BEACON Bridging European & Local Climate Action

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LABEEF IN LATVIA

Study

On behalf of:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

European Climate Initiative EUKI

LABEEF in Latvia
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Abbreviations

CAPEX	Capital expenditures
EA.NRW	Energy Agency North-Rhine Westphalia
EBRD	European Bank for Reconstruction and Development
EPC	Energy Performance Contracting
ESCO	Energy Service Company
ESD	Effort sharing decision
ESEB	Building and Energy Conservation Bureau
EU	European Union
GHG	Greenhouse gas
KEA	Climate protection agency Baden-Wuerttemberg
LABEEF	Latvian Baltic Energy Efficiency Facility
LGA	Latvian Guarantee Agency
NATO	North Atlantic Treaty Organization
SAENA	Saxon Energy Agency
SUNShINE	Save your bUildiNg by SavINg Energy (CIP funded project)

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1 Summary

The Latvian building sector is dominated by prefabricated high-rise buildings erected between 1941 and 1992 during the Soviet occupation era. About 95% of the buildings require deep renovation because of their low energy efficiency as well as insufficient maintenance measures over the past decades. Given a large energy savings potential, renovation measures are profitable in the long-term, but the procurement of investment has nevertheless proven difficult because of the long refinancing periods of about 20 years, the relatively low return rates in comparison with other financial products, and the difficulty for traditional financing institutions to perform adequate due diligence.

The Latvian Baltic Energy Efficiency Facility (LABEEF)[1] was developed specifically to address this problem. The company was founded in 2016 and aims to support energy service companies (ESCOs) that implement renovation measures in multifamily buildings based on energy performance contracting (EPC). EPC describes a financing mechanism in which the receivables consists of the cost savings achieved through greater energy efficiency of buildings. The ESCO finances renovation measures through a commercial bank and makes an EPC contract with the building owners. Once renovation measures are completed and their effectiveness has been monitored and verified, LABEEF forfeits[2] the EPC contract and continues to collect the EPC receivables from the building owners until the renovation investment has refinanced itself. Through this mechanism, the execution risk stays with the ESCO while the financing risk is transferred to LABEEF. To be able to forfeit the EPC contracts, LABEEF has collected loans from the European Bank for Reconstruction and Development (EBRD).

Latvia has a building stock of 39,000 multifamily buildings with a floor area of around 55,000,000 m^2. Currently, the average heating energy intensity of the multifamily building stock is at around 160-180 kWh/m^2 (Miezis, Zvaigznitis, Stancioff, & Soeftestad, 2016). To achieve the target of the Latvian Energy Strategy 2030, the average energy consumption must decrease to 100 kWh/m^2. LABEEF aims to modernise at least 20% of all multifamily apartments in Latvia by 2022. If successful, this would translate to annual avoided emissions of 21 kg CO2e per m^2. As a rough estimate, an investment of EUR 7,600 is needed to avoid a ton of CO_2e in the first year after the completed renovation. Given that the lifetime of the building is prolonged by 30-50 years, this goes down to ca. EUR 250-150 per ton in the long-term. The platform is a market-based instrument that finances itself, which means that, in the long-term, no public money must be spent to achieve CO_2e emission reductions.

In principle, a similar investment tool could be applied to the German context. While Germany has one of the most developed ESCO markets globally, the private sector has not been targeted as closely as the public building stock by support measures aiming to enable EPC business models. For single-family houses the receivables are not high enough to be worth the high transaction costs to put an EPC model in place, but multifamily buildings could be targeted with a mechanism similar to LABEEF. A comparable financing platform would have to be tailored to the different context and embedded in the existing actor landscape concerned with EPC. A direct application is more likely in Eastern European states, which feature a similar building sector structure as Latvia.

[1] We would like to thank Toivo Millert (EBRD), Inese Plume (Renesco) and Nicholas Stancioff (LABEEF) for insights shared during expert interviews on September 13, September 25 and October 1, 2018.

[2] Forfaiting means the practice of taking over the debt as well as the future cashflow of an investment. The forfeiting party becomes the creditor of the original financing party, while also acquiring the rights to future earnings.

2 Introduction to the instrument

LABEEF is a company that was developed to facilitate the deep renovation of the Latvian housing sector. Deep renovation refers to measures that cover the full economic energy efficiency potential, leading to energy consumption reduction rates of over 50% (Shnapp, Sitjà, & Laustsen, 2013).

To support the procurement of capital for such measures, LABEEF improves the conditions for energy performance contracting (EPC) to finance the renovations. Figure 1 below illustrates how EPC functions. In principle the entity financing the necessary upfront investments for renovation measures make a contract for a defined amount of time in which it receives the EPC receivables that make up the contracting rate. This amount is determined by the difference between the energy costs before and after the implementation of renovation measures.

