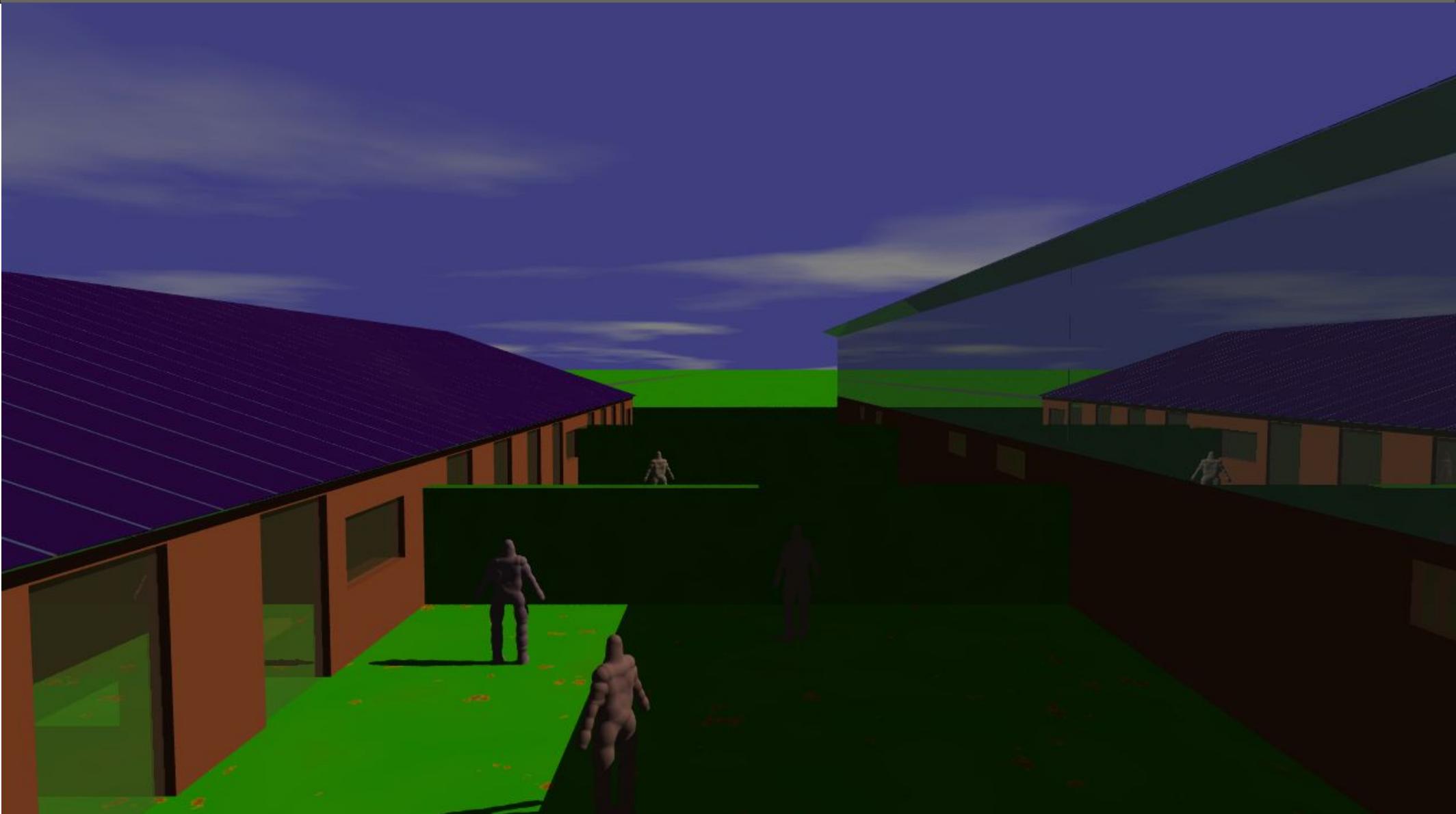
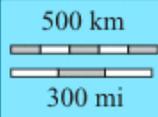


Land for Energy



Magnitude of „land for energy“

0.1% of land
10,000 km²
5% of population
70 million people
750 GW photovoltaic
1000 TWh electric power per year



The problem:

Chinese photovoltaic industry is more than 90% export dependent

The solution:

Built up a photovoltaic market in China by „land for energy“, to increase the growth of the Chinese photovoltaic industry and decrease export dependency.

The problem:

Chinese photovoltaic industry depends mainly on the German „EEG renewable energy law“.

This law was copied and adapted by many other countries and was in the last decade the main and only driving force of the photovoltaic industry.

The solution:

Establish the „land for energy“ concept as a new method to have more solar electric power.

This should be copied by many countries giving the photovoltaic industry a faster and stable growth.

