WORLD GREEN INFRASTRUCTURE NETWORK
vegetation makes it possible!

Hochschule Neubrandenburg
University of Applied Sciences

World Green Infrastructure network

Manfred Koehler, *

Prof. Dr. **Manfred Koehler**,

Hochschule Neubrandenburg, Präsident WGIN,

Agenda

- 1. Who we are? The network since 2007
- 2. Themes: Green Roof, facades, - Indoor – and related topics.
- 3. GI and Politics –
  - throughout Europe
  - North America
  - Latin America ….
  - Asia …. (Example India)
- 4. Focus on some Examples from Germany
- 4.1 Some highlighted examples from our (WGIN publication 2019)
- Adlershof Berlin …
- Wagnis Munich
- Munich, case studies (Maria Auböck)
- 4.1.1 Berlin: lessons learned: the last 30 years

  Eco house Rauchstr. / Block 108 / Ufa / BUGA 1985
- 5. Lessons learned – for a greener future – What is next?

1. Who we are

- Association of national non-governmental GI-Associations
- - Mission: To support establishing national associations …
- - Share information by working groups on Rain water, biodiversity, construction materials,
- **Europe:** BUGG – Germany, Adivet – France, … Norway,
- Pronatur – Spain, Belgium, SGRA –Scandinavia, Portugal …
- **America:** GRHC (North America), Amena –Mexico, Recive – Colombia, ATV – Brasil, Chile …
- **Asia:** IGIN – India, IRLA – China, Assoc. Vertical Greening, Japan,
- South Korea, Taiwan, Hongkong, Singapore,
- IGRA - Tehran,
- **Australia:** GRA – Australia
- Cross membership to EFB

2. Themes

- 1. Green roofs –Intensive – semi intensive - Extensive
- And related terms, such as: Sky gardens, Blue – green infrastructure …
- 2. Green facades and living walls.
- 3. indoor greening
- 4. Rain water management
- 5. Solar technology in contact with buildings
- 6. Guidelines and maintenance requirements
- 7. Research activities
- 8. Interpretation of City politics.

2. 1 **Green roofs –Intensive – semi intensive - Extensive And related terms, such as: Sky gardens, Blue – green infrastructure**

Orig. Köhler, 2019. May 29

2. 2 **Green facades and living walls**

- 29th of May 2019

2. 3 **Indoor greening**

Example: Prisma Nuremberg

2.4 **Rain water management**

Koehler, 2019, May 29: Berlin: Märkisches Viertel

2.5 **Solar technology in contact with buildings**

Koehler, 2019, May, 29

2. 6a Guidelines – Example Germany

- **FLL 2018**

2.6b Maintenance as important factor

- **Living Wall, Patrick Blanc, Berlin – Friedrichstr., 2019-May-29**

2.7 Research activity

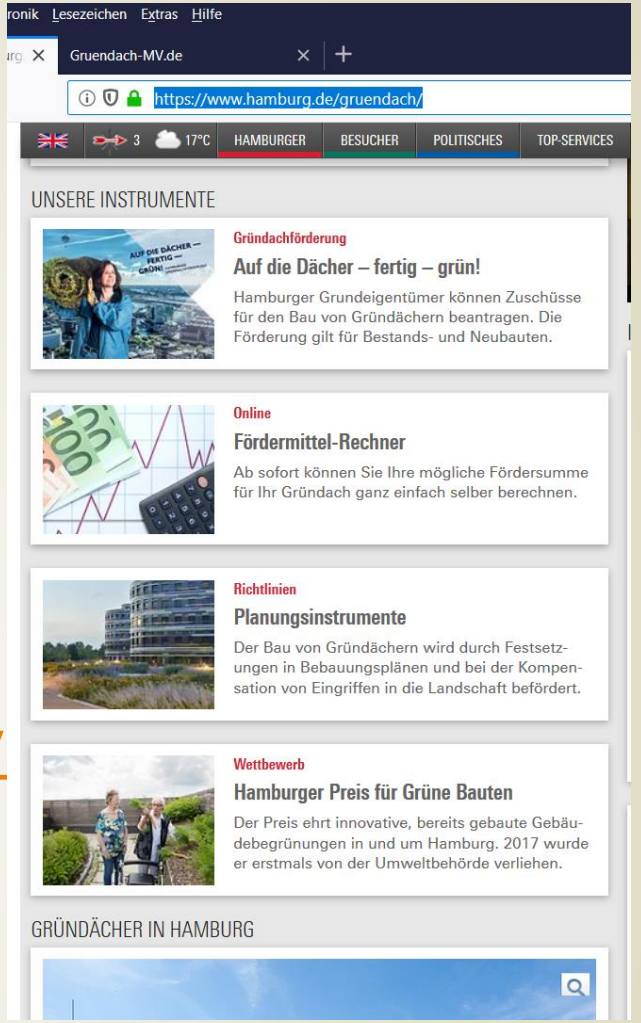
2.8 City politics

- Overview by BUGG,
- Incentives:
- Green roof politics in Hamburg
  https://www.hamburg.de/gruendach/

- versus regulation by laws (legal planning) in Berlin:

  -BFF (Habitat area factor BFF – Berlin)

https://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/htm



3. GI and politics

- **GI and Politics – throughout Europe**
- **EFB-survey (**

- **… North America**
- **GRHC – Presentation (S.Peck)**

- **… Latin America ….**
- **RECIVE, Kolombia – Andres Ibanez,**

- **… Asia …. (Example India, IGIN Hemakumar)**

4. Focus on the situation in Germany

- **4.1 BUGG**
- **4.2 Number of Green roofs about 10.Mill m² each year, about 85% extensive**
- **4.3 Survey about situation in German cities:**
  - **1/3 has regulations in legal plans**
- **4.4 Annual Conferences in Green roof, Façade and Indoor greening.**

5. Some highlight projects

- **(WGIN publication 2019)**
- **- Adlershof Berlin**
- **- Wagnis Munich**
- **- Munich, case studies (Auböck)**
- **- Berlin: lessons learned the last 30 years:**
  - **Eco house Rauchstr. / Block 108 / Ufa / BUGA 1985**

