EXAMPLES OF INNOVATIVE FINANCING SCHEMES

2014-2015

EurObserv'ER

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Examples of innovative financing schemes

EXAMPLES OF INNOVATIVE FINANCING SCHEMES

Under the current macro-economic trends in the EU it is difficult for public budgets to secure funds for the further support of renewables. Thus, the so far abundant support system for renewables (mainly in the form of feed-in-tariffs and quota systems) has been drastically downturned.

In many EU countries, companies are trying to find alternative ways to secure financing for their renewable energy projects. However, it has to be noted that the withdrawal of public support did not cancel the EU's green ambitions, therefore, new ways of attracting private capital for the realisation of green energy goals have to replace the old schemes.

The finance and investment gap needs to be filled by the private sector, by new business and financing models.

It takes effort to convince the market actors to mobilize their accumulated financial resources for the development of renewables.

Perception of risk is the most important factor impeding such investments, however, good news is that there is already a significant number of good practice examples, in this document we describe some of them.

Innovative financing mechanisms presented in the following pages are likely to play an increasingly important role in the allocation of risk among different investor classes and help mobilize investments for new green energy projects in the future.

ENERGY COOPERATIVES

CITIZEN INVOLVEMENT IN RENEWABLE ENERGY FINANCE

In Germany, an increasing involvement of citizens in renewable energy investments can be observed. In 2012, almost 50% of the existing renewable energy capacity was owned by citizens, e.g. private persons, farmers, or energy cooperatives. Hence, the renewable energy market substantially differs from conventional energy generation that is dominated by energy utilities.

There are different concepts of citizen contribution to renewable energy. Citizens can act as investors. Numerous regional banks offer green savings certificates. All the funds generated through these certificates are invested in regional renewable energy projects. A more direct option for citizen involvement are energy cooperatives. Generally, a cooperative is an association of natural or legal persons whose goal is the economic or social advancement of its members through a joint business operation. Activities of energy cooperatives often involve the establishment and operation of renewable energy production facilities or the participation in such systems. Citizens can become members of an energy cooperative by acquiring a share and receive dividend payments. The number of registered energy cooperatives in Germany grew from 136 in 2008 to 888 in 2013.

INNOVATIVE FINANCING MECHANISM – ENERGIEGENOSSENSCHAFT ODENWALD

One of the major challenges for the large-scale deployment of renewable energies is the substantial amount of required investments. Furthermore, renewables to some extent lack public acceptance which increases the risk of public opposition at the planning and permitting stages of renewable energy plants or the required transmission lines. A potential solution to these two challenges is citizen participation through energy cooperatives.

A primary example is the Energiegenossenschaft (energy cooperative) Odenwald (EGO) founded in 2009. Starting with 205 members and a balance sheet total of € 1.5 million at the end of 2009, the EGO had, at the end of 2013, 2515 members and a balance sheet total of € 37.6 million. With the capital of participating citizens, the EGO has installed more than 30 MW of capacity in the region. In addition to its engagement in renewable energy generation, the EGO developed the so called “Haus der Energie” (house of energy). It serves as a business park with office spaces for local companies and as a competence centre for renewable energy and energy efficiency in building. For its engagement for renewable energy, the EGO was awarded the German Solar Prize in 2013.

REPLICABILITY POTENTIAL

The general concept of citizen involvement in renewable energy financing has a high replicability potential, since it can be organized in quite a flexible manner. Next to cooperatives, there are other models of citizen participation frequently used in Germany, as GmbH & Co KG (hybrid of limited private partnership and limited liability company), that is often used for citizen wind parks in Germany. In other EU countries, as the UK or Denmark, energy cooperatives play an increasingly important role. One main advantage of citizen contribution in renewable energy deployment is the increased acceptance and hence a lower risk of resistance against renewable energy projects. A potential challenge for energy cooperatives is the planned replacement of the feed-in tariff by competitive procurement and bidding. This might negatively affect the success of citizen participation models that, among other things, profited from the high degree of investor protection offered by the feed-in tariff system. □

SOURCES:

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- *www.unendlich-viel-energie.de*
- *www.energiegenossenschaft-odenwald.de*
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EUROBSERV’ER – EXEMPLE OF INNOVATIVE FINANCING SCHEMES – 2014-2015

PENSIONDANMARK

NATURE OF THE FINANCING MECHANISM

Pension funds have large amounts of funds at their disposal. At the same time, the funds have to guarantee a certain return to their investors, which rely on the secure management of their invested money. As the committed funds are to be invested long-term, renewable energy projects with lifetimes of up to 30 years or more match the fund's investment horizon fairly well. Once the projects are set-up and running the reliable generation of stable cash flows moreover appears attractive to the investment model of pension funds. As renewable energy markets in most countries are marked by a high degree of government regulation, pension funds feel comfortable with this sort of projects. The involvement of these investors in renewables hence seems to be a reasonable step. However, comparatively high perceived risks in the initial stages of the technologies led to hesitation by the funds. With the development of a more comprehensive track record for technologies, such as on- and offshore wind and photovoltaics, the former skepticism appears to fade. In this process successful examples from one of the first-moving countries in renewable energy development contributes to more appreciation of suchlike projects as investment targets for pension funds.