Coal electric power is cheaper than photovoltaic

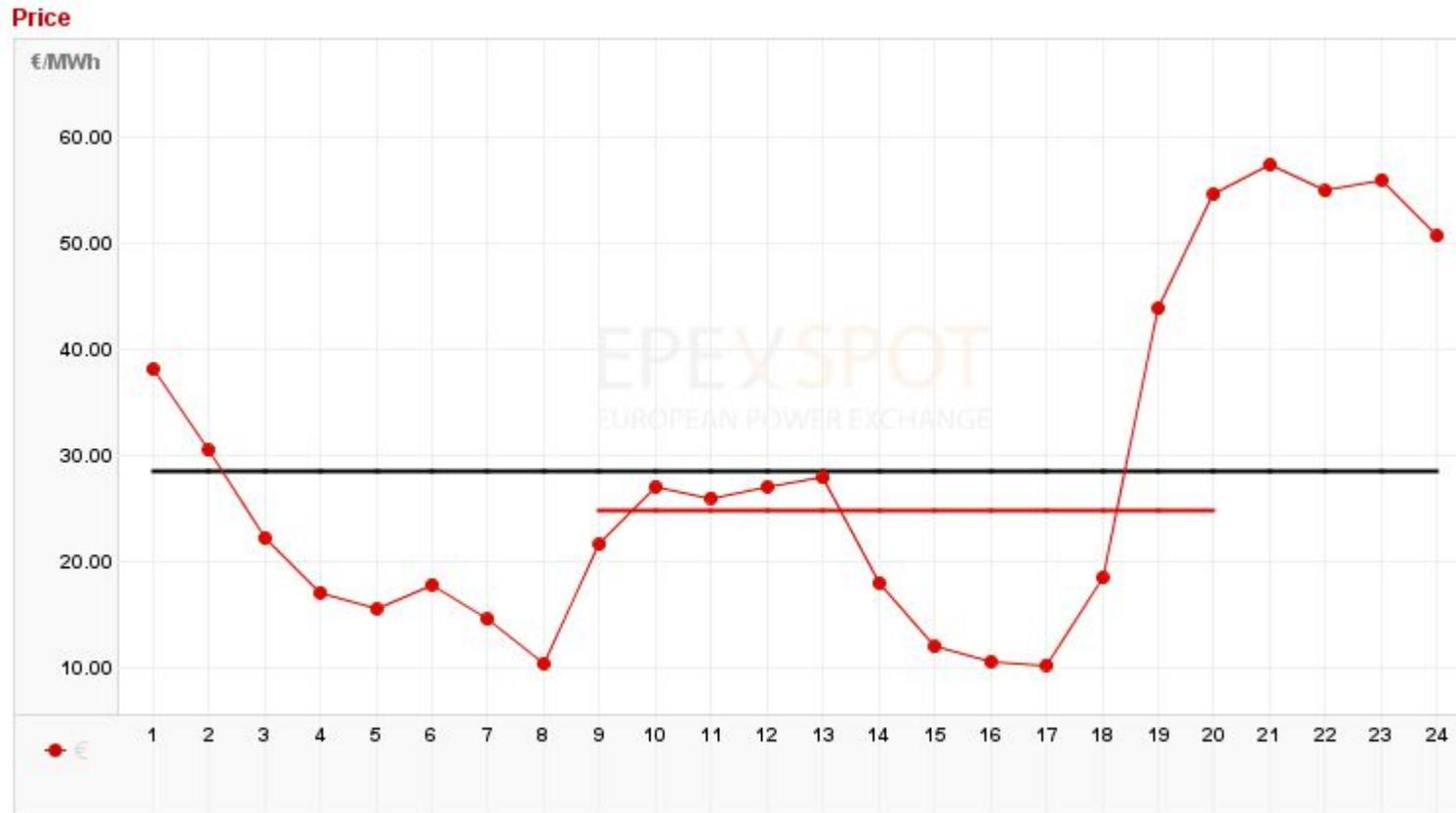
Since decades, industry decreases the cost for photovoltaic, but still is electric power from coal cheaper.

While the effort of the industry continues to compete against coal electric power in price, „land for energy“ is a method to let somebody pay for this price difference.

Living amongst nature, having an own garden, flee outside the big city. This are all high values for the individual and the price for it has to be paid by purchasing all the equipment to produce and store solar electric power very far beyond own usage.

The land is paid by the price difference between solar electric power and the market price of electric power. All the solar electric power produced has to be sold for a competitive price.

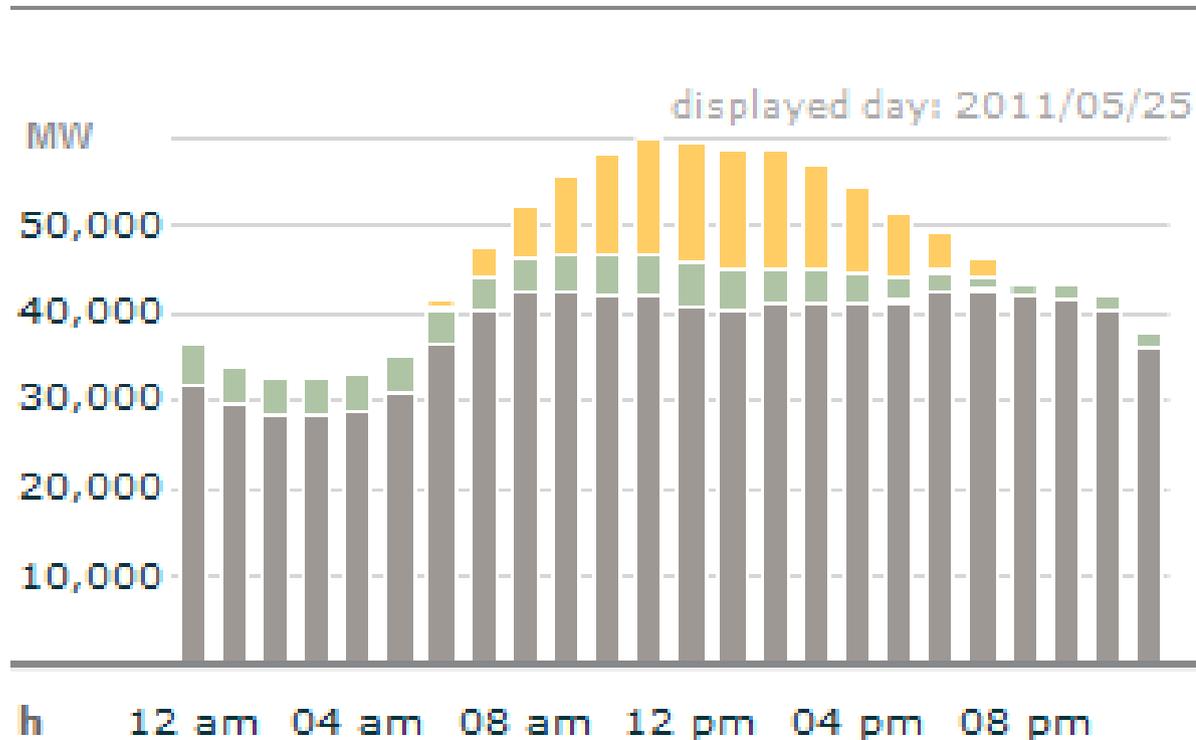
European Energy Exchange Market prices from Sunday April 10th 2011



