

GUIDELINE ON FINDING A SUITABLE FINANCING MODEL FOR PUBLIC LIGHTING INVESTMENT

Deliverable D.T2.3.2 Analysis of funding sources

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DYNAMIC LIGHT

The Dynamic Light project aims to demonstrate the importance of providing light under a variety of circumstances and to examine who uses lighting at what time and for how long. The project explores strategies for introducing energy-efficient lighting in urban areas and identifies the steps required to translate strategies into action, from the initial idea through the analysis, GIS data mining, strategy development, financial modelling, procurement process, implementation and evaluation. These strategies are intended to facilitate investment in pilot and demonstration projects that bolster acceptance of energy-efficient lighting among end-users and urban planners by improving the quality of dynamic light and adapting it to social needs. The project examines the implementation of public lighting under conditions typical of European municipalities.

Consortium

Hochschule Wismar	DE	Stadt Graz	AT
BSC, Poslovno podporni center d.o.o. Kranj	SL	Ernst-Moritz-Arndt-Universität Greifswald	DE
PORSENNA o.p.s.	CZ	SWARCO V.S.M. GmbH	DE
Međimurska energetska agencija d.o.o.	CR	Deutsche Lichttechnische Gesellschaft e.V.	DE
Comune di Cesena	IT	Poltegor-Instytut, Instytut Górnictwa	PL
TEA SpA	IT	Odkrywkowego	
Fondazione Bruno Kessler	IT	Hansestadt Rostock	DE
Spath MicroElectronic Design GmbH	AT	Grad Čakovec	CR

Associated partner

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GUIDELINE ON FINDING A SUITABLE FINANCING MODEL FOR PUBLIC LIGHTING INVESTMENT:

DELIVERABLE D.T2.3.2 - FUNDING SOURCES FOR ENERGY-EFFICIENT STREET LIGHTING IN CENTRAL EUROPE

Upgrading street lighting infrastructure to improve energy efficiency is an investment that reaps rewards in the form of substantial energy savings and reductions in carbon dioxide emissions. In addition, it is highly cost-effective and has a short payback period. In several European countries, infrastructure must be improved. Budget constraints on infrastructure owners—often municipalities—are commonly cited as the reason for inaction. Creative business models are required in order to attract additional investors and reduce the significant upfront costs that discourage investment.

This report summarizes the results of research into potential funding sources for energy-efficient street lighting projects. The analysis focusses primarily on the countries of Central Europe, namely Austria, Croatia, the Czech Republic, Germany, Hungary, Italy, Poland, Slovakia and Slovenia. It reviews available EU funding and assistance programmes, national public funding sources, multi- and bilateral financial intermediaries and private sources. All of these are assessed using a common framework. The report examines objectives, financial instruments, funded activities, beneficiaries and the application process for public sources.

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Abbreviations

BMU	Federal Ministry for the Environment, Nature Conservation, Building & Nuclear Safety of Germany
BMWi	Federal Ministry for Economic Affairs and Energy of Germany
CF	Cohesion Fund
CO ₂	Carbon dioxide
EAFRD	European Agricultural Fund for Rural Development
EASME	Executive Agency for Small and Medium Enterprises
eceee	Energy Council for an Energy Efficient Economy
eeef	European Energy Efficiency Fund
EFSI	European Fund for Strategic Investments
EIAH	European Investment Advisory Hub
EIB	European Development Bank
ELENA	European Local Energy Assistance
ERDF	European Fund for Regional Development
ESIF	European Structural and Investment Funds
ESMAP	Energy Sector Management Assistance Program
EU	European Union
FI	Financial instrument
GIB	Green Investment Bank
GNI	Gross national income
ICT	Information and communications technology
IEA	International Energy Agency
JASPERS	Joint Assistance to Support Projects in European Regions
JESSICA	Joint European Support for Sustainable Investment in City Areas
IROP	Integrated Regional Operational Programme
KfW	Kreditanstalt für Wiederaufbau
MA	Managing authority
NEEAP	National Energy Efficiency Action Plan
NGO	Non-governmental organisation
PDA	Project Development Assistance
PF4EE	Private Finance for Energy Efficiency
REEP	Regional Energy Efficiency Programme
REEPWB	Regional Energy Efficiency Programme for the Western Balkans



SEEF	SUSI Energy Efficiency Fund
SME	Small- and medium-sized enterprises



Terms and definitions

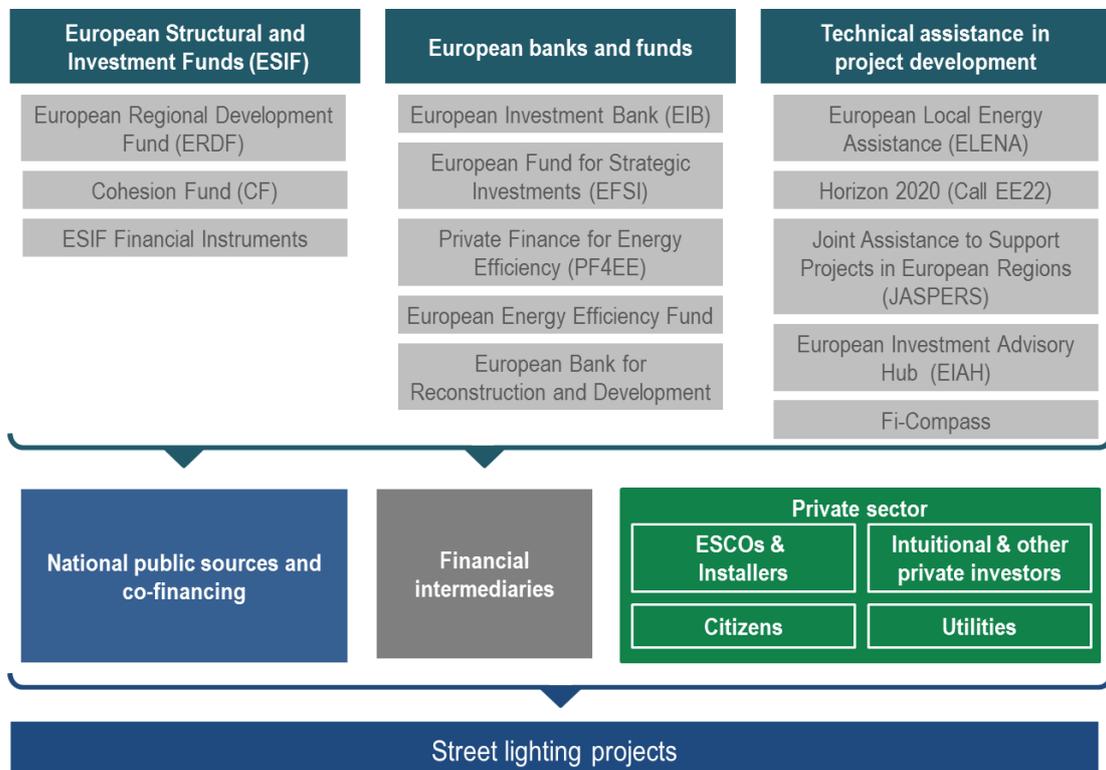
Term	Definition	Source
Blending	Ability to combine financing with additional sources of investment, such as guarantees, trust funds, and project bonds.	(EIB 2017a)
Debt finance	Lending money to a company, government or project in the form of a loan or bond.	(Reyes 2012)
Equity	A stock or any other security representing an ownership interest or partial ownership of a company. The value of the investment is related to the success or otherwise of the company, rather than the interest payments accrued by debt finance.	(Reyes 2012)
Forfeiting loan	A type of financing whereby a bank advances cash to the contractor against invoices or a promissory note guaranteed by the city. The term is used primarily in international trade of capital goods.	Own definition
Grant	Transfers made in goods, cash or services from a government or other organisation to an eligible recipient for a specified purpose, with no repayment required.	(OECD 2001)
Guarantee	A written commitment to cover risks for all or part of a third party's debt, obligation or loan portfolios in order to provide potential economic and regulatory capital relief.	(European Structural and Investment Funds 2014)
Institutional investors	An institution that manages and invests other people's money. Examples: pension funds, insurance funds, investment funds, and other entities on the capital market.	(OECD 2014)
Leasing structures	Renting of an asset for an agreed period of time as an alternative to outright purchase.	(OECD 2001)
Loan	The act of giving an agreed sum of money to another party in exchange for future repayment of the principal amount, along with interest or other finance charges, within an agreed period of time.	(European Structural and Investment Funds 2014)
Microcredit	Provision of thrift, credit and other financial services and products of very small amounts to low-income individuals in rural, semi-urban and urban areas in order to raise income levels and improve living standards.	(College of Agricultural Banking n.d.)
Mezzanine financing	A hybrid of debt and equity financing that gives the lender the right to convert to an ownership or equity interest in the company in case of default. Mezzanine debt may take the form of debt, senior subordinated debt or private, 'mezzanine' securities.	(Silbernagel and Vaitkunas n.d.)
Senior debt	Debt that is repaid before other claims in the event of liquidation.	(World Bank 1991)
Subordinated debt	The opposite of senior debt; it is repaid only after payments on other obligations have been made. Also referred to as 'junior debt'.	(World Bank 1991)
Venture capital	Financing provided in the form of capital investment for a new business or for product development, often in exchange for equity.	(OECD n.d.)



Executive summary

Although upgrading street lighting would cut energy costs, many areas of Central Europe have not yet taken measures to improve their lighting infrastructure. Budgetary constraints on owners (often municipalities) are commonly cited as a reason for this inaction. This report examines potential funding sources that could cover the costs of installing energy-efficient street lighting without depleting the resources of municipalities. Figure 1 provides an overview of the funding sources discussed in this report. The analysis focusses on the countries of Central Europe, namely Austria, Croatia, the Czech Republic, Germany, Hungary, Italy, Poland, Slovakia and Slovenia. Research is one component of the Dynamic Light project, which aims to promote dynamic, intelligent and energy-efficient urban lighting. The project is supported by INTERREG Central Europe.

Figure 1: Funding sources for energy-efficient street lighting in Central Europe



European funding sources

European funds and financial institutions offer substantial funding and technical assistance. The European Structural and Investment Funds (ESIF) channel their resources to the Member States through operational programmes which are designed by each country according to its policy priorities. The European Regional Development Fund (ERDF) and The Cohesion Fund (CF), which are under the ESIF umbrella, cover multiple energy efficiency measures, including street lighting. The country sections of this report provide a list of national operational programmes relevant to municipal energy efficiency upgrades. Municipalities interested in accessing the ERDF and CF resources should check the details of the operational programmes available in their jurisdictions.

ERDF and CF support is offered in the form of grants or loans. However, the use of more innovative financial instruments is strongly encouraged by the European Commission. ESIF financial instruments provide technical assistance for Member States in order to reduce the share of grant financing and transition to other financial instruments (including loans, equity and guarantees) to mobilise additional private investment.



The European Investment Bank (EIB) has identified energy efficiency finance as one of its priorities. It offers multiple instruments to both public and private sector, including dedicated credit lines through local financial intermediaries or direct framework loans to promote projects. EIB also manages and/or co-finances several funds and facilities, such as the European Fund for Strategic Investments (EFSI), Private Finance for Energy Efficiency (PP4EE) and the European Energy Efficiency Fund (eeef).

The European Bank for Reconstruction and Development (EBRD) has extensive experience in financing energy efficiency and municipal infrastructure projects in transition economies, including in Central and Eastern Europe, where it is currently active in Croatia, Hungary, Poland, Slovakia and Slovenia. The EBRD channels its support through credit lines to local commercial banks, which ultimately disburse funding to municipal lighting projects.

EU-funded technical assistance in project development is available through the European Local Energy Assistance (ELENA), the Joint Assistance to Support Projects in European Regions (JASPERS), as well as Horizon 2020 Call EE-22-2016-2017 Project Development Assistance. Furthermore, the European Investment Advisory Hub (EIAH) and the financial instruments advisory service Fi-Compass provide advice, practical know-how and learning tools.

National funding sources

Each Member State operates and co-finances multiple supporting programmes based on the ESIF funding. Many countries offer additional support options from the national budget; these options often include grants or low-interest rate loans and are channelled through national environmental funds, national development banks or other intermediaries. In some countries, such as Germany, national public funding far exceeds support from the EU funds. Sub-national governments often have regional support programmes. Later sections of this report provide further details on national funding options available in specific countries.

