

TACKLING URBAN HEAT WITH PLANTS ?

A learning module for more sustainability in the city of the future

WE TAKE ANOTHER LOOK AT LISA'S RESEARCH.
ONE OF THE ARTICLES MAKES LISA THINK.

BLOOMING WALLS AGAINST THE HEAT

Air, Environment / 20 July 2021 / by the Technic Journal editorial team

Climate change is causing the number of heat-related deaths in cities to rise — this is the finding of a study by the University of Bern. Vertical greening systems are intended to help address this problem. However, not every type of vertical garden offers the same benefits. // By Selina Stiegler and Daria Zietkowiak.



Avatar created with AI: Bing imagine creator (Microsoft), 04.12.2023

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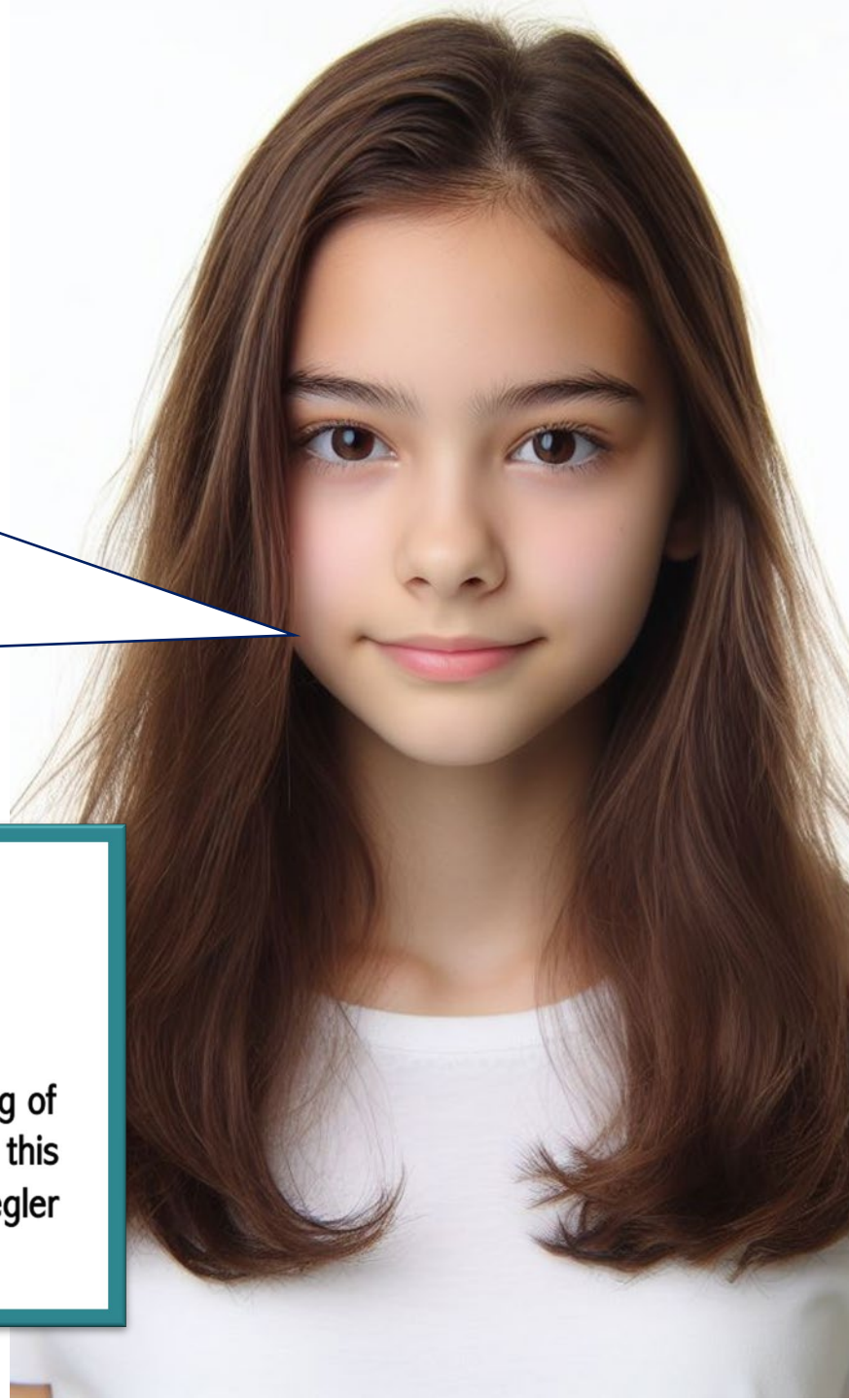
Vertical greening means planting plants on the exterior walls of buildings.

