

UNESCO WORLD HERITAGE SITES AND RENEWABLE ENERGIES IN SPAIN: CURRENT TRENDS IN THE LEGISLATIONS

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Summary: Renewable energies, in particular wind power, represent a large part of the energy production in Spain. At the same time, Spain hosts a large number of UNESCO World Heritage Sites. Although the development of renewable energies represents a necessity, the installations often have a great impact on the landscape. In the case of an impact of these installations on UNESCO World Heritage Sites, a conflict might arise if the UNESCO World Heritage Committee considers this impact as a threat to the UNESCO World Heritage Site in question. In this context, the legislations on heritage protection, nature conservation and renewable energies should regulate this kind of possible situation in order to avoid potential conflicts. This article aims at offering an overview of the current trends in these three legislations (heritage protection, nature conservation, renewable energies) in Spain at the national and regional levels. In order to conduct this research a legal in-depth analysis of the legislations at national and regional levels has been implemented. The results show a great disparity among the autonomous communities legislations and also between the national level and the regional level. Finally, some recommendations are elaborated upon the most advanced legislations.

Introduction

Spain hosts a large number of UNESCO World Heritage Sites. At the same time, renewable energy infrastructures, in particular wind power, have been proliferating all over Spain during the last 15 years. Although the development of renewable energies represents a necessity, the installations often have a great impact on the landscape. The nomination of World Heritage cultural sites, natural sites, and mixed sites since 1972 as defined in the World Heritage Convention and in the Operational Guidelines implies the protection of their authenticity, integrity and Outstanding Universal Value in order to ensure their transmission to the future generations. Furthermore, the introduction of the cultural landscapes in 1992 as a new category of sites to be nominated as World Heritage broadens the scope of the World Heritage Convention to the protection of landscapes as well. Once inscribed on the UNESCO World Heritage List, these sites are submitted to a legal protection at international and national levels. Consequently, any development project having an impact on them – including the installation of renewable energies – shall be regulated in the corresponding legislations.

Study Area

Situation with world heritage protection and renewable energy development in Spain

World Heritage in Spain

Spain has accepted the World Heritage Convention on 4th of May 1982. As of September 2016, 40 cultural sites, 3 natural sites, 2 mixed sites have been inscribed on the World Heritage List between 1984 and 2012 (Figure 1). Spain is the third country in the world most represented on the World Heritage List (with 45 sites in total), after Italy (51 sites), China (50 sites) and before France (42 sites) and Germany (41 sites). Additionally, there are 32 sites on the current Tentative List (1996-2016).



Figure 1. Repartition of the UNESCO World Heritage Sites in Spain (Source: Daniel Herrero)

The following table presents the repartition of the UNESCO World Heritage Sites in the 17 autonomous communities. As some of these sites can be found on the territory of several autonomous communities, they are counted several times (e.g. Routes of Santiago de Compostela).

Table 1: Repartition of the UNESCO World Heritage Sites in the 17 autonomous communities. Source: Ministry for Education, Culture and Sport ([http1](http://))

Autonomous Communities
UNESCO World Heritage Sites
Andalusia (6)
<ul style="list-style-type: none"> • Alhambra, Generalife and Albaicín, Granada • Historic Centre of Cordoba • Cathedral, Alcázar and Archivo de Indias in Seville • Doñana National Park • Rock Art of the Mediterranean Basin on the Iberian Peninsula • Renaissance Monumental Ensembles of Úbeda and Baeza
Aragon (4)
<ul style="list-style-type: none"> • Mudéjar Architecture of Aragon • Pyrénées - Mont Perdu • Routes of Santiago de Compostela: Camino Francés and Routes of Northern Spain • Rock Art of the Mediterranean Basin on the Iberian Peninsula
Asturias (1)
<ul style="list-style-type: none"> • Monuments of Oviedo and the Kingdom of the Asturias
Balearic Islands (2)
<ul style="list-style-type: none"> • Ibiza, Biodiversity and Culture • Cultural Landscape of the Serra de Tramuntana
Basque Country (2)
<ul style="list-style-type: none"> • Vizcaya Bridge • Cave of Altamira and Paleolithic Cave Art of Northern Spain
Canary Islands (3)
<ul style="list-style-type: none"> • Garajonay National Park • San Cristóbal de la Laguna • Teide National Park
Cantabria (1)
<ul style="list-style-type: none"> • Cave of Altamira and Paleolithic Cave Art of Northern Spain

Castilla La Mancha (4)
<ul style="list-style-type: none"> • Historic Walled Town of Cuenca • Historic City of Toledo • Rock Art of the Mediterranean Basin on the Iberian Peninsula • Heritage of Mercury. Almadén and Idrija
Castilla y Leon (8)
<ul style="list-style-type: none"> • Burgos Cathedral • Old Town of Segovia and its Aqueduct • Old Town of Ávila with its Extra-Muros Churches • Old City of Salamanca • Archaeological Site of Atapuerca • Las Médulas • Routes of Santiago de Compostela: Camino Francés and Routes of Northern Spain • Prehistoric Rock Art Sites in the Côa Valley and Siega Verde
Catalonia (6)
<ul style="list-style-type: none"> • Works of Antoni Gaudí • Palau de la Música Catalana and Hospital de Sant Pau, Barcelona • Catalan Romanesque Churches of the Vall de Boí • Poblet Monastery • Archaeological Ensemble of Tàrraco • Rock Art of the Mediterranean Basin on the Iberian Peninsula
Extremadura (3)
<ul style="list-style-type: none"> • Old Town of Cáceres • Archaeological Ensemble of Mérida • Royal Monastery of Santa María de Guadalupe
Galicia (4)
<ul style="list-style-type: none"> • Santiago de Compostela (Old Town) • Roman Walls of Lugo • Routes of Santiago de Compostela: Camino Francés and Routes of Northern Spain • Tower of Hercules
Madrid (3)
<ul style="list-style-type: none"> • Monastery and Site of the Escorial, Madrid • University and Historic Precinct of Alcalá de Henares • Aranjuez Cultural Landscape
Murcia (1)
<ul style="list-style-type: none"> • Rock Art of the Mediterranean Basin on the Iberian Peninsula
Navarre (1)
<ul style="list-style-type: none"> • Routes of Santiago de Compostela: Camino Francés and Routes of Northern Spain
La Rioja (2)
<ul style="list-style-type: none"> • San Millán Yuso and Suso Monasteries • Routes of Santiago de Compostela: Camino Francés and Routes of Northern Spain
Valencia (3)
<ul style="list-style-type: none"> • La Lonja de la Seda de Valencia • Palmeral of Elche • Rock Art of the Mediterranean Basin on the Iberian Peninsula

A great disparity in number of World Heritage Sites among the autonomous communities can be observed. While Asturias, Cantabria, Murcia and Navarre host respectively one World Heritage Site, Castilla y Leon have eight World Heritage Sites and Andalusia and Catalonia count each six World Heritage Sites on their respective territory. This is explained by the Spanish system for the process of the candidacies: each autonomous community selects the potential sites to be nominated as World Heritage. In this case, such a disparity depends on the respective policies regarding heritage protection of the 17 autonomous communities.

