



WORLD GREEN INFRASTRUCTURE NETWORK
vegetation makes it possible!

GI: From a square-meter scale research

(initiated by Reinhard Bornkamm)

to a world wide movement in Architecture.

WGIC, 20th June 2017.

Manfred Köhler, President, WGIN

- 1. WGIN – WGIC - Tradition**
- 2. Why now Berlin?**
 - 2.1 Berlin – Small – medium – large scale 1981/1982 – to 2017**
 - 2.1.1 Small: Early modules – TU Berlin.**
 - 2.1.2 Medium: Stephankiez from 1981**
 - 2.1.3 Large: City wide.**
 - 2.2 The Berlin Tradition in Eco – projects**
- 3. Dissemination of Green roof / GI technology to several countries**
- 4. Future smart City solution – never without GI**
 - Political anchored**
 - Architectural design**
 - Social connected.**

1. WGIN – WGIC - Tradition

Est. 2007 (Minneapolis): 10 Year anniversary: WGICs from Toronto 2009 to Berlin 2017



2.1 The early square-meter research in Berlin - 1986 -



Technical University Berlin

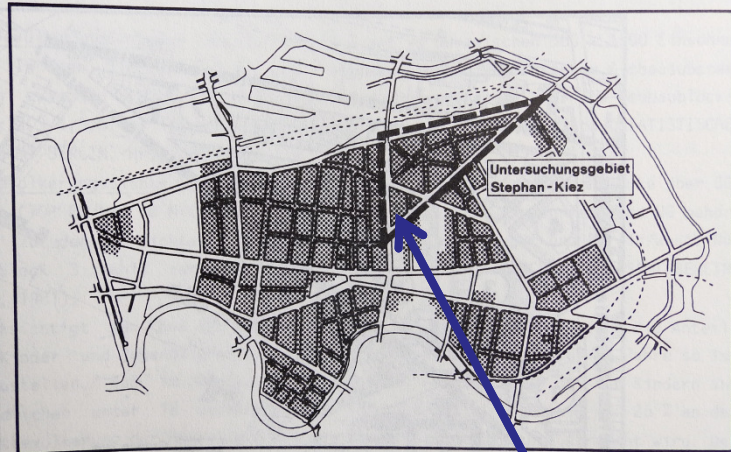


2.1.2 Scenic in the 1980th -Stephankiez- Strong need for GI, Retrofit of Central - City areas in Berlin: The beginning.



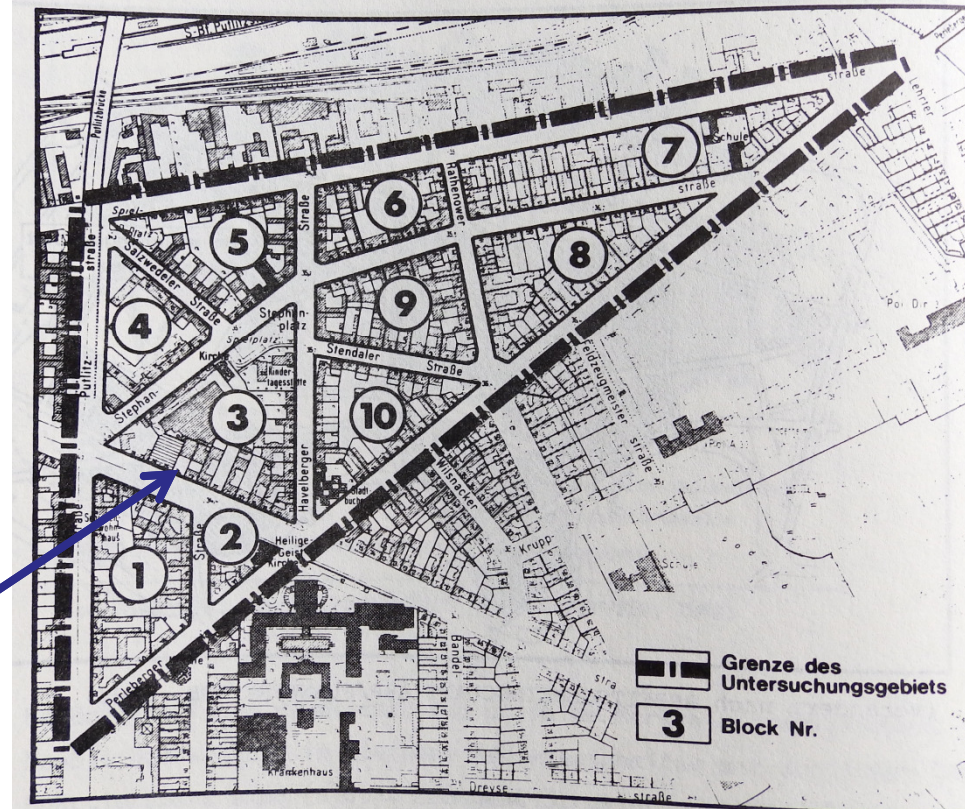
2.1 Berlin – Stephankiez – survey – 1981/1982 –, FBB-workshop group and Bartfelder & Köhler, 1987 (PhD).

Abb. 4: Wohninseln mit Kiez in Berlin/Moabit



(verändert nach ARBEITSGEMEINSCHAFT ARP/PLANWERK/FPB, 1982)

Abb. 5: Untersuchungsgebiet "Stephan-Kiez" mit 10 Baublöcken



MOA – IS HERE!

1980th – Stephankiez, pavements ... a special social milieu



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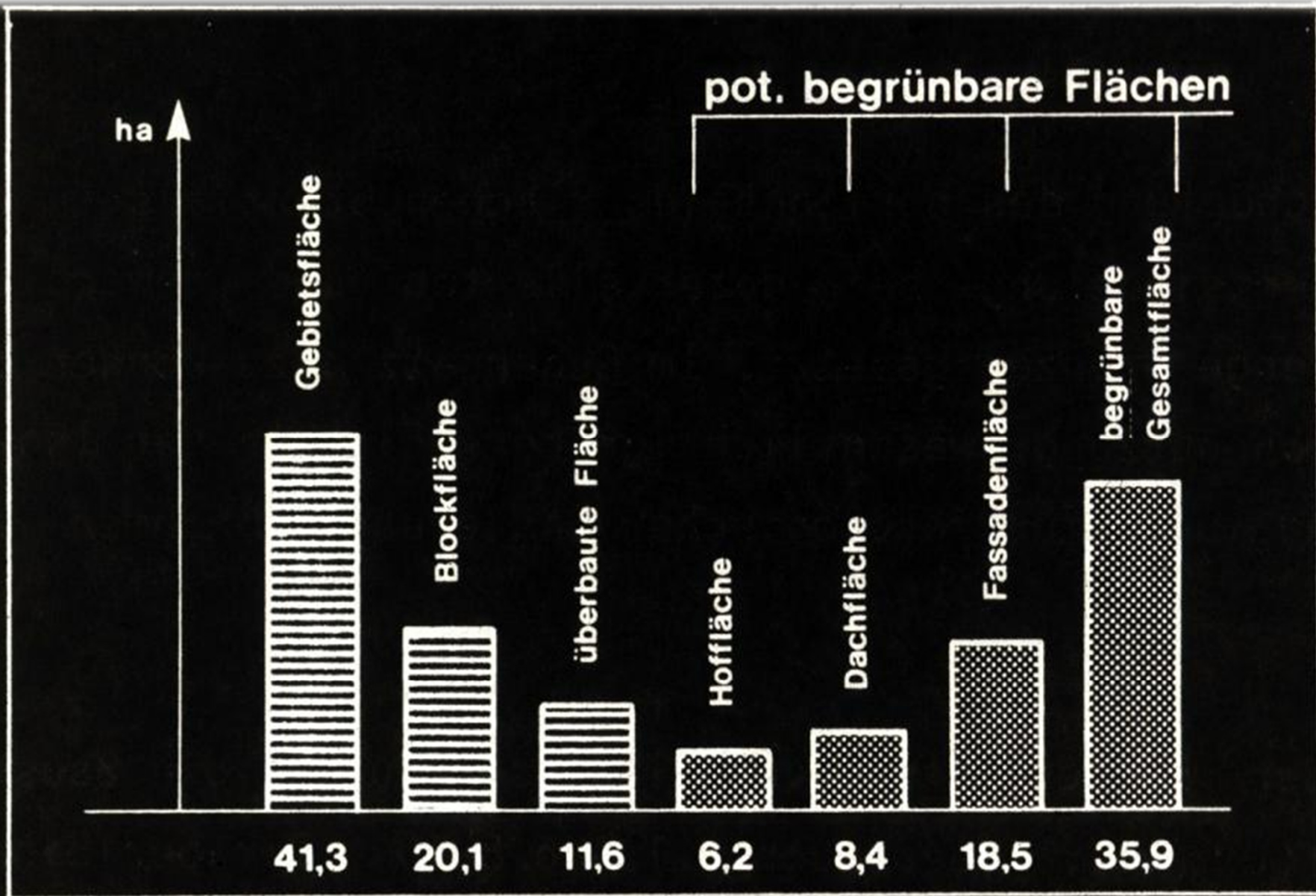
...

