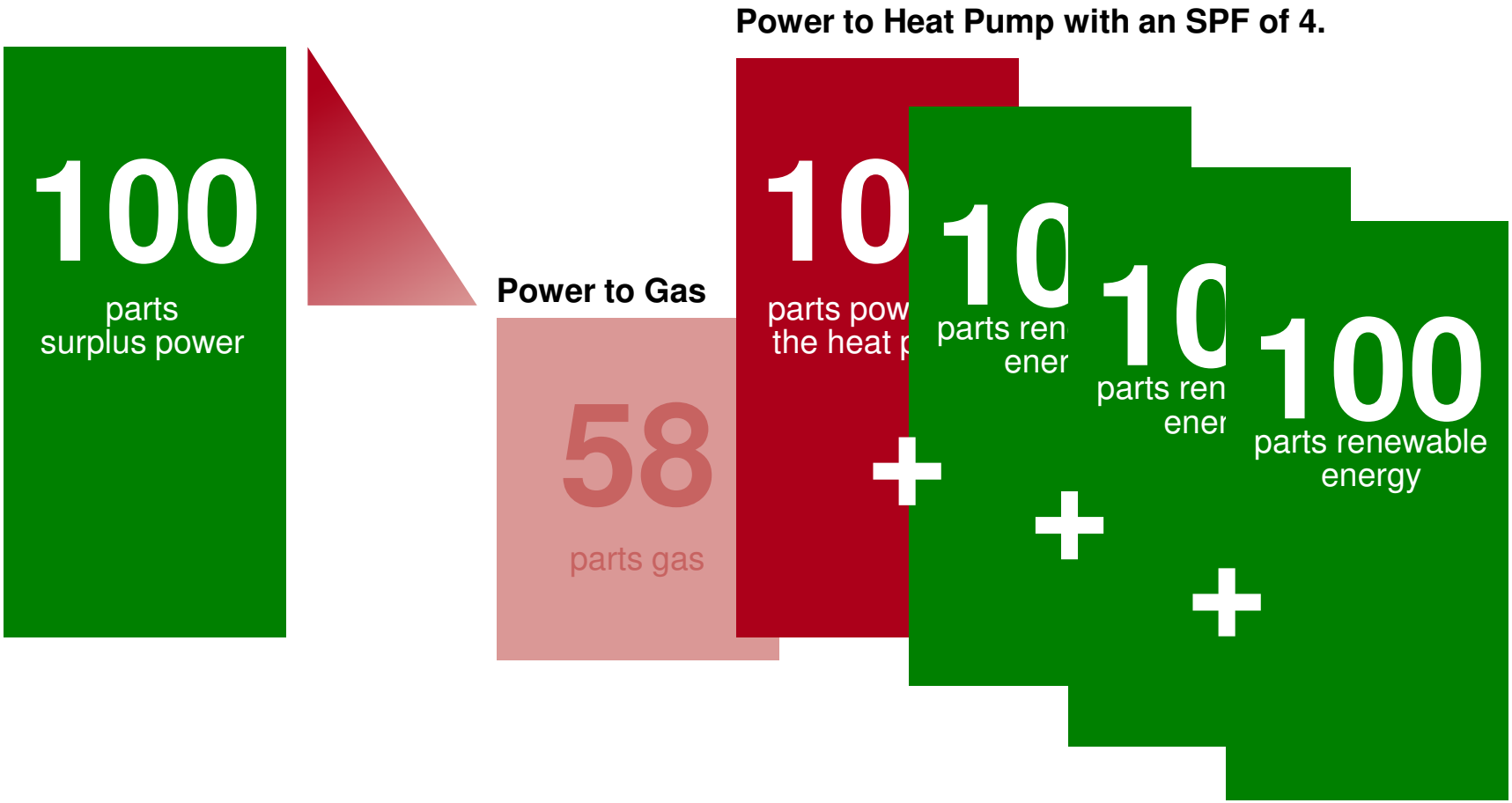
No doubt.

A direct use of electricity directly as heat (Power to heat) saves 40 % more primary energy than producing gas (Power to Gas) and burning it afterwards.