But what systems are available for vertical greening?



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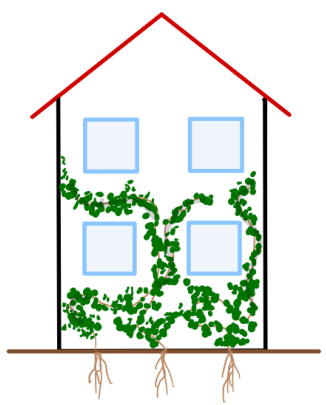
What types of vertical greenery systems are available?

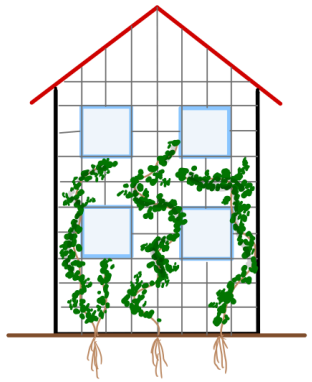
Use the interactive diagram: The fingerprint shows you what you can select.

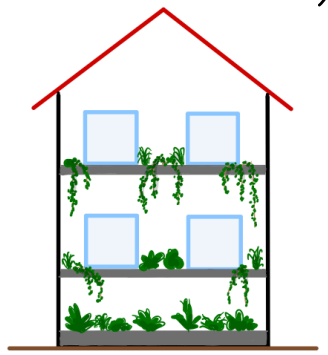
Vertical Greening

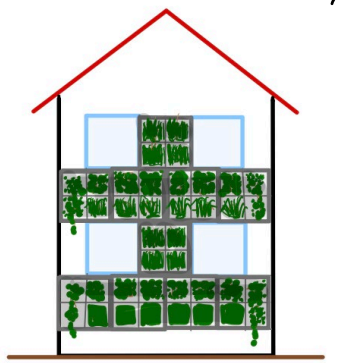
- **Ground-based Green Facade**
  - **Self-clinging System**
  - **Trellis-supported System**
- **Wall-mounted Greenery**
  - **Planter-based System**
  - **Modular System**











