LIFE HYPOBRICK

Towards hypocarbonic economy.

Development of non-fired building materials based on wastes

Action A.1. Monitoring of environmental and administrative legislation

DA1.1. List of legal requirements that can affect the project implementation

Version 2

Due date: 21/02/2020 **Delivery Date**: 31/03/2020

Author(s): Javier García (ITC-AICE), Salvador Gomar (ITC-AICE), Félix Kugler (THN), Wolfgang Krcmar (THN), J.J. Santos (RCS)

Editor: Javier García (ITC-AICE)

Lead Beneficiary of Deliverable: RCS

Dissemination level: Public

Nature of the Deliverable: Report

Internal Reviewers: Rebeca Domínguez (ITC-AICE), Mónica Vicent (ITC-AICE), Magda Lorente (ITC-AICE)

This project is financed by the LIFE Programme 2014-2020 of the European Union for the Environment and Climate Action under the project number LIFE18/CCM/ES/001114.

VERSIONING (ONLY MAJOR VERSIONS)			
VERSION	**DATE**	**NAME, ORGANISATION**	**DESCRIPTION OF THE NEW VERSION**
v1	21/02/2020	ITC-AICE	First draft
v2	10/03/2020	ITC-AICE, RCS, THN	Final version

LIFE HYPOBRICK Key Facts

Project title	Towards hypocarbonic economy. Development of non-fired building materials based on wastes.
Starting date	01/10/19
Duration in months	36 months
Call (part) identifier	LIFE18 CCM/ES/001114
Topic	Climate Change
Consortium	Spain and Germany

LIFE HYPOBRICK Consortium Partners

	Partner	Acronym	Country
1	ASOCIACIÓN DE INVESTIGACIÓN DE LAS INDUSTRIAS CERÁMICAS	ITC-AICE	Spain
2	LADRILLOS MORA, S.L.	MORA	Spain
3	RECYCLING, CONSULTING AND SERVICES, S.L.	RCS	Spain
4	SCHLAGMAN POROTON GMBH & Co.KG	SCH	Germany
5	TECHNISCHE HOCHSCHULE NUERNBERG GEORG SIMON OHM	THN	Germany

Disclaimer: LIFE HYPOBRICK is a project co-funded by the European Commission under Grant Agreement Number LIFE18 CCM/ES/001114.

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Executive summary

Deliverable DA1.1 deals with the legal requirements than can impact or limit the project realisation and implementation. These regulations can be divided in 2 groups, technical and environmental regulations, and 3 different levels have been analysed: European, national (Spain and Germany) and regional (Castilla la Mancha and Bavaria regions).

Due to the novelty of the products to be developed in LIFE HYPOBRICK project, no specific technical regulations for alkaline activated products exist nowadays. For this reason, the technical regulations used for clay masonry ceramic bricks will be taken as a reference for evaluating the suitability of the products to be developed during the project.

Technical regulations for bricks are defined at European and national levels. The European standard EN 771-1:2011 + A1:2015. “Specification for masonry units - Part 1: Clay masonry units” is the basis for all the regulations applicable to building products. This standard defines the type of ceramic bricks, their requirements and testing procedures to be used when the main application are protective and unprotective masonry. In addition, the CE marking regulation specifies the requirements for the marketing of the building products in the European Union.

Regarding the national regulation, the Technical Building Code “Código Técnico de la Edificación, CTE” is the frame that stablish the requirements to be accomplished by the Spanish building products in relation to the basic safety and habitability requirements. In Germany is regulated by the general building inspectorate approval “Allgemeine bauaufsichtliche Zulassung abZ” that is the frame that stablish the requirements to be accomplished by the building products.

Finally, the product certifications in each country are regulated by the N Mark "Marca N" in Spain and the Matching Certificate “Ü-Mark, Übereinstimmungs-Zertifikat” in Germany.

With respect to the environmental regulations, since the new building product to be produced in the HYPOBRICK project will be based on waste, there are some regulations at European, national and regional level that could affect the project implementation. The type of waste to be used and its classifications plays an important role in the way it must be storage, transported and used.