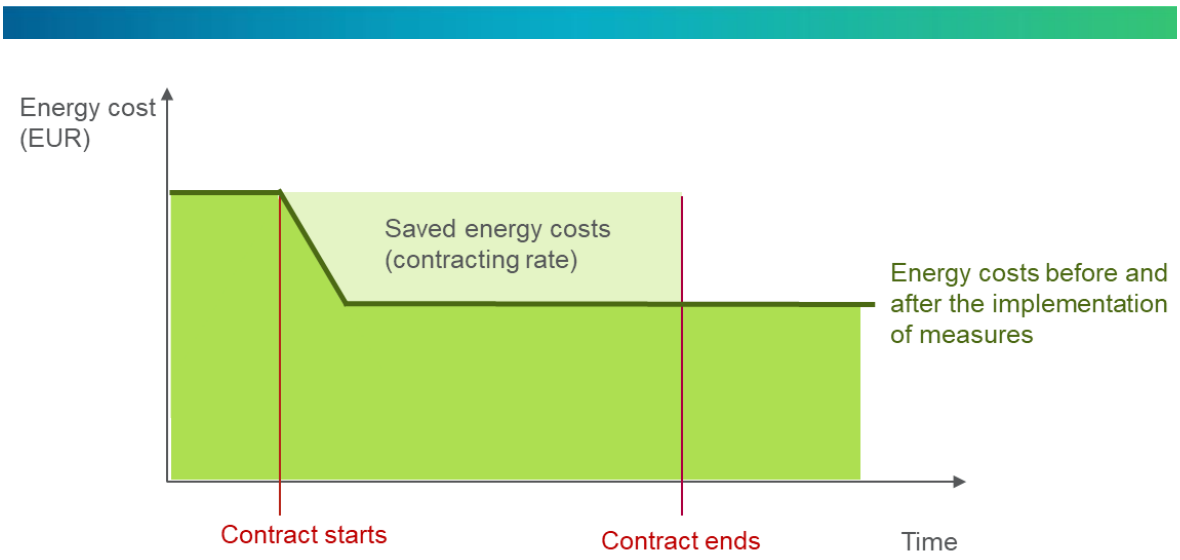

Figure 1: Simplified illustration of an EPC model
Source: Navigant based on (ECOFYS, 2017)[3]

Although EPC is profitable, ESCOs carrying out renovation measures are unable to support the long refinancing periods. After implementation of the renovation measures, LABEEF therefore forfeits an 80% share of the ESCOs future contracting rates, which means that it purchases part of the long-term revenue source (Graz Energy Agency, 2008).

The EPC projects are selected through defined financial, technical and legal guidelines. After a project is selected, the responsible ESCO carries out the previously proposed modernisation and energy efficiency measures. Once the measures are completed after approximately 1.5–2 years, LABEEF conducts a verification of the measures and promised savings and then purchases the forfeiting contract. The measures are conditional on the building's

[3] Energy costs do not equal energy bills in this context. The energy bill can remain constant or increase until the end of the contracting period depending on the type of contract.

residents' agreement and their willingness to pay about 15% higher energy bills. After about 20 years, the collection of EPC receivables ends, and residents pay the reduced energy costs.

3 National context

3.1 Legislative and political context

Over the past 30 years Latvia has seen tremendous political change. After the fall of the Soviet Union on 21st August 1991, the Latvian decision on independence that had been taken by the Supreme Soviet[4] on 4th May 1990 came into effect. The socialist Soviet regime was thus replaced by a democracy. Latvia's unicameral parliament, the *Saeima*, is elected by direct popular vote every four years. The prime minister is appointed by the president and forms the executive branch together with his cabinet. Only five years after gaining independence, the Republic of Latvia became a member to the European Union (EU) in 2004.

Latvia is a highly developed country, ranking 44th on the UNDP Human Development Index (United Nations Development Programme, 2018). It has a population of 1,934,379 inhabitants (2018) which has been decreasing since the fall of the Soviet Union. In 1990, Latvia still had 2,668,140 inhabitants (Central Statistical Bureau of Latvia, 2018).

The economic growth of Latvia had been significantly higher than the EU average until the economic crisis when economic growth experienced a downward peak at -14.4 % of GDP. In more recent years, economic growth has been close to the EU average with an above average 4.5% growth of GDP in 2017 (Central Statistical Bureau of Latvia, 2018).

3.2 Sectoral overview and national climate policy

Since 1990, Latvia has reduced its CO_2e emissions by 57%, which is partly due to the economic disruption after the fall of the Soviet Union and partly due to improved efficiency and a gradual shift to renewable energy sources (Eglīts, 2017).

In 2015, greenhouse gas emissions were at 11.32 million t CO_2e in total (Central Statistical Bureau of Latvia, 2018). 80% of GHG emissions are generated in the non-ETS sectors including buildings, transport, agriculture, waste or industry (Central Statistical Bureau of Latvia, 2018). The Effort sharing decision (ESD) target for 2020 is to limit the increase of CO_2e emissions to 17% compared to 2005 levels. By 2030, the Effort Sharing Regulation demands Latvia to reduce CO_2e emissions by 6% (EuropeanCommission, 2018). While achieving the 2020 target is still possible, meeting the 2030 target would require additional measures (Eglīts, 2017).

The Ministry of Economics is the institution responsible for energy policy and energy efficiency in particular (Klavs & Kudrenickis, 2016). Latvia's climate protection policy regime is constituted by four strategies, which are complemented by sectoral and local policies. The four strategies are the 'Sustainable Development Strategy of Latvia until 2030', the 'National Development Plan of Latvia 2014–2020', which is the national reform programme for EU 2020 strategy implementation, the 'Environmental Policy Guidelines 2014-2020' and the 'Latvia's Energy Long-Term Strategy 2030 – Competitive energy for society'. In addition, the government is currently working on the 'Low Carbon Development Strategy 2050' and the 'National Adaptation Strategy 2030'

[4] Supreme Soviet describes the legislative bodies of the Soviet socialist republics.

(Eglīts, 2017). For the building sector, the most important target is determined by the Latvian Energy Strategy 2030, which prescribes an average energy intensity of 100 kWh/m^2 by 2030 (Pavluts, 2013).

Gross domestic energy consumption has dropped from 204.9 PJ to 184.6 PJ between 2007 and 2016, a decrease of 9.9%. Consumption levels currently seem to be stagnating, with a 0.4% increase between 2015 and 2016 (Central Statistical Bureau of Latvia, 2018). Latvia's final energy consumption per capita of 584 kg oil equivalent is slightly higher than the EU average of 558 kg oil equivalent. In comparison, Germany has a much higher final energy consumption per capita with 681 kg oil equivalent (Eurostat, Final energy consumption in households per capita , 2018).

The Latvian energy mix is becoming less emission intense as the share of renewable energy is increasing. Over a period of ten years the share of renewable energy in final energy consumption has increased from 31.14 % to 37.16 % (2006-2016) (Central Statistical Bureau of Latvia, 2018). The European average is 17% (2016) (Eurostat, 2018). The target is to achieve 40% by 2020. Meanwhile, the share of energy imports has decreased from 62.5% to 47.2% (2007-2016) increasing Latvia's energy security (Central Statistical Bureau of Latvia, 2018).