Financial intermediaries

Financial intermediaries play a crucial role in providing finance for energy efficiency investments. As energy efficiency objectives are high on the EU and national agendas, many commercial banks have dedicated credit lines or other financial products to finance energy efficiency measures—including street lighting—implemented by municipalities or the private sector. More often, local financial institutions channel and co-finance resources from national and development banks (such as EIB, EBRD or EEEF), which enable these entities to offer finances at a lower cost. In some countries, such as Hungary, where allocation for street lighting from national or EU funds is limited, low-cost credit lines represent the main funding source for municipalities.

Private sector

Finally, multiple private sources can be utilised for lighting projects. First, energy service companies and contractors that provide upgrades can finance the upfront investment costs, e.g., through energy performance contracting. In energy performance contracts, municipalities repay the upgrade costs over time through energy savings. Second, in countries with utility obligation schemes in place, utilities finance energy efficiency measures in the end-use sector, including for street lighting. Finally, municipalities can raise finances through crowdfunding and engage with institutional investors. The details of financing models for street lighting upgrades involving private sources are discussed in detail in a parallel project deliverable, ‘Financing models for energy-efficient street lighting: Best practice guide’.¹

¹ Novikova, A., Stelmakh, K., Hessling, M., Emmrich, J., and Stamo, I. 2017. Guideline on finding a suitable financing model for public lighting investment: Deliverable D.T2.3.3 Best practice guide. Berlin: University of Greifswald, IKEM, SWARCO.



1. EU funds and assistance

We have identified multiple funding and assistance resources available at EU level. Figure 2: Financial support and technical and advisory assistance available from EU funds and institutions for upgrading the energy efficiency of street lighting summarises three main support streams available through EU funding and institutions: European Structural and Investment Funds, instruments of financial institutions, and dedicated technical assistance and advisory programmes funded by the European Commission. Support may be provided in the form of equity, grants, loans, guarantees or technical assistance and advisory services for project development. The following sections provide further detail on each of these sources.

Figure 2: Financial support and technical and advisory assistance available from EU funds and institutions for upgrading the energy efficiency of street lighting

European Structural and Investment Funds (ESIF)	European banks and funds	Technical assistance in project development
European Regional Development Fund (ERDF)	European Investment Bank (EIB)	European Local Energy Assistance (ELENA)
Cohesion Fund (CF)	European Fund for Strategic Investments (EFSI)	Horizon 2020 (Call EE22)
ESIF Financial Instruments	Private Finance for Energy Efficiency (PF4EE)	Joint Assistance to Support Projects in European Regions (JASPERS)
	European Energy Efficiency Fund	European Investment Advisory Hub (EIAH)
	European Bank for Reconstruction and Development	Fi-Compass

Source: Adapted from 'Covenant of Mayors for Climate & Energy 2016'

1.1. European Structural and Investment Funds (ESIF)

Regional policy is the main investment policy that supports job creation, economic growth, competitiveness, sustainable development and citizen's quality of life in all countries, regions and cities of the European Union (EC 2014a). Support is delivered through European Structural and Investment Funds (ESIFs), which provide resources based on the partnership agreements between the European Commission and each Member State.

ESIF resources are delivered through operational programmes, which the European Commission negotiates with Member States and regional authorities and which set strategic goals and investment priorities by country or region. The operational programmes are managed by national- or regional-level authorities in partnership with the European Commission.

Two of the ESI funds, the European Regional Development Fund (ERDF) and the Cohesion Fund (CF), provide support for energy efficiency, among other target areas. In the past, particularly high ESIF investments, co-financed by state funds, were used for energy efficiency in the public sector (including street lighting) in new EU Member States, including Hungary, Poland, Romania, Estonia (Czako 2013).

ESIFs are expected to provide a total of EUR 40 billion to support low-carbon economy between 2014 and 2020 (European Parliament 2016c). Table 1 presents the budget for the second EU budget period 2014-2020 allocated for INTERREG Central Europe partner countries.



Table 1: Budget allocation from the ERDF and the CF for the INTERREG Central Europe partner countries in 2014-2020, EUR billion

Country	ERDF			CF		
	EU	National co-financing	Total	EU	National co-financing	Total
Austria	0.5	1.5	2	–	–	–
Croatia	4.3	0.7	5	2.6	0.4	3
Czech Republic	11.9	5.2	17.1	6.2	1.1	7.3
Germany	10.8	6.9	17.7	–	–	–
Hungary	10.7	1.8	12.6	6	1	7
Italy	20.6	11.9	32.6	–	–	–
Poland	40.2	7.2	47.5	23.2	4	27.3
Slovakia	7.3	2.9	10.2	4.1	0.8	5
Slovenia	1.4	0.4	1.8	0.8	0.2	1

Source: Prepared based on information on the ESIF website (EC 2017c).

Note: The CF provides funding to Member States in which the gross national income (GNI) is lower than 90% of the EU average. This is why Austria, Germany and Italy are not covered by the CF.

In the next sections, we will review the various ESIF that offer support for upgrading the energy efficiency of street lighting.



1.1.1. European Regional Development Fund (ERDF)

Objectives:	To promote economic and social cohesion by reducing disparities between regions.
Financial instruments:	<ul style="list-style-type: none"> • Equity • Grants covering up to 75% of eligible costs (no minimum project size) • Grants through the European Territorial Cooperation Programmes INTERREG (see section 0 for details) • Low-interest loans • Guarantees • Microcredit <p>Specific financial instruments and amounts are listed in the operational programmes of each Member State. Financial instruments may also be offered in combination with other forms of assistance.</p>
Activities covered:	<ul style="list-style-type: none"> • Promoting business investment in research & innovation • Extending broadband deployment and the roll-out of high-speed networks and developing ICT products, services and e-commerce • Supporting the capacity of SMEs to grow and engage in innovation processes, including through the development of new business models • Promoting the production and distribution of renewable energy and energy efficiency and renewable energy in enterprises, public infrastructure and housing • Investing in adaptation to climate change • Investing in the waste and water sectors • Improving the urban environment, including regeneration of brownfield sites • Supporting the industrial transition towards a low-carbon economy • Supporting multimodal and environmentally-friendly transport and regional mobility <p>Specific activities are listed in operational programmes of each Member State.</p>
Beneficiaries:	<p>EU-28: Public bodies, local, regional, and national authorities, social, cultural and educational institutions, companies, small and medium-sized enterprises, associations, non-governmental organisations.</p> <p>Foreign firms based in the region covered by a relevant operational programme also may apply, provided they meet European public procurement rules.</p>
Timeline:	2014-2020
More info:	http://ec.europa.eu/regional_policy/en/funding/erdf/

Background

The ERDF aims to strengthen economic and social cohesion in the EU by mitigating imbalances between its regions. The ERDF funding priorities are linked to the Europe 2020 strategy for smart, sustainable and inclusive growth; one of these priorities is the promotion of a low-carbon economy (Lecarte and European Parliament 2016). Each region must allocate a minimum percentage of ERDF resources to the development of a low-carbon economy. For more developed regions, this minimum percentage is 20%; for transition regions, it is 15%; and for less developed regions, it is 12% (European Parliament 2016b). The ERDF provides support for sustainable urban development; a minimum of 5% of the ERDF allocated by each Member State is to be dedicated to this area (EC 2014a). The exact details of the allocation and use of the ERDF funds in each Member State are defined in ‘Partnership Agreements’.



How to apply to the EDRF:

- Find ERDF Operational Programmes available in your country:
http://ec.europa.eu/regional_policy/en/atlas/programmes/
- Find your country's managing authority, which will evaluate your proposal:
http://ec.europa.eu/regional_policy/en/atlas/managing-authorities/
- If you are a small business, you may consult the Enterprise Europe Network, which provides expert advice on accessing EU public funds and grants.

Further information and readings on the EDRF

- [Ongoing ERDF projects](#)
- [Past ERDF projects](#)



1.1.2. Cohesion Fund (CF)

Objectives:	To alleviate social and economic disparities in countries with lower gross national income.
Financial instruments:	<ul style="list-style-type: none"> • Loans • Guarantees • Equity <p>These financial instruments also may be offered in combination with technical support, interest rate subsidies or guarantee fee subsidies. Funding can cover to 85% of eligible costs (European Parliament 2016a).</p>
Activities covered:	<ul style="list-style-type: none"> • Trans-European transport networks, infrastructure projects under the Connecting Europe Facility • Environment: projects related to energy or transport that clearly benefit the environment in terms of energy efficiency, use of renewable energy, rail transport development, supporting intermodality, strengthening public transport, etc. • Promoting the production, distribution and use of energy derived from renewable sources • Supporting energy efficiency and smart energy management • Investing in the waste sector and water sector • Improving the urban environment
Beneficiaries:	Local and regional authorities
Timeline:	2014-2020
More info:	http://ec.europa.eu/regional_policy/en/funding/cohesion-fund/

Background

The CF provides funding for environmental and trans-European network projects in order to strengthen EU economic, social and territorial cohesion. Countries eligible to apply for CF funding are Member States whose gross national income (GNI) is lower than 90% of the EU average. Within the 2014-2020 European budget period, these Member States include Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. The CF budget is EUR 63.4 billion. The CF may allocate funds for projects promoting sustainable development, including energy efficiency and renewable energy (EC 2015).

How to apply to the CF:

- Find CR Operational Programmes available in your country:
http://ec.europa.eu/regional_policy/en/atlas/programmes/
- Find your country's managing authority, which will evaluate your proposal:
http://ec.europa.eu/regional_policy/en/atlas/managing-authorities/
- If you are a small business, you may consult the [Enterprise Europe Network](#), which provides expert advice on accessing EU public funds and grants.

Further information and readings on the CF

- [Ongoing CF projects](#)
- [Past CF projects](#)



1.1.3. ESIF financial instruments (FI) - technical assistance for ESIF use (formerly JESSICA)

Objectives:	To enhance the efficient use of EU funds.
Financial instruments:	Grants for technical assistance to cover up to 90% of eligible costs for necessary preparation of investment projects.
Activities covered:	<ul style="list-style-type: none"> • A technical assistance platform for financial instruments • Bilateral ex-ante assessments and advisory activities • Blending activities • Fund management activities
Beneficiaries:	Public authorities
Timeline:	2014-2020
More info:	http://www.eib.europa.eu/products/blending/esif/index.htm http://ec.europa.eu/regional_policy/en/information/legislation/guidance/

Background

ESIF financial instruments (FIs) are the current successors of the Joint European Support for Sustainable Investment in City Areas (JESSICA) initiative. JESSICA was a 2007-2013 framework programme designed to accelerate investment in urban development. ESIF FIs are intended to decrease grant dependency and improve the efficiency of ESIF use. The FIs transform ESIF grants into other financial products (loans, guarantees, equity or risk-bearing instruments) or combine these grants with other financial instruments and technical assistance (EC 2014b) to help mobilise additional private investment—for instance, in order to create public-private partnerships. ESIF FIs also support the design of investment projects based on the use of new or existing revolving instruments within the Member States.

The DG REGIO, the European Investment Bank (EIB), and Council of Europe Development Bank (CEB) implement ESIFs at EU level. At the national level, the dedicated national managing authorities (MAs) implement ESIF FIs and allocate the relevant resources. The EIB Group provides MAs with an in-depth, ex-ante assessment methodology for FIs. MAs may choose from among national, regional, cross-border, transnational and EU-level FIs and implement them through an entrusted intermediary (EC 2014b, 2016c).

In the current 2014-2020 programming period, ESIF FIs play a greater role, representing around 5% of total ERDF resources. Eligible projects must advance EU policy priorities. FIs now support eleven key priorities, or thematic objectives: research and innovation, information and communication technologies (ICT), small and medium enterprise (SME) competitiveness, low-carbon economy, adaptation and risk management, environment and resource efficiency, sustainable transport and network bottlenecks, employment and labour mobility, social inclusion and poverty, education, and institutional capacity (EIB 2017d, 2017f).

