PassREg

Co-funded by the Intelligent Energy Europe Programme of the European Union

The story of zero:e park Hanover

Int. Workshop
Sofia (BG)
30 September 2014

Matthias Wohlfahrt

proKlima
Der enercity-Fonds

PassREg is supported by the European Commision under the IEE Programme No IEE/11/072/SI2.61592511.

Region and City of Hanover

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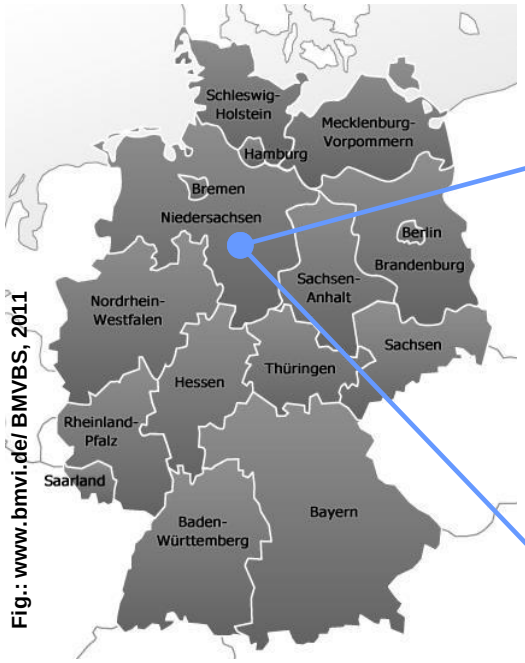
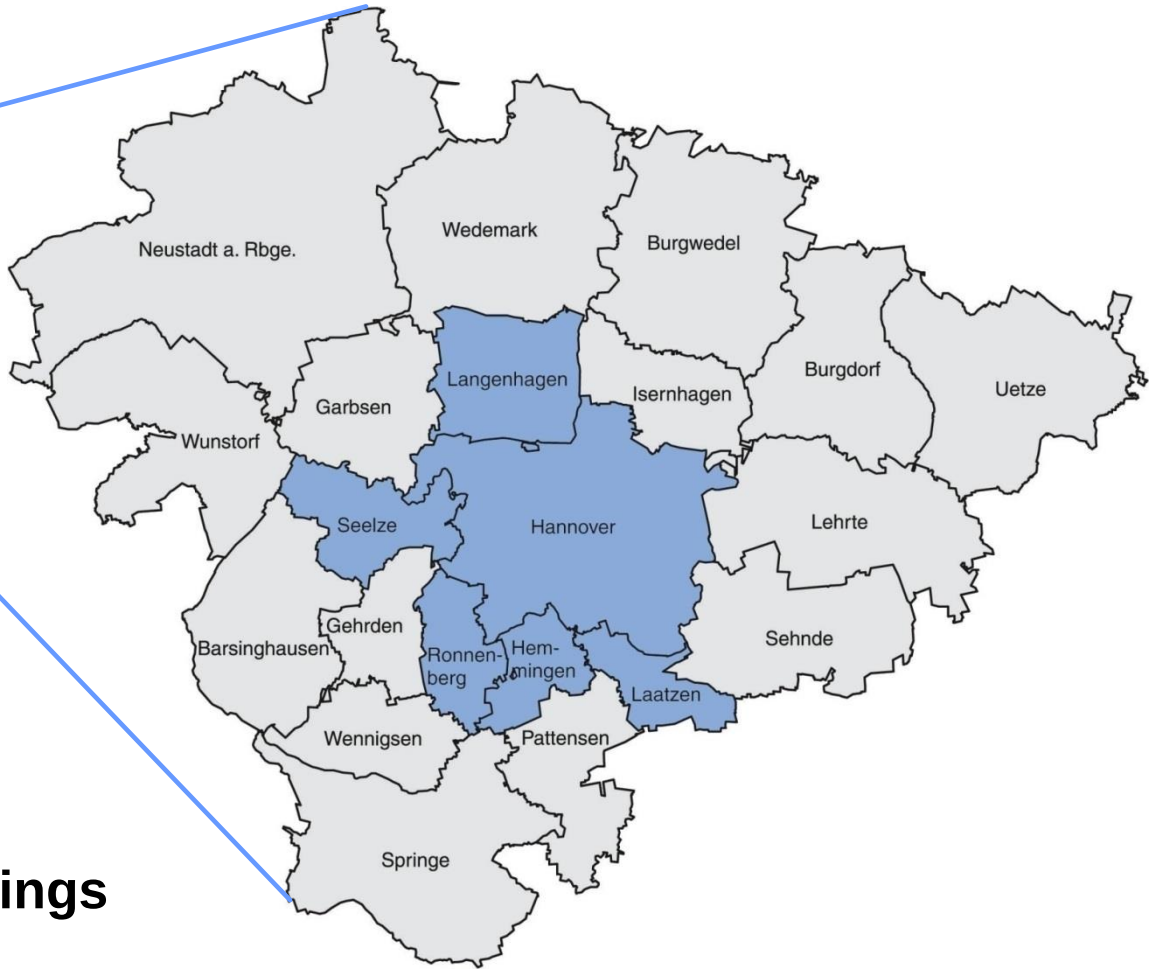


Fig.: www.bmvi.de/ BMVBS, 2011



21 municipalities
157.500 family houses
48.000 apartment buildings
49.800 companies
1.2 million inhabitants (ca. 514.000 City of Hanover)

- **zero:e-park**
- **political discussion and decisions**
- **technical feasibility**
- **role of proKlima**
- **success story**
- **success factors**