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5.1 Eco architecture in Berlin – lessons learned from the 1980th for today's solution

Manfred Koehler, Ulrike Grau*

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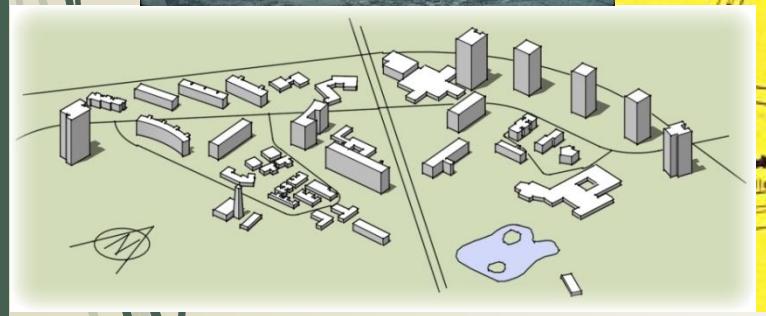
Agenda

- 1. Green architecture lab Berlin (West) after World War II
- 2. IBA 1957 and the post war time
- 3. Experimentals since 1970ths
  - Eco house Rauchstr.
  - Block 108
  - Ufa
  - BUGA 1985
- 4. Lessons learned – for the future

Orig. Frei Otto.

1. Green architecture lab Berlin (West) after World War II - Urban rentals in bad conditions

2. **IBA 1957 and the post war time**



Die Architekten und ihre Bauten

1	Müller	Berlin	4 Geschosse	22 Wohnungen
2	Gottwald	Graz	4 Geschosse	32 Wohnungen
3	Luckhardt u. Hoffmann	Berlin	4 Geschosse	28 Wohnungen
4	Schneider-Esleben	Düsseldorf	4 Geschosse	20 Wohnungen
5	Bezirksamt Tiergarten von Berlin, Amt für Hochbau		Kindertagesstätte	
6	Kreuer	Berlin	Kath. Kirche St. Ansgar	
7	Zinsser u. Pfarre	Hannover u. Berlin	Kino, Restaurant u. Läden	
8	Baldessari	Mailand	17 Geschosse	131 Wohnungen
9	van den Broek u. Bakema	Rotterdam	16 Geschosse	73 Wohnungen
10	Hassenpflug	München	16 Geschosse	76 Wohnungen
11	Lopez u. Beaudouin	Paris	16 Geschosse	87 Wohnungen
12	Schoszberger	Düsseldorf	16 Geschosse	61 Wohnungen
13	[illegible]	Berlin	Akademie der Künste	
14	Senn	Basel	4 Geschosse	16 Wohnungen
15	Fisker	Kopenhagen	3-4 Geschosse	16 Wohnungen
16	Taut	Berlin	3-4 Geschosse	19 Wohnungen
17	Schuster	Wien	3 Geschosse	21 Wohnungen
18	Eiermann	Karlsruhe	8 Geschosse	96 Wohnungen, Post
19	Niemeyer	Rio de Janeiro	7 Geschosse	78 Wohnungen
20	Jaenecke u. Samuelson	Malmö	10 Geschosse	69 Wohnungen, Läden
21	Düttmann	Berlin	Bücherei	
22	Aalto	Helsinki	8 Geschosse	78 Wohnungen
23	Vago	Paris	9 Geschosse	59 Wohnungen
24	Gropius	Cambridge, Mass. USA	9 Geschosse	67 Wohnungen
25	Müller-Rehm u. Siegmann	Berlin	16 Geschosse	164 Wohnungen
26	Lemmer	Berlin	Ev. Kaiser-Friedrich-Gedächtniskirche	
27	Baumgarten	Berlin	3 Geschosse	8 Wohnungen
28	Ludwig	Berlin	1 Geschoss	5 Einfamilienhäuser
29	Jacobsen	Kopenhagen	1 Geschoss	4 Einfamilienhäuser
30	Weber	Frankfurt a. M.	1 Geschoss	2 Einfamilienhäuser
31	Gieler u. Mäckler	Frankfurt a. M.	1 Geschoss	3 Einfamilienhäuser
32	Krahn	Frankfurt a. M.	1 Geschoss	3 Einfamilienhäuser
33	v. Möllendorff u. Ruegenberg	Berlin	2 Geschosse	1 Einfamilienhaus
34	Ruf	München	1 Geschoss	2 Einfamilienhäuser
35	Hönow	Berlin	1 Geschoss	1 Einfamilienhaus
36	Grimmek	Berlin	Grundschule	

- Source: https://de.wikipedia.org/wiki/Interbau
- Foto: Von Kurt Weinland - Eigenes Werk - Vater, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=20526102

1. Green architecture lab Berlin (West) after World War II

Oscar Niemeyer

Alvar Aalto

❖Source: https://de.wikipedia.org/wiki/Interbau

4. 1 Eco house Rauchstr. / Corneliusstr.

- **1000 interested**
- **Finally 26 groups/families selected**
- **10 architects involved**
- **Inner city ground**
- **Compact buildings**
- **Many eco features**

4. 1 Eco house Rauchstr.

