Interreg CENTRAL EUROPE
European Union European Regional Development Fund
Dynamic Light

PRIORITY: LOW CARBON CITIES AND REGIONS

D.T4.2.2 Analysis of the political and legal framework and the examples European Report

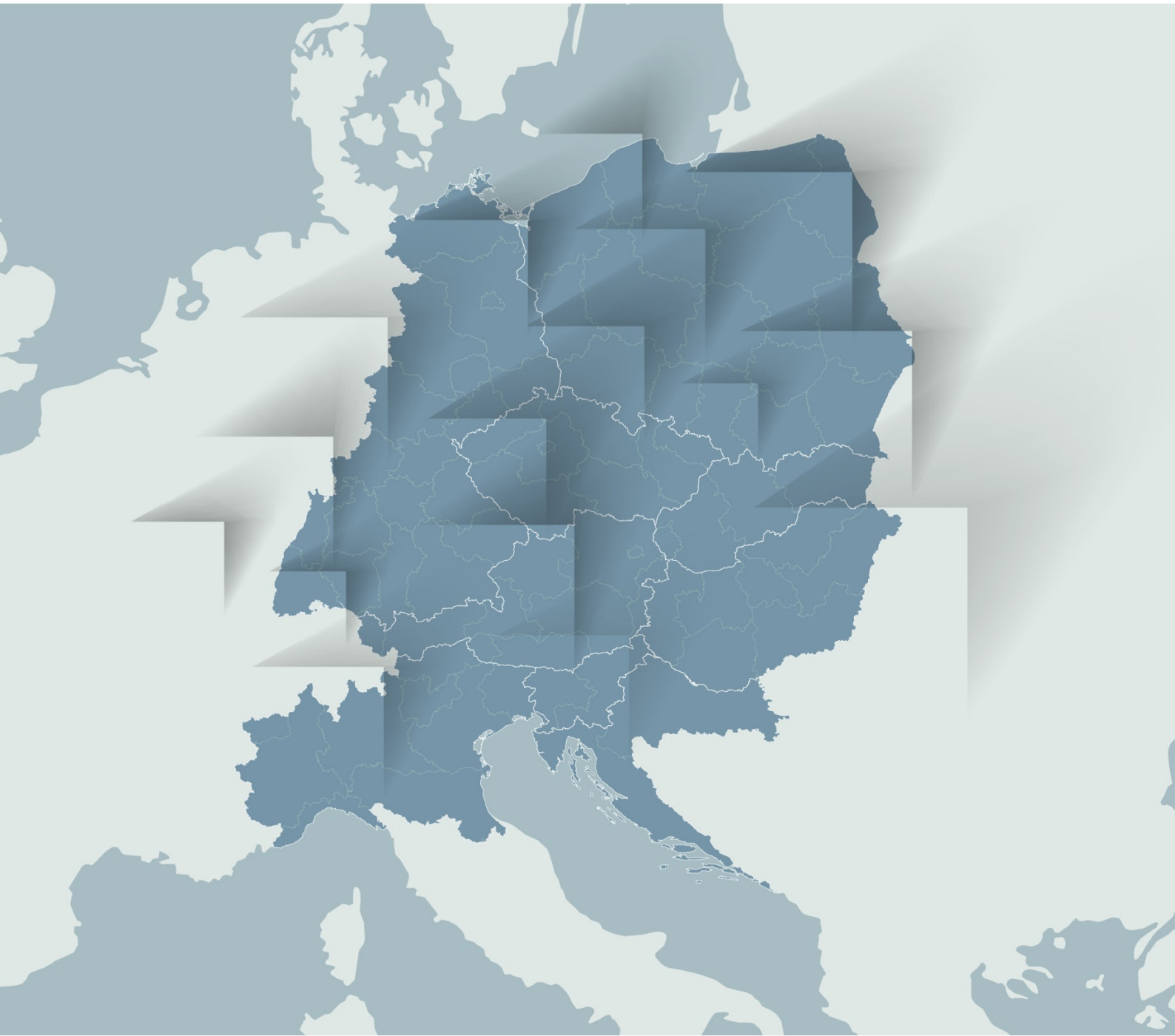

Table of Contents

Introduction

The European Report analyses 6 Country Reports elaborated within the Dynamic Light project. The report addresses: A) General policy aspects concerning public lighting; B) Legal aspects; and C) development of lighting facilities.

This report provides a detailed about legal questions and policy aspects regarding public lighting development in selected European Union (EU) Member States. Due to certain constrains related mainly to the diversity of languages spoken amongst the project partners, the main source of information for the analysis was the information provided by the projects partners, by means of filling out a questionnaire with legal and policy related questions. Once received the questionnaires, a secondary data analysis of the information was conducted. When needed, other sources of information were also consulted.

The Comparative Draft was chosen as the methodology for data analysis and elaborating, based on the questionnaires, one Country Report for each project partner and the European Report. The European Report follows therefore the same structure as the Country Reports.

