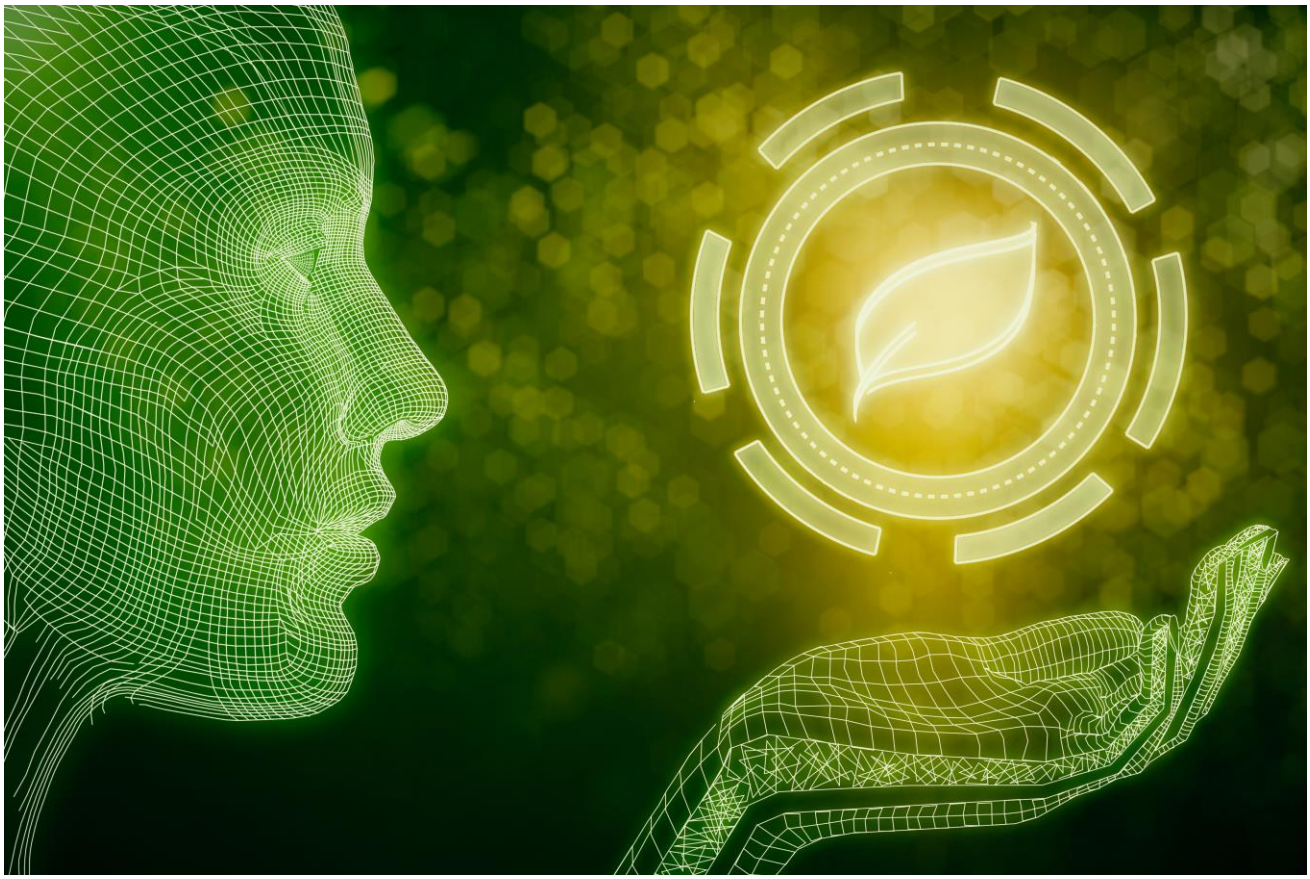
EUIPO
EUROPEAN UNION
INTELLECTUAL PROPERTY OFFICE

www.euipo.europa.eu

Green EU trade marks

Analysis of goods and services specifications, 1996-2020



September 2021

Green EU trade marks

September 2021

ISBN 978-92-9156-299-2 doi: 10.2814/900650 TB-06-21-077-EN-N

© European Union Intellectual Property Office, 2021
Reproduction is authorised provided the source is acknowledged

The authors would like to thank Professor Carolina Castaldi, Utrecht University, and the participants in the themed session on trade marks in the European Policy for IP conference in Madrid, 9 September 2021, for helpful comments.

Project team:

Francisco García Valero, Economist, EUIPO
Marie-Hélène Faria, Data Analyst, EUIPO
Plamen Ivanov, Legal Expert, EUIPO
Nathan Wajsman, Chief Economist, EUIPO

Contents

Foreword

Climate change and other environmental issues concern many citizens in the EU and beyond, and are more and more prominent in politics, in business and in the public debate. In 2019, the European Commission established action on climate change as a priority, promising to deliver a European Green Deal with the aim to make Europe the first climate-neutral continent by 2050.

Intellectual property (IP) is, alongside financial resources, an important success factor in the achievement of the Commission's goals. In order to accomplish the Green Deal objectives, new technologies will be created, new products and services will be brought to market, and existing products will be redesigned to make them more sustainable.

This study, carried out by the EUIPO through the European Observatory on Infringements of Intellectual Property rights, examines the increasing frequency with which goods and services specifications of EU Trade Marks reflect issues related to environmental protection and sustainability. It shows that filings of "green" EUTMs have increased significantly since the Office began operations in 1996, both in absolute figures and as a proportion of all EUTM filings.

This is the first study of its kind, pointing the way to further research that uses the information contained in the EUIPO register. The richness of this data, coupled with a new and innovative methodology, has made these insights possible. It is our hope that other researchers will take advantage of the possibilities offered by EUIPO's Open Data platform to deepen our knowledge of the role of IP in this important undertaking.

Christian Archambeau
Executive Director
EUIPO

1. Introduction

Climate change and other environmental issues concern many citizens in the EU – and beyond. These issues are becoming increasingly important in politics, in business and in public debate. In 2019, the European Commission established that action on climate change was now a priority, promising to deliver a European Green Deal with the aim of making Europe the first climate-neutral continent by 2050.

Alongside financial resources, intellectual property (IP) is an important factor in the achievement of the Commission's goals. In order to accomplish the Green Deal objectives, new technologies will be created, new products and services will be brought to market, and existing products will be re-engineered to make them more sustainable.

The role of IP in environmental protection has traditionally been studied by focusing on technology and innovation, using patent filings as the principal indicator of innovative activity in this sphere. In conjunction with the European Patent Office (EPO), the Observatory has engaged in this type of research on several occasions. One such joint research project consisted of a chapter dedicated to Climate Change Mitigation Technologies in the IP Contribution study, published in 2019. However, to date virtually no studies have considered trade mark filings as an indicator of innovation related to environmental protection. The present study seeks to fill that gap.

In particular, this study examines the description of goods and services (G&S) of the trade marks filed at the EUIPO since the start of its operation in 1996[1]. It did this to determine the presence of terms related to the protection of the environment and to sustainable development.

An inventory of 'Harmonised Green Terms' was developed based on the list of the standardised description of G&S in EUIPO's Harmonised Database. This inventory contains about 85 000 terms that are accepted by all IP offices in the EU, as well as several non-EU countries. On this basis, a predictive model was developed that enabled the algorithm to determine if any of the terms covered by the trade mark application can be considered a 'green term', thereby classifying the EUTM under the 'green EUTM' category. More than 2 million EUTM applications received by EUIPO since 1996 were searched using this algorithm. The output of this search constitutes the main results of this study, as presented in Chapter 6.

The remainder of this report is organised as follows: following the Executive Summary, Chapter 3 provides a brief review of the existing literature. Chapter 4 explains the definition of a 'green' trade mark and provides some examples. The data and methodology used are explained in Chapter 5. The main results are presented and discussed in Chapter 6. The final Chapter 7 concludes and suggests areas for further research.

This study is included in the 2021 Work Programme of the Observatory. The terms of reference for the study were discussed in the Public Awareness Working Group meeting, held online on 21 October 2020.

[1] EUIPO began accepting trade mark applications on 1 April 1996. The name of the Office at that time was Office for Harmonization in the Internal Market (OHIM) and the EUTM was called the Community Trade Mark. The current names of the Office (EUIPO) and the trade mark (EUTM) became effective in March 2016. For simplicity, the new names are used throughout this report.

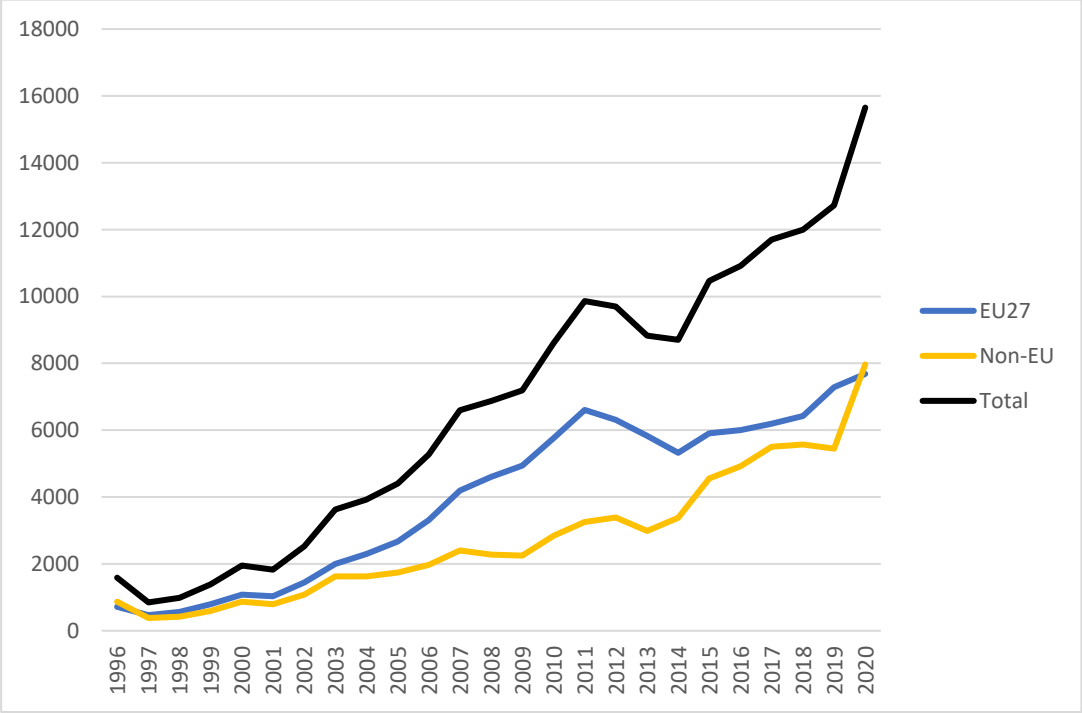
2. Executive summary

In this study, the G&S descriptions in the 2 million EUTM applications – filed at the EUIPO since it began operation in 1996 – are analysed for the presence of terms that can be said to be related to the protection of the environment and sustainability. Examples of such terms include expressions such as 'photovoltaic', 'solar heating', 'wind energy', 'recycling'. Using the EUIPO's Harmonised Database[2] as the source, approximately 900 such terms have been identified as 'green'; these terms have in turn been classified in 35 categories which are further organised into 9 groups.

An algorithm was developed to search through the more than 65 million terms contained in the EUTM applications filed over the years in order to identify applications that contain at least one 'green' term[3]. The purpose was to examine whether the increased concern among the public and policymakers over climate change and environmental degradation is reflected in the EUTM applications.

The main finding of the study is that growing interest in sustainability is indeed reflected in the EUTMs filed at the EUIPO. As seen in the graphs below, the absolute number of green EUTMs has increased significantly since 1996, as has the share of green EUTMs, although the latter has oscillated between 10% and 12% during the past decade.

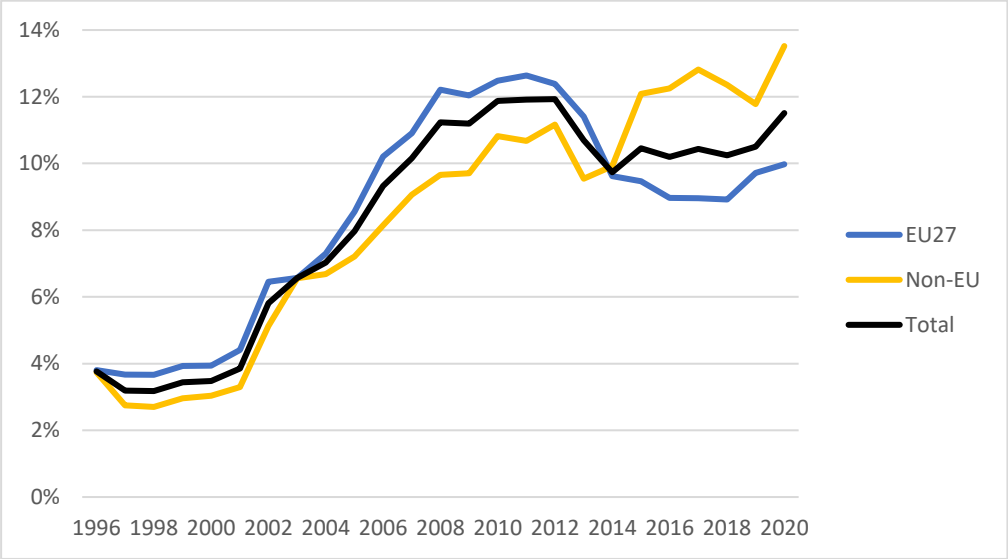
Figure 1. Green EUTM filings, 1996-2020



[2] The Harmonised Database (HDB) is a database of approximately 85 000 G&S terms available to EUTM applicants. These terms have been translated into all EU languages and have already been accepted by all IP offices in the EU as well as in some third countries.

[3] Such EUTMs are referred to as 'green EUTMs' in this report.

Figure 2. Green EUTM filings as a share of all EUTM filings, 1996-2020



A second trend that can be seen in the chart is the increasing importance of green EUTM filings from outside the EU. This reflects the increase in such filings from Chinese companies. Other non-EU countries with significant green EUTM activity are South Korea, Switzerland, the UK, and the USA. Among EU Member States, the top green EUTM filing countries are Germany, Spain, France, Italy and the Netherlands.