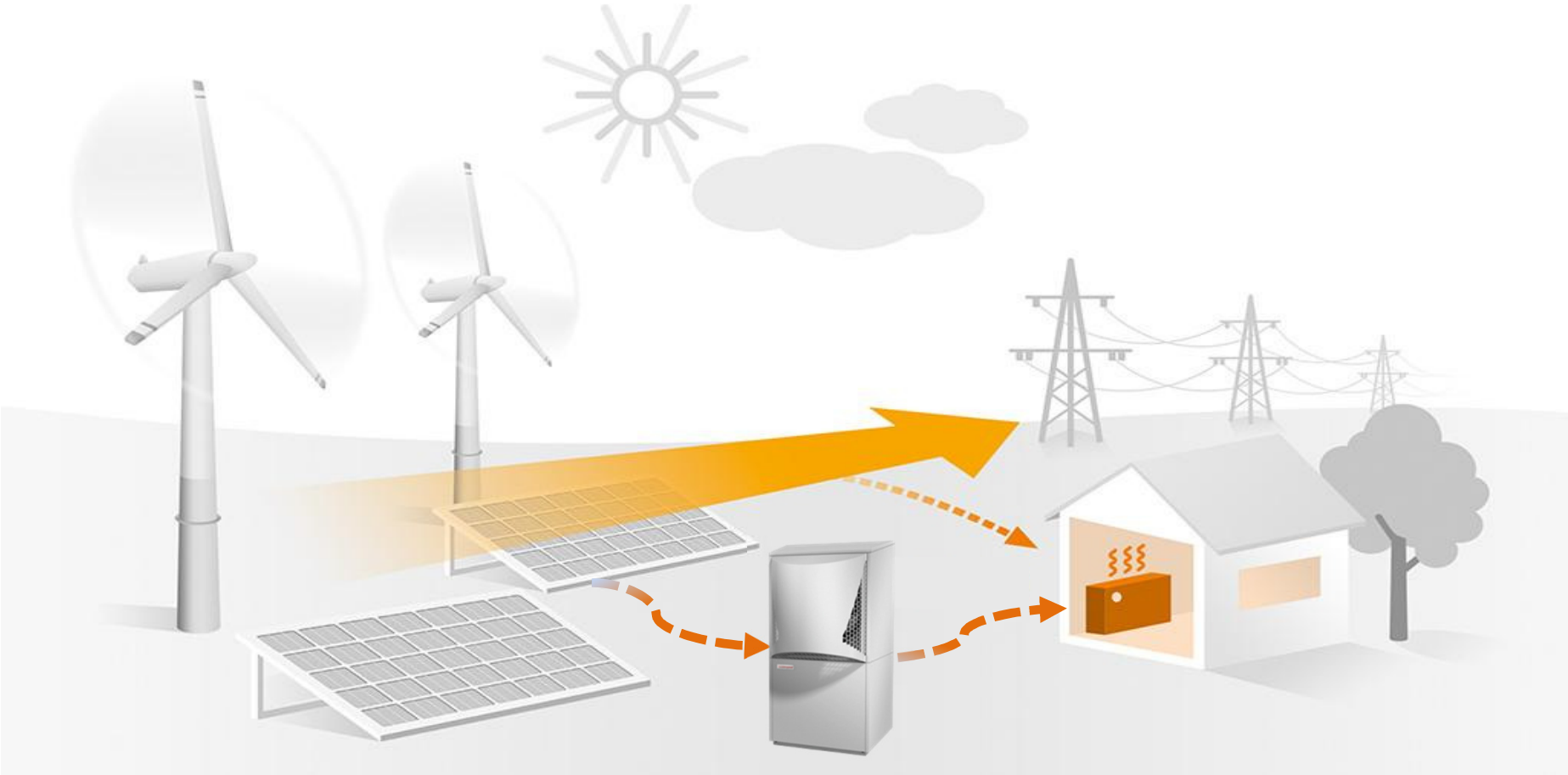
Quelle.
Wikipedia

Power to Gas vs. Power to Heat (Pump).

The conversion from power to heat with a heat pump is unbeatable in efficiency.



Heating with renewable energy is trendsetting.
Future load-variable tariffs are the ideal stimulation economical efficiency with a maximum of sustainability.