zero:e-park - location

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south district of Hanover

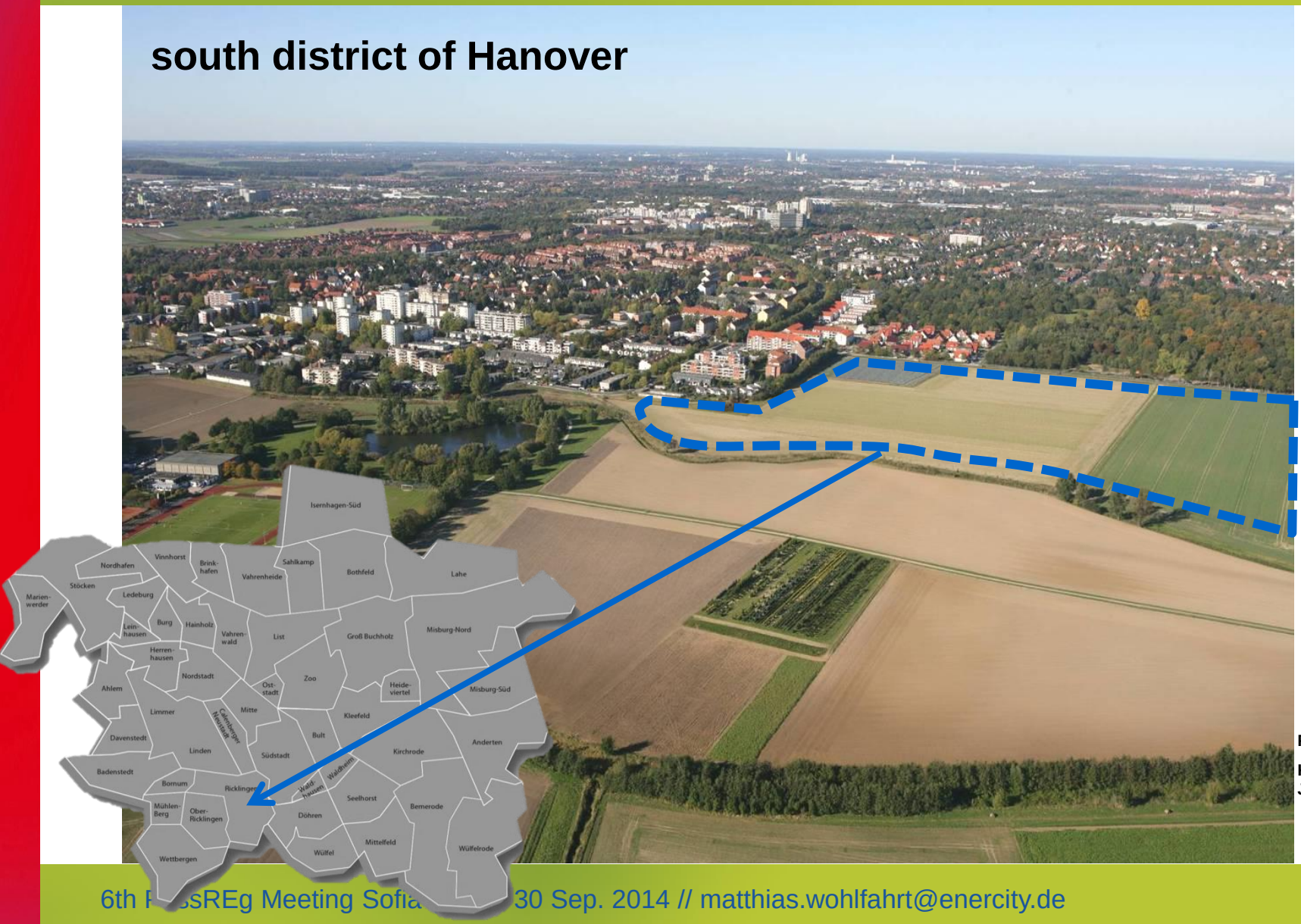

Foto:
Karl Johaentges

zero:e-park - size

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Single family houses, semi-detached houses, row houses, supermarket

total development area: 260,000 m²
(incl. green / public area, infrastructure)

net building plot: 130,000 m²

zero:e-park – design plan

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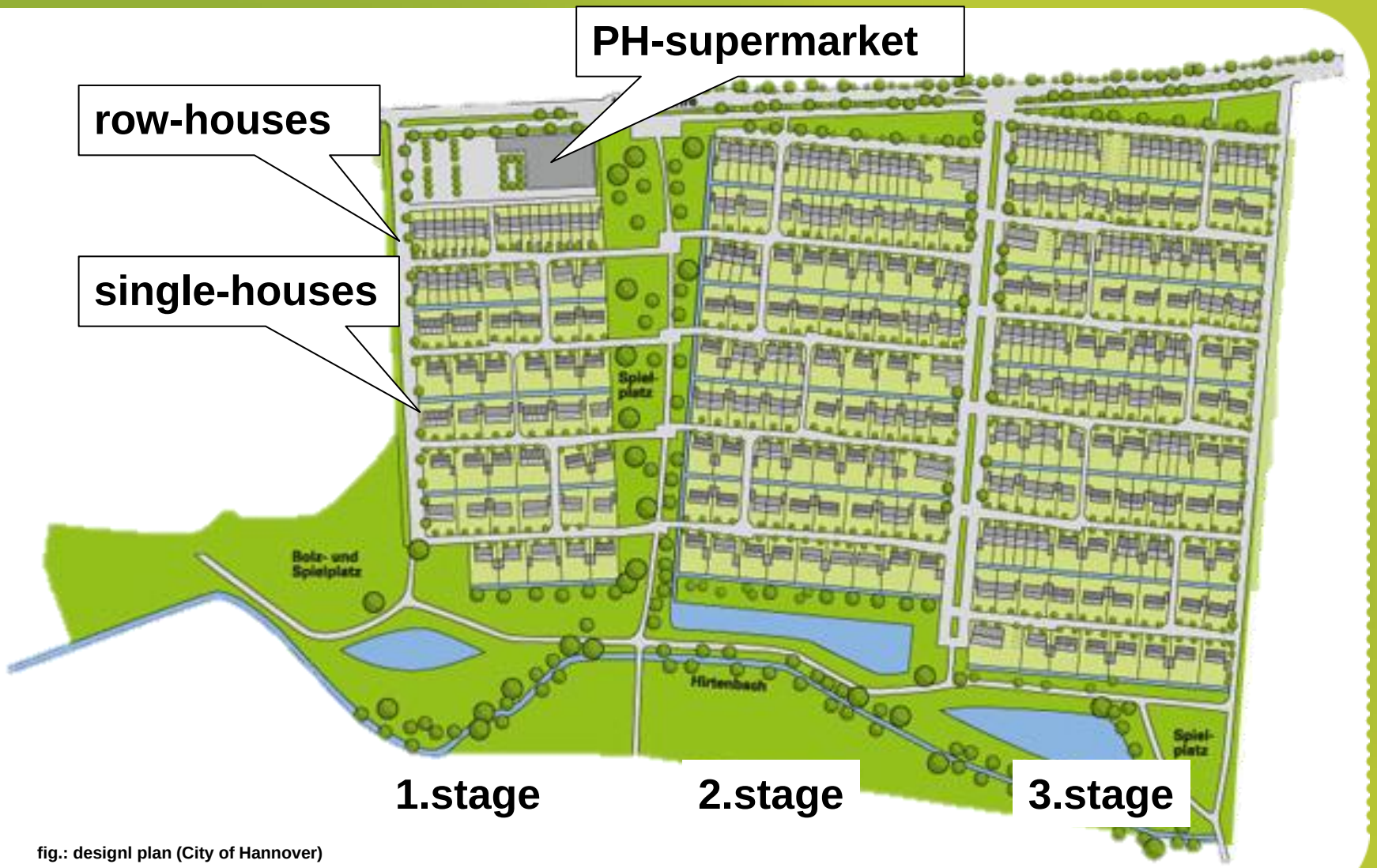