How to apply

- Find and contact the responsible managing authority in your country: http://ec.europa.eu/regional_policy/en/atlas/managing-authorities/

Further information and readings:

- [Past projects supported by ESIF FIs](#)



1.1.4. INTERREG Central Europe

Objectives:	To strengthen regional development capacity in Central Europe.
Financial instruments:	Grants (covering up to 85% of eligible project costs). There is no minimum project size.
Activities covered:	Transnational partnerships in innovation, carbon dioxide reduction, transport & mobility, protection of natural and cultural resources.
Beneficiaries:	Public authorities, regional development and innovation agencies, enterprises, chambers of commerce and associations, financial institutions, energy supplies and management institutions, education and training organisations, NGOs.
Timeline:	2014-2020 (current call: September 2017)
More info:	http://www.interreg-central.eu/Content.Node/apply/home.html

Background

The European Territorial Cooperation Programme (INTERREG) Central Europe is a European funding programme which aims to foster transnational cooperation in the areas of innovation, low-carbon development, transport, and environment & culture in Central Europe. The programme operates in countries including Austria, Croatia, Czech Republic, Germany, Hungary, Italy, Poland, Slovakia and Slovenia. The programme aims to support the evolution of cities and regions in these countries. INTERREG is financed through the ERDF, with EUR 246 million allocated during the second EU budget period 2014-2020; as of June 2017, 130 projects have already been funded. For the proposal, it is important that the cooperation consists of at least three financing partners from at least three countries (Interreg Central Europe 2017).

How to apply:

- Register and send your application through the online platform at: <https://ems.interreg-central.eu/app/main?execution=e1s1>
- Check and submit documents at: <http://www.interreg-central.eu/Content.Node/apply/documents.html>

Further information and readings:

- [Ongoing projects supported by INTERREG Central Europe](#)
- [Past projects by INTERREG Central Europe](#)
- [INTERREG Europe Programme Manual 2016 \(version 4\)](#)



1.2. European banks and funds

1.2.1. European Investment Bank (EIB)

Objectives:	To support EU policy goals in Europe and beyond.
Financial instruments:	<ul style="list-style-type: none"> • Loans • Municipal framework loans (to provide financial support for multiple projects in a municipality) • Guarantees • Microfinance • Equity investment • Administrative and project management support <p>Funding available for up to 50% of eligible costs.</p>
Activities:	<p>EIB provides funding and expertise for sustainable investment projects that contribute to EU policy objectives in the following areas:</p> <ul style="list-style-type: none"> • Innovation and skills • Access to finance for smaller businesses • Environment and climate • Infrastructure
Beneficiaries:	<p>Public authorities for the mobilisation of investments and implementation of their sustainable energy action plans (SEAPs).</p> <p>Public and private project promoters, including municipalities, regions, public/private infrastructure or transport operators, energy service companies, retail chains, estate managers, small and medium enterprises, and industry for the development and launch of substantial, investible (bankable) projects and programmes that can achieve and even surpass the objectives of EU energy policy.</p>
More info:	http://www.eib.org/projects/cycle/applying_loan/index.htm

Background

The EIB is the Bank of the European Union, which represents the interests of the Member States and implements EU policies. In order to achieve EU targets, the EIB borrows, lends multilaterally and provides guidance on questions regarding potential combinations of financing sources, and provides administrative and project management

EIB defines four priority areas, where only projects with sustainable contribution will be supported. One of the priority fields is environment and climate, where the Bank finances up to 50% of eligible costs for projects which fulfil strict requirements (EIB 2017b). For projects under EUR 25 million, funding is provided by financial intermediaries, to which the EIB outsources this task through credit lines. For projects above this threshold, the EIB itself provides the resources.

What could be particularly interesting for municipalities is that the EIB offers loans that provide funds for multiple projects within one common framework. These loans are used to finance subprojects within a municipality's investment programme if that investment programme requires long-term funding but may undergo changes over time. A typical individual project size is EUR 1-50 million over 3-5 years. The total size of the investment programme financed is usually over EUR 100 million. Examples of such projects are roads, public transport, public parks, green space, energy efficiency initiatives, and others (EC 2017f).



The project selection procedure for awarding municipal framework loans depends on the project size. Projects under EUR 25 million are selected by the borrower in line with EIB eligibility requirements under the finance contract, and the EIB confirms the selection and allocation of the projects to the loan after disbursement (EIB ex-post confirmation). Projects over EUR 25 million must be approved by the EIB before EIB funds can be used to finance them (EIB ex-ante confirmation).

Together with the European Commission, EU Member States and candidate countries, the EIB also operates the European PPP Expertise Centre (EPEC), which assists public sector actors in starting and operating Public-Private Partnerships (PPP). The municipalities that are members of EPEC exchange knowledge, experience, and best practices on the implementation of PPPs, including PPP street lighting projects. For more information, please consult <http://www.eib.org/epec/> and/or contact epec@eib.org.

How to apply

- Eligible projects must contribute to EU economic policy objectives. For further information regarding policy objectives, please see the web pages specifying the related priorities: <http://www.eib.org/projects/priorities/index.htm>
- For projects under EUR 25 million, please contact a financial intermediary in your country. The list of financial intermediaries is available at <http://www.eib.org/products/lending/intermediated/list/index.htm>
- For projects above EUR 25 million, please confirm mutual interest by contacting the EIB at http://www.eib.org/projects/cycle/applying_loan/index.htm or by email to EIB Infodesk at info@eib.org
- Once the confirmation is obtained, please submit the project application documentation as described at <http://www.eib.org/infocentre/publications/all/application-document-for-an-eib-loan.htm>

Further information and readings:

- [Past and ongoing projects](#)
- [Factsheet on the EIB framework loans](#)
- [Factsheet on street lighting from the European Public-Private Partnership Expertise Centre \(EPEC\)](#)



1.2.2. European Bank for Reconstruction and Development (EBRD)

Objectives:	To develop a sound investment and promote environmentally and socially sustainable development.
Financial instruments:	<ul style="list-style-type: none"> • Loans of EUR 5 - 250 million • Equity investments of EUR 2 - 100 million • Guarantees to promote trade
Activities:	<ul style="list-style-type: none"> • Policy Reform Dialogue services • Advisory services (under the Small Business Initiative) • Investments for promotion of modern market economy
Beneficiaries:	Public and private project promoters, including municipalities, regions, public/private infrastructure or transport operators, energy service companies, retail chains, estate managers, small and medium enterprises, and industry for the development and launch of substantial, investible (bankable) projects and programmes that can achieve and even surpass the objectives of EU energy policy.
More info:	http://www.ebrd.com/municipal-and-environmental-infrastructure.html

Background

The European Bank for Reconstruction and Development (EBRD) is a multilateral International Financial Institution (IFI) that provides financing, policy reform dialogue and advisory services to its clients. The EBRD's mandate is to promote modern market economies in 36 countries from Central Europe to Central Asia and the Southern and Eastern Mediterranean. Although the Bank focusses more on private sector funding (EBRD n.d.), municipal infrastructure is an important pillar of its portfolio. The EBRD aims to invest at least 40% of its finances in Green Economy Transition projects by 2020, up from its current level of 33% (Tanaka 2017).

EBRD financing for private sector projects generally ranges from USD 5 million to 250 million, in the form of loans or equity. The average EBRD investment is USD 25 million. Smaller projects may be financed through financial intermediaries or through special programmes for smaller direct investments in less advanced countries.

The overriding goal is sustainable provision of essential services, which include public lighting. EBRD puts special emphasis on sustainable environmental improvement of municipal infrastructure through market-based approaches and instruments (EBRD n.d.). Since late April 2017, EBRD has provided financing under the Street Lighting Framework for Central and South-East Europe for energy-efficient public lighting investments, such as street lighting and traffic lights. The budget allocated to the framework is EUR 140 million (EBRD 2017), which is provided through a number of finance products.

How to apply:

- Check the [list of countries](#) where the EBRD operates
- Use the eligibility checker to find out whether your project is eligible or not: <http://www.ebrd.com/work-with-us/project-finance/funding-adviser.html>
- The project concept will be reviewed by the Operations Committee and then by the Board of Directors
- For assistance, potential applicants for street lighting projects may contact [Mr. Toivo Miller](#)

Further information and readings:

- [Projects overview](#)



1.2.3. European Fund for Strategic Investments (EFSI)

Objectives:	To decrease the current investment gap in the EU by mobilising private finance for strategic investment projects and to promote growth and job creation.
Financial instruments:	<p>The eligibility to apply for a specific financial instrument depends on the beneficiary. The following instruments are available:</p> <ul style="list-style-type: none"> • Grants • Loans • Guarantees • Equity • Venture capital
Activities covered:	<ul style="list-style-type: none"> • Strategic infrastructure, including digital, transport and energy • Education, research, development and innovation • Expansion of renewable energy and resource efficiency • Access to finance for entities with up to 3,000 employees <p>EU cross-border projects are also eligible.</p>
Beneficiaries:	<ul style="list-style-type: none"> • Private sector entities - large corporations, special purpose vehicles or mid-cap companies and SMEs • Public sector entities - local authorities, public sector companies or other government-related entities • Banks, national promotional banks or other financial institutions • Funds and any other form of collective investment vehicles • Investment platforms.
More info:	<p>http://www.eib.org/efsi</p> <p>http://www.eib.org/attachments/press/investment_plan_for_europe_qa_en.pdf</p>

Background

The European Fund for Strategic Investments (EFSI) aims to facilitate investment in public- and private-sector projects and to provide improved access to finance for entities with up to 3,000 employees. The EFSI represents one of the core tools for accomplishing the goals of the Investment Plan for Europe, also known as the Juncker Plan, which was designed to overcome the current investment gap in the EU. The EFSI, which was launched by the European Commission (EC) and the European Investment Bank (EIB) Group, is managed by the EIB. EFSI operations are financed by a EUR 16 billion guarantee from the EU budget, along with EUR 5 billion contributed from the EIB's own capital (EIB 2015).

The EFSI extends the capacity of the EIB Group to provide financing for eligible projects and focuses particularly on projects with a risk profile higher than that of the projects generally accepted by the EIB. EFSI supports projects in a wide range of eligible sectors, and as a market-driven instrument, it has no sectoral or geographical target or quotas. By the end of 2016, the EIB Group had approved a total of EUR 30.2 billion under EFSI, which is expected to support a total investment volume of EUR 163.9 billion, covering projects in all Member States. Due to the success of EFSI, in September 2016, the EC proposed extending the operating period to 2020 with the aim of mobilising EUR 500 billion in additional investments (EC 2016c).



How to apply:

- Submit your request for financing to the EIB or to an EIF partner institution in your country at:
http://www.eib.org/projects/cycle/applying_loan/index.htm
- Each project will undergo the EIB due diligence process and be assessed by the EFSI Investment Committee
- Please contact EFSSecretariat@eib.org or info@eib.org with any questions

Further information and readings:

- [Ongoing projects](#)
- [How to apply for EFSI financing](#)
- [Investment Plan for Europe or Juncker Plan](#)



1.2.4. Private Finance for Energy Efficiency (PF4EE) instrument

Objectives:	To provide access to affordable debt financing in the area of energy efficiency
Financial instruments:	<ul style="list-style-type: none"> • Loans (EIB Loans for Energy Efficiency) • A portfolio-based credit risk protection (PF4EE Risk Sharing Facility) • Expert support services for financial intermediaries to support the implementation of the PF4EE Instrument (PF4EE Expert Support Facility)
Activities covered:	<ul style="list-style-type: none"> • Activities to implement the National Energy Efficiency Action Plans (NEEAPs) of EU Member States or other programmes in line with EU Directives relating to energy efficiency
Beneficiaries:	Public sector and private sector financial institutions
Timeline:	2014-2017 (next deadline is the 30 th of June)
More info:	http://www.eib.org/products/blending/pf4ee/index.htm

Background

The Private Finance for Energy Efficiency instrument (PF4EE) aims to facilitate the market of energy efficiency lending in the EU Member States and thus to increase the availability of debt financing for energy efficiency. The PF4EE was designed to assist EU Member States with the implementation of measures outlined in their National Energy Efficiency Action Plans (NEEAP) and other energy efficiency EU acquis. The PF4EE is financed by the EU LIFE Programme, which has allocated approximately EUR 80 million, and by the EIB, which has committed EUR 480 million for long-term financing (EC 2017g, 4). The instrument is managed by the EIB.