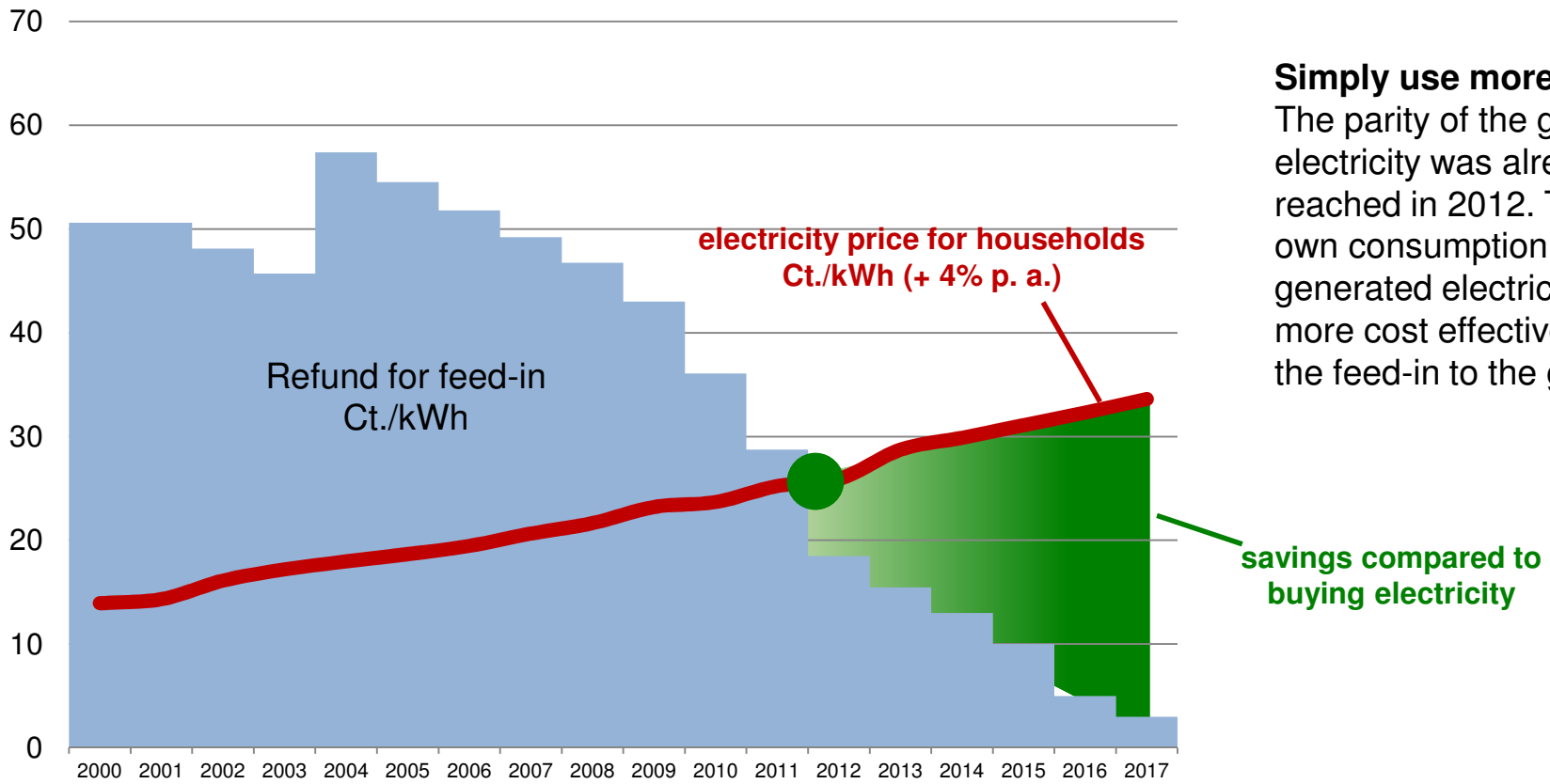
Load-variable tariffs vs. private solar PV systems.

The right tariffs are still missing, but the solar PV systems are already there.

Just use it yourself.

Private solar PV systems offer some kind of load-variable tariffs already today. The more generated electricity is used directly where it is produced, the higher the savings are for customer and the better for the grid.

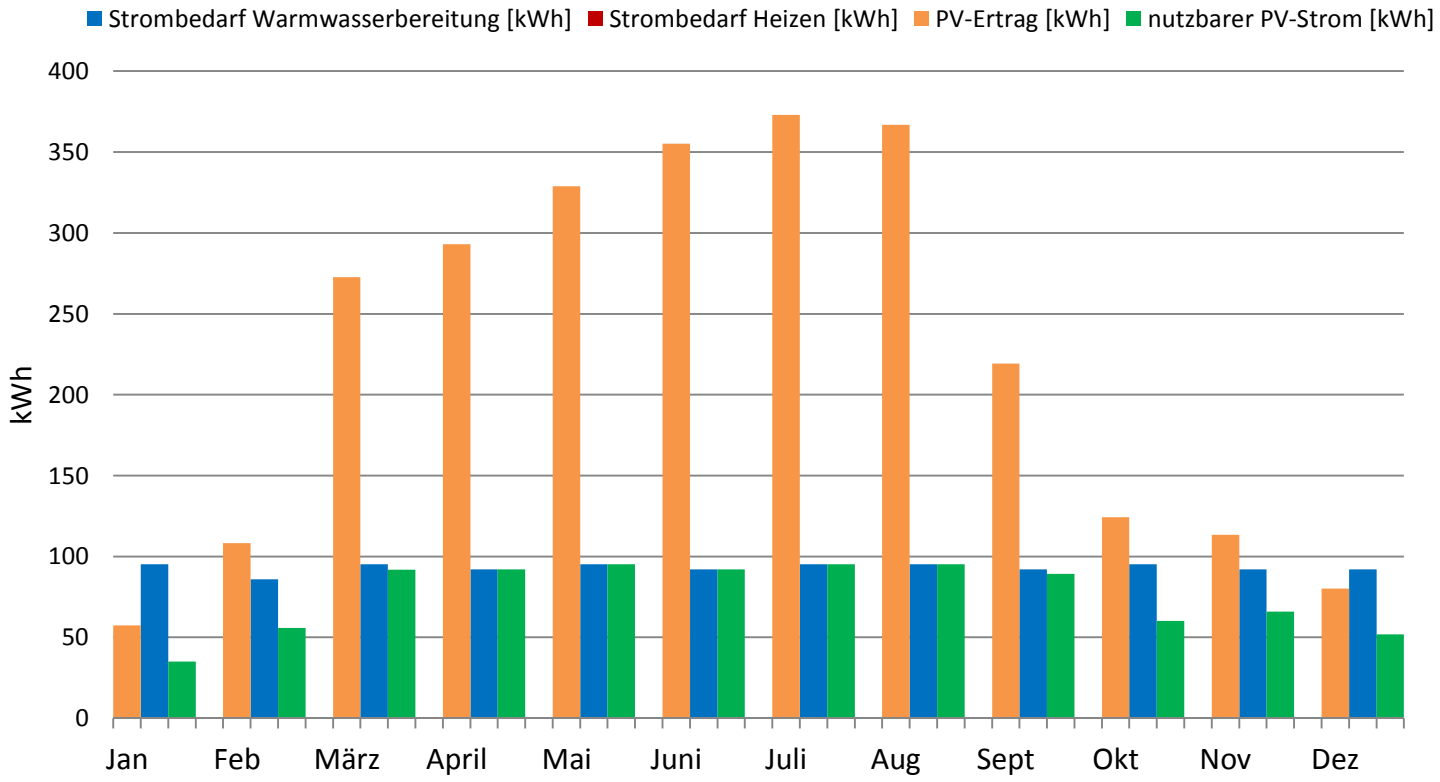
A question of cost effectiveness.
Parity of the grid since 2012.