Main findings are summarised below:

- **Political strategies and targets.** The Energy Efficiency Directive (EED) 2012/27/EU, is the most relevant instrument towards achieving EU targets by 2020. Urban and street lighting systems are also subject to meet energy efficiency targets; therefore, the actions and plans in each partner country are derived from/or in line with the EED. The project partners analysed in this report implemented National Energy Efficiency Action Plans (NEEAPs) shortly after the Directive came into force where clear goals and targets were set.
- **Actors and stakeholders**. Most relevant actors for policy making and implementation are Ministries, particularly the Ministry of Environment and the Ministry of Energy. Regulatory agencies, on the other hand, are heterogeneous and country specific; the usually belong to the Environment, Energy, and Spatial Planning sectors.
- **General legal background**. It varies considerably amongst the partner countries. The experts in each country identified a series of legal instruments related to public lighting in the following areas: Road Traffic Law, Criminal Law, Civil Law, and Public Law.
- **Ownership, maintenance, and operation of dynamic public lighting.** Public lighting ownership belongs mainly to municipalities; nonetheless, other private ownership schemes – namely service providers or energy distribution companies – and public private partnership schemes are also possible. The maintenance of public lighting is provided by the service provider. Public lighting operation could be either by a public body, like the municipality itself, or a private one, like a municipal utility company or an ESCOs.
- **Public procurement**. The main EU public procurement directives, implemented in the analysed countries are: 1) Directive 2014/23/EU – on the award of concession contracts, except for Slovenia; 2) Directive 2014/24/EU – on public procurement; and 3) Directive 2014/25/EU – on procurement by entities operating in the water, energy, transport and postal services sectors. All rules for procurement above threshold values have been transposed into the national regulations accordingly.

- **Green Procurement**. The following EU legislation and initiatives related to GPP were identified by the partner countries: 1) Communication on GPP (COM400, 2008); 2) European Green Paper COM (2011) 889; 3) Eco-design Regulation; 4) Energy labelling; 5) RoHS 2 – Directive on the Restrictions of Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU); 6) Waste Electrical & Electronic Equipment Directive (WEEE) (2012/19/EU); 7) Energy Efficiency Directive (EED); 8) Environmental Impact Assessment Directive (EIA) (2011/92/EU); and 9) Waste framework directive (2008/98/EC).
- **Lighting facilities.** The following crosscutting aspects of the law should be considered for planning and authorization of lighting facilities in the partner countries: Environment, Infrastructure, Urban Development/Spatial Planning, and Energy. The aforementioned aspects are country specific and vary, therefore, from country to country.

A. General Policy Aspects Concerning Public Lighting

The following section and its subsections concern political strategies and targets; currency; and actors and stakeholders related to dynamic public lighting in the studied countries.

I. Political strategies and targets

In its Energy 2020 strategy, issued in 2010, the European Commission (EC) stated: *"Energy efficiency is the most cost-effective way to reduce emissions, improve energy security and competitiveness, make energy consumption more affordable for consumers as well as create employment, including in export industries"*[1]. A year later, the Commission presented a proposal for a Directive on energy efficiency, which entered into force on 4 December 2012. The Energy Efficiency Directive (EED) 2012/27/EU is the most relevant step towards the achievement of the Europe 2020 strategy for smart, sustainable and inclusive growth, within which the promotion of energy efficiency was planned. The strategy identifies energy efficiency as a major element in ensuring the sustainability of the use of energy resources and sets the 20/20/20 targets by 2020[2]. Urban and street lighting systems are also subject to meet energy efficiency targets; therefore, the actions and plans in each Country are derived from/or in line with the EED.

Under the EED, each Member State (MS) must meet certain energy savings targets between January 1st, 2014 and December 31st, 2020. The project partners analysed in this report implemented National Energy Efficiency Action Plans (NEEAPs) shortly after the Directive came into force[3], like Germany in 2014, or some years later, like Poland in 2016. Moreover, the implementation period of the NEEAPs vary amongst the MS varies from country to country; i.e. Germany sets targets until 2020 while Croatia considers the period 2014-2016. In either case, MS implemented monitoring instruments that are reported on yearly basis. The NEEAPs are implemented depending on each MS's internal administrative structure; i.e. in Germany, each Federal Government fulfils its reporting requirements and informs about current framework conditions and achievements in energy efficiency policy in Germany regarding lighting over the past few years.

Nonetheless, most of the MS drafted and implemented political strategies, programs, and action plans on making dynamic public lighting more energy efficient and climate friendly before the requirements from the Commission. As an example, since 2008, the German government aims at increasing energy efficiency by 20% by 2020; the overall goals of this also include transforming the lighting infrastructure. Another good example can be found in Slovenia, which issued in 2007 a Decree on Limiting Values due to Light Pollution of the Environment and is considered to be the most advanced light pollution legislation. In both examples, environmental and energy related

1 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Energy 2020, COM (2010) 639

2 The 20/20/20 targets aim to: 1) reduce greenhouse gas emissions by 20%; 2) increase the share of renewable energy to 20%; and 3) improve energy efficiency by 20%.

3 Art. 24 par. 2 of the EED states: „By 30 April 2014, and every three years thereafter, Member States shall submit National Energy Efficiency Action Plans".

concerns seem to be the main drivers for policy implementation; therefore, the German Federal Environment Ministry, the Slovenian Ministry of Environment, and the Polish Ministry of Energy, to name a few, are the institutions supporting the policy making in the field of public lighting.

II. Currency

Germany, Slovenia, and Italy use the Euro as its currency, which makes trading between those countries rather smooth and easy due to the absence of exchange rates. On the other hand, Poland, Croatia, and the Czech Republic use their own currency, namely: Złoty, Kuna, and Czech Koruna, respectively.

III. Actors and Stakeholders

1. Ministries

Ministries play a relevant role regarding setting up the policy making in the field of public lighting in the countries involved in dynamic public lighting. As illustrated in the table below, the Ministries of Environment are transversal to mostly every country in the sample, except for the Czech Republic. The foregoing reflects the environmental concerns, described in the previous section, which are one of the main drivers for public lighting policy making.

The second most common is the Energy Ministry, whose involvement is considered essential to achieve the reduction goals in the fields of energy and energy efficiency, from which the abovementioned National Energy Efficiency Action Plans were derived at the European level.

Finally, the Ministry of Finance and the Ministries of Urban Development or Spatial Planning are named as the 3rd most often mentioned Ministries involved in public lighting implementation.