Illustrations: Institut für Biologiedidaktik, 2026

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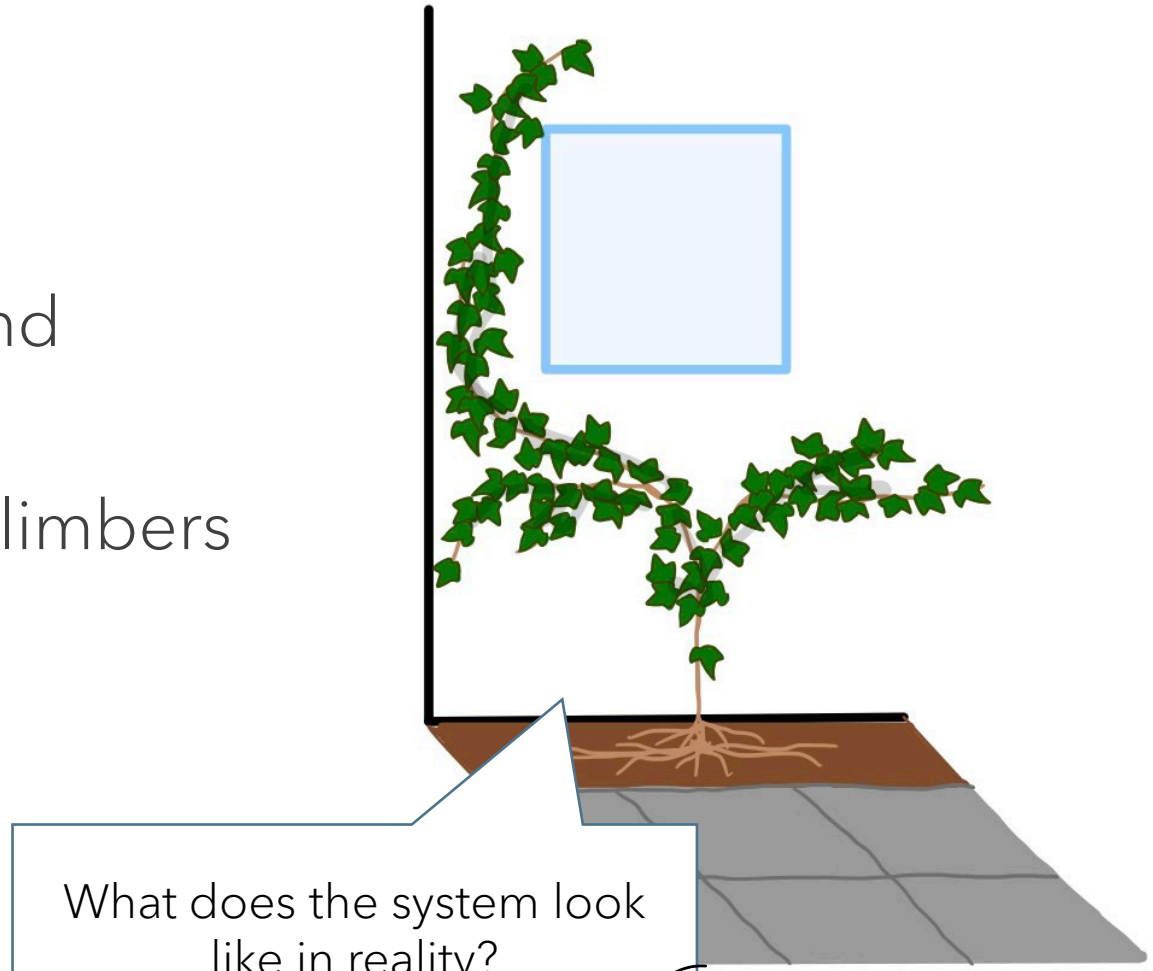
Ground-based Green Facade

Self-clinging System

- The plants are planted in the ground
- The plants grow directly on the wall
- The plants are called self-clinging climbers



What does the system look like in reality?

Illustration: Institut für Biologiedidaktik, 2026

Ground-based Green Facade

Self-clinging System

Ivy facade in Bonn

Photo: Institute for Biology Education, University of Cologne, 2016

Which plants can be used?



Self-clinging System: Example Plants

Boston Ivy (*Parthenocissus tricuspidata*)

- The leaves have three points (trilobed)
- The leaf margin is slightly serrated



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Common Ivy (*Hedera helix*)

- The leaves are heart shaped and lobed
- The leaf margin is smooth



Illustration: Institut für Biologiedidaktik, 2025

Ground-based Green Facade

Trellis-supported System

- The plants are planted in the ground
- The plants grow upward on a support frame
- This frame is also called a trellis