Simply use more.
The parity of the grid for electricity was already reached in 2012. The own consumption of the generated electricity is more cost effective than the feed-in to the grid

Use case domestic hot water.

Domestic hot water preparation with a SG ready DHW heat pump BWP30HS.



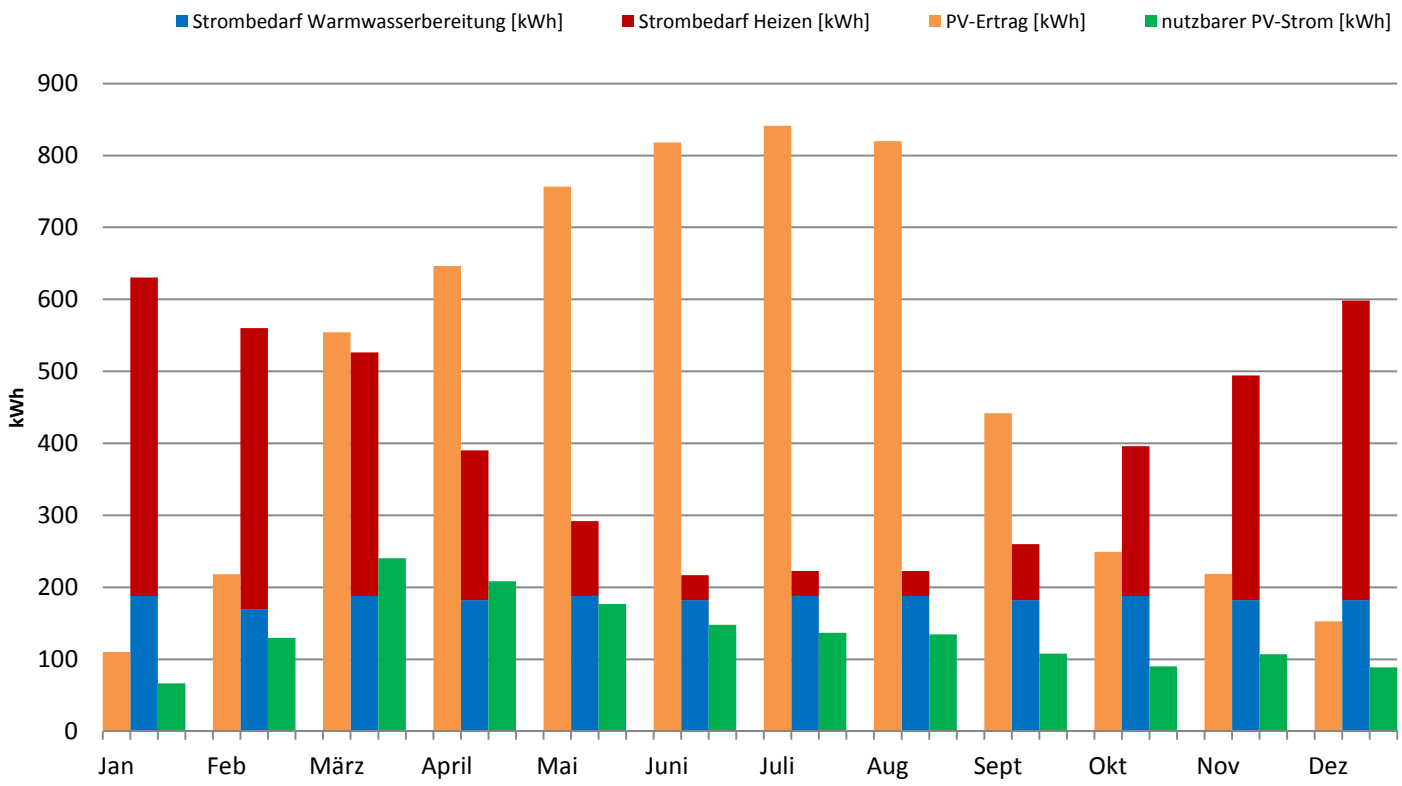
3 kWp PV system 87% savings

Up to 87% of the power needed by the DHW heat pump is being generated by the PV system..