Latvia's building stock was largely constructed between 1941 and 1992. Figure 2 shows that this building period accounts for over three fourths in terms of available square meters. A large part of this building stock is the Soviet era architecture of prefabricated high-rise buildings.

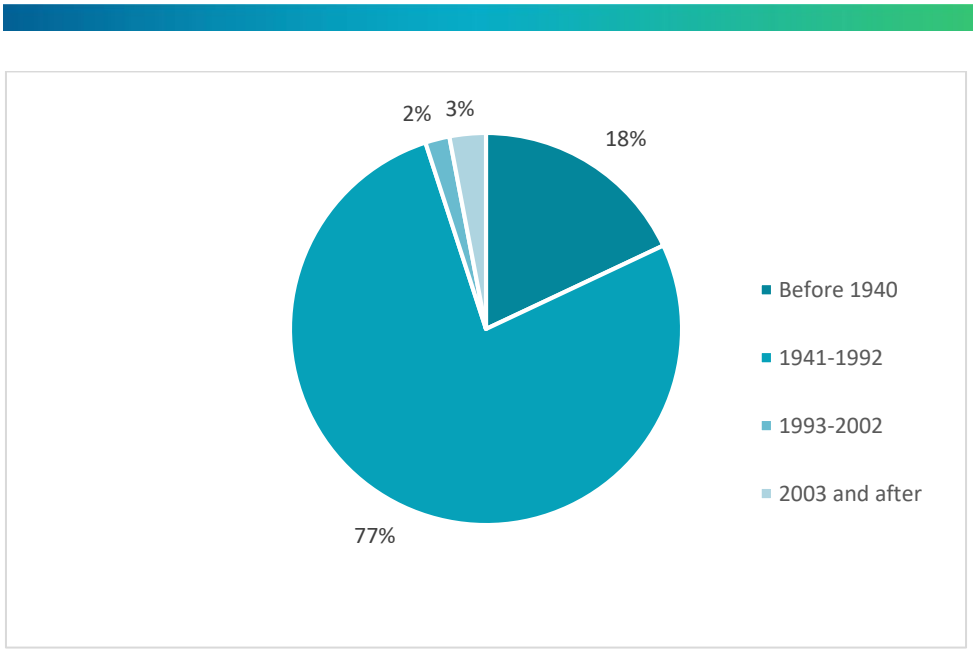

Figure 2: Structure of the housing stock in Latvia in % of m^2
Source: Latvian Ministry of Economics

Another distinct feature of the Latvian housing sector is the rapid privatisation after the fall of the Soviet Union. While only 43.1% of dwellings were privately owned in 1993, 83% of dwellings were under private ownership in 2002 (Pittini & Laino, 2011). The effect of this rapid privatisation is that especially Soviet era prefabricated high-rise dwellings are owned by parties who often do not have the capital to invest in refurbishments due to low purchasing power. Many buildings are slowly decaying because of the lack of investments in maintenance.

There are 39,000 multifamily buildings in the country, a large share of which has multiple owners living in the apartments. This means that any alteration or refurbishment of the building requires that a decision is taken by many different parties who need to be informed and convinced. This makes energy efficiency refurbishment a challenging endeavour in the Latvian context.

The building stock of multifamily buildings is very energy inefficient, with an average energy consumption for heating (space heating plus domestic hot water circulation losses) of 160-180 kWh/m^2 annually (Miezis, Zvaigznitis, Stancioff, & Soeftestad, 2016). Taking all households into account, Latvia is the EU state with the second highest average energy consumption for heating with over 200 kWh per m^2 annually (De Groote, 2016).

Final energy consumption in households increased by 4% between 2000 and 2013. During this timeframe, the consumption of natural gas increased by 66% and the share of district heating (DH) and wood fuel decreased. While electricity consumption increased by about 50% due to a growing number of electrical appliances, space heating per unit per dwelling decreased by 25%, which can be attributed to energy efficiency measures. Their positive effect on energy savings was to some extent counteracted by larger homes (Klavs & Kudrenickis, 2016).

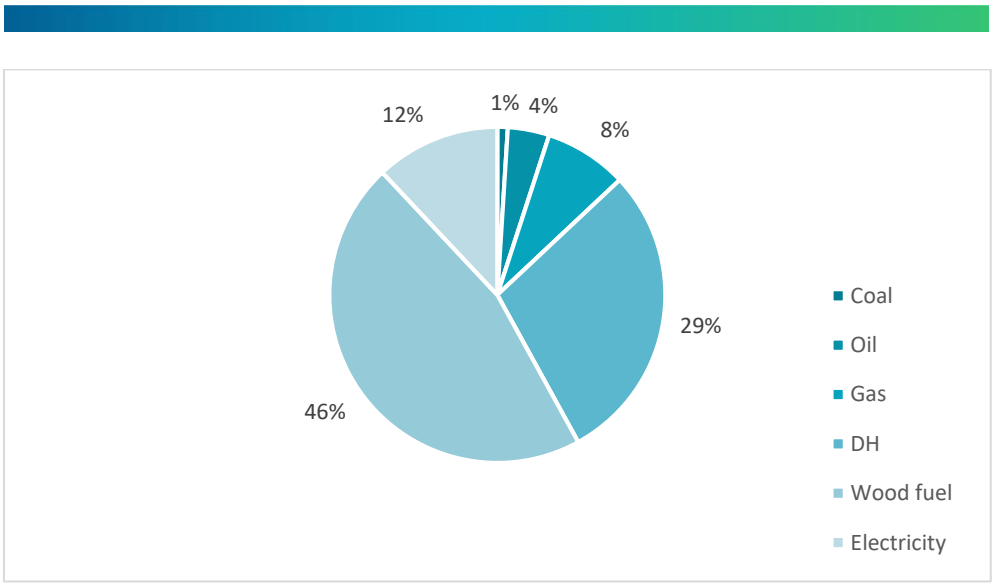

Figure 3: Final energy consumption in residential sector in Latvia in 2013

The largest share of heat demand is covered by wood, which is diminishing the role of natural gas. Latvia has a very high share of DH, with over 30% of the residential heat supplied in 2015. The share of combined heat and power (CHP) in DH generation is at 73% (2017) (Euroheat & Power, 2017). The overall fuel mix of district heating is dominated by natural gas with ca. 65% and wood fuel with ca. 30% (2014) (Kamenders, Vilcane, Inzere, & Blumberga, 2016).