**First neighborhood-
projects ...
depaving,
grass root projects,
social supported Plantings,
Stephankiez – Berlin, 1981**

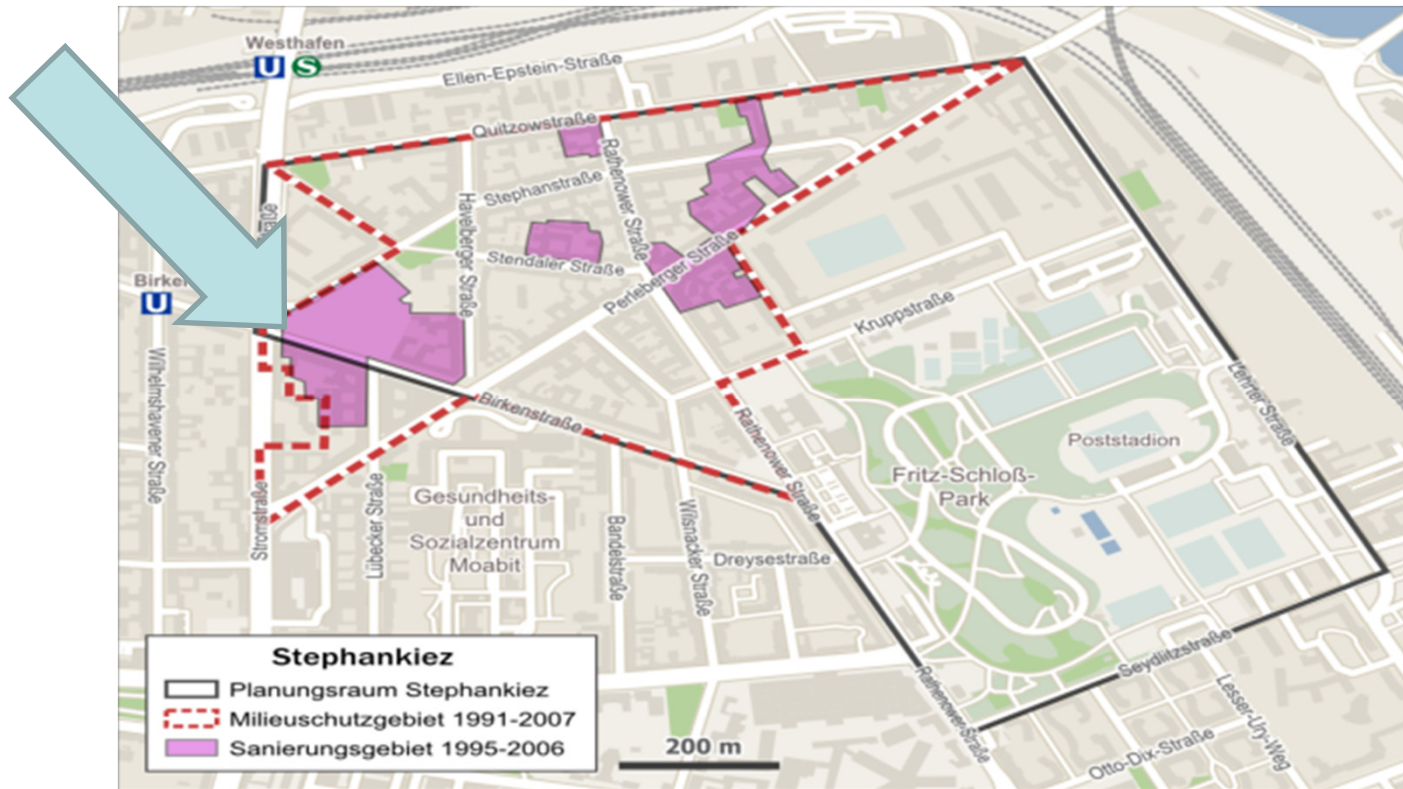


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2.1 Berlin – Stephankiez – Restoration since – 1981/1982 – Workshop ARP



SOURCE: VON ALEXRK2 - OWN WORK, USING OPENSTREETMAP DATA, CC BY-SA 3.0,
[HTTPS://COMMONS.WIKIMEDIA.ORG/W/INDEX.PHP?CURID=20555163](https://commons.wikimedia.org/w/index.php?curid=20555163)

Visit to Berlin - Stephankiez in the 2017 ... many problems solved ... But now double of rental prices.



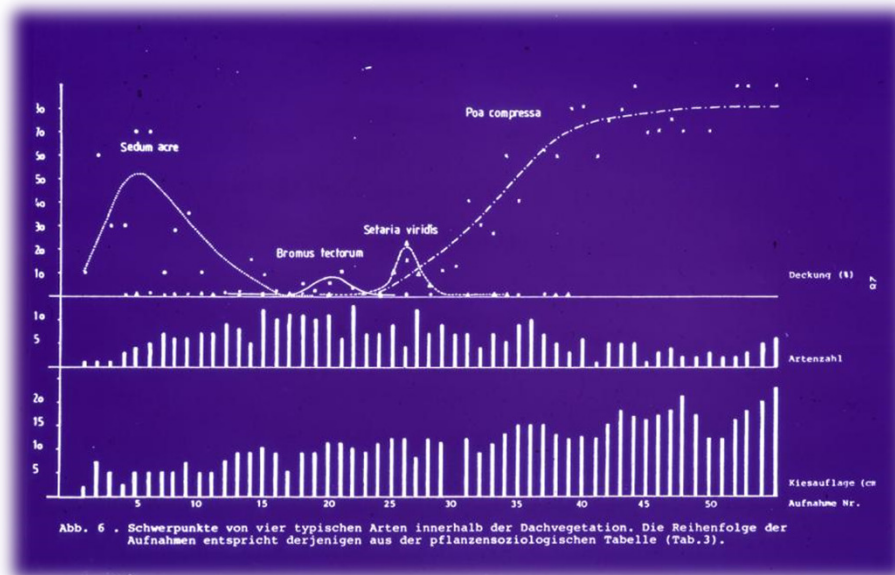


**Beginning: 1980th of greening: – Eco art installation
by Ben Wargin**

27.08.2017

**Tar Paper Green roofs from 1900:
The final last remaining 20 in Berlin:**

Darius u. Drepper, 1984



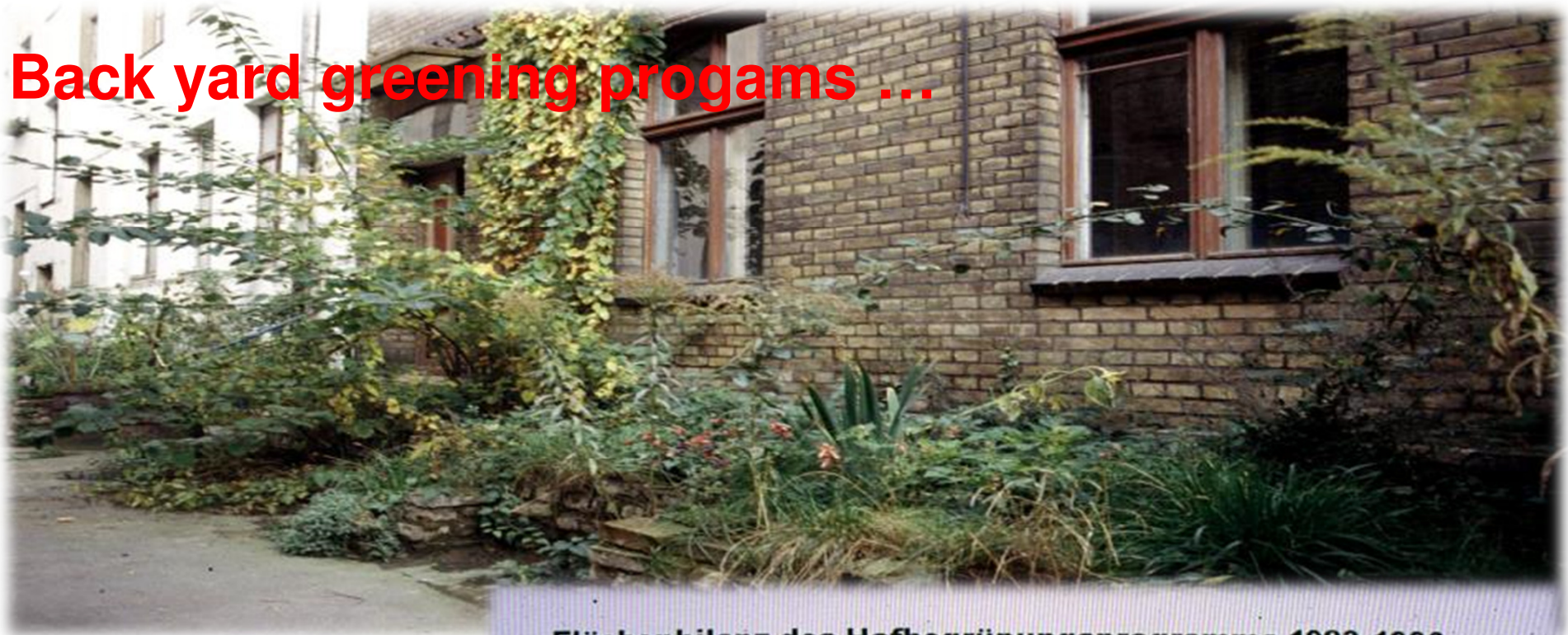
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... Ruderal- Gardening after LeRoy and ...