fig.: designl plan (City of Hannover)

zero:e-park – 2013

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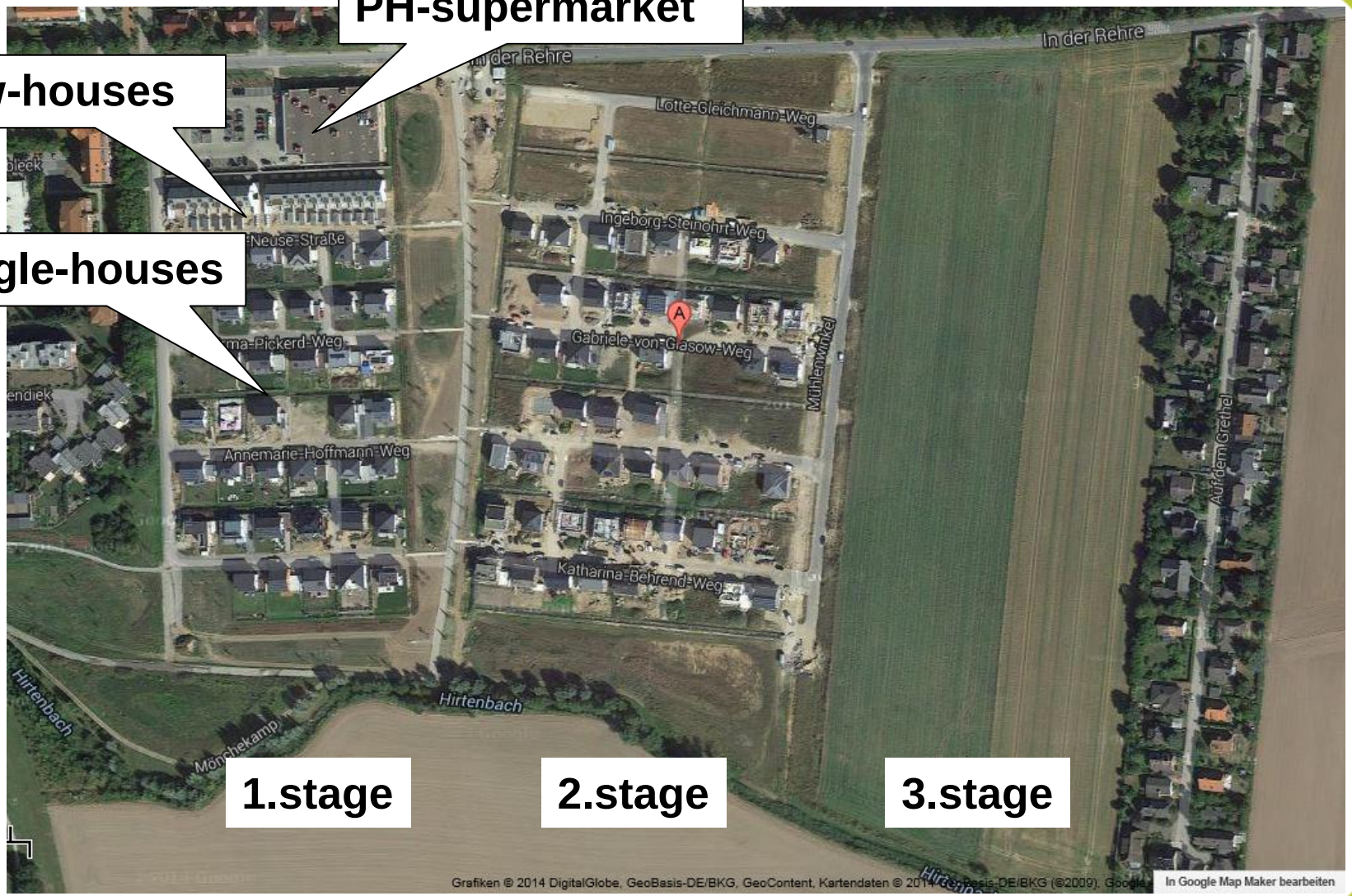

political discussion – road to zero-e

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EXPO 2000 district Hanover-Kronsberg with „Kronsberg standard“ (low energy standard)

PH-row houses Hanover-Kronsberg

as of 2000:
local housing corporation meravis (formely Reichsbund Wohnungsbau) look for developable plots and permissions to build

experience with PH

“market“ initiative to build

experience with RES

City of Hanover council decision 2002:
high ecological standards
→ new neighbourhood in Hanover-Wettbergen has to follow zero-emission-targets (CO2-neutral)

2002 – 2005: discussion what is “zero-e” and how to reach it

development partner

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meravis
mensch • raum • vision

meravis Wohnungsbau- und Immobilien GmbH

NLG
aktiv für land und leute

Niedersächsische Landgesellschaft mbH

Hannover

City of Hanover

framework – climate protection plan

Climate-Alliance 2020 Hanover (2008):
40 % CO2-reduction until 2020 on level 1990

City of Hanover council decision 2007: “ecological standards”

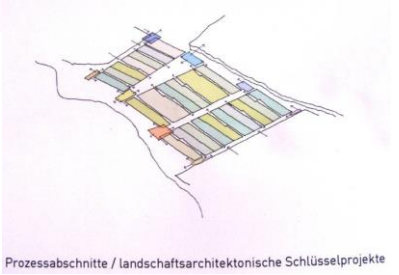
- **Energy (solar-) optimized urban development**
- **Passive House / High energy standard resolution to buildings in municipal influence (Urban development and sale contracts**

technical feasibility

2005 local development started

2005 energy concept studies by proKlima and climate protection unit city of Hanover

2005 - 2006 urban development competition 1st prize AG Baufrösche / foundation 5+