The EIB energy efficiency loans will be provided by the PF4EE for up to 20 years and at competitive rates, covering up to 75% of the capital costs. The EIB loans themselves can range from EUR 40,000 up to EUR 5 million (EIB 2017e, 4). Applicants are selected on the basis of quality and impact criteria, such as their experience in energy efficiency financing; their capacity to reach targets, manage risks and report requirements; the quality and plausibility of proposals; and a commitment to the goals set and a strategy for using the PF4EE instrument to accomplish them.

How to apply

- Financial institutions that function as one legal entity may submit a joint application.
- Express preliminary interest, ask questions and apply at: PF4EE_Instrument@eib.org

Further information and readings:

- [Request for proposals to become a financial intermediary under the PF4EE](#)



1.2.5. European Energy Efficiency Fund (eeef)

Objectives:	To foster 20-20-20 goals ² , promoting a sustainable energy market and climate protection.
Financial instruments:	<p>The next financial instruments are provided for direct investments and/or investment in financial institutions:</p> <ul style="list-style-type: none"> • Senior debt • Subordinated debt • Guarantees • Mezzanine instruments • Leasing structures • Forfeiting loans
Activities covered:	<ul style="list-style-type: none"> • Public and private buildings incorporating renewable energy and/or energy efficiency solutions, including those based on the usage of information and communications technologies (ICT) • Investments in highly energy-efficient combined heat and power (CHP), including micro-cogeneration, and district heating/cooling networks, in particular from renewable energy sources • Local infrastructure, including efficient lighting of outdoor public infrastructure such as street and traffic lighting, electricity storage solutions, smart metering, and smart grids that make full use of ICT • Energy efficiency and renewable energy technologies that have innovative and economic potential and have the best available operating procedures
Beneficiaries:	Municipal, local and regional authorities, as well as public and private entities acting on behalf of those authorities, such as utilities, public transportation providers, social housing associations, energy service companies, etc.
More info:	http://www.eeef.lu/Application-eeef-financing.html

Background

The European Energy Efficiency Fund (eeef) aims to support EU goals to promote a sustainable energy market and climate protection. Its objective is to contribute to the mitigation of climate change while also achieving economic sustainability and attracting additional private and public capital into financing climate initiatives (European Energy Efficiency Fund 2017d). The eeef provides direct project investment and investment in financial institutions.

The eeef provides direct investments to project developers, energy services companies (ESCOs) and small scale energy service providers for projects that promote energy efficiency and renewable energy. Direct investments can range from EUR 5 to 25 million. The eeef also offers a range of investment instruments, such as senior debt, mezzanine instruments, leasing structures and forfeiting loans. Equity (co-)investments or equity participation in special purpose vehicles is also possible and may be offered for the whole project lifetime in direct cooperation with municipalities. The fund can also act as part of a consortium and cooperate with a local bank.

² The EU's 2020 energy goals are to have a 20% (or even 30%) reduction in CO₂ emissions compared to 1990 levels, 20% of renewable energy in the EU's energy mix and a 20% increase in energy efficiency.



The investments in financial institutions include those into commercial banks, leasing companies and other financial institutions that ultimately disburse finances to the target group of the fund for energy efficiency and climate related actions. The investment instruments provided by the eeef to financial institutions include senior debt, subordinated debt and guarantees.

One of the central investment categories is municipal infrastructure, which includes street and traffic lighting as well as electricity storage solutions (European Energy Efficiency Fund 2017c). Municipalities may submit inquiries or project proposals online at the Fund's website to an investment manager for an eligibility check. The investment manager will assess whether the project meets the funding requirements and provide feedback within two weeks after the submission of one or even several projects (European Energy Efficiency Fund 2017a).

It is also possible to apply for technical assistance, which provides support in feasibility studies, energy audits, legal issues, and assessments of the economic viability of investments. This assistance is intended to help beneficiaries implement projects more successfully (European Energy Efficiency Fund 2017b).

How to apply:

- Find out whether your project is eligible: <http://www.eeef.lu/eligibility-check.html>
- Contact investments@eeef.eu or technical_assistance@eeef.eu for technical assistance (eeef is always open for TA project proposals: no deadline)

Further information and readings:

- [Current investments](#)



1.3. Technical assistance in project development

1.3.1. European Local Energy Assistance (ELENA)

Objectives:	To strengthen the technical expertise and organisational capacity of beneficiaries.
Financial instruments:	Grants to cover up to 90% of technical assistance or/and project development costs for projects of at least EUR 30 million.
Activities covered:	<p>The facility provides funds for technical assistance in developing and implementing an investment programme in the following areas:</p> <ul style="list-style-type: none"> • Energy efficiency improvements in public and private buildings, including social housing and street and traffic lighting • Integration of renewable energy sources (RES) into the built environment • Investments into renovating, extending or building new district heating/cooling networks • Urban transport to support increased energy efficiency and integration of renewable energy sources • Local infrastructure, including smart grids, ICT infrastructure for energy efficiency, energy-efficient urban equipment, inter-modal transport facilities and infrastructure for alternative fuel vehicles <p>The facility focusses on large investment projects of at least EUR 30 million.</p>
Beneficiaries:	<p>Public and private project promoters, including municipalities, regions, public/private infrastructure or transport operators, energy service companies, retail chains, estate managers, small and medium enterprises, and industry for the development and launch of substantial, investible (bankable) projects and programmes that can achieve and even surpass the objectives of EU energy policy.</p> <p>In particular, public authorities for the mobilisation of investments and implementation of their sustainable energy action plans (SEAPs).</p>
Timeline:	As of January 2017, funds were available. When funds are exhausted, a notice will be posted on the ELENA webpage.
More info:	http://www.eib.org/products/advising/elena/index.htm

Background

The European Local Energy Assistance (ELENA) was established in 2009 by the European Commission (EC) and the European Investment Bank (EIB) in order to mobilise investments for sustainable energy projects at local level. At present, ELENA is funded by the Horizon 2020 Programme of the EC. The indicative budget for 2017 is EUR 30 million (EC 2016b). Energy efficiency in street lighting is one of ELENA's focus areas (EIB 2016a).

ELENA enhances the capacity of local authorities to develop investment programmes and implement economically feasible projects by providing the funding to prepare these projects and programmes for financing and implementation. ELENA usually supports projects of at least EUR 30 million for a two- to four-year period and covers up to 90% of technical assistance and/or project development costs (EIB 2017c).

The programmes and projects submitted will contribute towards the EU's 20-20-20 goals, distribution of best practices and/or implementation of new technologies with significant local impact. The projects and programmes themselves can be financed by various means (e.g., own equity, debt, EIB loans, national or EU



grants, third party capital, etc.), as long as there is evidence of implementation. ELENA funding can be used exclusively for technical assistance and/or project development costs and not as a direct investment into the programmes and projects themselves. The total cost of the investment programmes or projects to be realised should be at least 20 times the amount of the technical assistance provided (EIB n.d.). The ELENA support can be complemented by other national or EU grants, but it cannot be applied to investment programmes that could be funded by other instruments (EIB 2016a).

How to apply:

Contact ELENA staff directly by email at elena@eib.org. Attach the following to your email:

- A brief description of the applicant and the planned investment programme/project, e.g., the project/programme type, its schedule, investment costs, the implementation approach, etc.
- A brief description of the need for technical assistance and the amount requested for it.

The ELENA team will then follow up with further guidance on how to submit a formal application.

Further information and readings

- [Ongoing and completed projects](#)
- [ELENA FAQs](#)



1.3.2. Horizon 2020 (Call EE-22-2016-2017 Project Development Assistance)

Objectives:	Build the technical, economic and legal expertise that is needed to develop projects and stimulate concrete investments.
Financial instruments:	Grants covering 100% of eligible costs for project development assistance in the range of EUR 0.5 - 1.5 million. Submission of proposals requesting other amounts is allowed. The call focusses on small and medium-sized investment projects of EUR 7.5 - 50 million.
Activities covered:	<ul style="list-style-type: none"> • Sectors of existing public and private buildings • Street lighting • Retrofitting of existing district heating/cooling; energy efficiency in urban transport (such as transport fleets, the logistics chain, e-mobility, modal change and shift) in urban/sub-urban agglomerations and other densely populated areas and energy efficiency in industry and services
Beneficiaries:	Public authorities or their groupings, public/private infrastructure operators and bodies, energy service companies, retail chains, estate managers and services/industry
Timeline:	A few deadlines per year
More info:	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ee-22-2016-2017.html

Background

The Horizon 2020 Work Programme 2016-2017 allocated EUR 194 million for energy efficiency calls. Among them, the programme offers several opportunities for street lighting projects in Work Programme part 10, 'Secure, Clean and Efficient Energy', within the Energy Efficiency area. In particular, the sub-area 'Innovative Financing for Energy Efficiency Investments' issues a regular call EE-22-2016-2017: Project Development Assistance (PDA). The call aims to assist in introducing innovative projects to the market by helping minimise transaction costs and leverage private finance. Street lighting is among the focus sectors of the call. The call, like all other Horizon 2020 calls, is managed by the Executive Agency for Small and Medium Enterprises (EASME) of the EC, which has an overall budget of EUR 194 million (for 2016-2017) (EC 2017e).

The call invites consortia to submit proposals that demonstrate ambitious reduction of energy consumption and/or ambitious investment size. The proposals should provide innovative solutions in financing energy efficiency (e.g., on-bill financing schemes, guarantee funds or factoring funds) and/or in scaling up the funding (e.g., bundling, pooling or stakeholder engagement). In particular, proposals that demonstrate high replicability in other EU members are encouraged. The project consortia should consist of at least three legal entities from three different EU Member States or Associate Countries (EC 2016e).

How to apply:

- [Online guide outlining procedures: from proposal submission to managing your grant](#)

Further information and readings

- [European Commission. Horizon 2020 Work Programme 2016 - 2017. 10. 'Secure, Clean and Efficient Energy'. \(European Commission Decision C\(2016\)4614 of 25 July 2016\).](#)
- [Ongoing projects](#)



1.3.3. Joint Assistance to Support Projects in European Regions (JASPERS)

Objectives:	Improve the quality of investment allocated by ESIF.
Financial instruments:	Free-of-charge technical assistance in the form of project preparation and capacity-building support and quality review.
Activities covered:	All categories of projects assisted by ESIF (EC 2017d). The focus is on projects with total eligible cost of more than EUR 75 million (transport) and EUR 50 million (other sectors).
Beneficiaries:	Public authorities.
Timeline:	Since 2006
More info:	http://www.jaspers-europa-info.org/

Background:

The Joint Assistance to Support Projects in European Regions (JASPERS) is an EU regional development policy instrument set up between the EC, EIB and EBRD. JASPERS offers capacity-building support and independent consulting services to help prepare high-quality projects that will be supported by the ESIF. Public authorities are welcome to make use of such services, preferably for large-scale projects in specific areas defined by JASPERS (EC 2014d). The ‘Energy and Solid Waste’ area supports projects promoting energy efficiency measures and renewable energy development (JASPERS Europe n.d.).

Currently, JASPERS is in its 2014-2020 programming period. JASPERS identifies its first priority as major projects in nineteen EU Member States (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, France, Ireland, Italy, Greece, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia, Slovakia, Spain and the United Kingdom). Second-priority projects are any other projects eligible or potentially eligible for CF assistance. Other projects supported by or potentially eligible for ERDF assistance are the last priority.

As part of project preparation and capacity building, JASPERS offers the following free of charge: screening to assess project viability and suitability for EU grant funding; project development, from pre-feasibility and feasibility stages through the final grant application stage; horizontal tasks, such as the development of a suitable approach for multiple beneficiaries to tackle state aid or environmental requirements arising from EU requirements; strategic support; capacity building through the JASPERS Competence Centre; and implementation support. The JASPERS quality review includes an appraisal by independent experts.

The managing authorities of ESIF (see section 0) are contact points for applicants from individual EU Member States and serve as intermediaries during the project application process. They gather applications and request assistance from JASPERS.