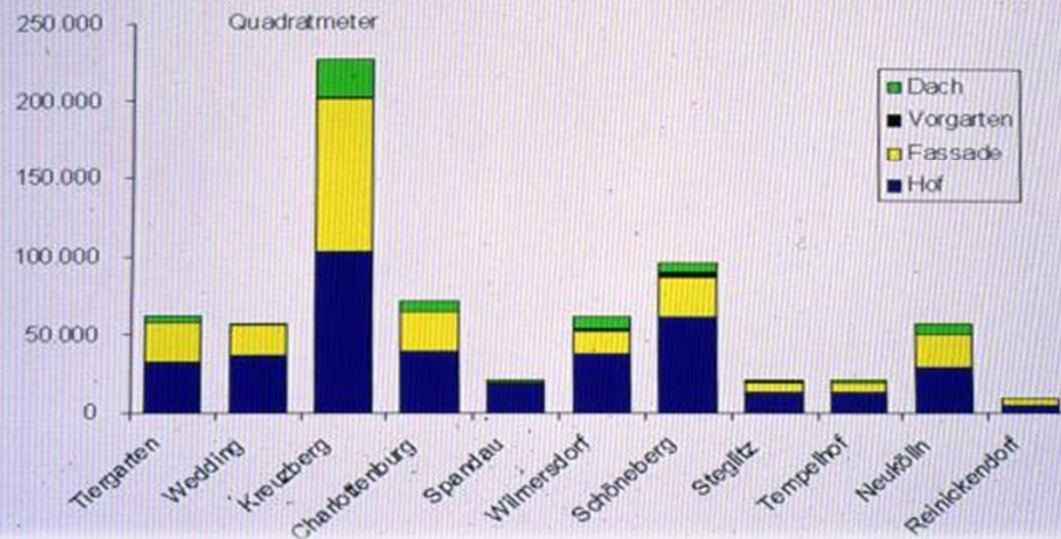


Ben Wargin

Back yard greening programs ...



**Flächenbilanz des Hofbegrünungsprogramms 1983-1996
- westliche Bezirke Berlins -**



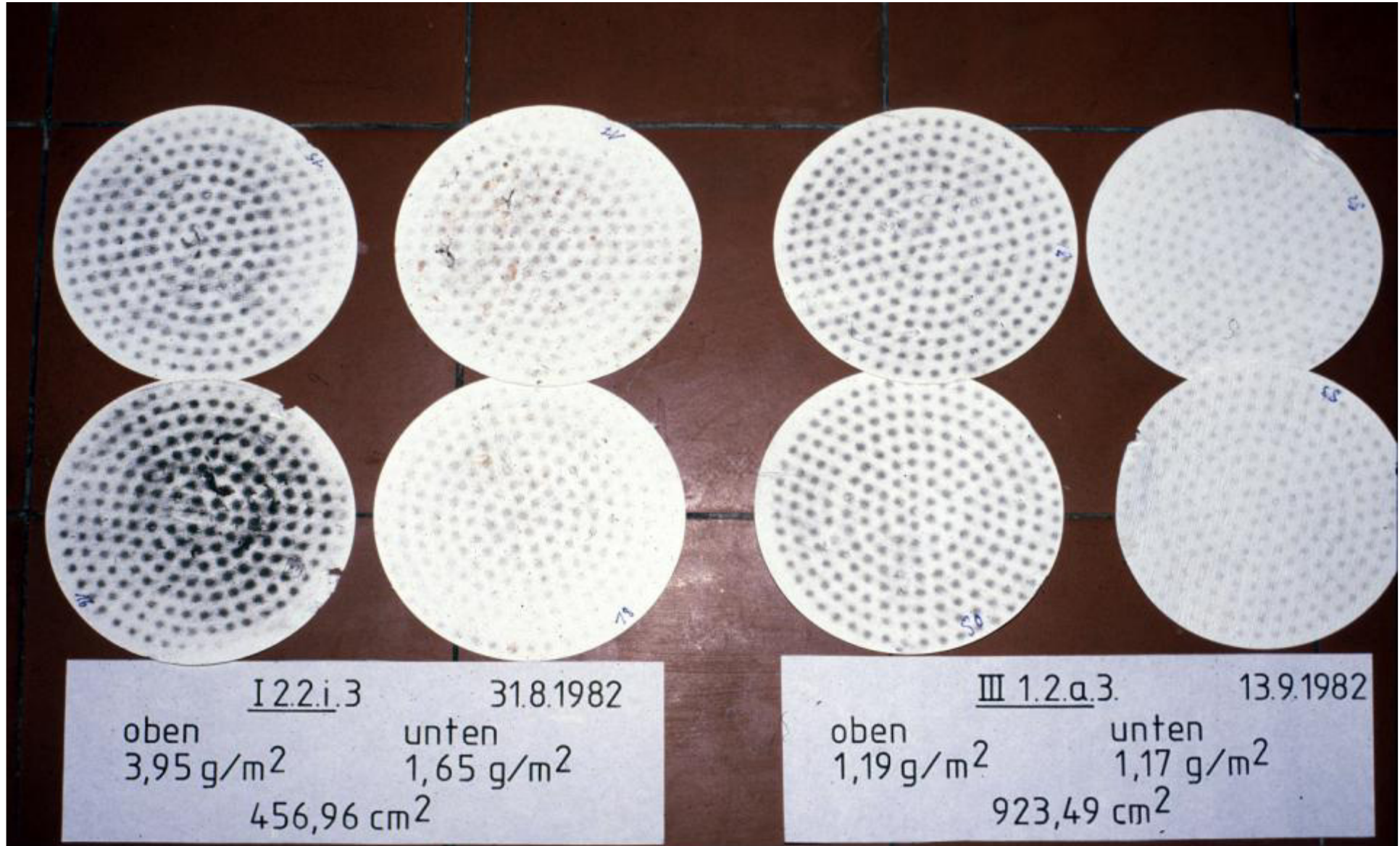
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Vegetationskunde

