

# Analyse von Großparkplätzen zur Photovoltaiknutzung in Österreich: Ein Beitrag zur nachhaltigen Energieversorgung, zukünftiger Elektromobilität und Bewusstseinsbildung bei EntscheidungsträgerInnen

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## Endbericht

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## 0 Abstract

Since some years in a row, photovoltaic industry is growing rapidly (IEA 2014; EPIA 2014) and brings ongoing economic impulses for Austria and therefore benefits for Austrian entrepreneurs. Statistics show, that Austrian entrepreneurs could gain a value added of 37,1% related to the total turnover and regarding the already installed pv-capacity in 2013 (PVA 2014). This creates new jobs and ensures social structures in Austria.

Nevertheless, the exploitation of photovoltaic potential is limited because its ongoing development claims additional space and is in competition with other land uses. As there is already a huge bandwidth of landscape functions (settlement, agriculture, nature protection, industry, tourism etc.) the implementation of photovoltaic energy is and always will be additional. This shows that photovoltaic energy production is only attractive if there is on the one hand enough space available with little competition in land use, or on the other hand a multi-functional usage is possible.

The suitability of rural open space for PV-production is already well researched (BfN 2012; BfN und TUB 2013; Knoll 2011; NABU and BSW Solar 2005; Stadt Wien 2013). However little research is available regarding the suitability of photovoltaic in open urban spaces (settlements). This roots on the theory that those spaces, with exception of horizontal urban spaces like roof surfaces, show little efficiency and are not worth to consider (Hunter und Baldwin 2013; Genske et al. 2009). In addition recent research often only respect available urban public spaces for PV-potential analysis whereas private urban spaces were not considered at all. Until now the research on siting for photovoltaic implementation does only pay little tribute to a potentially well-suited land use category like large urban parking spaces (Strauss et al. 2009; Neumann et al. 2012; Tulpule et al. 2013; Chukwu und Mahajan 2014; Serrano-Luján et al. 2015). Multi-level use of low-threshold usages (like parking space used for vehicles) can potentially gain synergies with a photovoltaic energy production through for example prevention of additional sealing, which is an ongoing problem in Europe and especially in Austria (Heinrich-Böll-Stiftung et al. 2015). An added value occurs for users (shadow for the parked cars; protection of rain and snow; refueling of batteries for electric vehicles etc.), as well as for owners/management (additional economic value through energy sales; potentially reduction of operating costs for maintenance; new services etc.).

However until now, there is no overview about the quantity of potentially suited urban parking spaces in Austria, their potentially contribution to a sustainable energy production in Austria and to the Austrian photovoltaic industry. Furthermore there is no knowledge about which economic sectors could potentially benefit in case of implementation.

This paper identifies large public and private parking spaces in Austria, potentially suitable for photovoltaic energy production. Therefore it calculates and aggregates the theoretic photovoltaic potential on all urban parking spaces in Austria with a minimum of 600 m<sup>2</sup> and gives information about the potential total energy production per year with respecting surrounding infrastructure (3D-buildings), long-term climate- and atmospheric parameters (DSSF).

Results of this paper will contribute to awareness regarding the potentials of public and private urban parking spaces especially addressing owners of relevant estates, public administration and responsible funding agencies. Therefore it supports the Austrian photovoltaic industry in a long term and contributes to ensure existing and create additional workplaces.