Figure 3. Green EUTMs by main product group, 2015-2020

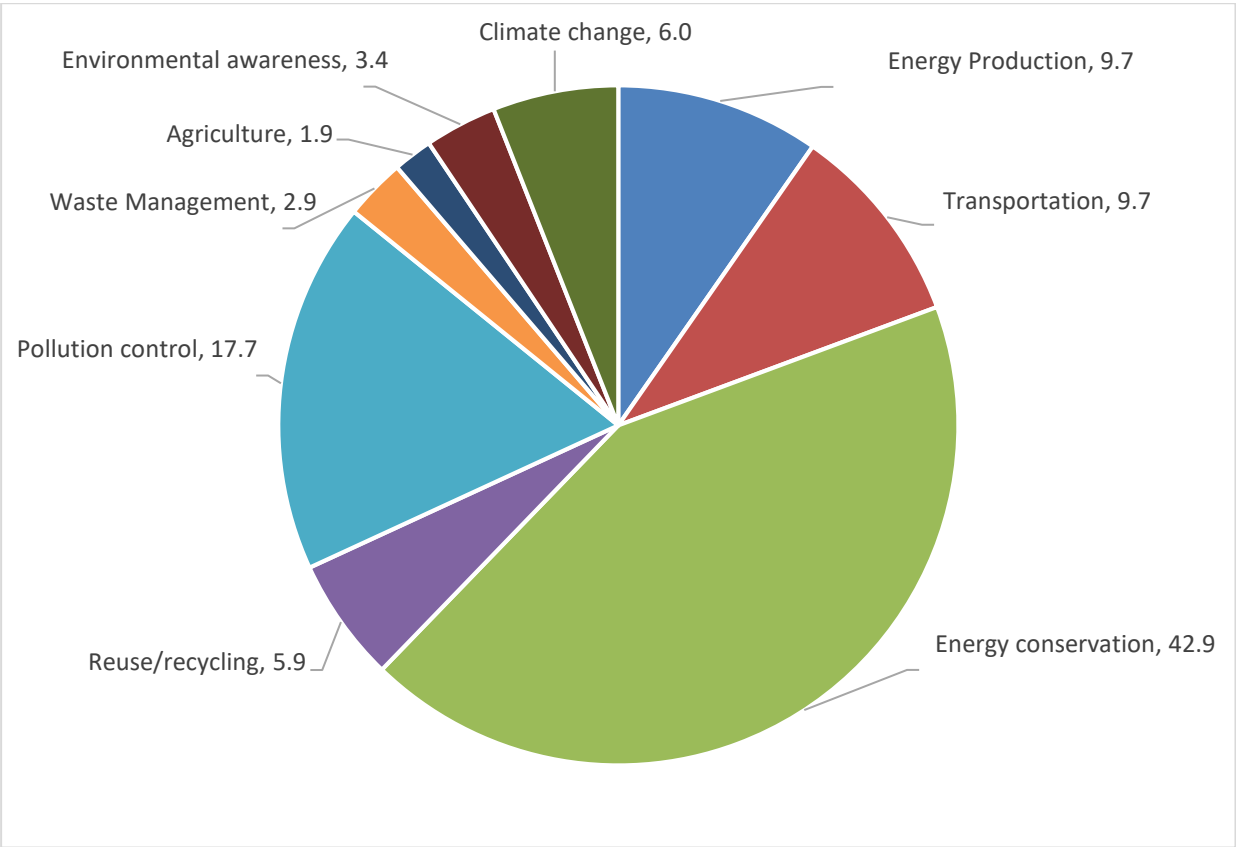


Figure 3 shows the distribution of green EUTMs filed in the most recent 5-year period among the 9 main product groups. The dominant product groups are Energy Conservation and Energy Production, which together account for more than 52% of green EUTM filings, followed by Pollution Control with 18% of filings, and Transportation (close to 10%).

Another interesting finding is that small and medium-sized enterprises (SMEs) are active in the sphere of green EUTMs, as shown in Table 1.

Table 1. Green EUTMs by size of applicant, 2015-2020

Firm size	Green TMs	Total TMs	Green	Bundle with patents
Large	**8 571**	**67 754**	**12.7%**	**36.3%**
SME	**11 554**	**118 860**	**9.7%**	**7.8%**
medium	4 261	43 821	9.7%	11.7%
small	4 031	38 759	10.4%	6.8%
micro	3 262	36 280	9.0%	4.2%

For large companies in this sample, close to 13% of EUTM filings are green. This percentage is somewhat lower for SMEs, but even for the smallest companies in this group the green EUTM share is 9%. As shown in the last column, when it comes to patent activity, large companies are far more active than SMEs, but the table shows that SMEs still play a significant role in bringing environmentally relevant G&S to the EU marketplace.

3. Literature review

Of the main IP rights (IPR), patents are by far the most widely studied right among economists. This is because the main focus of economic research into IP has been innovation and technological progress, and patents were traditionally seen as the main (or the only) indicator of such progress.

In recent years, however, economists have begun to recognise that to fully analyse innovation and firm behaviour, other IP rights need to be considered, in particular trade marks. While a successful patent application means that a firm has developed a new product or a new production method, a trade mark registration indicates that a new product or service has been offered on the market, thus contributing to the firm's sales and consumer welfare. In her review paper, Castaldi (2020) discusses the research possibilities enabled by trade mark databases made available by IP offices such as EUIPO and USPTO.

In the past 15 years, an increasing number of studies using trade mark data – mainly from Europe and the USA – have been published. These studies fall into two main groups, briefly discussed below.

Studies on the contribution of trade marks to the economy

Several studies have looked at the impact of trade mark registrations on a firm's growth and profitability[4]. Some examples include Greenhalgh and Rogers (2012) and Sander and Block (2011), both of whom find a positive relationship between a firm's trade mark activity and its value added and/or stock market valuation. Davis (2009) and Schwiebacher (2010) examine the relationship between a firm's use of trade marks and its use of other IP rights, especially patents. Both find a positive impact of bundling trade marks and other IP rights, although the question of whether trade marks and patents are substitutes or complements depends on the nature of the innovation.

In a series of studies carried out jointly by the EUIPO and the European Patent Office (EPO), the relationship between IPR ownership (including ownership of trade marks) and firm performance is analysed. The EUIPO-EPO (2019) study of high-growth SMEs found that trade mark activity was associated with higher likelihood of subsequent growth, in particular when combined with patenting activity, and even more so when EU-level rights were being registered. Similarly, EUIPO-EPO (2021) found that firms that own patents, trade marks or registered designs have higher revenue per employee and employ more workers than firms that do not own any of the three IP rights.

There are also studies that look at the contribution of trade mark on a national or regional level. In their industry-level IP Contribution study of 2019, EUIPO and EPO found that sectors that make intensive use of trade marks account for 37% of the EU's economic output (as measured by GDP) and 22% of employment. Belderbos, Kazimierczak and Goedhuys (2021) look at the impact on new firm formation on a regional level of existing patent and trade mark stocks owned by firms already established in each region, and find that trade mark stocks can encourage entry of new firms into the region, depending to some degree on the behaviour of existing firms.

[4] Summarised in Schautschick and Greenhalgh (2016).

DeGrazia, Myers and Toole (2019) consider whether economy-wide trade mark filings can be considered a leading indicator of the business cycle. They conclude that this is indeed the case and advocate for the inclusion of trade mark filings as a component in existing leading indicator indices.

Studies on the relationship between trade marks and innovation

The second main strand of research using trade mark data concerns using trade mark filings as an indicator of innovation, whether on the company level or within a given sector or country. Two pioneering studies stand out. Mendonça, Pereira and Godinho (2004) studied the possibility of using trade mark filings as an indicator of innovation, based on data on EUTM and Portuguese filings. They conclude that trade mark data can indeed be a useful indicator of patterns of innovation and industrial dynamics but that further empirical and methodological work is required. Schmoch (2003) focused on trade marks as an indicator of innovation in services, finding a significant correlation between trade mark activity and innovation, in particular in knowledge-intensive service sectors.

Building on this idea, in subsequent years, many studies examining the link between trade mark activity and innovation have appeared. Malmberg (2005) examined this link for the electromechanical, automotive and pharmaceutical industries in Sweden and concluded that trade marks can be an indicator of innovation in sectors whose products target consumers and professional end users and in which trade marks are used frequently.

In an attempt to discern the motivation behind trade mark filings, Flikkema, de Man and Wolters (2014) combine data from trade mark applications filed at the Benelux Office of Intellectual Property (BOIP) in 2007 by companies based in the Benelux countries. They found that 60% of these trade mark registrations were related to innovative activity and that most trade marks are filed close to the date new products or services are put on the market. Therefore, they conclude that trade marks are a useful indicator of late-stage innovation, especially in service industries and in the case of SMEs. However, in a later study by Seip, Castaldi, Flikkema and de Man (2018), this conclusion is nuanced somewhat. It appears that the timing of a trade mark filing by an innovating firm depends on many factors and can occur early or late in the process of bringing a new product or service to market.

While most of the studies examining the link between trade mark activity and innovation are carried out on the national level, some take a regional approach. Drivas (2020) studies the relationship between the technological capabilities of regions within the EU and the applications for EUTMs from those regions. For their part, Block, Fisch and Kato (2021) study the relationship between trade marks and innovation in Japanese prefectures, finding that trade mark applications are a good indicator of economic performance of regions within Japan.

The above studies analyse various relationships between the economy and trade mark filings using the number of such filings during a particular period, or the distribution of filings among various originating countries or sectors as the main variables to be analysed. However, the description of G&S in any given trade mark filing also contains a wealth of information worthy of study. This information was used by von Graevenitz, Graham and Myers (2021) to analyse the diffusion of innovation between US states. This was based on the tracking of novel ‘tokens’ (i.e. descriptions of G&S not previously encountered in the USPTO register). Such analysis of

the G&S specifications of trade mark applications is quite new, and it is also one of the distinguishing characteristics of the present study. In this study the G&S descriptions are used to detect the presence of terms relevant to protecting the environment and promoting sustainability.

4. Definitions

Trade marks distinguish the products of a firm from those of its competitors. Trade mark applications must contain a representation of the trade mark (typically words, graphic elements or a combination thereof) and a list of the products (goods and/or services) to be covered by the trade mark.

In the case of EUIPO, the atomic definition of a product is called 'term'. The terms are classified under one of the classes of the Nice Classification and grouped accordingly[5].

The 'term' (plus its Nice class) will be the basic data unit for this study. For example, 'Nice 9, Solar Panels' or 'Nice 9, carbon dioxide monitors' are both considered green terms (Nice Class 9 covers a broad range of technical goods). It is important to note that the term is comprised of the Nice class and the expression since, without this pairing, ambiguity can result. A particular expression (description) can be 'green' or otherwise, depending on the Nice class. For example, 'carbon dioxide monitors' will not be a green term if included in Class 10 (medical instruments), but will be green if included in other classes.

As an example, the Swedish firm InnoVentum AB registered an EUTM in 2012, for the following goods:

Nice 6	Towers [metal structures];
Nice 7	**Wind turbines;**
Nice 7	**Generators for wind turbines;**
Nice 19	Towers [non-metallic structures].

The algorithm developed for this study will find the two green terms of this trade mark, highlighted above. It will also assign the trade mark to the category 'Wind energy' within the broad group 'Energy production'.

An EUTM is considered 'green' if its G&S specification contains at least one green term, regardless of other non-green terms included. In the example above, two of the terms are green terms, and two are not, but in this case it seems clear that the main activity is related to the production of wind energy, the other terms being subsidiary to this activity. In other cases, the green activity of a trade mark will be secondary. Therefore, the definition 'a trade mark is green if at least one of its terms is green' can sometimes overestimate the degree to which a particular trade mark is truly related to environmental protection.

[5] The Nice Classification, administered by the World Intellectual Property Organisation (WIPO), is a system of classifying goods and services for trade mark applications. It consists of 45 classes, 34 of which cover goods and 11 services. Each class is represented by a class heading which give general information about the type of goods or services covered, and further contains a set of terms within that class to better define the goods or services to be protected by the trade mark application.

5. Data and methodology

Defining sustainable activities

A challenge for the compilation of statistics on 'green IPR' is to define with the necessary precision the object of the study. In this case, it is a matter of giving a precise meaning to institutional declarations and international treaties, which by their nature may be ambiguous and in some cases contradictory[6].

In recent years, the EU and international organisations have sought to define the sustainable economy, drawing up green inventories or taxonomies, attempting to systematically include all the 'matters' (activities, technologies, products) related to the protection of the environment and to sustainable development.

Thus, the *EU taxonomy for sustainable activities*, currently under review[7], will govern investment in activities that the EU classifies as environmentally friendly[8]. The EU produced the taxonomy to help meet climate and energy targets for 2030 and reach the objectives of the European Green Deal. According to the European Commission, the taxonomy lays out clear performance criteria for determining which economic activities make a substantial contribution to Green Deal objectives. More information on the current list of activities can be found on page *EU Taxonomy Compass* (https://ec.europa.eu/sustainable-finance-taxonomy/) where they can be listed and classified using NACE[9].

Eurostat produces the *Environmental Goods and Services Sector* (EGSS) statistics, one of the modules of the environmental economic satellite accounts. The EGSS indicate the proportion of the economy that is engaged in producing G&S for environmental protection purposes and resources management activities. The EGSS consists of a heterogeneous set of activities to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems.

Another important environmental classification is WIPO's inventory of 'green technologies', the *IPC Green Inventory* which is a taxonomy of environmentally friendly technologies, where the terminal elements are the areas of technologies defined in maximum detail by the IPC[10] code.

Table 2 below summarises the main taxonomies.

---

[6] For example, discussions have taken place in the European Parliament on whether to include nuclear energy in the EU's Sustainable Finance Taxonomy. In this study, trade marks with terms related to nuclear energy are not identified as green.

[7] At the moment of the drafting of this study the first EU Taxonomy Climate Delegated Act has not yet entered into force.

[8] See https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

[9] The *Statistical classification of economic activities in the European Community*, abbreviated as NACE, is the classification of economic activities in the European Union.

[10] The International Patent Classification (IPC) provides for a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain. Unlike the abovementioned taxonomy of activities, this list does include nuclear energy.