2010 had been in Germany 7,5 GW photovoltaic new installed.
So on some days, the electric power is at day time cheaper
than in the night. Out of this reason 3 kWh buffer batteries
per kW peak photovoltaic at „land for energy“.
(photovoltaic has a fixed feed in price and is not part of this market)

18 GW photovoltaic in Germany

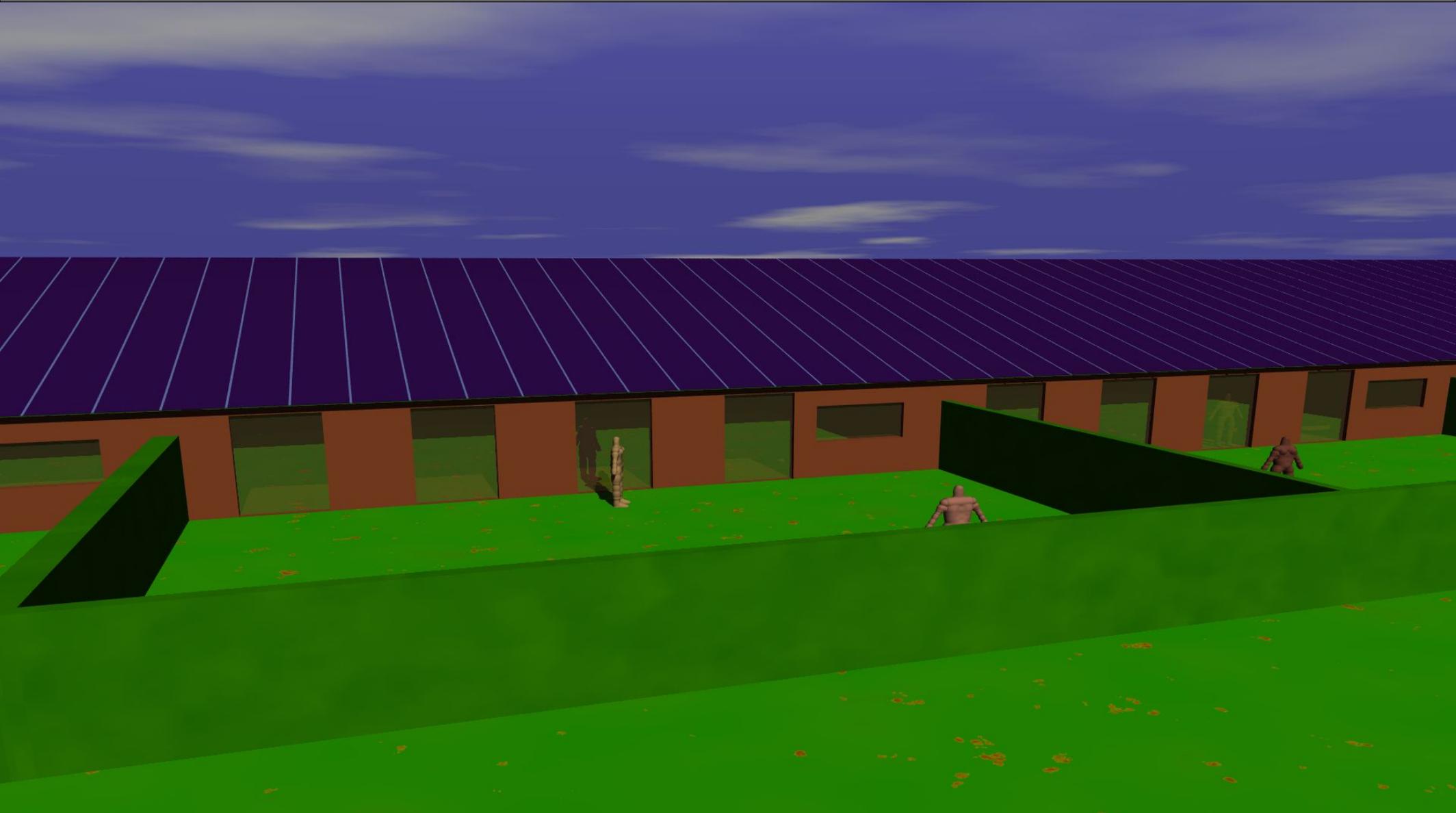
Planned production

