

# Operational Delivery of EPCs in Europe – Case Study

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| Area of interest   | Croatia   |
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| Overview of Governance Model   | The Ministry of Physical Planning, Construction and State Assets (MPGI) is responsible for the implementation of the EPBD including EPCs, the ICS and accrediting independent experts. The Ministry of Economy, Market Inspectorate is responsible for ensuring EPCs are correctly advertised during the sale or lease of a building.   |
| Affordability  | The price of EPCs was capped at €1.5 / m <sup>2</sup> , but this requirement was removed in 2014 and the price is now controlled by the market. The average price for an EPC is reported at around 200 EUR for an apartment and 380 EUR for a house.  |
| Minimum qualifications, training and accreditation for EPC assessors | Assessors must have both specific higher education qualifications and at least five years of work experience in the profession or two years of work experience in design and/or expert construction supervision. They must then complete a two-week course, followed by a written and practical examination. Every year, assessors must attend eight-hours of training to upgrade their skills.   |
| Auditing, verification and QA  | As of October 1, 2017, EPCs can only be issued using the Information System of Energy Certificates (IEC). All EPCs go through administrative checks when uploaded to the EPC database. A random sample undergo more detailed checks, as well as EPCs which have received a complaint. Detailed checks are performed on the contents and accuracy of the EPC report, the input data, and the recommended energy efficiency measures. Assessors are penalised when EPCs are found to be invalid. Penalties include warnings, re-issue of the EPC at their own cost, and having accreditation revoked. Monetary fines are possible, but are rarely used in practice. |
| Enforcement  | If building owners fail to produce an EPC at the point of sale or rental, they can receive fines between 662 – 3,976 EUR.   |

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## Glossary and Abbreviations table

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| ECTS | European Credit Transfer and Accumulation System - a tool of the European Higher Education Area to make studies and courses more transparent and help the identification and recognition of Croatian academic qualifications internationally. Bachelor's degrees usually consist of 180 or 240 credits, and Master's degrees consist of 90 or 120 credits. |
| EPBD | Energy Performance of Buildings Directive  |
| EPC  | Energy Performance Certificate   |
| EUR  | Euro   |
| HRK  | Croatian Kuna  |
| ICS  | Independent Control System - EPBD requirement that Member States must allocate responsibility for upholding the quality of EPCs and their associated QA procedures. This can be allocated to a government department or to an external organisation.   |
| IEC  | Information System of Energy Certificates <a href="http://mgipu.hr">eEnergetskiCertifikat (mgipu.hr)</a>   |
| MS   | Member State (of the European Union)   |
| MPGI | Ministry of Physical Planning, Construction and State Assets   |

# 1 Introduction

## 1.1 Implementation of the EPBD and EPC regimes

The implementation of the Energy Performance of Buildings Directive (EPBD) in Croatia took place between 2005 and 2008 (Nahod & Šeledić, 2020). It is supported in legislation by the Building Act of 2013 and governed by the Ministry of Physical Planning, Construction and State Assets (MPGI). Annex IV of the EPBD outlines the requirement set in Article 27 for Member States to ensure that an Independent Control System (ICS) for EPCs is implemented. MSs are free to delegate responsibility for implementing the ICS as they deem fit (European Commission, 2015).

Ministry of Physical Planning, Construction and State Assets (MPGI) is responsible for the implementation of the EPBD in Croatia. Therefore, the MPGI is responsible for overseeing the execution and implementation of EPCs in Croatia, as well as overseeing the ICS<sup>1</sup> and accreditation of the experts permitted to carry out EPC assessments. As of January 2014, there is an obligation to indicate the energy class in the sales advertisements published in the media. Penalties are imposed by law both for owners and for authorised real estate brokers. Supervision of penalties is under the competence of the Ministry of Economy, Market Inspectorate. Governance of EPC implementation in Croatia is thought to work well<sup>2</sup>.