Table 2. Environmental taxonomies

Taxonomy	Object	Origin
EU taxonomy for sustainable activities	Economic activities (NACE)	EU
Environmental Goods and Services Sector	Economic activities (NACE), Environmental activities (CEPA & CREmA)	Eurostat, UN
IPC Green Inventory	Technologies (IPC)	WIPO
Harmonised Green Terms	Products (G&S) (HDB, Nice)	EUIPO

This study sets out a first version of the **green taxonomy for trade marks** and proposes methods that may be used for further mapping with the other classifications.

Methodology

Starting from taxonomies of activities and technologies, the first step was to 'project' the Green Deal objectives onto the specific scope of protection of the trade marks, that is, the description of the products (goods and/or services) of the trade mark applications.

The G&S are coded following the Nice classification. However, this classification lacks the necessary granularity for a precise 'green' definition. Instead, the Harmonised Database (HDB) was used for this purpose.

The HDB is used in the EUTM online application form. It contains more than 85 000 entries that have already been accepted by all intellectual property offices in the EU as well as in several non-EU countries. The HDB contains for example *0032872 Advertising by mail order* in Nice Class 35 or *0006396 Roofing, not of metal, incorporating photovoltaic cells* in Nice Class 19.

Thus, the definition of the **object to be measured** was done by choosing, in an exhaustive way, the terms in the HDB which are considered green. This inventory of 904 terms is the first output of this study and is reproduced in the Annex.

Once this *Harmonised Green Terms* inventory was established, an option considered for the analysis of all trade marks filed at EUIPO was to study only the applications that used HDB terms. In 2020 more than 85% of the terms in applications filed at EUIPO were from the HDB.

However, during the first 10 years of operation of the EUTM system, the use of HDB terms was below 50%[11]. Therefore, instead of taking the subset of 'HDB trade marks' as the sample for the study, an algorithm was developed that could determine if a trade mark was green, even if it used terms not included in the HDB. This approach has two advantages: older EUTM activity is better assessed, avoiding selection bias; and trade marks containing new green terms

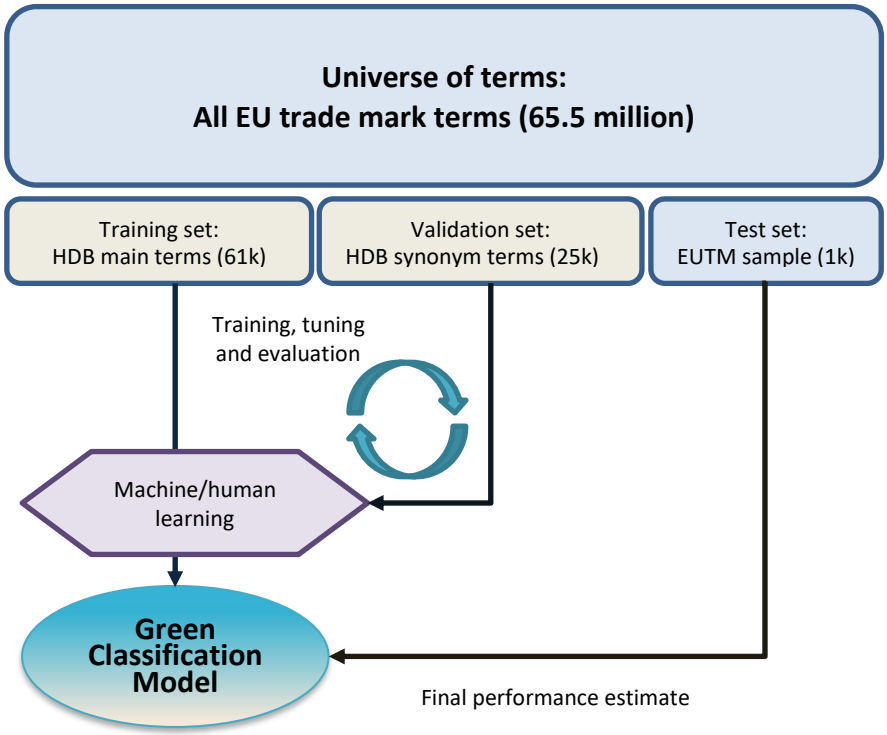
[11] HDB use is relatively recent, but for this study all the past (from 1996) trade marks containing terms consistent with the current version of the HDB were identified.

(not yet in HDB) can be identified. This algorithm was able to recognise 120 000 different green terms[12] in the EUIPO registry.

Therefore, the second output of the study is the **Green Term Classifier**, an algorithm that determines whether a product description is green and assigns to it the appropriate green category.

The algorithm combines machine learning with human intervention and is summarised in Figure 4.

Figure 4. Green TM algorithm development



The HDB, after having been classified into green/non-green terms by EUIPO experts[13], was selected as the training set for the algorithm. This set is made up of two parts: the 61 000 main terms, each of which has a unique identifier, and the 25 000 synonyms (sometimes several for each main term, sometimes none). Synonyms can be linked with their main term because they share the same HDB identifier. The main terms were used as the initial training set while the synonyms were used as the validation set during the repeated tuning cycles.

The objective of the exercise was to find a final set of 'green expressions' that could be used to correctly classify all the terms in the HDB.

[12] The terms are 'different' from a 'machine' point of view; many of the different terms may be considered synonymous by humans; but searching for 900 terms and their synonyms in a database of 65 million terms is a task that can only be carried out if it is automated.
[13] The classification created for this study was inspired by the existing taxonomies shown in Table 2. However, no attempt was made at creating a precise correspondence with those taxanomies.

Three examples of such green expressions are shown below.

REF	Green expression
35	+carbon +monitor –10
114	+filter.engine –air –oil
225	+solar +heating

The first expression (Ref. 35) means: *a term is green if it contains the word **carbon** and the word **monitor** except if it is in the class of Nice 10 'medical instruments'*. The second expression (Ref. 114) means: *a term is green if it contains the words **filter engine** (together, and in that order) and does not contain either the word **air** or the word **oil***. The third expression (Ref. 225) means that *a term is green if it contains the words **solar** and **heating***.

Before the search, the descriptions and expressions were normalised, that is, stop words[14] and suffixes were eliminated in the green expressions and in the descriptions of the G&S of the trade marks.

In each iteration the set of rules was modified to maximise 'precision' and 'recall'[15], or, stated differently, to minimise false positives and false negatives. The development process did not fully follow the machine learning paradigm as it required a significant number of human decisions. This development model can be described as 'machine-supported learning'.

A fully automated model is not optimal, for two reasons: human intervention is required for the correction of classification inconsistencies that are revealed after applying the first sets of rules; and sometimes spurious rules are generated by the machine[16].

Once the algorithm was fine-tuned, the 'green classifier' search program used 375 green expressions to search for green terms in the descriptions of all EUTM G&S specifications.

The grouping of these green expressions defined the 35 **green categories**; for example, the **'+solar +heating'** expression was assigned to category '*12. Solar energy*' along with (among other expressions) **'+photovoltaic'**. The expression **'+wind +power'** belongs to the category '*13. Wind energy*'.

The categories were further combined into nine **groups**. The two categories in the preceding paragraph both belong to the group '*1. Energy Production*'.

The green expressions are shown in the Annex. The algorithm can be applied to any trade mark G&S description in English.

[14] Stop words are a set of commonly used words in a language. Examples of stop words in English are "a", "the", "is", "are" and etc. Stop words are commonly used in Text Mining to eliminate words that are so commonly used that they carry very little useful information.

[15] *Precision* is the percentage of truly green terms among the terms marked as green by the algorithm, while the *recall* is the percentage of green terms of the total of all green terms found by the algorithm. The trade-off between precision and recall is one of the most complex parts of algorithm development.

[16] In some cases, the HDB contains terms for 'green' goods but not their associated services, for example repair or installation of such goods. A fully automatic learning system will tend to exclude such ancillary services, even if they appear in the G&S description of the relevant trade marks.

Once the model has classified the terms, a green EUTM is defined as one that contains at least one green term. This definition requires that trade marks with a very large number of terms (up to 27 000 in some cases[17]) should be excluded in order to avoid spurious identification of green EUTMs. In this study, only directly filed EUTMs with less than 200 terms have been considered, representing 97% of EUIPO's direct filings registry.

Data

Trade mark data

As previously mentioned, the main data sources for this study were the 85 000 terms in the HDB and the 65.5 million terms in the G&S descriptions of the trade mark applications filed at the EUIPO from 1996 to 2020.

The data is publicly available data from the EUIPO's Open Dataset[18]. From this data, the directly filed[19] trade marks and the descriptions of G&S in any of the official languages of the EUIPO can be extracted. The English language version was used for this study.

After excluding trade marks with more than 200 terms, 1 802 195 EUTMs filed from 1996 to 2020 constitute the universe of trade marks for this study. Some of the analyses in Chapter 6, are based on EUTMs filed between 2015 and 2020 (a total of 693 577 trade marks).

It is important to note that it is EUTM applications in general that are the subject of this study, that is, regardless of whether they ended up being registered or not. The referenced dates are the filing dates.

For convenience, in this report **trade mark** will always mean **trade mark application**. Similarly, for simplicity, expressions such as 'Spanish trade marks' refer to trade mark applications filed by, or on behalf of, a resident of Spain (the same format is used for other countries). Finally, the acronym EU refers to the 27 Member States of the European Union following Brexit, even for data referring to earlier years[20].

Economic data

Two main sources of economic data are used in Chapter 6.

The environmental economic statistics (EGSS) from Eurostat are defined as follows:

> *Environmental goods and services either reduce environmental pressures or help maintain the stock of natural resources (e.g. vehicle catalysts, soil remediation services) or they are designed to be cleaner and more resource efficient than conventional products (e.g. electric*

[17] There are several EUTMs with more than 25 000 terms, for example EUTM no. 017992149 , with 27 128 terms in 12 Nice classes, of which 343 are green terms.
[18] https://euipo.europa.eu/ohimportal/en/open-data
[19] G&S descriptions of EUTM applications filed using the Madrid Protocol route are not available in this database.
[20] This is equivalent to the Eurostat acronym EU27_2020.

cars, zero-energy buildings). Environmental goods and services can be produced by corporations, households, governments and non-profit institutions.

The EGSS comprises all entities in their capacity as 'environmental producers' (i.e. an undertaking engaged in economic activities that result in products for environmental protection and resource management). Producers in the EGSS may or may not be specialised in the production of environmental G&S, and may produce them as their principal or secondary activities, or they may produce these products for their own use. Consequently, the scope of the EGSS may overlap with existing legal definitions or statistical classifications of units only to a certain extent.

Eurostat estimates four variables: Output, Gross Value Added (GVA), Employment and Exports. In this study, GVA and Employment are used.

The second economic data source consists of the data used in the EUIPO study 'Use of IPR bundles by EU firms[21]'. The study looks at EU firms' simultaneous use of patents, trade marks and registered designs to protect their innovation. It is based on a sample of more than 63 000 companies across all EU Member States. The demographic data of the firms is used here, in particular their size, their economic sector and their use of IP bundles. This data is used in connection with EUTMs filed after 2015.

[21] EUIPO (2020).

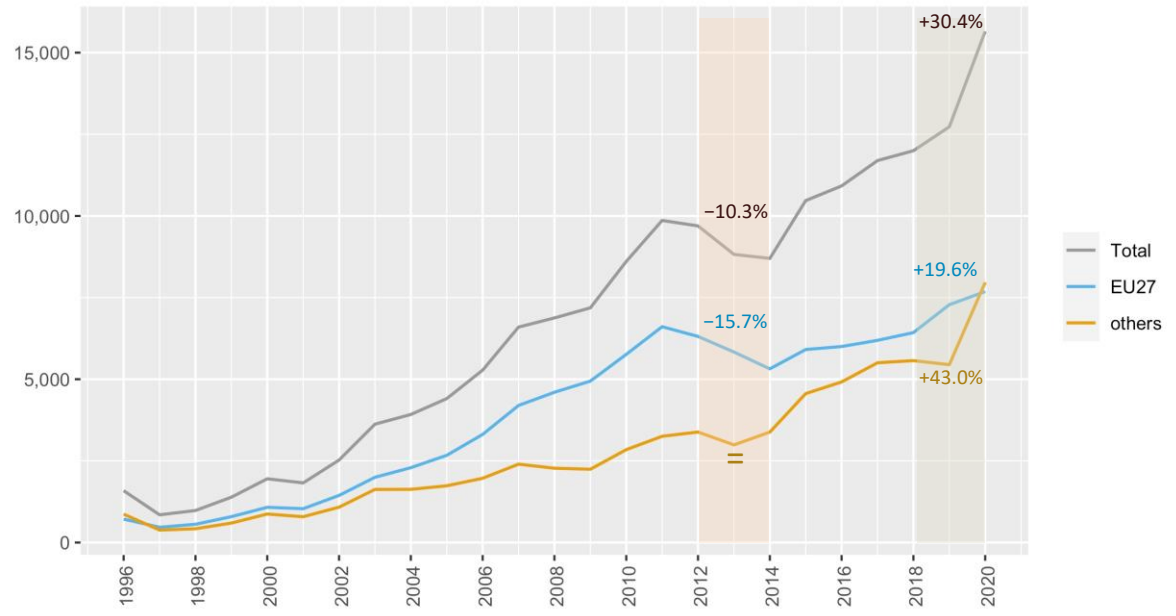
6. Main results

Overall trends

Of the approximately 46 700 EUTM applications received by EUIPO in 1996, the first year of operation, 1 588 were green trade marks. Since then, the increase in green trade marks has been continuous, except for 2001 and between 2011 to 2014. In 2020, the number of green EUTMs filed approached 16 000.

These trends are illustrated in Figure 5. As can be seen, part of the overall increase is due to a strong increase in green EUTM filings from outside the EU. For most of the past two decades, green filings from the EU were higher than such filings from third countries. However, in 2020 non-EU green filings had caught up and, in fact, slightly exceeded filings from within the EU.

