

Business models for renewable energy in the built environment

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Executive Summary

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Executive Summary

The project “Business Models for Renewable Energy in the Built Environment (RE-BIZZ)” aims to provide policy makers and other market actors insight into the way new and innovative business models can stimulate the deployment of renewable energy technologies (RET) and energy efficiency (EE) measures in the built environment.

Today, various barriers prevent an increased deployment of RET in the built environment including

- Market and social barriers: price distortion through externalities, low priority of energy issues, split incentives, etc.
- Information failures: lack of awareness, knowledge and competence
- Regulatory barriers: restrictive procurement rules, cumbersome building permitting processes
- Financial barriers: low (or no) returns on investment, high up-front costs, lack of access to capital etc.

For the scope of this study, a business model was defined as **‘a strategy to invest in RET (and EE measures), which creates value and leads to an increased penetration of RET in the built environment.’** Successful business models represent approaches in which the financing and implementation of RET or EE in buildings is organised in such a way that certain barriers for the deployment of RET are overcome. Based on the main drivers for value creation, business models for RET in the built environment can be grouped in three categories, in which overall 10 business models were analysed:

- **Product-Service-Systems / Energy Service Companies (ESCOs):**
 - 1) Energy Supply Contracting (ESC): An Energy Service Company (ESCO) supplies useful energy, such as electricity, hot water or steam to a building owner (as opposed to final energy such as pellets or natural gas in a standard utility contract). The ESC model is particularly well suited for generating electricity and heat from RET.
 - 2) Energy Performance Contracting (EPC): An ESCO guarantees energy cost savings in comparison to a historical (or calculated) energy cost baseline. For its services and the savings guarantee the ESCO receives a performance based remuneration.
 - 3) Integrated Energy Contracting (IEC): The IEC model is a hybrid of ESC and EPC aiming to combine supply of useful energy, preferably from renewable sources with energy conservation measures in the entire building. The model is currently being piloted in Austria and Germany.
- **Business models based on new revenue models:**
 - 4) Making use of a feed-in remuneration scheme: Through a feed-in remuneration scheme the producer of renewable energy receives a direct payment per unit of energy produced. A feed-in scheme guarantees access to a predictable and long-term revenue stream, which can serve as a stable basis for a business model.
 - 5) Developing properties certified with a green building label: ‘Green’ building certification systems assess a building’s performance according to environmental and wider sustainability criteria. In this business model a property developer or architect designs and builds buildings certified according to a voluntary ‘green’ certification scheme, expecting to realize a sales price premium compared to conventional buildings.
 - 6) Building owner profiting from rent increases after the implementation of energy efficiency measures: Building owners who do not occupy a building themselves or housing corporations can profit from additional revenue opportunities after undertaking investments in RET and EE measures if they are allowed to charge higher rent from their tenants after the renovation.

- **Business models based on new financing schemes:**

- 7) Property Assessed Clean Energy (PACE) financing: PACE financing is a mechanism set up by a municipal government by which property owners finance RET and EE measures via an additional tax assessment¹ on their property. The property owners repay the 'assessment' over a period of 15 to 20 years through an increase in their property tax bills. When the property changes ownership, the remaining debt is transferred with the property to the new owner.
- 8) On-bill financing: Utilities provide financing (i.e. a loan) for RET and EE measures. The building owners (or building users) repay the loans via a surcharge on their utility bills.
- 9) Leasing of renewable energy equipment: Leasing enables a building owner to use a renewable energy installation without having to buy it. The installation is owned or invested in by another party, usually a financial institution such as a bank. Leasing can be a central component of the business model of an ESCO or of a company that introduces a new technology to the market.
- 10) Business models based on Energy Saving Obligations: Energy Saving Obligations are a policy instrument that obliges energy companies to realise energy savings at the level of end users. It stimulates business models based on financial incentives offered by energy suppliers to building owners, renters or energy service companies.