INNOVATIVE FINANCING MECHANISM - PENSIONDANMARK AS FRONTRUNNER IN SUSTAINABLE ENERGY FINANCING

Denmark can justifiably be declared the birth place of wind energy application for electricity generation purposes. Whereas other countries started wind energy development in the late 90's or the beginning of the new millennium, the technology has for a long time been developed and applied in the Scandinavian country. As a consequence, there are a number of companies with special expertise in the sector. Most popular examples certainly include the major wind turbine manufacturer Vestas Wind Energy Systems or the utility DONG Energy, which is world-leading in offshore wind development.

It is therefore no surprise that Danish pension funds are amidst the first-movers in renewable energy financing. One of the primary examples is the pension fund PensionDanmark, which started its involvement in renewable energies in 2010. The fund was established as industry-wide pension fund in the early 1990's and has more than 640,000 members as of today. Total assets amount to approximately € 20bn with fast projected growth rates. To date, PensionDanmark has invested approximately $ 2.4bn in infrastructure project, of which the majority are renewable energy projects. The below tables provides an overview of the investments undertaken until today.

1

Renewable energy investment by PensionDanmark

Year	Project name	Description	Investment amount
2014	DolWin 3	Offshore wind grid connection in Germany	€ 384m
2013	UK Wind Farms	Six wind farms in Wales and Scotland	$ 240m
2013	Biomass	JV with Burmeister & Wain, which will build biomass power plants internationally	£ 120m
2013	Cape Wind	Offshore wind farm in the USA	$ 200m
2012	US Wind Farms	Three onshore wind farms in the USA	n/a
2011	Anholt	Offshore wind farm in Denmark	$ 680m
2010	Nysted	Offshore wind farm in Denmark	$ 130m

In addition to the presented investments, PensionDanmark committed DKK 200m (approx. € 27m) in the Danish Climate Investment Fund, which invests in renewable energy and climate change mitigation projects in developing countries.

The pension fund aims to increase investments in infrastructure to 10 per cent of total assets. Due to that ambition PensionDanmark plans to invest a further 1.5 billion $ in infrastructure over the next four years. Most of these investments will be in energy-related infrastructure. Therefore, PensionDanmark committed € 970m to a fund managed by the newly established investment management company Copenhagen Infrastructure Partners in 2012. Moreover, € 382m were committed to a fund solely investing in the offshore wind grid connection DolWin3.

The fund's CEO Torben Möger Pedersen highlighted the attractiveness of renewable energy investments to the company in connection with the investment in six wind farms in the United Kingdom: "Our investments in different types of infrastructure ensure our members an attractive and inflation linked return for many years. The investment in the six UK wind farms is an important element in this strategy with Falck Renewables as a very strong partner in European wind."

Besides PensionDanmark, other Danish pension funds are also active in renewable energy projects to a varying degree. The funds include: ATP, PKA, PBU, Sampension. Moreover, the Danish export credit agency EKF has a significant commitment level in Danish exports related to renewable energy projects and provides funding for certain types of projects (e.g. offshore wind farms). On 2 October 2014, Copenhagen Infrastructure Partners announced the launch of a new fund, Copenhagen Infrastructure II K/S, where PensionDanmark is also one of eight Danish institutional investors that have in total committed DKK 8 bn € 1.05 bn. This fund will be active in Northern and Western Europe as well as North America and focus on investments as, among others, wind and biomass power as well as investments in the electricity grid.

REPLICABILITY POTENTIAL

In the current low-yield environment, pension funds all over the globe are looking for attractive investment opportunities. More and more of them identify renewable energy projects as potentially profitable investments. The example of PensionDanmark is thus being replicated in some cases with e.g. pension funds in Canada or Germany venturing first renewable energy investments. However, pension funds and other institutional investors, such as insurance companies, still bear a considerable potential for the provision of supplementary funds for projects. □

SOURCES:

- *www.ifu.dk/en/services/the-danish-climate-investment-fund*
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- *www.renewableenergyworld.com/rea/news/article/2014/04/pension-funds-hold-a-key-to-renewable-energy-finance*
- *www.cipartners.dk*
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INTEGRATED ENERGY CONTRACTING (IEC) IN STYRIA, AUSTRIA

NATURE OF THE INNOVATIVE FINANCING MECHANISM

The underlying principle of the Integrated Energy Contracting (IEC) is the integration of both energy efficiency measures and renewables to achieve the climate protection goals: any (renewable) supply should first of all focus on energy efficiency by evaluating all possible demand-reduction opportunities. The remaining energy demand is supplied as efficiently as possible from renewables.

« We believe that there is great need for action in terms of energy efficiency. The potential [in energy savings] must be used much more than before. The remaining should be covered by renewable sources. » States Bernd Stampfl, Sales Energy Efficiency, Building Technologies, Siemens AG Austria.