Figure 5. Annual number of EUTMs with at least one green term

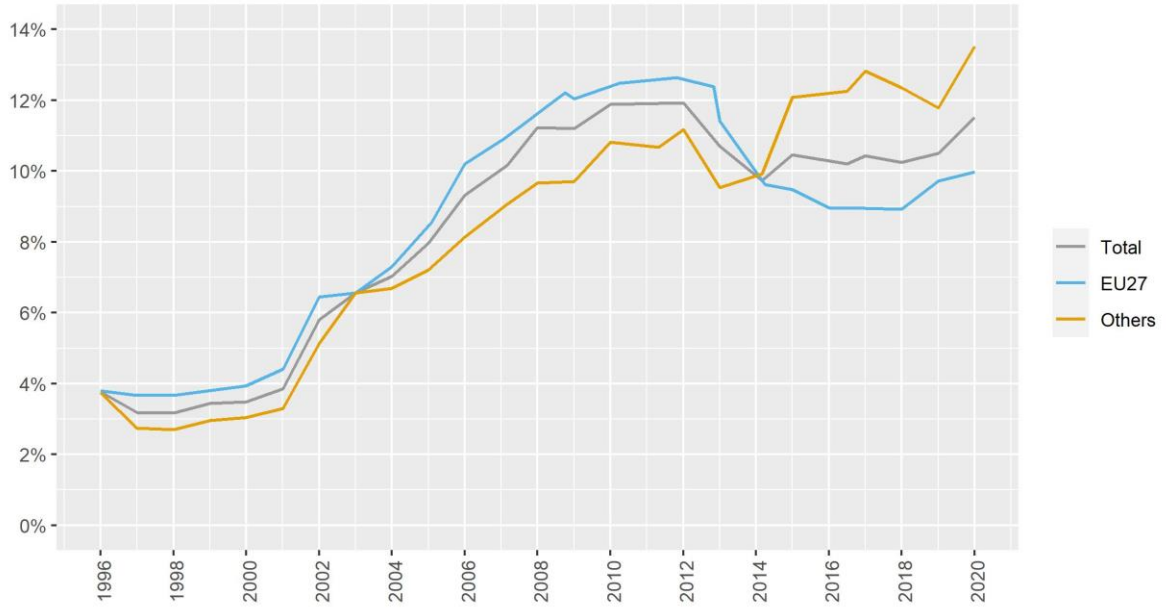


The temporary drop in 2011-2014 is mainly due to three categories: ‘storage of electricity’, ‘solar energy’ and ‘other energy’. All the other categories continued to grow.

The fall in the first category is related to a fall in filings from EU firms and the others could be related to European Emission Allowances[22] prices and level of investment in low carbon energy.

Of course, the total number of EUTM filings has also increased strongly since 1996. Therefore, Figure 6 shows the *proportion* of green filings. This proportion has also increased significantly, from less than 4% in 1996 to more than 11% in 2020, although it has stagnated in the past 10 years. The ascending tendency of green EUTM filings from outside the EU is also evident: in 2020, the proportion of EU green filings was 10% while for filings from outside the EU it was close to 14%.

Figure 6. Green EUTM filings as a share of all EUTM filings, 1996-2020



Although it is difficult to clearly establish the causes of the temporary slowdown in 2011-2014, it seems consistent with Eurostat's Environmental Goods and Services Sector (EGSS) statistics on employment in the relevant sectors. EGSS show a decrease in employment and Gross Value Added (GVA) as a percentage of GDP in 2013 and 2014, both of which did not regain 2012 levels until 2017. Figure 7 shows the evolution in EGSS employment in the EU, while Table 3

[22] The European Union Emissions Trading System (EU ETS), launched in 2005, was the world's first major greenhouse gas emissions trading scheme. The ETS covers all EU Member States as well as countries in the EEA and Switzerland. According to the 'cap and trade' principle, a maximum (cap) is established on the total amount of greenhouse gases that all participating entities can emit. EU allowances are auctioned or allocated free of charge and can subsequently be traded. If a participant exceeds its allowance, it must purchase allowances from others. Conversely, if a facility has done well in reducing its emissions, it can sell its excess credits. This allows the system to find the most cost-effective ways to reduce overall emissions by using the market mechanism.

shows the underlying data for both employment and GVA. Nevertheless, the long term trend for both employment and GVA is clearly positive.

Figure 7. Employment in EGSS (thousands)

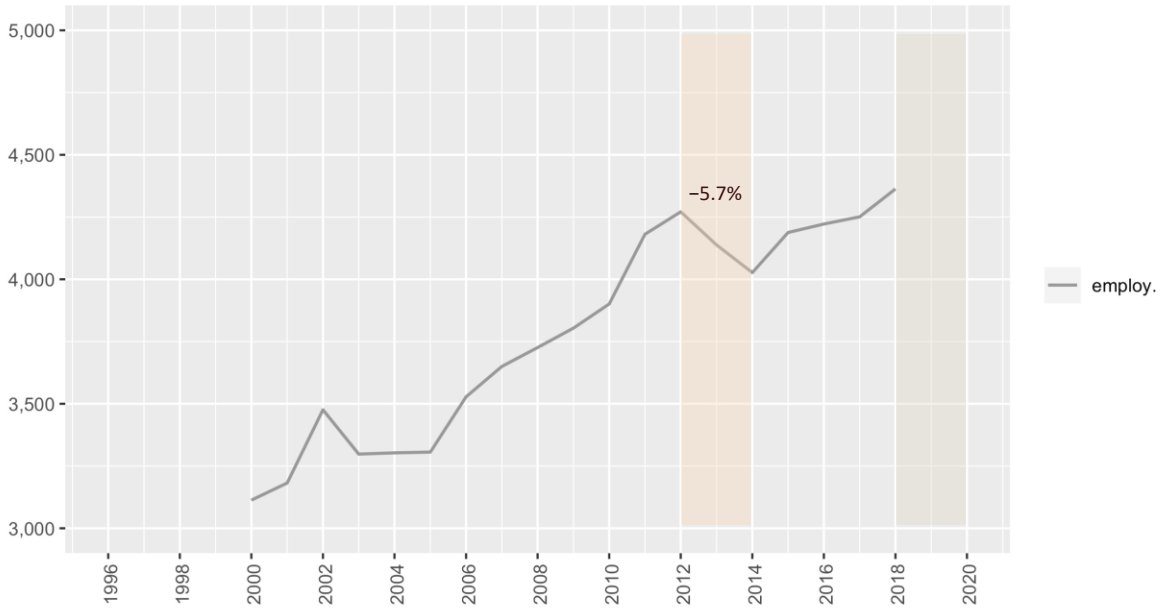


Table 3. Environmental Goods and Services Sector statistics

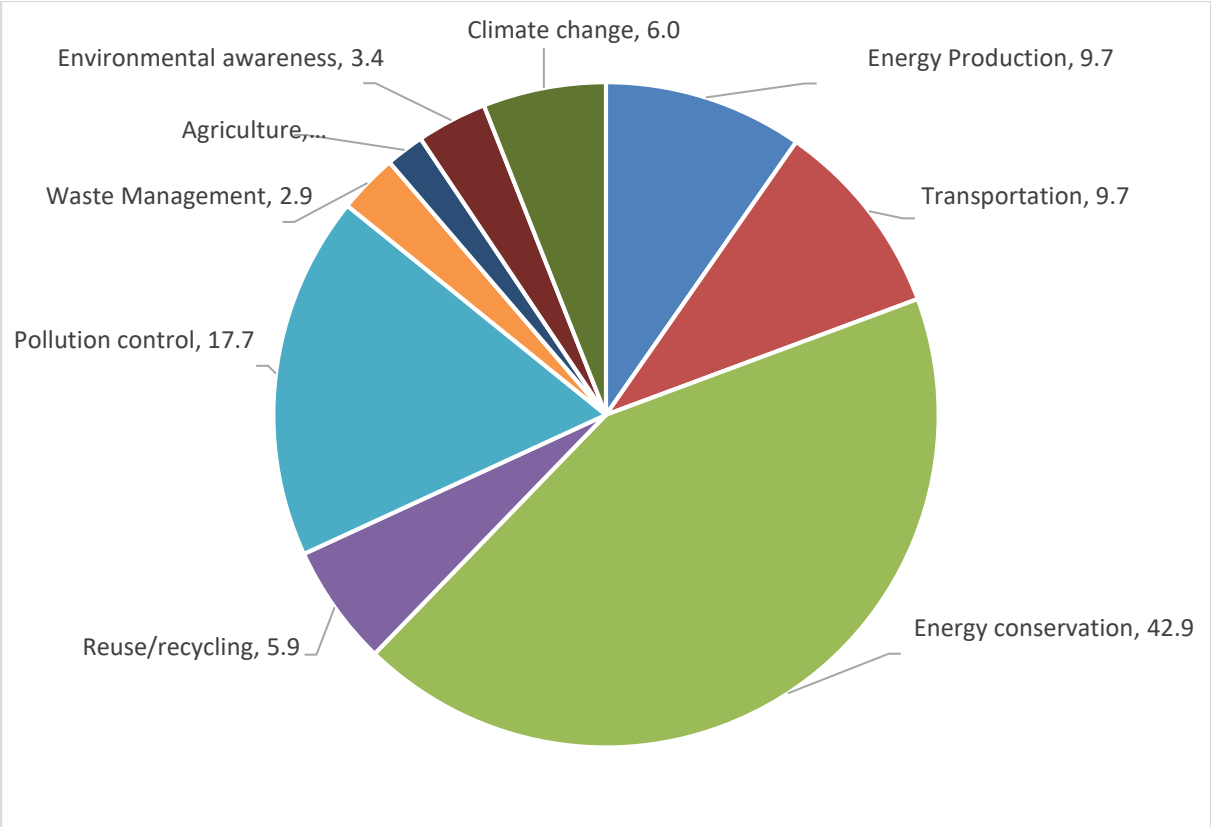
year	employment (million FTE)	GVA (billion €)	GVA (% GDP)
2000	3.113	129	1.63%
2001	3.182	135	1.64%
2002	3.476	145	1.70%
2003	3.298	149	1.70%
2004	3.303	158	1.72%
2005	3.306	165	1.72%
2006	3.528	183	1.81%
2007	3.650	200	1.87%
2008	3.726	215	1.94%
2009	3.804	213	2.01%
2010	3.901	231	2.11%
2011	4.181	249	2.19%
2012	4.271	256	2.25%
2013	4.138	258	2.24%
2014	4.027	255	2.17%
2015	4.188	269	2.20%
2016	4.222	282	2.25%
2017	4.251	294	2.25%
2018	4.363	307	2.27%

Source: Eurostat, env_ac_egss2

Green EUTMs by product categories, by countries, and by company size

In order to analyse the distribution of the green EUTMs among the various G&S, the algorithm distributes the green trade marks into 35 green categories, which are further aggregated into 9 green groups. Figure 8 shows the distribution of green EUTMs from 2015 to 2020 among the groups.

Figure 8. Percentage of green EUTMs by product group (2015-2020)



Energy-related products[23] are predominant, with energy production and conservation accounting for more than half of all green EUTMs. **Energy conservation** is the largest group with 43% of all green filings. Within this group, 'storage of electricity' (that is, mainly batteries of various kinds) with 38% of all green filings, is the most important category. This category is dominated by Chinese firms.

The second most important group is **Pollution control** with 18% of filings, dominated by water purification products (11% of all green filings, mainly from China and South Korea). Two groups account for 10% of filings each, **Energy production** and **Transportation**. In the former group, solar energy products stand out (close to 5% of green filings, mainly from South Korea).

[23] As used here, "products" refers to the groups or categories of G&S, as appropriate.

Products related to **Climate change** and to **Reuse/recycling** each account for 6% of green EUTM filings. Finally, three smaller groups account for 2-3% each, with products linked to **Environmental awareness** (ecology and sustainability), products linked to **Waste management**, and alternative products in **Agriculture**.

Table 4 provides a more detailed breakdown of the green EUTM applications by category and by group. It also indicates the main countries of origin of applications in each category.

The countries of origin of the applicants are quite varied, dominated in absolute terms by large countries (such as China or Germany) but with some smaller countries showing a much greater intensity in specific areas of specialisation, for example Denmark in Wind Energy and Hydrogen Vehicles, or Poland in Fertiliser Alternatives.

Table 4. Green EUTM filings by category (2015-2020)

	Category	EUTM	% green	Top countries
1	**Energy production**	**7 121**	**9.7**	
11	Biofuels	1 334	1.82	DE, UK, IT
12	Solar Energy	3 358	4.57	CN, DE
13	Wind Energy	421	0.57	DE, DK
19	Other energy	2 008	2.73	DE, IT, US
2	**Transportation**	**7 092**	**9.7**	
20	General transport	3 065	4.17	CN, DE
21	Electric car	201	0.27	IT, CN, DE
22	Electric moto	585	0.80	CN, DE
23	Electric bike	991	1.35	CN, DE
24	Hybrid vehicle	24	0.03	DE, US
25	Hydrogen vehicle	24	0.03	KR, DE, DK
26	Electric engines	1 918	2.61	DE, CN
29	Other vehicles	284	0.39	IT, CN, FR
3	**Energy conservation**	**31 516**	**42.9**	
31	Energy saving	1 656	2.25	DE, FR, ES
32	Storage of electricity	27 571	37.53	CN
33	Low energy lighting	701	0.95	DE, IT, ES
34	Energy management	1 588	2.16	DE, FR
4	**Reuse/recycling**	**4 324**	**5.9**	
41	Recycling	2 603	3.54	DE, IT, ES
42	Reusable bags	527	0.72	CN, US
43	Reusable bottles	364	0.50	US, CN
44	Refilling cartridge	198	0.27	UK, US
49	Other reusable	632	0.86	CN
5	**Pollution control**	**12 993**	**17.7**	
50	Pollution general	6 478	8.82	CN, DE
51	Water purification	3 011	4.10	DE, CN
52	Air purification	2 247	3.06	CN, DE
53	Biodegradable	1 257	1.71	DE, IT
6	**Waste management**	**2 133**	**2.9**	
61	Waste disposal	485	0.66	DE
62	Process waste	1 648	2.24	DE, CN
7	**Agriculture**	**1 374**	**1.9**	
71	Fertiliser alternatives	900	1.23	ES, IT, PL
72	Pesticide alternatives	395	0.54	IT, FR
79	Other agriculture	79	0.11	IT, ES
8	**Environmental awareness**	**2 519**	**3.4**	
81	Ecology	1 392	1.89	DE, US, UK
82	Sustainability	1 127	1.53	DE, FR, US
	Climate change	**4 390**	**6.0**	
91	Environmental services	3 553	4.84	DE, US, UK
92	Carbon monitor	119	0.16	UK, US
93	Carbon brokerage	718	0.98	DE, IT
	GREEN EUTMS	**73 459**	**100**	**CN, DE**

*NOTE: The column '**Top countries**' is the list of countries from which at least 1/3 of the green applications in the category originate. In the case of Biofuels, for example, at least 1/3 of the total filings come from firms in Germany, Italy or the United Kingdom. In some categories, for example Waste disposal, a single country (Germany) has at least a 1/3 share.*

From the analysis of the data, it appears that green EUTMs combine G&S more often than do other EUTMs: 44% of green EUTMs contain both G&S in their specifications. This is compared to 31% in the case of non-green trade marks. Many of the services relate to the sale, advice, training, evaluation or support provided for new green goods, since in some cases it involves a complex deployment/substitution processes. For example, the complexity of the deployment of hydrogen cars is reflected in the related trade marks covering both G&S terms. These trade marks contain terms related to devices to generate hydrogen, devices for storage or transport of the hydrogen, services related to transport or generation of hydrogen (installation, maintenance and repair), devices for fuelling cars in stations, the operation of fuelling stations, engines for cars, reformers for cars, fuel cell cars, rental of those cars, and the wholesale or retail sale of the above.

