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SUNRISE Project

*Financing for Prosumer Renewable Energy
in Lithuania, North Macedonia, and Bulgaria*
November 2023



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1. Background

The European Union is at the forefront of a transformative shift in renewable energy financing, navigating a complex landscape shaped by public investment initiatives and private market dynamics. As the EU pursues its climate ambitions, the marriage of innovative policies, emerging technologies, and strategic investments has motivated significant developments in renewable energy.

This report identifies the renewable energy financial products and services available to prosumers in three target countries: Lithuania, North Macedonia, and Bulgaria. These countries, each at different stages of their renewable energy journey, showcase the diversity within the EU framework. North Macedonia, advancing towards EU accession, is aligning its renewable energy policies with EU standards and benefits from a relatively vibrant financing environment for residential renewable energy installation, albeit with high borrowing costs. Lithuania, a leader in residential energy upgrading, boasts a robust environment for the deep retrofitting and renovating of multi-family apartment buildings alongside its renewable energy investments. Bulgaria has organized €1.1B in support for energy renovations of residential and public buildings, although private financing for consumer-level residential energy installation is currently limited to two commercial banks. Against European trends, the individual financing environments of these three countries, summarized in this document, contribute significantly to the collective EU narrative in renewable energy innovation and adaptation.

2. Key Trends

European Initiatives Are Driving Progress in Renewable Energy & Energy Efficiency

Recent EU initiatives have kickstarted new approaches to renewable energy financing, but managing variability remains a challenge. The following broad trends and exemplary programs capture this dynamic environment:

1. **EU Renewable Energy Financing Mechanism (RENEWFM):**

- **Background:** The EU introduced RENEWFM to support renewable energy projects and increase the uptake of renewable energy sources across the EU. This mechanism pools financial contributions from participating countries, allocating funding through competitive tenders.
- **Recent Developments:** In April 2023, the first cross-border tender for renewables was opened, supporting solar PV projects in Finland with a total capacity of 400 MW. Luxembourg contributed EUR 40 million, exemplifying cross-country collaboration in renewable energy financing.¹

2. **EU Renewable Energy Law and Targets:**

- **Background:** The EU has been revising its renewable energy targets as part of its strategy to combat climate change and reduce reliance on fossil fuels.
- **Recent Developments:** In September 2023, EU lawmakers approved a law requiring 42.5% of EU energy to be renewable by 2030, up from the previous target of 32%. This law also facilitates faster approval of new renewable projects

¹ https://cinea.ec.europa.eu/news-events/news/renewfm-eu-renewable-energy-financing-mechanism-launches-its-first-call-proposals-2023-04-18_en

and encourages the development of innovative technologies like floating solar cells and wind kites.²

3. LIFE Clean Energy Transition Program:

- **Background:** This program aims to accelerate the market uptake of energy efficiency and renewable energy solutions in the EU.
- **Recent Developments:** In 2023, stakeholders across Europe submitted 236 proposals under this program. Topics covered include building energy performance, heat pump deployment, and support for public authorities in clean energy transition, with a total budget of around EUR 100 million.³

4. Integration and Flexibility Challenges:

- **Background:** The increasing share of renewable energy in the EU's electricity system poses challenges in terms of grid flexibility and storage capacity.
- **Recent Developments:** Studies show that flexibility requirements in the EU will more than double by 2030 and grow sevenfold by 2050. To address this, the EU is looking into various technologies and storage solutions to manage the variability in power systems.⁴

5. Future Areas for Growth and Improvement:

- **Challenges:** The EU faces significant challenges in integrating the variable nature of renewable energy, especially in terms of storage capacities and power system operations.
- **Prospective Solutions:** The EU is exploring a combination of technologies and storage solutions to provide the necessary flexibility. This includes a focus on interconnections, demand response strategies, and continuous reliance on conventional thermal units for flexibility needs. The aim is to ensure a reliable and sustainable energy system while transitioning to a higher share of renewables.⁵

These trends indicate a robust and evolving landscape in renewable energy financing and policy in the EU, with a strong emphasis on innovation, collaboration, and addressing the challenges of integrating renewable energy into existing power systems.

