



SELLING SOLAR SERVICES AS A CONTRIBUTION TO A CIRCULAR ECONOMY

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Key messages

- I The solar services sector sells the service of providing the use of solar electricity to its customer instead of selling solar PV systems (the product). This new business model can be seen as a radical innovation for the solar sector – as it is in other sectors. It is particularly interesting from the perspective of systemic eco-innovation fostering a carbon-free and circular economy.
- II There are several barriers that prevent the uptake of solar services in Europe. This includes financial barriers – finding a private investor who is willing to provide funding for such an innovative business model is difficult, and public funding might not always be accessible. There are also information and public acceptance barriers – neither the financial stakeholders nor the end customers are aware of the solar service option, understand its mechanisms or see the advantages that this option could offer to them.
- III The political and policy relevance of selling solar services is clear. Stimulating new business models based on selling 'services' instead of 'products' is a crucial factor in optimising resource flows in our society. Integration of the solar services debate into wider renewable energy and/or circular economy policies could serve this aim. Several solutions already exist that could mitigate the information and financial barriers identified. Rather than research into new technological solutions, this would require research regarding the possibilities and pitfalls of economic and social innovation towards a circular economy in Europe.



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 308680.

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RECREATE is a 5-year project running from 2013 to 2018, funded by the European Commission. It is carried out by a consortium consisting of 16 key partners from European research and industry and is led by the Joint Institute for Innovation Policy (JIIP). The overall objective of the project is to support the development of the European Union's research and innovation funding programme Horizon 2020, with a specific focus on the part *Societal Challenge 5: Climate Action, Resource Efficiency and Raw Materials*.

www.recreate-net.eu



Dear Reader,

We are very pleased to present you with the first of our series of RECREATE Policy Briefs. These briefs translate the key outcomes of the project into policy-relevant messages. These first three RECREATE Policy Briefs are directly based on the so-called Evidence-Based Narratives (EBNs). The purpose of the EBNs is to describe, in a narrative form, the potential but also the risks and remaining challenges of particularly promising innovations in the DG RTD priority areas of Systemic Eco-Innovation, Nature-Based Solutions and Climate Change Services. Ultimately, the objective is to support DG RTD with the formulation of future H2020 Work Programmes.

Policy Brief no.1 focusses on the selling of solar services as a radically new business model, as opposed to the selling of solar panels as a product. These services cover the use of solar electricity produced on the customer's roof, including the installation, monitoring, maintenance, repair and replacement, similar to a comprehensive leasing arrangement. The benefits of this business model are manifold. The two main benefits are first the possibility of many house-owners to use self-produced solar electricity (even those to whom the purchase of solar panels would constitute too much of a financial burden). Hence, it is a powerful way to increase the share of renewable energies (and thus to help mitigate climate change, to reduce dependency on fossil fuels and of course to save costs). Secondly, as the service arrangements include the maintenance, repair and replacement, this business

model is a crucial factor in optimising resource flows and thus a strong contribution to a Circular Economy.

The challenges that this innovation still faces are not so much of a technological nature but primarily in finding and convincing investors and, linked to this, in lack of public awareness and acceptance barriers. Therefore, the key message of this policy brief is not a call for further technological research but for exploration of the business model and its economic and environmental benefits both at micro and at macro-level. This may provide the business case and evidence that is needed to convince both investors and potential customers. It goes without saying that the support for this type research efforts should be accompanied by much wider policy efforts, consisting of information and capacity building efforts, offering (publicly supported) financing options and/or regulatory means.

On behalf of the entire RECREATE consortium, we wish you a good read and look forward to your feedback. If you would like to find out more about the project, please visit our website www.recreate-net.eu or send an email to info@recreate-net.eu.

Kind regards,

A handwritten signature in blue ink, appearing to read 'Robbert Fisher', with a stylized flourish at the end.

Robbert Fisher

Project Coordinator

Selling Solar Services as a Contribution to a Circular Economy

This policy brief discusses the case of selling solar services as an example of systemic eco-innovation fostering the realisation of a circular economy. It is based on one of the detailed narratives carried out for the RECREATE project. This case is an example of an innovative business model based on providing services rather than products which is one of the key mechanisms to support the transition to a circular economy.

I What is the problem? What is the suggested innovative solution?

Solar Services and the Circular Economy

“Selling Solar Services” represents a business model innovation that provides a snapshot of the on-going transition from a centralised and fossil fuel-based energy system towards an energy system that is more based on decentralised self-production and consumption of renewable energy. A company offering solar services does not sell solar PV systems to rooftop owners, but instead provides the service of the use of solar electricity produced

on the customer’s roof. This service is delivered via a financial and organisational leasing arrangement that includes financing, installation, monitoring, and maintenance and repair. In this arrangement, the ownership remains with the solar service company, it is not passed to the end-customer – as is done in the conventional outright purchase model. As such, the solar services model can contribute to the transition to a circular economy.