Table 5 shows the distribution of green EUTM applications by country of applicant and also indicates the categories in which each country specialises.

Table 5. Green trade marks by country (2015-2020)

country		% green in country	green TMs	category (SE = Storage of Electricity) (at least 33%)	total TMs
China	CN	22.6	16 356	SE (59%)	72 422
Germany	**DE**	**11.6**	**12 003**	**SE, Air purification (42%)**	**103 150**
United Kingdom	UK	8.7	4 801	SE, Environmental services (40%)	55 391
Italy	**IT**	**8.0**	**4 748**	**SE, Air purification, Pollution general (39%)**	**59 102**
United States	US	6.8	4 501	SE, Environmental services (43%)	66 151
France	**FR**	**10.9**	**4 025**	**SE, Pollution general (38%)**	**36 969**
Spain	**ES**	**7.1**	**3 790**	**SE (34%)**	**53 712**
Netherlands	**NL**	**11.1**	**2 667**	**SE (36%)**	**23 967**
Sweden	**SE**	**9.6**	**1 809**	**SE, Pollution general (39%)**	**18 816**
Poland	**PL**	**9.1**	**1 785**	**SE, Air purification, Pollution general (39%)**	**19 688**
South Korea	KR	25.4	1 761	SE (46%)	6 926
Austria	**AT**	**8.0**	**1 360**	**SE, Air purification (36%)**	**16 940**
Switzerland	CH	10.7	1 228	SE (52%)	11 452
Finland	**FI**	**12.1**	**1 064**	**SE, Pollution general (37%)**	**8 772**
Belgium	**BE**	**8.2**	**1 030**	**SE, Air purification, Environmental services (37%)**	**12 571**
Hong Kong SAR China	HK	14.1	995	SE (58%)	7 052
Denmark	**DK**	**9.5**	**914**	**SE, Pollution general (36%)**	**9 662**
Japan	JP	10.2	765	SE (38%)	7 519

country		% green in country	green TMs	category (SE = Storage of Electricity) (at least 33%)	total TMs
Czechia	**CZ**	**10.1**	**595**	**SE, Pollution general (34%)**	**5 903**
Luxembourg	**LU**	**10.8**	**581**	**SE (34%)**	**5 381**
Taiwan	TW	14.1	561	SE, Electric bike, Pollution general (41%)	3 969
Turkey	TR	20.0	555	SE (56%)	2 778
Canada	CA	7.4	547	SE, Environmental services, Reusable bags, Recycling (39%)	7 346
Ireland	**IE**	**6.0**	**390**	**SE, Environmental services (37%)**	**6 464**
Greece	**EL**	**6.3**	**293**	**SE, Environmental services, Other energy (34%)**	**4 671**
Romania	**RO**	**6.7**	**284**	**SE, Air purification, Pollution general (40%)**	**4 216**
Cayman Islands	KY	23.4	248	SE (78%)	1 060
Norway	NO	12.6	247	SE (39%)	1 956
Estonia	**EE**	**8.5**	**243**	**SE (37%)**	**2 858**
Bulgaria	**BG**	**7.1**	**231**	**SE, Air purification, Solar Energy, Fertiliser alternatives (39%)**	**3 255**
Slovakia	**SK**	**11.1**	**231**	**Electric engines, SE (37%)**	**2 084**
Slovenia	**SI**	**12.8**	**226**	**SE, Air purification, Recycling (38%)**	**1 762**
Hungary	**HU**	**6.8**	**222**	**SE, Air purification, Pollution general (38%)**	**3 269**
Australia	AU	7.8	164	SE, Air purification (40%)	2 095
Lithuania	**LT**	**6.6**	**139**	**SE, Pollution general, Solar Energy, Sustainability (40%)**	**2 120**
Singapore	SG	9.2	134	SE (54%)	1 452
British Virgin Islands	VG	7.0	112	SE (50%)	1 592
Croatia	**HR**	**8.4**	**63**	**SE, Environmental services, Recycling (38%)**	**751**
South Africa	ZA	5.8	63	SE (73%)	1 079
Russia	RU	6.1	42	SE (45%)	688
Monaco	MC	7.1	41	SE (51%)	581
New Zealand	NZ	6.3	32	SE, Pollution general, Carbon monitor (38%)	510

Note: the list contains countries with more than 500 EUTMs with at least 5% of these being green EUTMs.

In many countries, the domains of storage of electricity and products related to pollution control are dominant. Environmental services are important in Belgium, Greece and Croatia but also in Canada, the UK and US.

The countries with the highest percentage of green trade marks in relation to all their EUTM filings are South Korea and China with 25.4% and 22.8% respectively. The Cayman Islands and Turkey are also above 20%, but with lower absolute numbers. These countries are specialised in products related to the storage of electricity although South Korea is more diversified, with filings in solar energy, and hydrogen vehicles.

There seems to be a greater propensity in the EU, Canada, the UK and US for green services, while Asian countries tend towards energy-related goods.

Table 6 shows the breakdown of green EUTMs by company size, as well as the propensity of the different types of companies to bundle trade marks with patents. While large companies are somewhat more active when it comes to filing green EUTMs (and much more likely to bundle trade marks with patents), with 12.7% of the EUTMs filed during 2015-2020 in the green category, SMEs also play a significant role, with about 10% of their EUTMs classified as green. In terms of absolute figures, SMEs filed more green EUTMs than large companies during the period: 11 554 versus 8 571, respectively. This underlines the role played by SMEs in the EU economy, including in the green transformation.

Table 6. Green trade marks by size of applicant (2015-2020)

Firm size	Green TMs	Total TMs	Green	Bundle with patents
large	**8 571**	**67 754**	**12.7%**	**36.3%**
SME	**11 554**	**118 860**	**9.7%**	**7.8%**
medium	4 261	43 821	9.7%	11.7%
small	4 031	38 759	10.4%	6.8%
micro	3 262	36 280	9.0%	4.2%

Sample: 27% of total EUTMs filed during the period

Details of green EUTMs by product group

In the remainder of this section, the evolution of green EUTMs for each of the nine product groups and for the categories within those groups is presented. For each group, the evolution of filings from EU Member States and third countries, respectively, is shown, followed by a breakdown of the group into the relevant categories.

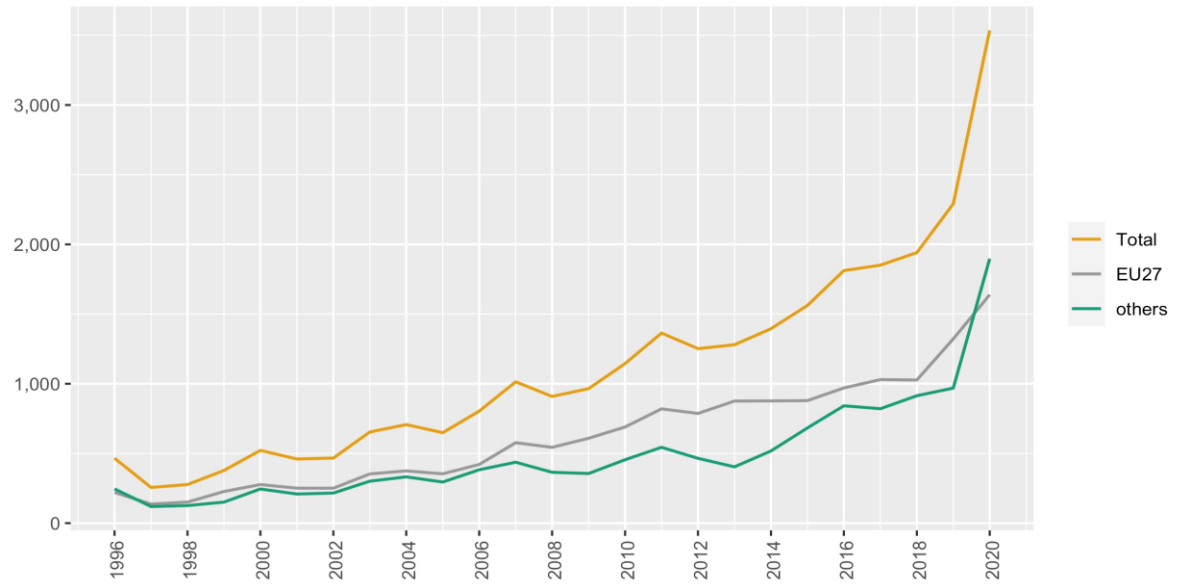
Figure 9. Number of green EUTMs: Energy conservation

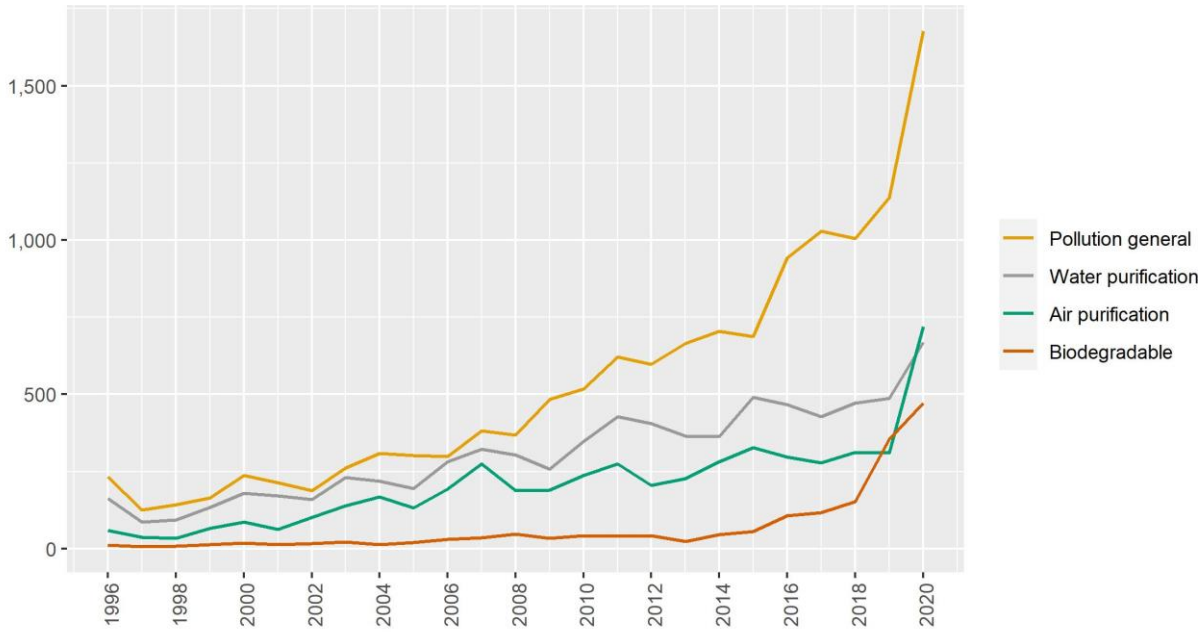
Energy conservation is the dominant product group among green trade marks, accounting for 42.9% of all green EUTMs since 2015. Within this group, electricity storage is the most important category, with 37.5% of green EUTMs. As noted above, this category is dominated by Chinese firms but it is also the most important category for many other countries. Chinese firms filed nearly 10 000 EUTMs in the 'storage of electricity' category, compared to nearly 4 000 from Germany and about 1 400 each from Spain, the UK and US. However, since 2011 the number of 'storage of electricity' filings has stagnated and even decreased in the case of non-EU countries.

Although still modest in absolute terms, the category 'energy management' is the one that grew most in 2020, concentrated in Germany (304 EUTMs) and France (249 EUTMs). The trade marks in this category contain, above all, the expressions 'energy management', 'energy consumption' or 'energy audit' but also 'energy consultancy'. As in almost all service trade marks, these filings come mainly from the EU, UK, USA or Switzerland. Finland is the country with the highest intensity of trade marks in 'low energy lighting' and 'energy management' and Norway shows the highest intensity in 'energy saving'.

The second most numerous product group is related to **pollution control**, with 17.7% of green EUTM filings. This group is growing, especially since 2019, for biodegradable products while in 2020 growth was seen in applications for air purification products (this could possibly in part be due to the COVID-19 pandemic).