At European level the waste management framework is stablished in the Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste. This Directive has been transposed into the national (Spanish and German) law by the publication of the relevant national regulations. At regional level, different procedures, regulations and licences are stablished for the waste management.

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1 Technical regulations for the commercialisation of the products produced in the HYPOBRICK Project

1.1 Introduction

There are 3 types of technical regulations that may affect the marketing of bricks manufactured under the LIFE HYPOBRICK project:

- European standards (EN), specifications and testing procedures. These standards are voluntary but are usually accomplished by manufacturers due to market requirements. Tests are usually carried out in-house.
- Regulations. They are compulsory to accomplish by the manufacturers:
    - European regulations: CE marking. Through the European Regulation of the Building Products (Nº 305/2011) the requirements for the marketing of the building products are established.
    - National regulation. In Spain is regulated by the Technical Building Code “Código Técnico de la Edificación, CTE” that is the frame that stablish the requirements to be accomplished by the building products in relation to the basic safety and habitability requirements. In Germany is regulated by the general building inspectorate approval “Allgemeine bauaufsichtliche Zulassung abZ” that is the frame that stablish the requirements to be accomplished by the building product. For this purpose, all important aspects are checked, especially the safety-related properties and influences.
- Product certifications in each country. It is voluntary and in Spain it is called N Mark "Marca N". It implies the compliance with European product standards and additional requirements. In Germany it is called Matching Certificate or Ü-Mark (“Übereinstimmungs-Zertifikat”). It implies the compliance with European product standards and additional requirements and is subject to factory production monitoring and external monitoring.

1.2 European standards (EN), specifications and testing procedures

The European standard EN 771-1:2011 + A1:2015. “Specification for masonry units - Part 1: Clay masonry units” define the type of ceramic bricks, their requirements and testing procedures to be used when the main application are protective and unprotective masonry.

The standard includes the following terms and definitions:

- **Clay masonry unit:** Unit for masonry made up of clay or other clayey materials with or without sand, fuel or other additives, fired at a high enough temperature to reach the ceramic bonding.
- **Protective masonry:** Masonry that is protected against water penetration and is not in contact with the ground or groundwater.
- **Unprotective masonry:** Masonry which may be exposed to rain, ice/thaw and/or may be in contact with the ground and groundwater without adequate protection.
- **Unit P:** Fired clay unit to be used in protective masonry.
- **Unit U:** Fired clay unit to be used in unprotective masonry.

The manufacturer must declare if the unit complies with the requirements defined for Unit P or for Unit U. Table 1 details the technical characteristics and test procedures for assess those characteristics, according to the type of unit, P or U.

Table 1. Technical characteristics included in EN 771-1:2011 + A1:2015

Characteristic		Test procedure	Unit P	Unit U
Dimensions, dimensional tolerances		EN 772-16	X	X
Flatness of the supporting faces		EN 772-20	X	X
Parallelism of the supporting faces		EN-772-16	X	X
Configuration	Wall thicknesses	EN-772-16	X	X
	Percentage of voids	EN-772-3	X	X
	Volume of the largest hole	EN-772-9	X	X
	Combined thickness of dividers	EN-772-16	X	X
Density		EN-772-13	X	X
Compressive strength		EN-772-1	X	X
Thermal properties		EN 1745	X	X
Water vapour permeability		EN 1745	X	X
		or EN ISO 12572	X	X
Durability against freeze/thaw		EN 772-22	X (1)	X
Water absorption	External elements	EN 772-21		X
	Anti-capillarity barriers	EN 772-7		X
Initial water absorption rate		EN 772-11		X
Moisture Expansion		EN-772-19	X (1)	X (1)
Active soluble salts content		EN 772-5		X
Reaction to fire		EN 13501-1	X	X
Adhesion resistance	Tabulated value	Annex C EN 998-2:2010	X	X
	Test value	EN 1052-3	X	X
Dangerous substances		-	X (1)	X (1)

(1) To be declare according to national standard/regulation

The code and title of the standards and, in some of them, some aspects of interest are detailed below.