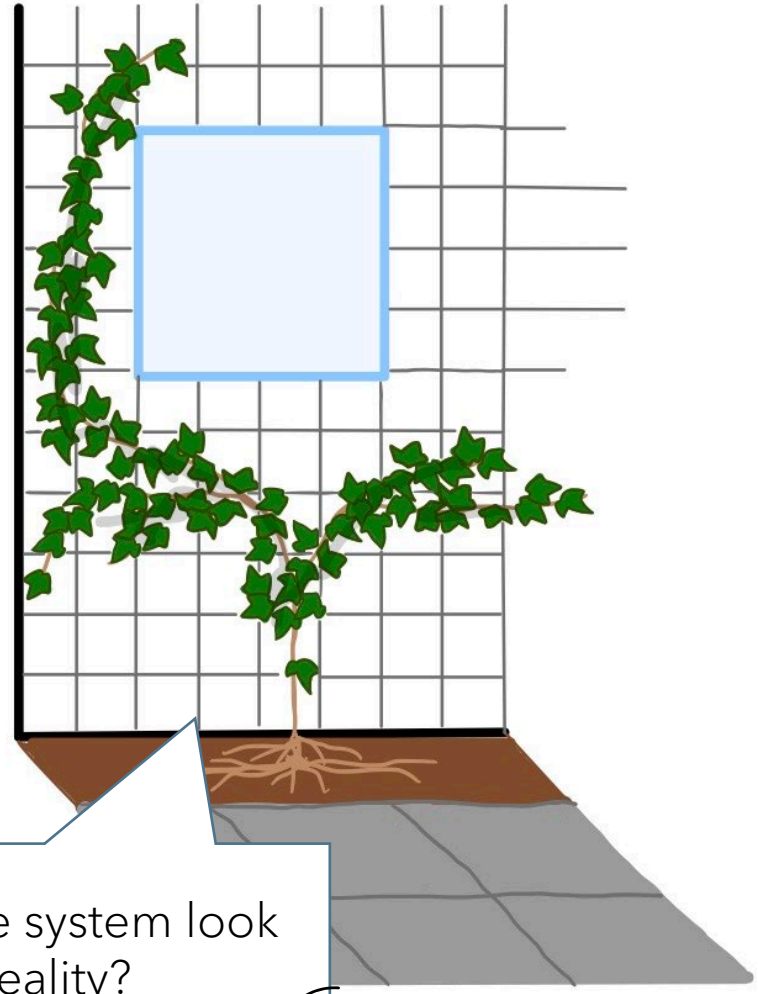


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Illustration: Institut für Biologiedidaktik, 2026

Ground-based Green Facade

Trellis-supported System

Climbing plants on trellises

Photo: Institute of Physics, Humboldt University of Berlin
Marco Schmidt

Which plants can be used?

Trellis-supported System: Example Plants

Chinese Kiwi
(*Actinidia chinensis)*



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Wisteria (*Wisteria*)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Trachelospermum jasminoides