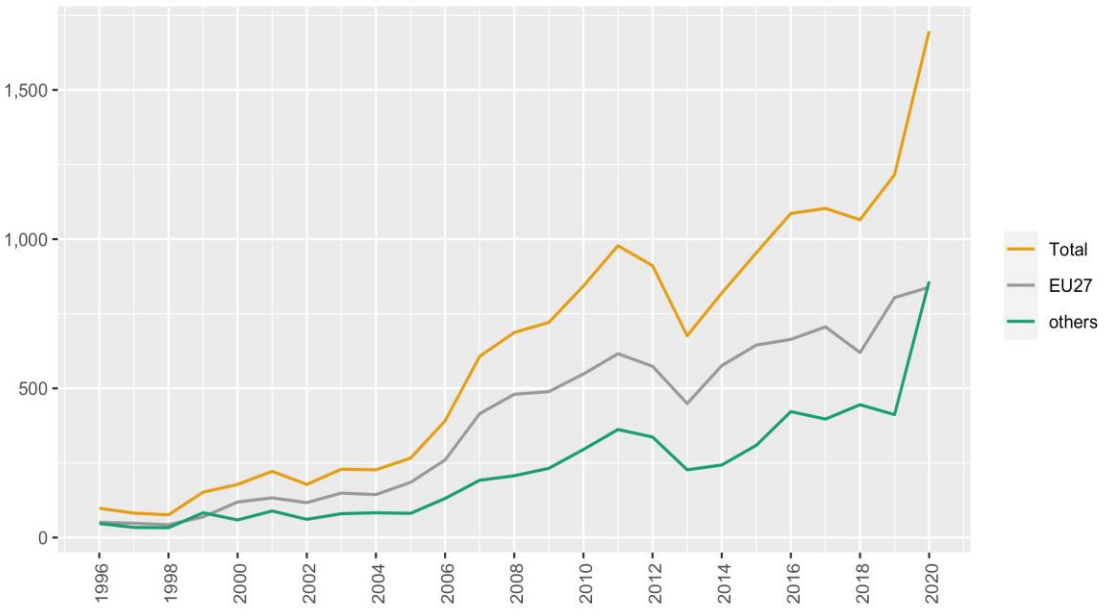
Figure 10. Number of green EUTMs: Pollution control

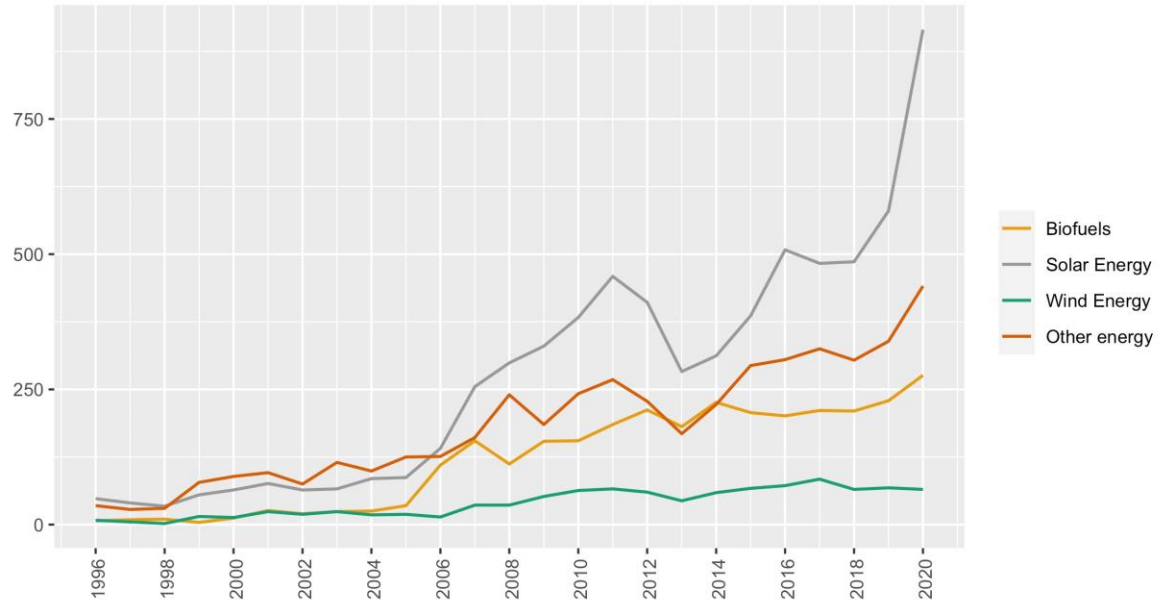




The recent growth in all the categories of this group is due to growth in Chinese filings. Australian filers show the highest intensity in water purification products while Irish filings centre on biodegradables, even though the absolute numbers of such EUTMs are relatively small. Overall, EU and non-EU filings are about equal in number.

Figure 11. Number of green EUTMs: Energy production



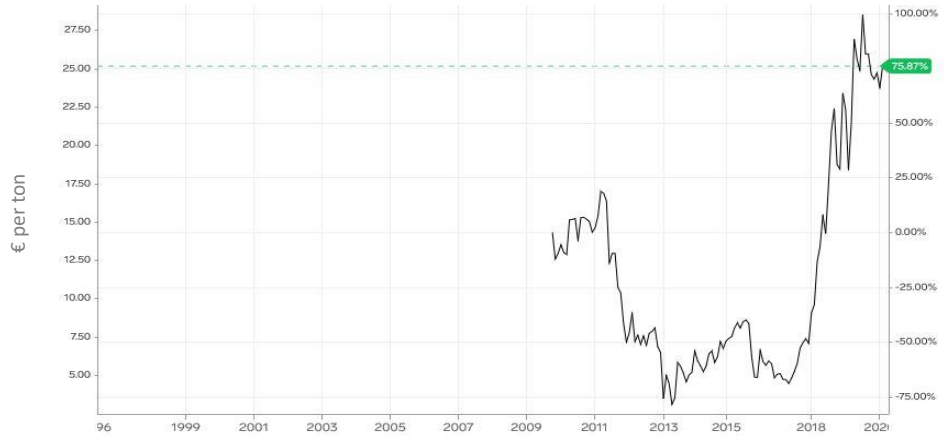


The **energy production** group accounts for 9.7% of green EUTM filings. It is one of the most interesting groups from an economic point of view and has also been extensively studied by examining the number of patent filings. Furthermore, this group is related to two other groups: energy storage and transportation.

The group is dominated by filings that contain terms related to solar energy such as 'photovoltaic', 'solar collector' or 'solar battery'. The group also contains terms such as 'wind energy', 'research energy', and 'biogas' or 'biomass'. It also includes trade marks with generic terms such as 'renewable energy'.

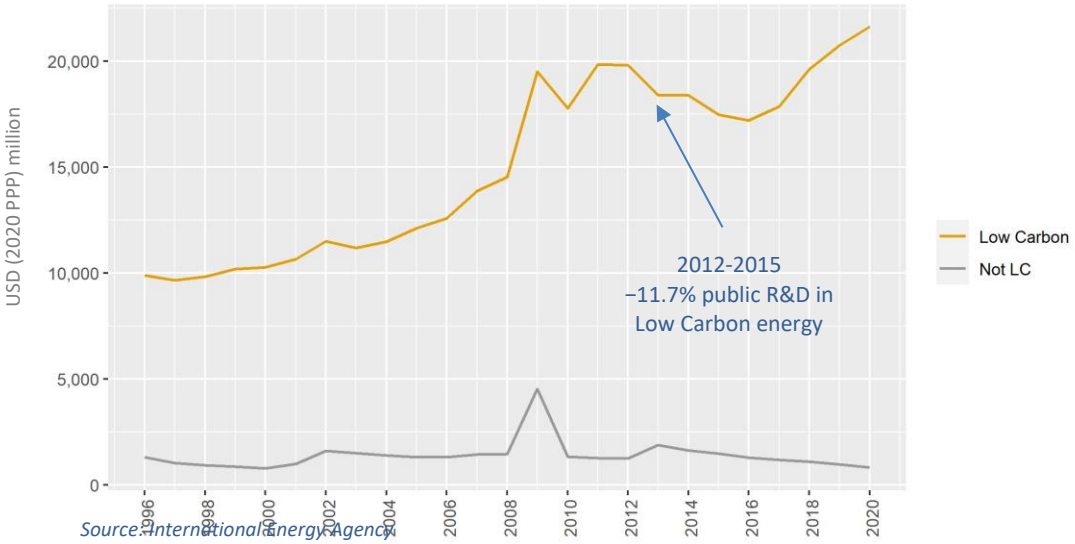
A significant decrease can be observed between 2011 and 2014. This decline coincides with a severe fall in the prices of CO_2 Emission Allowances and also a stagnation of public R&D in energy, as shown in Figures 12 and 13. In 2018, the price of allowances grew strongly, and there was a strong increase in EUTMs related to solar energy, especially from Chinese firms.

Figure 12. Price of European emission allowances



Source: Business Insider

Figure 13: R&D in energy (IEA members)



Source: International Energy Agency

The fluctuations in this product group and the stagnation in the linked category 'storage of electricity' are responsible for the decline observed for the entire green EUTM filing volume in 2011-2014, (see Figure 5), which was followed by the decline in EGSS employment shown in Figure 7.

In absolute terms, the category 'biofuels' is dominated by German, Italian and UK filings. In the case of solar energy more than a third of filings come from China and Germany; South Korean firms also are well represented. Wind energy is dominated by Danish and German firms.

The **transport sector** represents 9.7% of green EUTM applications. This product group has seen a continuous increase throughout the period, only dampened somewhat in 2013 by a decline in trade marks related to electric motors used in transport. In recent years, categories such as electric bicycles and motorcycles have seen steady growth.

Most categories in this group are dominated by Chinese and German firms, but also Italian firms in the case of 'electric cars' and 'other vehicles', and South Korean firms for 'hydrogen vehicles'. Practically all the EUTMs for hydrogen vehicles are related to refuelling or other services. Overall, EU and non-EU firms file approximately the same number of EUTMs in this product group.

Figure 14. Number of green EUTMs: Transportation

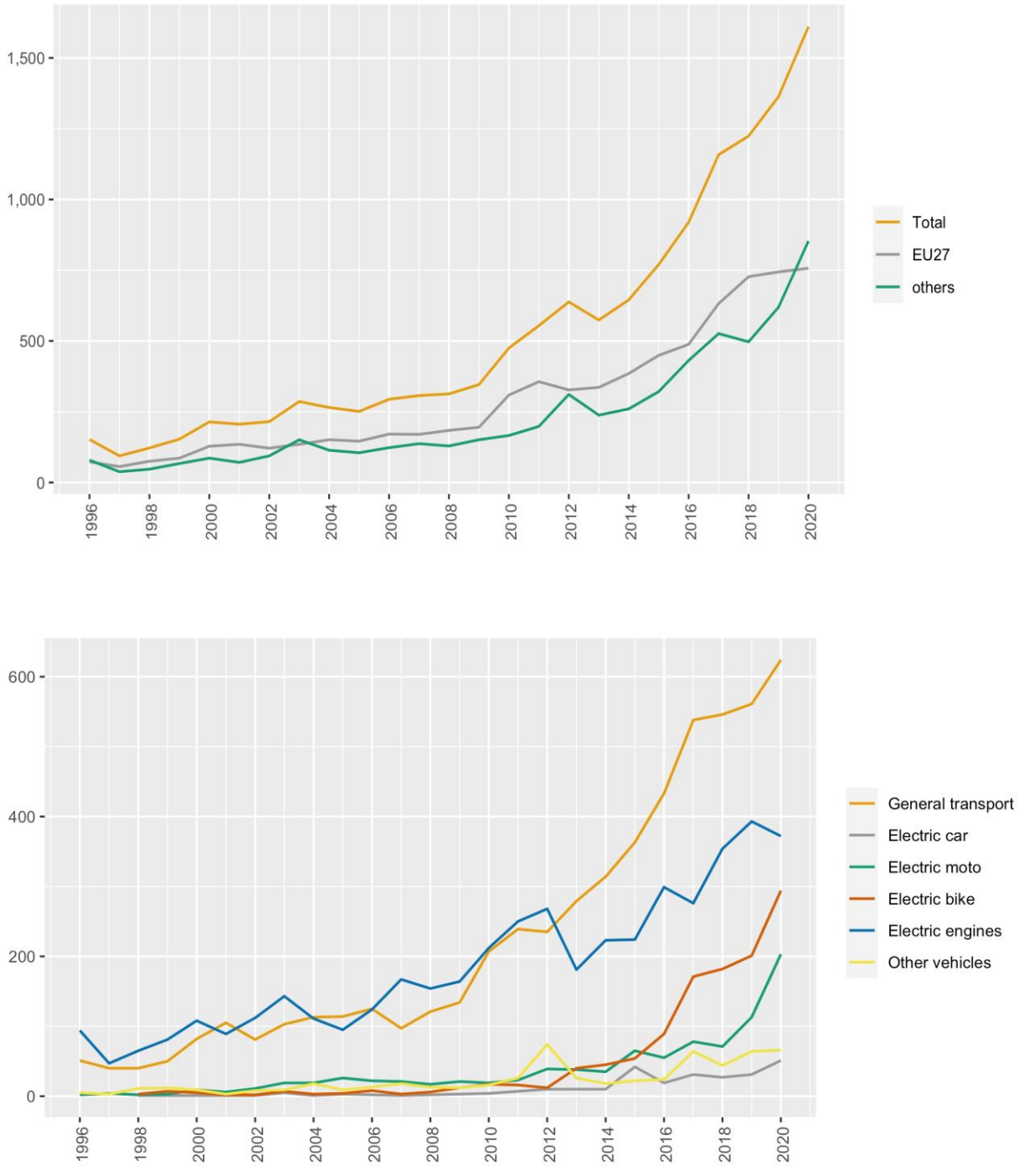
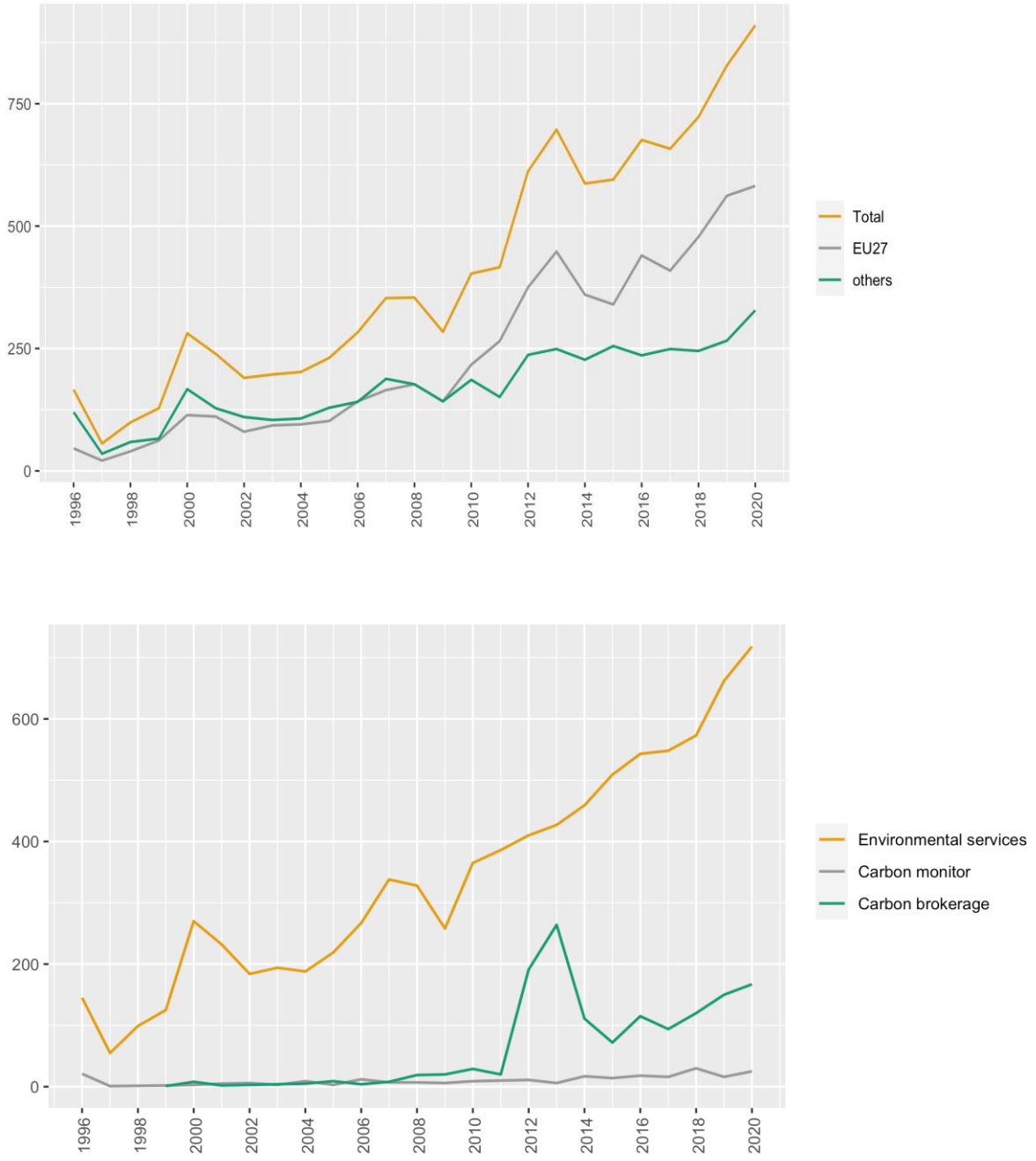