Reduction of pollution by green facades – Values from Moabit



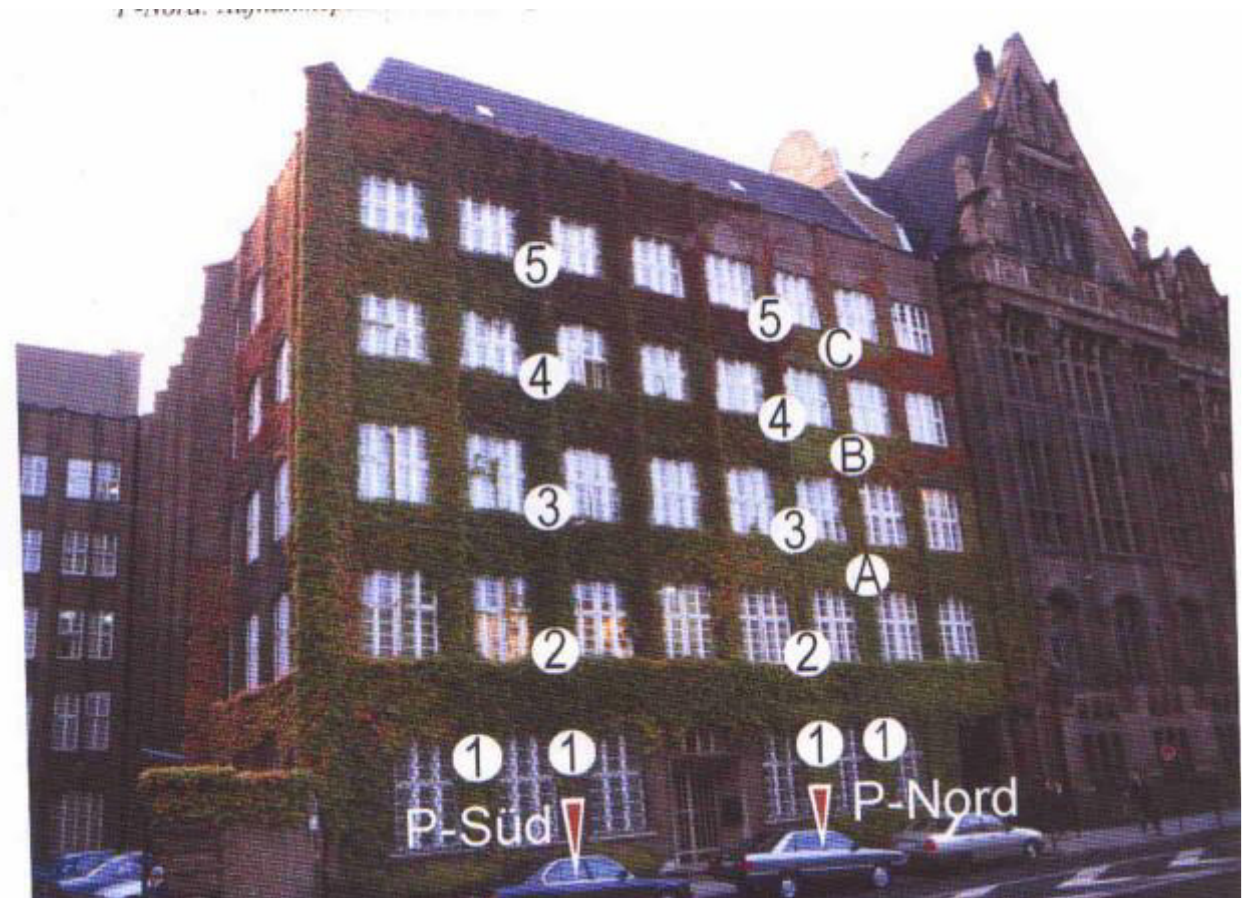
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**Research on Green here in Stephankiez,
and about 10 years later similar measurements done in Duesseldorf
(Thoennessen, 2002)**

- Edable fruits (e.g. Wine)
- Biomass production
- Dust reduction
- Heavy metal reduction
- Thermal insulation
- Energy savings
- Noise reduction
- Biodiversity
- Evapotranspiration cooling

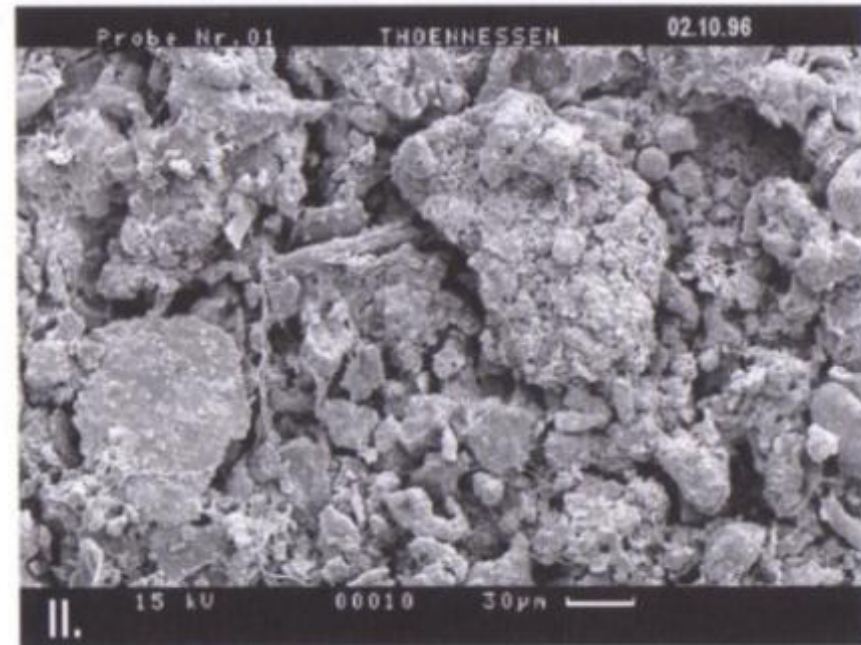
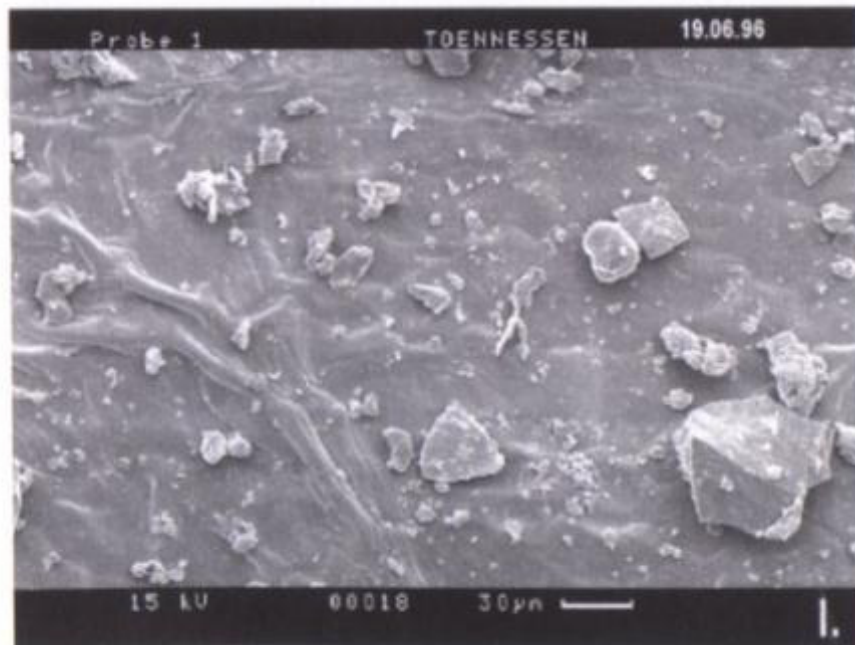


2. Dust reduction



- Depends on type of vegetation structure, esp. Leaf structure
- Up to 4% of a inner City dust input can be fixed of leafs.

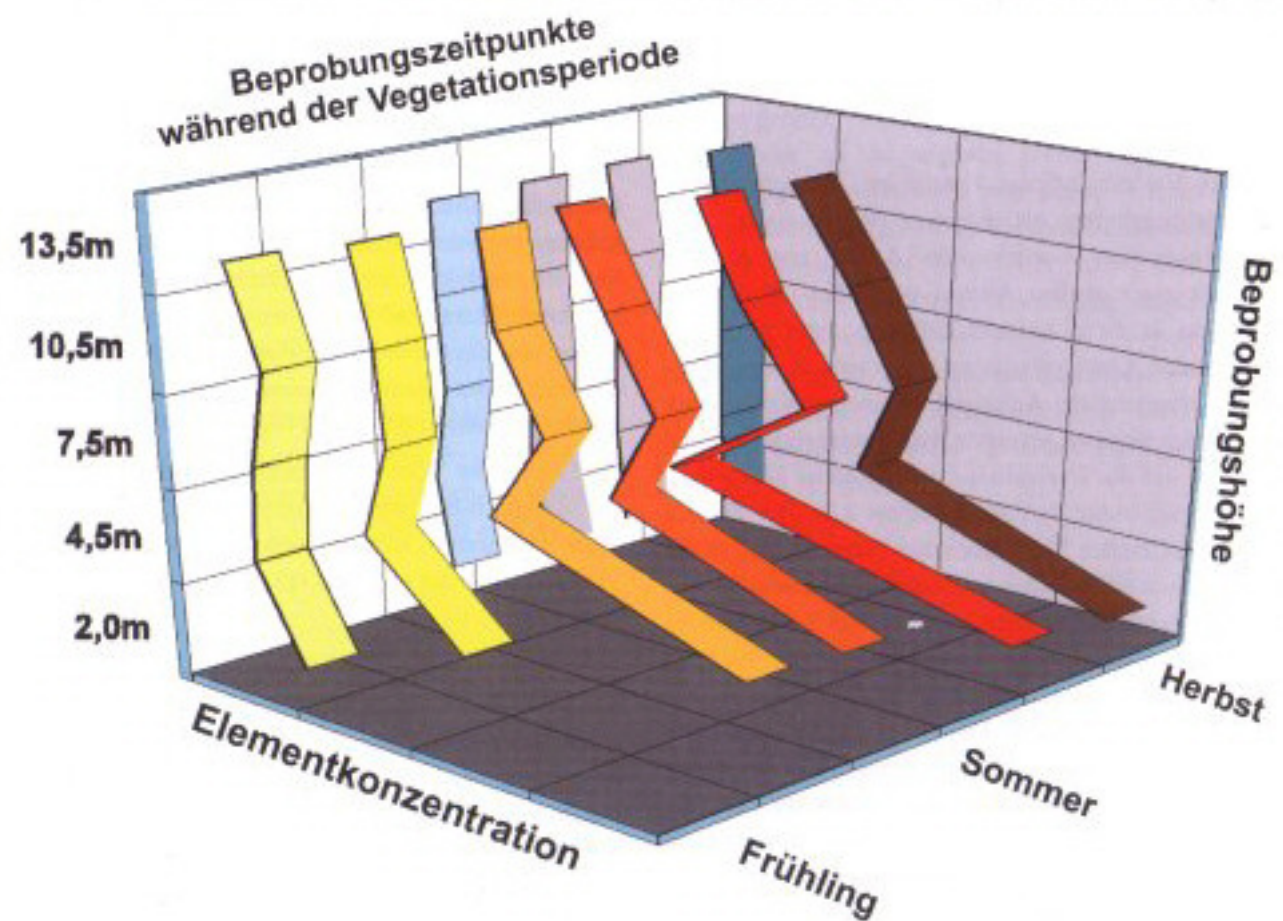
Bild 3.6 *Aerosol- und Staubablagerungen auf ungereinigten Blattoberseiten von Parthenocissus tricuspidata im REM-Bild. I. Probennahme 19.06.1996 II. 02.10.1996*