How to apply:

- Identify the national authority in your country:
http://ec.europa.eu/regional_policy/en/atlas/managing-authorities/
- Managing Authorities can contact the JASPERS staff directly by [email](#)

Further information and readings:

- [Past and ongoing JASPERS projects](#)
- [Current statistics](#)
- [JASPERS Knowledge and Learning Centre](#)



1.3.4. European Investment Advisory Hub (EIAH)

Objectives:	To encourage investment in the environment by addressing the main financial and non-financial obstacles.
Financial instruments:	Free-of-charge advisory and technical assistance programmes and initiatives, including technical project support, project structuring, financial advice, capacity building and policy advice.
Activities covered:	The Hub supports projects that may be eligible for EIB financing (either under EFSI or otherwise), but is not limited to EIB-financed projects.
Beneficiaries:	Public and private sector; managing, procuring authorities; national promotional banks and institutions
More info:	http://www.eib.org/eiah/support/faq.htm http://www.eib.org/eiah/index.htm

Background

The European Investment Advisory Hub (EIAH), or ‘the Hub’, aims to strengthen support for project development and preparation with the ultimate aim to mobilise more private capital for EU strategic investment projects. The Hub is one of the key tools to achieve the goals of the Investment Plan for Europe, which aims to overcome the current investment gap in the EU. It builds on the expertise of the EC, the EIB Group, national promotional institutions and the ESIF managing authorities in Member States.

The Hub offers a single point of entry to advisory and technical assistance programmes and initiatives in the EU. It also provides a cooperation platform for partners and other beneficiaries to exchange expertise. Project promoters, public authorities and private companies can receive technical support to help get their projects off the ground, make them investment-ready, gain advice on suitable funding sources, and access a unique range of technical and financial expertise. The services can be provided throughout the whole project cycle. Policy guidance and financial advice are also among the services offered (EIB 2016c).

Municipalities and public and managing authorities (among others) may contact the Advisory Hub. In 2016, the energy field accounted for 17% of all project-specific requests—more than any other field (EC 2016a).

How to contact

- Fill out the contact form here: <http://www.eib.org/eiah/contact/index.htm>

Further information and readings:

- [Past projects](#)



1.3.5. Financial instruments advisory service (Fi-Compass)

Objectives:	To provide practical know-how and learning tools on ESIF FIs.
Financial instruments:	<ul style="list-style-type: none"> • Technical assistance
Activities covered:	The activities covered by the European Structural and Investment Funds (ESIF) and the Programme for Employment and Social Innovation (EaSI)
Beneficiaries:	ESIF managing authorities, EaSI microfinance providers, other stakeholders
More info:	https://www.fi-compass.eu/

Background

Fi-Compass is an advisory platform on ESIF FIs and microfinance under the Programme for Employment and Social Innovation (EaSI (EC 2017b)). It was created by the EC in partnership with the EIB to provide support for ESIF managing authorities and EaSI microfinance providers.

Fi-Compass offers a broad range of information, practical and learning tools to support its beneficiaries through a project cycle. These include, but are not limited to, manuals, factsheets, case study publications, practical tools, trainings, events and video.

Further information and readings:

- [Fi-Compass fact sheet](#)



2. National public financing sources

The next sections of this chapter describe national public funding for street lighting by country.

2.1. Austria

A comprehensive review of national funding sources for street lighting in Austria was provided by Streetlight-EPC project partners (Streetlight-EPC 2015). The review includes EU- and national-level funding sources.

Of the ESIF funds discussed in section 1.1, Austrian beneficiaries can receive financial support from ERDF and INTERREG Central Europe, as well as technical assistance on the use of ESIF FIs. From the ERDF budget, the support for energy efficiency upgrades of street lighting in Austria is possible through the operational programme ‘Investments in Growth and Employment’ (see section 0 for details on ERDF). Table 2 contains information on the budget and managing authority and provides a source to consult for further information on the programme.

Table 2: ESIF funding opportunities for energy efficiency upgrades of street lighting in Austria for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
Investments in Growth and Employment	ERDF: 536,262,079	Geschäftsstelle der Österreichischen Raumordnungskonferenz	http://www.oerok.gv.at/esi-fonds-at/efre/ziel-iwb-efre.html

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

Austrian beneficiaries can obtain financial support from all instruments of financial institutions listed in section 0. They also have access to technical assistance and advice from all sources reviewed in section 1.3 except for JASPERS.

Der Klima- und Energiefonds (Climate and Energy Fund). The Climate and Energy Fund can provide support for financing street lighting in municipalities under its programmes ‘Smart Cities Demo 9. AS’ and ‘Klima- und Energie-Modellregionen’. The programmes change from year to year and a full list, with details, is available on the Fund’s webpage.³ The individual programme pages contain detailed information and leaflets on topics, beneficiaries and conditions. Please click here for information on [Smart Cities demo 9. AS](#) and [Klima- und Energie- Modellregionen](#) (current information as of June 2017).

Energiesparen in Gemeinden (Energy Savings in Local Communities). Among other priority areas, the federal programme ‘Energy Savings in Local Communities’ provides grants to municipalities for energy-saving measures for street and outdoor lighting. The minimum number of lighting points to be covered by an applicant is 20. As of June 2017, the programme covered up to 30% of eligible costs and was contingent on obtaining regional co-financing for 12% of eligible costs. For details, please see the programme information sheet [here](#).

³ More information is available at <https://www.klimafonds.gv.at/foerderungen/aktuelle-foerderungen/>.



Energiesparen in Betrieben (Energy Savings in Industry and Commerce). The parallel federal programme ‘Energiesparen in Betrieben’ provides grants to municipal enterprises for the same measures and with similar conditions. For details, please see the programme information sheet [here](#).

‘Energie-Contracting-Programme’ of Upper Austria. The programme provides grants to municipalities to support implementation of energy performance contracting. The maximum project length is 10 years; requested support can be between EUR 50,000 and 250,000 (Streetlight-EPC 2015).

The regional programmes to support energy savings exist in all regions of Austria. Comprehensive programme descriptions (including application criteria, conditions and contacts) is available in the publication ‘Support for environmental and energy consulting: Examples of successful joint federal/regional consulting programmes’ [[Förderungen für Umwelt-und Energieberatungen Erfolgsbeispiele aus den gemeinsamen Beratungsprogrammen von Bund und Ländern](#)].

Each region offers information and advisory services for their municipalities and municipal enterprises. The list of advisory offices by region is provided [here](#).

Further information and readings

- Information on public programmes for the environment is available on the website of the service provider for the federal public programmes, Kommunalcredit Public Consulting, at <https://www.umweltfoerderung.at/>
- Der Klima- und Energiefonds webpage at <https://www.klimafonds.gv.at/>



2.2. Croatia

EU funds. As will be discussed in section 1.1, Croatian beneficiaries can obtain financial support from the ERDF, CF and INTERREG Central Europe and are eligible to receive technical assistance through ESIF financial instruments on how to use these funds.

From the ERDF and CF budget (see section 0 for details on the ERDF and section 0), the most prominent programme supporting energy efficiency is the operational programme ‘Competitiveness and Cohesion 2014-2020’. Table 2 contains information on the budget and managing authority and provides a source to consult for further information on the programme.

Table 3: ESIF funding opportunities for energy efficiency upgrades of street lighting in Croatia for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
Competitiveness and Cohesion OP	CF: 2,559,545,971 ERDF: 4,321,499,588	Ministry of Regional Development and EU Funds	http://www.strukturfondovi.hr

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

The ‘Competitiveness and Cohesion’ programme reserved EUR 20 million for the priority axis 4.c.4, ‘Increasing the efficiency of public lighting’, until 2020. Based on this axis, in 2017, Croatia started developing a programme for the energy renewal of public lighting. The programme aims to introduce innovative financing mechanisms for public lighting projects and to provide assistance for the implementation of models like energy performance contracting (EPC), in cooperation with energy service companies (ESCOs) and public-private partnerships (PPP) that provide grants and loans. Based on experience from nationally funded programs, measures addressing the public lighting system could achieve significant energy savings.

In the period 2014-2020, the Croatian Bank for Reconstruction and Development (HBOR) took over the role of creditor for EU projects that will be co-financed by ESIF. Private and public sector projects can receive loans under better lending conditions and at lower interest rates. HBOR credit funds are intended to support projects financially by covering part of the project co-financed by ESIF as well as project expenditures that are not eligible for ESIF coverage.

Furthermore, the Croatian Agency for SMEs, Innovation and Investments (HAMAG BICRO) has adapted its programmes to all groups of entrepreneurs by providing guarantees and loans to fund projects from ESIF. The agency provides financial support to innovative and technologically oriented companies in Croatia.

Regional Energy Efficiency Programme for the Western Balkans (REEP). The programme provides credit lines, direct financial and technical assistance to support investment by businesses and municipalities in energy efficiency and small-scale renewable energy projects. As of June 2017, EPC street lighting tenders prepared under REEP with a capex⁴ of EUR 4 million had been contracted and implemented in Croatia and were underway. EPC street lighting projects with a capex of EUR 12.9 million had been prepared and were in different stages of the procurement process. In April 2017 EBRD signed the first transaction with an ESCO that had also implemented one Croatian project. The financing was provided under EBRD’s street lighting financing framework for EUR 140 million (Reiserer 2017; Miller T. pers. com.).

⁴ Capital expenditure, or CapEx, are funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment [Investopedia at www.investopedia.com].



The Green for Growth Fund Southeast Europe (GGF). The GGF is a public-private partnership initiated by the European Investment Bank and KfW Development Bank. It provides financing to financial institutions in Croatia for energy efficiency purposes. GGF established a credit line and technical assistance that will deliver support for energy efficiency and renewable energy investments by municipalities and businesses. As of February 2016, the Fund had financed two projects in Croatia with a total volume of EUR 45 million (Green for Growth Fund 2016), which were unrelated to street lighting (Green for Growth Fund 2016).

The Environmental Protection and Energy Efficiency Fund (FZOEU). The Fund is the central point for collecting and investing extra budgetary resources in the programmes and projects for environmental and nature protection, energy efficiency and the use of renewable energy sources. The dedicated programmes of the fund to sustainable public lighting aim to improve energy efficiency using advanced technologies and practices; protect the environment restricting light pollution, CO₂ emissions, and the use of mercury lamps; as well as meeting the road lighting standard EN 13201. By the end of 2016, the Fund had supported 389 street lighting projects with a total value of more than EUR 43 million [HRK 326 million], thereof EUR 22 million [HRK 166 million] was provided by the Fund. The energy savings and CO₂ emission avoided per annum reached 41 GWh and 15,000 tCO₂ respectively (Tomić D. pers. comm.).



2.3. Czech Republic

EU funds. As stated in section 1.1, beneficiaries from the Czech Republic can obtain financial support from ERDF, CF and INTERREG Central Europe and are eligible to receive technical assistance through ESIF FIs.

Table 4 contains information on the budget and managing authority and provides a source to consult for further information on the funding from ERDF and CF. In particular, in line with the Czech Republic's Regional Development Strategy for 2014-2020 (Ministerstvo pro místní rozvoj ČR n.d.), the Ministry for Regional Development (MRD) established the Integrated Regional Operational Programme (IROP) 2014-20. The IROP includes a component on energy efficiency and smart energy management for public and residential multi-family buildings. The total budget allocated for the component is EUR 625.2 million [CZK 16.9 billion] (for all components including energy efficiency) (Ministry of Regional Development CZ 2015).

Table 4: ESIF funding opportunities for energy efficiency upgrades of street lighting in the Czech Republic for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
Integrated Regional Operational Programme	ERDF: 4,640,699,371	Ministry for Regional Development of the Czech Republic	http://www.mmr.cz/
Environment OP	CF: 2,315,531,476 ERDF: 394,824,020	Ministry of the Environment of the Czech Republic	http://www.mzp.cz/
Technical assistance	CF: 223,704,582	Ministry for Regional Development of the Czech Republic	http://www.mmr.cz/

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

The National Environmental Programme. Implemented by the Ministry of the Environment, the Programme announces calls for applications requesting support from the State Environmental Fund of the Czech Republic for innovative and demonstration projects with a positive impact on the environment. The purpose is to improve the environment through innovative and demonstration projects, which can be made standard practice after pilot verification. The maximum amount of total support per project is 75% of the total eligible costs. The next call for applications can be expected during the years 2017-2020.