Figure 15. Number of green EUTMs: Climate change

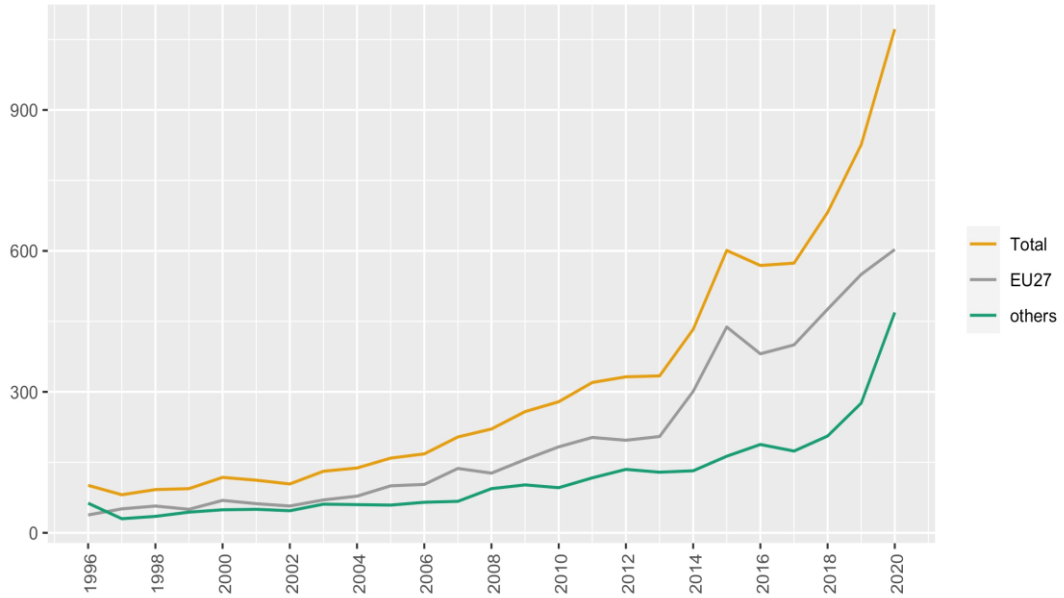


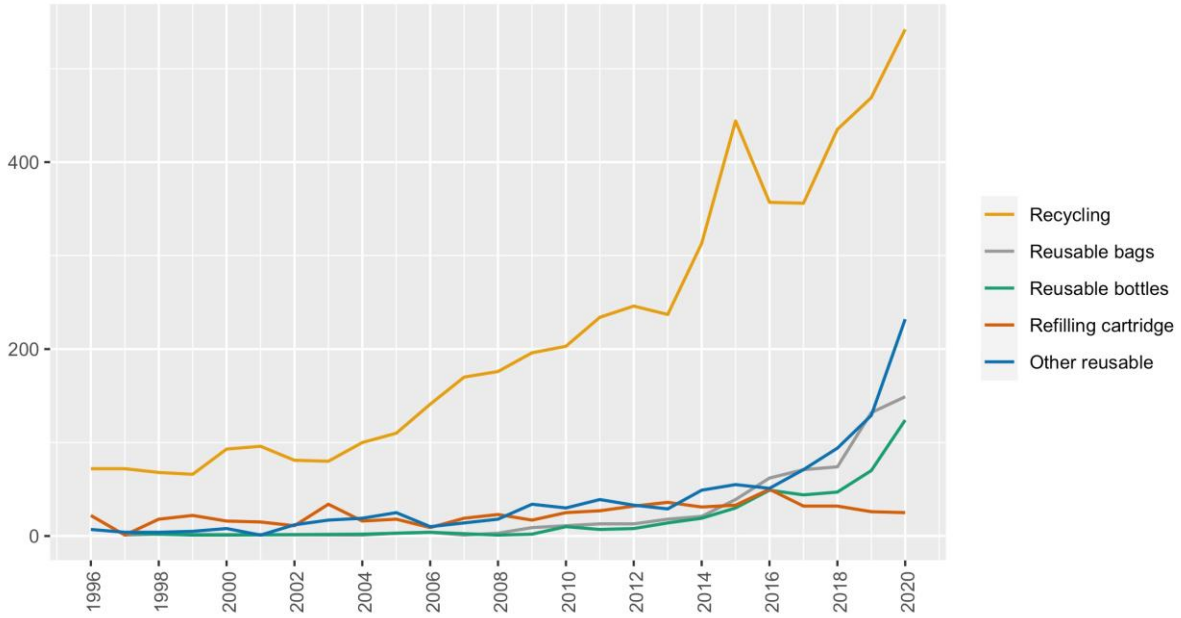
With 6% percent of EUTM applications, the group **climate change** is smaller than energy production or transportation, but it has grown strongly since 2009. The peak in 2013 and 2014 in trade marks related to 'carbon brokerage' coincided with phase II of the EU Emission Trading System (ETS). Most of these trade marks are in Nice Class 36 and include the term 'Brokerage of carbon credit' along with a long list of other financial or insurance services.

In this group, EU-based applicants account for the majority, especially German and Italian firms.

This group also contains the category ‘Environmental services’, which has grown continuously throughout the period. The vast majority of trade marks in this category contain ‘environmental services’ or ‘environmental protection’ in their G&S description. Again, as for other services, filings from European and American companies predominate. Trade marks in this category often include other, non-green, services but are in general more specific than those related to ‘carbon brokerage’.

Figure 16. Number of green EUTMs: Reuse/recycling





This group, similar in size to climate change, represents 5.9% of filings, and it has also grown significantly in recent years. Since opening in 1996, EUIPO has received 21 000 applications using the expression 'recycle', which is one of the most commonly used green expressions identified in green trade marks, that is, 2 063 since 2015.

The strongest growth in recycling-related products between 2013 and 2015 came from Germany, but Spain was also a significant filer. However, the growth in the other categories is due to Chinese trade mark filings. The timing of this growth spurt may be related to the European Commission's Circular Economy Action Plan[24], adopted in 2015.

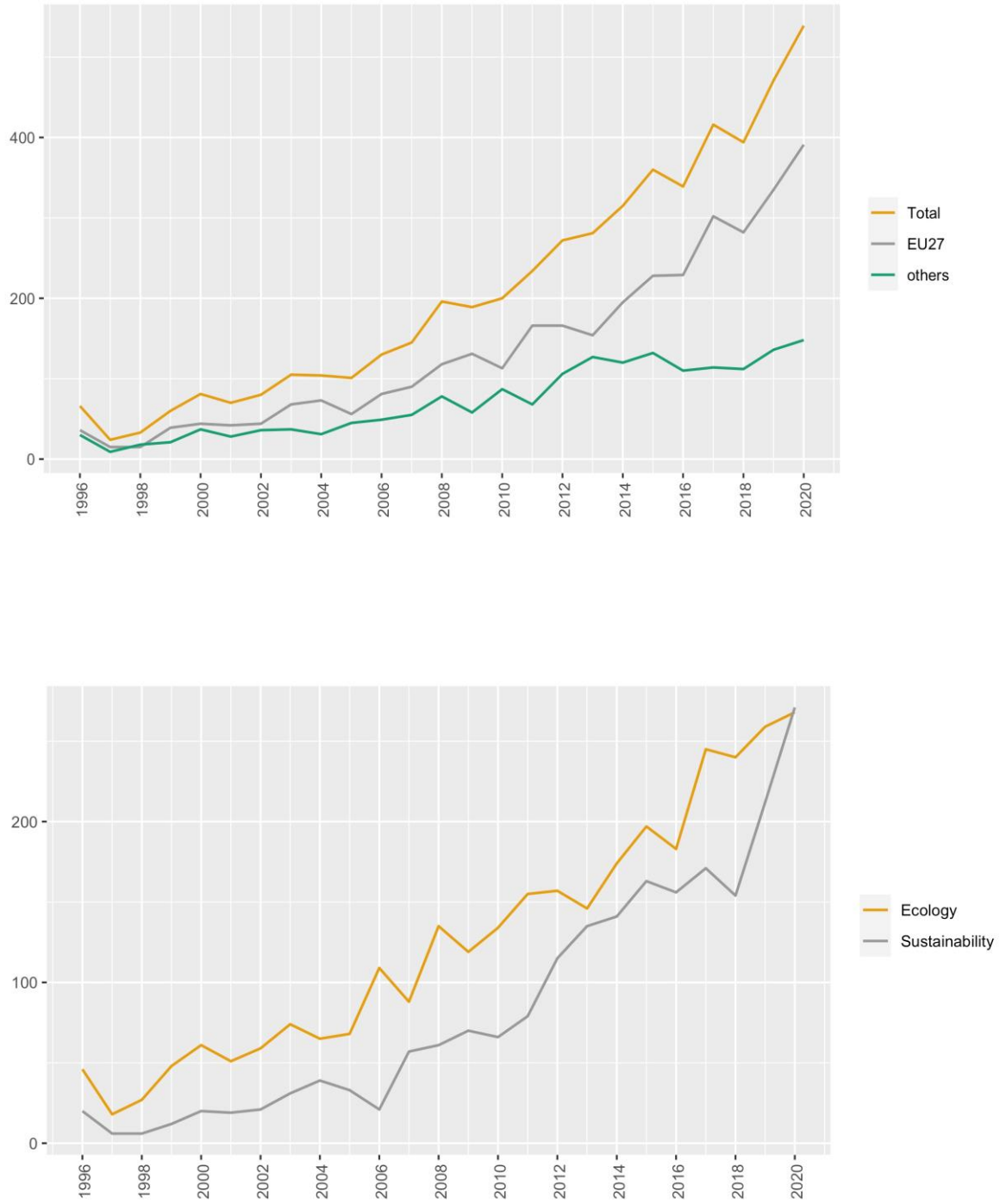
There are three more groups that in total only account for 8.2% of the applications. These represent important economic sectors and are growing. The first of these groups is **environmental awareness**, accounting for 3.4% of green EUTM filings.

Most of the EUTM filings in this group contain the terms 'ecology' or 'sustainable'.

Although EU filings dominate and the difference becomes greater over time, there are a significant number of UK filings with the term 'ecology' and Chinese filings with the term 'sustainability'.