Increasing Interest in Renewable Energy & Energy Efficiency from Private Finance

Recent key trends in private financing for renewable energy in Europe demonstrate a dynamic shift towards greater investment in energy efficiency and renewable energy projects:

1. Increasing Attractiveness of Energy Efficiency Investments:

- Energy efficiency is becoming a more attractive investment for the private sector. This shift is crucial for Europe's goal of becoming carbon-neutral by 2050. Private financing is essential for meeting EU's ambitious climate and energy targets, including cutting carbon emissions and achieving energy efficiency targets.⁶

² <https://www.reuters.com/markets/europe/eu-lawmakers-pass-bill-hiking-renewable-energy-targets-2023-09-12/>

³ https://cinea.ec.europa.eu/news-events/news/life-clean-energy-transition-call-2023-received-236-proposals-2023-11-27_en

⁴ https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/future-eu-power-systems-renewables-integration-require-7-times-larger-flexibility-2023-06-26_en

⁵ https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/future-eu-power-systems-renewables-integration-require-7-times-larger-flexibility-2023-06-26_en

⁶ https://managenergy.ec.europa.eu/private-finance-energy-efficiency-new-solutions-funding-europes-energy-transition-2023-05-03_en

2. **Challenges and Opportunities in Energy Efficiency Investments:**

- Energy efficiency investments, such as deep retrofits of buildings, often face high transaction costs and long payback periods. However, the perceived risks are lower than what is realized by the markets. Increasing technical and legal standardization is needed to simplify transactions and boost investor confidence. Non-energy benefits like improved indoor comfort and building value are becoming key incentives for investment.⁷

3. **Innovative Financing Schemes and EU Support:**

- There is a growing need for innovative financing schemes at the regional or national level to ensure an adequate supply of private finance for energy efficiency investments. The EU supports such schemes through technical assistance programs. These innovative financing schemes aim to maximize the leverage ratio of public funds to private finance.⁸

4. **SUNSHINE:**

- The SUNSHINE project in Latvia exemplifies these trends.⁹ It focuses on prolonging the life of old Soviet-era residential buildings while enhancing their energy efficiency. This project uses energy performance contracting (EPC), where an energy service company (ESCO) guarantees energy savings. Such projects highlight the role of private financing in transforming energy efficiency at a large scale.¹⁰

These trends reflect a growing recognition of the strategic importance of private investment in Europe's transition to a more energy-efficient and renewable-based economy, showcasing both the challenges and the innovative solutions being developed to overcome them.

⁷ https://managenergy.ec.europa.eu/private-finance-energy-efficiency-new-solutions-funding-europes-energy-transition-2023-05-03_en

⁸ https://managenergy.ec.europa.eu/private-finance-energy-efficiency-new-solutions-funding-europes-energy-transition-2023-05-03_en

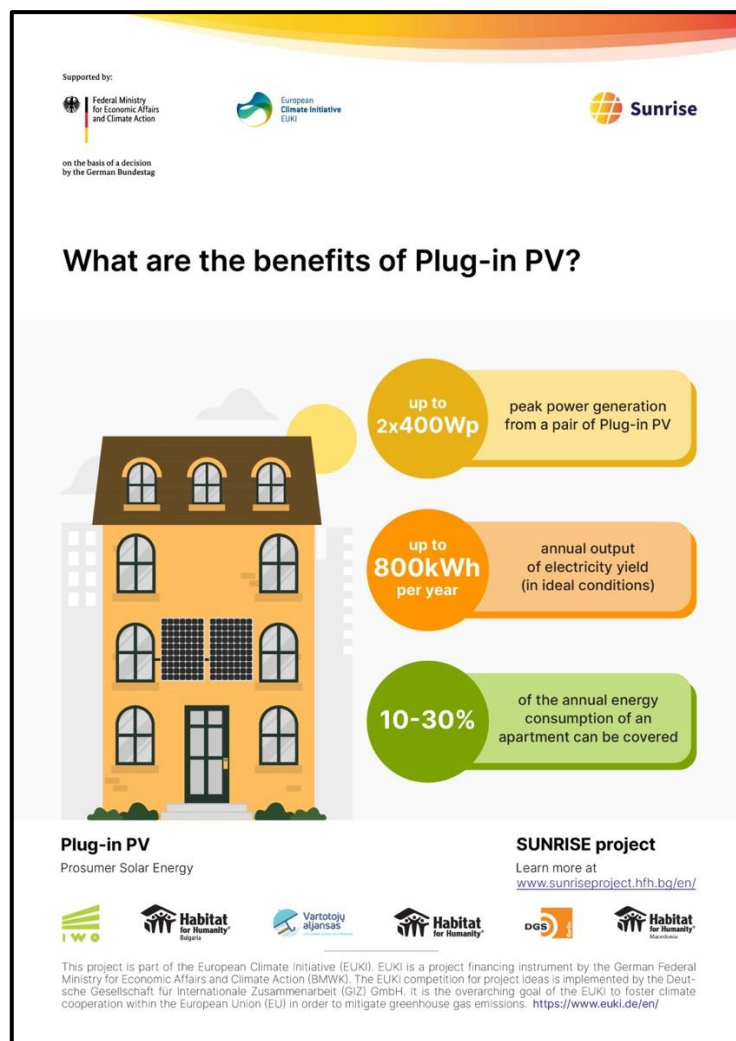
⁹ <https://cordis.europa.eu/article/id/422275-innovative-financial-instrument>