	DE	SL	IT	PL	HR	CZ
Economy	X	X	X			
Energy	X		X	X	X	
Environment	X	X	X	X	X	
Buildings	X					
Nuclear Safety	X					
Nature Conservation	X					
Transport	X		X			
Digital Infrastructure	X					
Urban Development/Spatial Planning	X	X		X		
Infrastructure		X				
Finance		X	X	X		
Industry & Trade						X

Source: own elaboration

2. Regulatory Agencies

Regulatory agencies are heterogeneous and country specific. To name some examples, while in Slovenia the regulatory agencies belong to the Environment, Energy, and Spatial Planning sectors, in Italy such regulatory agencies are part of the Regional Government.

IV. General Legal Background

The general legal background varies considerably amongst the analysed countries. The experts in each country identified a series of legal instruments in the four areas predefined in the questionnaire, that are related to public lighting. These four areas are: 1) Road Traffic Law, 2) Criminal Law, 3) Civil Law, and 4) Public Law. The table below lists the number legal instruments found in each country in before-mentioned areas.

	DE	SL	IT	PL	HR	CZ	Total
Road Traffic Law	4	-	1	2	2	3	**12**
Criminal Law	2	-	-	-	2	-	**4**
Civil Law	1	-	1	1	12	3	**18**
Public Law	14	-	1	2	8	-	**25**
Total	**21**	**-**	**3**	**5**	**24**	**6**	

Source: own elaboration

As shown in the table above, Croatia and Germany identified significantly more legal instruments compared to the other countries.

Croatia most of the legal instruments were identified in the field of Civil Law. Furthermore, most of the instruments focus, in descending order, on the following fields: first, Planning and building; second, Security; and third, Energy and Electricity. On the other hand, in the case of Germany most of the legal instruments were identified in the field of Public Law. Moreover, most of the instruments focus, in descending order, on the following fields: first, energy and electricity; second, contracting and concessions; and third, environment.

Moreover, all studied countries in this report are EU member states and, therefore, they are members of the World Trade Organization (WTO) and all studied countries ratified the Agreement on Government Procurement (GPA).

B. Legal aspects

The following section and its subsections concern ownership, maintenance and operation, and public procurement for dynamic public lighting in the studied countries.

I. Ownership, maintenance and operation

1. Ownership

In most of the cases, lighting systems are owned by public institutions. In such cases, municipalities are the main owners, but lighting systems could also be owned by a national institution, like the National Electricity Company in Croatia, or regional governments, like the case of the Czech Republic. In Germany and Poland ownership of lighting systems is diverse; municipalities are the main owners, followed by service providers, energy and distribution companies.

In some cases, like in Slovenia, Public Private Partnership schemes for providing public lighting structure and facilities where found. In such cases lighting infrastructures and facilities of a concession shall become property of the public partner, either immediately or after a given period, unless this is not possible or economically justified.

Moreover, instances where lighting infrastructures have shared ownerships where also found. There are cases, i.e. Poland and Croatia, where light poles and their accompanying infrastructure belong to an energy company, but the luminaries belong to the municipality.

2. Operation

Lighting systems operation is rather divers amongst the cases. In most of the cases, street lighting and urban lighting systems are either operated by municipalities, municipal utility companies, energy distribution companies, or companies established by energy companies. In Germany and the Czech Republic municipalities are the main operators of lighting systems (45% and 50%, respectively), the rest of the operation share is distributed amongst energy service providers (either municipal or private), and other energy contractors.

3. Maintenance

Service providers bear the responsibility of providing maintenance in most of the cases (for example in Germany, Slovenia, and Croatia). In other cases, like Poland, maintenance costs for lighting structures owned by municipalities belong solely to the municipality. When street lighting is owned by energy companies, the bearing of the costs for maintaining the light points is carried out based on the tariff contained in the service charge, and not based on any separate agreements.

II. Public procurement

In the cases where the public lighting is owned by a municipality or other public institution and operated by a third party, i.e. not by the municipality itself or "*in house*", the operation contract is subject to public procurement rules.

The following sections describe the various aspects involved with the procurement of public lighting the studied countries, as well as green procurement. Topics addressed are general legal aspects ranging from the EU level and the national level.

1. EU legal framework

General aspects of EU public procurement law

The main EU legal framework concerning public procurement, implemented in the analysed countries regarding public street lighting, include the following directives:

- Directive 2014/23/EU – on the award of concession contracts; Slovenia failed to transpose this directive within the deadline, which is why the Commission has started an infringement procedure against the country[4];
- Directive 2014/24/EU – on public procurement (also known as Classical Directive); and
- Directive 2014/25/EU – on procurement by entities operating in the water, energy, transport and postal services sectors (also known as Utilities (Sectors) Directive).

These directives were transposed into the national legal framework of each partner country, with the exceptions mentioned before, including the rules for public procurements above threshold values. Moreover, EU law sets minimum harmonised rules for tenders whose monetary value exceeds a certain amount, as described in the sections below, and which are presumed to be of cross-border interest; although this might not be necessarily the case for public street lighting, it is worth to be mentioned.

The overall aim of European rules is to ensure that the award of contracts of higher value for the provision of public goods and services must be fair, equitable, transparent and non-discriminatory. For tenders of lower value however, national rules apply as described in the subsequent sections, which nevertheless have to respect general principles of EU law.