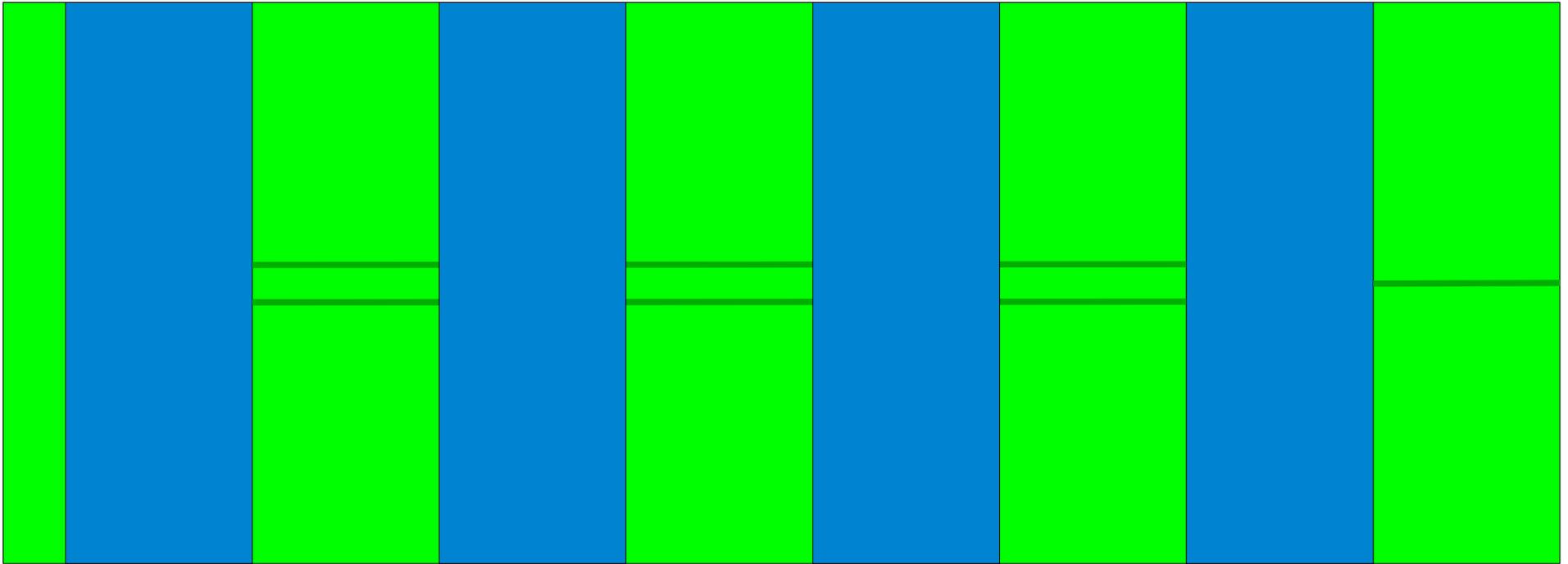


The midday peak in electric power consumption becomes on a sunny day for the conventional power plants (grey) a small decrease in production at midday..

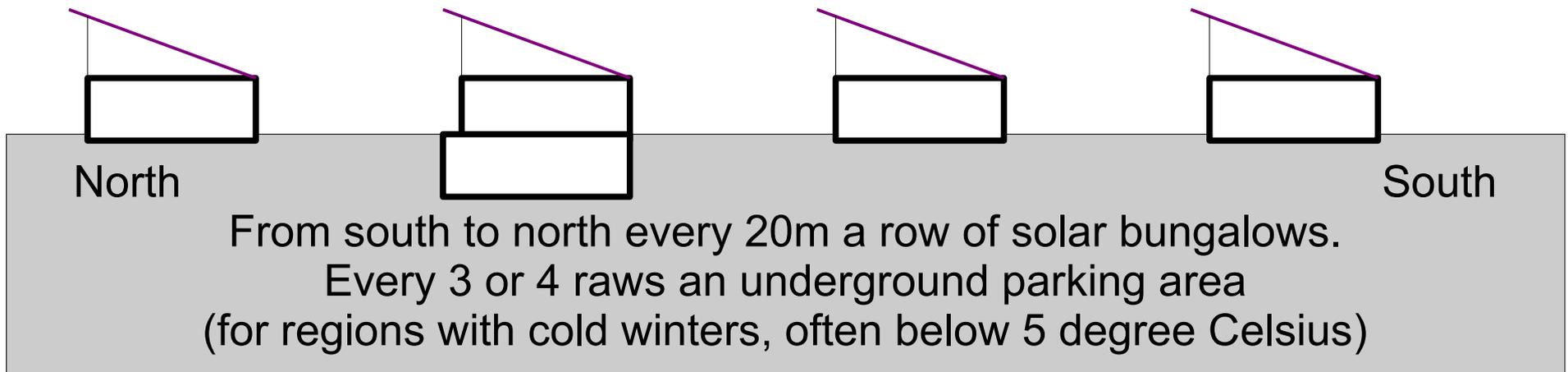
A relevant extension of photovoltaik (>400 GW in Germany) is only possible with storage technology. Therefore, this is from the start away implemented in the system „land for energy“.