According to Montoya et al., in 2014 the installed renewable energy of 32,472 MW represented 11.6% of the country's primary energy consumption. Furthermore, the installed renewable energy average of electric power in Spain was 0.7 kW per capita and 59 kW/km². Biomass, wind and hydropower constitute the main sources of renewable energy. In terms of power generation, the gross renewable energy production amounted to 86,600 GW h, or 29.7% of the country's total. This distribution implies that renewable energies are the main source of electrical energy for the country, surpassing natural gas (28.9%) and nuclear power (19.7%). The distribution within the renewable energy sector by type has indicated an 84% contribution by wind and hydropower (49% and 35%, respectively), which is an 11% decrease from 2010 due to a year of reduced hydraulic and wind resource availability. The following table shows the repartition of the renewable energy production (solar, wind, hydro and biomass) in the 17 autonomous communities.

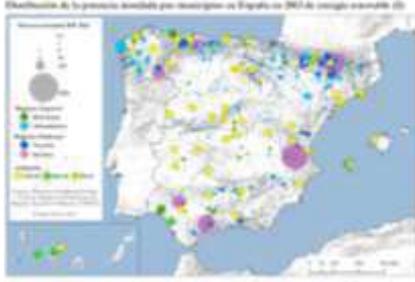
Table 2: Repartition of the renewable energy production. Source: Montoya et al. (2014)

Renewable energy production by autonomous community (MW): solar, wind, hydro, and biomass.

Autonomous community	Wind	Solar	Hydro	Biomass	Total	Area (km ²)	Average (kW/km ²)	Population	kW/citizen
Castilla and Leon	5532.6	493.4	250.5	28.1	6305	94,221	67	2,546,078	2.5
Andalucía	3274.8	1824.3	147.1	199.7	5446	87,598	62	8,449,985	0.6
Castilla-La Mancha	3841.8	1268.7	126.5	50.9	5288	79,462	67	2,121,888	2.5
Galicia	3317.0	15.6	498.2	39.1	3870	29,574	131	2,781,498	1.4
Aragón	1883.2	167.6	275.6	6.2	2333	47,720	49	1,349,467	1.7
Cataluña	1309.7	288.8	281.2	52.2	1932	32,113	60	7,570,908	0.3
NAVARRA	1234.7	160.0	162.1	36.8	1594	10,390	153	644,566	2.5
C. Valenciana	1193.2	344.4	31.4	17.3	1586	23,255	68	5,129,266	0.3
Extremadura	0.0	1161.6	19.6	17.1	1198	41,635	29	1,108,130	1.1
MURCIA	262.0	474.6	11.4	4.8	753	11,313	67	1,474,449	0.5
ASTURIAS	507.4	0.8	84.7	86.0	679	10,604	64	1,077,360	0.6
RIOJA, LA	448.1	85.6	22.8	4.3	561	5045	111	323,609	1.7
Islas Canarias	145.8	166.2	1.2	3.7	317	7447	43	2,118,344	0.1
Pais Vasco	153.3	23.8	50.2	26.5	254	7235	35	2,193,093	0.1
MADRID	0.0	62.0	44.2	42.6	149	8028	19	6,498,560	0.0
CANTABRIA	35.3	2.1	76.2	12.9	127	5327	24	593,861	0.2
BALEARIS, ILLES	3.7	77.7	0.0	2.1	83	4992	17	1,119,439	0.1
MELILLA	0.0	0.1	0.0	0.0	0	13	5	80,802	0.0
Total or average	23,142.4	6617.3	2083.0	630.2	32,473	505,972	59	47,181,303	0.7

The following maps indicate the locations of the World Heritage Sites in Spain (cultural/natural/mixed) and the locations of the different sources of renewable energies present in Spain (Figure 2.). The first map shows bioenergy, hydroelectricity, flowing and pumping; the second map presents solar panels and thermosolar; the third map indicates wind energy; and the fourth map represents hydroelectricity. The observation of these four maps shows that among the installations creating the most power, pumping exists around three World Heritage Sites, thermosolar can be found around four World Heritage Sites, wind power can be found around eleven World Heritage Sites and hydroelectricity can be found around nine World Heritage Sites. They all possibly have impacts on these World Heritage Sites and thus lead to potential conflicts if these installations do not guarantee the sustainable protection of these sites under the 1972 World Heritage Convention.

I. Bioenergy, hydroelectricity, flowing and pumping



II. Solar Panels and Thermosolar



III. Wind energy



IV. Hydroelectricity

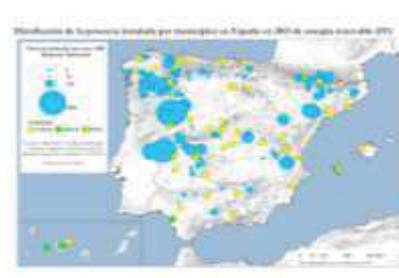


Figure 2. Repartition of renewable energies and UNESCO World Heritage Sites in Spain (Source: Daniel Herrero)

Materials and Methods

Numerous researches have been conducted on the impact of renewable energies on landscapes, such as Frolova (2010), Frolova and Perez Perez (2008) and on landscape policies in Spain with regard to the European Landscape Convention, e.g. Frolova (2009). Elorrieta and Sanchez-Aguilera (2011) have studied landscape planning and legislation. Equally, Hernandez Hernandez (1996) and Perez Galan (2011) have researched on the legislation of cultural and natural heritage protection in Spain. In addition, a study of world heritage in Spain has been compiled by Salinas (2008). The repartition of competencies concerning renewable energies in the autonomous community has been analysed by Bacigalupo Saggese (2010). More precisely, Frolova (2010) and Iglesias et al. (2011) have conducted a research respectively on the landscape of wind energy in Spain and on wind energy policy and authorisation in Spain.