EU thresholds[5] according to type of procurement under the 2014 directives on concessions, general procurement and utilities are described as follow:

4 http://europa.eu/rapid/press-release_IP-17-4771_en.htm

[5] Source: https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation/thresholds_en

- **Directive 2014/23/EU** on the award of concession contracts.
    - All works or services concessions: €5,548,000

Commission Delegated Regulation (EU) 2017/2366 of 18 December 2017 amending Directive 2014/23/EU in respect of the application thresholds for the procedures for the award of contracts

- **Directive 2014/24/EU** on public procurement:

Central Government authorities	Works contracts, subsidised works contracts		€5,548,000
	All services concerning social and other specific services listed in Annex XIV		€750,000
	All subsidised services		€221,000
	All other service contracts and all design contests		€144,000
	All supplies contracts awarded by contracting authorities not operating in the field of defence		€144,000
	Supplies contracts awarded by contracting authorities operating in the field of defence	Concerning products listed in Annex III	€144,000
		Concerning other products	€221,000
Sub-central contracting authorities	Works contracts, subsidised works contracts		€5,548,000
	All services concerning social and other specific services listed in Annex XIV		€750,000
	All other service contracts, all design contests, subsidised service contracts, all supplies contracts		€22

Commission Delegated Regulation (EU) 2017/2365 of 18 December 2017 amending Directive 2014/24/EU in respect of the application thresholds for the procedures for the award of contracts

- **Directive 2014/25/EU** on procurement by entities operating in the water, energy, transport and postal services sectors:
    - Works contracts: €5,548,000
    - All services concerning social and other specific services listed in Annex XVII: €1,000,000
    - All other service contracts, all design contests, all supplies contracts: €443,000

Commission Delegated Regulation (EU) 2017/2364 of 18 December 2015 amending Directive 2014/25/EU in respect of the application thresholds for the procedures for the award of contracts

Other EU procurement rules that apply in the analysed countries include:

- Directive 2009/81/EC[6] of the European Parliament and of the Council of 13 July 2009 on the coordination of procedures for the award of certain works contracts, supply contracts and service contracts by contracting authorities or entities in the fields of defence and security, and amending Directives 2004/17/EC and 2004/18/EC.
- Commission Implementing Decision (EU) 2016/1195[7] of 4 July 2016 exempting courier services and other services than postal services in Poland from the application of Directive 2014/25/EU of the European Parliament and of the Council on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC (notified under document C(2016) 3986).Commission Regulation (EU) No 1336/2013[8] of 13 December 2013 amending Directives 2004/17/EC, 2004/18/EC and 2009/81/EC of the European Parliament and of the Council in respect of the application thresholds for the procedures for the awards of contract. Commission Regulation (EU) No 1251/2011[9] of 30 November 2011 amending Directives 2004/17/EC, 2004/18/EC and 2009/81/EC of the European Parliament and of the Council in respect of their application thresholds for the procedures for the awards of contract. Commission Regulation (EC) No 1177/2009[10] of 30 November 2009 amending Directives 2004/17/EC, 2004/18/EC and 2009/81/EC of the European Parliament and of the Council in respect of their application thresholds for the procedures for the award of contracts.
- Commission Implementing Regulation (EU) 2015/1986[11] of 11 November 2015 establishing standard forms for the publication of notices in the field of public procurement and repealing Implementing Regulation (EU) No 842/2011.
- Commission Regulation (EC) No 213/2008[12] of 28 November 2007 amending Regulation (EC) No 2195/2002 of the European Parliament and of the Council on the Common Procurement Vocabulary (CPV) and Directives 2004/17/EC and 2004/18/EC of the European Parliament and of the Council on public procurement procedures, as regards the revision of the CPV.
- Commission Implementing Decision (EU) 2016/578[13] of 11 April 2016 establishing the Work Programme relating to the development and deployment of the electronic systems provided for in the Union Customs Code.
- Commission interpretative communication[14] on the Community law applicable to contract awards not or not fully subject to the provisions of the Public Procurement Directives.

6 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32009L0081

7 http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32016D1195

8 http://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex%3A32013R1336

9 Source: http://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex%3A32011R1251

10 Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32009R1177

11 Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2015.296.01.0001.01.ENG

12 Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32008R0213

13 Source: http://eur-lex.europa.eu/eli/dec_impl/2016/578/oj

14 Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52006XC0801%2801%29

Procurement process

According to Traverso et al. (2017) the purchase process of public street lighting products is controlled by public authorities and is therefore a Business to Government (B2G) market. Exploitation can be done by the authorities themselves or can be subcontracted to Energy Services Companies (ESCOs) energy distribution companies, or companies established by energy companies, as described in the section B.2. In general, the market uses public tenders.

For luminaire replacement or the development and implementation of public lighting projects, the municipalities will specify the road lighting requirements in accordance with classes defined in EN 13201-2:2016 together with some additional infrastructural and technical requirements[15].

In many cases public tenders might also require a second source supplier for repair components, mainly for replacement lamps and/or control gear to safeguard long term operation.

Afterwards, usually the lowest cost bid that satisfies the tender requirements is selected. Although environmental aspects can be included either as a minimum requirement or as reward criteria in the tenders, there is growing interest in the EU to highlight the relevance of environmental issues within the procurement procedures, as detailed in the section below.

Green Public Procurement

Public procurement constitutes approximately 16% of overall green public procurement (GDP) in Europe[16]. Therefore, considering the environmental performance of publicly procured products and services offers the chance to gain significant environmental improvements in the public sector.

The Energy Efficiency Directive[17] (EED) it is a relevant policy tool for energy efficiency related public investments. The following paragraphs of the Article 6, about *Purchasing by public bodies*, are the most relevant for public lighting:

> *1. MS shall ensure that central governments purchase only products, services and buildings with high energy-efficiency performance, insofar as that is consistent with cost-effectiveness, economical feasibility, wider sustainability, technical suitability, as well as sufficient competition (…). The obligation (…) shall apply to contracts for the purchase of products, services and buildings by public bodies in so far as such contracts have a value equal to or greater than the thresholds laid down in Article 7 of Directive 2004/18/EC.*

[15] The main infrastructural requirements consider: pole distance, maximum pole height, design style (functional, decorative), etc. For more details about the technical requirements, please refer to the Deliverable D.T4.2.1. "*Comparative Inventory of the political/legal framework (EU level, selected national/regional levels) that affect the implementation and dissemination of dynamic lighting, focusing both on hard and soft instruments*"; in detail the "*Annex II: Inventory Part II – EU Standards/Norms/Regulations & Policies*".