4 General description of the policy instrument

4.1 Functioning

EPC has been carried out to renovate buildings in Latvia since around 2009, but the renovation rates remain low. The limited success in renovating older apartment buildings is mainly due a shortage of financial resources to invest in energy efficiency measures (Ziemele, et al., 2017).

The LABEEF facility works as an innovative platform to facilitate the EPC (see Figure 1) for the refurbishment of the Latvian Soviet era residential buildings. Besides the implementation of energy efficiency measures, EPCs can include the development of energy concepts, financing and training (ECOFYS, 2017). In the Latvian context, the implementation of refurbishment measures is the focus. The main elements of a typical Latvian EPC project include the following:

- Turnkey service: The ESCO takes up responsibilities throughout the entire project lifetime, from the initial energy audit and project design to implementation of measures to the operation and maintenance of the renovations as well as the measurement and verification of energy savings.
- The arrangement of long-term project financing through third party Financing.
- Announcing a project energy savings guarantee which assures that the projected reductions in energy use will come into effect (Sunshine, Deep renovation of multifamily residential buildings - Market Assessment Report, 2015).

There are several challenges to EPC including the investment risks for the ESCO, the long refinancing timeframes, information deficits of the customer and the complex legal set-up of contracting models, accompanied by regulations on energy and electricity taxes. These are the challenges that LABEEF aims to overcome. Figure 4 below presents the functioning of LABEEF.

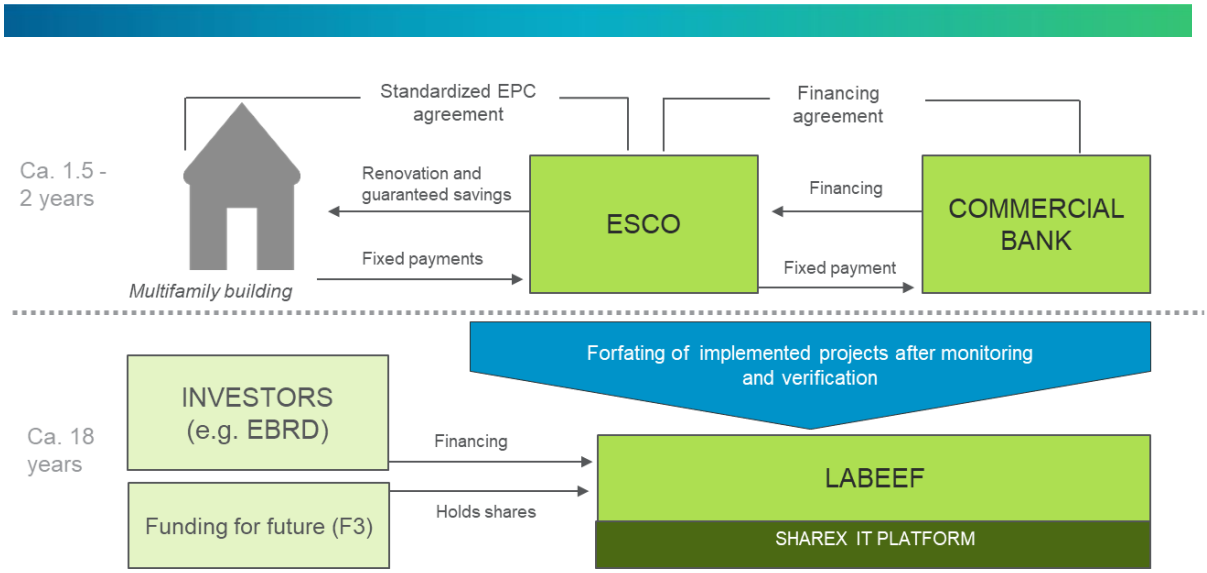

Figure 4: Functioning of LABEEF
Source: Own illustration based on Stancioff, 2018

To initiate the renovation of a multifamily building, an ESCO identifies a suitable multifamily building and acquires the agreement of the building's residents. The owner's agreement to the implementation of the measures is essential. Given the multi-party ownership structure of most of the buildings, it can be challenging to adequately inform and convince an appropriate majority of inhabitants, which is usually 50 or 75% of the owners. Once the agreement is secured, LABEEF enters into a standardised EPC agreement with the building's parties who must fulfil LABEEF's guidelines. These specific guidelines follow standardised technical, financial and legal conditions for the acceptance of a project. They have been drafted in cooperation with the EBRD and other stakeholders and guarantee a due diligence towards the investor. They are reviewed annually to conform with the standards of the Investor's Confidence Project[5] and Transparense[6].

The EPC determines that the ESCO guarantees specific energy savings as well as and improved micro-climate, comfort, and affordability. The building party agrees to fixed increased energy payments over a timeframe of approximately 18 years, which are about 15% higher than the original energy bill (Stancioff N. , 2018).The ESCO then enters into a financing agreement with a commercial bank to cover the upfront investment costs for the renovation measures. The agreement with the bank is supported by LABEEF, which guarantees to assume the financing risks after the measures are completed, monitored and verified. The monitoring and verification process is initiated once the measures are completed and lasts through a winter season. If the guaranteed energy savings can be verified during the cold season, LABEEF forfeits the EPC contract. Forfaiting can be described as the practice of discounting individual bills of exchange or promissory notes originating from commercial business transactions on a non-recourse basis (Mäntysaari, 2010). Through forfeiting, the payment risk as well as the ESCO's debt are transferred to LABEEF instead of banks. Figures 5 illustrates the financing circle after forfeiting.