2. e.g. Heavy metal fixation on leaves



- Al, Cd, Co, Cr, Cu, Fe, Ni, Pb, (yellow-red) not cleaned leaves.
- Cleaned leaves, grey lines.



2. Berlin as role model

2.2 Tradition in Eco – projects

-Tradition in academic urban ecology;

With: Profs: Herbert Sukopp, Reinhard Bornkamm. TU Berlin.

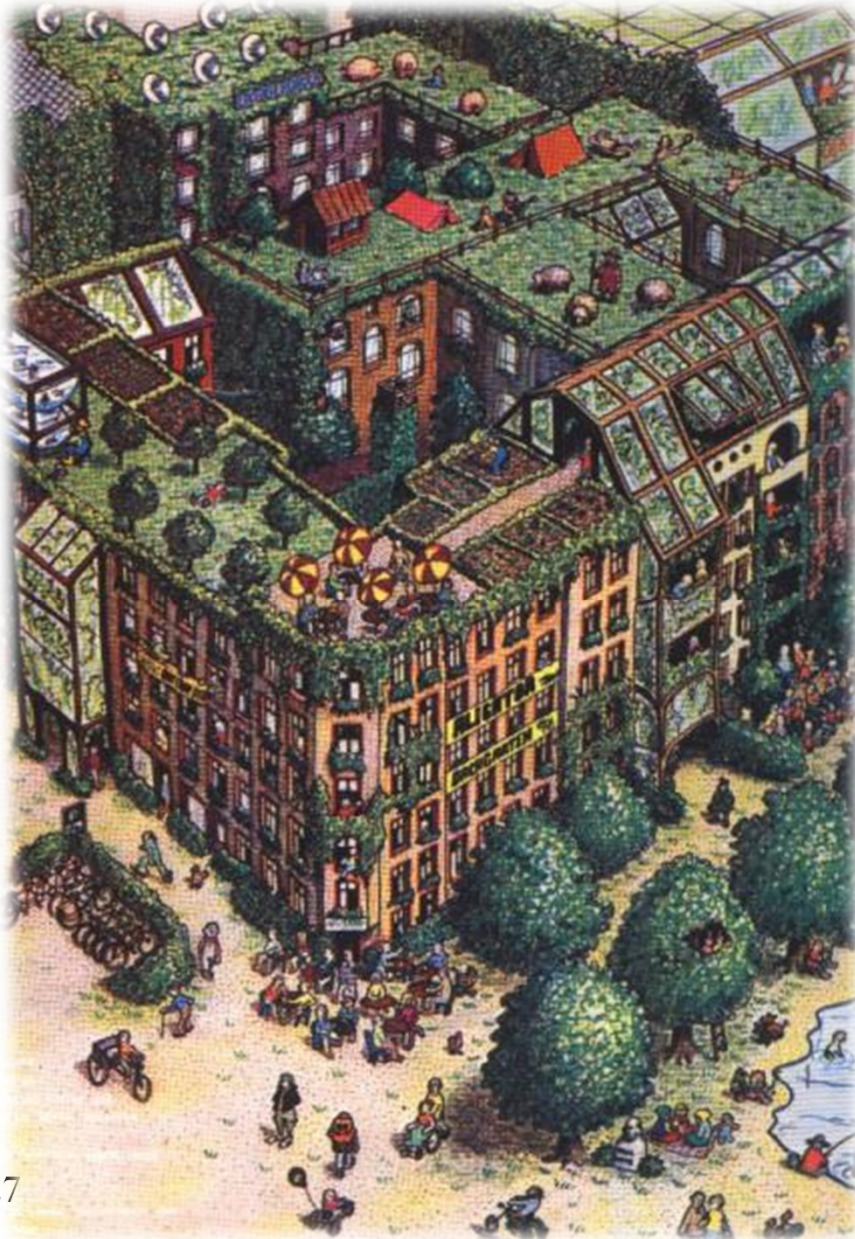
- IASP – Humboldt University,**
- Research projects in cooperation with the Berlin Senate,**
- related projects, such as IBA, case studies.**

Berlin:

http://stadtentwicklung.berlin.de/bauen/oekologisches_bauen/de/ausstellung/index.shtml

Examples: Berlin – Adlershof, ...

... But also some visions ...



Artists:

-Rio Reiser („Ton,
Steine,Scherben“)

„Der Mariannenplatz war blau ...“

-Hundertwasser

-Permaculture ...

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Urban concretes of the 1970th – increasing greening, a compare 1981 / 2004 / 2017

clean and clear – Märkisches Viertel

http://www.st-martin-berlin.de/html/st__martin.html



Project “Berlin-Adlershof” 2002-2010: Monitoring



- Rain water management
- Shading/ ET-cooling

Research:

Berlin Adlershof:

Wisteria 70% coverage of the facades.

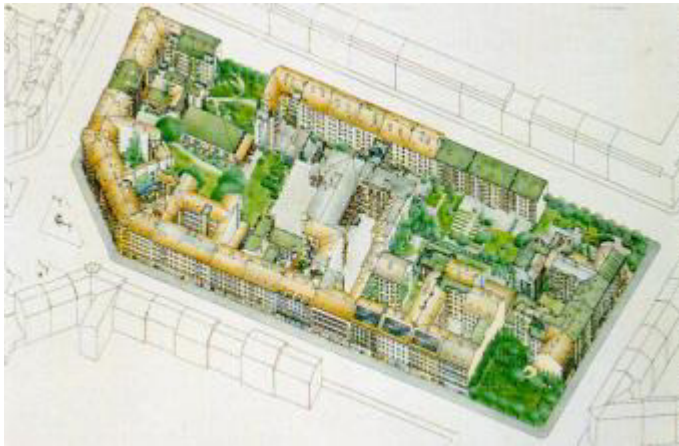


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Case studies in Berlin

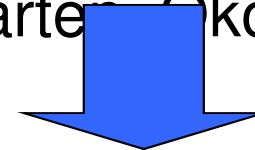
e.g. EXWOST,
Front runner of „Smart City“



Block 108, 103

Block 6

Eco houses –Berlin
Tiergarten – Ökohäuser



„Pioneers in urban ecology“
Compiled by: B. Reichmann, updated.