[16] Source: http://ec.europa.eu/trade/policy/accessing-markets/public-procurement/

[17] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

> *3. MS shall encourage public bodies, including at regional and local levels (…) to follow the exemplary role of their central governments to purchase only products, services and buildings with high energy-efficiency performance. MS shall encourage public bodies, when tendering service contracts with significant energy content, to assess the possibility of concluding long- term energy performance contracts that provide long-term energy savings.*

Moreover, for ensuring a higher share of GPP in Europe, identifying and developing GPP criteria for products and services with a high degree of leverage in procurement decision-making combined with a significant improvement potential for environmental performance plays a relevant role[18].

The EC adopted in 2008 the Communication COM (2008) 400 (called "*Public Procurement for a Better Environment*"[19]), which sets a target for MS to achieve a level of 50% GPP by 2010. According to the Communication, the basic concept of GPP relies on having clear and ambitious environmental criteria for products and services. Public procurement is essentially a process and, for the Communication, can be understood as:

> *"… a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured."* (COM400/2008, p.4)

Moreover, the Communication seeks to cover all public procurement procedures, above and below the thresholds, discussed in the following sections, defined by the European public procurement Directives. In all cases, environmental specifications, selection and award criteria and contract clauses are formulated in full compliance with EU public procurement legislation and other relevant EU or national legislation.

Regarding the legislative principles, the GPP must consider four specific principles of EU environmental policies, namely: 1) the precautionary principle; 2) the principle of preventive action; 3) the principle of rectification at source; and 4) the polluter pays principle.

The work from Traverso et al. (2017) provides a comprehensive review of EU GPP criteria for street lighting and traffic signals. The table below summarizes the relevant EU policy tools (namely: Directives, Regulations, Communications from the Commission) and their key aspects for the purposes of this report:

[18] See: Traverso, M., Donatello, S., Moons, H., Rodriguez Quintero, R., Gama Caldas, M., Wolf, O., Van Tichelen, P., Van Hoof, V. and Geerken, T. *Revision of the EU Green Public Procurement Criteria for Street Lighting and Traffic Signals - Preliminary Report: Final version.* EUR 28622 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-69097-6, doi:10.2760/479108, JRC106647

[19] Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52008DC0400

EU legislation and initiatives	Key Aspects
Directives on public procurement	- EU directives 2014/24/EC and 2014/25/EC set requirements for public procurement, in general, and for GPP. - Directives allow the use of various tender procedures ranging from an open procedure to competitive dialogue. - The scope of the directives is limited to contracts above certain values.
Communication on GPP (COM400, 2008)	- Adopted as part of the Sustainable Production and Consumption Action Plan. - Introduced several measures aimed at supporting GPP implementation across the EU
European Green Paper COM (2011) 889	- Called "*Lighting the Future: Accelerating the deployment of innovative lighting technologies*". - Based on this green paper a public consultation was launched (EC CONNECT, 2012) and a report was produced (EC CONNECT, 2013). - From the public consultation the top 3 concerns that emerged are: quality, performance, and standardization.
Eco-design Regulation	- Three principal eco-design regulations and two amendments related to lighting are in place today, namely: Regulations (EC) No 245/2009, 347/2010 and 1194/2012. They are under revision.
Energy labelling	- Commission Delegated Regulation (EU) No 874/2012 - Supplementing Directive 2010/30/EU of European Parliament and of the Council about energy labelling of electrical lamps and luminaires.
RoHS 2 – Directive on the Restrictions of Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU)	- Restricts the use of lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr6+), polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE) in manufacturing of certain electrical and electronic equipment (EEE) sold in the EU.
Waste Electrical & Electronic Equipment Directive (WEEE) (2012/19/EU)	- Issued in July 2012 as a recast of Directive 2002/96/EC. - Aim: to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment (WEEE) and by reducing overall impacts of resource use and improving the efficiency of such use. (See Art.1)
Energy Efficiency Directive (EED)	The EED 2012/27/EU amends Directive 2009/125/EC on Eco-design requirements for energy-related products and Directive 2010/30/EU on energy efficiency labelling of energy-related products, and repeals Directive 2004/8/EC on the promotion of cogeneration and Directive 2006/32/EC on energy end-use efficiency and energy services
Environmental Impact Assessment Directive (EIA) (2011/92/EU) amended in 2014 by the Directive 2014/52/EU[20]	The EIA Directive 2011/92/EU ensures that the environmental consequences of projects are identified and assessed before authorisation is given.
Waste framework directive (2008/98/EC)	Establishes rules on how waste should be managed in the EU

Source: own elaboration based on Traverso et al. (2017)

In this regard, the implementation of GPP among studied countries are at different implementation stages and levels of implementation. They range from a having National Action Plans for Green

[20] Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052

Procurement, like Poland and Croatia, to having Ministerial Resolutions, like the Czech Republic. In most of the cases, however, the Ministry of the Environment seems to be a key player for implementing public initiatives in the field.