MPGI introduced an upgraded system for issuing EPCs in 2013, known as the Information System of Energy Certificates (IEC) (Regionalni, 2022; e-Citizens Information and Services, n.d.a)<sup>2</sup>. The IEC enables assessors to issue and store energy certificates and it ensures all EPCs are geo-referenced and identifiable (Regionalni, 2022)<sup>2</sup>. The system is thought to have improved EPC implementation, as it is comprehensive and enables access to the EPC database, information on authorised assessors, and information on education<sup>2</sup>. As of August 2022, over 100,000 EPCs have been issued in Croatia through IEC system, with up to 20,000 issued annually (Regionalni, 2022).

## 1.2 Issuing and pricing of EPCs in Croatia

In accordance with EPBD, Energy Performance Certificates (EPCs) are required for all buildings in which energy is required to maintain indoor temperatures (Nahod & Šeledić, 2020). EPCs must be issued for existing buildings when they are sold, rented, or leased, and for new buildings prior to a building permit being issued (Nahod & Šeledić, 2020). EPCs are valid for 10 years, and then must be reproduced at the point of sale or rental (Nahod & Šeledić, 2020).

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<sup>1</sup> The EPBD requires MSs to establish an ICS to verify a random selection of a statistically significant proportion of the EPCs issues annually (Build Up, 2020).

<sup>2</sup> Information obtained in an interview with an EPC expert in Croatia.

All types of buildings are required to have EPCs other than:

- Buildings used for holding religious ceremonies or religious activities
- Temporary buildings with usage term of two years or less, an industrial plant, workshop and a non-residential agricultural building with small energy needs
- Residential buildings that are used less than four months a year
- Free-standing buildings with a total usable area of less than 50 m<sup>2</sup>.

The price of EPCs is thought to be low in Croatia in comparison to other nations (Sayfekar & Jenkins, 2024). In 2010, the price of EPCs began to rise, due to a shortage of authorised assessors pushing prices up<sup>3</sup>. A price cap was introduced, in which the cost of EPCs was limited to no more than €1.5 / m<sup>2</sup> (BPIE, 2014). This price cap was removed in 2014 when the number of assessors rose, and the price is now well controlled by the market.<sup>3</sup> The average price for an EPC is thought to be around 200 EUR for an apartment and 380 EUR for a house (Balustrade Estates, n.d.)<sup>3</sup>.

## 2 Approach to Assessor Accreditation and Re-certification

The MPGI is responsible for upholding the accreditation process for EPC assessors in Croatia. They have established a series of requirements and pre-requisites which are necessary to become an accredited EPC assessor in Croatia. Croatia is thought to have some of the highest levels of education and experience requirements for EPC assessors in comparison to other MS (Sayfekar & Jenkins, 2024). It is thought that the high requirements for EPC assessors results in few invalid EPCs being submitted<sup>3</sup>.

There are a total of 1096 personnel authorised to perform EPC assessments in Croatia, and records are held by the MPGI in an official registry of EPC assessors within IEC<sup>3</sup>.

### 2.1 Pre-requisites for assessor accreditation

Assessors must have both specific higher education qualifications and at least five years of work experience in the profession or two years of work experience in design and/or expert construction supervision (Sayfekar & Jenkins, 2024)<sup>3</sup>.

There are different education requirements based on the type of buildings personnel will be authorised to assess. To carry out an EPC assessment for simple buildings of up to 400m<sup>2</sup>, assessors must have a post-graduate degree in any of the fields of (Nahod & Šeđedić, 2020):

- Architecture
- Civil engineering
- Mechanical engineering
- Electrical engineering.

Alternatively, they must have completed a specialist graduate professional programme in any of these fields to teach them the required knowledge and skills. The same requirements are in place for carrying out an EPC assessment for complex buildings, however assessors

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<sup>3</sup> Information obtained in an interview with an EPC expert in Croatia.

must also have achieved at least 300 European Credit Transfer and Accumulation System (ECTS) credits<sup>4</sup> (Nahod & Šeledić, 2020).