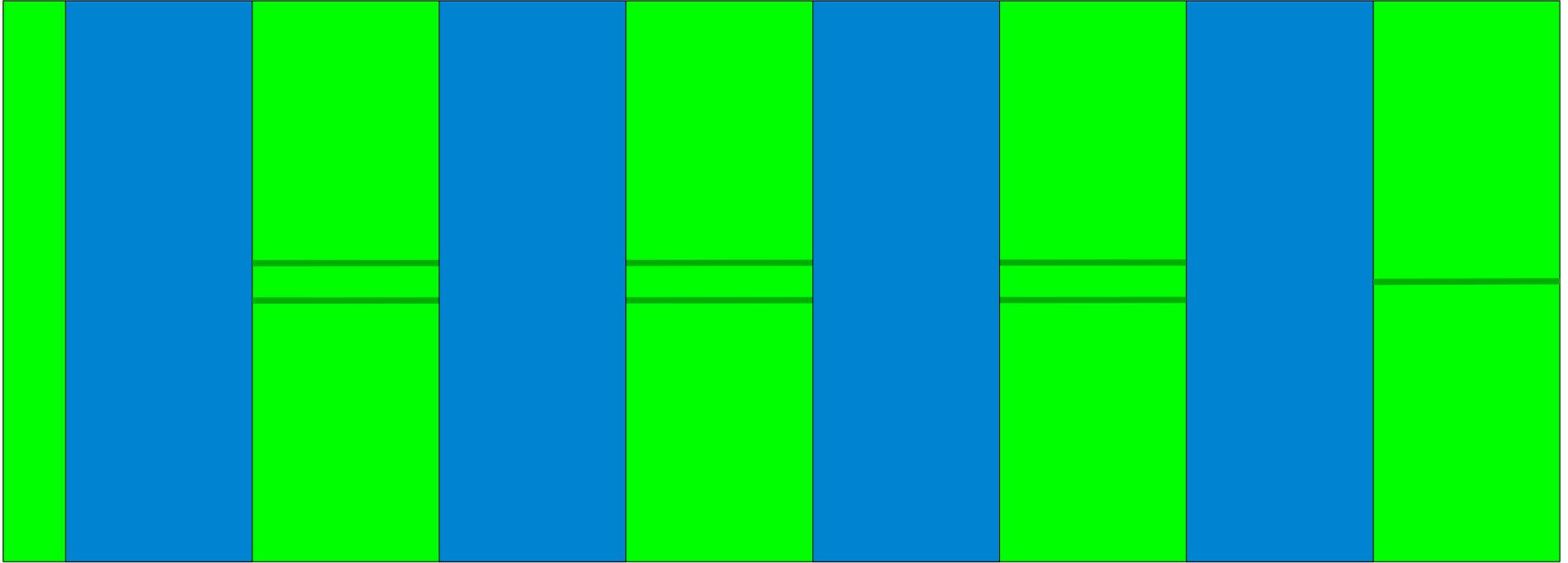
Solar terraced house bungalow



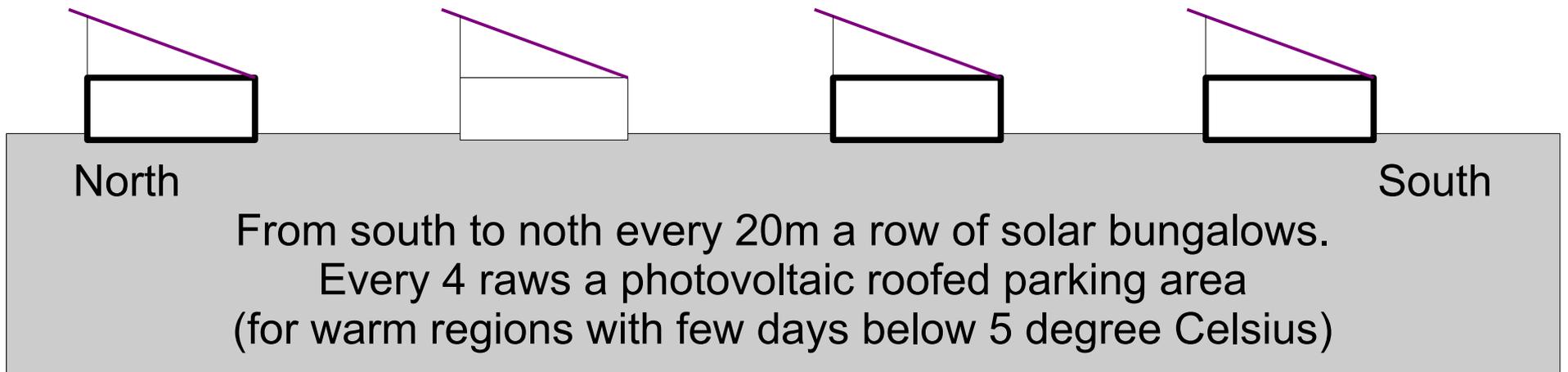


From the row with the underground parking area are ways on the surface to the other rows, one way leads to 2 houses.





From the row with the roofed parking area are ways on the surface to the other rows, one way leads to 2 houses.



Technical data solar terraced house bungalow

Area for a normal sized unit	300 m ²
Length from south to north	20 m
Width from east to west	15 m
Photovoltaic roof	158 m ²
Photovoltaic peak	23 kW
Yearly yield depending on region	27000 to 45000 kWh
Greatest height at the north side	6 m
Buffer battery lithium iron phosphat	70 kWh
Area covered by the building	135 m ²
Garden area	165 m ²
Living space	100 to 115 m ²

Living space varies depending on several things including thermal insulation of the walls required for the region where it's built – up to 40cm.

High income

5% of population



Land for Energy

What to do with increasing income?

Best to invest in products made in China, help the emerging industries to have a fast and stable growth, produce clean energy.

The exchange for this is living amongst nature, having a house with own garden near a town.