Moreover, the case of Poland described a set of environmental management systems and certification schemes that are also considered for GPP, as detailed below:

- Environmental Management Systems
    - **ISO 14000** - voluntary ISO 14001 standard is a series of ISO 14000 standards designed to assist companies and other organizations to improve their business in the field of environmental protection. These standards were developed by the International Organisation for Standardisation, based in Geneva.
    - **EMAS** - Community eco-management and audit system (EMAS), as well as ISO 14001 is a voluntary system. The rules of its operation establish the EMAS regulation. The purpose of this regulation is also continuous improvement the organisation in the field of environment and to provide relevant information to the public and other interested parties.
- Environmental Criteria and Certification Schemes:
    - **Ecolabel** - the aim is to promote products which have limited negative impacts on the environment compared with other products in the same group throughout the life cycle and contributes to the efficient use of natural resources while maintaining a high level of environmental protection.
    - **Eco-design** - energy-using product must consider environmental aspects in order to improve the environmental characteristics of energy-using products during the entire life cycle.
    - **Energy Star** - signs of energy efficiency for devices - participation in the Energy Star program is voluntary.
    - **EU Energy** – EU Energy is a labelling system which classifies products according to their energy efficiency. The framework of the energy labelling system regulates an EU Energy Directive. The purpose of this Directive is to enable the harmonization of national measures on the publication, particularly by means of labelling information on products such as the consumption of energy and other essential resources, and additional information concerning certain types of household appliances, thereby encouraging consumers to choose energy-efficient devices.

2. National legal frameworks

a. Relevant national laws regarding general obligations and procurement

Relevant national laws regarding general obligations and procurement were found in the selected countries, as detailed in the table below:

Fields	DE	SL	IT	PL	HR	CZ
Labour	3	-	-	-	-	-
Contracting	1	5	1	1	2	2
Financing	-	-	-	1	-	2
Information	-	6	-	6	6	1
Monitoring and Methodologies	-	1	-	-	3	-
International Affairs	-	-	-	-	1	-
Security	-	1	-	-	1	-
Total Relevant National Laws	**4**	**13**	**1**	**8**	**13**	**5**

Source: own elaboration

Contracting laws, referring to the regulatory frameworks, for either procurement documents or procurement procedures, are crosscutting to all countries. Moreover, these regulations enable contracting authorities to set out the adequate proceedings, documents, and timeframes for public procurement. The following example from Slovenia highlights the aforementioned:

- *Rules on the publication of contracts in the field of public procurement, concessions and public-private partnerships (Official Gazette No. 5/15)* (See Country Report of Slovenia, p. 8)

Information instruments are found cross-cutting in almost all cases, with greater emphasis in Slovenia, Poland, and Croatia. The main function of this type of instrument is to inform public opinion of the decision of the national government to implement new regulations and / or to modify or update regulations already in force regarding public procurement. The following example from Slovenia highlights the aforementioned:

Decision of the Government of the Republic of Slovenia on the award of public contracts by electronic auction dated 4 December 2014 (See Country Report of Slovenia, p. 8)

b. National threshold values

National threshold values were identified for Germany, Italy, Slovenia, and Croatia, as detailed in the sections below. In part, MS have stricter rules than required by EU law. National threshold values vary from country to country and they are set according to the national policy making and regulations within the framework allowed by EU law.

Germany

Below German threshold values, procurement law is purely budgetary ruling, and not legally visible. Thus, there is no legal protection quite like it is ruled in the Restriction of Competition Act (*Gesetz gegen Wettbewerbsbeschränkungen*, or GWB). Still, it is possible to go before civil courts and sue for damages or "temporary legal protection". On the other hand, above threshold values, there are

possibilities for review by supervisory authorities, such as a review of the decision of a procurement chamber by a high court (Public Procurement chamber at Oberlandesgericht); sofortige Beschwerde § 171 GWB).

If a tender goes beyond the European thresholds, it is still possible to have several "single bids" which do not exceed the threshold individually, which can be procured on a national level, if their estimated net worth is below EUR 80,000 for services and below EUR 1,000,000 for building/construction works and together they account for less than 20% of the entire order volume (so-called 20% contingent, § 3 Abs. 8 VgV). Moreover, all federal states have threshold amounts which allow the contracting authority to award a tender via restricted procedure with or without competition. On the other hand, all federal states that have threshold amounts which allow the contracting authority to award a tender directly without having to justify their decision ("freihändige Vergabe").

Italy

All tender procedures are regulated by the D.Lgs. 50/2016 (Public Contracts Regulation). There may be exceptions within regional laws of some regions with Political Autonomy in certain matters such as the autonomous Provinces of Trento and Bolzano.

Slovenia

The provisions of the Public Procurement Act (Official Gazette of the Republic of Slovenia, No. 91/2015, hereinafter: ZJN-3) do not apply in the general field to public procurement of goods, services or design competitions whose estimated value is less than EUR 20,000 without VAT, for public works contracts whose estimated value is less than EUR 40,000 excluding VAT and for public contracts, i.e. social and other specific services whose estimated value is less than EUR 750,000 excluding VAT, except for services covered by CPV code 79713000-5 that are the subject of the procurement, if their estimated value is or exceeds 20,000 excluding VAT.

The provisions of the ZJN-3 do not apply in the infrastructure area to public procurement of goods or services whose estimated value is less than EUR 50,000 excluding VAT for public works contracts whose estimated value is less than EUR 100,000 excluding VAT and for public procurement of social and other special services whose estimated value is less than EUR 1,000,000 exclusive of VAT, except for services covered by CPV code 79713000-5.

Croatia

National thresholds are the same throughout all of Croatia and they amount to 26,489 EUR (200,000 HRK) for goods and services and to 66,224 EUR (500,000 HRK) for works.

c. National rules for public procurement below the EU threshold value

National public procurement rules for values below EU thresholds were identified for Slovenia, Poland, Croatia, and the Czech Republic. Such values below EU thresholds are considered by contracting authorities as low-value contract procedures; their values vary from country to country. Slovenia and Croatia were selected examples to illustrate the variety of values found within the country reports.

Slovenia

The contracting authority may use a low-value contract procedure for public supply and service contracts with respect to which it is not obliged to send a contract notice to the Publications Office of the European Union, as described in the table below.