¹⁰ https://managenergy.ec.europa.eu/private-finance-energy-efficiency-new-solutions-funding-europes-energy-transition-2023-05-03_en

3. Sunrise Project

The project SUNRISE aims to support local organizations in Bulgaria, Lithuania and North Macedonia in initiating the expansion of solar energy projects through exchange of experience and knowledge sharing. It will identify barriers on the national and local level and develop solutions for multi-family buildings. The relatively low-threshold approach of plug-in PV-modules will raise apartment owners' and tenants' awareness of the solar potential and initiate larger installations in the medium term.

In the long-term, SUNRISE will enable self-consumption and putting consumers at the heart of the low-carbon transition for unleashing private investment in RE, creating a potentially cost-effective strategy to meet renewable energy and emissions reductions targets. Citizens becoming prosumers will lead to financial, environmental and security benefits for households and society at large. Benefits from using self-generated electricity include cheaper energy bills, energy autonomy, reduced carbon emissions and the creation of new local jobs. Small-scale installations will make people aware that they can collectively have a large impact on energy transition and carbon emissions reduction.



An example infographic from the SUNRISE project helps consumers understand the benefits of solar PV installation.




How to generate easily energy for our own housing?




Install on your balcony or on the facade of your home **Plug-in PV system**.
 The Plug-in PV systems can generate up to **800 kWh electricity per year**, enough to power a refrigerator, TV, computer and other appliances with free energy from the sun.

Plug-in PV **SUNRISE project**
 Prosumer Solar Energy Learn more at <https://www.sunrise-project.de>

This project is part of the European Climate Initiative (ECI) under a grant funding instrument by the German Federal Ministry for Economic Affairs and Climate Protection (BMWi) under the umbrella brand of the ECIP in the form of the "Sunrise Project". The information is for informational purposes only and does not constitute an offer. The ECIP is a joint initiative of the German states and the Federal Government. For more information, please visit <https://www.eci-project.de>.



What is Plug-in PV and how to attach the modules?



- Plug-in PV consists of up to four solar modules, a microinverter which is limited to 800W output, cables and a plug.
- They are easily attached to balconies and facades.
- They are plugged into the outside socket of your balcony or facade. The need of an electrician and wiring the household with electricity.

Plug-in PV **SUNRISE project**
 Prosumer Solar Energy Learn more at <https://www.sunrise-project.de>

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Interest in Plug-in PV installation keeps growing all the time!




- The number of Plug-in PV Systems in Germany has extremely increased over the past years. Sales have even **doubled** compared to previous years.
- Market study showed about **200,000 systems** sold in 2021. Market manufacturers estimate that **300-500,000 systems** are currently sold.

Plug-in PV **SUNRISE project**
 Prosumer Solar Energy Learn more at <https://www.sunrise-project.de>

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New Targets for EU Directive on the promotion of the use of energy from renewable sources



- 42,5%** energy from renewable sources in the energy mix up to 2030
- 49%** energy of renewable sources in buildings up to 2030

Simplification of grid feed-in and grid stability for renewable energies.

Plug-in PV **SUNRISE project**
 Prosumer Solar Energy Learn more at <https://www.sunrise-project.de>

This project is part of the European Climate Initiative (ECI) under a grant funding instrument by the German Federal Ministry for Economic Affairs and Climate Protection (BMWi) under the umbrella brand of the ECIP in the form of the "Sunrise Project". The information is for informational purposes only and does not constitute an offer. The ECIP is a joint initiative of the German states and the Federal Government. For more information, please visit <https://www.eci-project.de>.

A selection of other SUNRISE infographics.

4. Renewable Energy Financial Products and Services

This report focuses on the availability of private financing for renewable energy installation at the consumer level in the study countries of North Macedonia, Lithuania and Bulgaria. Where applicable, financing that is not directly targeted at, but may be applied to, renewable energy installation (for example, subsidized green mortgages which allow spending on solar panels) is also included. This report represents information that was available as of December, 2023. It should be said that the dynamic nature of the retail financial space means new lending products are constantly introduced, and occasionally withdrawn.

Our overarching conclusion is that a diverse and developing market for consumer finance of renewable energy already exists in all three countries, although the overall availability of consumer financing for renewable energy is limited by relatively few “sellers” (i.e., banks offering products aimed at RE financing), fragmented regulatory requirements (i.e., what is needed from a consumer to apply for and receive financing), and still-developing government incentive programs (e.g., in Bulgaria, where a consumer solar lending program was launched in the week before this report was finalized).