1.2.1 Dimensions and tolerances

- Dimensions: EN 772-16:2011. “Methods of test for masonry units - Part 16: Determination of dimensions”.
- Dimensional tolerances:
    - Tolerances: EN 772-16:2011. “Methods of test for masonry units - Part 16: Determination of dimensions”.
    - Flatness of the supporting faces: EN 772-20:2000 and EN 772-20:2000/A1:2005. “Methods of test for masonry units - Part 20: Determination of flatness of faces of masonry units”.

- Parallelism of the supporting faces: EN 772-16:2011. “Methods of test for masonry units - Part 16: Determination of dimensions”.

1.2.2 Configuration

EN 1996-1-1:2005+A1:2012. “Eurocode 6 - Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures”.

EN 1996-1-2:2005 and EN 1996-1-2:2005/AC:2010. “Eurocode 6 - Design of masonry structures - Part 1-2: General rules - Structural fire design”.

EN 772-16:2011. “Methods of test for masonry units - Part 16: Determination of dimensions”.

EN 772-9:1998 and EN 772-9:1998/A1:2005. “Methods of test for masonry units - Part 9: Determination of volume and percentage of voids and net volume of clay and calcium silicate masonry units by sand filling”.

EN 772-3:1998. “Methods of test for masonry units - Part 3: Determination of net volume and percentage of voids of clay masonry units by hydrostatic weighing”.

1.2.3 Density

EN 772-13:2000. “Methods of test for masonry units - Part 13: Determination of net and gross dry density of masonry units (except for natural stone)”.

1.2.4 Compressive strength

EN 772-1:2011+A1:2015. “Methods of test for masonry units - Part 1: Determination of compressive strength”.

1.2.5 Thermal properties

EN 1745:2012. “Masonry and masonry products - Methods for determining thermal properties”. As an alternative, the dry bulk density or dry absolute density and the configuration can be provided.

1.2.6 Durability against freeze/thaw

EN 772-22:2018. “Methods of test for masonry units - Part 22: Determination of freeze/thaw resistance of clay masonry units”. Also declare the type of exposure: passive (F0), moderate (F1) or severe (F2).

1.2.7 Water absorption

- External elements: EN 772-21:2011. “Methods of test for masonry units - Part 21: Determination of water absorption of clay and calcium silicate masonry units by cold water absorption”.
- Anti-capillarity barriers: EN 772-7:1998. “Methods of test for masonry units - Part 7: Determination of water absorption of clay masonry damp proof course units by boiling in water”.

1.2.8 Initial water absorption rate

EN 772-11:2011. “Methods of test for masonry units - Part 11: Determination of water absorption of aggregate concrete, autoclaved aerated concrete, manufactured stone and natural stone masonry units due to capillary action and the initial rate of water absorption of clay masonry units”.

1.2.9 Active soluble salts content

EN 772-5:2016 and EN 772-5:2016/AC:2017. “Methods of test for masonry units - Part 5: Determination of the active soluble salts content of clay masonry units”.

1.2.10 Moisture expansion

EN 772-19:2000. “Methods of test for masonry units - Part 19: Determination of moisture expansion of large horizontally perforated clay masonry units”.

1.2.11 Reaction to fire

- Samples containing ≤ 1% (by mass or volume) of organic content: CLASS A1. No need for testing.
- Parts containing >1% (by mass or volume) of organic content. EN 13501-1:2007+A1:2009 and EN 13501-1:2018. “Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests”.

1.2.12 Permeability to water vapour

EN 1745:2012. “Masonry and masonry products - Methods for determining thermal properties”.

EN ISO 12572:2016. “Hygrothermal performance of building materials and products - Determination of water vapour transmission properties - Cup method (ISO 12572:2016)”.

1.2.13 Adhesion resistance

EN 1052-3:2002 and EN 1052-3:2002/A1:2007. “Methods of test for masonry - Part 3: Determination of initial shear strength”.

EN 998-2:2010. “Specification for mortar for masonry - Part 2: Masonry mortar (Superseded standard)”.

1.2.14 Dangerous substances

When building products are marketed in countries where national regulations on dangerous exist, such regulations may require verification and declaration of the emission, and sometimes content, of certain substances. In the absence of harmonised European test methods, the verification and declaration of the emission/content should be done considering national regulations at the place of use.