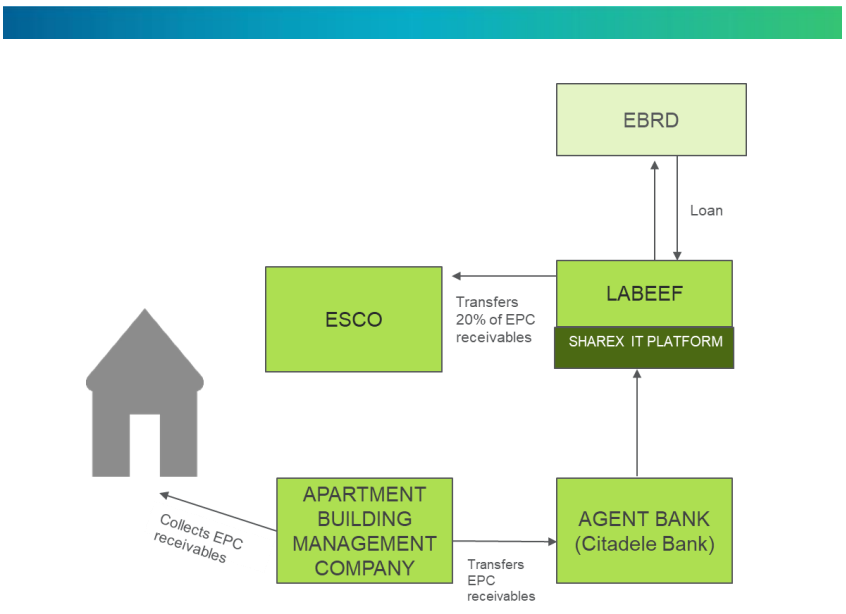

Figure 5: LABEEF's financing flows after forfeiting
Source: Own illustration based on Miller, 2017

[5] ICP: The Investor Confidence Project Europe works on the development of a global standardisation process for the energy efficiency market.

[6] Transparense: Project Transparense adressed EPC and aimed to increase the trustworthiness in the European contracting market by increasing market transparency.

The apartment building management companies collect the EPC receivables from the building's residents and transfers them to an agent bank. The agent bank is interposed to increase securities for investment institutions such as the EBRD. It then transfers the receivables to LABEEF, which uses them to repay its loans, transfer 20% to the ESCO, and retain a low margin. Figure 6 illustrates the project phases and shows that LABEEF takes over 80% of the risk and rewards, leaving 20% with the ESCO.

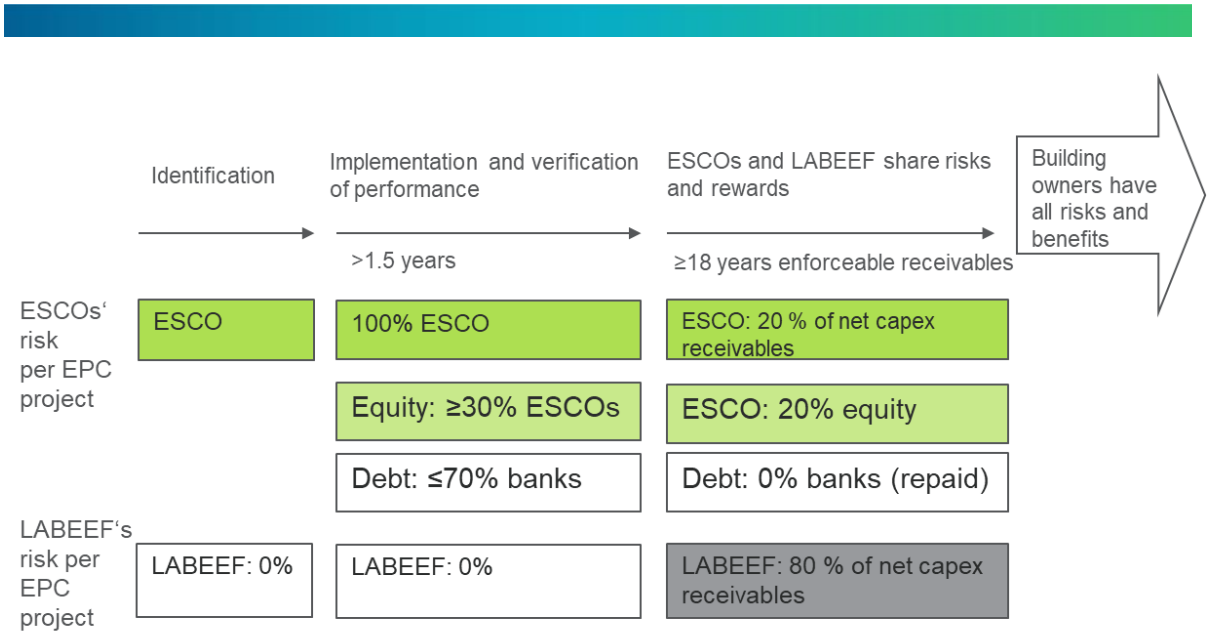

Figure 6: Distribution of risks and receivables throughout the project cycle
Source: Navigant, based on (Miller, 2017)

LABEEF's IT platform 'Sharex' allows for the standardised online process for the selection of projects. It also facilitates benchmarking projects.

At present, LABEEF accepts three EPC packages. The standard EPC package encompasses only energy efficiency measures, which are identified and carried out by the ESCO. The EPC+ package includes additional measures such as, e.g. the installation of an elevator. These measures not related to energy savings need to be financed by the owners of the building. The EPC++ packages includes further measures such as e.g. the installation of a swimming pool, which also need to be financed by the inhabitants.