What follows is a comprehensive overview of these products along with their specifications, organized by country and financial institution.

4.1 North Macedonia

Consumer lending is supported under the EBRD's GEFF (Green Economy Financing Facility) in the Western Balkans ([see more here](#)). Despite its relatively small population, and its non-member-state-status, North Macedonia benefits from a relatively large number of consumer lenders in the renewable energy financing sector. However, there is a high level of variability in the specific terms between lenders and interest rates are relatively high compared to Lithuania and Bulgaria.

Direct Consumer Lending

Financial institution	Stopanska Banka
URL to Product	https://www.stb.com.mk/naselenie/kredit/potroshuvacki-kredit/do-1-500-000-denari-25-000-evra/
Status	Active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer loan
Price	5,80% fixed annual interest rate for the first 2 years, with life insurance policy, variable annual interest rate 11.60% for the clients with salary or pension in Stopanska Banka, or for other clients 12,89%.
Purpose	Consumer loan.
Loan amounts	€250 - €25,000
Loan term	Up to 10 years
Description	The criteria is a maximum of 35% of disposable monthly income vs monthly payment. The credit bureau confirmed the credit status. At least 6 months of the last six months' bank accounts. Confirmation of employment and monthly salary, not older than 30 days. Any other documents as requested by the bank.
State support	n/a

Financial institution	GEFF (Green Economy Financing Facility)
URL to Product	https://ebrdgeff.com/macedonia/the-programme/the-facility/
Status	active (as of 21.12.2023)
Customers	<ul style="list-style-type: none"> • Individuals owning or residing in a house or an apartment in which they intend to implement an <u>eligible investment</u>. • Groups of individuals, Housing Associations, condominium associations of apartment owners in multi-level buildings or other equivalent body which represents the interests of residents. • Service providers, such as Housing Management Companies and Energy Service Companies (ESCO) who provide maintenance, operation, installation, construction, refurbishment or similar services under a contractual arrangement with individuals and Housing Associations. • Vendors, who supply and/or sell eligible technologies listed in the <u>Technology Selector</u>. • Manufacturers, who produce eligible technologies listed on the <u>Technology Selector</u> and are planning to sustain or expand this part of their production.
Product and services	Energy efficiency loans
Price	Depending on banks and long-term financial outlook
Purpose	<p>Financing under WB GEFF is available for the following measures that contribute to reduction of energy consumption and CO₂ emissions in the residential sector.</p> <p>Household technologies that meet the following performance standards are eligible to be financed under the GEFF in North Macedonia:</p> <ul style="list-style-type: none"> • Refrigerators (fridges, freezers, combi fridges/freezers)*: energy label A++ or better • Air conditioners*: energy label A++ or better • Lighting: luminous efficacy <ul style="list-style-type: none"> • LED lighting ≥ 110 lumens/Watt • High pressure sodium lamps ≥ 110 lumens/Watt • Other gas discharge lamps ≥ 57 lumens/Watt • Gas boilers (gas boiler including control system): thermal efficiency ≥ 95% • Biomass stoves/boilers (biomass stoves / boilers including fuel supply system and control system): thermal efficiency ≥ 90% • Energy efficient windows, doors and glazing: thermal transmittance (U-value) <ul style="list-style-type: none"> • Windows: ≤1,3 W/m²K • Doors: ≤1,3 W/m²K

	<ul style="list-style-type: none"> • Glazing: $\leq 1,2 \text{ W/m}^2\text{K}$ • Insulation for outdoor walls, roof, floor, and partition walls dividing areas: thermal conductivity (λ) <ul style="list-style-type: none"> • Lamellar structure slabs: $\leq 0,04 \text{ W/mK}$ • Styroasphalt sheets: $\leq 0,04 \text{ W/mK}$ • Mineral wool: $\leq 0,04 \text{ W/mK}$ • Styrofoam (XPS, EPS): $\leq 0,04 \text{ W/mK}$ • Polyurethane: $\leq 0,04 \text{ W/mK}$ • Others: $\leq 0,04 \text{ W/mK}$ • Heat pumps (electricity or gas driven): COP <ul style="list-style-type: none"> • Water heat pump: $\geq 4,3$ • Air heat pump: $\geq 4,3$ • Ground heat pump: $\geq 4,3$ • Ground water heat pump: $\geq 4,3$ • Recycled air heat pump: $\geq 4,3$ • Brine heat pump: $\geq 4,0$ • Solar thermal water heaters (solar collectors including control system): thermal efficiency $\geq 75\%$ • Solar photovoltaics installations (PV): electrical efficiency $\geq 16\%$ • Balanced mechanical ventilation: energy label A or better • Hot water storage tanks – energy label C or better
Loan amounts	Up to €50,000
Loan term	Up to 20 years
Description	Depending on banks.
State support / Incentives	<p>Successfully implemented and verified projects may be eligible to receive an investment incentive for:</p> <p>A. Individuals</p> <ul style="list-style-type: none"> • Up to 20% of eligible costs for an eligible project within an individual apartment or house involving technologies from the Technology Selector, depending on the type of the sub-project. • Household appliances (e.g. refrigerators, freezers and air-conditioners) are not eligible for investment incentives. <p>B. Groups of individuals, Housing Associations*, Service providers*</p> <ul style="list-style-type: none"> • Up to 35% of eligible costs for a multi apartment buildings sub-project involving technologies from the Technology Selector, depending on the type of the sub-project. • Household appliances (e.g. refrigerators, freezers and air-conditioners) are not eligible for investment incentives.