1.3 CE Marking

On 4th April 2011, regulation (EU) No 305/2011 of the European Parliament and of the Council of 9th March 2011 laid down harmonised conditions for the marketing of building products and was published in the Official Journal of the European Union (OJEU).

The harmonised standard for fired clay units is EN 771-1:2011+A1:2015. Annex ZA of this standard sets out the conditions for CE marking of fired clay units for masonry for the intended uses indicated in table 2.

Table 2. Essential characteristics. Standard EN 771-1:2011 + A1:2015. Annex ZA

Essential Characteristics	**Product: Clay masonry P units.** **Intended use: In protected masonry walls, columns and partitions**	**Product: Clay masonry U units.** **Intended use: In unprotected masonry walls, columns and partitions**
Dimensions and dimensional tolerances (1)	Declared value in mm, and tolerance category	
Configuration (1)	Declared configuration as illustrated or described	
Compressive strength (1)	Declared value, in N/mm^2 (with indication of direction of load and unit category)	
Dimensional stability (1)	Declared value of moisture movement, in mm/m	
Bond strength (1)	Fixed value or declared value of initial shear strength, in N/mm^2	
Active soluble salts content (1)	Declared value of active water-soluble salts content	Declared value of active water-soluble salts content on

	on the basis of technical class S0	the basis of technical classes S0, S1, S2	
Reaction to fire (2)	Declared reaction to fire Class A1 to F		
Water absorption (3)	Declared text: "Not to be left exposed"	External elements	Declared value in %
		Damp proof courses	
Water vapour permeability (4)	Declared value (tabulated water vapour diffusion coefficient)		
Direct airborne sound insulation (in end conditions) (density and configuration) (5)	Declared value of gross dry density in kg/m^3 and tolerance category and declared configuration as illustrated or described		
Thermal resistance (density and configuration) (6)	Provided value of thermal conductivity ($\lambda_{10,dry,}$unit value) in W/mK, and means of evaluation used or density and configuration		
Durability against freeze/thaw	Declared text: "Not to be left exposed" or declared value (7)	Intended exposure and declared value of freeze/thaw resistance (7)	
Dangerous substances (8)	-		

(1) For units intended to be used in elements subject to structural requirements

(2) For units intended to be used in elements subject to fire requirements

(3) For units intended to be used in damp proof courses or in external elements with exposed face

(4) For units intended to be used in external elements

(5) For units intended to be used in elements subject to acoustic requirements

(6) For units intended to be used in elements subject to thermal insulation requirements

(7) As requested by assessment method used

(8) National regulations

1.4 National Regulation

1.4.1 Spanish regulation. Technical Building Code (Código técnico de la edificación, CTE)

In Spain, the CTE defines the requirements to be met by building materials according to their intended use. The technical characteristics of the products are determined by means of the tests defined in the European standard EN 771-1:2011 + A1:2015. "Specification for masonry units - Part 1: Clay masonry units".

1.4.2 German regulation. General building inspectorate approval (Allgemeine bauaufsichtliche Zulassung, abZ)

In Germany, the abZ can only be issued by the German Institute for Building Technology "Deutsches Institut für Bautechnik DIBt". The abZ defines the requirements for the building product, in particular, safety-related properties and influences. The technical characteristics of the products are determined by means of the tests defined in the European standard EN 771-1:2011 + A1:2015.

1.5 Product certification

1.5.1 Spanish certification. N Mark

In Spain it is possible to certify fired clay units with the AENOR N mark. The regulations of the AENOR N mark for units of fired clay for masonry are:

- RP 34.01. Revision 21. Regulation of the AENOR N mark for U type fired clay units for unprotected masonry.
- RP 34.14. Revision 10. Regulation of the AENOR N mark for P type fired clay units for protected masonry.

AENOR mark for these types of units is a compliance mark of the product with UNE-EN 771-1:2011+A1:2016 and with the additional requirements included in both regulations.

The additional test methods described in the Regulations are described in table 3.