Location: Kulmbach
PV gain: 2.656 kWh/a
cons. DHW HP: 1.120 kWh/a
Use. PV gains: 977 kWh/a
Covarage ratio BWP:
977 kWh / 1.120 kWh = 87 %
Own consumption PV system:
977 kWh / 2.656 kWh = 37 %
Assumption: 4 person each 50l DHW per day, no circulation line

Use case heating and domestic hot water.

heating and domestic hot water preparation with SG ready heat pump LA6TU.



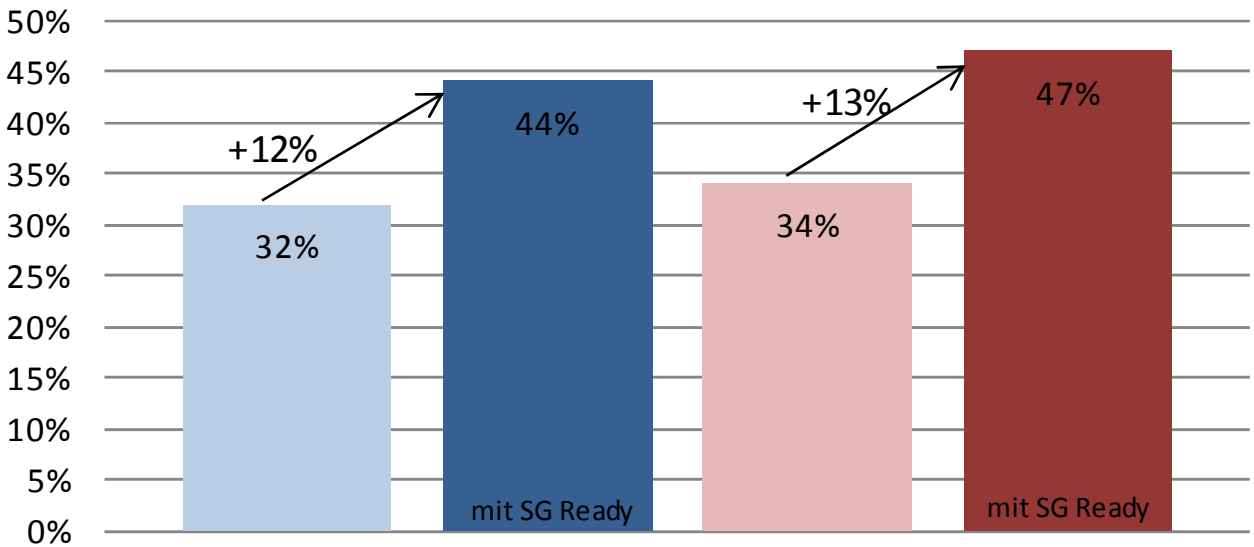
6 kWp PV system 32% saving

Up to 32% of the power need by the heat pump is being generated by the PV system.

Location: Kulmbach
PV gains: 5.312 kWh/a
Consum. HP: 3.014 kWh/a
Use PV gains: 960 kWh/a
Coverage ratio HP:
960 kWh / 3.014 kWh = 32 %
Own consumption PV system:
960 kWh / 5.312 kWh = 18 %
Assumption: 4 person each 50l DHW per day

By the way...
Heat pumps with Smart Grid functionality do it better.

Coverage ration Solar PV system and heat pump



Air source LA 6TU

Ground source SI 6TU

SG ready pushes efficiency.
By enabling the SG ready functionality (means increasing DHW temperature and increasing the room or return set temperature) the coverage ratio of the PV system can noticeably be increased.

The best place for heat is under your feet.
Additional buffer cylinder vs. floor heating system.