Low income

The price for the ground of a solar bungalow

23 kW peak photovoltaic	400,000.--YUAN
70 kWh lithium iron phosphat battery	200,000.--YUAN
„land for energy“ exchange investment	600,000.--YUAN
Average yearly yield, east cost regions	30,000 kWh
Average price oer kWh	1.--YUAN
Average yearly earnings	30,000.--YUAN

The electric power from the house has a higher market value than coal electric power because most delivered in the midday peak, delivering in other peak price times with the buffer battery,

In cold regions, thermal insulation and air exchange with heat recovery like German „Passiv-house“ standard.

In warm regions cooling system with minimal electric power usage.

Houses optimized for low own energy usage to deliver most of the energy.

Yield of „land for energy“

	per house	per ha hektare
Electric power yield	30,000 kWh	1,000,000 kWh
This is the consumption of households	9	300
Reduction of CO2 (700g / kWh)	21,000 kg	700,000 kg
Midium sized electric car (15 kWh/100km)	200,000 km	6,666,667 km
Electric scooter (3 kWh/100km)	1,000,000 km	33,333,333 km
Reduction compared to Diesel car (6l/100km)	12,000 l	400,000 l

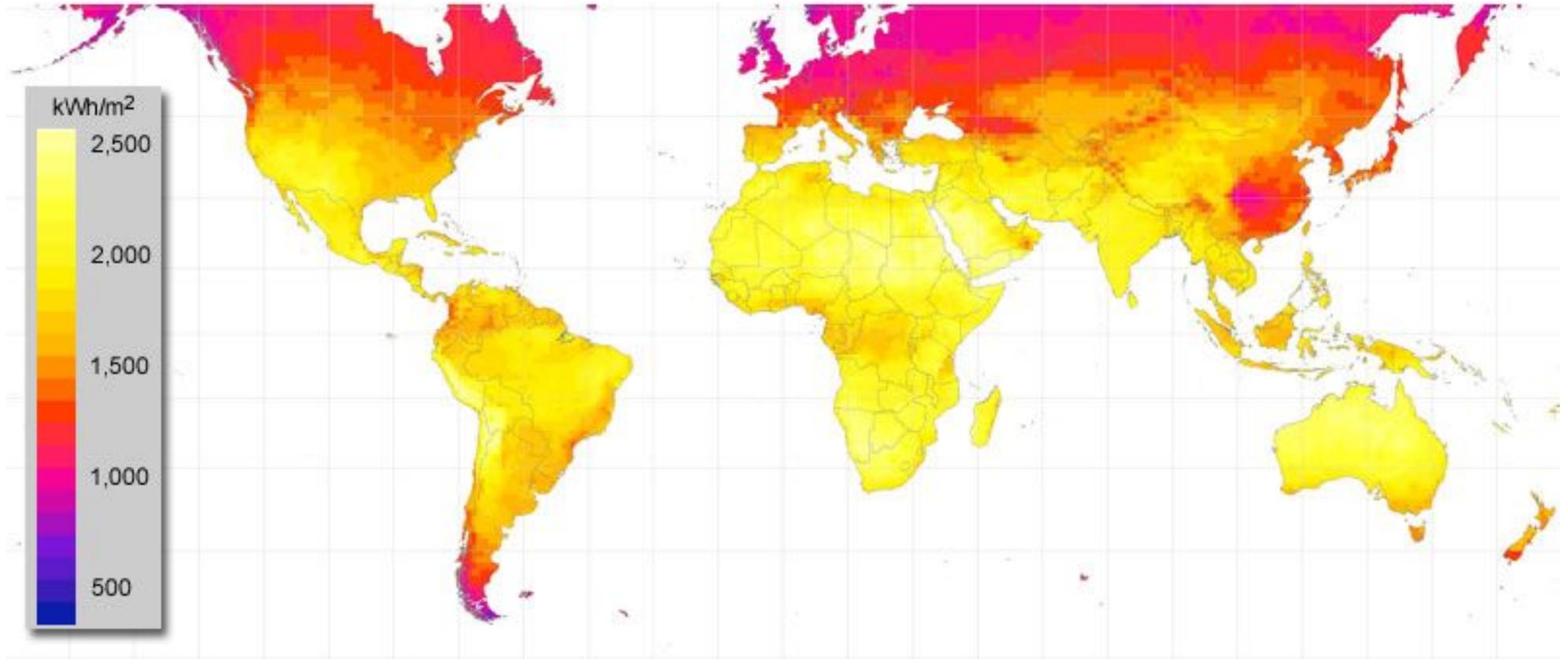
Yield is average at east cost regions.

Compare to households is with German average.

The yield can increase, when by more and more clean energy, the irradiation values become similar to other regions on the same latitude

Yield of photovoltaic can be changed by more and more clean energy

Yearly sum of global irradiance



Case study of the effects of atmospheric aerosols and regional haze on agriculture:
More frequent cloud-free sky and less surface solar radiation in China from 1955 to 2000

Typical data for 1 ha hektare „land for energy“

Housing units	35 - 40
Inhabitants by occupancy 2.3 per unit	80 - 90
Area covered by buildings	4500 m ²
Garden area	5500 m ²
Street and parking places	1250 – 1667 m ²
Photovoltaic area	5280 m ²
Photovoltaik peak	750 kW
Lithium iron phosphat batteries	2250 kWh

The inhabitants per hectare are equal to typical European towns

<http://buch.pege.org/groesenordnungen/einwohner-arbeitsplaetze-pro-hektar.htm>

International examples

The first „Land for Energy“ villages should be examples for energy production, energy storage, smart grid, energy efficiency in heating, cooling, lightning, electric mobility because only electric vehicles and plug-in hybrid vehicles are allowed in the village.