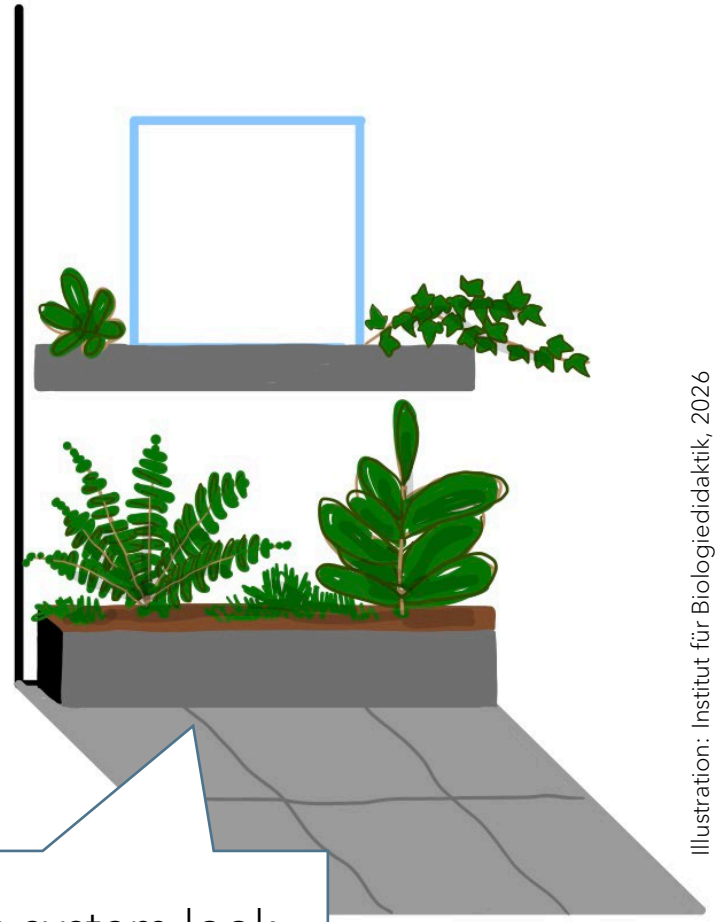


Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Wall-mounted Greenery

Planter-based System

- The plants are in planters
- The planters are placed in front of the wall or stacked on top of each other as plant shelves
- The system requires its own water and nutrient supply -> ground-based plants do not need this!



What does the system look like in reality?

Illustration: Institut für Biologiedidaktik, 2026

Planter-based System

You can use lots of different plants, and it all comes down to the planter system!

- Herbaceous perennials
- Small shrubs
- Climbing plants (with support)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.



Which plants can be used?

Illustration: Jonas Bomba für Institut Für Biologiedidaktik

Planter-based System: Example Plants

Perennials

Waldsteinie
(*Waldsteinia ternata*)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Small shrubs

Winter-Jasmine
(*Jasminum nudiflorum*)

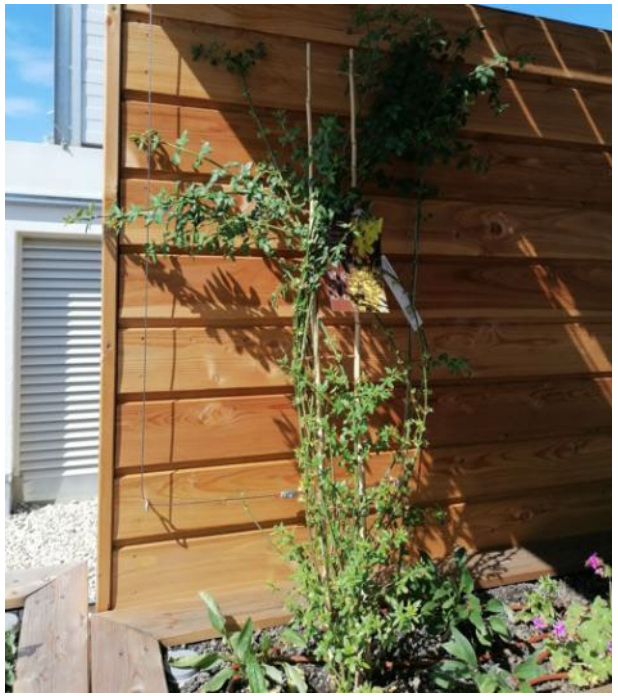


Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Climbing Plants

Clematis
(*Clematis montana*)