Programme EFEKT. The Ministry of Industry and Trade implements Programme EFEKT, which supports measures by municipalities to reduce energy use for public lighting. The measures include replacing luminaires and optimising the lighting system (EC 2016d). For the period 2017-2021, the Programme provides funding of up to EUR 73,992 [2 million CZK], covering up to 50% of eligible project costs (Ministerstvo průmyslu a obchodu 2016). In 2014, EFEKT supported 131 projects. In order to receive funding from EFEKT, municipalities should have sufficient expertise on lighting technologies, make the project a high priority and complete an energy audit before application (EC 2013).



2.4. Germany

EU funds. As shown in section 1.1, Germany can obtain financial support from ERDF and INTERREG Central Europe and is eligible to receive technical assistance through ESIF FIs on how to use these funds. ERDF support for energy efficiency upgrades of street lighting in Germany is possible through the Operational Programmes shown in Table 5.

Table 5: ESIF funding opportunities for energy efficiency upgrades of street lighting in Germany for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
OP Baden-Württemberg	ERDF: 246,585,038	Ministerium für Ländlichen Raum und Verbraucherschutz Baden-Württemberg Referat 40 EFRE	http://www.efre-bw.de
OP Bayern	ERDF: 494,704,308	Bayerisches Staatsministerium für Wirtschaft und Medien, Energie und Technologie	http://www.efre-bayern.de/
OP Berlin	ERDF: 635,213,023	Senatsverwaltung für Wirtschaft, Technologie und Forschung, Referat IV C - Europäische Struktur fondsförderung	http://www.berlin.de/sen/wirtschaft/gruenden-und-foerdern/europaeische-struktur fondsfonds/
OP Brandenburg	ERDF: 845,643,228	Ministry of Economic Affairs and Energy of the State of Brandenburg	http://www.efre.brandenburg.de
OP Bremen	ERDF: 103,021,352	Der Senator für Wirtschaft, Arbeit und Häfen der Freien Hansestadt Bremen Referat Z3	http://www.wuh.bremen.de
OP Hamburg	ERDF: 55,472,740	Freie und Hansestadt Hamburg - Behörde für Wirtschaft, Verkehr und Innovation, EFRE-Verwaltungsbehörde, Referat WF 4	http://www.hamburg.de/efre
OP Hessen	ERDF: 240,723,366	EFRE - Verwaltungsbehörde Hessen - Ministerium für Wirtschaft, Energie, Verkehr und Landesentwicklung	http://www.efre.hessen.de
OP Mecklenburg-Vorpommern	ERDF: 967,806,184	Ministerium für Wirtschaft, Bau und Tourismus Referat 350 EFRE-Fondsverwaltung/-steuerung	http://www.europa-mv.de/cms2/Europamv_prod/Europamv/de/eufoerderinstrumente/Europaeische_Fonds_in_Mecklenburg-Vorpommern/EFRE/index.jsp
OP Niedersachsen	ERDF: 690,789,930	Niedersächsische Staatskanzlei - Referat 403	http://www.stk.niedersachsen.de/star tseite/themen/regionale_landesentwicklung_und_eufoerderung/eufoerderung/eu-foerderung-in-niedersachsen-124135.html
OP Nordrhein-Westfalen	ERDF: 1,211,731,011	Ministerium für Wirtschaft, Energie, Industrie, Mittelstand und Handwerk des Landes Nordrhein-Westfalen	http://www.efre.nrw.de
OP Rheinland-Pfalz	ERDF: 186,025,744	Referat Europäische Strukturpolitik (EFRE, INTERREG A) Ministerium für Wirtschaft, Verkehr, Landwirtschaft und Weinbau RHEINLAND-PFALZ	http://efre.rlp.de/



OP Saarland	ERDF: 143,289,081	EFRE-Verwaltungsbehörde Ministerium für Wirtschaft, Arbeit, Energie und Verkehr	http://www.wirtschaft.saarland.de
OP Sachsen	ERDF: 2,089,020,063	Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr - Referat 55 Verwaltungsbehörde Sachsen für den EFRE	http://www.strukturfonds.sachsen.de
OP Sachsen- Anhalt	ERDF: 1,427,495,230	Ministerium der Finanzen des Landes Sachsen-Anhalt, EU- Verwaltungsbehörde	http://www.europa.sachsen-anhalt.de
OP Schleswig- Holstein	ERDF: 271,244,600	Ministerium für Wirtschaft, Arbeit, Verkehr und Technologie des Landes Schleswig-Holstein Referat VII 21 Regional- und Strukturpolitik, EFRE, GRW, EU-Angelegenheiten	http://www.schleswig-holstein.de/DE/Fachinhalte/F/foerderprogramme/MWAVT/efre_inSH_2014_2020.html
OP Thüringen	ERDF: 1,165,077,915	Thüringer Ministerium für Wirtschaft, Wissenschaft und Digitale Gesellschaft - Referat 34 Verwaltungsbehörde und Bescheinigungsbehörde EFRE	http://www.efre20-thueringen.de/efre_2014/

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

KfW programmes. The programmes of the Kreditanstalt für Wiederaufbau (KfW) are the main funding source for municipalities, aside from budget funding. The bank offers concessional loan programmes for energy-efficient retrofit of municipal and social infrastructure, including energy efficiency improvements in street lighting. Municipalities or municipal enterprises can receive funding for street lighting through two main programmes, IKK [Investitionskredit Kommunen (208) (KfW 2016a)] and IKU [Investitionskredit Kommunale und Soziale Unternehmen (148) (KfW 2016b)].

The National Climate Initiative (NKI), implemented by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, also offers significant support to the municipalities. The initiative is a product of Germany's energy concept of 2010 (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety [BMU] and Federal Ministry of Economics and Technology [BMW] 2011), which called for a reduction of greenhouse gases by at least 40% by 2020, relative to the year 1990. In order to achieve this, an additional programme ('Aktionsprogramm Klimaschutz') was approved in 2014, including grants for investments for climate protection. This also includes investments into LED street lighting. The newest version of this programme provides grants of up to 20% of eligible costs if CO₂ emissions are reduced by at least 70%, or up to 25% if the emissions are reduced by at least 80% and a control system that adapts to daylight intensity is installed. If municipalities can prove that their financial situation does not allow them to finance the remaining part of the investment, then grants may be increased by up to 25% (for 70% emissions reduction) or 31% (80% reduction) (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit 2016).

Grants under this programme have been available for several years already, enabling many old luminaires with inefficient technology and lamps to be replaced with LED luminaires. These exchanges mainly involve luminaires with high pressure mercury (HPM) lamps, which have been banned by the EU due to their low efficiency but were used extensively in Germany. Applications for grants under the current programme must be submitted before 30th September 2017. It is not clear if a successor programme will be available after this date.



2.5. Hungary

European Bank for Reconstruction and Development (EBRD). EBRD opened a EUR 100 million credit line through financial institutions in Hungary, Slovakia and Romania for on-lending needs to municipal borrowers. The credit line is dedicated specifically to energy efficiency and renewable energy measures. Local banks are able to on-lend up to EUR 5 million of individual sub-loans to municipalities, ESCOs and municipal managing companies for municipal infrastructure as well as municipal and residential buildings. Each of these tools can be complemented by an advisory package, consisting of audits, project assessments, marketing support or trainings to help implement successful projects. (Miller T. pers. com.). More information is available at <http://ebrdgeff.com/> and <http://seff.ebrd.com/index.html>.

The International Finance Corporation (IFC). The Hungarian financial institution IFC offers flexible finance options, including credit lines and guarantees. For the financing of street lighting projects, IFC may also offer special financial enhancements, such as partial first loss coverage on portfolios and performance incentives (Szalkai and Sturm n.d.). For information, please contact Ms Eva Szalkai (evszalkai@ifc.org) and Russell Sturm (rsturm@ifc.org).



2.6. Italy

EU funds. As stated in section 1.1, Italian beneficiaries can obtain financial support from ERDF and INTERREG Central Europe and is eligible to receive technical assistance through ESIF FIs on how to use these funds. The ERDF has funded several regional street lighting projects in Italy and represents the biggest funding source, financing 100% of the costs for 70% of all public-sector projects (EC 2014c).

The ESIF budget for Italy has allocated EUR 22 billion for increasing regional energy efficiency in the 2014-2020 programming period, but focusses mainly on public buildings with energy performance contracting (EC 2014c). The development of projects addressing public illumination and renewable energy could also be financed under thematic objective 4, low-carbon economy of regional operational programmes, including those involving Energy Services Companies (ESCOs). Table 6 provides the list of national and regional operational programmes in Italy from which the support for energy efficiency upgrades of street lighting in Italy is possible.

Table 6: ESIF funding opportunities for energy efficiency upgrades of street lighting in Italy for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
National Operational Programme on Metropolitan Cities	ERDF: 445,723,942	Ufficio dell'Autorità di Gestione del PON Città Metropolitane - Direzione Generale per la Politica Regionale Unitaria Comunitaria	http://www.dps.gov.it/it/Agenzia/
ROP Abruzzo	ERDF: 115,754,890	Dipartimento della Presidenza e Rapporti con l'Europa - AdG por FESR e por FSE OdP par FSC	http://www.regione.abruzzo.it/portale/index.asp?modello=ServiziDPA&servizio=xList&stileDiv=monoLeft&template=intIndex&tom=DPA&b=dip arDPA2
ROP Basilicata	ERDF: 413,015,666	Dipartimento Programmazione e Finanze - Ufficio Autorità di gestione dei PO FESR Basilicata	http://www.pofesr.basilicata.it/fesr2014-2020
ROP PA Bolzano	ERDF: 68,310,599	Provincia autonoma di Bolzano - Ripartizione Europa, Ufficio per l'integrazione europea	http://www.provincia.bz.it/europa/it/
ROP Calabria	ERDF: 1,529,877,755	Regione Calabria	http://www.regione.calabria.it/index.php?option=com_frontpage&Itemid=1
ROP Campania	ERDF: 3,085,159,382	Regione Campania	http://www.regione.campania.it/it/utilita/programmazione-unitaria-regionale
ROP Emilia Romagna	ERDF: 240,947,636	Regione Emilia-Romagna	http://fesr.regione.emilia-romagna.it/
ROP Friuli Venezia Giulia	ERDF: 115,389,592	Regione Autonoma Friuli Venezia Giulia	http://www.regione.fvg.it/rafvfg/cms/RAVFG/fondi-europei-fvg-internazionale/por-fesr/FOGLIA128/
ROP Lazio	ERDF: 456,532,597	Regione Lazio - Assessorato Sviluppo Economico - Direzione Regionale per lo Sviluppo Economico e le Attività Produttive	http://www.porfesr.lazio.it

ROP Liguria	ERDF: 196,272,620	Regione Liguria - Dipartimento Sviluppo Economico - Settore Competitività e Innovazione del Sistema Produttivo	http://www.regione.liguria.it/argomenti/affari-e-fondi-europei.html
ROP Lombardia	ERDF: 485,237,258	Regione Lombardia - Programmazione comunitaria e coordinamento autorità di gestione	http://www.ue.regione.lombardia.it
ROP Marche	ERDF: 168,691,644	Regione Marche	http://www.europa.marche.it/
ROP Molise	ERDF: 52,950,497	Regione Molise	http://www3.regione.molise.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/8548
ROP Piemonte	ERDF: 482,922,370	Regione Piemonte - Direzione Attività Produttive	http://www.regione.piemonte.it/europa2020/
ROP Puglia	ERDF: 2,788,070,047	POR Puglia	http://fesr.regione.puglia.it/portal/pls/portal/
ROP Sardegna	ERDF: 465,489,541	Regione Sardegna - Centro Regionale di Programmazione - Assessorato della Programmazione, Bilancio, Credito e Assetto del Territorio	http://www.sardegnaprogrammazione.it
ROP Sicilia	ERDF: 3,418,431,018	Regione Sicilia - Dipartimento Programmazione Economica	http://pti.regione.sicilia.it/portal/page/portal/PIR_PORTALE/PIR_LaStrutturaRegionale/PIR_PresidenzadellaRegione/PIR_Programmazione
ROP Toscana	ERDF: 396,227,254	Regione Toscana - Direzione Generale della Giunta regionale Settore Autorità di Gestione Por Fesr	http://www.regione.toscana.it/porcreo-fesr-2014-2020
ROP PA Trento	ERDF: 54,334,047	Provincia Autonoma di Trento - Dipartimento Affari Istituzionali e Legislativi _ Dirigente del Servizio Europa	http://www.europa.provincia.tn.it/servizio_europa/
ROP Umbria	ERDF: 178,146,602	Regione Umbria- Servizio Programmazione Comunitaria	http://www.regione.umbria.it/programmazione-fesr
ROP Valle d'Aosta	ERDF: 32,175,475	Presidenza della Regione Val d'Aosta Dipartimento Politiche Strutturali e Affari Europei	http://www.regione.vda.it/Europa/Politica_regionale_di_sviluppo_2014-20/Programmi/investimenti_per_la_crescita_i.aspx
ROP Veneto	ERDF: 300,155,358	Regione del Veneto - Dipartimento Politiche e Cooperazione Internazionali/ Sezione Programmazione e Autorità di Gestione FESR	http://www.regione.veneto.it/web/guest/sezione-programmazione-e-autorita-di-gestione-fesr

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

White certificate scheme. Italy is one of the first countries in the EU to introduce a utility obligation scheme with tradable energy savings for financing energy efficiency (see section 4.2 for the definition of utility obligation schemes). The scheme sets annual targets for national primary energy savings and obligates electricity and gas distributors to implement energy efficiency measures to meet these targets.