So the air in the underground parking area is so clean, that it can be used as a playground for children at bad weather conditions outside.

No combustion allowed

This „no combustion allowed“ symbol was first time published in my book „Advande to solar age“ 1993.

It stands for all domestic heat by heat pump, electric mobility and all this nasty loud small internal combustion engines for lawn reapers, hedge shears, leaf blowers, snow plow are also forbidden.

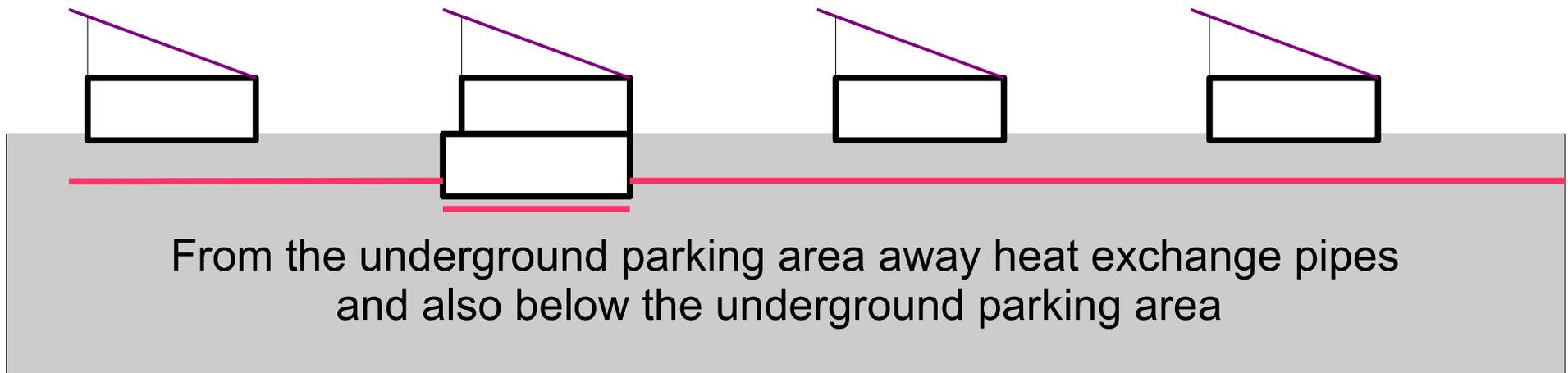


Heat technology

This is for regions with cold winters.

It is possible to take out heat from the warmed up air below the photovoltaic. This heat can be brought below the ground and below the underground parking area.

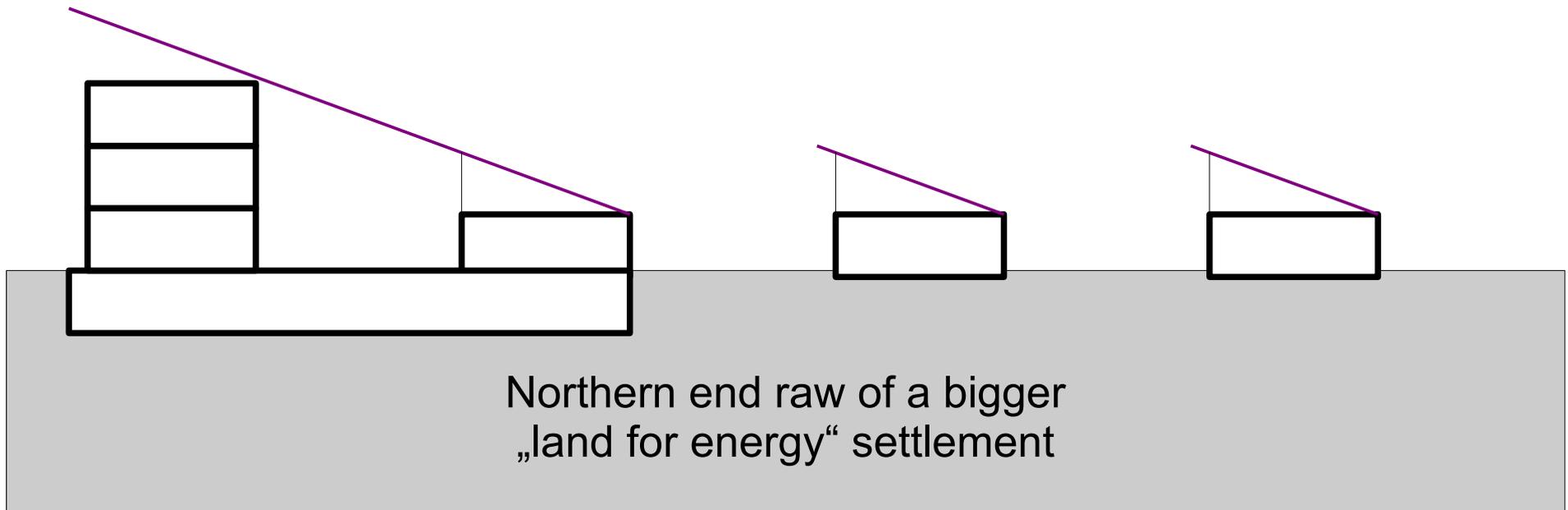
This improves the efficiency of the heat pump. It's also to have it more warm in the underground parking area, this is important for electric cars.