The RENFORUS (Renewable Energy Futures for UNESCO Sites, <http2>) initiative of the UNESCO aims at integrating renewable energies sources and World Heritage Sites as a model of best practices. However, such a policy requires adequate legislations in order to be implemented successfully. Since the creation of this initiative, a compilation of best practices has been published (UNESCO 2013). But the analysis of the legislations concerning heritage protection, nature conservation and renewable energies through the angle of the potential impact of renewable energies on the World Heritage Sites remains an innovative research.

Confronting the installation of renewable energies and the protection of UNESCO World Heritage Sites in Spain has led us to three main questions:

- (1) What is the state-of-the-art in terms of legislations in Spain concerning the various renewable energies and the UNESCO World Heritage Sites?
- (2) Are the UNESCO World Heritage Sites protected under Spanish legislation?
- (3) Based on this comparative analysis, what kind of recommendations for the legislations can be proposed?

In order to deal with these questions an in-depth analysis of primary sources such as the Spanish legislation about renewable energies, heritage protection and nature conservation at regional and national level has been implemented. Equally UNESCO documents and European documents concerning both renewable energies and heritage protection have been

analysed. In order to anchor this research in both fields of (1) renewable energies and of (2) heritage protection and nature conservation, secondary sources have also been analysed.

Results and Discussions

Legislations concerning heritage protection

As Salinas (2008) explains, the competence of culture is transferred to the 17 autonomous communities (comunidades autónomas). The Ministry of Culture takes care of the management of new candidacies for World Heritage and of the Tentative List. In addition, the Council of Historical Heritage (Consejo del Patrimonio Histórico) is the institution in which representatives of the Ministry of Culture and the ministries of culture of the different autonomous communities are represented.

The National Plans for Conservation (Planos Nacionales de Conservación) are a policy or instruments developed in the middle of the 1980's after the competence of heritage protection had been transferred to the autonomous communities and the adoption of the new Law 16/1985 dated 25 June, on the Spanish Historical Heritage (Official State Bulletin of 29 June 1985). This law does not mention the concept of World Heritage although Spain had accepted the 1972 World Heritage Convention in 1982. As Hernandez Hernandez (1996) shows, the preamble of the Spanish Constitution of 1978 states that “the Spanish Nation [...] proclaims its will to [...] protect all Spaniards and peoples of Spain in the exercise of human rights, of their cultures and traditions, and of their languages and institutions”. The next paragraph specifies “promote the progress of culture and of the economy in order to ensure a worthy quality of life for all”. However, the Spanish Constitution does not mention landscape as showed by Elorrieta and Sanchez-Aguilera (2011): “By contrast, the Statutes of some of the autonomous communities do make mention of this concept, which can be interpreted as an assumption of competence in this field. However, this issue remains largely unexplored.”

Since the 17 autonomous communities have the competency for the protection of heritage, their respective legislation concerning heritage protection has been analysed and summed up in chronological order in the following tables elaborated based on Perez Galan (2011).

The elements of comparison taken for this analysis are the following: (1) UNESCO World Heritage Convention; (2) Definition of cultural heritage; (3) inclusion of Environmental or Cultural/Heritage Impact Assessment; (4) Inclusion of cultural landscapes; (5) Installation of Renewable Energies.

Table 3. Abstracts of the legislations of the 17 autonomous communities concerning heritage protection in chronological order. Source: Bénédicte Gaillard

Title of the Law
Category of Heritage
BASQUE COUNTRY
Law 7/1990, dated 3 rd July, of Basque Cultural Heritage
- Title I, Art. 2 Para. 2: monument, monumental ensemble, cultural space - Title II, Chapter 1, Art. 13: in the treatment of environmental impact assessments that can directly or indirectly affect qualified or the inventoried ones cultural properties, the competent administration will collect the necessary information to include in the declaration of environmental impact the considerations or conditions resulting from the quoted report
CATALONIA
Law 9/1993, dated 30 September, of Catalan Cultural Heritage

<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 7: historical monument, historical ensemble, historical garden, historical place, area of ethnological interest, archaeological area, paleontological area - Title II, Chapter 2, Art. 35 Para. 3.: the volume, the typology, the morphology and the chromaticism of the interventions in the environments of protection of the immovable properties of national interest cannot alter the architectural and landscape character of the area nor disturb the visualisation of the property
VALENCIA Law 4/1998, dated 11 June, of Valencian Cultural Heritage
<ul style="list-style-type: none"> - Title I, Chapter 2, Art. 11: the studies of environmental impact relative to all sorts of projects, public or private, which can affect the properties constituents of the Valencian cultural heritage should incorporate the report of the council competent for culture concerning the conformity of the project with the legislation of cultural heritage protection [...] - Title II, Chapter 3, Art. 26: monument, historical ensemble, historical garden, ethnological space, historical site, archaeological area, paleontological area, cultural park
CANTABRIA Law 11/1998, dated 13 October, of Cultural Heritage of Cantabria
<ul style="list-style-type: none"> - Title III, Chapter 1, Art. 46 Para. 3: In the procedure of all the environmental impact assessments, the administrative organ competent for environment will request report of the council of culture and sport and will include the considerations and conditions resulting from such report. - Title III, Chapter 2, Art. 49: monument, historical ensemble, cultural place (historical garden, historical site, place of ethnographical interest, cultural landscape, cultural route), archaeological area, natural place
BALEARIC ISLANDS Law 12/1998, dated 21 December, of Historical Heritage of the Balearic Islands
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 6: monument, historical ensemble, historical garden, historical place, place of ethnological interest, archaeological area, paleontological area
ARAGON Law 3/1999, dated 10 March, of the Aragonese Cultural Heritage
<ul style="list-style-type: none"> - Preamble, I: mention of the 1972 UNESCO World Heritage Convention - Title 1, Chapter 1, Art. 12 Para. 12: monument, ensemble of cultural interest (including historical ensemble, historical garden, historical site, paleontological area, archaeological area, place of ethnographical interest)
CANARY ISLANDS Law 4/1999, dated 15 March, of the Historical Heritage of the Canary Islands
<ul style="list-style-type: none"> - Title II, Chapter 1, Section 1, Art. 18: monument, historical ensemble, historical garden, historical site, archaeological area, paleontological area, ethnological site
EXTREMADURA Law 2/1999, dated 29 March, of the Historical and Cultural Heritage of Extremadura
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 6: monuments, historical ensembles, historical garden, historical sites, archaeological area, paleontological area, places of ethnological interest, archaeological sites, spaces of archaeological protection - Title II, Chapter 2, Art. 30 Para. 1: In the procedure of the environmental impact assessments (for programmes, plans or projects) that can affect the properties constituents of the Extremaduran historical and cultural heritage, it will be mandatory to obtain a report of the General Direction of Cultural Heritage and the considerations or conditions resulting of such a report will be included in the declaration of environmental impact
ASTURIAS Law 1/2001, dated 6 March, of Cultural Heritage
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 11: monument, historical ensemble, historical garden, historical site, archaeological area, historical route
CASTILLA Y LEON Law 12/2002, dated 11 July, of Cultural Heritage of Castilla y Leon
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 8 Para. 3: monument, historical garden, historical ensemble, historical site, archaeological area, ethnological ensemble, historical route
LA RIOJA Law 7/2004, dated 18 October, of Cultural, Historical and Artistic Heritage of La Rioja
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 12: monument, historical ensemble, cultural place (historical gardens, historical sites, archaeological areas, paleontological areas, places of ethnographical interest, cultural routes, cultural landscapes) - Title II, Chapter 2, Art. 31 Para. 2: In particular, any project submitted to an environmental impact assessment