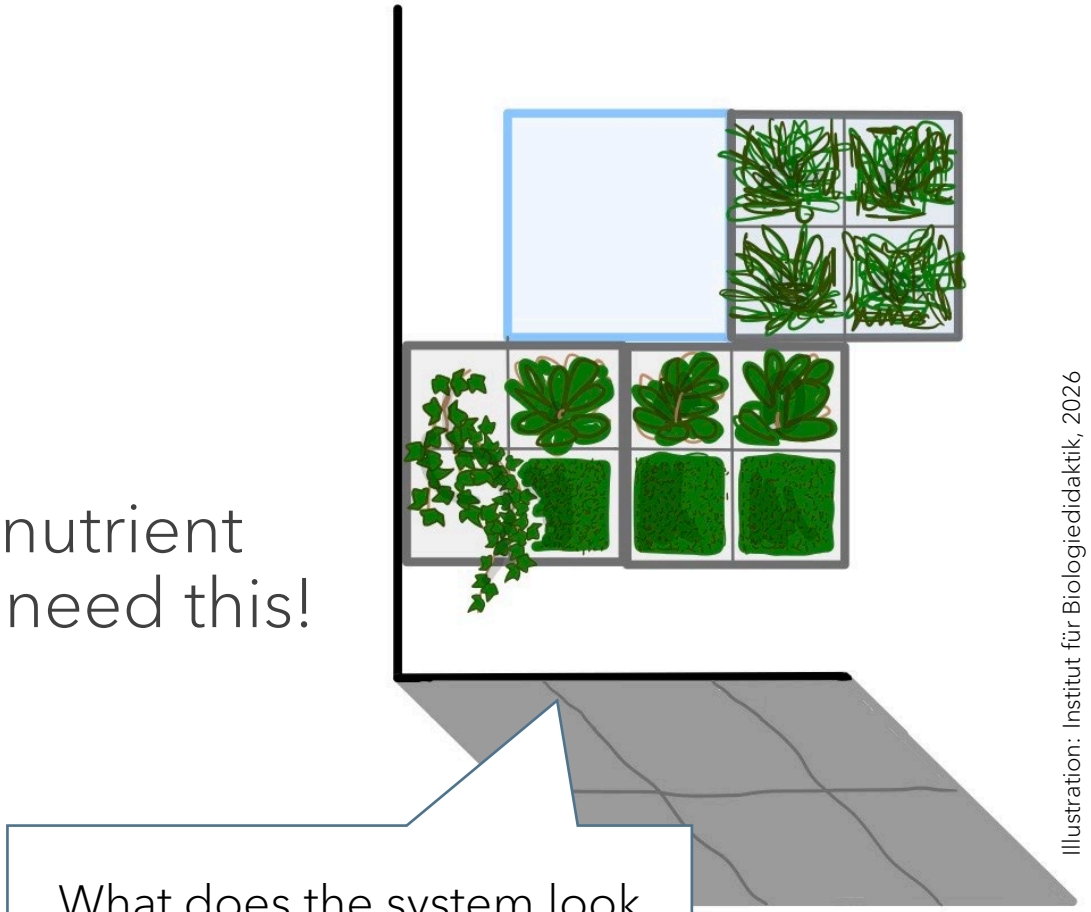


Illustration: Jonas Bomba für Institut für Biologiedidaktik

Wall-mounted Greenery

Modular System

- The plants are planted in modules
- The modules are installed on the wall
- The system requires its own water and nutrient supply -> ground-based plants do not need this!



What does the system look like in reality?

Illustration: Institut für Biologiedidaktik, 2026

Modular System

You can use lots of different plants :

- Herbaceous Perennials
- Grasses
- Ferns



Which plants can be used?

Illustration: KREBS & CONRADS, Forschungsprojekt GrüneFassadeKöln, Institut für Biologiedidaktik 2023

Modular System: Example Plants

Perennials

Bergenia (*Bergenia i.S.*)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Grasses

Feather grass (*Stipa tenuissima*)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.

Ferns

Shield fern (*Polystichum i.S.*)



Illustration: Dipl.-Ing. Ralf Dopheide e.U.



Illustrations: Dip.-Ing. Ralf Dopheide e.U.

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Schokolade-Manufaktur Zotter, Steiermark



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Innenhof-Begrünung in Wien



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Schattenplatz mit Wasservernebelung, 1060 Wien



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Selbstklimmer Efeu, Krakau



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Selbstklimmer, Pfarrhof Dorotheergasse, Wien



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Hotel Wien



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Subway Vienna Spittelau



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Residential Complex Vienna Penzing, Boston ivy



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Grammar School, 1070 Vienna



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Grounds maintenance using an aerial work platform
Grammar school, 1070 Vienna



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Climbing plants on trellises
Office building, 1050 Vienna