2007 – 2009 detailed studies and work on the development plan and regulations

2010 1st construction side started

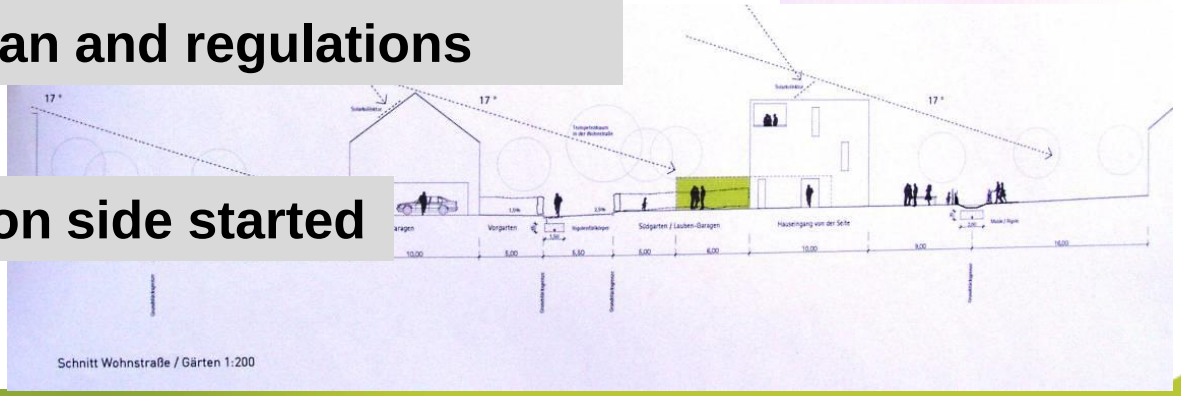


Fig. AG baufrösche und foundation 5+

technical feasibility

energy studies:

starting point: Passive Houses with minimum energy demand →

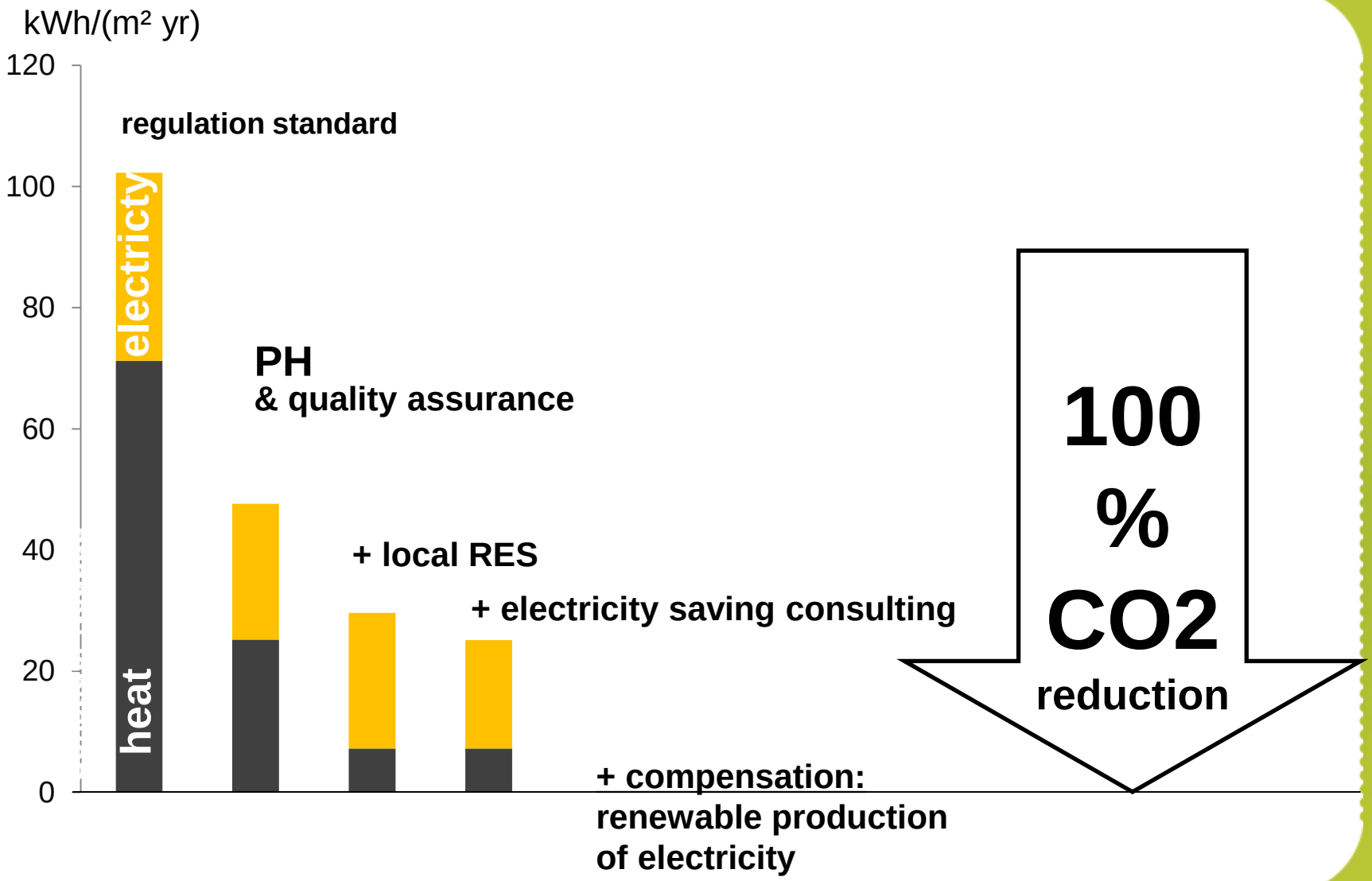
gas-supply/ gas-grid is not economic

district heating is not economic because of high level of heat losses

Need of variable heating solutions

with renewables (thermal solarplants and PV)