<p>that can affect properties belonging to the cultural, historical and artistic heritage of La Rioja, will have to rely on a mandatory report of the Council competent for culture, which will hear the High Council of the Cultural, Historical and Artistic Heritage of La Rioja, for this purpose. The considerations and conditions resulting from this report will have to be included in the declaration of environmental impact that guarantee the protection and safeguarding of the affected cultural properties</p>
<p>NAVARRRE Regional Law 14/2005, dated 22 November, of the Cultural Heritage of Navarre</p>
<ul style="list-style-type: none"> - Explanatory Memorandum 2: mention of the 1972 UNESCO World Heritage Convention - Title III, Chapter 1, Art. 15: monuments, historical ensemble, historical site, archaeological area, cultural landscape, historical route, historical garden - Title IV, Chapter 2, Section 1, Art. 32 Para. 1: The instruments of territorial planning and urban planning, as well as the environmental evaluations of plans and programmes and the projects that are subject to an environmental impact assessment will have to contain, within its documentation, determinations to guarantee the conservation and protection of the properties inscribed on the Register of Properties of the Cultural Heritage of Navarre or collected in the Archaeological Inventory of Navarre
<p>MURCIA Law 4/2007, dated 16 March, of Cultural Heritage of the Autonomous Community of the Region of Murcia</p>
<ul style="list-style-type: none"> - Preliminary Title, Chapter 1, Art. 3 Para. 3: monument, historical ensemble, historical garden, historical site, archaeological area, paleontological area, place of ethnographical interest - Preliminary Title, Chapter 2, Art. 12 Para. 2: When an activity, work, project, plan or programme requires an environmental impact assessment or an integrated environmental authorisation, the environmental organ will gather mandatory report of the general direction with competencies for cultural heritage, which will have to be emitted within ten days and whose considerations or conditions will incorporate the corresponding declaration or authorisation. - Title IV, Art. 61 Para. 2: mention of cultural landscapes
<p>ANDALUSIA Law 14/2007, dated 26 November, of the Historical Heritage of Andalusia</p>
<ul style="list-style-type: none"> - Title I, Chapter 3, Art. 19: Measures to be taken by municipalities on the territory of which are located properties inscribed on the General Catalogue of historical heritage of Andalusia to avoid its visual or perceptive contamination, it concerns among others the control of the necessary installations for the energetic supply, generation and consumption - Title III, Chapter 1, Art. 25: monuments, historical ensembles, historical gardens, historical sites, archaeological areas, places of ethnological interest, places of industrial interest, heritage areas - Title III, Chapter 1, Art. 26 Para. 8: in the heritage areas the landscape and environmental values are included - Title 9, Chapter 2, Art. 77: cultural spaces are cultural ensembles and parks
<p>CASTILLA-LA MANCHA Law 4/2013, dated 16 May, of the Cultural Heritage of Castilla-La Mancha</p>
<ul style="list-style-type: none"> - Preliminary Title, Art. 1 Para. 2: Movable and immovable property, intangible manifestations - Title 1, Chapter 1, Art. 8: Immovable properties are monument, historical garden, historical ensemble, historical site, archaeological area, paleontological site - Title II, Chapter 1, Art. 26 Para. 1: The competent council for cultural heritage will have to issue a report of the process of acceptance, modification, and revision of the instruments of territorial and spatial planning and of the activities to which the Environmental Impact Assessment applies that are constraining in the matters that affect the cultural heritage - Title II, Chapter 3, Section 1, Art. 39 Para. 1: The conservation of the historical ensemble includes the maintenance of the architectural, urban and landscape structure
<p>MADRID Law 3/2013, dated 18 June, of Historical Heritage of the Community of Madrid</p>
<ul style="list-style-type: none"> - Preliminary Title, Art. 3: monument, historical ensemble, cultural landscape, historical garden, historical site or territory, property of ethnological or industrial interest, area archaeological and/or paleontological interest
<p>GALICIA Law 5/2016, dated 4 May, of Galician Cultural Heritage</p>
<ul style="list-style-type: none"> - Title I, Chapter 1, Art. 10: monument, historical garden, historical site, field or archaeological area, cultural routes, place of ethnological value, historical ensemble, cultural landscape, historical territory - Title II, Chapter 4, Art. 47 Para. 2.c.: despite for its scope and the risk of deterioration or destruction of its cultural values derived from its territorial implantation, the prior authorisation will be required of the competent council for cultural heritage in the following interventions: [...] installations of the energetic industry such as refineries, thermal centrals, of fossil fuel, hydraulic, wind power, solar panels, nuclear, or of any other type of production, transport or depository