Financial institution	Komercijalna Banka
URL to Product	https://www.kb.com.mk/kredit-energetska-efikasnost.nspx#!#0
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	7.998% fixed annual interest, variable thereafter. Up to 20% of loan principal returned as grant.
Purpose	Energy-efficiency purposes
Loan amounts	Up to €50,000
Loan term	Up to 20 years
Description	GEFF-supported green upgrading loan for energy upgrading & solar PV. Offered in two variants, one secured by real property and the other by draft statement (i.e., income). Minimum income of €240 / month for employed individuals or €150 / month for pensioners. Loan must not exceed 50% of monthly income. Borrowers must be younger than 70 at end of loan if employed, 72 if pensioner.
State support	n/a

Financial institution	NLB MK
URL to Product	https://nlb.mk/Физички_лица/Понуда/Кредити/НЛБ_Кредити_за_енергетска_ефикасност.aspx (product URL does not appear to be working, but this is the page linked from GEFF)
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	We assume the terms are very similar to all other GEFF programs, NLB ME offers an analogous product in Montenegro: https://www.nlb.me/me/stanovnistvo/proizvodi/nlb-eko-kredit
Purpose	Energy-efficiency purposes
Loan amounts	Up to €50,000
Loan term	Up to 20 years
Description	GEFF energy upgrading & energy installation loan.
State support	n/a

Financial institution	SparKasse
URL to Product	https://www.sparkasse.mk/Private_clients/Loans_and_Financing/Purpose_Loans/ECO_loans_.aspx
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	Starting from 5.7% fixed for 3 years, or 5.9% depending on credit. Up to 20% of loan amount returned as grant.
Purpose	Energy-efficiency purposes
Loan amounts	Up to €50,000

Loan term	Up to 20 years
Description	Green loan product under GEFF, covers all usual energy efficiency upgrades + solar PV installation. Loan secured by co-guarantors or by mortgage on immovable property, proportional to amount borrowed.
State support	n/a

Financial institution	Halk Bank
URL to Product	https://halkbank.mk/eko-loan.nspix
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	5,80% fixed annual interest rate for the first 2 years, thereafter 3,75% + referent rate for calculation of legal interest rates NBRM (currently 6%).
Purpose	Energy-efficiency purposes
Loan amounts	Up to about €10,000 (600,000 MKD)
Loan term	Up to 95 months (7.9 years)
Description	Credit worthiness: 1/2 of the total monthly incomes for employees and 1/3 of the monthly incomes for pensioners .
State support	n/a

Financial institution	Teteks Banka
URL to Product	www.ttk.com.mk/Web/ФИЗИЧКИ ЛИЦА/Кредити/Кредити_без_ризико_животно_осигурување/ЕКО_кредит.aspx
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	4,70% for first two years.
Purpose	Energy-efficiency purposes
Loan amounts	Credit secured by bill of exchange: <ul style="list-style-type: none"> • €300 to €10,000 (20,000 MKD to 600,000 MKD) Loan secured by mortgage: <ul style="list-style-type: none"> • €1,500 to €490,000 (100,000 MKD to 3,000,000 MKD)
Loan term	Credit secured by bill of exchange: <ul style="list-style-type: none"> • Up to 95 months Loan secured by mortgage: <ul style="list-style-type: none"> • Up to 240 months
Description	For investments that will contribute to greater energy efficiency and energy saving in the home, for the purchase of environmentally friendly means of transport and for the purchase of energy-efficient household appliances.
State support	n/a

Financial institution	ProCredit Bank
URL to Product	https://www.pcb.mk/geff-programa-za-eko-kredit.nspix

Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Energy efficiency loans
Price	7.75% fixed for 3 years; after 5% + monthly treasury bill interest rate, minimum of 8.0%
Purpose	Energy-efficiency purposes
Loan amounts	Up to about €16,000 (1,000,000 MKD)
Loan term	Up to 7 years
Description	Covers installation of: <ul style="list-style-type: none"> • Heat pump system, biomass or gas boiler • Insulation of exterior walls - facade, roof, floors • Window installation, ventilation, solar photovoltaic system Eligible for 15-20% return of asset value (grant) through EBRD Green Energy Financing Facility (GEFF) program
State support	n/a

Subsidized Green Mortgages

Financial institution	NLB MK
URL to Product	nlb.mk/Физички_лица/Понуда/Кредити/Зелени_Кредити.aspx
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Green mortgage
Price	3.45% fixed annual interest rate for first 5 years; 3.95% for first 10 years; the variable interest rate for the rest of the repayment period is tied to 6-month EURIBOR + 3.6 p.p.
Purpose	Energy-efficiency purposes
Loan amounts	Up to €300,000
Loan term	Up to 30 years
Description	Requirements: Real estate mortgage (1.4:1 to 3:1) Promissory note from the applicant For a housing loan securing a mortgage on future real estate (mortgage on future construction), the mortgage is established on the basis of a pre-notification sheet, until the moment of completion of the entire documentation for registering a mortgage on the real estate in the title deed.
State support	n/a

4.2 Lithuania

Lithuania has a smaller number of market players than North Macedonia despite a larger population; however, lower interest rates and greater state support for EE & RE financing promise to promote consumer uptake of these financial products and promote the development of the sector. Lithuania has numerous renewable energy incentives available through APVA, the Environmental Project Management Agency.

Financial Institution	Swedbank	
URL to Product	Energy efficiency loans;	Loans for solar panels
Status	active (as of 21.12.2023)	active (as of 21.12.2023)
Customers	individuals	individuals
Product and services	Home energy efficiency loans	Loans for solar panels
Price	Special interest rate, starting from 1.79% + 6-month EURIBOR*,	Fixed annual interest rate of 4.9%. Interest is paid from the total outstanding amount of the loan granted. Contract fee is 1% of loan amount (min €95). If the loan amount is used for another purpose, the bank reserves the right to withdraw the special fixed annual interest rate and to apply a fixed annual interest rate of 15%.
Purpose	For improving of your existing private house (for example, private house, twin house, row house), including works which improve energy efficiency, such as: <ul style="list-style-type: none"> • Insulation of all or separate structural elements of the house (walls, floor, ceilings, roof, foundation, etc.). • Installation of centralized or local ventilation system with recuperation. • Replacing doors and/ or windows with new/more energy efficient ones. • Installation of a heating system management tool. • Other tools which will improve energy savings (e.g. solar panels, LED lighting, etc.). 	The loan is for the purchase of a remote solar power plant and the installation of your own solar power plant on the roof of your house or on your plot of land. The loan is also suitable for the purchase and installation of a heat pump or wind turbine.

	No need for a down payment as your property is the collateral.	
Loan amounts	Loan amount from €20,000; the maximum loan amount is limited by customer income. Loan amount cannot exceed 85% of the value or price of mortgaged property, whichever is lower. Loan term up to 30 years. Income at least €700 per month after taxes, at least €1100 per month with a co-borrower.	€3,000 to €20,000.
Loan term		6 months to 10 years
Description	The loan must be secured by mortgage of real estate acceptable to the bank. Improper fulfilment or non-fulfilment of financial obligations may have a negative impact on your credit history and make borrowing more expensive; you also risk losing ownership rights to the mortgaged real estate.	When you enter into a solar loan agreement, you commit to using the loan for its intended purpose.
State support	https://www.apva.lt/en/ - a part of investment is subsidy	

Financial Institution	SEB
URL to Product	https://www.seb.lt/en/private/loans/loan-home-energy-efficiency
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Loan for improving home energy efficiency
Price	fixed interest rate from 4.9 % using a credit not by its purpose, may result in the increase of the annual interest rate up to 14 %
Purpose	for the purchase and installation of: <ul style="list-style-type: none"> • a solar power plant or a part of a remote solar power plant • heat pump (excluding air conditioners for air cooling only) • wind turbine • energy storage battery • charging equipment for electric vehicles
Loan amounts	Up to €40,000
Loan term	Up to 7 years
Description	Multi-purpose loan program facilitating PV installation among other potential uses.
State support	The Environmental Projects Management Agency (APVA) provides financial support for private persons, https://www.apva.lt/en/ Loans can be partially paid off with these grants.