LABEEF was built up with the technical support of the SUNShINE programme and its successor programme Accelerate SUNShINE, which is part of the EU's Horizon 2020. It receives capital in the form of a loan from the EBRD**.** The company Funding for future (F3) acts as a shareholder for LABEEF.

The facility has set itself multiple ambitious goals. First, an average of 90 kWh or lower per m^2 should be achieved until 2022. This means to more than halve the energy consumption of the complete building sector. Second, the facility seeks to have a credit rating by Moody's, S&P and Fitch by 2022. Third, the facility aims to attract 100% private funding by 2025 (Stancioff & Rochas, 2017).

4.2 History and legal basis

Until LABEEF's creation in 2016, the main financial sources for renovation of the Latvian Soviet time building sector was EU funding and commercial banks (Building and Energy Conservation Bureau, 2016). LABEEF aims to prepare for an eventual end of the funding period and provide a long-term solution to ensure full renovation. The idea was first discussed with the Latvian Ministry of Environment and the EBRD in 2012. The fund proposal was then sent to the EBRD. In the same year the Building and Energy Conservation Bureau (ESEB)[7], which has facilitated EPC market development in Latvia, was created to support the development and rollout of the facility through studies and multiplying events. In 2014, the EBRD set out its schedule and provided a term sheet to the Latvian Guarantee Agency (LGA). In the same year, KPMG London initiated the technical due diligence. In 2015, the Latvian government set aside EUR 10 million according to the EBRDs term sheet and the EBRD finally approved the proposal. The EBRD also invited ALTUM to participate and channel the EBRD funds to LABEEF. ALTUM is a state-owned development finance institution, which offers state aid for various target groups with the help of financial tools including loans, credit guarantees, investments in venture capital funds, etc. It develops and implements state aid programmes (Altum, 2018). In 2017, the second term sheet with the EBRD was initiated and ALTUM approved a EUR 160 million Programme (Švarcs, 2016).

LABEEF will help to achieve the objectives of the Latvian Law On the Energy Performance of Buildings, which entered into force on 9 January 2013 to implement EU Directive 2010/31/EU on Energy Performance of Buildings (EPBD) (Ministry of Economics, 2014). The regulation prescribes the procedures for energy certification of buildings, the procedures for registration, and the system for the comparability of energy performance of buildings, the classification system for energy performance of buildings, and the energy performance requirements. For multi-apartment residential houses, which are at the core of LABEEF, the energy performance indicator for heating may not exceed 90 kWh per square metre per year in reconstructed or newly constructed buildings (Government of Latvia, 2013).

[7] ESEB is a national EPC Code Administrator in Latvia.

5 Impacts of the policy instrument

5.1 Effectiveness

The effectiveness of a financing tool such a LABEEF in terms of GHG emission is derived from the energy savings achieved through renovation. LABEEF supports the uptake of EPC projects, ensures high-quality technical, financial and legal standards of the projects, and provides off-balance-sheet financing for ESCOs to increase the number of projects in their portfolio. There are, however, also EPC projects in Latvia which are not supported by LABEEF. The greatest effect of LABEEF is probably the provision of best-practice EPC examples that work in a complex and low-income ownership structure and that are highly replicable. To date, the renovation of 15 buildings has been completed. Given that the facility was created only two years ago in 2016, this is not indicative of the instruments effectiveness and the future effect on CO_2e emission reductions triggered through EPC projects can only be estimated.

A recent study investigating 12 projects from the past 5 years found that energy savings in renovated multifamily buildings were between 55% and 65%. On average, space heating consumption and network losses combined[8] were between 74.7 and 81.5 kWh/m^2 after the renovation measures (Rochas, Zvaignitis, Kamenders, & Zogla, 2014). LABEEF estimates that about 21 kg CO_2e per m^2 are saved annually. In buildings where energy efficiency measures are complemented by a switch from coal to renewable energy, the benchmark is estimated to be more than twice as high (Stancioff N. , 2018).

Currently, LABEEF is financing about 110 buildings, amounting to 300,000 m^2 floor space and around EUR 50 million of investment. (Kotin- Föster, et al., 2018). LABEEF aims to modernise at least 20% of all multifamily apartments in Latvia by 2022, including some public buildings from the Soviet era. If successful, this would translate to CO_2e savings of 231,000 t/year.[9]

Another impact of improving the energy efficiency of buildings relates to energy imports: According to some estimates, the complete renovation of the building sector would reduce gas imports from Russia by about 50% (Fawkes, 2016).

5.2 Cost efficiency

According to a comprehensive market assessment for the Latvian building sector, investment costs for renovation in Latvia range from 130 EUR/m^2 to 155 EUR/m^2. On average, about EUR 140/m^2 need to be invested. In addition, about 20 EUR/m^2 is needed for structural repairs (Sunshine, 2015).

As a rough estimate, an investment of EUR 7,600 is needed to avoid a ton of CO_2e in the first year after the completed renovation. Given that the lifetime of the building is prolonged by 30-50 years, this goes down to ca. EUR 250-150 per ton.

[8] Not including electricity consumption

[9] Calculation: 55 million m^2 x 0,2 x = 231,000 t CO_2e/year

For comparison between renovation and reconstruction, it was estimated that reconstruction of the entire building stock requiring renovation would cost approximately EUR 40 billion while roughly EUR 9.5 billion are required for renovation (Sunshine, Deep renovation of multifamily residential buildings - Market Assessment Report, 2015).

LABEEF is a market-based instrument which means that, in the long-term, no public money will have to be spent to achieve CO_2e emission reductions. Figure 6 shows the long-term cash flow of the renovations. It illustrates that the energy cost savings will be larger than the investment for the first time in the 14th year, which will be in 2030.