- Google, 2018,
- See the roofs,

4. **Experimentals since 1970ths**

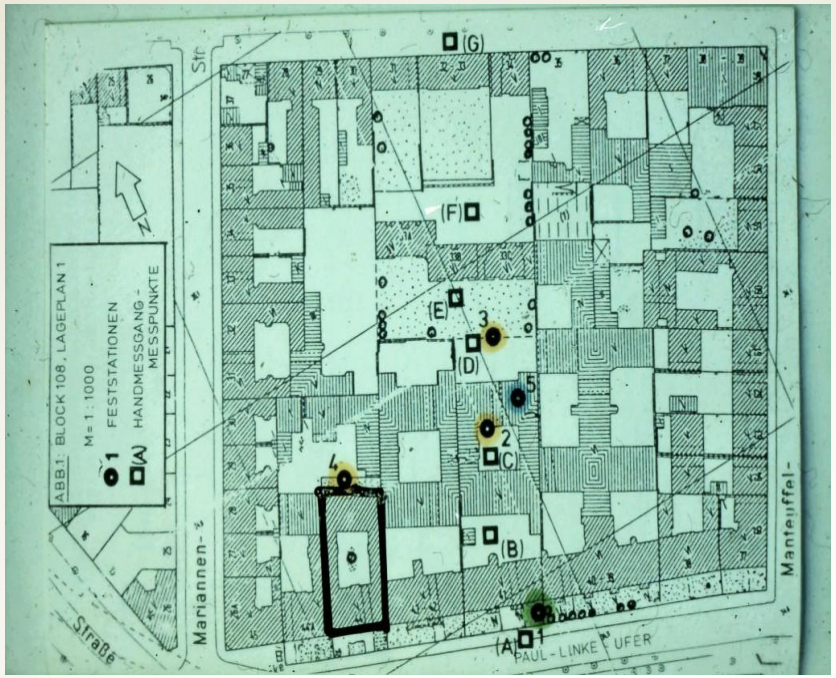
- **Eco house Rauchstr.**
- **Block 108**
- **Ufa**
- **BUGA 1985**

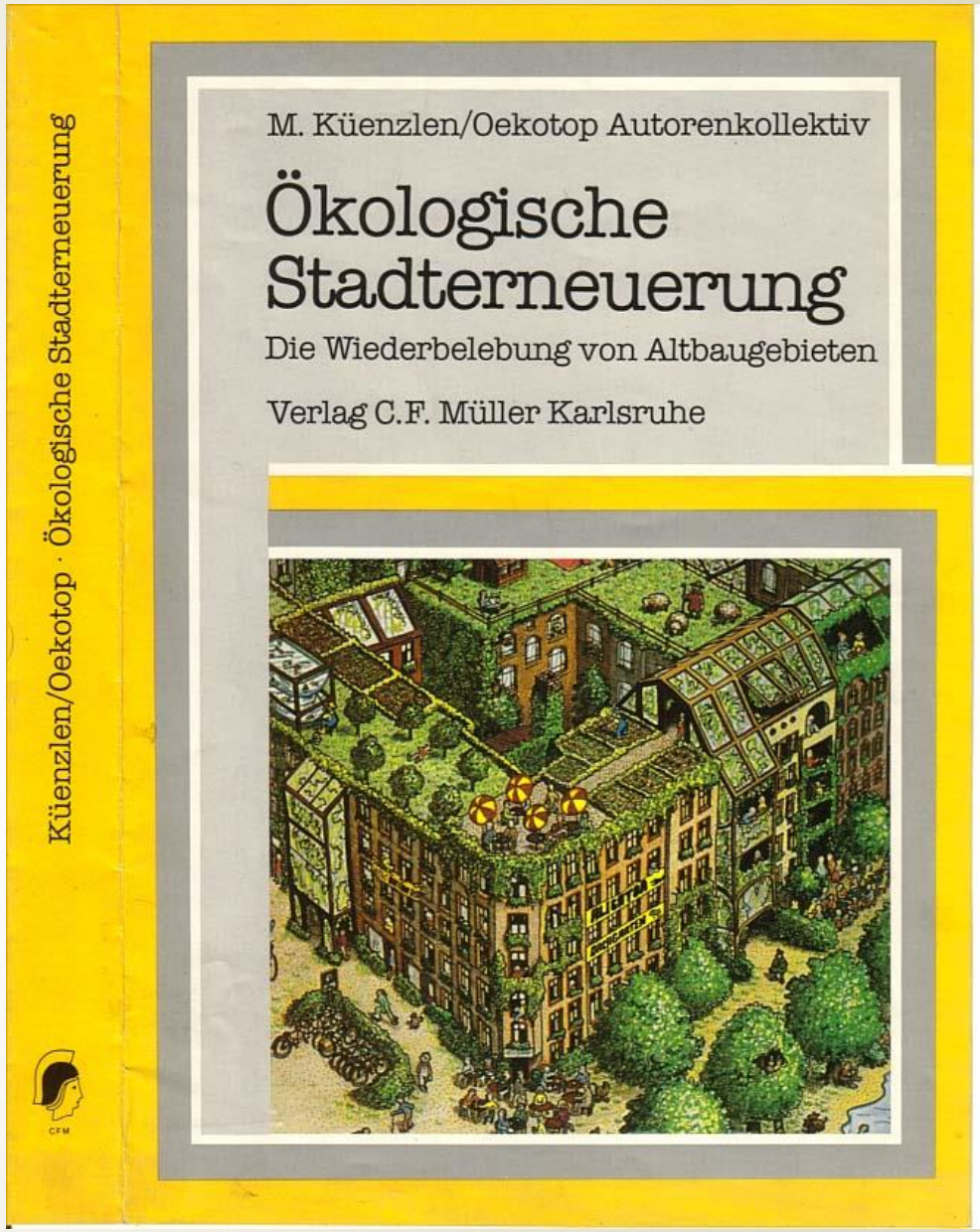
Eco – elements – called bricks

- **Reduction of ground paving**
- **Traffic**
- **Clima – Energy consumption**
- **Water**
- **Habitats – Faktor Green**
- Social