Financial Institution	Luminor Bank
URL to Product	https://www.luminor.lt/en/private/real-estate-purchase-or-repair-loan
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Home renovation and energy efficiency
Price	Annual fixed interest rate from 4.9 % Loan agreement fee – 1 % of the loan amount, not less than €60
Purpose	Consumer loan for improving home energy efficiency when solar, wind power, or heat pumps are installed. Real estate purchase or repair loan
Loan amounts	from €4,000 to €30,000
Loan term	from 12 up to 120 months
Description	After applying for a consumer loan, cost estimation of a project or agreement with a vendor completing a home energy efficiency project should be provided. After signing the agreement with the bank, you commit to purchasing of home energy efficiency solution/solar panels. Bank can request to deliver a copy of the agreement in connection to the ESO in the case of Solar Panels
State support	Consumers can receive up to €3,230 “compensation payment” or rebate for the “installation of electricity production facilities from renewable resources in households” through APVA. Consumers may also receive compensation based on installed capacity: €322.91 per 1 kW of installed power & inverter. Numerous other programs exist for refunds at apva.lt

4.3 Bulgaria

Bulgarian consumers can already access a variety of financial supports to install solar PV, solar water heating, and battery storage systems in their homes. Lending support is available from several major banks, with direct consumer lending for RE installation available at ProCredit Bank and FiBank, and more generally targeted energy efficiency mortgage lending discounts available at International Asset Bank, UBB, and UniCredit Bulbank. Green building renovations are supported by a €924 million allocation from Bulgaria’s Recovery and Resilience plan; beginning in December 2023, individual solar PV installations are supported by grants covering 70% of installation costs up to 15,000 BGN (about €7,500).¹¹

Direct Consumer Lending

Financial institution	First Investment Bank (Fibank)
URL to Product	https://www.fibank.bg/en/personal-banking/loans/consumer-loans/consumer-loan-green-energy-for-households

¹¹ <https://renewablesnow.com/news/bulgaria-opens-eur-123m-home-solar-scheme-to-applications-822619/>

Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer loan
Price	5,80% fixed annual interest rate
Purpose	Consumer loan
Loan amounts	€ 0 – 13,000
Loan term	Up to 10 years
Description	For purchase and assembly of installation for own production of energy from renewable sources, including systems for storing the produced electrical energy. Variable annual interest rate based on SBIR* + margin; must pay back with any proceeds from National Fund for Renewable Energy (NFRE) grant
State support	n/a

Financial institution	ProCredit Bank
URL to Product	https://www.procreditbank.bg/en/for-private-clients/loans/loan-for-photovoltaic-installation/
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer loan
Price	3.25%, total APRC is 4.92%
Purpose	Consumer loan
Loan amounts	€ 2,600 – 13,000
Loan term	Up to 7 years
Description	For photovoltaic installation. Does not require approval from NFRE grant program.
State support	n/a

Subsidized Green Mortgages

Financial institution	International Asset Bank
URL to Product	https://www.iabank.bg/en/individuals/loans/in-mortgage-loans/promotional-housing-loan-asset-energy-efficiency
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer mortgage
Price	2.95% is promotional subsidized rate for first 12 months of loan, variable rate after (currently 3.25%). APRC is 3.36%.
Purpose	Consumer loan
Loan amounts	€ 0 – 312,000
Loan term	Up to 30 years
Description	Subsidized green mortgage. Intended for financing the purchase or construction of a residential property with a certificate of energy performance class "A+", "A" or "B", repair and/or finishing works, refinancing of housing loans.
State support	n/a

Financial institution	UBB
URL to Product	https://www.ubb.bg/en/individual-clients/credits/ipotechen-kredit-za-energiyno-efektiven-dom
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer mortgage
Price	2.65%
Purpose	Consumer loan.
Loan amounts	€ 0 – maximum unknown
Loan term	Up to 30 years
Description	With regard to mortgage loans for purchase and for refinancing in the cases when the property you buy is of A, A+ or B energy class and when the mandatory requirement that the primary energy demand should be not more than 150 kWh/sq.m. as per an implemented project has been fulfilled, upon the loan approval the interest rate, determined as per the product parameters and your individual profile, will be reduced by 0.15 %.
State support	n/a

Financial institution	UniCredit Bulbank
URL to Product	https://www.unicreditbulbank.bg/en/individual-clients/loans/mortgage-loans/live-energy-efficient-home/
Status	active (as of 21.12.2023)
Customers	individuals
Product and services	Consumer mortgage
Price	2.65%* (representative APR, actual terms are 0.15% discount on approved loan APR)
Purpose	Consumer loan.
Loan amounts	€ 0 – maximum unknown
Loan term	Up to 30 years
Description	A special interest discount when purchasing a home which is in a building with energy efficiency class A or higher, evidenced by a copy of an Energy Efficiency Certificate.
State support	n/a

5. Key Takeaways

The landscape of renewable energy and energy efficiency investments in the EU and in EU accession countries is rapidly evolving, influenced by a confluence of factors including legislative changes, innovative financing mechanisms, and private sector engagement. The war in Ukraine has added an urgency to these trends, highlighting the need for energy independence and security. This urgency is catalyzing investments in renewable sources and efficiency projects, accelerating the transition away from fossil fuels.