700ltr. buffer cylinder
temperature rise of **25 K**
~ 20 kWh

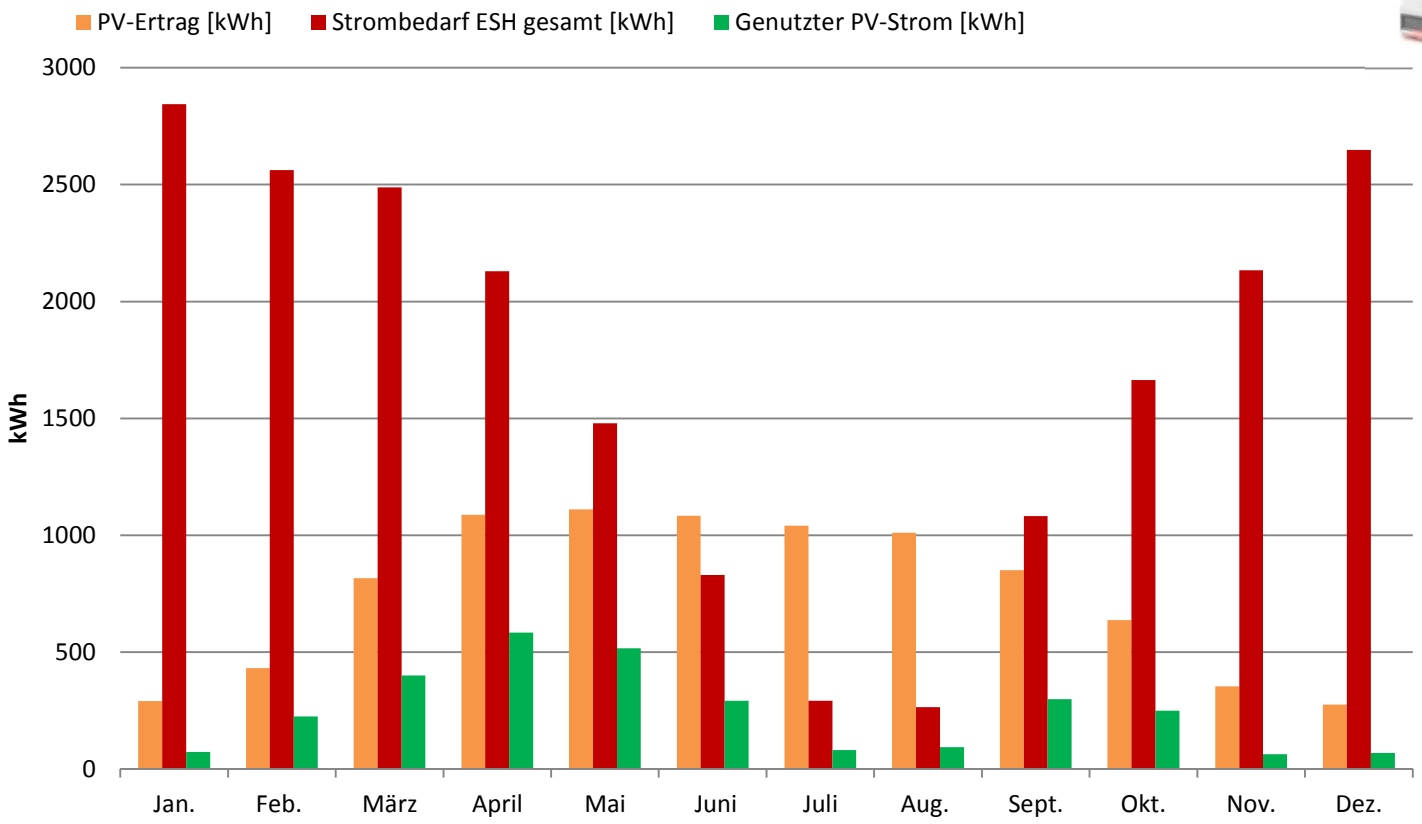
- High flow temperatures reduce the efficiency (2,5 % per 1 K)
- Additional heat losses
- Additional investment cost

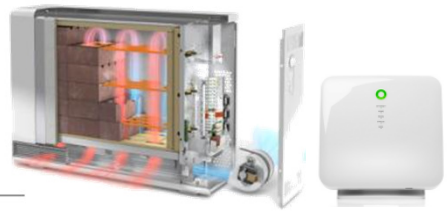
air source Heat pump
with 10 kW capacity

150m² floor heating
temperature rise **2 K**
~ 20 kWh

- Low flow temperatures
- No extra investment cost
- Little influence on the room temperature
- Ideal for Utility block times
- Smart room thermostats

Use case storage heater.
heating with Intelligent Quantum & Smart Eco System.