## 2.2 Assessor certification process

To become certified to carry out EPC assessments, assessors are required to participate in a two-week course, followed by an examination (Sayfekar & Jenkins, 2024). Attendees must complete the exam within 15 days of finishing the initial course, and must obtain at least 70% in each written section and complete a practical examination to pass (FESB University of Split, n.d.). The courses are only offered by institutions which are authorised by the MPGI, of which there are currently 7 distributed throughout Croatia<sup>5</sup>.

The authorised institutions offer two training modules:

- **Module 1** trains assessors to carry out EPC assessments for simple buildings (Nahod & Šeledić, 2020). The module has a duration of 40 hours and covers topics such as regulations, building physics, heating systems, and the methodologies and tools used to carry out EPC assessments (Nahod & Šeledić, 2020).
- **Module 2** trains assessors to carry out EPC assessments for complex buildings (Nahod & Šeledić, 2020). This module also has a duration of 40 hours, and builds upon Module 1 learnings with some more advanced topics, such as understanding complex heating and cooling systems (Nahod & Šeledić, 2020).

## 2.3 Requirements for re-certification

Once qualified, EPC assessors are obligated to attend mandatory training every two years in order to update their skills<sup>5</sup>. These training courses are carried out by the same 7 regionally distributed authorised institutions (Nahod & Šeledić, 2020). However, assessors are not required to undertake examinations again (Nahod & Šeledić, 2020). This training is usually 8 hours long and includes training on any new legislation or technical requirements and any technological progress relevant to the sector (Society of Civil Engineers Zagreb, n.d.). The training usually costs around 150 EUR (Society of Civil Engineers Zagreb, n.d.; FESB University of Split, n.d.). Assessors are reminded to undertake the mandatory training via notifications on their IEC portal, and if they do not complete the training within 6 months their access to the IEC system is revoked (meaning they cannot issue any EPCs)<sup>5</sup>.

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<sup>4</sup> The ECTS is a tool of the European Higher Education Area for making studies and courses more transparent, and helps individuals have their academic qualifications and study periods recognised internationally. Bachelor's degrees usually consist of 180 or 240 credits, and master's degrees consist of 90 or 120 credits. (European Commission, n.d.).

<sup>5</sup> Information obtained in an interview with an EPC expert in Croatia.

## 3 Auditing, Verification and Quality Assurance in the Production of EPCs

### 3.1 Approach to QA of EPCs

All EPCs are submitted via the IEC system, in which a digital form is filled out and automatically uploaded to the EPC database (Regionalni, 2022; Nahod & Šeledić, 2020). All issued EPCs undergo administrative checks when they are uploaded, to check for completeness (Nahod & Šeledić, 2020). Some EPCs are then randomly selected via the IEC platform for further checks, as well as EPCs that have received complaints from property owners (Nahod & Šeledić, 2020). Complaints can be sent to a dedicated email account at MPGI<sup>5</sup>.

The MPGI aims to check 40 EPCs per month, out of the 20,000 EPCs issued each year (around 0.2%)<sup>6</sup>. The detailed checks are carried out via authorised “legal persons” for independent control, of which there are currently 5 who are contracted via a publicly procured framework agreement on a yearly basis<sup>6</sup>. These authorised legal persons must have at least 2 full-time employees, both of which must have specific qualifications including Modules 1 and 2 of the EPC assessor training, have minimum three years’ experience, and have submitted at least 20 EPCs for complex buildings<sup>6</sup>. The detailed control checks are mostly desk-based, but individuals can arrange site visits if deemed necessary<sup>6</sup>. The process is thought to be complicated and time-consuming, which limits the number of EPCs that can undergo detail checks, but it ensures any errors in EPCs are identified<sup>6</sup>.

The individual carrying out the detailed control checks re-calculates the EPC from start to finish,<sup>6</sup> and includes checks on: (Nahod & Šeledić, 2020)<sup>6</sup>

- The contents of the EPC report
- The validity and completeness of the input data
- The accuracy of the EPC
- The measures recommended to improve energy efficiency.