Consumers in Bulgaria, North Macedonia, and Lithuania can already access a fairly large variety of commercial financing for solar PV installation, a testament to the increasing viability of photovoltaics at the consumer scale. Additionally, a diverse ecosystem of preparatory and complementary financing is available for energy systems and energy efficiency upgrading. Although these programs tend to be at least partially underwritten by government supports, interest from consumer lenders suggests positive lender sentiment toward PV investments over the longer term. The involvement of the private sector will likely increase as consumer supports continue to be brought online.

Assessing consumer uptake of these programs is difficult: in all three countries, consumer lending programs for solar PV are still relatively new; furthermore, commercial lending institutions have not released their internal figures. Some insight can be gleaned from the general levels of investment made by the study countries. In 2023, its inaugural year, Bulgaria devoted €123 million to support their solar PV rebate scheme (of which €40 million was earmarked for the first round of applications); Lithuania increased from €35 million in 2022 to €40 million in 2023 its support for a similar scheme; North Macedonia devoted just under €1 million to its own equivalent in 2022. It can at minimum be said that state support for consumer solar PV is increasing alongside the availability of commercial consumer lending, which suggests that consumers are taking advantage of these loans. In Bulgaria, for example, only 5,300 households would need to receive the maximum €7,500 support to exhaust its first-round budget.

As North Macedonia, Lithuania, and Bulgaria adapt to broader changes in consumer energy markets, the focus on consumer-level financing is becoming increasingly vital, presenting both challenges and opportunities for a sustainable energy future in Europe. Reflecting on the increasing relevance of private, consumer-level financing for renewable energy in the European context, we recognize its growing impact on regional renewable initiatives.

For future research, two hypotheses stand out:

1. **Expanding Consumer Investment in Renewable Energy:** In North Macedonia, Lithuania, and Bulgaria, there's potential for a significant increase in consumer-level investment in renewable energy. This could be driven by enhanced government incentives, increased awareness of renewable benefits, and more accessible financing options. Lending programs that offer advance funds for those approved under national renewable energy installation schemes in particular hold the promise to motivate faster uptake of these systems.
2. **Divergent Paths of Renewable Energy Development:** Over the next five years, these countries may follow different trajectories in renewable energy financing, influenced by their unique economic, political, and social landscapes. North Macedonia, amid EU accession talks, might see accelerated growth due to EU alignment pressures.

Lithuania, with its developed public-sector support and numerous consumer-level grants for renewable energy, could witness steady growth in consumer-level investments. Bulgaria's progress might be slower, contingent on its progress toward implementing consumer-level grants following the initial launch of its home solar installation scheme.

These hypotheses warrant further investigation to understand the evolving landscape of renewable energy financing in these nations.

6. Next Steps

Based on the results of this research, we identify and suggest three priorities for future investigation and implementation. Encouraging uptake is a matter of identifying and reaching households with the potential to benefit from green financing programs. But these programs must make good use of allocated funds if they are to be sustainable and financeable over the longer term. We suggest that targeting the financing “gap” *between* what is a commercially-viable investment and what is not might help to reach more households and use funding resources more efficiently.

a. Awareness raising:

Create demand for renewable energy products, by educating the public, stakeholders, and customers about the benefits and potential providing accurate and reliable information, data, and examples of successful renewable energy projects and initiatives. Increase the awareness of existing products and services available to support financing and funding the renewable energy interventions.

b. Renewable products development – incentives and awards:

Essential way to promote renewable energy is to offer incentives and rewards that can motivate and attract more users and producers of renewable energy. This can include providing financial and non-financial benefits, such as grants, loans, prizes, or recognition. It can also involve creating and expanding the markets and opportunities for renewable energy products and services, such as green certificates, carbon credits, or green bonds. Additionally, it can encourage and facilitate the collaboration and partnership among the different actors and sectors involved in the renewable energy value chain, such as governments, utilities, businesses, NGOs, or academia.

c. Smart Use of Subsidies in development of renewable energy financing products for customers use:

Encourage government to engage in providing subsidies, create guarantee funds, tax credits, feed-in tariffs, or net metering schemes that will help make renewable energy financial products more affordable for the Customers, less riskier for financial institutions and attract additional investment and funding from investors.