The IEC combines two already well established ESCO financing mechanisms. i.e.: Energy Supply Contracting (expressed in MWh of energy supplied i.a. by heating and cooling from renewables) and Energy Performance Contracting (expressed as NWh saved i.a. by energy management, new HVAC[1], lighting, insulation and induction of behavioral changes) in one investment.

CASE STUDY APPLICATION

The IEC model was developed by Graz Energy Agency (consultant) and the real estate company of the region Styria: Landesimmobiliengesellschaft Steiermark (LIG Styria, an investor). LIG, the investor was founded in 2001. LIG is a state-owned real-estate holding and management agency of the regional government of Styria (100% owned), Austria. LIG is managing some 420 buildings in Styria; about 200 of these, (> 600,000 m²) are owned by LIG. The original motivation of LIG was to substitute renewable energy sources for heating oil wherever possible.

LIG Styria has performed a number of IEC-projects in the years 2007-2012. The Graz Energy Agency supported the investor, by organizing 3 pools for tenders. The IEC model has been implemented in 10 buildings with different size and usage (conference hotel, schools, home for the elderly, office buildings). The outsourced heat supplies have been switched from fossil to renewable fuels and various energy efficiency measures have been established (controls for lights, solar thermal collectors, optimization of heat distribution, etc.). In total 790 thousand € were spent with 17-31% heat savings, 5-12% electricity savings and 90% of CO_2 reduction levels due to replacement of fossil fuels with renewables, prevailingly biomass boilers and solar thermal collectors.

Closure of a contract for IEC is proceeded by a tendering procedure, which is negotiated as defined in public procurement law, with the following criteria for the project-cycle: 1. The lowest cost for energy supply 2. The lowest CO_2 emissions 3. The highest energy cost savings through demand-side saving measures proposed by the ESCO. The IEC contract is awarded for 15 years. An integral part of the IEC contract is the quality assurance plan (additional requirements of the contract, i.e. detailed procedures at the stages of planning, commissioning, auditing, proof of function, performance measurement, handover).

The national subsidies (30%) by the Kommunalkredit Public Consulting (KPC) were made available for public customers, if energy efficiency measures were implemented through contracting concepts.

One of the investment realized under the IEC, with LIG Styria as an investor scheme was a regional care center for eldery people in Bad Radkersburg, located at the feet of the southern side of Weineberge mountain.

« Styria has set a goal to reduce greenhouse gases in 2008 through the replacement of heating oil to renewable heat in the nursing home for elderly persons in Bad Radkersburg and in parallel to introduce energy efficiency measures in the areas of heating, water and electricity. » states Alfred Scharl, Head house engineering at the LIG

The dwellers are 28 elderly persons and 100 caretakers. The building was constructed in 1964, and refurbished under the IEC contract in 2010. The investment costs amounted to 340.000 €, expected profit after 15 years contract has been estimated at 260.000 €. At the supply side (MWh) 8 MW biomass district heating network supplies this site with space heat, of which 500 kW (in the future reduced to 320 kW) is dedicated only for this site. At the same time 143 m² of solar collectors and 3,000 liters storage covers the demand for hot water. Heat demand was reduced by 35% (364 MWh/a) and electricity demand by 12% (51 MWh/a), which is to be proven by a dedicated auditing procedure.

« The contract period is 15 years. This is sufficient to guarantee the project's profitability. » States Bernd Stampfl, Sales Energy Efficiency, Building Technologies, Siemens AG Austria.

REPLICABILITY

The implementation of the future EPC supposes that subsidies are obtained to lessen the high initial investment costs □

SOURCES:

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- *www.iea-retd.org*
- *www.grazer-ea.at*
- *www.intendesign.com*
- *www.energie-bau.at*
- *www.technik.steiermark.at*
- *www.soziales.steiermark.at*
- *www.cee.siemens.com*
- *www.stadtbadradkersburg.at*

1. Heating, ventilation and air-conditioning.

ENERGIEGENOSSENSCHAFT RITTERSDORF EG

SOLAR25 REGIONAL TARIFF

CASE STUDY APPLICATION

Solar25 regional tariff is a product offered by the company Grünstromwerk in two German regions: Mittelthüringen and New Nordoberpfalz, the next one is expected in Hesse. Green electricity is sold both to private and commercial customers as a product of Grünstromwerk with an outstanding feature – local product. Solar energy without governmental support is purchased directly from the producer, sold to customers in its vicinity. The exceptional feature of the product is the guarantee of the local production: at least 25% of green electricity is produced locally. It gives new customers a feeling of not only doing something for the environment in the global sense but also of becoming supporters of regional economic development. New PV projects are developed where there are enough customers- at least 1000 for a new PV plant (local expansion guarantee).

The product guarantees that at every moment, the custumers' consumption is covered by an equal injection of Norwegian hydroelectricity or local German photovoltaic electricitiy into the grid. The electricity is bought by Grünstromwerk directly from the PV producers without intermediaries. One of the green energy producers participating in the scheme is the Energy Cooperative Rittersdorf, founded at the beginning of 2013. The PV farm is located on a former landfill site, has the capacity of 1.5 MW with 17 000 modules, and producing 1,5 GWh per annum. The investment costs were € 1.7 million. The contract details between Grünstromwerk and energy producer remain secret.