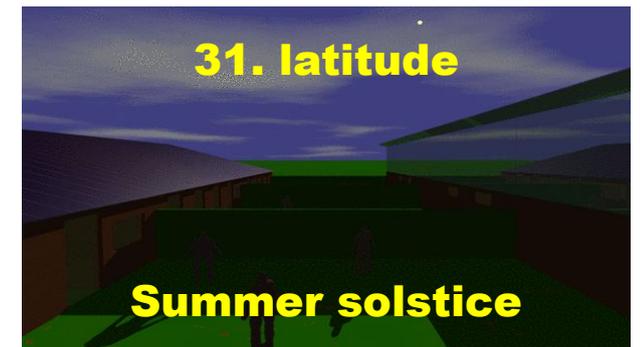
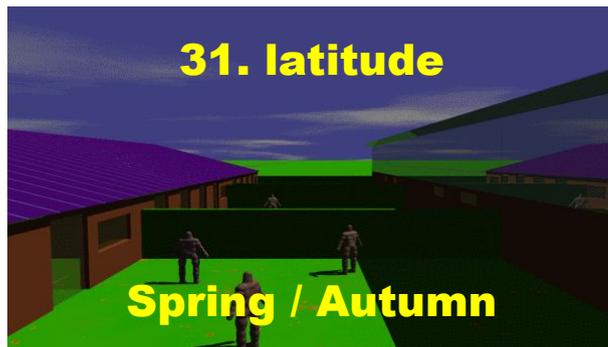
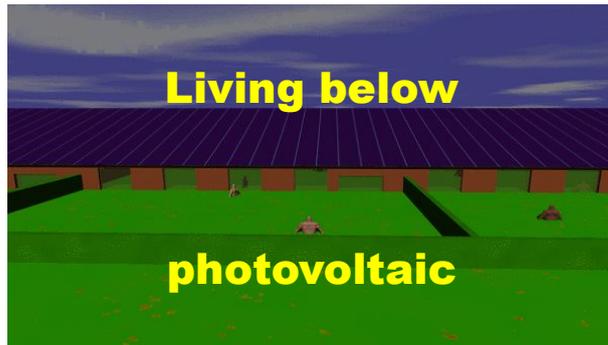
Bigger settlements

As the northern end of a „land for energy“ settlement could be a higher row with space for shops, offices and other commerce.

The photovoltaic is in the same angle like in the other rows. Some parte above the yard with glas instead of photovoltaic for lightning the yard between the rows.



Videos about „land for energy“





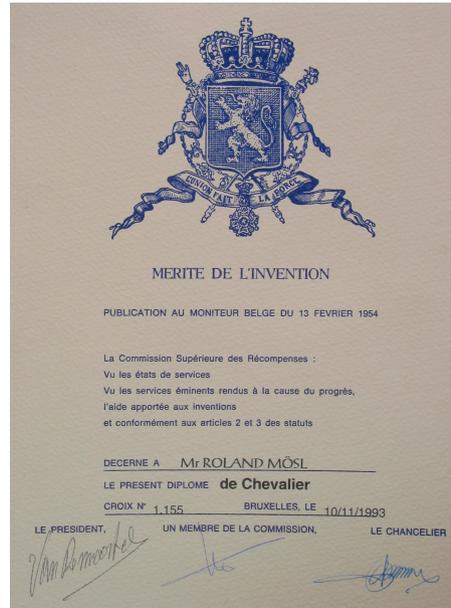
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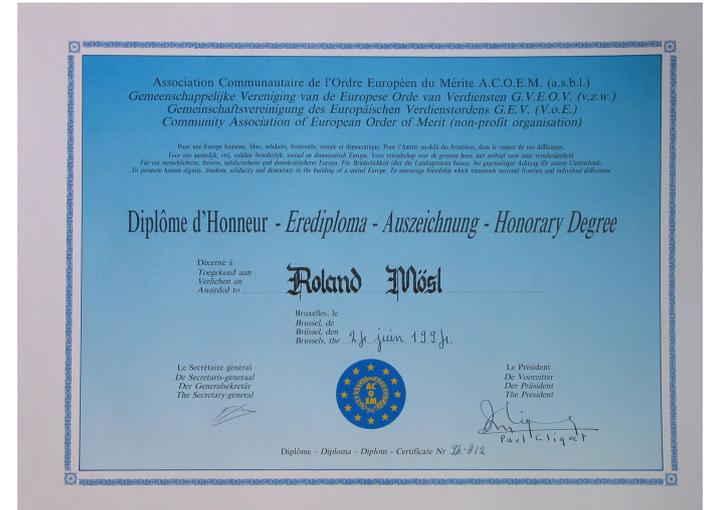
1991 **GEMINI** inhabited solar power plant

Design of the first plus energy house in Austria

GEMINI no better house no better solar power plant possible on the same ground



1993 Brussels Inventor fair Merite de invention for **GEMINI** project



1994 European order of merit for the project **GEMINI** inhabited solar power plant



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2001 **GEMINI** house as the main attraction at the Styria country exhibition about energy in Austria.

ÖSTERREICHISCHER SOLARPREIS 2008



EUROSOLAR AUSTRIA verleiht den Österreichischen Solarpreis 2008

Kategorie: Medien

an

Roland Mösl, Gartenau bei Salzburg

Internet-Plattform pege.org

Laakirchen, am 4. Oktober 2008

H. A. Schmidt
RA Dr. Hans Otto Schmidt
Vorsitzender

2008 Eurosolar Austria award for publishing **PEGE.org**



2010 invitation from the provincial government of Jilin Province to the **1st WORLD EMERGING INDUSTRIES SUMMIT**, key note about changing the tax system to boost the growth of the emerging industries