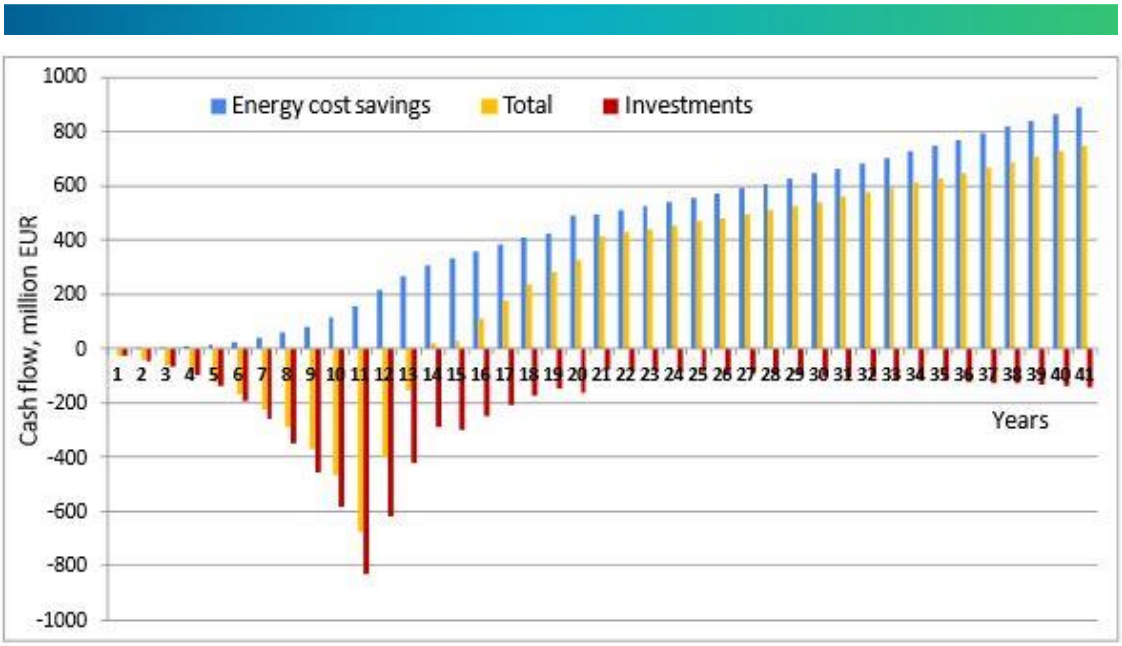

Figure 7: Long-term cash flow of LABEEF
Source: Sunshine 2015

5.3 Co-benefits and side-effects

There are several co-benefits to the platform that go beyond CO_2e reductions. These are for example the following.

- The renovations result in improved housing conditions for the residents. Living comfort and quality increases through heat reduction in warm periods and an improved indoor climate in the apartments.
- The property value rises both due to the improved housing conditions and because the renovations extend the building lifetime by 30 to 50 years. This significantly contributes to the financial value of the apartments. Given the heterogeneous ownership structure in these buildings, the added value is distributed amongst a large population share.

- The instrument can contribute to a continuous labour demand for the building maintenance and renovation industry for the next 20 years, helping the industry to thrive and supporting jobs in Latvia.
- The availability of jobs may also influence the current migration flows out of the country by stopping people from migrating or even incentivising those who have migrated to return to their home country.
- Municipalities can benefit both from a more attractive urban environment and, in particular, the additional tax revenue. Figure 6 gives an impression the aesthetic improvement after the renovation.

Figure 8: Photos showing a Latvian multifamily building before and after renovation
Source: Miller, 2017

To date, no negative side-effects of the instrument have been observed. One possible rebound effect may emerge if EPC+ and EPC++ renovations finance energy-intense applications such as elevators to a large extent. The probability for this should be the matter of further investigation.

5.4 Success factors and challenges

The introduction of LABEEF has been facilitated by several success factors.

- First, residents do not have to take on a loan, which can be a barrier for low-income households aiming to invest in renovation measures. In addition, the transaction cost to residents is reduced significantly given that they are approached and do not have to organize the renovation themselves.
- The importance of convincing the residents has been considered from the very beginning. The cost to residents is limited to an increase in energy bills of about 15%, meaning that the affordability risk for them is mitigated. This is particularly important in Latvia, where many apartment owners do not have a large income. The absence of financial risk does not guarantee the agreement of the residents. That is why the non-governmental organization ESEB plays an important role for the success of the scheme. ESEB helps to approach and convince residents. Residents may even register complaints during or after the renovation directly with ESEB, which then either solves the issue (e.g. by explaining the functioning of the new heating system) or forwards the complaint to LABEEF. This has proven to increase trust from residents.
- Further, the apartment management companies are an essential actor in the mechanism. The apartment building management companies are in direct contact with the residents. Involving them therefore

relieves both the administrative burden of collecting the contact data and communicating with the large heterogeneous ownership community as well as keeping track of the consumption reduction.

- Another characteristic of the development phase was the early involvement of many stakeholders, including the Latvian Ministry for the Environment and Ministry of Economy, the EBRD, Riga technical university, the ESEB, the LGA, the fund ALTUM and the SUNShINE project. Because of their early involvement, they could shape the platform according to their requirements and develop ownership for it. As a result, a powerful coalition of stakeholders was formed.
- The development of the platform also benefited from the consideration of international good practice examples. In the year 2012, the Latvian Ministry of Economy visited the Berlin Energy Agency, an institution with vast experience in the field of ESCO services and EPC.
- The instrument is, in principle, market-based and aims to become independent from public funds by 2025. This is a powerful argument during the acquisition of funds and supporters.
- Challenges during the implementation lie in the inherent risk of introducing a new business model. On the one hand, there is a necessity to attract sufficient funding to create demand. On the other hand, it is also possible that a mismatch between the national ESCO market with currently six main ESCOs operating in Latvia (Sunshine, 2018), and the demand for renovation generated by LABEEF occurs.
- There is ample evidence of corruption scandals in Latvia, including the building and energy sector (Bloomberg, 2018). This poses a general challenge to the implementation of a new financing mechanism aiming for a high degree of transparency of payment flows.