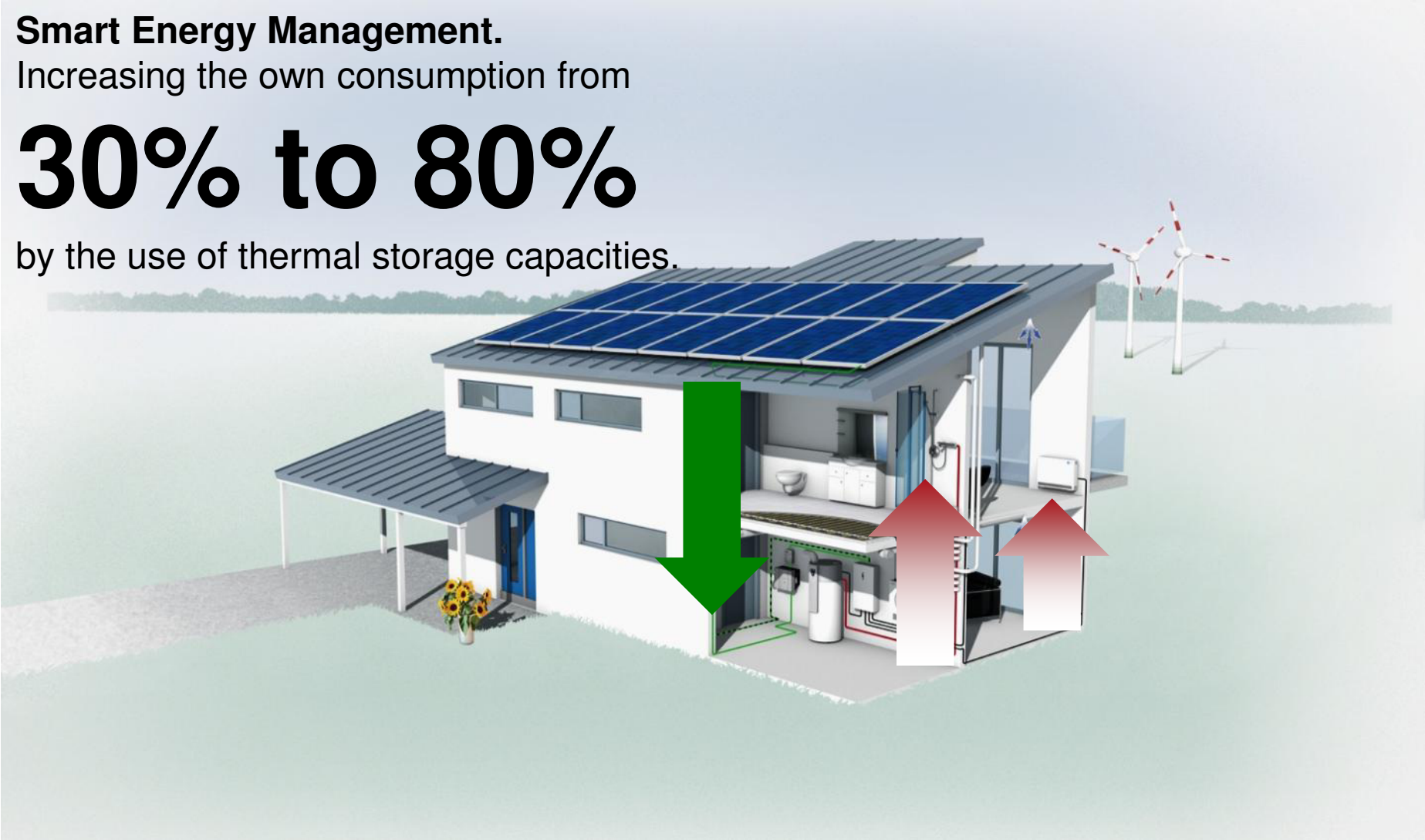
10 kWp PV system
14% savings

Up to 14% of the power needed by the Intelligent Quantum are being generated by the PV system. Load management by Dimplex Smart Eco System.

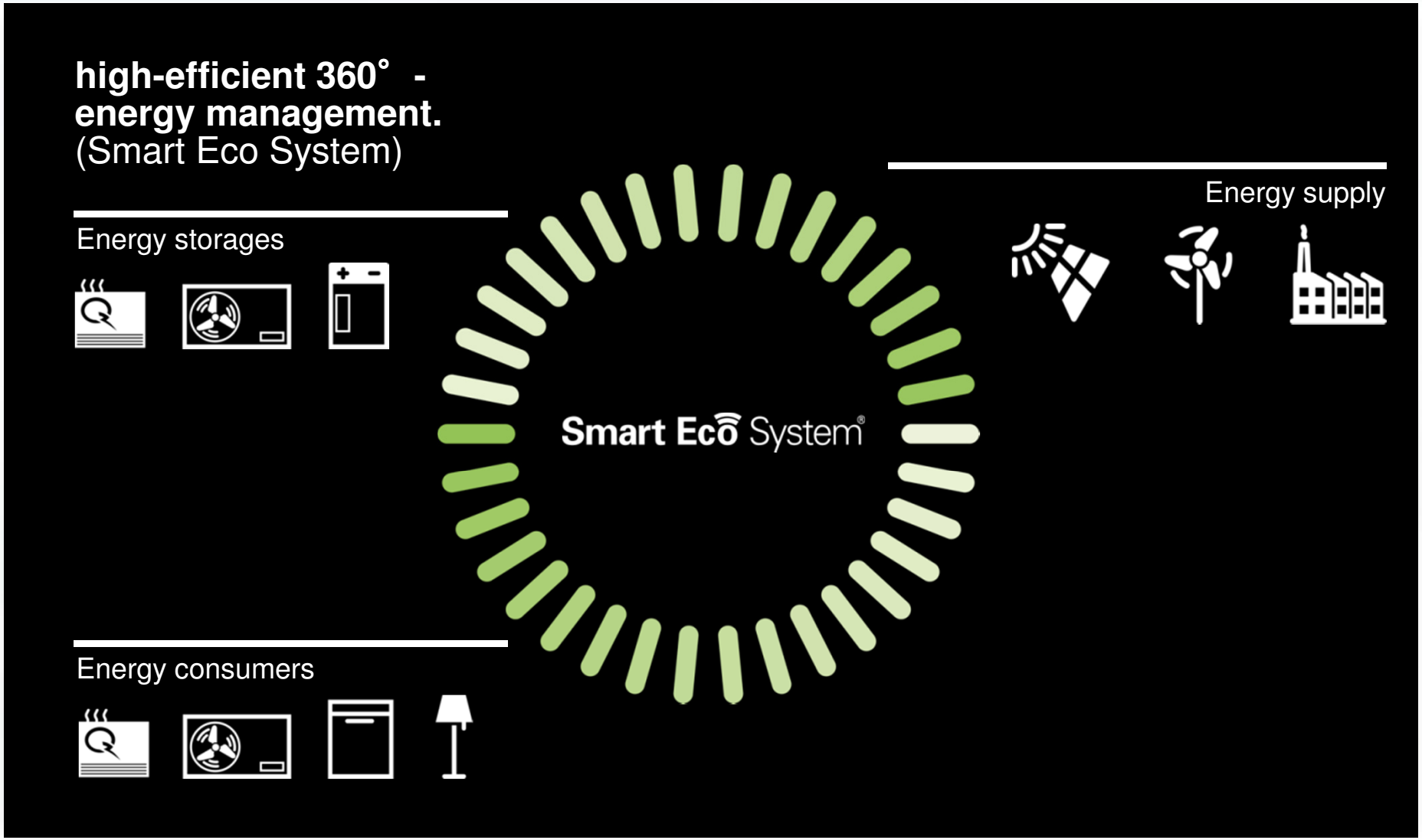
Location	Kulmbach
PV gains:	8.992 kWh/a
Consum. IQ:	20.418 kWh/a
Use. PV gains:	2.946 kWh/a