The analysis of the legislations concerning heritage protection reveals a great disparity between them. For example, only a few legislations integrate the concept of cultural landscape as developed by UNESCO (Cantabria, La Rioja, Navarre, Murcia, Madrid, Galicia). Furthermore, solely Aragon and Navarre mention the 1972 UNESCO World Heritage Convention in their legislation and only Galicia mentions that the installations of all types of renewable energies require prior authorisation in view of the risk of deterioration of the cultural heritage. Nevertheless, Andalusia also mentions the control of the installations of energetic supply, without precision about renewable energies. Furthermore, eight autonomous communities adopt a monumental approach in their definition (Basque Country, Balearic Islands, Aragon, Canary Islands, Extremadura, Asturias, Castilla y Leon and Murcia) while the definition of the nine others adopts an approach combining cultural and natural features (Catalonia, Valencia, Cantabria, La Rioja, Navarre, Andalusia, Castilla-La-Mancha, Madrid and Galicia). In addition, solely Catalonia and Andalusia take into account the landscape character and only Castilla-La-Mancha refers to intangible heritage. Finally, seven autonomous communities state in their legislations that Environmental Impact Assessments shall take into consideration cultural heritage (Basque Country, Valencia, Extremadura, La Rioja, Navarre, Murcia, and Castilla-La-Mancha).

Legislations concerning nature conservation

The Law 15/1975 dated 2nd May on the Protected Natural Areas does not mention the concept of natural heritage or the 1972 World Heritage Convention, which had not yet been accepted by Spain. On the contrary, the Law 42/2007 dated 13 December on the Natural Heritage and Biodiversity does integrate the concept of natural heritage and of landscape, with reference to the European Landscape Convention. Its Art. 49, Title II Chapter 4, refers to the areas protected by international instruments and explicitly mentions the natural sites inscribed on the UNESCO World Heritage List. This law serves for actualisation of the Spanish legislation against numerous international norms (Diaz-Martinez et al. 2008).

The analysis of the 17 legislations for nature conservation has been implemented using the same elements of comparison as in the above section.

Table 4. Abstracts of the legislations concerning nature conservation in the 17 autonomous communities in chronological order. Source: Bénédicte Gaillard

Title of the Law
Elements specified in the Law
ASTURIAS Law 5/1991, dated 5 April, of Conservation of the Natural Areas
- Title III, Chapter 2, Art. 20: The protected landscapes are such concrete places of the natural environment that, for their aesthetical and cultural values, deserve a special protection
MURCIA Law 4/1992, dated 30 July, of Planning and Protection of the Territory of the Region of Murcia
- Title VI, Chapter 3, Art. 48 Para. 1: the definition of protected landscapes is the one used in the Law 4/1989, dated 27 March (Title III, Chapter 2, Art. 17: The protected landscapes are such concrete places of the natural environment that, for its aesthetical and cultural values, deserve a special protection.)
VALENCIA Law 11/1994, dated 27 December, of the Generalitat Valenciana, of nature protection areas of the Valencian Community
- Title I, Chapter 2, Art. 13 Para. 1: The protected landscapes are areas both natural as transformed, meriting a special protection as well as significant examples of a harmonious relation between man and the natural environment or for its special aesthetical or cultural values
MADRID Law 16/1995, dated 4 May, Forestry and of Protection of the Nature in the Community of Madrid
- No mention
NAVARRRE

Law 9/1996, dated 17 June, of Natural Areas of Navarre
- Chapter 1, Section 1, Art. 3 Para. 1: The protected landscapes are such concrete places of the natural environment that, for their aesthetical and cultural values, deserve a special protection
EXTREMADURA
Law 8/1998, dated 23 December, of Conservation of the Nature and Natural Areas of Extremadura
-Title I, Art. 3: Natural heritage: The ensemble of natural resources, independently from the ownerships that are exercised over them, existing within a determined territorial framework, including the waters, the living beings, the gea, the soils and the dynamic effects derived from themselves or from the atmosphere.
- Title III, Chapter 1, Art. 20 Para. 1: Are such concrete places of the natural environment that, for their aesthetical and cultural values, deserve a special protection
CASTILLA LA MANCHA
Law 9/1999, dated 26 May, of Conservation of Nature
- Title III, Chapter 1, Art. 46 Para. 1: Are protected landscapes such concrete places that, for their aesthetical and cultural values, deserve a special protection. Will be understood in these assumptions the agricultural traditional and extensive of meadows landscapes, clove meadows, hay meadows and cereal steppes that, additionally to its aesthetical and cultural valorisation, contribute to the conservation of an important part of the biodiversity of the region.
CANARY ISLANDS
Legislative Decree 1/2000, dated 8 may, approving the Restated Text of the Law of Planning of the Territory of Canary Islands and of Natural Areas of Canary Islands
- Title II, Chapter 1, Art. 48 Para. 12: The protected landscapes are such areas of the territory that, for their aesthetical and cultural values are declared as such, to achieve their special protection
GALICIA
Law 9/2001, dated 21 August, of Conservation of the Nature
-Title I, Chapter 3, Art. 15 Para. 1: The protected landscapes are areas that deserve a special protection for their singular, aesthetical and cultural values or for the harmonious relation between man and the natural environment
LA RIOJA
Law 4/2003, dated 26 March, of Conservation of Natural Areas of La Rioja
- Title III, Chapter 1, Art. 16: The protected landscapes are such places of the natural environment that, for their natural, aesthetical and cultural values, deserve a special protection
BALEARIC ISLANDS
Law 5/2005, dated 26 May, for the conservation of the areas of environmental relevance (LECO)
-Title III, Chapter 1, Art. 16: The protected landscapes are such concrete areas of the natural environment that, for their aesthetical and cultural values, deserve a special protection
CATALONIA
Law 8/2005, dated 8 June, of protection, management and planning of the landscape
- Chapter 1, Art. 13: Is understood as landscape, for the purpose of the present law, any part of the territory, as the community perceives it, whose character results from the action of natural or human factors and of its interrelations
CANTABRIA
Law 4/2006, dated 19 May, of Conservation of the Nature of Cantabria
- Title II, Chapter 1, Art. 13: The protected landscapes are such concrete areas of the natural environment that for their aesthetical and cultural values, deserve a special protection
ANDALUSIA
Law 42/2007, dated 13 December, of the Natural Heritage and Biodiversity
- Preliminary Title, Art. 3 Para. 26: definition of landscape as any part of the territory whose character is the result of the action and the interaction of natural and/or human factors, as the population perceives it
BASQUE COUNTRY
Legislative Decree 1/2014, dated 15 April, approving the Restated Text of the Law of Conservation of Nature of the Basque Country
- No mention
CASTILLA Y LEON
Law 4/2015, dated 24 March, of the Natural Heritage of Castilla y Leon
-Title II, Art. 15: The landscape, as it appears defined in the article 3.26 of the Law 42/2007, of 13 December, constitutes an integrative element of the natural heritage of Castilla y Leon For this purpose, the Regional Government of Castilla y Leon will adopt the necessary legislation to guarantee the recognition, protection, management and planning of the landscape in order to preserve its natural, patrimonial, cultural, social, economic values within the framework of sustainable development

