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Streamlining photovoltaic deployment: The role of local governments in reducing soft costs

Lars Strupeit^{a,*}

^a*The International Institute for Industrial Environmental Economics, Lund University, 22100 Lund, Sweden*

Abstract

Steep declines in photovoltaic (PV) technology prices have directed attention to the so-called soft costs associated with PV deployment. This paper focuses on one element of soft costs: those that arise from local permitting and inspection processes typically being handled by municipalities. Based on a literature review, the paper compares the status of local PV permitting in the US and Germany. Results show the significant potential for municipalities to streamline local permit procedures, a process that can be facilitated by higher-level governance rules, standardizing bodies, and other solar advocacy coalitions.

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Keywords: photovoltaic; permitting; soft cost reduction; municipality; governance

Nomenclature

PV	Photovoltaic(s)
US	United States

* Corresponding author. Tel.: +46 46 222 02 19; fax: +46 46 222 02 40.
E-mail address: lars.strupeit@iiee.lu.se.

1. Introduction

Competitive, building-sited photovoltaics (PV) has the potential to become one of the key pillars of low-carbon urban energy systems. Recent declines in PV system prices[†], largely driven by PV module cost reductions, have improved the economics of PV technology. As a consequence of PV hardware cost reductions, the importance of soft costs is increasing. Soft costs for PV deployment arise from processes related to customer acquisition, technical and legal-administrative planning and inspection, installation work, financing, etc. Soft costs now constitute 20–64% of turnkey residential and small commercial PV system prices [1–4]. Recent literature has focused on the mapping and benchmarking of soft costs [5,6] and their variations in different geographic contexts [4,7–11].

Municipal governments serve an important role in urban PV deployment. Many cities around the world have implemented a variety of policies and measures, including grant programmes, local feed-in tariffs schemes, showcase projects, and various other measures, to support solar PV market development [12–16]. The role of urban jurisdictions in streamlining PV deployment and supporting the reduction of soft costs, however, has not received much attention in the academic literature so far.

This paper focuses on one element of soft costs, namely that arising from local permitting and inspection processes and involving municipal departments. The paper presents a novel comparison of the status of local PV permitting in two major PV markets, the US and Germany. Soft costs for local permitting have shown to vary widely across these different jurisdictions, suggesting that a significant potential for cost reduction in “high-cost” locations does exist. Specifically, the paper analyses the role of municipalities and higher-level jurisdictions in streamlining local permit processes. By comparing two countries, the paper offers novel insights into the role of multilevel governance interactions in streamlining PV deployment at the local level.

2. Material and methods

The paper is based on a literature review of the status of local, municipal permitting for rooftop PV in the US and Germany.

3. Results

3.1. Local permitting in the United States

The purpose of the permitting and inspection processes required for new PV systems is to ensure compliance with public health, safety and design standards. In most U.S. states, the local city or county building department controls the review and issuance of permits for rooftop solar installations within its jurisdiction, the most common ones being building and electrical permits as well as zoning and design review. In many US municipalities, this process is characterized by a diversity of documentation requirements, cumbersome application procedures, multiple inspection processes, and permit fees, which all add up to significant extra costs for PV installations [5,6]. Besides, requirements and processes for the permitting of PV across the 18,000 different local jurisdictions in the US vary widely, further complicating matters for installer firms that work across several municipalities.

[†] Key components of a grid-connected PV system are modules, inverter(s), a mounting system, and cabling. In addition to the hardware costs, PV system turnkey prices typically also incorporate the costs for technical and legal-administrative planning, permitting, installation, and connection to the grid.

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