II Environmental and economic potential of the solution

The solar services model promises to deliver a hassle-free use of solar PV without the hurdle of having to first invest a substantial amount of money and without any problems related to maintenance. The services can be applied to domestic and commercial buildings.

Market size and potential

The exact size and potential of the solar services market and its economic significance is difficult to assess, as this specific market is closely linked to other energy supply services. However, key market players expect demand to substantially increase leading to a growing market for solar services in the next five years.¹ Companies offering solar PV leasing options today see themselves as energy man-

I have worked roughly 14 years for the biggest car leasing company in the world. Basically I bumped into solar energy, related to electric vehicles and leasing electric vehicles. Then the whole puzzle came together because I thought, I know this model inside out—car leasing and hassle-free mobility—and solar panels have next to a great financial return also a great sustainable return. So the only thing that prevents mass adaptation of decentralised solar energy is hassle-free solar energy. That can be done by removing the investment, hassle and risk barrier. That is how we started with Solease. Pierre Vermeulen, Solease

agement companies of the future. Being supported amongst other things by a further take-up of solar services, by 2020, those European solar companies might realise an annual turnover of \$US 46 billion² and create more than 1 million jobs.³ A rapidly growing solar PV market (Figure 1) also offers ample potential for employment in related services.

Sales arguments for selling solar services:

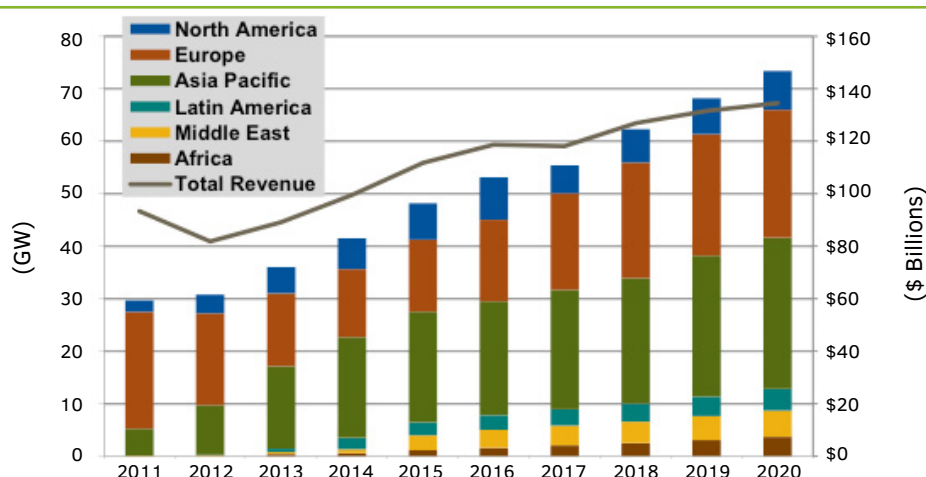
- ✓ Cost savings from the first day – while the costs of solar PV technology are decreasing, the price of conventional electricity for end-consumers are increasing.
- ✓ Self-consumption allows independence from energy market developments – in comparison with the traditional option of being connected to the grid, solar services allow the customer to be largely independent from energy price developments.
- ✓ Solar energy is clean and comes from a renewable source – unlike energy supplied from a conventional fossil fuel source.
- ✓ Financing distributes high upfront costs over a longer time period – compared to buying a solar PV system, leasing it allows the customer to avoid the high upfront cost of such a system.
- ✓ One-stop shop offering a worry-free package – with solar services, the customer does not need to worry about installation, maintenance and repair, and/ or the regulatory framework.

Market experiences

A solar services market with a broad range of investors is already developing. Innovative funders and actors are active in this new market, but so are traditional funders such as banks, business angels. Large players such as the incumbent energy supply companies have also decided to invest in solar services. All companies expect an increasing demand and a

growing market for solar services. In five years, they see themselves being more active in the solar service market. They regard solar services not as a standalone solution but rather as an entry into holistic home energy management that will mainly consist of combined electricity solutions for home and e-mobility, or even neighbourhood supply via local grids.