The analysis of the business models included an analysis of the organisational and financial structure, the existing market and policy context and an analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT). Some of the analysed business models are specific to a certain market segment (e.g. new vs. existing, owner-occupied vs. rented, residential vs. commercial buildings), whereas others can easily be generalised. Practical experience with the models varies among countries.

Strong role of policy makers required

The study demonstrates that business models can play an important role in increasing the deployment of RET in the built environment. They provide opportunities for building owners, e.g. facilitating access to capital, financing of up-front costs, outsourcing of technical and economic risks, and offering further energy related services. In many cases business models require only a supporting role by government, e.g. through changes of legislation. However, business models alone will not lead to a significantly increased deployment of RET. The analysed business models generally only lead to a deployment of cost-effective technologies because they are unable to improve the returns on investment of RET and EE measures by themselves. Moreover, business models cannot address all barriers, e.g. no business model addresses the barrier of 'low priority of energy issues', which keeps building owners from taking action. This implies that a strong role of policy makers is still required.

In which market segments can the business models be applied?

The built environment is a complex sector where barriers for an increased deployment of RET differ among market segments. The results show that **in existing and new, large commercial, residential and public buildings**, ESCO models can address the barriers of high upfront costs and access to capital. In **small residential and commercial buildings** this can be achieved by PACE or on-bill financing. These business models make a life cycle approach possible where building owners can spread the investment costs across the project life time. For business models to work in **rented buildings**, the split incentives barrier must be addressed. One way of doing this in regulated rental sectors, especially the social housing sector, involves a change in legislation, allowing building owners to

¹ 'Tax assessments' are comparable to loans as the property owner pays off its debt in installments over a period of various years.

pass on the cost of the investment to the tenant through a rent increase. To cushion the social effects of the measure, the benefits of energy savings should be higher than the rent increase for the tenants. Business models have the advantage that they can work well for **existing buildings** whereas building codes / obligations so far tend to be limited to new buildings and substantial renovations.

Business models for non cost-effective technologies

Today, there are already many cost-effective opportunities for a deployment of RET and EE measures (e.g. insulation of buildings, solar water heating in sunny climates), although cost-effectiveness largely depends on the background situation. For technologies that are not (yet) cost-effective, business cases may be based on supporting policy measures such as feed-in remuneration schemes. 'Green' certification of buildings can stimulate investments in RET even when they are not cost-effective. However, because such certification is voluntary, it typically only works in niche markets.

Energy saving obligations are introduced by governments to stimulate EE measures and energy services through the participation of energy suppliers. In practice, this policy measure promotes for example the role of ESCOs and on-bill financing but originally it only focused on EE. The scope of energy saving obligations could be broadened to include RET in the built environment.

Recommendations for policy makers

- Policy makers should first analyse the **cost-effectiveness** of RET/EE measures in different market segments of the built environment within their jurisdiction.
- To support cost-effective RET in **existing and new large commercial, residential and public buildings** policy makers can stimulate ESCO models, e.g. by supporting market facilitators, facilitating access to finance and changing procurement rules for public buildings.
- To support cost-effective RET in **smaller residential and commercial buildings**, policy makers can stimulate business models such as on-bill financing or PACE financing, e.g. by
 - deciding on the most promising model based on a stakeholder analysis (which actors have an interest in RET, the ability to offer access to capital, the technical capacity and access to the decision makers)
 - mandating or strongly incentivising utilities, e.g. through energy savings obligations to take an active role
 - clarifying outstanding legal issues, e.g. on linking liabilities to a property.
- To address split incentives in **rented buildings**, depending on how their rental market is regulated, policy makers may change rental legislation to make rent increases possible after RET or EE investments.

Recommendations for building owners

Public building owners play a special role, as they can serve as a role model and a means to drive the implementation of government targets for RET deployment and energy efficiency in the built-environment. Governments can be proactive in applying suitable business models. Public building owners can for example:

- Apply certification with voluntary 'green' building labels to new buildings and during substantial renovation of existing facilities, and;
- Directly support ESCO business models by using these models in the public building stock. This may require a change in public procurement rules.

This provides a unique opportunity for local governments to become active in increasing the deployment of RET in the built environment.