The scheme has existed since 2004; the latest amendment was issued in April 2017. The decree includes a detailed list of efficient actions that qualify, including interventions for the retrofit and installation of innovative public lighting networks.

The annual primary energy saving targets are set by the Ministries of Economy and Environment. The National Energy Market Operator [Gestore Servizi Energetici (GSE)] is responsible for the administration of the scheme and for monitoring and verifying energy savings, with technical support from the Italian Energy Agency (ENEA) and other public bodies. Penalties for non-compliance are set by the regulator of the energy markets, AEEGSI. Entities bound by the terms of the scheme can implement energy efficiency measures themselves, outsource the implementation to third parties through bilateral contracts or purchase the verified energy savings through a trading platform (ATEE 2015).

For each verified saved tonne of energy (tonne of oil equivalent) generated by implementing energy efficiency measures, entities receive a white certificate. It is a tradable instrument that certifies that a specific reduction of energy consumption has been achieved. Obligated electricity and gas distributors are not the only entities that can pursue energy efficiency measures and obtain white certificates: third parties (such as non-obligated distributors, ESCOs, companies or organisations with an energy manager or ISO-certified energy management system in place) can do so, too. Having achieved and verified a certain amount of energy savings, they can sell their white certificates to the parties that need the certificates to meet their obligations under the scheme (GSE 2015).



2.7. Poland

Various public bodies offer funding for energy efficiency in street lighting in Poland. Support comes from EU funds and from the National Fund for Environmental Protection and Water Management. Of the ESIF funds discussed in section 1.1, Polish beneficiaries can obtain support from the ERDF, CF and INTERREG Central Europe and are eligible to receive technical assistance through ESIF FIs on how to use these funds.

EU funds. Table 7 contains information on the budget and managing authority and provides a source to consult for further information on ERDF and CF funding. The Operational Programme Infrastructure and Environment does not indicate directly that it supports the modernisation of street lighting, but it doesn't neglect it. For instance, Action 2.5 'Improving air quality - Urban green projects' allows for the financing of lighting infrastructure (Fundusze Europejskie 2017). Furthermore, it aims to modify the advisory system to promote a low-emission economy. It encourages local authorities to create workplaces for such advisors in order to raise awareness among municipalities regarding issues including energy-efficient street lighting systems and their benefits as well as low-emission plans for municipalities (EC 2014e). Besides the national operational programmes, activities to construct or modernise external lighting of voivodeships⁵ are possible under Regional Operational Programmes of Poland (Ministerstwo Rozwoju 2017).

Support for rural areas can also be obtained from the Polish Rural Development Programme 2014-2020, co-financed by the European Agricultural Fund for Rural Development (EAFRD). The Rural Development Programme does not indicate directly that it supports the modernisation of street lighting, but some of its activities contribute to renewal and rural development, including improvements in technical infrastructure. The modernisation of street lighting is therefore possible under the action 'Basic services and village renewal in rural areas' when it is included in broader projects, e.g., construction or reconstruction of public roads.

Table 7: ESIF funding opportunities for energy efficiency upgrades of street lighting in Poland for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
OP Development of Eastern Poland	ERDF: 2,000,000,000	Ministry of Infrastructure and Development	http://www.popt.gov.pl
OP Infrastructure and Environment	CF: 22,507,865,679 ERDF: 4,905,881,206	Ministry of Infrastructure and Development	http://www.popt.gov.pl
OP Technical Assistance	CF: 700,123,363	Ministry of Infrastructure and Development	http://www.popt.gov.pl
ROP 1 Regional Operational Programme for Dolnośląskie Voivodeship	ERDF: 1,618,916,106	Urząd Marszałkowski Województwa Dolnośląskiego	http://www.umwd.dolnyślask.pl/
ROP 2 Regional Operational Programme for Kujawsko-Pomorskie Voivodeship	ERDF: 1,368,083,592	Council of the Kujawsko-Pomorskie voivodship - Marshal's Office of the Kujawsko-Pomorskie voivodship	http://www.kujawsko-pomorskie.pl/
ROP 3 Regional Operational Programme for Lubelskie Voivodeship	ERDF: 1,603,400,406	Zarząd Województwa Lubelskiego	http://rpo.lubelskie.pl/

⁵ Voivodeships (Polish: województwo) is the highest-level administrative subdivision of Poland, corresponding to a "province" in many other countries.

ROP 4 Regional Operational Programme for Lubuskie Voivodeship	ERDF: 651,814,747	URZĄD MARSZAŁKOWSKI WOJEWÓDZTWA LUBUSKIEGO	http://www.lubuskie.pl
ROP 5 Regional Operational Programme for Łódzkie Voivodeship	ERDF: 1,621,433,387	Zarząd Województwa Łódzkiego obsługiwany przez Urząd Marszałkowski Województwa Łódzkiego Departament Polityki Regionalnej	http://www.pokl.lodzkie.pl/
ROP 6 Regional Operational Programme for Małopolskie Voivodeship	ERDF: 2,068,587,710	Zarząd Województwa Małopolskiego, Departament Zarządzania Programami Operacyjnymi	http://www.malopolskie.pl/
ROP 7 Regional Operational Programme for Mazowieckie Voivodeship	ERDF: 1,544,686,317	Zarząd Województwa Mazowieckiego	urzad_marszalkowski@mazovia.pl
ROP 8 Regional Operational Programme for Opolskie Voivodeship	ERDF: 679,152,913	Board of the Opolskie Voivodeship	http://rpo.opolskie.pl/rpo/
ROP 9 Regional Operational Programme for Podkarpackie Voivodeship	ERDF: 1,519,517,194	Zarząd Województwa Podkarpackiego	marszalek@podkarpackie.pl
ROP 10 Regional Operational Programme for Podlaskie Voivodeship	ERDF: 872,217,214	Urząd Marszałkowski Województwa Podlaskiego	http://www.wrotapodlasia.pl
ROP 11 Regional Operational Programme for Pomorskie Voivodeship	ERDF: 1,340,249,168	Urząd Marszałkowski Województwa Pomorskiego	http://urząd.pomorskie.eu
ROP 12 Regional Operational Programme for Śląskie Voivodeship	ERDF: 2,498,891,499	Zarząd Województwa Śląskiego	http://www.slaskie.pl/
ROP 13 Regional Operational Programme for Świętokrzyskie Voivodeship	ERDF: 980,704,066	Board of the Świętokrzyskie Voivodeship	http://www.rpo-swietokrzyskie.pl/
ROP 14 Regional Operational Programme for Warmińsko-Mazurskie Voivodeship	ERDF: 1,242,117,496	Zarząd Województwa Warmińsko-Mazurskiego	http://www.uw.olsztyn.pl/
ROP 15 Regional Operational Programme for Wielkopolskie Voivodeship	ERDF: 1,760,975,177	Zarząd Województwa Wielkopolskiego	http://www.wrpo.wielkopolskie.pl/
ROP 16 Regional Operational Programme for Zachodniopomorskie Voivodeship	ERDF: 1,150,818,353	Zarząd Województwa Zachodniopomorskiego	http://wzp.pl/

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

National Fund for Environmental Protection and Water Management. ‘Intelligent energy networks (smart grid)’, a priority programme of the National Fund for Environmental Protection and Water Management, provides financial support for the implementation of energy-efficient lighting systems in pilot areas of smart cities. The purpose of the program is to optimise and rationalise energy consumption (e.g., electricity, heat and hot water) in pilot areas for the purpose of limiting or avoiding emissions of pollutants, including CO₂, into the air.



2.8. Slovakia

EU funds. Of the ESIF funds discussed in section 1.1, Slovak beneficiaries can obtain financial support from the ERDF, CF and INTERREG Central Europe and are eligible to receive technical assistance through ESIF FIs on the use of these funds. Table 8 contains information on the budget and managing authority and provides a source to consult for further information on ERDF and CF funding. Based on the ERDF and CF budgets, funding for street lighting may be available through the ‘Integrated regional operational programme’, ‘Quality of Environment’, and ‘Technical assistance’.

Table 8: ESIF funding opportunities for energy efficiency upgrades of street lighting in Slovakia for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
Integrated Regional Operational Programme	ERDF: 1,754,490,415	Ministry of Agriculture and Rural Development of the Slovak Republic	http://www.ropka.sk/
Quality of Environment	CF: 1,861,112,261 ERDF: 1,276,787,849	Ministry of Environment of the Slovak Republic	http://www.opzp.sk/
Technical Assistance	ERDF: 159,071,912	Government Office of the Slovak Republic	http://www.vlada.gov.sk

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

The Slovak Rural Development Program, initiated by the European Agricultural Fund for Rural Development (EAFRD), aims to increase the competitiveness of the agriculture and forestry sectors. Investment projects supported under other priorities are expected to have additional impacts on resource efficiency and climate. This priority may support investment into energy efficiency projects, including street lighting. Support under measure 7 (‘Basic services and village renewal in rural areas’), sub-measure 7.2 (‘Aid for investment in the creation, improvement or expansion of all types of small-scale infrastructure, including renewable energy and energy savings’) may benefit projects related to construction and reconstruction of local roads, improvement of the appearance of municipalities, including the modification and creation of public spaces, squares, parks and others. The support of public lighting investments is not mentioned directly, but projects oriented towards an improvement in the appearance of municipalities can be expected to include public lighting. Eligible applicants are municipalities in rural areas with populations of up to 1,000 people. The eligible expenditure per project is EUR 10,000-100,000. Aid covers 100% of eligible costs, and it is possible to obtain an advance payment, up to a maximum 50% of eligible expenditure.⁶

SlovSEFF. SlovSEFF is a mechanism for financing sustainable energy initiatives. It was introduced by EBRD to encourage the involvement of national financial intermediaries in projects, including projects related to municipal energy efficiency (SlovSEFF 2017). SlovSEFF is generally used by private companies, ESCOs and housing associations/cooperatives. Municipalities can apply for funding with ESCOs that are willing to develop street lighting projects and upgrade energy efficiency in cities and towns. Prospective applicants should contact [Slovenská sporiteľňa, a.s.](http://www.slovenska-sporitelna.sk), [VÚB, a.s.](http://www.vub.sk), [OTP Banka Slovensko, a.s.](http://www.otpslovensko.sk) or the SlovSEFF office (office@slovseff.eu) to find out whether a project is suitable for the programme.

⁶ Information from the source <http://www.apa.sk/index.php?navID=545>



2.9. Slovenia

EU funds. Of the ESIF funds discussed in section 1.1, Slovenian beneficiaries can obtain financial support from ERDF, CF and INTERREG Central Europe and are eligible to receive technical assistance through ESIF FIs on how to use these funds. Table 9 contains information on the budget and managing authority, and provides a source to consult for further information on ERDF and CF funding. Based on the ERDF and CF budgets, funding for street lighting may be available through the ‘Operational Programme for the Implementation of the EU Cohesion Policy’.