Table 3. Addition technical characteristics. Specific regulations 34.01 y 34.14

Characteristic		Test procedure	P units	U units
Thermal properties	Finite elements	Software		X
	Finite elements	UNE 136021	X	
	Tabulated value	Catalogue of building elements (CTE)	X	X
	Tabulated value	UNE-EN 1934	X	
Durability against freeze/thaw		UNE 67028 EX		X
Moisture expansion		UNE 67036	X	X
Aspect and structure		Sections 3 and 4.2 RP 34.01 and 34.14 AENOR	X	X
Chips		UNE 67039 EX	X	X
Mass		Annex D RP 34.01 and 34.14 AENOR	X	X
Efflorescence		UNE 67029 EX		X
Coloration		Annex D RP 34.01 AENOR		X

Below is briefly description of some aspects of interest for each of the characteristics are detailed:

1.5.1.1 Thermal properties.

UNE-EN 1934: 1998. “Prestaciones térmicas de edificios. Determinación de la resistencia térmica por el método de la caja caliente utilizando el medidor de flujo de calor. Albañilería”.

UNE 136021:2019. “Método de cálculo por elementos finitos para determinar la transmitancia térmica de muros de fábrica de piezas de arcilla cocida”.

1.5.1.2 Duration against freeze/thaw

EN 772-22:2018. “Methods of test for masonry units - Part 22: Determination of freeze/thaw resistance of clay masonry units” and UNE 67028:1997 EX. “Ladrillos cerámicos de arcilla cocida. Ensayo de heladicidad”. Coexist at present.

1.5.1.3 Moisture expansion

UNE 67036:1999. “Productos cerámicos de arcilla cocida. Ensayo de expansión por humedad”.

EN 772-19:2000. “Methods of test for masonry units - Part 19: Determination of moisture expansion of large horizontally perforated clay masonry units”.

1.5.1.4 Aspect and structure

Sections 3 and 4.2 RP 34.01 and 34.14 AENOR.

1.5.1.5 Chips

UNE 67039:1993 EX. “Productos cerámicos de arcilla cocida. Determinación de inclusiones calcáreas”.

1.5.1.6 Mass

Annex D RP 34.01 y 34.14 AENOR

1.5.1.7 Efflorescence

UNE 67029:1995 EX. “Ladrillos cerámicos de arcilla cocida. Ensayo de eflorescencia”. Standard cancelled.

1.5.1.8 Coloration

Annex D RP 34.01 AENOR.

1.5.2 German Certification. Ü-Mark

In Germany there is the Matching Certificate or Ü-Mark (“Übereinstimmungs-Zertifikat”). It implies the compliance with European product standards and additional requirements and is subject to factory production monitoring and external monitoring and their compliance.

2 Environmental regulations for the waste management, manufacturing and commercialisation of the products produced in the HYPOBRICK Project

2.1 Introduction

Due to the fact that the building product to be produced in the HYPOBRICK project will be based on waste, there are some regulations at European, national and regional level that could affect the project implementation. Some of these regulations are linked to the type of waste to be used (Table 4).

Table 4. Typologies of the waste to be used in the HYPOBRICK project

Waste	Classification		LoW code
Cathodic X-Ray tube glass (CRTWG) panel	Non-hazardous	Absolute non-hazardous	19 12 05
Cathodic X-Ray tube glass (CRTWG) funnel	Hazardous	Mirror hazardous (MH) entry	19 12 11*
Fly ashes from thermal power plants (FA)	Non-hazardous	Absolute non-hazardous	10 01 02
Plastic from electric and electronic equipment (WEEE)	Inert	Absolute non-hazardous	19 12 04
Fired scraps from the brick production (BR)	Inert	Absolute non-hazardous	10 12 08
Paper sludge (de-inking sludges from paper recycling)	Non-hazardous	Absolute non-hazardous	03 03 05
Construction and demolition waste (CDW) (mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06)	Non-hazardous	Mirror non-hazardous (MNH) entry	17 01 07

2.2 European frame framework for waste management

At European level there are 71 consolidated legal documents linked to the waste management and clean technologies (15.10.30.30). These documents are classified according to the type of normative document in the following groups: Decision (34), Regulation (13), Directive (12), Implementing decision (4), Decision (4), Delegated Decision (1) and Implementing Regulation (3).