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Boutique Hotel, Vienna

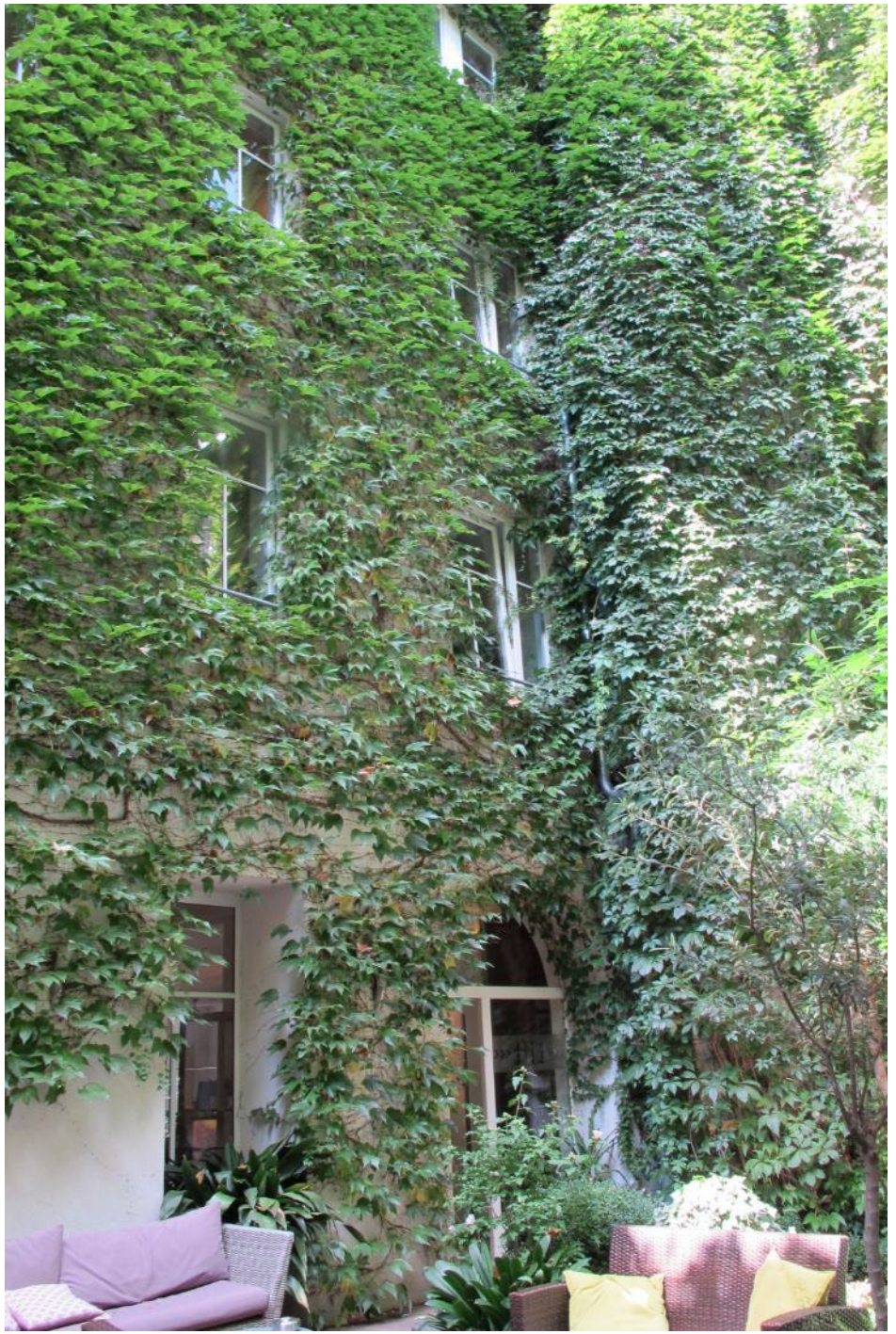

Illustration: Dip.-Ing. Ralf Dopheide e.U.

Wall-mounted system Hotel in Baden, Lower Austria



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Haus des Meeres, former flak tower, 1060 Vienna



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Mobilane facade greening system, 1223 Vienna



Illustration: Dip.-Ing. Ralf Dopheide e.U.

Interior greenery for a dental practice in Burgenland



Illustration: Dip.-Ing. Ralf Dopheide e.U.

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Authors: Wibke Niels und Marlin Penzenstadler, Institut für Biologiedidaktik, Universität zu Köln

Contributors: Elena Schippel, Layout, Institut für Biologiedidaktik, Universität zu Köln

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