energy concept



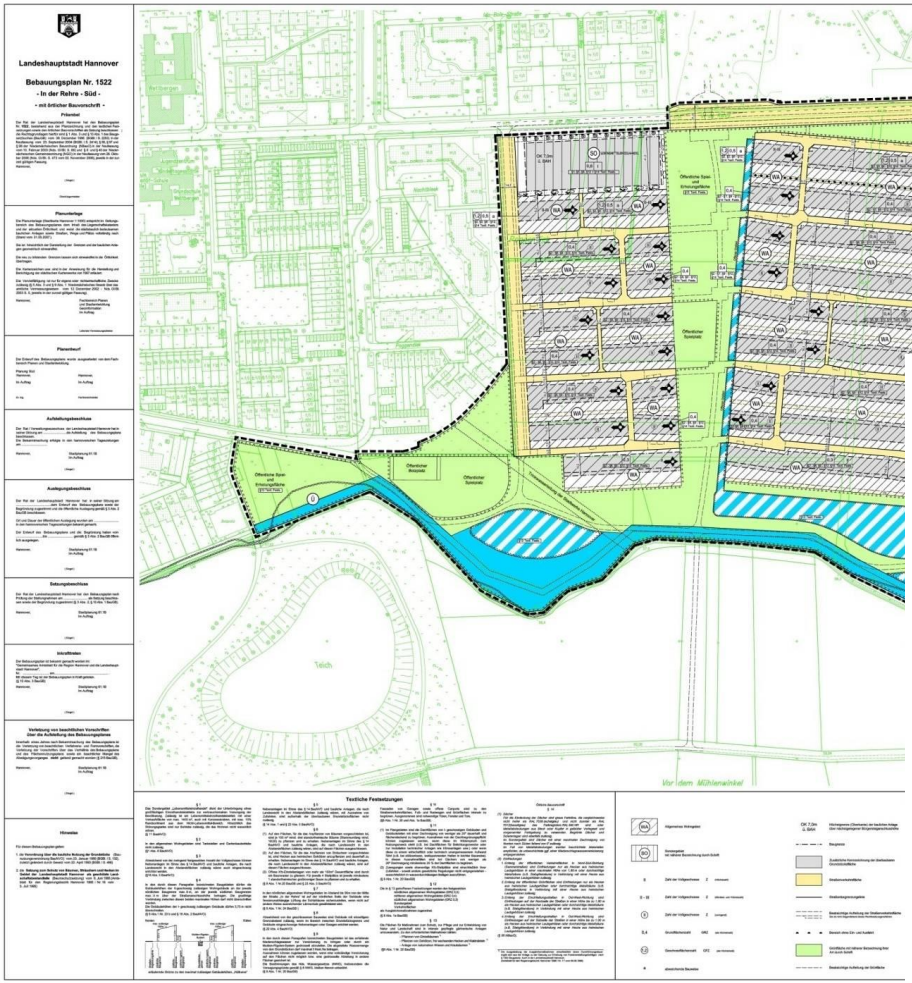
CO2 balancing

compensation per housing unit:

	1,600 kWh/yr	**heat demand**
		(DHW + heating system + vent. system)
+	**2,400 kWh/yr**	**electric demand**
	4,000 kWh/yr	**total demand**

x 330 housing units = 1,320 MWh/yr → by local hydro power

development plan

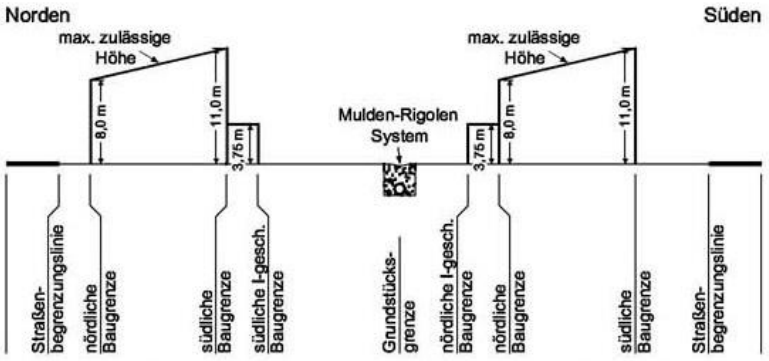


§ 4

In den durch diesen Paragrafen bezeichneten Baugebieten dürfen die Gebäudehöhen der II-geschossig zulässigen Wohngebäude an der jeweils nördlichen Baugrenze max. 8 m, an der jeweils südlichen Baugrenzen max. 11 m über der Straßenanschlusshöhe betragen. Die gradlinige Verbindung zwischen diesen beiden maximalen Höhen darf nicht überschritten werden.

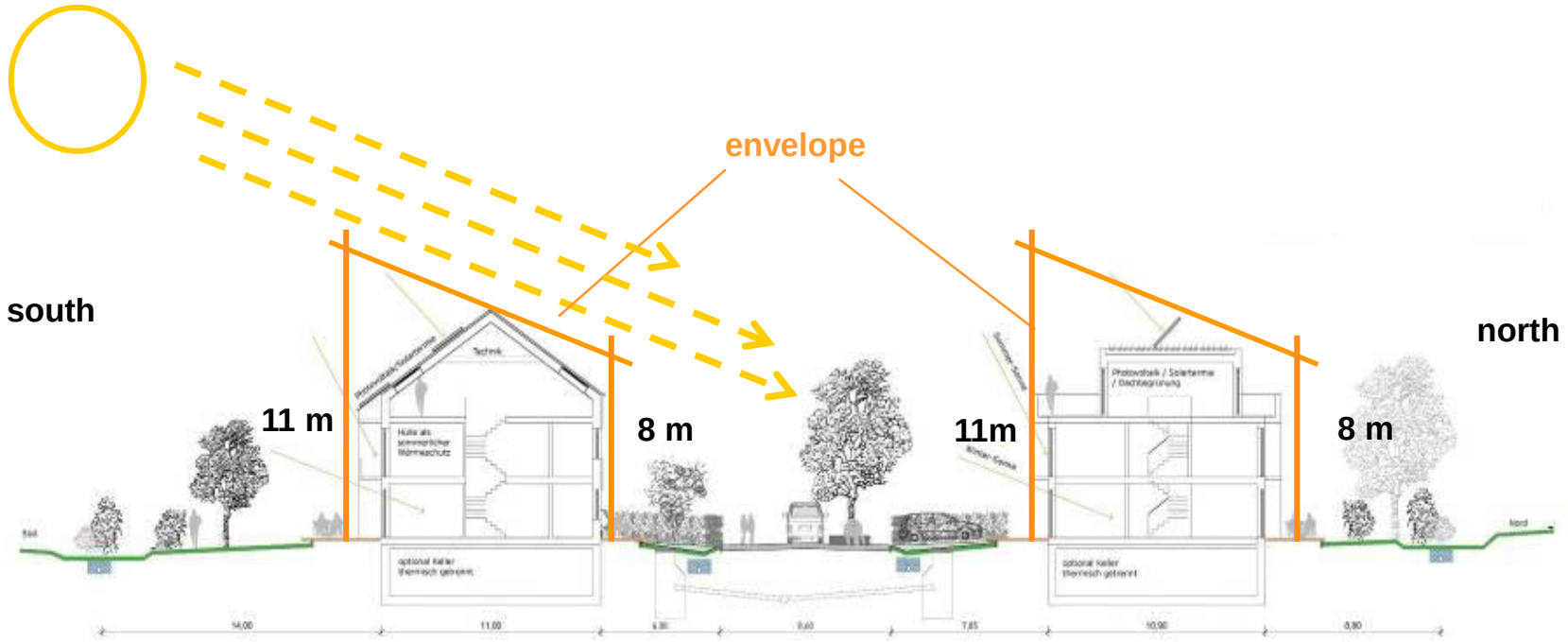
Die Gebäudehöhen der I- geschossig zulässigen Gebäude dürfen 3,75 m nicht überschreiten.