4. 2 Block 108

- **PLU 44**
- **1984**



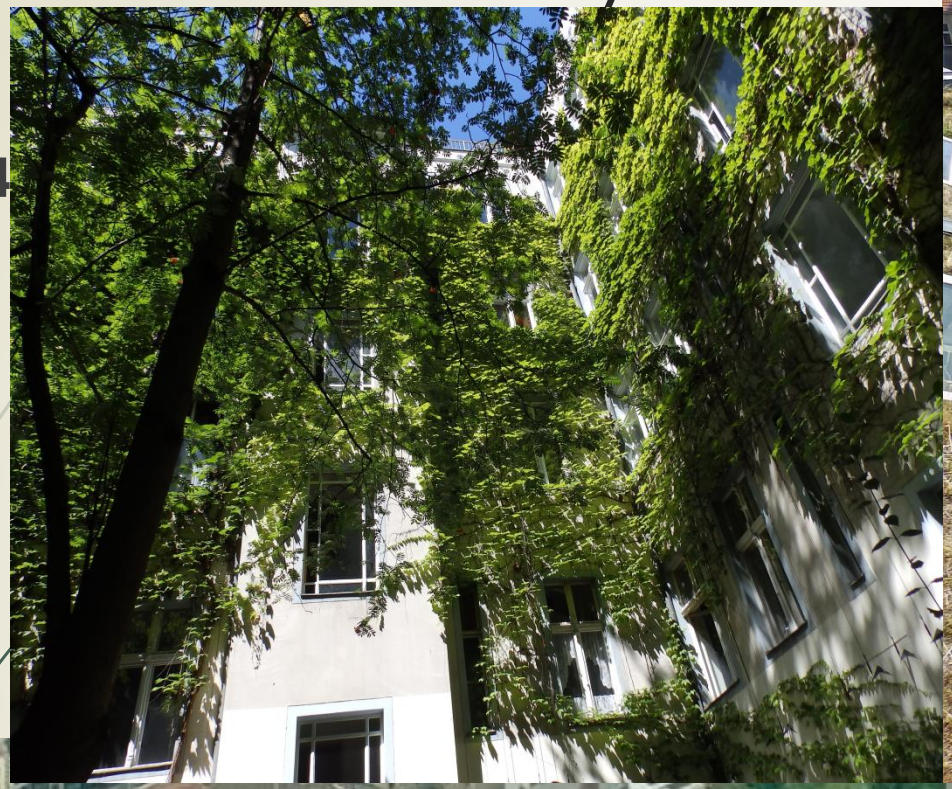


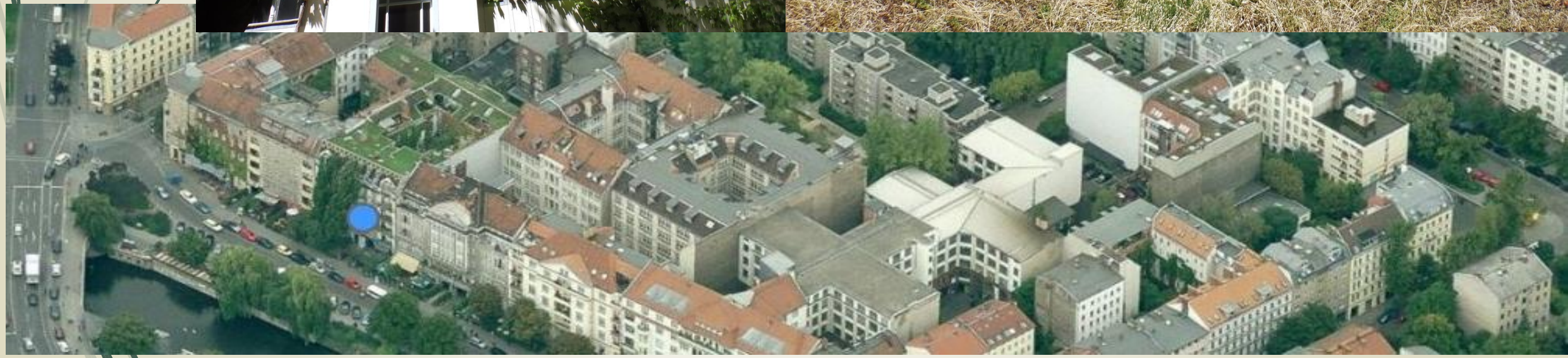
4. 2 Block 108

- **PLU 44**
- **1984**

4. 2 Block 108 today

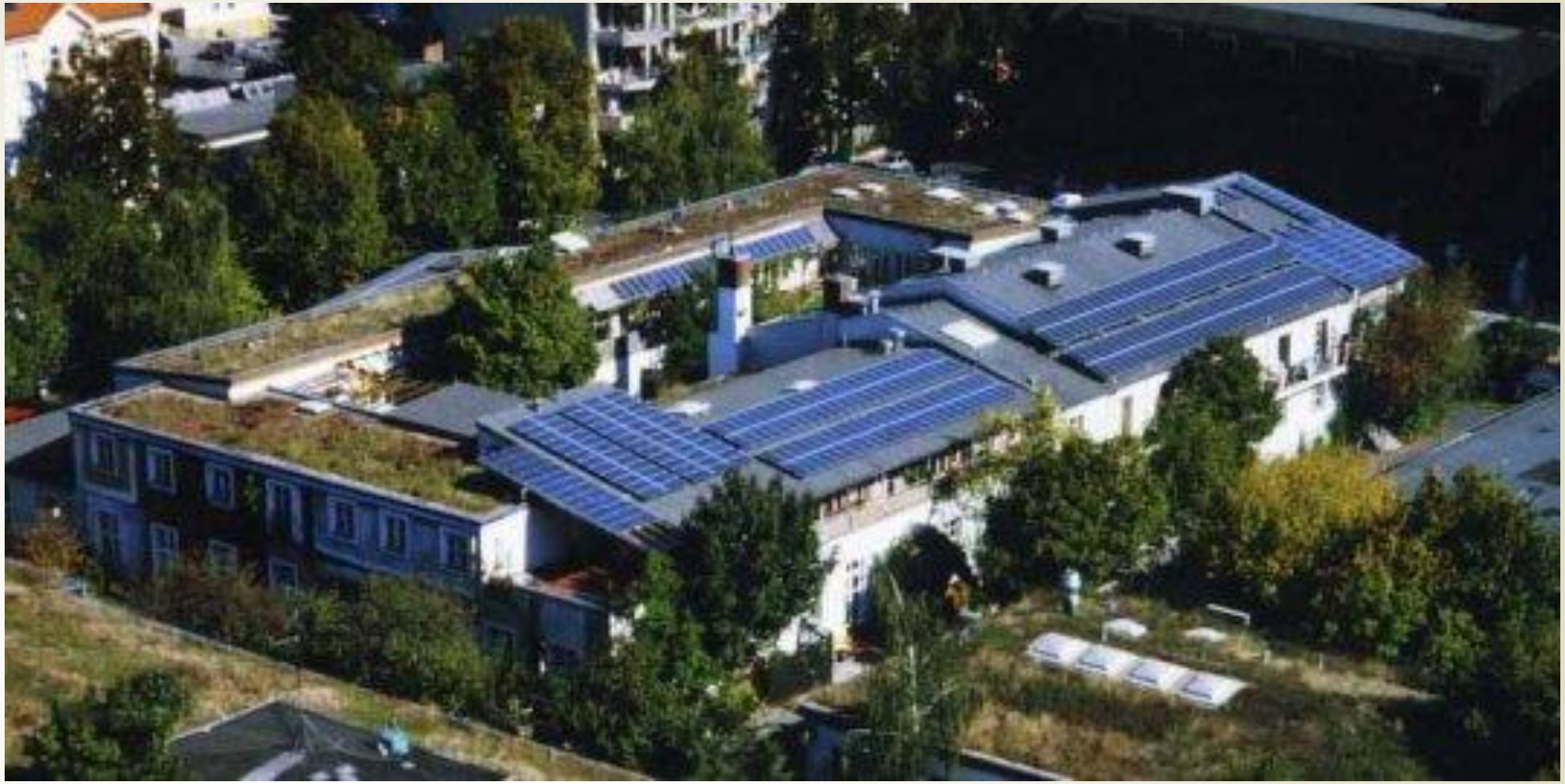
- PLU 44
- 2018





4. 3 Ufa

- 15.000m² space
- -Green roofs
- -green facades
- -BHKW
- -Rain water usages
- - PV Cells
- Cultural programs
- Social

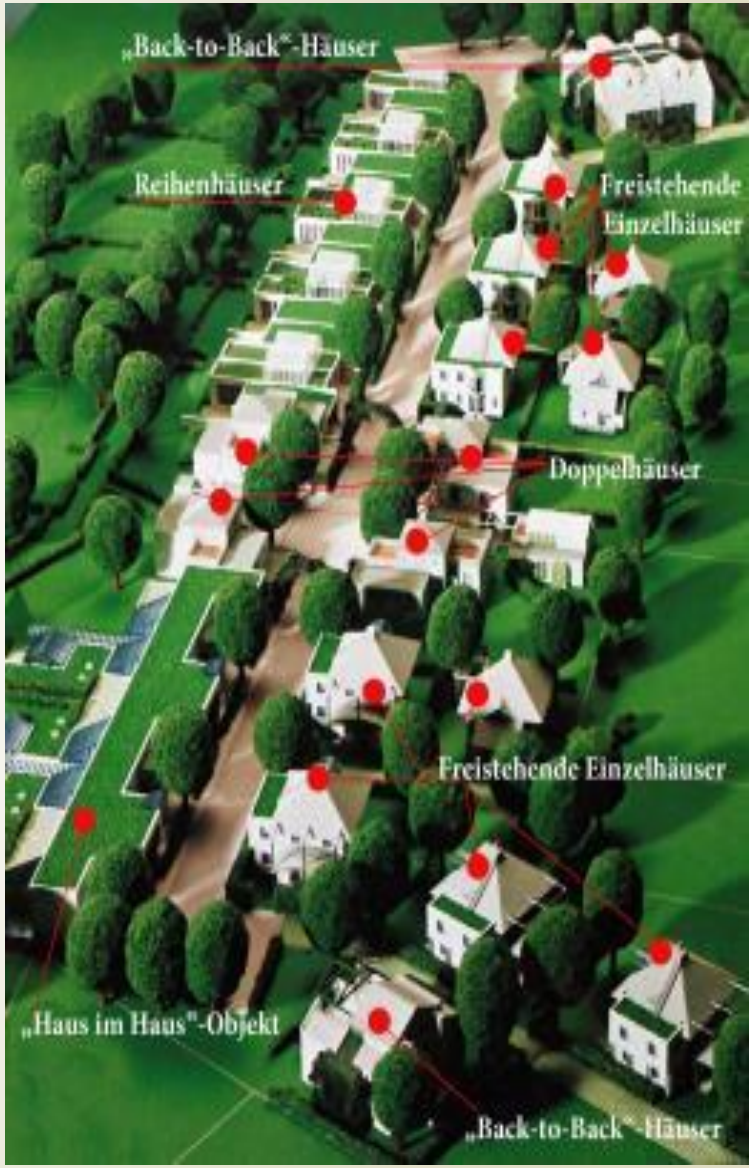


4. 3 Ufa

- **Some details: PV, Loam – architecture workshops**

4.4 BUGA houses 1985

Architects	Characterization	Main green features
1.Peter Stürzebecher 1941-2012	Compact single houses	-Eco gardens, -Green roofs, -Hedges,
2.Otto Steidle 1943-2004	Double-houses	-Engergy concept, -Earth architecture subsurface, Winter-garden as energetic buffer.
3. Erich Schneider-Wessling *1931	House in house	-Complex greening concept, -Intensive roof gardens, -Indoor greening and urban gardening features
4. Thomas Herzog *1941	Chain houses	-Urban roof garden, -Roof terraces, -Indoor urban gardening with direct ground contact
5. Bernd Faskel *1943	„Back to Back“ - houses	-Compact cubature energtic optimised, compact four houses together, -Indoor greening as climate buffer, -Climber and espalier fruits.