Fascination Green roofs

Case study: Ufa, Berlin



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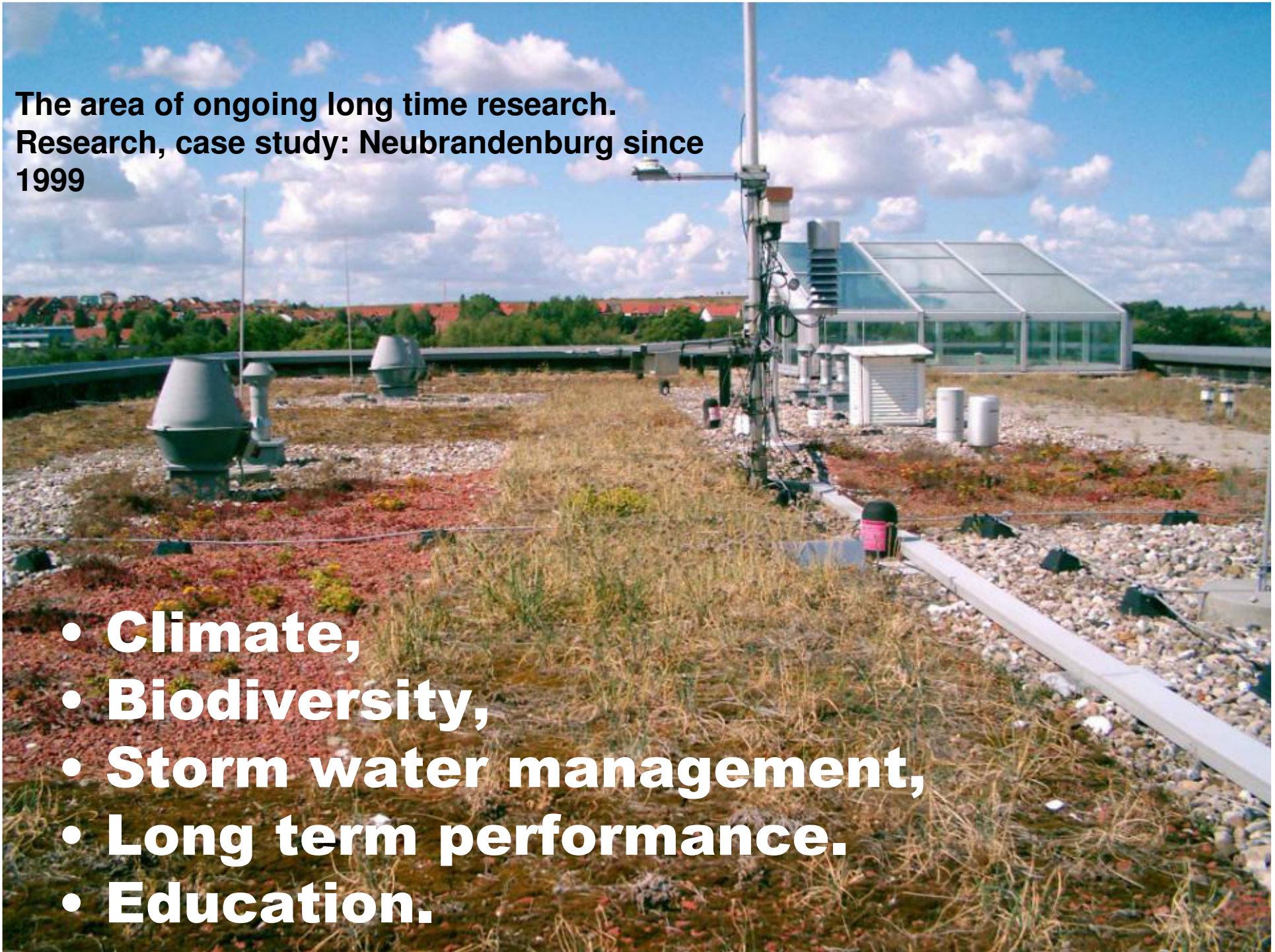
Green roof research since 1992,
With first green roofs from the 1930th.



2.1.3 City wide studies ... example Kuras project

**The area of ongoing long time research.
Research, case study: Neubrandenburg since
1999**

- **Climate,**
- **Biodiversity,**
- **Storm water management,**
- **Long term performance.**
- **Education.**



3.3 Research in Neubrandenburg Case study: Living walls.



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The Journey started internationally in 2003



1. Since that time a number of stopps in between: WGIN – WGIC



2009 starting in Toronto: as Cities Alive, WGIN as branding name since: Sydney 2014, China – Hangzhou was had the biggest audience with 1600 delegates.

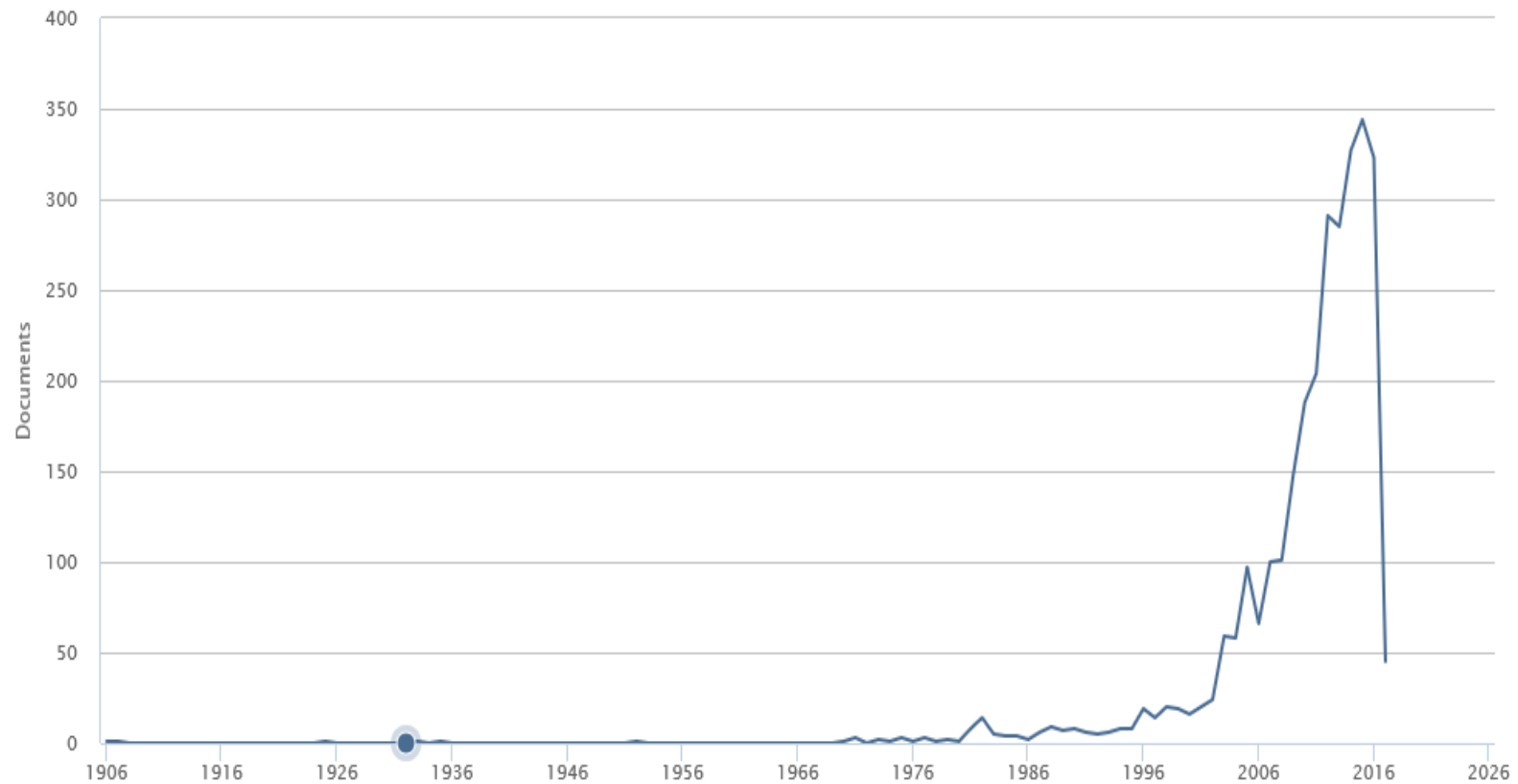


1. WGIN: est. 2007; national association Members: Now to celebrate the 10th Aniversary

Country (alphabetic order)	Organization / contact	Contact person(s) to WGIN
Australia	GRA	Matt Dillon / former: Geoff Wilson.
Brazil	ATV	João Linck Feijó
Canada/USA	GRHC	Steven Peck
Chile	AIVECH, Latingreen	Ignacio Espoz
China	IRLA	Zhaolong Wang
Colombia	Recive	Andres Ibanez
France	ADIVET	Francois Lassalle
GB	Ind. For GB	Nigel Dunnet
Germany	FBB	Manfred Köhler
Hongkong	Ind. for Hongkong	C.Y. Jim
India	IGIN	Hemar Kumar
Italy	Promoverde	Ricardo Rigolli
Japan	Urban Green	Hajime Koshimizu
Mexico	Amena	Tanya Muller Garcia, Uli Grau, Gilbert Navaz
Poland	Dachy Zielone	Martha Weber-Siwirska
Portugal	ANCV	Paulo Pahla
Scandinavia	SGRA	David Brasfield, former: Dorthe Rømø (DK),
Singapore	SGIN	Maria Boey, former: WW Ho
South Korea	Kogria	Min Han Kang
Spain	Pronatur	Julian Briz
Taiwan	Taiwan Green Roof and Green Wall Association	Nelson Li
Tehran	IRLA	Aslan Jonoubi