Title II, Art. 19 Para. 2: Likewise the criteria to follow to achieve the landscape integration in the following actions will be determined: construction and other installations on rural land, forest management, agricultural reorganisation, introduction of linear infrastructures and wind farms, as well as the restoration of grounds affected by extractive activities

ARAGON

Legislative Decree 1/2015, dated 29 May, of the Government of Aragon, approving the Restated Text of the Law of Protected Areas of Aragon

-Title II, Chapter 1, Art. 13 Para. 1: The protected landscapes are concrete places of the natural environment that deserve a special protection in accordance with the Council of Europe Landscape Convention, for their natural, aesthetical and cultural values

- Title III, Chapter 5, Art. 67: The Government of Aragon will contribute to the recognition and application of the Convention about the protection of World Cultural and Natural Heritage that considers property of Natural Heritage [...]

- Title III, Chapter 5, Art. 68 Para. 5: The regime of protection will be articulated in accordance with the article 5 of the Convention concerning the Protection of the World Cultural and Natural Heritage, signed in Paris on 16 November 1972

In the same vein, there exists a great disparity between the legislations concerning nature conservation. For example, even though a majority of autonomous communities defines landscapes as a combination of cultural and natural values (Cantabria, Balearic Islands, Aragon, Canary Islands, Extremadura, Asturias, La Rioja, Navarre, Murcia, Castilla-La-Mancha and Galicia), the legislations of Madrid and Basque Country do not mention protected landscapes. Furthermore, Catalonia, Valencia and Andalusia define landscapes as the interrelation between man and nature, while Extremadura and Castilla y Leon define landscapes as natural heritage. Additionally, as with the legislation concerning heritage protection, Aragon is the only autonomous community that mentions the 1972 UNESCO World Heritage Convention in its legislation concerning nature conservation. Finally, solely Aragon mentions the European Landscape Convention and solely Castilla y Leon refers to the integration of landscapes in other policies and actions such as construction and other installations on rural land, forest management, agricultural reorganisation, introduction of linear infrastructures and wind farms, as well as the restoration of grounds affected by extractive activities.

Legislations concerning renewable energies

Spanish wind energy is subject to environmental legislation that limits it by forbidding installation in national and natural parks (Montoya et al. 2014).

According to Iglesias et al. (2011), the three levels of public administration in Spain (central government, autonomous communities, local administrations) have competencies concerning renewable energy sources. As a matter of fact, Iglesias et al. decompose the competencies of each level (Table 5.).

Administrative level	Competencies
Central government level	<ul style="list-style-type: none"> • Electricity sector legislation • FIT scheme • Central registry of RES-E plants and pre-registry • Indicative planning. Renewable targets • Binding planning: participation of the AACC • Administrative authorisations for RES-E plants > 50 MW
Regional level	<ul style="list-style-type: none"> • Regional legislation • RES-E/wind energy planning • Environmental and territorial planning competencies • Administrative authorisations for RES-E plants ≤ 50 MW • Regional registry of RES-E plants

Local level	<ul style="list-style-type: none"> • Municipal land-use plans • Building permits
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Table 5. Repartition of the competencies for renewable energies between the three administrative levels. Source: Iglesias et al. (2011)

As described by Bacigalupo Saggese (2010), the Spanish legislation regulates renewable energies within the electricity production. Additionally, the competencies in terms of renewable energies are concurrent between the different decisional levels.

The following comparison of the legislations concerning renewable energies uses the same scheme as the two above sections.

Title of the Law
Mention of cultural/natural heritage, landscape
BASQUE COUNTRY
No legislation
BALEARIC ISLANDS
No legislation
GALICIA Decree 205/1995, dated 6 July, regulating the procedure of the wind energy in the Autonomous Community of Galicia
No mention
NAVARRRE Foral Decree 125/1996, dated 26 February, regulating the implantation of the wind farms
-Art. 2 Para. 2.a.: In no case wind farms may be established on grounds categorised as Natural Areas, with the exception of the Natural Parks, the provisions in their respective Management Plans of the Natural Resources; high agricultural productivity, protected waters, non-wind existing or planned infrastructures, in the surroundings of population centres, in the surrounding of immovable properties of cultural interest, glens and zones of protection in the Camino de Santiago or of other itineraries of interest - Art. 2 Para. 2.d.: In no case wind farms may be established within fifty meters of immovable properties of cultural interest or of buildings of interest that participate in the historical, cultural or environmental values. The urban planning may establish justifiably other distances, higher or lower, that always continue to guarantee the preservation of the immediate surroundings of this type of properties of cultural interest
CASTILLA Y LEON Decree 189/1997, dated 26 September, which regulates the procedure for the authorisation of the electricity production installations from the wind energy
No mention
LA RIOJA Decree 48/1998, dated 24 July, which regulates the procedure for the authorisation of the installations of electric energy production from the wind energy, within the Autonomous Community of La Rioja
- Chapter II, Art. 6 Para. 5: Environmental impact assessment of the project of Wind Farm, including the complementary works that evaluate the conditions that could be produced on the landscape, the vegetation, the fauna and the protected natural areas
ASTURIAS Decree 13/1999, dated 11 March, which regulates the procedure for the installation of Wind Farms in the Principality of Asturias
In the annex to the decree regulating the authorisations of electric energy production installations from the wind energy, the content of the environmental impact assessments is stated and it includes among others protected landscapes, natural reserves, historical heritage, the impact on the landscape and on the historical heritage and the respective corrective measures
VALENCIA Agreement of 26 July 2001, of the Valencian Government, approving the Wind Plan of the Valencian Community
- Chapter 2, Second section, Art. 13: The evaluation of environmental impact must understand the consideration of the direct and indirect effects derived from the implementation of the project, on the population, the fauna, the flora, the vegetation, the sea, the ground, the water, the climate, the landscape, the structure and function of the ecosystems, on the historical-cultural heritage [...]
MADRID Order 98/2005, dated 13 January, of the Council of Economy and Technological Innovation, regulating the