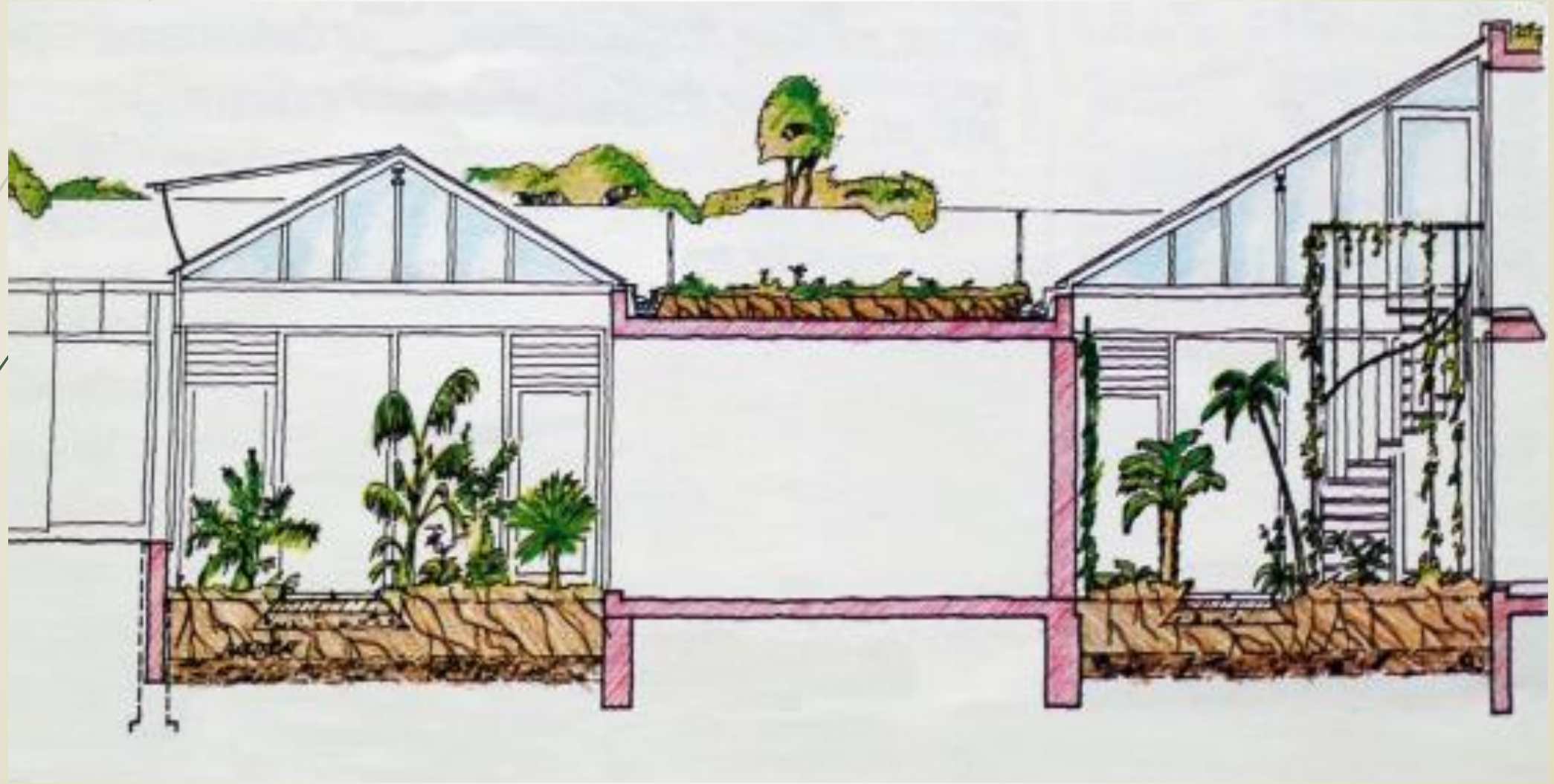


4.4 BUGA houses 1985

- : Chain house roof gardens, from Thomas Herzog, left: 1990, right 2018

4.4 BUGA houses 1985

Cross section of the „house in house“ from Erich Schneider-Wessling.