From the point of view of the implementation of the project results, the waste management framework directive is as follows:

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

2.3 National regulations

2.3.1 Spain

This Directive has been transposed into the national (Spanish) law by the publication of the following basic regulations:

- Royal Decree-Law 17/2012 of 4th May on urgent environmental measures.
- Law 5/2013, of 11th June, that modified Law 16/2002, of 1st July, on integrated pollution prevention and control and Law 22/2011, of 28th July, on contaminated waste and soil.
- Law 11/2012, of 19th December, on urgent environmental measures.
- Law 10/1998, of 21st April, on waste.

- Law 22/2011, of 28th July, on waste and contaminated soils.

All these documents are available at: https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/legislacion/buscador-estatal.aspx?cat3=2

On the other side, the basic regulations are complemented with an abundant transversal normative, that are not directly applicable to the project implementation.

The type of waste to be used becomes important in the project because it gives rise to different environmental requirements. Specifically, three different types of waste will be used in this project: inert, non-hazardous and hazardous. Each of these categories has specific regulations in this area.

Inert waste:

a) Plastic from electric and electronic equipment (WEEE)

- Royal Decree 110/2015 of 20th February on waste electrical and electronic equipment.
- Royal Decree 219/2013 of 22nd March on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Royal Decree 208/2005, of 25th February, on electrical and electronic equipment and the management of its waste.

b) Fired scraps from the brick production (BR)

- No specific legislation is available, so it is regulated by the general legislation.

Non-hazardous waste:

a) Cathodic X-Ray tube glass (CRTWG) panel

- No specific legislation is available, so it is regulated by the general legislation.

b) Fly ashes from thermal power plants (FA)

- No specific legislation is available, so it is regulated by the general legislation.

Hazardous waste:

a) Cathodic X-Ray tube glass (CRTWG) funnel. No specific legislation is available, so it is regulated by the general legislation for hazardous waste, that is the following:

- Royal Decree 255/2003 of 28th February 2003, which approves the regulation on the classification, packaging and labelling of hazardous preparations.
- Royal decree 1802/2008, of 3rd November, which modifies the Regulation on the notification of new substances and the classification, packaging and labelling of dangerous substances, approved by Royal Decree 363/1995, of 10th March, in order to adapt its provisions to Regulation (EC) Nº 1907/2006 of the European Parliament and of the Council (REACH Regulation).
- Royal Decree 363/1995, of 10th March, approving the Regulation on the notification of new substances and the classification, packaging and labelling of hazardous substances.
- Royal Decree 952/1997, of 20th June, which modifies the Regulation for the execution of Law 20/1986, of 14th May, basic toxic and hazardous Waste, approved by Royal Decree 833/1988, of 20th July.
- Royal Decree 717/2010, of 28th May, which modifies Royal Decree 363/1995, of 10th March, which approves the regulation on the classification, packaging and labelling of hazardous substances and Royal Decree 255/2003, of 28th February, which approves the regulation on the classification, packaging and labelling of hazardous preparations.
- Resolution of 28th April 1995, of the Secretariat of State for the Environment and Housing, by which the agreement of the Council of Ministers of 17th February 1995 approving the National Plan for Hazardous Waste was published.

- Royal Decree 258/1989, of 10th March, establishing the general regulations on the dumping of hazardous substances from land into the sea.
- Royal Decree 1416/2001, of 14th December, on packaging of phytosanitary products.
- Royal Decree 833/1988, of 20th July, approving the Regulations for the execution of Law 20/1986, Basic Toxic and Hazardous Waste.