granting of aids for the promotion of the renewable energies and of the economy and energy efficiency for the period 2005-2007
No mention
CANARY ISLANDS Decree 6/2005, dated 30 January, approving the regulation that rules the installation and exploitation of the Wind Farms in the Canary Islands
No mention
EXTREMADURA Decree 192/2005, dated 30 August, regulating the procedure for the authorisation of the electric energy production installations from the wind energy, through wind farms, within the Autonomous Community of Extremadura
No mention
MURCIA Law 10/2006, dated 21 December, of renewable energies and economy and energetic efficiency of the Region of Murcia
- Title I, Chapter 1, Art. 6 Para. 1: When is raised the territorial implantation of a project of use of renewable energies that through its size, innovative nature or other relevant circumstance, suppose a benefice for the Region in its ensemble, whether within the public services, the economy, the conservation of the environment, the historical heritage or the improvement of the communal wellbeing, may be declared of regional interest, with the processing, effects and planned deadlines for this type of actions in the territorial and urban legislation
CASTILLA LA MANCHA Law 1/2007, 15 February 2007, encouraging the renewable energies and incentive of the economy and energetic efficiency in Castilla La Mancha
- Title I, Chapter 1, Art. 5 Para. 1: In the frame of the Strategic Plan for the Energetic Development of Castilla La Mancha established in the Article 11, the Council competent for energy will proceed in the elaboration and approval of a Programme of Promotion of the Renewable Energies that will take into account territorial, environmental, cultural, urban and infrastructural constraints, for the purpose of energy zoning
ANDALUSIA Law 2/2007, dated 27 March, encouraging the renewable energies and the economy and energetic efficiency of Andalusia
-Title I, Art. 11 Para. 1: In line with the energetic planning of the Government of Andalusia, the Council competent for energy will elaborate a Programme for the promotion of the renewable energies that will take into account the territorial, environmental, cultural, urban and infrastructural constraints established in other planning Such programme of promotion will take into consideration the plan with incidence on the planning of the territory of those planned in the section I of the annex of the Law 1/1994, dated 11 January, of Planning of the Territory of the Autonomous Community of Andalusia - Title I, Art. 14: The buildings and installations of use and public service property of the Government of Andalusia and its autonomous organisms will have to incorporate solar installations that may be complemented or substituted with any other installation of use of renewable energy of cogeneration or of use of residual heats. The applicable requirements and their exceptions will be determined legally, with special attention to the following circumstances: Intended use of the building or installation. Intended energetic consumption. Limitations of access to the sun by existence of external barriers. Limitations derived from the prior configuration of the building or installation, or of the applicable urban regulation. Clamps of the building or installation to characters of historical-artistic protection. Architectural, aesthetical and landscape integration. Relation between the costs of the measures to adopt and the obtained energetic economy
CATALONIA Decree 147/2009, dated 22 September, regulating the applicable administrative procedures for the implantation of wind farms and photovoltaic installations in Catalonia
- Chapter 1, Art. 1.a.: establish the requirements for the installation of wind farms and define the energetic, environmental, urban and landscape criteria that have to rule the installation of the wind farms - Chapter 3, Art. 13.2.: In all cases, the organ competent for energy will have to request a report from the city council or city councils corresponding to the department competent for agriculture, as well as the department competent for culture in order to comply with the governing regulations of the Catalan cultural heritage
ARAGON Decree 124/2010, dated 22 June, of the Government of Aragon, which regulates the procedures of prioritisation and authorisation of installations of electric energy production from wind energy in the Autonomous Community of Aragon
- Chapter III, Art. 8 Para. 2.2.b.: The technical criteria of situation that from the point of view of wind resource use, optimisation of the electric evacuation and transportation network planning, regarding the historical-

cultural heritage and the environmental values have been followed to choose the grounds on which the installation will concretely be placed.
CANTABRIA Law of Cantabria 7/2013, dated 25 November, which regulates the wind use in the Autonomous Community of Cantabria
No mention

Table 6. Abstracts of the legislations concerning renewable energies in the 17 autonomous communities in chronological order. Source: Bénédicte Gaillard

Regarding the renewable energies legislations in the 17 autonomous communities, two autonomous communities do not have legislation at all (Basque Country and Balearic Islands). The rest of the autonomous communities have adopted a law (Murcia, Castilla La Mancha, Andalusia, Cantabria), a decree (Galicia, Navarre, Castilla y Leon, La Rioja, Asturias, Canary Islands, Extremadura, Catalonia, Aragon), an agreement (Valencia) or an order (Madrid). Additionally, although diverse legislations have been adopted, some do not mention heritage protection, nature conservation, and/or protected landscape (Galicia, Castilla y Leon, Madrid, Canary Islands, Extremadura, Cantabria). Among the legislations mentioning heritage protection, nature conservation, and/or protected landscape, one solely takes into account the natural, environmental, landscape aspects (La Rioja) while all the others consider the natural and cultural aspects (Navarre, Asturias, Valencia, Murcia, Castilla La Mancha, Andalusia, Catalonia, Aragon).

Conclusions

To conclude, the findings of this research are summarised and some recommendations concerning the respective legislations in terms of heritage protection, nature conservation and renewable energies can be elaborated based on the results of this research.

While heritage protection and nature conservation are a competence of the autonomous communities, renewable energies are a concurrent competence at the national level and the regional level. Only the World Heritage Sites located on the territory of the autonomous communities that clearly state the World Heritage Convention in their legislations concerning heritage protection and concerning nature conservation are fully protected under the World Heritage Convention. Great disparities between the 17 autonomous communities concerning the legislations of heritage protection, nature conservation and renewable energies have been found in terms of definitions and approaches adopted.

First, concerning heritage protection, all the legislations of the 17 autonomous communities should explicitly mention the World Heritage Convention as well as cultural landscapes. Furthermore, they should state that before installing renewable energies, a heritage impact assessment should be conducted.