Coverage ratio IQ:
2.946 kWh / 20.418 kWh = 14%
Own consumption PV system:
2.946 / 8.992 kWh = 33 %

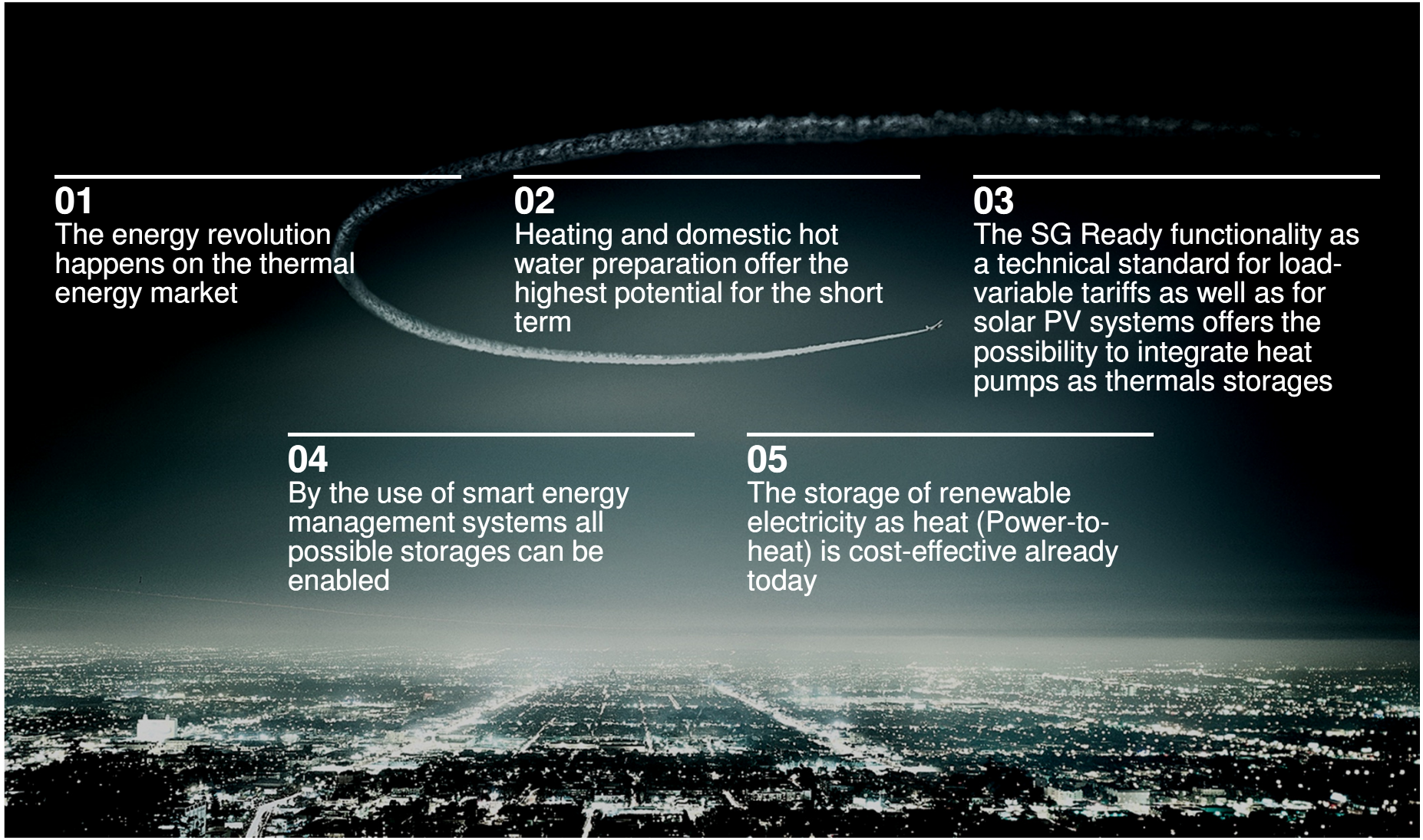
Today's target.
Increasing the own consumption to the maximum.



The future target.
Using the energy revolution in the right way.



The opportunities of the energy revolution.
Summary.



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