NATURE OF THE INNOVATIVE FINANCING MECHANISM

Solar25 regional tariff allows to realize new renewable energy investments regardless of the political climate, electricity is supported by means of a special tariff without any support from the national feed-in tariff (FIT) scheme, guaranteed under the German Renewable Energy law (EEG). PV power plants producers do not get the EEG feed-in tariffs. Energy cooperatives receive no FIT and thus have to be compensated for the risk they take. The reimbursement height is negotiated. However, PV power has become an attractive commodity: generation costs have fallen from 56,7 c€ kWh in 2003 to 14,9 in 2013.

« PV plants are often criticized for their expansion geared by maximization of feed-in tariffs. Decoupling of the electricity market from the demand for power is indicated as a consequence (...). With Solar25 we want to make PV independent of the EEG remuneration and integrate them in the market. In order to convince the producer we have to offer a more attractive price than the EEG, it makes the whole thing expensive. We manage to offer attractive prices to customers by providing 25% of regional PV power and the rest from hydropower. » States Tim Meyer, Grünstromwerk CEO. Cited in PV-magazine.de.

The new elements of the innovative scheme, which are planned for the future are i.a. inclusion of wind parks in the scheme as well as power purchase agreements for renewables located in the vicinity of big customers.

REPLICABILITY

The idea is perceived as innovative in Germany and it was apprised by the PV Magazine as the "Top Business Model" award winner (2014) for the most innovative PV business models in Germany.
It has to be noted that its existence is conditioned to the availability of a cheap hydroelectricity which allows to cover the remaining 75% of consumption. □

SOURCES:

- *www.pv-magazine.de*
- *www.gruenstromwerk.de*
- *www.faz.net*

ESTER, THE SEMI-PUBLIC COMPANY

A JOINT VENTURE BETWEEN A FRENCH REGION, A LOCAL UTILITY AND A MANUFACTURER

ESTER that stands for Electricité Solaire des Territoires (Solar Electricity for local Territories), benefits from a solar energy development support mechanism. It was founded on the basis of a partnership between Solairedirect, a manufacturer and operator of photovoltaic installations, the Poitou-Charentes region and Sorégies and Séolis, two local utilities (for the departments of Vienne and Deux-Sèvres). The concept was the brainchild of Solairedirect in 2011 in reaction to the December 2010 moratorium on photovoltaic Feed-in Tariffs and took form during the course of the year as the semi-public company ESTER was set up. The first PV solar plant to emerge from this initiative, TIPER 3, with 8.7 MWp of capacity was commissioned early in December 2014. Construction of another facility, TIPER 1, with 10.8 W of capacity is underway on an adjoining plot. Incidentally the TIPER solar plants are located on disused military land and are at the heart of an ecosite project with educational bent. Séolis has entered into a contract with Solairedirect to purchase the electricity produced by TIPER 3 for 30 years.

AN INNOVATIVE BUSINESS MODEL

ESTER is a semi-public company owned 65% by the Poitou-Charentes region and 35% by Solairedirect. The region had many good reasons to take up this stake – to develop its local photovoltaic production capacities, gain from the resulting positive socio-economic impacts, build on its assets and make a return on investment. The local utility, for its part, wanted to secure its electricity supplies at below the wholesale market price for 10 to 15 years. The following principle applies: ESTER takes shares in a project company that includes the power plant operator and possibly other shareholders. The project company sells electricity to the local utility, Séolis in TIPER 3's case, according to the terms of the framework contract signed with Solairedirect. The solar power purchase agreement (SPPA) stipulates that the sale is made in two phases – firstly via a Feed-in Tariff contract (local utilities are entitled to enter Feed-in Tariff contracts) then as soon as the wholesale price exceeds the Feed-in Tariff, the electricity is sold at market price. In the second phase, the sale price to the local utility confined by floor and ceiling prices will be indexed to the wholesale market price minus an undisclosed discount. This arrangement enables the project company to set its banks' minds at rest about the potential risk and the local utility to restrain the impact of market price fluctuations. The Phase I maximum term is for 20 years, which equates to the Feed-in Tariff term (c.f. graph no. 1). However the Feed-in Tariff curve may intersect the wholesale market price before the 1st phase term expires, which Solairedirect assumes will happen.