Secondly, concerning nature conservation, the legislations of the 17 autonomous communities should follow the model of the national legislation concerning nature conservation and thus mention the World Heritage Convention. Additionally, as for the legislations concerning heritage protection, the legislations concerning nature conservation should state that before installing renewable energies, an environmental impact assessment should be conducted.

Thirdly, concerning renewable energies, the autonomous communities without proper legislation on renewable energies yet should adopt one based on the existing ones. Moreover they should all mention cultural and natural heritage as well as the World Heritage Convention and cultural landscapes. The implementation of both a heritage impact assessment and an environmental impact assessment concerning the installation of renewable energies should be regulated.

Finally, a harmonisation between the legislations of the 17 autonomous communities concerning heritage protection, nature conservation and renewable energies should be implemented in order to guarantee an equal protection of the UNESCO World Heritage Sites located in Spain independently from their repartition among the 17 autonomous communities.

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- Law 16/1985 dated 25 June, on the Spanish Historical Heritage
- Law 7/1990, dated 3rd July, of Basque Cultural Heritage
- Law 9/1993, dated 30 September, of Catalan Cultural Heritage
- Law 4/1998, dated 11 June, of Valencian Cultural Heritage
- Law 11/1998, dated 13 October, of Cultural Heritage of Cantabria
- Law 12/1998, dated 21 December, of Historical Heritage of the Balearic Islands
- Law 3/1999, dated 10 March, of the Aragonese Cultural Heritage
- Law 4/1999, dated 15 March, of the Historical Heritage of the Canary Islands
- Law 2/1999, dated 29 March, of the Historical and Cultural Heritage of Extremadura
- Law 1/2001, dated 6 March, of Cultural Heritage (Asturias)
- Law 12/2002, dated 11 July, of Cultural Heritage of Castilla y León
- Law 7/2004, dated 18 October, of Cultural, Historical and Artistic Heritage of La Rioja
- Regional Law 14/2005, dated 22 November, of the Cultural Heritage of Navarre
- Law 4/2007, dated 16 March, of Cultural Heritage of the Autonomous Community of the Region of Murcia
- Law 14/2007, dated 26 November, of the Historical Heritage of Andalusia
- Law 4/2013, dated 16 May, of the Cultural Heritage of Castilla-La Mancha
- Law 3/2013, dated 18 June, of Historical Heritage of the Community of Madrid
- Law 5/2016, dated 4 May, of Galician Cultural Heritage

[Legislation on Nature Conservation]

Law 15/1975, dated 2nd May, on the Protected Natural Areas

Law 42/2007, dated 13 December, on the Natural Heritage and Biodiversity

Law 5/1991, dated 5 April, of Conservation of the Natural Areas (Asturias)

Law 4/1992, dated 30 July, of Planning and Protection of the Territory of the Region of Murcia

Law 11/1994, dated 27 December, of the Generalitat Valenciana, of nature protection areas of the Valencian Community

Law 16/1995, dated 4 May, Forestry and of Protection of the Nature in the Community of Madrid

Law 9/1996, dated 17 June, of Natural Areas of Navarre

Law 8/1998, dated 23 December, of Conservation of the Nature and Natural Areas of Extremadura

Law 9/1999, dated 26 May, of Conservation of Nature (Castilla La Mancha)

Legislative Decree 1/2000, dated 8 May, approving the Restated Text of the Law of Planning of the Territory of Canary Islands and of Natural Areas of Canary Islands

Law 9/2001, dated 21 August, of Conservation of the Nature (Galicia)

Law 4/2003, dated 26 March, of Conservation of Natural Areas of La Rioja

Law 5/2005, dated 26 May, for the conservation of the areas of environmental relevance (LECO) (Balearic Islands)

Law 8/2005, dated 8 June, of protection, management and planning of the landscape (Catalonia)

Law 4/2006, dated 19 May, of Conservation of the Nature of Cantabria

Law 42/2007, dated 13 December, of the Natural Heritage and Biodiversity (Andalusia)

Legislative Decree 1/2014, dated 15 April, approving the Restated Text of the Law of Conservation of Nature of the Basque Country

Law 4/2015, dated 24 March, of the Natural Heritage of Castilla y Leon

Legislative Decree 1/2015, dated 29 May, of the Government of Aragon, approving the Restated Text of the Law of Protected Areas of Aragon

[Legislation on Renewable Energy]

Decree 205/1995, dated 6 July, regulating the procedure of the wind energy in the Autonomous Community of Galicia

Foral Decree 125/1996, dated 26 February, regulating the implantation of the wind farms (Navarre)

Decree 189/1997, dated 26 September, which regulates the procedure for the authorisation of the electricity production installations from the wind energy (Castilla y Leon)

Decree 48/1998, dated 24 July, which regulates the procedure for the authorisation of the installations of electric energy production from the wind energy, within the Autonomous Community of La Rioja

Decree 13/1999, dated 11 March, which regulates the procedure for the installation of Wind Farms in the Principality of Asturias

Agreement of 26 July 2001, of the Valencian Government, approving the Wind Plan of the Valencian Community

Order 98/2005, dated 13 January, of the Council of Economy and Technological Innovation, regulating the granting of aids for the promotion of the renewable energies and of the economy and energy efficiency for the period 2005-2007 (Madrid)

Decree 6/2005, dated 30 January, approving the regulation that rules the installation and exploitation of the Wind Farms in the Canary Islands

Decree 192/2005, dated 30 August, regulating the procedure for the authorisation of the electric energy production installations from the wind energy, through wind farms, within the Autonomous Community of Extremadura

Law 10/2006, dated 21 December, of renewable energies and economy and energetic efficiency of the Region of Murcia

Law 1/2007, 15 February 2007, encouraging the renewable energies and incentive of the economy and energetic efficiency in Castilla La Mancha

Law 2/2007, dated 27 March, encouraging the renewable energies and the economy and energetic efficiency of Andalusia

Decree 147/2009, dated 22 September, regulating the applicable administrative procedures for the implantation of wind farms and photovoltaic installations in Catalonia

Decree 124/2010, dated 22 June, of the Government of Aragon, which regulates the procedures of prioritisation and authorisation of installations of electric energy production from wind energy in the Autonomous Community of Aragon

Law of Cantabria 7/2013, dated 25 November, which regulates the wind use in the Autonomous Community of Cantabria

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