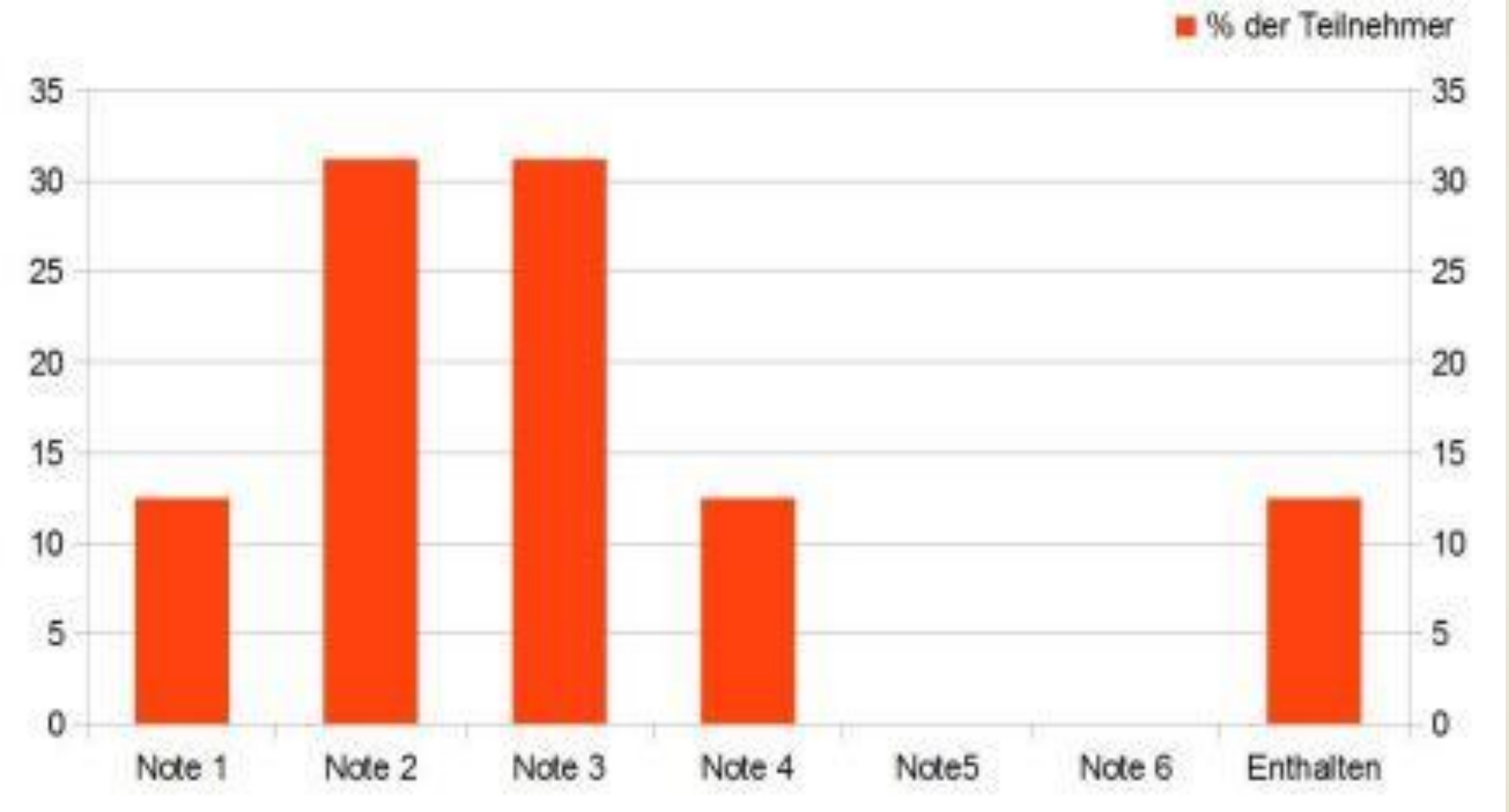


4.4 BUGA houses 1985

Climber at the Back to Back-houses of Bernd Faskel

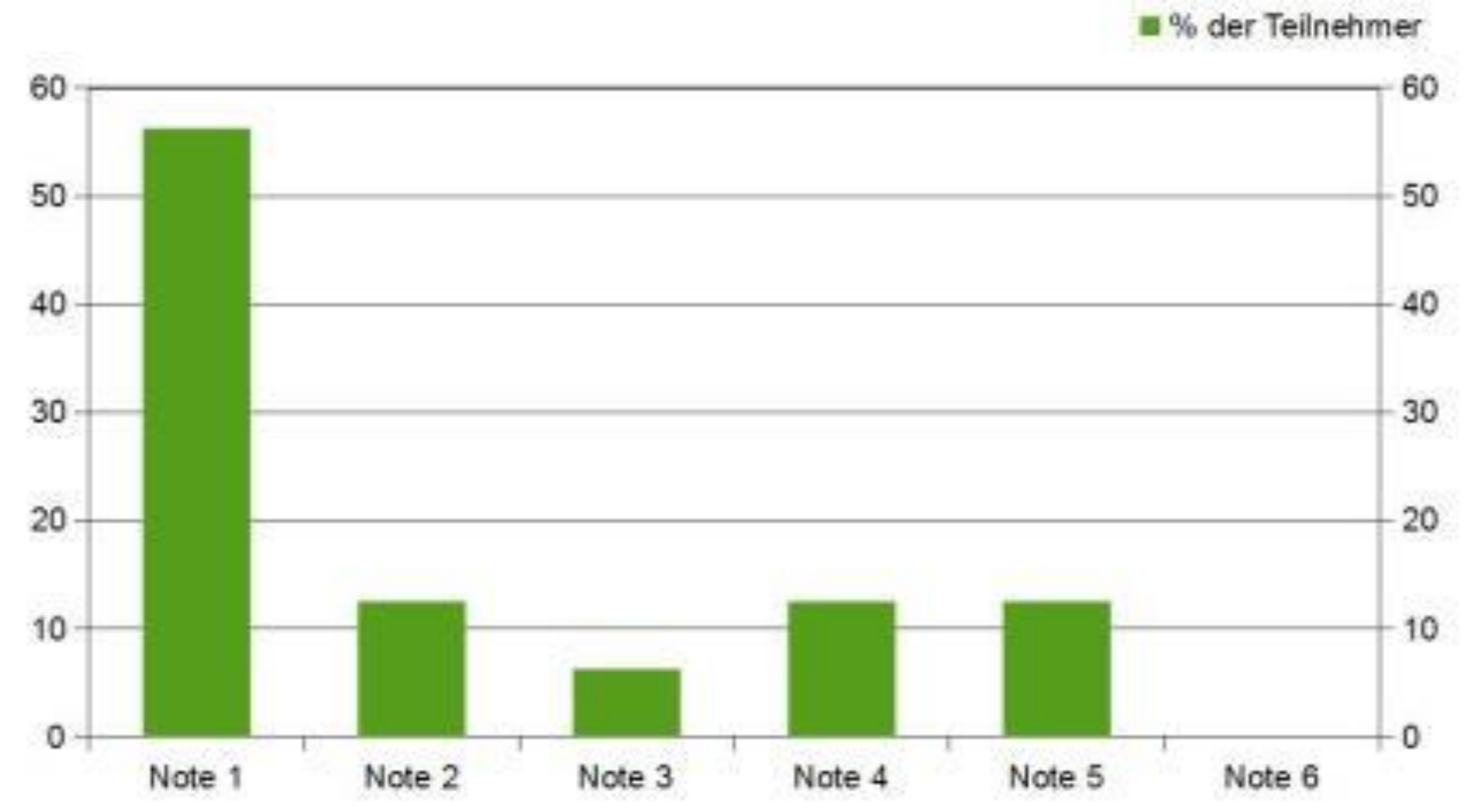
4.4 BUGA houses 1985

Do you use the opportunity for food production on your building (1=yes – 6 no)



4.4 BUGA houses 1985

Are you happy with your extra space on the roof, atrium or winter garden? (Yes 1 – No= 6)



4.4 BUGA houses 1985

Question	Yes – percentage of the answers % der Teilnehmer	No, % of the answers
Are you happy with the Winter-/roof gardens at your home?	100%	0
Are the Wintergarden / Green roofs locations of your relaxtion?	94	6
Is the necessary maintenance of the Winter-/Roof gardens an burden for you?	13	87
Do you feel a higher quality of live related to the other without such green structures?	100	0
Is there a Können Sie behaupten, dass eine besondere Wohngemeinschaft zwischen Besitzern der “grünen Häuser” entstanden ist?	38	62
Ist der Winter-/Dachgarten auch in der kalten Jahreszeit für den Pflanzenanbau nutzbar?	50	50

4.4 BUGA houses 1985

-Evaluation of the Eco-houses BUGA 1985 – in the year 2016* and a summarized view of current Greening building technologies in the last years (2018).