A REPRODUCIBLE SETUP

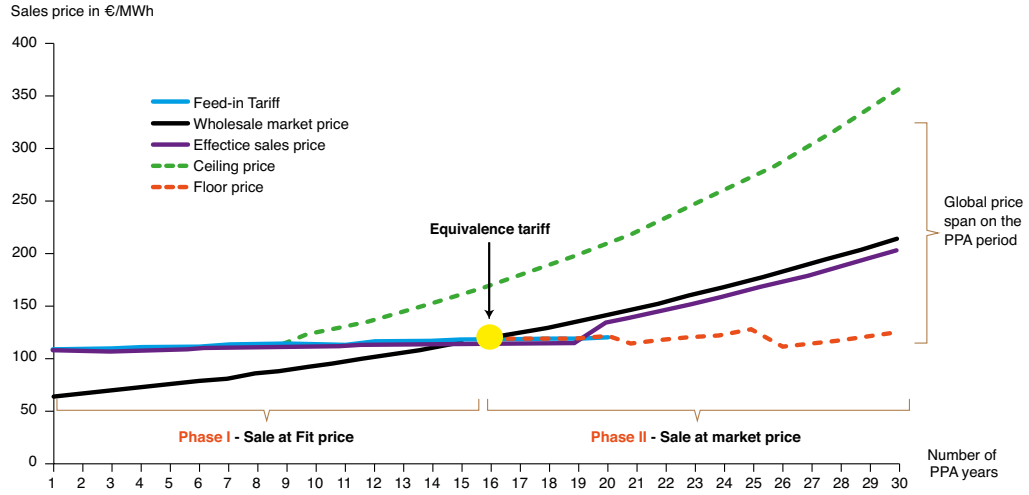
In this model, entering a 30-year term contract, securing low-cost finance and the efforts made by Solairedirect all along the value chain to reduce the investment costs mean that it can operate at the currently very low Feed-in Tariff rate applicable to PV solar plants. Recent successful tender bids in France for new plants specify a much higher purchase price. This particular application was also helped by the region's fund set up in 2011 to support PV development projects, which contributed 9% towards the TIPER 3 plant (intervention is capped at 10%). The advance from the region becomes repayable once the banks have been paid off, which smoothes out the debt without depressing shareholders' revenues during the first years. But as a regional official reminds us, "The absolute prerequisite, is to find a purchaser ready to buy electricity for 30 years. In TIPER 3's case it is Séolis." □

SOURCES:

- *www.poitou-charentes.fr/ester*
- *www.solairedirect.com*
- *www.territoires-energie-positive.fr*
- *www.tiper.fr*

1

Evolution of the sales price of the photovoltaic electricity



Source: Solairedirect

FINANCING RES PROJECTS WITH MEZZANINE/SUBORDINATED DEBT

RENEWABLE ENERGY PROJECT FINANCING OPPORTUNITIES USING THE DEBT CAPITAL MARKETS

After the economic crisis, the environment for renewable energy projects got harder and the competition among them sharply increased. The competition was so tight that it not only touched equipment or social impacts of projects but also became harsher on the financial level (such as rates of bank loans). Banks and renewable energy projects developers learned how to work together, in order to build innovative and competitive financing schemes. This also helped to bring to the market bigger projects.

Now that the competition is on the financial aspect of projects and that financial institutions learned about renewable energies, more financing tools appear on this market, such as mezzanine and junior debt.

A mezzanine is a subordinated debt, which means it will only be repaid from project revenues after operating costs and senior debt service, the latter usually coming from banks. The mezzanine is useful to close the gap between equity and standard debt. Although it is a more expensive debt, with rates of return around 15% due to higher risks, it offers many advantages. First, it is easy to access and can be provided more quickly to the project than a senior debt. Second, it does not imply as much loss on the project control for the developer than equity financing. And third, it may convince banks to finance the project more easily, as from their point of view, it strengthens the possibility of being paid back in the case of default. It has to be noted that in case the mezzanine loan is not paid back in time or in full, it gives the lender the right to convert it into equity.

MEZZANINE FINANCING FOR PV PROJECTS – THE UNITED KINGDOM'S CASE

A typical example can be the Lightsource case from the UK. Lightsource is a major solar energy company and an important developer, asset manager and operator of utility scale solar in the UK. It is currently managing a portfolio of more than 1 gigawatt of operational assets. Their portfolio is distributed across central and southern UK and became operational throughout 2011-2015. It was previously financed by a combination of multiple bank loans. Due to the size of its projects and its financial expertise, Lighthouse has to take a sharp look at the way it fulfils its project financial needs.

In October and November 2015, Lightsource refinanced two PV project portfolios thanks to senior debt and mezzanine. The first financing implied £ 12 million of mezzanine as part of a million £ 94 million financing. In November, Lightsource refinanced another portfolio of solar projects, owned or operated. It was a 101-megawatt portfolio that consisted of 33 operational ground-mounted solar projects. It attracted 20-25 year fixed income tariffs under the UK Government's Feed in Tariff subsidy regime. The total financing was £ 284 millions. M&G Investments provided £ 247 million of 22-year inflation linked finance (senior debt) and AMP Capital provided a £ 37 million 8-year mezzanine facility.

As stressed in the introduction, mezzanine is a useful tool for major projects that needs a multi-million financing. Moreover, mezzanine debt is not designed to be the main financing source of a project. It usually represents between 10% and 15% of a project finance.

REPLICABILITY POTENTIAL

Financing of renewable energy projects through mezzanine debt has replicability potential and will spread across Europe, since the mezzanine debt is considered to be a complementary or alternative solution to guarantees. It is the major tool to close the gap between debt and equity.