(§ 9 Abs.1 Nr. 23 b und § 16 Abs. 2 BauNVO)



erläuternde Skizze zu den maximal zulässigen Gebäudehöhen, „Hüllkurve“

local plan guarantees solar input



The envelope curve determines distances between buildings and heights for the homes that will be built. Within these limits, building owners still have plenty of room for various building and roof shapes so that they can implement individual, high-quality architectural designs.

Fig. AG baufrösche und foundation 5+

property sale contract and conditions

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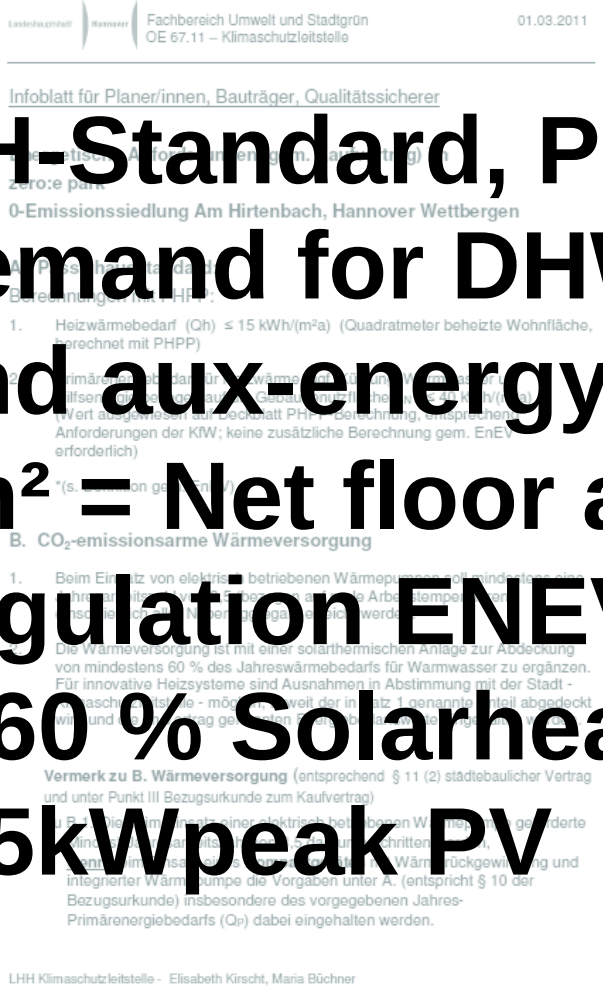

Fachbereich Umwelt und Stadtgrün 01.03.2011
OE 67.11 – Klimaschutzleitstelle

Infoblatt für Planer/innen, Bauträger, Qualitätssicherer

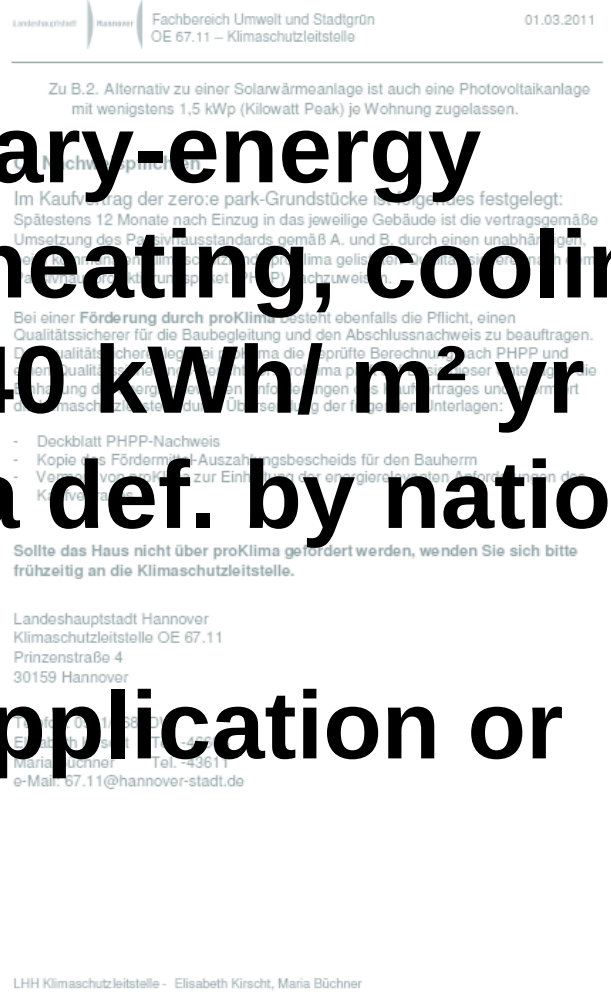
0-Emissionssiedlung Am Hirtenbach, Hannover Wettbergen

1. Heizwärmebedarf (Qh) ≤ 15 kWh/(m²a) (Quadratmeter beheizte Wohnfläche, berechnet mit PHPP)

B. CO_2-emissionsarme Wärmeversorgung

Vermerk zu B. Wärmeversorgung (entsprechend § 11 (2) städtebaulicher Vertrag und unter Punkt III Bezugsurkunde zum Kaufvertrag)

LHH Klimaschutzleitstelle - Elisabeth Kirscht, Maria Büchner


Fachbereich Umwelt und Stadtgrün 01.03.2011
OE 67.11 – Klimaschutzleitstelle

Zu B.2. Alternativ zu einer Solarwärmeanlage ist auch eine Photovoltaikanlage mit wenigstens 1,5 kWp (Kilowatt Peak) je Wohnung zugelassen.

Im Kaufvertrag der zero:e park-Grundstücke

Bei einer **Förderung durch proKlima** besteht ebenfalls die Pflicht, einen Qualitätssicherer für die Baubegleitung und den Abschlussnachweis zu beauftragen.

- Deckblatt PHPP-Nachweis

Sollte das Haus nicht über proKlima gefördert werden, wenden Sie sich bitte frühzeitig an die Klimaschutzleitstelle.