Table 9: ESIF funding opportunities for energy efficiency upgrades of street lighting in Slovenia for the period 2014-2020

Programme	Total budget (in EUR)	Managing Authority	More information
Operational Programme for the Implementation of the EU Cohesion Policy	CF: 895,370,363 ERDF: 1,390,392,899	Republic of Slovenia Government Office for Development and European Cohesion Policy	http://www.svrk.gov.si

Source: http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020

The Slovenian Environmental Public Fund (Eco Fund). The Fund offers low-interest loans for energy efficiency upgrades of existing lighting infrastructure. It is overseen by the Ministry of the Environment and Spatial Planning. The beneficiaries may be municipalities, public utilities, enterprises and other legal entities. More information on the lighting programme is available from the website of the Eco Fund (Slovenian Environmental Public Fund n.d.). As of June 2017, the Eco Fund’s dedicated financing product for street lighting was [Kredit 57LS16](#).

Energy efficiency obligation scheme. In Slovenia, the responsibility for achieving energy savings under Article 7 of the Energy Efficiency Directive is shared between the Eco Fund, the energy distributors and the retail energy sales companies covered by the energy efficiency obligation scheme. These actors must provide their own capital to comply with energy saving targets assigned to them. They may also invest in improving the energy efficiency of street lighting, among other possible measures.

The Slovene Export and Development Bank (SID Bank). SID Bank provides financial services for the development and upgrade of infrastructure, including street lighting. Channelling resources through other national commercial banks, it refinances credits of banks and other financial institutions, co-finances transactions and investments and finances direct investment. Eligible beneficiaries include municipalities, municipally owned organisations, small and medium enterprises (SMEs), and others. More information and contacts are available on the bank website (SID Bank n.d.).



3. Financial intermediaries

3.1. Commercial banks

Many municipalities, whose own funding resources are limited, incur debt, which will be paid back from the municipal budget (e.g., tax revenue of municipalities and/or saved energy costs). Most commonly, municipalities obtain low-interest (soft) loans. Low-interest rate lending programs offered by national development banks, dedicated funds, or by the European banks and funds (such as the European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD) or the European Energy Efficiency Fund) are widely used for energy efficiency investments by municipalities in Central Europe. In Hungary, for instance, EBRD cooperates with Erste Bank, through which EBRD offers its products tailored to finance street lighting projects.

In few countries, public lending programmes have limited budgets or do not exist. Therefore, municipalities can obtain commercial loans at a market rate from commercial banks. For commercial loans, the interest rate at which the loan is awarded depends on the borrower's credit record, not on saved energy costs.

Nevertheless, municipalities may face scepticism in dealing with commercial loans. Generally, assets given under energy efficiency projects will not be considered collateral for such a loan, since there are many risks associated with these projects. Lenders are quite unsure about giving loans to municipalities, especially small ones. They tend to protect themselves with securities backed by municipal assets or other means transferred from other governmental funds. This means that municipalities with a larger revenue base are more likely to be creditworthy for a lender. Smaller municipalities are also especially vulnerable due to the issue of transaction costs. They may put a constraint on such a procedure, since a commercial lender should be confident that a portfolio with standardised processes can be developed for such projects (ESMAP 2014).

The most significant barrier to starting an energy-efficient project is the large upfront investment, which is often needed for street lighting projects. In particular, smaller municipalities—and those that want to remain flexible and responsible for the installation and maintenance of street lights—can avoid this investment by leasing. Leasing provides the right to use an asset in return for payments over a certain period of time, as stated in a contract. This method also makes it possible to avoid debt increases: risks are transferred to the lessor and rental expenditures can be offset by the resulting energy savings. However, it is still possible that, due to risk transfer to the lessor and overall higher financing costs, there will be greater long-term costs (PricewaterhouseCoopers 2013).



4. Private sources

Financing models for street lighting upgrades involving private sources are discussed in detail in a parallel project deliverable, ‘Financing models for energy-efficient street lighting. Best practice guide’. The present section provides a brief summary and definition of the relevant actors.

4.1. Financing by private contractor

Municipal actors can reallocate to third parties the burden of financing street lighting infrastructure. For instance, financing can be covered by a private partner, which delivers the upgrade works, is usually not responsible for the energy supply and therefore cannot use energy savings for its financing needs. The private partner finances the street lighting project from its own funds or obtains the funds from third parties. For its services, the contractor receives payment from municipalities. If the contractor obtains financing from additional third parties, it repays the debt to them. The municipal payment to the contractor and the contractor’s payments to a lender are not contingent on energy savings.

Alternatively, financing can be provided by a private partner, which delivers the upgrade works, makes payments on the basis of the energy savings achieved, and uses these payments to make the project investment. This model is referred to as ‘energy performance contracting’ (EPC) and the private actor is referred to an ‘energy savings company’ (ESCO). There are different descriptions and models of EPCs. The basic element of all EPC models, however, is that cost savings achieved by reducing energy consumption are used to finance the investment. In EPC models, the municipality or a private partner is responsible for the energy supply. In the end, however, it is always the municipality that pays for the services (including energy supply, planning, financing and installing the new equipment), either separately or as a lump sum. One of the major benefits of such a financing model is that a municipality may transfer all of the risks related to implementation, design and maintenance of new street lighting technologies to an ESCO and eventually benefit from its experience and capabilities (EIB 2013).

4.2. Utilities

Traditionally, utility programmes aim at the demand-side load management to produce the desired changes in the utility’s load shape. Following the 2012 Energy Efficiency Directive, sixteen EU Member States decided to adopt energy efficiency obligation schemes.⁷ In line with the Directive, the schemes oblige energy distributors or retail energy sales companies to achieve specific quantitative goals of energy savings through the implementation of energy efficiency measures (EC 2017a).

In order to achieve the targets, utilities collect dedicated funds, either as a special charge or as part of the cost of doing business (Rosenow and Bayer 2016). These funds are further used to implement energy efficiency measures. For instance, utilities may design and adopt utility programs that provide financing incentives to end-users, including municipalities.

Under some obligation schemes, energy-saving goals can be met if certified energy savings are purchased from other parties, but this occurs only if a utility finds it more cost-effective than implementing its own measures. The certified energy savings are referred to as ‘white certificates’ and the obligation schemes are ‘white certificate schemes’ (The Regulatory Assistance Project [RAP] 2016).

⁷ Bulgaria, Denmark, Luxembourg, Poland, Austria, Croatia, Estonia, France, Ireland, Italy, Latvia, Lithuania, Malta, Slovenia, Spain and the United Kingdom.



4.3. Institutional investors

Institutional investors represent another source of funding for energy efficiency projects. Insurance companies, pension funds, mutual funds and sovereign wealth funds belong to this group. Although the interest is quite high, urban infrastructure, sustainable lighting and green buildings in municipal environments still lack capital. Institutional investors are quite eager to add such projects to their portfolios because of this, and because they understand the risks associated with infrastructure projects and their lifecycle (Barysch, Hewitt, and Köferl 2014).

The number of such investors is still quite small. The main reason for this is that the costs of finding and assessing green municipal projects are often higher than what the investors can expect back from them. Another barrier arises from the nature of such infrastructure projects. They often require a huge initial investment, and an investment mistake can cost a lot, especially where new green technologies are concerned. In order to overcome the hurdles, institutional investors can team up with other investors with more experience and proficiency (Barysch, Hewitt, and Köferl 2014).

One example of a street lighting project funded by institutional investors is the SUSI Energy Efficiency Fund (SEEF), a fund managed by SUSI Partners AG. SUSI Partners is a Swiss asset manager specialising in sustainable energy infrastructure investments through three active funds. Recently, SEEF has acquired from GGE d.o.o. (GGE) a portfolio of long-term receivables from energy efficiency contracts. GGE is one of the leading ESCOs in South-East Europe, headquartered in Ljubljana, Slovenia. The approximate value of the transaction between GGE and SEEF was EUR 7.5 million. Using the proceeds of the transaction, GGE may invest in delivering new energy savings projects to its clients. The portfolio of energy efficiency projects included a set of municipal street lighting refurbishments, among others (Puskas, A. pers. com.).

4.4. Crowdfunding

Crowdfunding is financing provided by a group of individuals and organisations who commit their resources in order to support ideas initiated by others. Various crowdfunding platforms issue online calls to donate, lend or invest money in specific projects. Individual projects may attract a few hundred individuals or organisations leveraging hundreds of thousands of euros. Citizenergy⁸ is the European portal which provides links to sustainable energy crowdfunding platforms across Europe.

When financing sustainable energy projects, municipalities often face various difficulties stemming from the fact that they are too small-scale or not attractive enough for local banks. Crowdfunding could be of interest as an alternative financing model, because it allows municipalities to maintain assets within local boundaries and raises public awareness of energy efficiency topics (JD Alois 2017).

4.5. Energy communities

Recently, cooperative energy funding has gained great popularity, which offers the energy market a community-financed solution for project investment. Such communities consist of individuals, households, customers and businesses. They form a development finance institution that provides financial and credit services to markets run by local banks (ManagEnergy n.d.). Energy communities have been very successful in Denmark, while in other countries they have faced local opposition. The Danish government has invested financially in the development of local communities by funding energy projects. Germany is also a frontrunner in this respect and now has more than 600 energy communities (ManagEnergy n.d.).

⁸ www.citizenergy.eu/



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Annex I. Methodology

Inventory

We relied on several data collection approaches. First and foremost, we gathered information available in the public domain. In particular, we identified projects that conducted similar studies in the past and reviewed their source documentation. We also gathered other information available, e.g., from reports, articles, interviews and internet websites.

Then, we surveyed the project target group using two questionnaires. First, we conducted a detailed survey among project partners using an online-based questionnaire. After analysing this internal survey, we revised the questionnaire and sent it out to street lighting experts and stakeholders beyond our consortium. For this step, we identified the contacts of 34 associations of municipalities, cities, towns and countries in Central Europe and asked them to forward our survey to their members. We also identified the contacts of approximately 200 key stakeholders from the priority group for our task and sent them invitations to fill out the survey. Those contacted in this way included representatives of regional and national energy agencies, utilities, product manufacturers, engineering service providers, energy services companies and researchers. Finally, we sent out the survey through the mailing list Climate-L.⁹

Our survey was answered by 59 respondents. Of these, 55 were from EU Member States. Respondents represented 15 municipalities; two associations of municipalities, including the Association of Cities of the Republic of Croatia and the Association of Polish Cities; four regional energy and development agencies, including the North-West Croatia Regional Energy Agency, the Energy Agency for Southeast Sweden, the APE FVG Energy Management Agency of Friuli Venezia Giulia, and AGIRE Energy Agency of the Province of Mantova of Italy; five lighting product manufacturers; three energy service contractors and/or energy service companies and/or their affiliates; 21 research organisations or consultancies; and six consumers. For details, please see our Deliverable D.T2.3.1., ‘Baseline inventory’.¹⁰

Data analysis and validation

Data collection enabled us to identify the number of public and private sources. Public sources included EU funds and assistance, national public funding sources, and financial multi- and bilateral public and semi-public intermediaries. All of these were assessed using a common framework. In particular, we identified the objectives of each source, as well as the financial instruments applied, activities funded, beneficiaries and application process. The private sources included financing by private contractor, utilities and institutional investors, as well as crowd-based funding.

In order to validate our results, we contacted the organisations and individuals at EU and national level. Thus, for the EU funds and assistance and for EU financing institution instruments, we identified the appropriate contact persons and sent them our results for review. To validate the information on national public sources, we contacted national energy agencies. Finally, we contacted private financial intermediaries to validate the information on their funding.

⁹ Please see <http://sdg.iisd.org/sdg-update/about-the-sdg-update-newsletter/> for information on Climate-L.

¹⁰ Novikova, A., Stamo, I., Stelmakh, K., and Hessling, M. 2017. Guideline on finding a suitable financing model for public lighting investment: Deliverable D.T2.3.1 Baseline inventory. Berlin: University of Greifswald, IKEM, SWARCO.