As the financial market is now aware of renewable energies opportunities, it offers to the latter all the financial mechanisms reserved for mature technologies, such as mezzanine. For example, in 2011 the European Energy Efficiency Fund (EEEF) was launched. It has been initiated by the European Commission and founded by the European Investment Bank and the Cassa Depositi e Prestiti (a state-owned Italian bank). The aim of the fund has been to provide market-based financing for commercially viable public energy efficiency and renewable energy projects within the EU. EEEF has been pursuing investments into financial institutions and direct investment (to project developers, energy service companies (ESCOs), small scale renewable energy and energy efficiency service and supply companies). Investment instruments provided by EEEF include senior debt, mezzanine instruments, leasing structures and forfeiting loans. □

SOURCES:

- *www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home*
- *www.lightsource-re.co.uk/news/2015/11/lightsource-renewable-energy-closes-284m-senior-and-mezzanine-refinancing*
- *www.eeef.lu*


PIXABAY

NET METERING FOR LOCAL COMMUNITY RENEWABLE ENERGY PROJECTS IN THE NETHERLANDS

NET METERING IN THE NETHERLAND

With a 5.6% RES share in gross final energy consumption (year 2014), the Netherlands has to intensify its efforts to achieve the national target for year 2020, i.e. 14% as specified in RE Directive CE/28/2009. The main support instrument for RES projects is the SDE+ scheme, which is a combined floating feed-in premium/tendering scheme.

In order to boost both RES implementation as well as to broaden the political support base for dedicated RES stimulation, in 2004 net metering was introduced as an alternative new renewable electricity support instrument. Electricity consumers – households and companies – can install a renewable electricity generating installation on the consumer side of the meter that measures electricity exchanges with the public electricity grid. To date, net metering allows such *prosumers* to settle the annual electricity bill with their electricity supplier based on *net delivery* of electricity by the supplier over the whole past accounting year. This implies, that over all own generation by prosumers up to the level of their total gross electricity consumption they save for each kWh produced the per kWh variable part of the electricity bill. This arrangement is especially favourable for low-volume retail electricity prosumers, as in the Netherlands the variable components of their electricity bill add up to, currently, about 21 €ct/kWh.

In 2013 the so-called *reduced (energy tax) tariff* or *postcoderoos* (PCR) regulation was introduced for local community projects. Following the PCR, households, participating in an eligible community installation generating power from a renewable energy source (such as solar PV, wind power, biomass or other technologies) can instruct their supplier to reduce their payable energy tax by 10 €ct/kWh plus 21% VAT for their part in the annual production of the community power generating installation. The number of kWh to which the tax deduction is applicable is determined through "virtual net metering": virtual in the sense that the public grid is notionally transferring the kWh's generated by the community installation to the community participants. The upper limit is 10 000 kWh per annum per PCR participant. The PCR regulation defines the area where the premises of participating households need to be situated relative to the location of the community installation: i.e. in the same postal ZIP zone of the one where the installation is located or an adjacent postal ZIP zone. The resulting area is dubbed 'rose of postal codes' ('*postcoderoos*' in Dutch).

THE SPECIAL NET METERING VARIANT FOR COMMUNITY PROJECTS

With PCR projects, the Dutch government sets out to stimulate local initiatives to generate renewable energy. In doing so, citizens and - especially SME- business entrepreneurs become directly involved in the production of "their" renewable energy. Moreover - and this is key - citizens who are not so fortunate as to possess a house with a roof, including low-income city dwellers renting a multi-storey apartment building, are eligible and can afford to participate in PCR projects through entering into an operating lease contract with their landlords on their respective share in the local community renewable power system concerned. Hence, PCR projects enable social inclusion of a diversity of population strata, to engage in local renewable energy initiatives and meet their energy needs by "own" renewable energy. And, what is more, at attractive costs.

So far, virtually only PCR projects applying solar PV technology have been applied. Nonetheless, the PCR regulation explicitly allows for eligibility of a wide diversity of RES technology, including wind, solar (notably but not only PV), geothermal, wave and tidal energy, hydropower, biomass, landfill gas, digestion of sewage sludge and biogas.[1] The local public acceptance of , especially, (small-scale) wind projects can be enhanced if being operated as a PCR project. Several PCR projects which include non-PV technologies are in an advanced stage of preparation.

REPLICABILITY POTENTIAL

The Netherlands is the only MS with a dedicated application of (virtual) net metering to local community projects. In replicating the concept in other countries, notably within the European Union, there are several lessons to be learned from the experience gained so far with local community renewable energy (PCR) projects in the Netherlands. The overriding considerations for introduction of the PCR concept are stimulation of grass-root local renewable energy initiatives and social equity. A country-specific, suitable definition is to be designed for local community renewable energy projects, whose members will become eligible to attractive but not exorbitant fiscal incentives. The definition will need to address issues such as the geographical boundaries of membership with respect to the project installation site and the maximum participation size of non-household actors (companies). As for the project installation size, arguably no upper limit seems warranted to enable maximum participation by civil society. All electricity suppliers should be obliged to facilitate eligible local renewable energy community projects. Such projects should be eligible to public concessionary financing programmes for renewable energy projects. □