Figure 1: Annual solar PV installed capacity and revenue by region (2011–2020)



Source: (Navigant Research, 2013)⁴

III Good practice examples

Examples of solar services companies active in the market

There is a wide range of companies already active in the solar services market, varying from start-ups to incumbent electricity companies. Examples are:

Solease

Solease is a Dutch start-up that was founded in 2011. Solease aims to sell “hassle- and risk-free solar energy” with a goal to “remove all barriers that people have and to make sure that they switch to decentralised production as soon as possible, because it makes sustainable and financial sense. Within its business model, Solease purchases the solar system,

installs it and takes care of maintenance, repairs and insurance. In addition, it provides additional value added services like system monitoring, reporting and energy saving measures. The initial focus was on private customers, but recently Solease has also started to offer its services for commercial customers.

DZ-4

The German company DZ 4 understands its service package as a “one-stop shop” because DZ-4 takes care of all hassles accompanying the operation of a solar PV system, such as equipment selection, procurement, installation, operation, monitoring, maintenance, insurance and removal. In this re-

spect, DZ-4 differs from the other companies, since it contains not only the solar service that makes it possible to deliver solar energy not only by day but also by night. Target group are residential homeowners that can choose between two tariffs—with or without storage solutions.

Trianel

Trianel is a European municipal utility cooperation that aims for a collective realisation of projects. Trianel is active solely on the business-to-business market. One solution developed in 2012 by Trianel is “Energiedach” that gives utilities assistance regarding the deployment of solar services via rooftop-based PV systems including storage solutions. “Energiedach” has evolved into the lead product of Trianel’s energy contracting. The solar service provided includes planning, financing, installation, maintenance and repair of the solar technology solutions.

RWE

In 2012, RWE developed its solar service-product “RWE Photovoltaic Pachtmodell”. The target group to which the service is sold is the commercial end-customer that is usually facing upfront investment costs in a larger order of magnitude,

supporting them to invest in more business core process-related assets and activities. The solar service offered includes customer-related planning and design of the system, financing, installation, monitoring, and repair, cleaning and maintenance of the system is the responsibility of the customer. RWE also offers the energy from the grid the customer needs to obtain in case that the rooftop energy produced is not sufficient. Additionally, the customer can decide for a contracting option that analyses and optimises lighting performance.

Conergy

Conergy is a worldwide operating downstream solar company, specialised in the design, financing, building and operation of high performance solar systems for homes, businesses and utility-scale power. It co-operates with Trianel in the business-to-consumer market and with RWE in the business-to-business market. Despite that Conergy is still active in the outright purchase market, Conergy’s role in its solar service cooperations is to realise the solar service from a technical point of view. Conergy designs the PV systems, manages and plans the system installation in cooperation with local craftsmen.

IV Barriers to implementation

Despite the fact that solar services can take away some of the hurdles for further implementation of solar PV, there are also barriers to further growth of this market. These include financial barriers for investors as well as information and public acceptance barriers for potential customers.⁵

- On the supply side, **financial barriers** have been identified as the main hurdle for selling solar services as a business model for companies active in the solar services market. They often lack public and private financing and commercial investors are hesitant to invest in solar services market as they perceive high risks and do not yet see sufficient rates of return. Public investors do not

see the innovation value of the service, as there is no technical or service innovation involved for which appropriate funding mechanisms exist.

- **Information barriers** exist on the supply and on the demand side. Financial stakeholders – investors and banks – sometimes do not know or seem to sufficiently understand the solar service model and its potential barriers. On the

Barriers for potential customers are a lack of knowledge, fear, seeing solar PV as a non-core business, and unpredictable developments in the energy market.

Policymakers and entrepreneurs need to act in concert in order to put this model on the right track and to put the idea across that there is only one solution—you need to become a decentralised power producer.

Philipp Birkenstock, RWE

Economic and social innovation faces difficulties to attract funding

With regard to attracting financial support from R&D funds, The German company DZ 4 reported that their intensive search for appropriate kick starting support ended unsuccessfully. The observation was rather that while technology and patent-based start-ups receive funding from technology-oriented funds, and IT-based start-ups receive funding from a service-oriented fund—the funding of a non-IT service and non-patent owning, but still technology-based start-up is extremely difficult. Acquiring research and development funding for business model innovations does not comply with current R&D guidelines, especially those from the EU. Currently, service-oriented business model concepts that are based on ideas, intelligence and on people fail to find and convince investors.

demand-side, potential customers are often not aware of the possibility of renting solar services, instead of buying the solar PV technology and installing solar panels themselves. They might also be sceptical about leasing physical assets

in general. The entrance of more market players, especially the incumbent energy companies, will make the model better known and trusted, which would help overcome this barrier.