	Aims		1985	Evaluation	2018
1	Compact neighborhood, "called space saving buildings"		X	Success	X
2	Urban food production		X	Too difficult, only marginal realized	X
3	Intensive Green roofs		X	Roof terraces are in use and a great benefit	X
4	Green Facades		X	Success	X
5	Passive heating/cooling		X	Success	X
	Future ideas of the last years.				
	Energy plus buildings				X
	Solar heating				X
	Individual PV – Energy systems				X
v	Rain water systems				X
	Local biodiversity concepts				X
	Living walls				X ?
	Digital smart home (traffic, energy, consumption, …)				X ?

4.5 Project data of the four case studies

Criteria	Rauchstr.	Block 108	Ufa	BUGA 1985
Ownership	Building lease, Erbbaurecht	Several ind. owner	Legalized	Individual owner
Size	26 Appartements Max 100 persons	200+ Appartements 2200+ residents	30plus residents and 180 employees	26 family houses Max 100 persons
Architects	Frei Otto, Bernward Derksen, Alessandro Vasella, Eckhard Hahn, and Several for the individual appartement planning.	Martin Küenzlen and the team Oekotop	n.a.	Bernd Faskel, Thomas Herzog, Erich Schneider-Wessling, Otto Steidle Peter Stürzebecher
Decision make procedure	Selection procedure, common aim discussion	Owners discussion and neighborhood convention	Occupier forum	Discussion forum
Year of establishment	1983-1992	1984-1986	Since 1979	1984-1986
Financing	Private, State, federal	Private, state, federal	Private, state, federal	Private, state.
Overall owner	Private- building lease	private	Building lease,	private
Satisfaction of the residents	high	high	high	high
Urban type	Compact villas	Block structure, 5 stories.	Individual buildings in parkland	Compact chain houses, single houses
Age	New	Retrofit	Retrofit	New
Located in Berlin …	Inner City	Inner City	Commuter	Commuter

4.5 Eco features realized

Criteria eco-features	Rauchstr.	Block 108	Ufa	BUGA 1985	New eco functions 2019
Green roofs Extensive, Intensive Urban farming Biodiversity roof	 X X -- --	 X X -- --	 X X X (X)	 X X X --	x x x x x
Green facades Climber Living walls	 X -	 X -	 X -	 X -	x
Energy concept	X	X	X BHKW	X	X Energy plus
Waste concept	x	X	X	n.a.	x
Mobility concept	X	X Bicycles	x	n.a.	X Car sharing
Solar energy	X	-	x	n.a.	X Energy plus
Rain water managemet	X	X	X	(X)	x
Indoor greening	n.a.	-	-	X	x

4.5 Recommendations for future projects, inner City/ commuter region; small about 100 citizen, large 2000 + citizens:

Eco criteria	small	Large projects
Green roofs: Extensive Intensive Urban farming Biodiversity roof	 X X -- X	 X X X (X)
Green facades Climber Living walls	 X (X)	 X (X)
Green indoor	X -	X -
Garden green	Where ever possible	Where ever possible
Energy concept	X	X BHKW (Block heating system)
Waste concept	X	X
Mobility concept	X	X
Solar energy	X	X
Rain water managemet	X	X
Overall monitor/evaluation		X smart online documentation

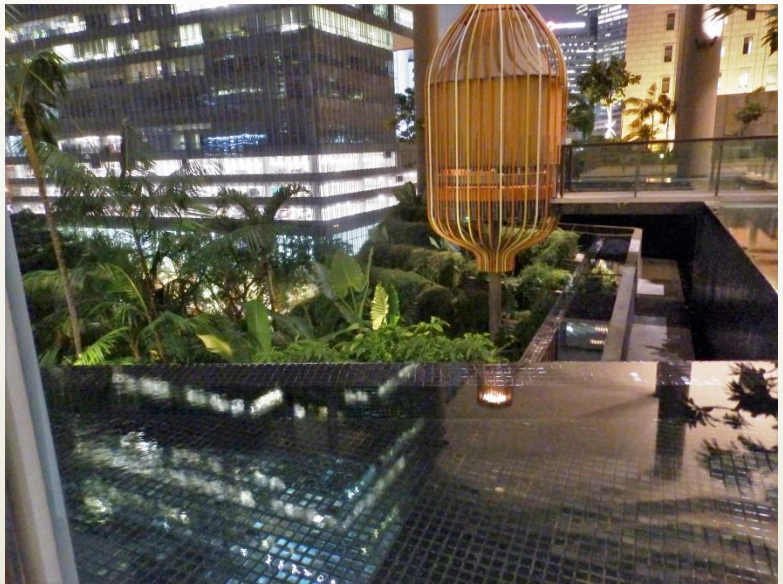
5. Conclusion/Outlook for the next Generation of Eco houses

- **- the basics of individual needs are not so different between earlier years and today.**
- **-be creative – adapt solutions for the future,**
- **Keywords: energy plus, low maintenance, life cycle analysis, low environmental impact design.**

5. Roof gardens – lessons learned

New Urbanism:
Biophilic design meets biodiversity for more liveability

- Local situations (climate, architectural history, building codes, genius loci),
- Social aspects (the wide range between elaborate private domains – and/or socially inclusive garden projects, such as urban gardens on top of buildings),
- Ecological values (multiplicity of benefits, such as: urban climate mitigation, noise reduction, water management, biodiversity etc.),
- Design questions (building as landmark or masked by vegetation).



3. Roof gardens – new trends …

- 3.1 Biophilic architecture
- 3.2 Biodiversity – deeper knowledge
- 3.3 “edible” roof gardens / vertical agriculture
- 3.4 Green roofs for the public
- 3.5 smart home solutions – with shared economy

6. Lessons learned what is next?

- Local situations (climate, architectural history, building codes, genius loci),
- Social aspects (the wide range between elaborate private domains – and/or socially inclusive garden projects, such as urban gardens on top of buildings),
- Ecological values (multiplicity of benefits, such as: urban climate mitigation, noise reduction, water management, biodiversity etc.),
- Design questions (building as landmark or masked by vegetation)
- Landscape architects are the key persons to handle biophilic.