1. *http://www.hieropgewekt.nl/kennis/verlaagd-tarief/de-regeling-het-kort, section 1.5.*

Michel Gop / Ho

CROWDFUNDING FOR RENEWABLE ENERGY

CROWDFUNDING – BASIC CONCEPT AND GROWTH

Crowdfunding (CF) has experienced a rapid and increasing growth in the recent years. Global funding volumes grew by 167% in 2014 compared to 72% in 2011. These growth rates led to total funding volumes of USD 16.2 bn compared to USD 0.85 bn in 2010. The basic concept of CF is as follows: businesses (or households) that require funding pitch their project, business idea, etc. on a crowdfunding platform and other private people or business etc. decide on whether they provide funding to the respective project. Hence, the CF platform takes somewhat the role of a financial intermediary of transforming many small contributions of the "crowd" into projects. The main difference with a bank is that the providers of finance can directly chose the projects or business they want to allocate their funding to. Currently, there are over 1,250 crowdfunding platforms worldwide. CF platforms offer an alternative to classical financing usually intermediated by financial institutions.

In general, CF platforms can be split into non-financial and financial CF. The former includes donation-based CF – there is no material or financial reward – and reward-based crowdfunding – there is no financial return, but a material reward (e.g. the prototype of a product). Financial CF includes equity-based CF (crowdinvesting) and debt-based CF (P2P lending). While non-financial CF is often used for creative start-up ideas or projects in the field of arts (music, film, etc.) financial crowdfunding is increasingly used for financing RE projects.

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Types of crowdfunding platforms

NON-FINANCIAL CROWDFUNDING

Donation-based	Reward-based
"Crowd donation" No rewards	"Crowd sponsoring" Material rewards (prototypes, early access)

FINANCIAL CROWDFUNDING

Lending-based	Equity-based
"P2P lending" Micro-credits with financial returns (interest)	"Crowdinvesting" Micro-investments with financial returns (profit-sharing)

CROWDFUNDING OF RENEWABLE ENERGY IN THE EU

Crowdfunding of renewable energy grew substantially in the EU in the past few years. The increasing interest in this form of financing becomes apparent in the Renewable Energy Crowdfunding Conference that was first held in 2014 and attracts attendees from crowdfunding platforms as well as project developers and representatives of governments and association. According to a mapping of the Renewable Energy Crowdfunding Conference, 17 major CF platforms in the EU focus solely on RE projects. In addition to these platforms, further platforms are also not exclusively active in renewable energy (RE). In contrast to other forms of financing, as e.g. green bonds, crowdfunding offers a possibility for private investors to invest in a RE project they personally value. In addition, crowdfunding platforms are very flexible with respect to the investment amount. In order to give more insight in crowdfunding of RE, two major crowdfunding platforms in the EU with different business models are presented hereafter.

PRESENTATION OF TWO PLATFORMS: ABUNDANCE (UK) AND WINDCENTRALE (NL)

Abundance is one of the largest and oldest RE-CF platforms having started its operations in 2012 after being set up in 2009. So far, around EUR 16 million from almost 2 000 investors have been used to finance RE projects. Abundance is a financial CF platform according to the definition above. For the money provided for a RE project, investors receive financial returns in form of different types of debentures. Fixed return debentures offer fixed payments and hence are similar to the interest of a loan. Alternatively,

variable return debentures also exist. In this case, the return is determined by the project performance and hence depends on the volume of energy produced and the price as well as the costs of the project.

Windcentrale has a different concept. The CF platform buys windmills and offers consumers to buy shares of this windmill. Currently, a share costs about the EUR 250 plus an additional yearly charge of around EUR 25 per year for maintenance. The benefit for investors is that they receive the electricity produced by their windmill, which is on average around 500 kWh per year. Hence, the concept of Windcentrale is very similar to a cooperative with the main difference that households and business can buy parts of windmills independent of their location. Furthermore, Windcentrale offers the possibility to produce your own renewable electricity for individuals that do not want to or cannot use e.g. solar home systems. Assuming an increase of electricity prices of 2% per year, Windcentrale estimates the financial benefit on a wind share to be approximately 5%. So far, around 15,000 individuals have invested a total of around € 15 million into nine wind power projects through this CF platform.

REPLICABILITY POTENTIAL

Crowdfunding of renewable energy (RE-CF) financing has a high replicability potential, since it can be organized quite flexibly. It provides an opportunity to engage citizens in financing RE. Furthermore, it complements other financing mechanisms with citizen involvement as cooperatives acting as interested investors can invest in renewable energy projects, irrespective of their location. Cooperatives have usually a regional focus. As the two examples above show, there is also a lot of flexibility with respect to the concept of a CF platform, as there are models where investors profit mainly from the green energy generated as well as platforms with pure financial returns.