Landeshauptstadt Hannover
Klimaschutzleitstelle OE 67.11
Prinzenstraße 4
30159 Hannover

Tel. -43611
e-Mail: 67.11@hannover-stadt.de

LHH Klimaschutzleitstelle - Elisabeth Kirscht, Maria Büchner

PH-Standard, Primary-energy demand for DHW, heating, cooling and aux-energy < 40 kWh/ m² yr (m² = Net floor area def. by nation. regulation ENEV);
> 60 % Solarheat application or 1,5kWpeak PV

role of proKlima

financial incentives:

owners

information and training:

owners / construction workers

organisation of quality assurance process

+ expert knowlegde → involved in energy studies

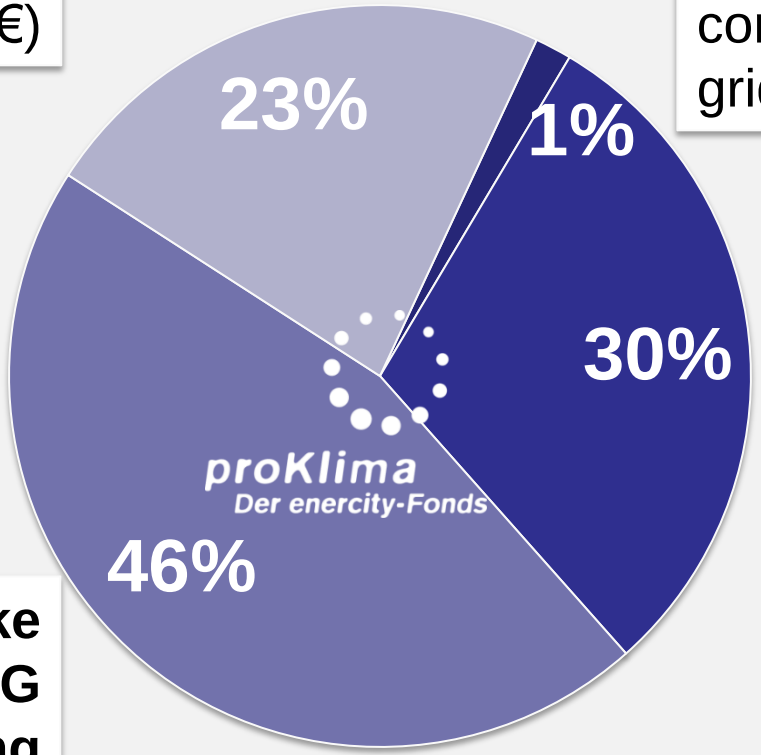
proKlima fund – established 1998

Foto: proKlima Partners - extension of the contract, 2004

proKlima – financing model

City of Hanover
(3.25 %, max.1 M €)

4.4 M €/year*



Suburb-cities:
concession levy for grid usage (2.5%)

enercity Stadtwerke Hannover AG profit sharing
(3.25 %, max. 2 M €)

enercity Stadtwerke Hannover AG gas price component
(0.05 ct/kWh)

*** in 2013**

proKlima – statistics

1 EUR support generates 13 EUR local investments.

Quelle: Pestel-Institut Hannover, 2011

proKlima – subsidies

proKlima supports new Passive House residential buildings

single house **semi-detached house** **row house**	**5,000 EUR/ house**
apartment house	**3,000 EUR/ dwelling**

conditions:
Passive House Standard + Quality Assurance
maximal support: 50,000 EUR per house

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Start of construction 2010

Foto: pr-omotion/ City of Hanover

success story zero:e-park

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Start / end of sale

1. stage: 2010/2012 (Plan End 2013)

2. stage: 2012/2013 (Plan End 2017)

3. stage: 2013/…. (Plan End 2021)

Foto: 03/2014 proKlima/M. Wohlfahrt

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End of Summer 2014: sold out of all single plots

www.zero-e-park.de

Foto: 03/2014 proKlima/M. Wohlfahrt

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voluntary monitoring programme

Fig.: voluntary monitoring programme for zero:e park- building owners (source proKlima)

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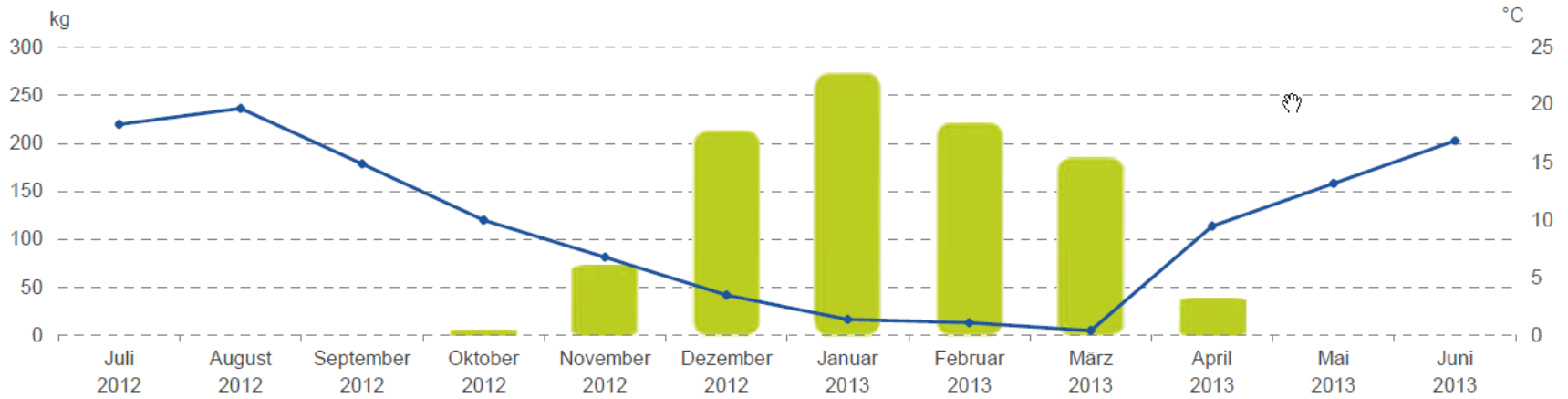
monitoring example