3. The peer reviewed scientific publication

www.sciencedirect.com; scopus, „Green roofs“ access: 2017_Feb_11



3. The peer reviewed scientific publication

www.sciencedirect.com; scopus, „Green roofs“

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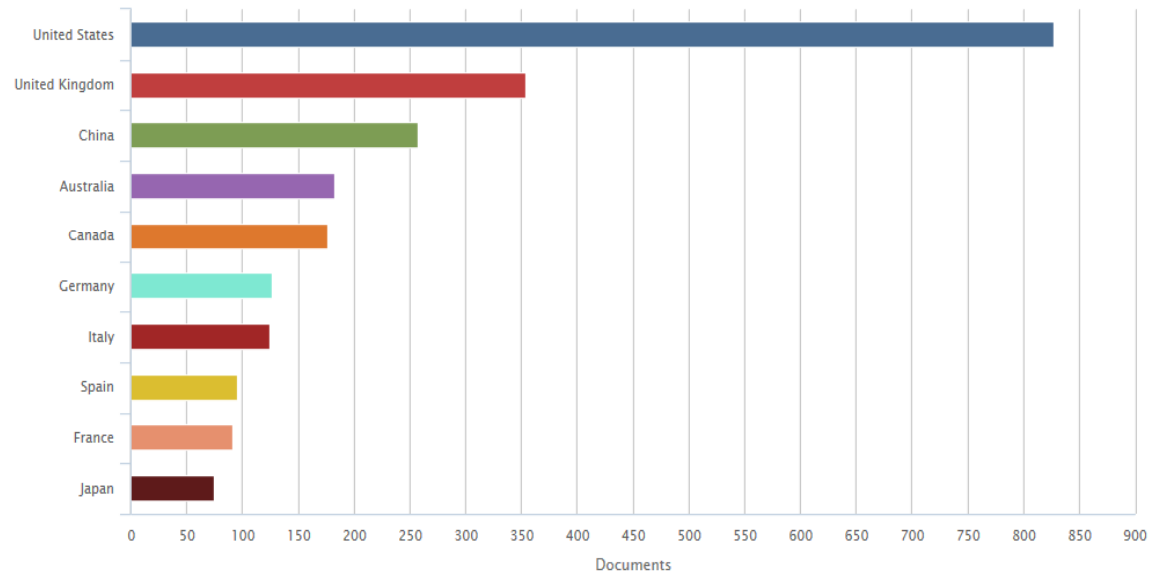
2892 document results Choose date range to analyze: 1906 to 2017 [Analyze](#)

Year Source Author Affiliation **Country/Territory** Document type Subject area

Country/Territory	Documents
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<input checked="" type="checkbox"/> Undefined	243
<input checked="" type="checkbox"/> Australia	183
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<input type="checkbox"/> Malaysia	45
<input type="checkbox"/> South Korea	44

Documents by country/territory

Compare the document counts for up to 15 countries/territories



**1. WGIN: est. 2007; national association Members from Europe and far away :
Now 10th Aniversery: ... some spots from the homepages:**

Australia

Canada/USA

Chile

China

Darlinghurst Garden

Washington DC

Santiago

Kunming



Scandinavia
Education

... France, Colombia, Germany, Hongkong, India, UK, ...



- #### 4. Future smart City solution – never without green infrastructure
- political aims
 - Architectural design simple indicators, like GDF
 - social connected.



4. Future smart City solution – Definition:

Smart – safe – sustainable -- never without green infrastructure

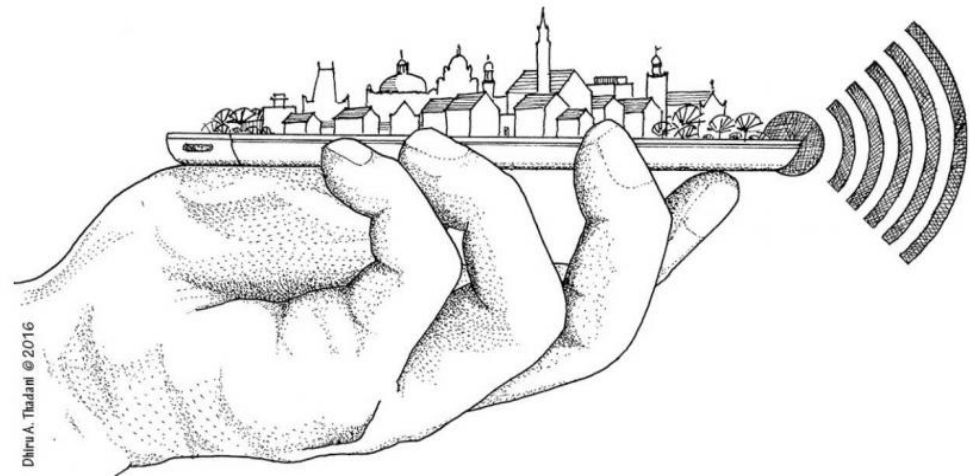
- political aims

- Architectural design simple but effective indicators, like GDF

- social connected.



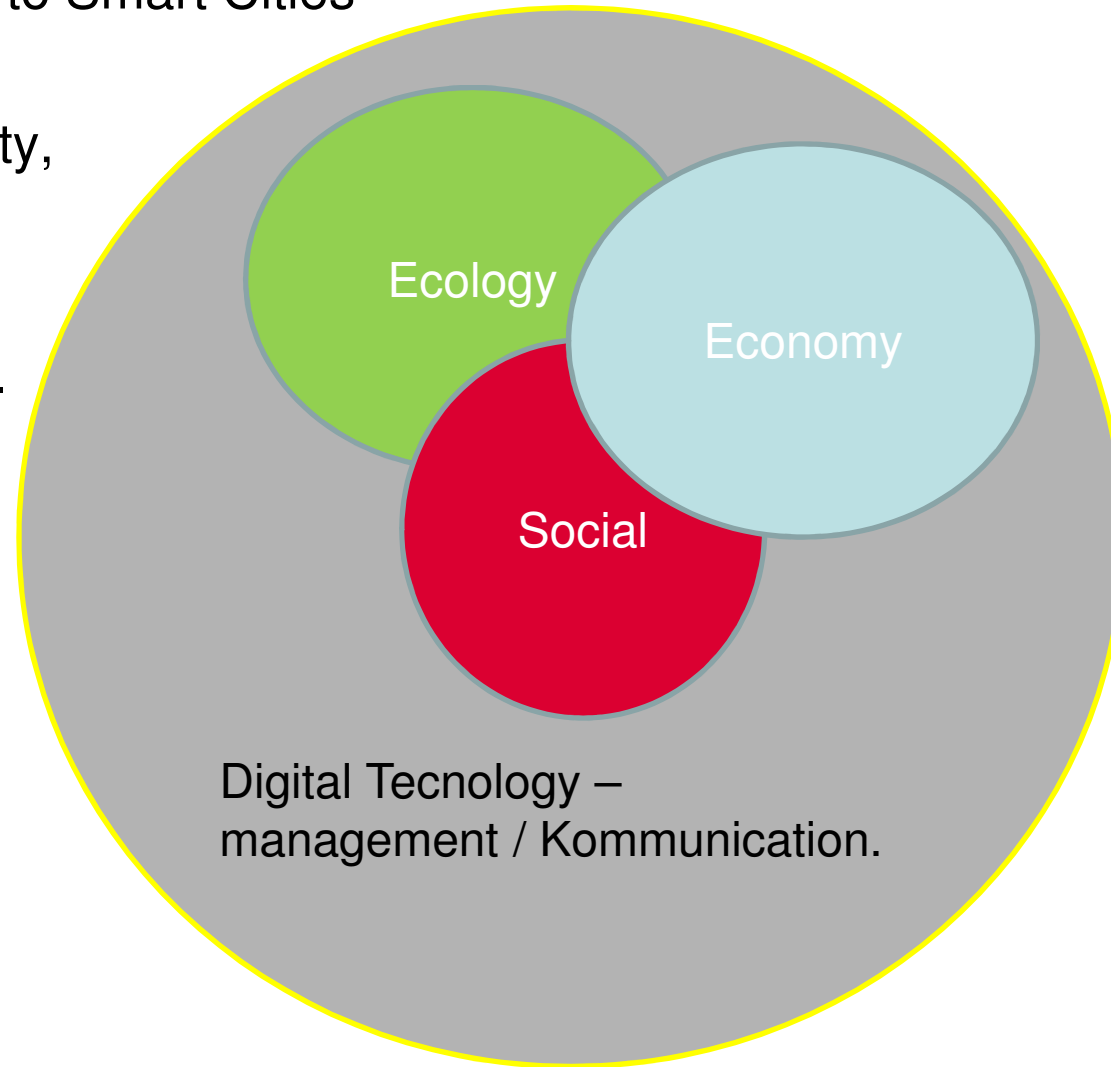
WHAT IS A SMART CITY ?