A better understanding of the potential benefits of solar services is needed

Before the company DZ-4 was officially founded in 2011, its founder visited several trade fairs, e.g. the “E-World Energy & Water” in order to discuss the basic idea of solar leasing in Germany with other experts and relevant market players. During that time, he also had initial talks with the incumbent energy companies. “Back in 2010, the idea was perceived as unrealistic, yet even too imaginative, while in every further year the idea became more realistic. Later, three of the four big German energy players were interested in bilateral talks in order to understand the business model concept”. Finally, this resulted in cooperation between DZ-4 and the incumbent energy company EnBW described earlier in this paper. “Cooperating with this big player is helpful insofar as it provides the start-up with access to end-customers that is not necessarily possible to get as a standalone player. Furthermore, cooperating with an important market participant helps to “educate” the customer”. This refers to the fact that the DZ-4 business model is still so new to the German market and its participants that sales talks with potential customers are rather more about the business model mechanisms in general than about why for example the offer of DZ-4 is much better than of another solar service provider from the same market. Apart from addressing investors, having a social network that helped to make the solar service concept more known has been evaluated as very valuable by DZ-4. DZ-4 regards itself as a network company as it cooperates with 50 partners in distribution, supply and installation.

V Policy support needs

New business models can be a topic for research and innovation policies⁶

Traditionally, research and innovation policies focus on product and process development, as well as – to a lesser extent – on the development of new services. The stimulation of new business models is something that is completely new to R&I policies. At first sight, such new business models seem a typical market activity that should be left to private investors. However, this view changes if such new business models are a crucial factor in optimising resource flows in our society.

‘Use’ instead of ‘own’ in this case can take away barriers to adopting an environmentally friendly innovation, for example the barrier of high upfront costs in the case of solar panels purchased by the end consumer. This approach also stimulates the owner of the assets to design (or select) these assets in a sustainable way, i.e. to last as long as possible. A secondary market for used solar panels could also be developed.

Research and innovation into solar services should be accompanied by wider policies

There are two ways in which the promotion of solar services can be integrated in wider policy efforts for greening the economy.

- I One direction for policy integration of solar services is to link it into wider **stimulation of renewable energy**.

Simple information and dissemination campaigns for this purpose could be accompanied by competitions, leading to prizes and awards, or the introduction of standards labels, which, should help improve the reputation and extent to which solar service companies are trusted.

- II A second option is to link it to the **stimulation of a circular economy**.

The **first strategy** would start from the notion that high initial investment costs are only one of the obstacles to the wider implementation of solar PV. Promoting solar services therefore needs to be integrated into wider policies on the stimulation of renewable energy and solar PV in particular. Here, solar has to compete with other renewables.

The **second strategy** regards ‘buying a solar service’ as a concept that can be part of a wider campaign on stimulating sustainable business models. As the implementation of such models would conflict with the traditional business model of ‘sell-and-replace’, stimulation of services would need to be integrated with wider measures to stimulate a green economy. A broader discussion with business on the likely impacts of such ‘new business models’ is therefore a crucial political aspect that needs to be considered here.

In order to increase the size of the circular market economy, research and innovation policy could investigate new service-market combinations, their potential and barriers encountered, by acting like an entrepreneur itself. Investing one Euro into the market brings higher revenues than investing it into research. Pierre Vermeulen, Solease

Funding structures which would be appreciated and helpful could be realised either with a fixed kick-starting funding amount, or with funding related e.g. to the first ten customers, or in a more structured way with e.g. three financing stages, complemented by coaching and support.

Cross-cutting through the two strategies, there are three general routes of policy instruments that could stimulate the uptake of solar services:

- a **'Information/ capacity building' options** – 'Buying a service' as a business model is something new and innovative, while the customer is still used to the traditional 'ownership' business model. Knowledge generation and diffusion towards new customers and investors of this alternative business model is important.
- b **'Financing' options** – Lack of sufficient public and private financing can be mitigated via several routes, which could also be accompanied with special arrangements for pilot regions or first-mover customers. Existing financing options include fiscal instruments (innovation/renewables subsidies or tax advantages), debt financing (soft loans, specific credit lines), equity (buying in, etc.) and others. The development

of a secondary market would also help decrease the perceived financial risk.

- c **'Regulatory' options** – Investors perceive unforeseen changes in the political and economic environment regarding the energy market as one of the risks. Clear political will to support framework conditions in which innovative business models can flourish would help the uptake of the solar services market. For instance, standard setting for leasing companies could be helpful here.

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- 5) Barriers have been identified based on the expert interviews with solar services companies
- 6) Based on the analysis done in the Selling Solar Services narrative under RECREATE.



Policy Brief No.1, December 2015

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Berlin/Brussels 2015

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