2.3.2 Germany

In Germany, the landfill ordinance applies, which regulates the landfill law for mineral waste. In Germany, landfills must be built, operated and monitored in accordance with the Landfill Ordinance. It defines landfill classes (DK), from which follow different requirements for operation and, in particular, for decommissioning and aftercare. The structure of the landfill is decisive for determining the landfill class. The waste is analysed and, depending on the load, deposited in the respective landfill class. The landfill ordinance provides for five landfill classes for above-ground disposal depending on the danger of the waste to be deposited as follows:

- DK 0 - Above-ground landfill for inert waste.
- DK I and DK II - These are landfills for "non-hazardous waste", including treated household and commercial waste, industrial waste and storage materials without special monitoring requirements.
- DK III - Above-ground landfill for "hazardous" waste.
- DK IV – Underground landfill for dangerous waste.

2.4 Regional regulations

2.4.1 Region of Castilla La Mancha

At regional level, there is no legislative development on this subject in Castilla La Mancha, the Autonomous Community in which Ladrillos Mora is located, with the exception of the regulation regarding the need of carrying out communications prior to the start of the activity by producers, transporters, agents and dealers, and the obtaining of an authorisation for the companies, natural or legal persons wishing to carry out waste treatment operations. This regulation can be found in:

https://www.castillalamancha.es/gobierno/desarrollosostenible/estructura/vicmedamb/actuaciones/residuos

Once the necessary formalities have been carried out, the data on producers, managers and carriers will be included in the Register of Waste Production and Management, which depends on the Vice-Ministry of the Environment, where they can be consulted by all those who are interested.

Some other documental requirements are need, all of them are available via webpage:

- Registration of Production and Waste Management (Registro de Producción y Gestión de Residuos).
- Authorization of Waste Treatment Operations. The authorisation to carry out waste treatment operations must be requested to the Vice-Ministry of the Environment of Castilla la Mancha, depending on the type of waste to be managed (Autorización de Operaciones de Tratamiento de Residuos)
- Transmission of the waste manager's authorisation.
- Review of the authorisation for the management of waste electrical and electronic equipment.
- Castilla-La Mancha Waste Production and Management Registry.
- Information on waste: application ACRO for Waste Producers and INDA (Environmental Data Exchange) for treatment of waste.

2.5 Requirements to be fulfilled for the implementation of the project results

The environmental legislation applicable to the use of secondary raw materials classified as waste implies the need to cover certain environmental requirements. These requirements can be divided into documentary, technical and communication requirements.

2.5.1 Spanish case. Castilla la Mancha (Ladrillos Mora)

According to the available information, the requirements that Ladrillos Mora should fulfil are the followings:

- To obtain an authorisation for the facilities in which waste management operations are conducted. An application, payment of fees and registration in the Registry of Production and Waste Management is required.
- Registration in the Castilla-La Mancha Waste Production and Management Register.
- Annual submission of the waste treatment summary report.

Currently **Ladrillos Mora, S. L., that does not have** the authorisation for the waste management in its Integrated Environmental Authorisation (File number: AAI-TO-007). In this case it is necessary to obtain the authorisation to be waste manager and register in the register of waste managers, carrying out the procedures explained above.

However, Ladrillos Mora, S. L. has the Cod. NIMA: 4500000214. (Waste Management) for the following waste:

- 170504. Soil and stones other than those specified in code 170503
- 191209. Minerals (e.g. sand, stones)

It also has the code NIMA: 4520410508 as a Waste producer.

On the other side, **for conducting the activities included in the project life-span (i.e. industrial trials)**, it is not necessary to have this authorisation, due to the Law 16/2002, for the integrated prevention and control of the contamination specifies the following:

Article 2. Scope of application. Without prejudice to the provisions of the fifth final provision, this Law shall be applicable to public or private facilities in which any of the industrial activities included in the categories listed in Annex 1 are carried out, with the exception of facilities or parts thereof used for research, development and the testing of new products and processes.

2.5.2 German case. Bayern. (Schlagmann)

In Bavaria there is an extra landfill Ordinance, called LAGA-Verordnung (LAGA = Länder-Arbeitsgemeinschaft Abfall). For Bavaria in particular, this regulates that mineral waste materials may be filled into pits and quarries according to following classification criteria (Zertifizierungsklassen: Z0; Z1; Z2)

- Z0: unlimited installation.
- Z1: restricted open installation.
- Z2: restricted installation with defined technical safety measures.