2.1 From sustainable to Smart Cities

3 Cycle of sustainability,
Covered by

Digital developement.



Smart City, case study: Berlin – Adlershof



SOURCE: KOEHLER ET AL: 2012: BAUWERKSBEGRÜNUNG, ADLERSRHOF

Consequent roof greening and GI-technology in Berlin.



SOURCE:HGI-BMW_LEIPZIGER PLATZ

Or case study „Green Campus“ DESY, Hamburg



Green roofs: 8% in the City,

- Several old ones with more than 100 years,
- About 4.400.000 m² green roofs in Berlin (own calculation)
1 m²/person
- Numbers of smart green Living Labs,
- The shortest distance within a City to see two Patrick Blanc – Installation!
- Lot of old green roofs – more than 100 y

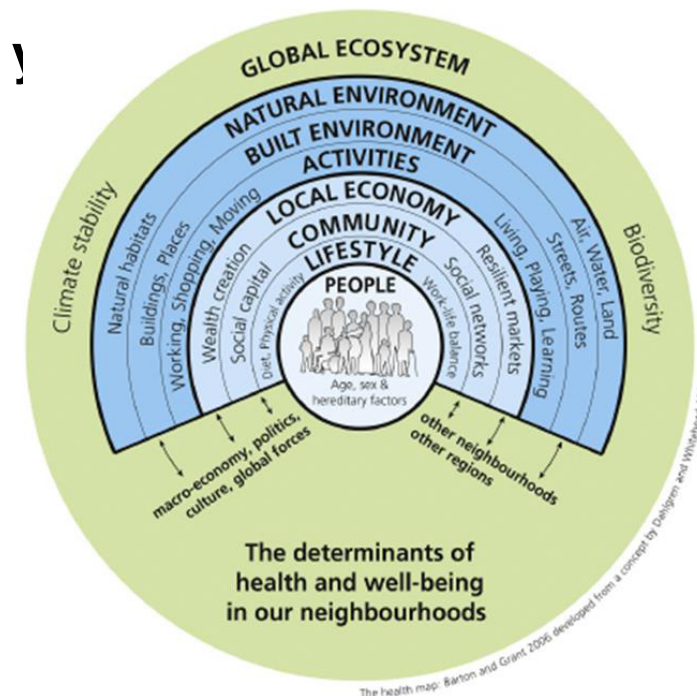
Source:

Cities, green infrastructure and health

A paper for the Foresight Future of Cities project

by Dr. Val Kirby FLI and Stephen Russell,

- Landscape Institute, July 2015



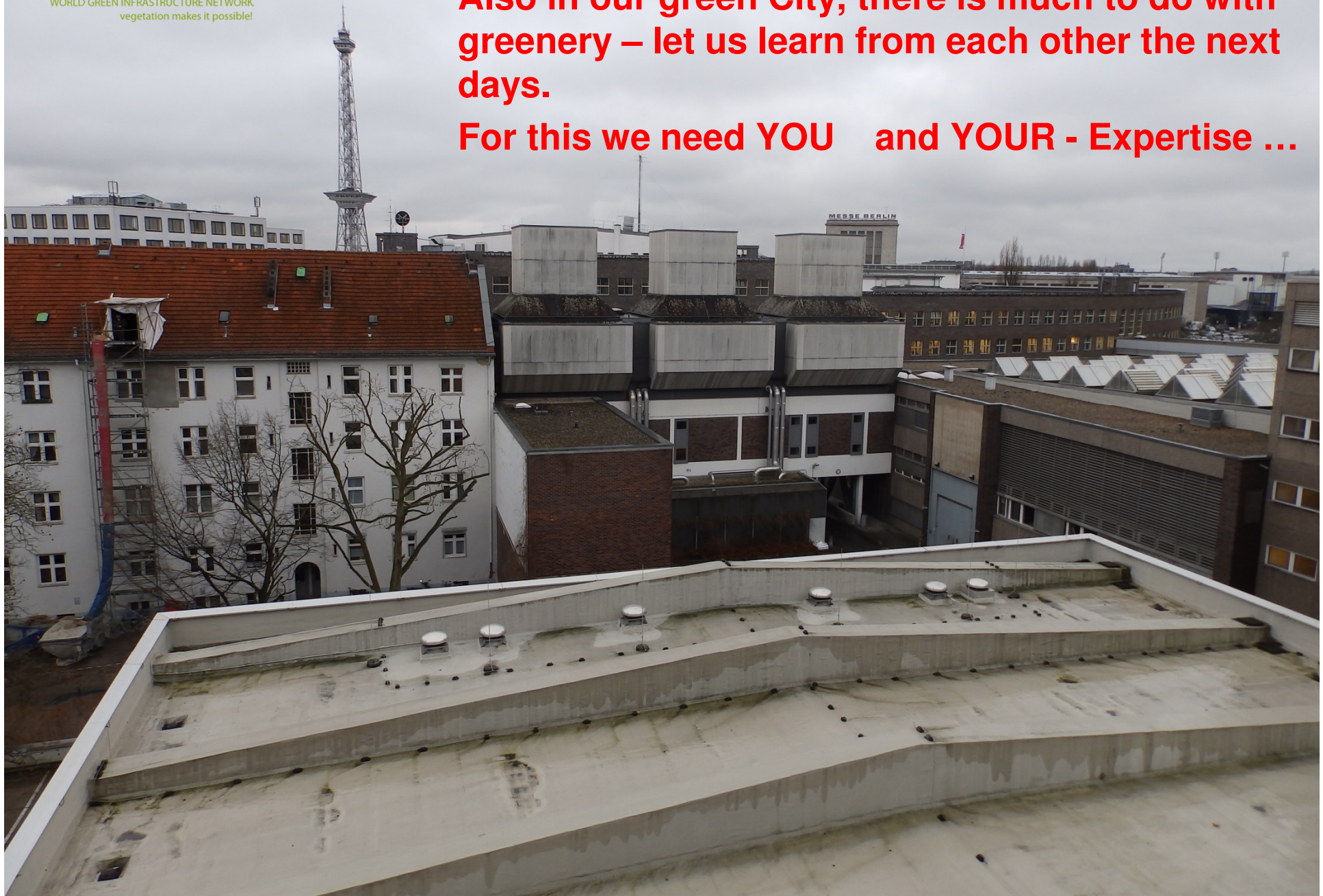


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vegetation makes it possible!

Welcome to Berlin,

Also in our green City, there is much to do with greenery – let us learn from each other the next days.

For this we need YOU and YOUR - Expertise ...



Case study: Dach des Cafes – alter Teil





The new roofs of the Ufa

Anthyllis vulneraria
Echter Wundklee



A photograph of a yellow Linaria vulgaris flower in a field of low-growing vegetation. The flower is the central focus, showing its characteristic two-lipped structure with a bright yellow center. The surrounding vegetation consists of various small, green and reddish-brown plants, likely groundcover species. The lighting is bright, suggesting a sunny day.

Linaria vulgaris
Echtes Leinkraut,
Nicht gefährdet

Hypericum perforatum
- Johanniskraut



**Trifolium arvense,
Bromus tectorum und B. hordeaceus**





Medicago sativa – Saat Luzerne



Anthemis tinctoria – Färber Hundskamille, i, n.g.



Sedum sexangulare – Milder Mauerpfeffer – i., n.g.



**Erigeron annuus, -Feinstrahl Berufskraut
– eingebürgerter Neophyt**

Coronilla varia – Securigera varia (L.) Lassen
Bunte Beilwicke – Kronwicke, indigen, nicht gefährdet.





Sedum hispanicum – Blaugrüne Fetthenne – unbeständig – Synanthrop – selten – eingeburgerte Neophyt.



Panicum italicum – Kolbenhirse – Neophyt - Vogelfutter



<http://www.worldgreenroof.org/>

Bogota 2016
Berlin 2017
WELCOME TO THE CONGRESS!





WORLD GREEN INFRASTRUCTURE NETWORK
vegetation makes it possible!



WGIC Berlin - 2017
Welcome to Berlin ...
Enjoy ...