

Syn[En]ergy



©CC Jock Rutherford



ENERGY CONSCIOUS CITIES & REGIONS

Potential analysis of unconventional photovoltaic use in urban spaces

The Syn[En]ergy project explored synergies between photovoltaic use on horizontal urban surfaces and other claims on utilisation as a basis for sustainable energy generation. Drawing on site-specific information from the primary research areas, Vienna and Korneuburg, the project team made an estimate of energy production potentials. Based on these findings, economically efficient and socially acceptable application scenarios were then developed for individual sites.

- Development of a comprehensive method for calculating the solar potential of open spaces in urban areas using GIS.
- Architectonic landscape designs and economically detailed calculation of three case studies were carried out with the implementation partners.
- Web visualisation of PV potentials, plus 3D and VR models of the case studies.
- Technical and economic calculations of photovoltaic potentials in urban areas, taking social acceptance into account.
- Development of usage types — i.e. a combination of urban open-space types and different photovoltaic system applications.

smart & resilient cities

AIT Austrian Institute of Technology
www.ait.ac.at/city
 Ernst Gebetsroither-Geringer
ernst.gebetsroither@ait.ac.at

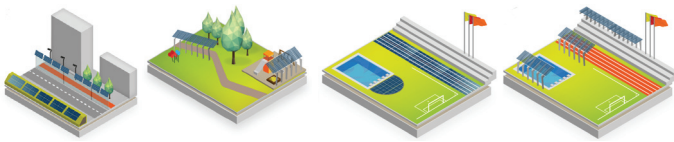


Open spaces in cities — such as roads, car parks or recreation areas — offer untapped potential for the implementation of photovoltaic systems. In addition to sustainable energy production, synergy effects, which make alternative uses possible for cities and their inhabitants, should be generated. Because using such sites for electricity production can bring a great deal of added value, the project investigated the numerous technical, spatial-planning, legal, creative, ecological and economic conditions that must be taken into account when installing photovoltaic (PV) systems. In addition, urban open-space types were identified and combined with different PV applications. The synergy potentials of these types of use were examined for their suitability for the use of photovoltaics — from both a design and economic perspective. Based on use type, architectonic landscape designs from three case studies were developed in cooperation with the implementation partners. The economic component, which plays an important role in the development of innovative solutions, was also investigated within the project framework.

To offer an example:

higher PV-energy consumption rates significantly increase the cost-effectiveness of PV systems because PV electricity generation costs are lower than end-user prices.

In addition to a three-dimensional illustration of the case study examples, the project used virtual reality representations, which deliver more realistic scenario assessments.



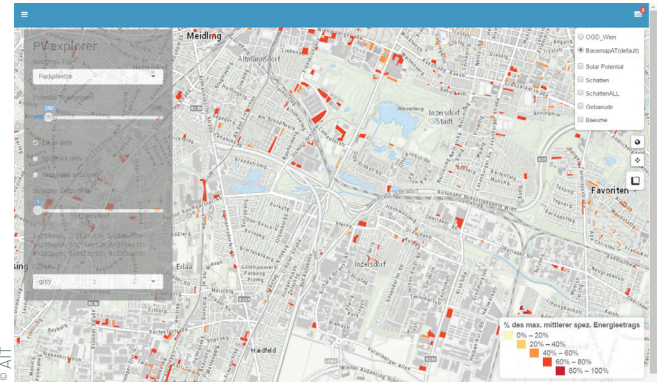
© Georg Bautz, Institut für Landschaftsarchitektur, BOKU

Client

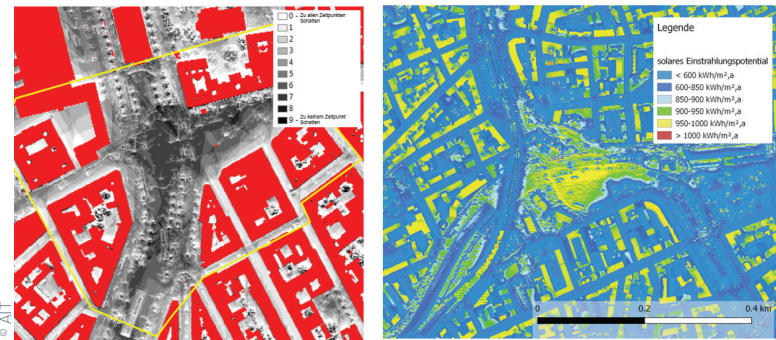
FFG / 2. bidding: City of the future

Partner

Universität für Bodenkultur, Landschaftsentwicklung, Erholungs- und Naturschutzplanung (ILEN)
 Universität für Bodenkultur, Institut für Landschaftsarchitektur (ILA)
 Nikko Photovoltaik GmbH
 Practice Partners:
 Stadt Wien – MA 20 Energieplanung
 Stadtgemeinde Korneuburg
 G3 Shopping Resort Gerasdorf



//01 PV-Potential Explorer



//02 Forecasted Shadows | Solarpotential