A potential challenge for CF platforms are the planned and observed reductions in government support for RE. In the UK, the leading market for RE-CF in the EU, platforms started to experience difficulties due to policy changes. The by far largest RE-CF platform, the Trillion Fund, has recently stopped its activities in RE stating on their website that "*In these uncertain times, the company will instead focus on offering technology and crowdfunding services to other businesses across all sectors*". Other challenges may arise due to the different national regulations in the EU. Currently, the EU Project CitizEnergy aims at creating a European CF platform for renewable energy that, among other goals, tries to overcome this challenge. It remains to be seen whether CF will continue its success story in spite of the challenges. □

SOURCES:

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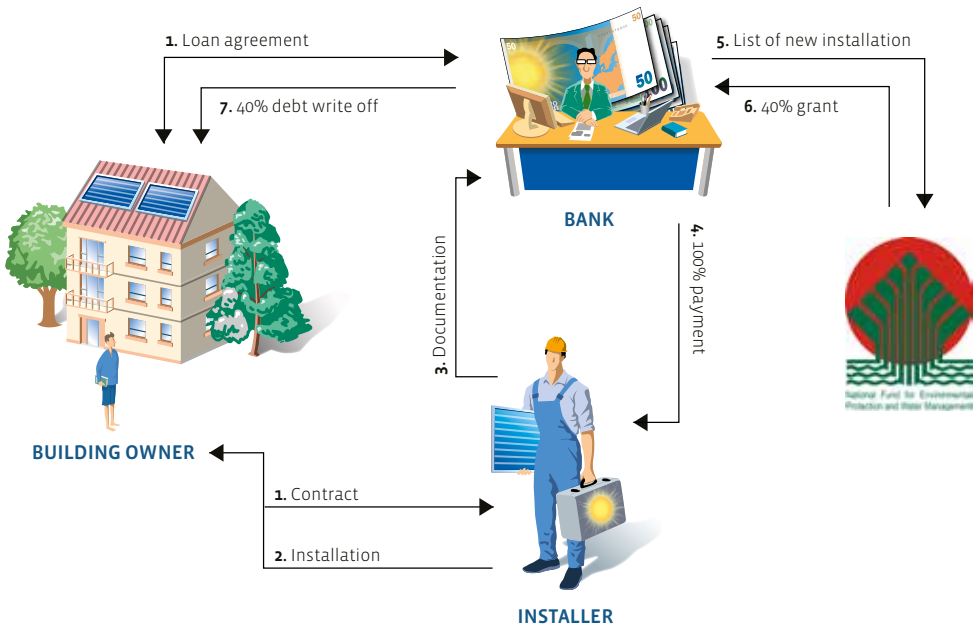

FACILITATION OF DECENTRALIZED RENEWABLE ENERGY USE IN POLAND

INNOVATIVE FINANCING SCHEME INVOLVING LOCAL BANKS

The Prosument program is an innovative financing scheme, which has helped bring sunshine to households and renewable energy (RE) businesses right across Poland. The key to the initiative's success has been to think local. The fund was set up to enable households and residential communities to obtain a loan from one of six partner banks in order to install solar thermal collectors (STC). They would then receive a subsidy, which reimbursed the loan by up to 40% and the 60% remaining of the loan would be based on a 1% rate. This 40% grant is attributed by the National Fund for Environmental Protection and Water Management, through the partner bank. The success that followed has exceeded all expectations. Over 67 000 installations have been installed all over the country, with some 3 500 local bank branches involved. The program has also helped to support Poland's STC manufacturing industry, with an estimated 9 600 new jobs created. The scheme also represents another step forward in the transition from a fossil fuel-based economy to one that embraces clean technology and renewable sources. In 60% of investments which benefited from this kind of financial support, STC contributed to replace installations that used coal as their energy source.

Since 2010, the STC have received support in the amount of 110 MEUR, the majority of which was dedicated to private households (7 m² of the collector area), whereas multifamily buildings (50 m² of the collector area on average) received minor share of the total support (< 1%). Thanks to this innovative financing mechanism the STC market in Poland grew very dynamically in the period 2010-2014, taking the country's total installed capacity from 656 000 m² in 2010 to 1.7 million m² in 2014. Thus Poland became a fast track leading ST market in the EU.

In the 2010 -2014 period two other financing programmes contributed to a rapid STC market development in Poland: the Swiss Contribution Programme as well as the EU supported Regional Operational Programmes. However, in the period 2010-2014 the support from the National Fund for Environmental protection and Water Management was the most significant; it supported 40% of all new installations and in the peak 2013 period even 55%.

VALIDATION BY THE INTERNATIONAL MILIEU

This innovative financing scheme was nominated (nine nominees chosen from a record of 373) to the Sustainable Energy Europe Awards Competition 2015 in the category 1: renewable energy. This category awards actions, which substitute fossil fuels with RE, while substantially reducing CO_2 emissions by innovative integration of RE into the local energy economy.

REPLICABILITY POTENTIAL

In the face of massive investment in the area of prosumer technologies a decision to grant a subsidy or a loan to a large number of potential beneficiaries can be a challenging task. Therefore, aggregated solutions with the involvement of local partners (here banks) is highly recommended. This solution can be applied by any financing institution supporting mass development of small prosumer technologies. □

SOURCES:

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