	General Field	Infrastructure Field
Public supply or service contracts	-	-
Public works contracts	≥ € 40.000 or < 500.000	≥ € 100.000 or < 1.000.000
Public service contracts	-	-

Source: own elaboration

In a low-value contract procedure, any economic operator may submit a tender in response to a call for competition.

Croatia

Procurements of a low-value are all those which amount from 26,489 EUR for goods and services and from 66,224 EUR for works. The procurement documentation must be delivered only to the Electronic Public Procurement Advertiser (EOJN). In open procurement procedures and in restricted procurement procedures, the deadline for the application delivery is 20 days from the delivery of the procurement documentation to the EOJN. In negotiation procedures with prior notion and competitive dialogue, the deadline for the application delivery is also 20 days from the delivery of the procurement documentation to the EOJN.

Legal claims of third parties against public contracting below threshold value

Legal claims of third parties against public contracting below threshold value were described in Slovenia, Italy, Poland, Croatia and the Czech Republic; it varies greatly from country to country, depending on the national legislative framework in place.

In Poland and Croatia, contracts with value below the threshold are not subject to the public procurement rules. In such cases, the contracting authority makes its own procurement rules and apply them accordingly; no third-party claim is admissible against the awarding of the contract.

In Italy, legal third-party claim is possible by filing an appeal to the Regional Administrative Court. In the Czech Republic, objections may be filed at the contracting authority.

Finally, in Slovenia legal protection from infringement in public procurement procedures shall be granted in:

- The pre-review procedure, which takes place before the contracting authority;
- The review procedure taking place before the National Commission for Reviewing Public Procurement Award Procedures (hereinafter: National Review Commission), and;
- Judicial proceedings at the first instance which take place at the district court, which is exclusively competent according to the act regulating courts (hereinafter: The Court).

d. National rules for high-value public procurement

National public procurement rules for values above EU thresholds were identified for Slovenia, Poland, Croatia, and the Czech Republic. Such values above EU thresholds are considered as procurement of high value; their values vary from country to country. Slovenia and Poland were selected examples to illustrate the variety of values found within the country reports.

Slovenia

Act shall apply to procurements with a value net of value-added tax (hereinafter VAT) estimated to be equal to or greater than the following thresholds:

	General Field	Infrastructure Field
Public supply or service contracts	€ 20.000	€ 50.000
Public works contracts	€ 40.000	-
Public service contracts	€ 750.000	€ 100.000

Source: own elaboration

Moreover, notices regarding public contracts whose value, net of VAT, is equal to or greater than the values referred to in paragraph 1 of the preceding Article shall be published by the contracting authority on the public procurement portal. Notices regarding public contracts whose value, net of VAT, is equal to or greater than the following values shall be published by the contracting authority on the public procurement portal and in the Official Journal of the European Union, as described in the table below:

	General Field	Infrastructure Field
Public supply or service contracts	€ 134.000	€ 414.000
Public works contracts	€ 5.186.000	5.186.000
Public service contracts	€ 750.000	€ 1.000.000

Source: own elaboration

In Slovenia, when the European Commission announces changes to thresholds for publications referred to in the preceding paragraph, the ministry responsible for public procurement shall publish the new European thresholds on its website within ten days of such an announcement.

Poland

The new regulation of the Prime Minister was published on 29 December 2015, on the value threshold of contracts and design contests which imposes an obligation for the dispatching of notices to the Publications Office of the European Union. The Regulation provides for the following EU thresholds, also applicable from 1 January 2016:

- for construction works regardless of the ordering: 5,225,000 EUR,
- for supplies and services:
    a) classical contracting: 135 000 EUR,
    b) sectoral contracting and in the fields of defence and security: 418 000 EUR,
    c) for other authorities: 209,000 EUR.

e. Other relevant aspects

Central, National, and Regional Databases for Public Procurement

National databases for public procurement could be found for Germany, Slovenia, Poland, and Croatia, as detailed below:

- Germany: https://www.dvtp.de/
- Slovenia: www.enarocanje.si
- Poland: www.portalzp.pl; www.przetargi.info; www.zamowienia20.pl.
- Croatia: https://eojn.nn.hr/oglasnik

Method of Lighting System Acquirement

Public procurement is used by Germany, Poland, and Croatia for Lighting System Acquirement. It is also the commonly used method of system refurbishments and repairs. Furthermore, in Croatia, public lighting is also acquired via public-private partnership (PPP) or Energy Service Company (ESCO).

Method	DE	SL	IT	PL	HR	CZ
Concession		X				
Public Procurement	X			X	X	
Public Tender			X			X
Public Private Partnership					X	

Source: own elaboration

Regarding public lighting acquisition, concessions are rare amongst the selected countries; nonetheless, in Slovenia, lighting systems are acquired 100% through the method of concessions.

C. Development of Lighting Facilities

The following section and its subsections on planning and authorization, refinancing sources/mechanisms, construction, and cost relevant aspects about dynamic public lighting in the studied countries. Moreover, it describes the relevant aspects in respect of law, the general planning process before official administrative processes begin, technical standards, the authorisation process, the role of land use plans, opportunities for public, civil and other stakeholders' participation in administrative processes, and the possibilities to review authorizations once they have been granted.

I. Planning and authorisation

1. Relevant legal aspects in respect of planning and authorisation

The table below summarises the relevant aspects of law regarding public lighting found within the studied countries. Crosscutting aspects are Infrastructure, Urban Development/Spatial Planning, and Energy. For most of the countries, Environment also seem to play a relevant role.