6 Transferability

6.1 General comparability of the context

With regard to the comparability of the context in Germany in Latvia, the following considerations are of relevance.

- The scale of the context is very different, with a relatively small Latvian population of under 2 million inhabitants (2018) compared to the almost 83 million (2018) in Germany (Statistisches Bundesamt, 2018). Eastern Germany and Latvia share a similar history as they were both part of the Eastern block countries until the fall of the Soviet Union in 1991. This is also reflected in the architecture, with a larger share of buildings being prefabricated high-rise buildings in the former East Germany. As LABEEF was specifically designed for this type of building, it could be applied particularly well to this context. Multifamily buildings are responsible for 24% of the final energy consumption in Germany (Energie-Agentur, 2016). The German building stock features 3.2 million multifamily buildings compared to 39,000 in Latvia. The much larger target building stock means that an instrument similar to LABEEF would have to be scaled up significantly to match the German context.
- Three quarters of the building stock in Germany was erected before 1979 (Energie-Agentur, Zahlen & Fakten - Daten und Hintergründe zu Nichtwohngebäuden in Deutschland, 2016). Average energy intensity for heating in multifamily houses in Germany in 2016 was between 102-126 kWh/m^2 per year depending on whether it is DH, oil heating or gas heating. The average energy intensity is lower than in Latvia with 180 kWh/m^2.
- For EPC to work, relatively high energy costs are required so that the renovation measures can be refinanced in a much shorter term. In terms of electricity, Germany and Latvia fulfil this prerequisite (Eurostat, 2017). Data for heating costs in Latvia is not available.
- Compared to Latvia, Germany has a very developed ESCO landscape already. The German market is particularly well developed on the supply side and is characterised by high competition. In Germany, EPC has been implemented since the 1990s. EPC and other contracting forms have a high market volume of around EUR 7.2-8.4 billion with a steady annual increase (BfEE, 2017). More than 60% of energy service suppliers expect growth or even strong growth of the ESCO market until 2020 (Kotin- Föster, et al., 2018). This means that Germany features an adequately qualified labour market, which can cover the technical and economical expertise needed for EPC. The market development notwithstanding, the refurbishment rate in Germany is still far from where it should be for achieving energy efficiency and climate targets.
- The role of apartment building management companies is different in the two countries. While in Germany, apartment building management companies are responsible for heating only, their Latvian counterparts are responsible for energy provision on the whole, including electricity. The companies in Latvia are very large, with Riga's main company being in charge of around 4,000 buildings. The Latvian apartment building management companies are therefore more powerful and play a more important role than they do in the German context.
- An important reason for the slow uptake of EPC in Latvia was that there were no track records and a lack of standardised guidelines. A due diligence process was therefore difficult to implement. This may be easier to establish in the German context given the extensive experience with EPC. There are also guidelines for EPC in place, such as the state of Hessen's (Berliner Energieagentur, 2012) or the German

Energy Agency's guide (Energie-Agentur, 2016). These could serve as orientation for future financing mechanisms. The larger ESCO market in Germany means that there is also a longer track record, which is central to winning over commercial banks as financiers.

- In Germany, facilitating institutions already exist in several states: In the Berlin, the local energy agency channels demand and works as a platform to connect projects and ESCOs. Other institutions include the Energy Agency North-Rhine Westphalia (EA.NRW), the Saxon Energy Agency (SAENA) and the Climate protection agency Baden-Wuerttemberg (KEA). In all cases a moderating agency is the key success factor. The support measures have previously targeted mainly public buildings.

Rather than focusing on the German context, the founders of LABEEF are currently working on plans to extend the facility to other Eastern European countries. According to estimations, over 0.5 billion m^2 of building floor area have comparable energy saving potentials to Latvia (Kotin- Föster, et al., 2018).

6.2 Properties of the instrument

A similar financial tool in the German context would require a thorough market assessment to estimate the market size. Such an analysis should also evaluate which types of buildings to target in the German context as the platform does not necessarily toned to be restricted to multifamily, prefabricated high-rise buildings. Instead, it could be adjusted to support those building types that are most difficult to finance through EPC models, such as e.g. multifamily apartments.

To introduce a similar platform, the next concrete steps would be to adjust the technical, legal and financial guidelines to the German context, lobby for financial support equivalent to the one granted to LABEEF and establish a company.

A barrier to EPC has been the accounting regulations under EUROSTAT 'ESA 95' which declared third party financing for EPC projects as debt and, hence, hindered municipalities and cities in the uptake of energy efficiency projects. However, the EU Commission has updated the guidance note on the recording of EPCs in government accounts in 2017 making it easier for public buildings to invest in energy saving measures.

6.3 Potential impacts

If successful, a financing facility similar to LABEEF may speed up the renovation rate in Germany. With a current renovation rate of 1% of total m^2 each year, it would take 100 years to renovate the existing building stock (Buildings Performance Institute Europe, 2015). Unless the renovation rate is increased significantly, the climate targets for the building sector will probably not be reached. An innovative financial product tailored to the German context and conditions may help speed up the renovation rate by generating further capital.

As a general tendency, a financing platform such as LABEEF can play a significant role in the institutional landscape and generate the required investment volumes. However, the effect of the individual instrument will not be very large.

6.4 Conclusion

The key advantages of LABEEF are the standardisation of processes and the takeover of the long-term risks, which facilitates the acquisition of capital for EPC to renovate the Latvian residential building sector. Germany has a significantly larger stock of multifamily buildings which would require renovation. Even though the German EPC market as well as facilitating institutions are much further developed than in the Latvian context, efforts to speed up the renovation rate through EPC have focused mainly on public buildings. An additional financing mechanism tailored to multifamily buildings may help increase the renovation rate in this segment.

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