EPCs are considered incorrect, and therefore invalid, for various reasons, including<sup>6</sup>:

- If the input data is more than 30% incorrect
- If the calculation results are more than 30% incorrect
- If the recommended energy measures are thought to be inadequate
- If the errors result in a change in one or more energy classes.

### 3.2 Approach to assessor infractions

When an EPC is declared invalid, the EPC assessor can be sanctioned by means of a fine or by annulment of authorisation in the case of three or more invalid EPCs.

While monetary fines are technically possible, these are not imposed in practice due to lack of resources within MPGI to action these processes (BPIE, 2014)<sup>6</sup>.

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<sup>6</sup> Information obtained in an interview with an EPC expert in Croatia.

## 4 Enforcement Mechanisms

For both existing and new buildings, EPCs must be obtained by the building owner prior to selling, renting, or leasing the building (or parts of the building), and it then must be passed to the buyer, tenant, or leaser<sup>7</sup>. This practice is mostly enforced through reports of malpractice, though inspectors can also check if EPCs were presented after the buying, renting or leasing process<sup>7</sup>. The Ministry of Economy, Market Inspectorate, are responsible for ensuring this practice is upheld across the nation (Škoro, 2018). As of January 2014, sale advertisements published in the media must also display the building energy class<sup>7</sup>.

The law imposes monetary penalties for building owners who fail to provide an EPC at the time of selling, renting, or leasing a building. Penalties can also be imposed if the building owner fails to deliver the EPC to the buyer, or if they fail to display the building's energy class in a sale advertisement published in the media (Nahod & Šelendić, 2020)<sup>7</sup>. Real estate brokers are also liable for fines if EPC ratings are not advertised correctly.<sup>7</sup> Fines are between 200 EUR and 400 EUR<sup>7</sup>, and were introduced in 2014 for building sellers and 2016 for those renting or leasing their building (StanGRAD, n.d.).

It is thought that building owners are aware of the benefits of an EPC, including the requirement of an EPC for accessing funding for energy efficiency measures<sup>7</sup>. Obligations are thought to be commonly followed<sup>7</sup>.

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<sup>7</sup> Information obtained in an interview with an EPC expert in Croatia.



## 5 Conclusions

- The MPGI removed the price-cap which was previously implemented to ensure the cost of EPCs was not too high for building owners, but EPCs are still considered affordable in Croatia. The growing number of EPC assessors resulted in costs decreasing, and costs are now adequately controlled by the market.
- Croatia has very high requirements for EPC assessors, and findings suggest this has resulted in few invalid EPCs being submitted. EPC assessors must have specific educational qualifications, undergo approved training courses and pass an examination before accreditation. Training programmes are carried out by organisations that are authorised by the governmental body responsible for EPBD implementation (MPGI). Assessors must attend re-training every two years to ensure their skills are up to date, and are unable to carry out EPC assessments if they delay this training by more than six months.
- The EPC database system (IEC) checks all EPCs for completeness. The MPGI have authorised 5 organisations to carry out further detail checks on around 0.2% of submitted EPCs. These are randomly selected from the EPC database system or are in response to complaints from building owners. Assessors can face penalties for submitting multiple invalid EPCs, including suspension of accreditation. The process of the detailed checks is very thorough, although this means that the authorised organisations are limited in how many EPCs they can perform detailed checks for. However, few EPCs are found to be invalid so this is not considered a problem.
- Compliance with the requirement to present an EPC at the point of sale/rental is thought to be very high, as the benefits of EPCs are well understood. Further, EPCs are required for building owners to obtain any funding for energy efficiency measures. Building owners can face monetary fines for not holding a valid EPC at the point of sale or rental. Real estate brokers can also face fines for incorrectly advertising EPCs for buildings for sale or rental. However, as compliance is thought to be high no monetary fines have yet been imposed.

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