consumption wooden pellets per month



Consumption of wooden pellets: 1,011 kg

= 136 kg CO2-Equivalent

success story – exemplary zero:e house

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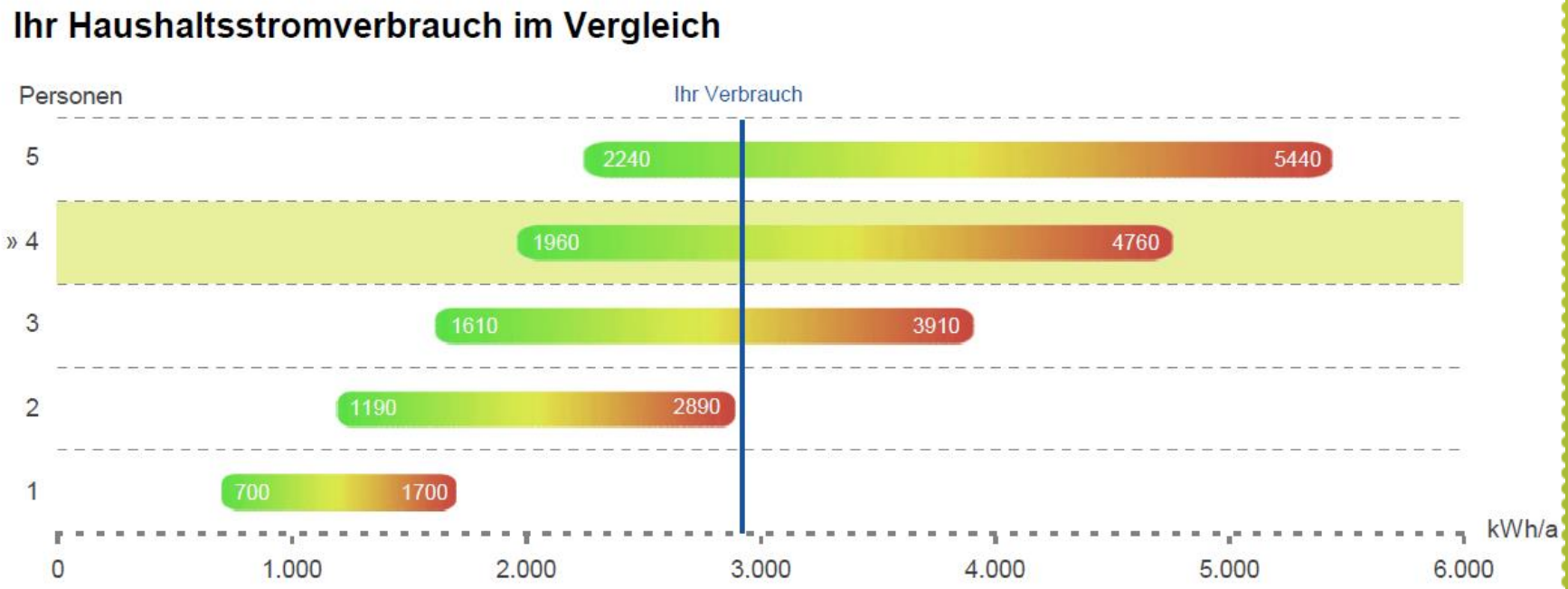
consumption of domestic electricity per year



electr. consumption: 2,920 kWh

= 2,745 kg CO2-Equivalent

success story – exemplary zero:e house

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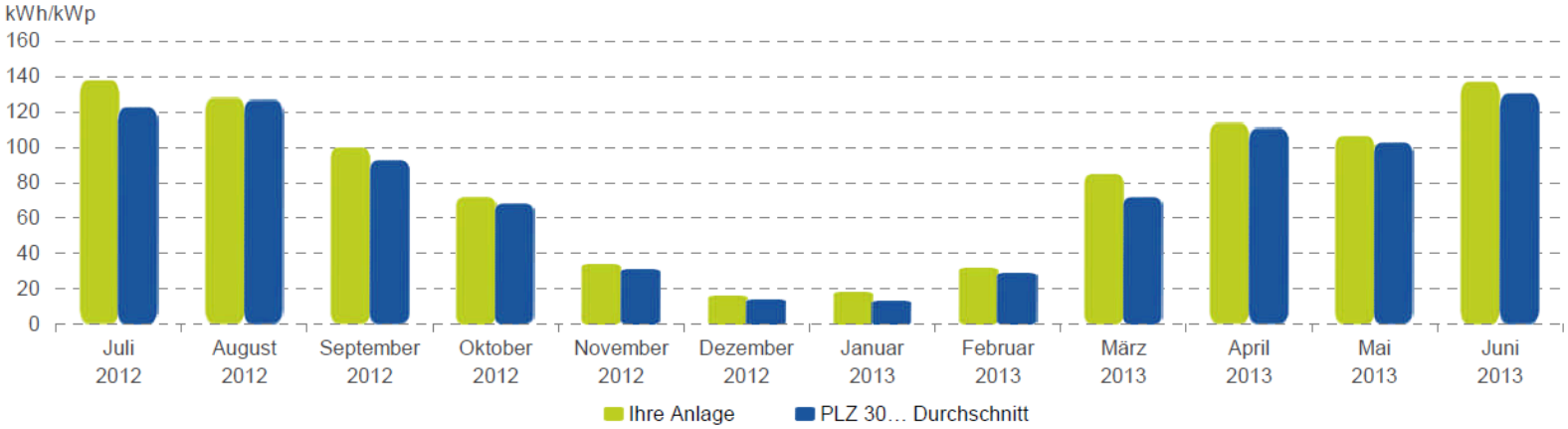
PV-earnings per month

Die Ernte Ihrer PV-Anlage im Vergleich zu anderen Anlagen in monatlicher Übersicht



Die Effizienz Ihrer Anlage in kWh pro Nennleistung wird mit einem regionalen Durchschnittswert aus der Online-Datenbank "www.pv-ertraege.de" verglichen. Ihre Anlage erreicht einen jährlichen Ertrag von 980 kWh/kWp und liegt damit oberhalb des regionalen Vergleichswertes von 915 kWh/kWp.

production of electricity (PV-panels): 5,582 kWh

success story – exemplary zero:e house

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consumpt. of wooden pellets :

1,011 kg = 136 kg CO2-Equivalent

corresponds roughly to

145 kWh electricity

+

domestic electricity consumpt. :

2,920 kWh = 2,745 kg CO2-Equivalent

=

Electricity-Equivalent: 3,065 kWh

production of electricity (PV): 5,582 kWh

success story – PH supermarket

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REWE **supermarket**, zero:e-park, Hanover (2012)

→ Developing the Standard and monitoring by PHI

PassREg Study Tour Hanover , May 2012

success story – PH supermarket

REWE **supermarket**, zero:e-park, Hanover (2012)

→ **Developing the Standard and monitoring by PHI**

Fotos: proKlima/Olaf Mahlstedt

Architects: Spengler-Wiescholek, Hamburg

barriers and success factors

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first barriers:

- refusal by planners and real estate developers → generate excessive prizes for PH buildings ?

turnaround / success factors

- free building design is possible (limited market of free building plots in Hanover)
- first „projects“ (beacon effect)
- (early) consulting is required (owners)
- contract to built was connected with mandatory use of quality assurance and compliance with PH Standard → penalty clause

zero:e-park
experience between the lines

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We plan to buy a plot of land, how could we fullfill the conditions?

We bought a plot of land, what should we do next?

“passive house is a research project”

“passive house is normal, because my neighbour doesn’t fail.”

Thank you for your attention!

Matthias Wohlfahrt
Program Manager
Non Residential Buildings and
Energy Efficiency for companies

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Partner of PassREg

Foto: proKlima team at Int. Passive House Conf. Hannover 2012