	DE	SL	IT	PL	HR	CZ
Economy		1				
Energy	1	4	4	1	2	
Environment		3	2	1	1	
Safety and Health					9	1
Contracting		1	2	2		
Standardisation					5	
Urban Development/Spatial Planning	1	1	1	2	4	
Infrastructure	2	1	4		2	3
Total relevant aspects	**4**	**12**	**13**	**6**	**23**	**4**

Source: own elaboration

Croatia shows a remarkable interest in two aspects, where other countries did not show much interest, namely: Safety and Health and Standardisation, as shown in the table above.

a. General Planning Process

The process is diverse in the studied cases. For each country, in the following subsections the public lighting planning process is summarized, and the key aspects for each country are mentioned accordingly.

Germany: dependent on existing lamps, mainly conversion and modification of the existing grid; power supply company is responsible for technical feasibility and implementation.

Slovenia: lighting operator is responsible for urban lighting development; road lighting is by law responsibility of municipalities; regional land planning determines the location of urban lighting

infrastructure; municipalities carry the cost from planning stages, they have annual budget for modernization of public lighting.

Italy: the responsible party for development of urban lighting is the municipality; the local public administration carries the cost from planning.

Poland: the municipality is responsible for the planning of the lighting of public places and municipal roads, county roads, provincial roads in the municipalities and their financing. Poland's case provides an interesting illustration of the division of responsibilities regarding the public lighting development, namely:

- Municipality: must ensure urban lighting;
- Road administration (municipal, national, district and provincial): during building or renovating roads must also build provisional lighting;
- Energy company: is obliged to generation, transmission, distribution and trading of energy through the own devices, road administration devices or devices that belong to the municipality.

Croatia: The Department of Municipal Services and the Department of Planning and European Funds are the responsible parties for the development of urban lighting, in accordance with professional standards and in accordance with legal regulations. The Administrative Department for Economy deals with development in terms of the technical improvements for existing urban lighting, and the Administrative Department for Planning oversees planning of new public lighting in empty construction areas. The location of urban lighting infrastructure is determined by the urban plan and the costs associated with urban planning are absorbed in the town's budget.

Czech Republic: Municipalities are mainly responsible for the development of urban lighting; the divisions of responsibility are dependent upon the owners of the urban lighting structures and systems; if new urban lighting is planned, the project must first be prepared and then it must be implanted into the spatial/municipal plan, with construction works finally coming at the end of the process; restoration of poles and street light luminaires are, unfortunately, often only renewed if their state is of disrepair (without any action plans or systematic solutions).

b. Authorisation

For all studied countries, the building permit was mentioned as the required permit for building lighting facilities and public lighting infrastructure.

In Germany, Poland and Croatia, there are also certain environmental requirements that lighting infrastructure developers need to fulfil for enabling the construction. In Germany, besides the environmental impact assessment of the lighting infrastructure, an emissions permit is also required. Similarly, in Croatia, before obtaining a building permit for public lighting, it is necessary to obtain an opinion on the acceptability of the ecological network and the confirmation of the project.

c. Land use

The relevance of the land use and spatial planning regarding public lighting and the development of lighting infrastructure is transversal to all the studied countries.

General land use plans define areas that are consistent with the economic, social, and environmental standards in a county or country, in accordance with the specific national spatial planning regulations for each studied country. Also, within the defined areas of a land use plan would be designated areas for grid development. If infrastructure is to be built on an area that is not already clearly defined in a land use plan, the necessary steps must be taken to change the plan to adapt to this.

When planning of lighting infrastructure development implies the use of private property, land use plans do not need to be changed. Private property is also susceptible to expropriation in cases where there a need for construction which is in the interest of the country. In these instances, property owners are reimbursed for the actual value of the land. The main financial risk involved with settling claims is, usually, the compensation of expropriated land.

2. Opportunities for public civil and other stakeholders' participation in the administrative process

Public participation opportunities are given by the respective national law in each studied country. Such processes are defined within the spatial planning and the environmental impact assessment procedures.

Thus, all interested citizens, groups or entities may be included in the planning process through the institution of a public debate on the draft of the physical plan. In general, the department of physical planning, environmental protection and construction of the municipality – or a similar entity depending on the local administrative structure – is responsible for ensuring public participation. The goal of encouraging participation is to create a better quality of physical plans that meet the interests of the wider circle of society. The main instrument in place that facilitates participation is public debates, usually encouraged and hosted by the municipality.

II. Construction

Construction process are always complex and face a great deal of obstacles. In the selected countries, different obstacles were mentioned and the vary depending on the country. For example, while financial were mentioned as the main barrier in Germany, spatial/municipal plans and environmental protection were mentioned as the main obstacles for building new infrastructure in the Czech Republic. Moreover, several other obstacles were mentioned in Italy and Poland; namely: bureaucratic, administrative, logistical, technical, procedural, installation, and chronological.

The case of Poland offers a very clear description of the building process, namely: 1) obtaining the appropriate permits; 2) excavations, ballasts and backfilling; and finally, 3) the laying and installation

of lighting cables, poles, and luminaires. In the studied countries, there are settled timeframes for the completion of construction and the duration of the works, which vary depending on the local building regulations. Moreover, their deadlines are specified in the contract established between the contracting authority, generally the municipality, and the contractor or investor.

III. Refinancing sources and mechanisms

Financing schemes for public lighting and the lighting infrastructure development vary amongst the studied countries. Two main financing schemes where found, namely:

- The municipality carries the costs arising from the construction of a permitted facility. The public service is financed by the municipal budget, funds acquired through the public for tenders, and other sources such as public-private partnerships. An additional way of incentivizing projects is subsidizing the renovation of public lighting. Such financing scheme exists in Slovenia and the Czech Republic.
- The costs arising from the construction of new facilities are carried by the contractor, and only the contractor or investor. There are also additional ways of financial support to incentivize investments such as project loans under favourable conditions as well as government subsidies on energy efficient lighting structures. Such financing scheme exists in Italy, Poland and Croatia, with an interesting difference, namely: in Poland and Croatia, the costs are not passed on to the end consumer, while in Italy they are.

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