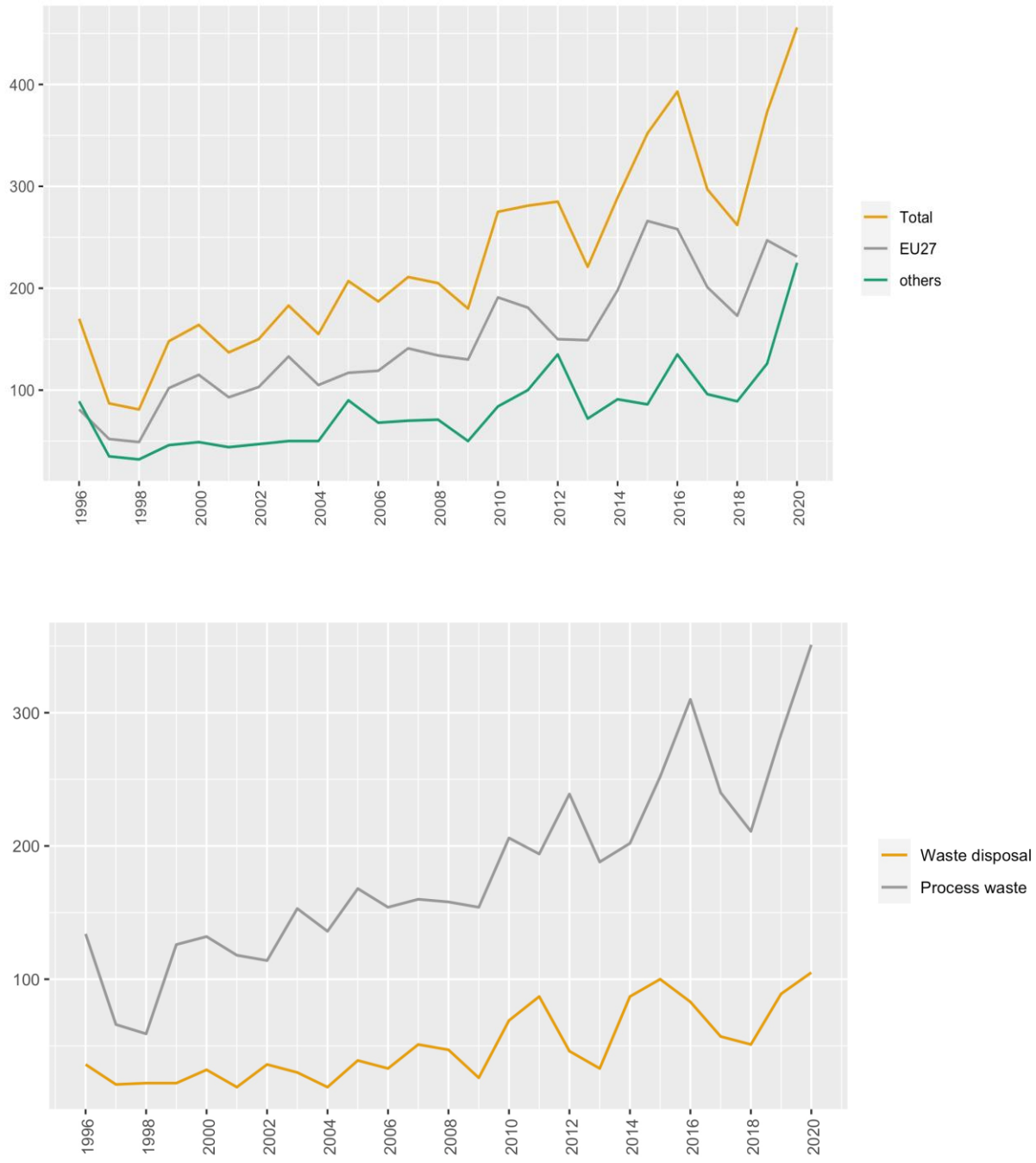
[24] See: https://ec.europa.eu/environment/topics/circular-economy/first-circular-economy-action-plan_en

Figure 17. Number of green EUTMs: Environmental awareness



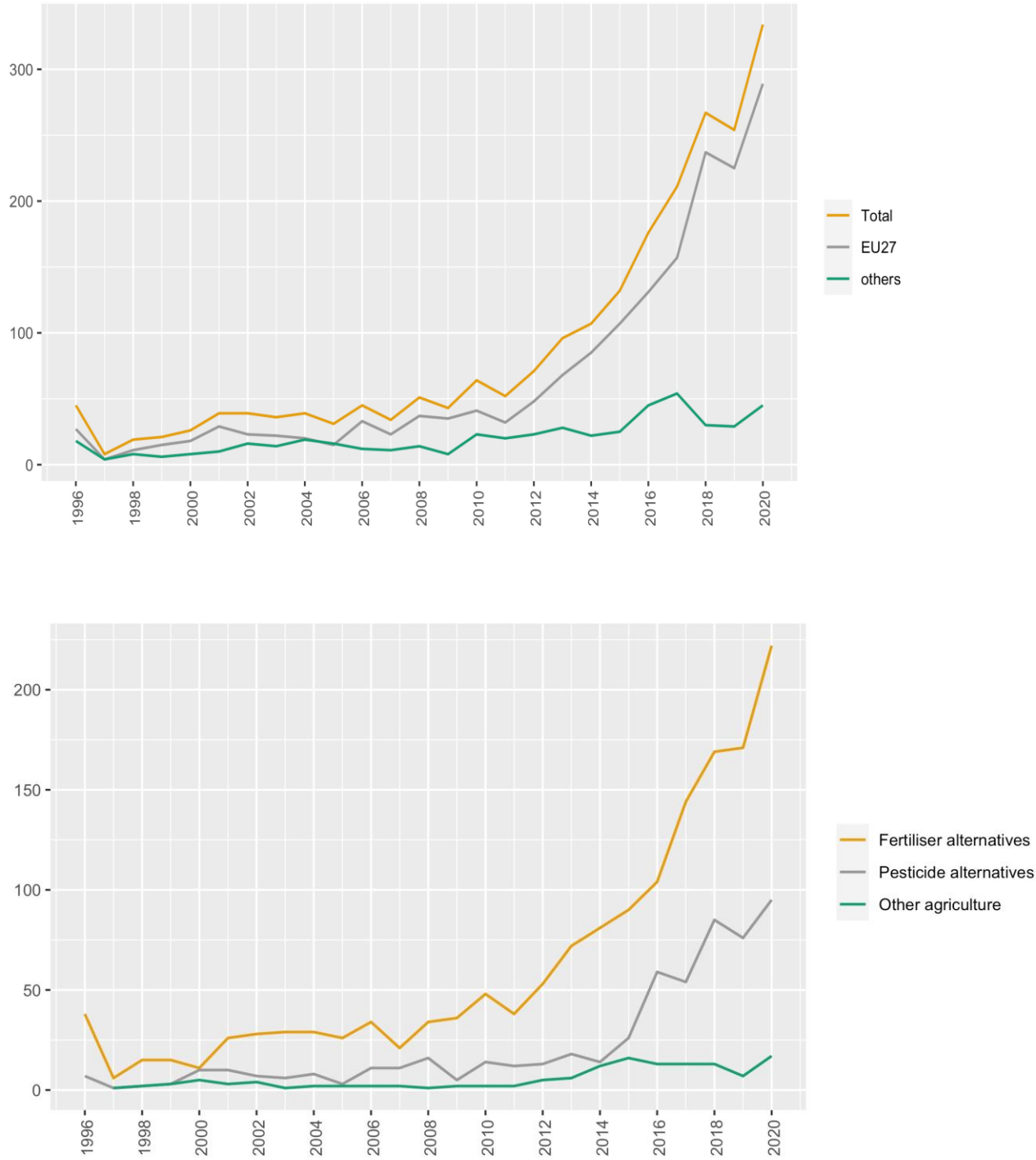
Waste management accounts for 2.9% of EUTM filings. The most common references for these trade marks are 'waste process' or 'waste treatment'. The number of trade marks in this group is modest, perhaps because the products in question are not aimed at consumers.

Figure 18. Number of green EUTMs: Waste management



Finally, the group with the fewest green EUTMs (1.9% of the total) but with significant growth in recent years consists of alternative products for **Agriculture**. The group is heavily dominated by filings from EU-based companies.

Figure 19. Number of green EUTMs: Agriculture



Since 2011 there has been significant growth in filings related to alternative fertilisers from Spain and Italy, as well as growth since 2015 in alternative pesticides from these two countries.

7. Conclusions and areas for further research

Dealing with all forms of environmental degradation and especially climate change is one of the greatest challenges of our time. Many kinds of policies and resources need to be mobilised, and among them is the innovation of European and global companies, leading to products and services that pollute less and/or mitigate the impact of past pollution. Such innovations are often protected by IP rights.

Traditionally, patents are the IP right most closely associated with innovation in the eyes of policy makers and the general public. However, this report has shown that trade marks, specifically EUTM filings that contain relevant terms in their G&S specifications, are also a valid indicator of innovation in the applicable sectors. The number of such trade marks has grown significantly since the EUIPO began accepting EUTM applications in 1996, both in absolute terms and as a proportion of total EUTM filings. This shows that environmental considerations are becoming increasingly important for brand owners filing trade mark applications, and to the consumers who buy the resulting products and services.

In several of the sectors examined in this report, EU-based companies perform well, as judged by their EUTM filings. This observation is also reinforced by the examination of patent filings related to climate change mitigating technologies in the EUIPO-EPO joint study (2019a). Environmental protection and climate change mitigation is therefore an area of strength for the European economy and this can be expected to contribute to the fulfilment of the European Commission's Green Deal objectives.

This report is the first study that uses trade mark data to examine the evolution of the environmentally relevant G&S markets in the EU. The data on which the study is based represents a rich source of information, which in the future could be combined with other data, whether data on other IP rights such as patents, or more granular data on sectoral economic activity to get a better picture of the factors that drive innovation in this area.

The study has also shown that SMEs play an important role in bringing 'green' G&S to the marketplace. More detailed studies could determine the sectors in which such innovative SMEs are particularly active, and could conceivably help fine-tune policy instruments aimed at supporting SMEs, this being another important goal for EU policy makers.

Annex 1. Green terms in the Harmonised Database

reference	Nice	type	description
0000601	1	M	Enzyme preparations for the processing of waste matter
0001255	1	M	Biodegradable detergents for use in manufacturing processes
0001781	1	M	Chemicals for use in the treatment of waste water
0001781	1	S	Sewerage water treatment chemicals
0002072	1	M	Chemical substances for use in treating poisonous gases
0002630	1	M	Filter aids for liquid purification
0002725	1	M	Chemical preparations for the binding of gaseous industrial wastes
0002809	1	M	Catalysts for use in the control of carbon dioxide emissions
0003836	1	M	Chemical compositions for the control of fuel spillages
0007526	1	M	Chemical compositions for water treatment
0007526	1	S	Chemical preparations for the treatment of water
0007526	1	S	Chemical products for the treatment of water
0007526	1	S	Chemical substances for purifying water
0007526	1	S	Chemicals for the purification of water
0007526	1	S	Chemicals for treating water
0007526	1	S	Chemicals for use in purifying water
0007526	1	S	Chemicals for use in the purification of water
0007526	1	S	Chemicals for use in the treatment of water
0007526	1	S	Purifying chemicals (Water- -)
0007526	1	S	Water-purifying chemicals
0007526	1	S	Water purifying agents
0007526	1	S	Water purifying chemicals
0007526	1	S	Water treatment chemicals
0008427	1	M	Chemical preparations for the binding of liquid waste
0008428	1	M	Chemical preparations for the dispersal of petroleum
0010142	1	M	Reagents for use in environmental testing
0012168	1	M	Chemical products for the treatment of sewage
0012168	1	S	Chemical products for sewage treatment
0012193	1	M	Carbon for filters for removing organic contaminants from water
0012195	1	M	Enzyme preparations for the decomposition of waste matter

reference	Nice	type	description
0014674	1	M	Chemical compositions for controlling a spillage of hazardous wastes
0015074	1	M	Chemical substances for use in dissolving poisonous gases
0017087	1	M	Chemicals for use in the prevention of environmental damage to plants
0017766	1	M	Chemicals for use in the decontamination of polluted sites
0018639	1	M	Biological additives for converting vegetation into silage
0019182	1	M	Sealing compounds for stopping leakage from oil tanks [chemicals]
0019633	1	M	Natural fertilizers
0019633	1	S	Natural manure
0019635	1	M	Toxic gas neutralizers
0019635	1	S	Neutralizers (Toxic gas -)
0020131	1	M	Chemical preparations for use as additive to fuels for combatting pollution
0020216	1	M	Catalysts for use in control of hydrocarbon emissions
0020347	1	M	Waste treatment chemicals
0026587	1	M	Chemicals used in the treatment of waste streams
0026920	1	M	Decontaminants for fuels
0028028	1	M	Combustion enhancers [chemicals]
0028028	1	S	Combustion promoting chemicals
0029604	1	M	Fuel-saving preparations
0030153	1	M	Biological additives for converting crops into compost
0030154	1	M	Biological additives for converting vegetation into agricultural feeds
0036792	1	M	Organic composts
0037893	1	M	Chemical formulations for use in biological sewage treatment
0037898	1	M	Additives (Chemical -) for combustion enhancers
0039826	1	M	Fuel economising compositions
0039841	1	M	Inorganic precipitation agents for the purification of waste water
0040051	1	M	Flocculating chemicals for treating waste and industrial process water
0041310	1	M	Horticultural growing media composts
0041717	1	M	Chemical reagents for decontaminating gases
0041717	1	S	Chemical reagents for cleansing gases
0042802	1	M	Chemical products for the treatment of drinking water
0043307	1	M	Chemical substances for the protection of the environment

reference	Nice	type	description
0043498	1	M	Chemicals for the control of environmental pollution
0044129	1	M	Bacteria for waste water treatment
0044248	1	M	Chemical compositions for the control of spillage of liquids
0045140	1	M	Waste water treatment chemicals for industrial use
0050520	1	M	Bacterial cultures for wastewater treatment
0058758	1	M	Compost
0058758	1	S	Compost [fertilizer]
0058758	1	S	Composts
0069816	1	M	Recycled paper pulp
0072870	1	M	Biological water treatment preparations
0072872	1	M	Bacteria for water treatment
0073028	1	M	Chemicals for the treatment of irrigation water
0073157	1	M	Preparations containing bacteria for water treatment
0073390	1	M	Microorganisms for use in water treatment
0073391	1	M	Enzymes for use in water treatment
0073396	1	M	Biodegradable anionic surfactants for use in manufacture
0073558	1	M	Biofertilizers
0073558	1	S	Bio-fertilizer
0073594	1	M	Chemicals for use in the manufacture of solar cells
0074463	1	M	Bacteria for sewage treatment
0074464	1	M	Microalgae for waste water treatment
0074472	1	M	Biofertilizers for use in soil treatment
0074473	1	M	Biofertilizers for use in seed treatment
0077462	1	M	Biostimulants being plant growth stimulants
0018547	3	M	Biological laundry detergents
0000294	4	M	Smokeless solid compositions for use as fuels
0001295	4	M	Ethanol [fuel]
0001295	4	S	Ethanol fuels
0004508	4	M	Hydrocarbon fuels derived from tar
0004719	4	M	Biodiesel
0005336	4	M	Combustion enhancers [oils]

reference	Nice	type	description
0005337	4	M	Combustion enhancers [petroleum products]
0005908	4	M	Sunflower oil for industrial purposes
0006071	4	M	Solid oxygen fuel
0017615	4	M	Smokeless fuels
0023464	4	M	Smokeless compositions for use as fuels
0025922	4	M	Peat [fuel]
0037538	4	M	Rape oil for industrial purposes
0037538	4	S	Colza oil for industrial purposes
0037538	4	S	Rapeseed oil for industrial purposes
0042376	4	M	Additives (Non-chemical -) for combustion enhancers
0045560	4	M	Fuel additives for inhibiting ash deposition in fossil fuel burning apparatus
0050651	4	M	Electrical energy from renewable sources
0050653	4	M	Electrical energy from solar power
0050654	4	M	Electrical energy from wind power
0055188	4	M	Vegetable wax
0055400	4	M	Bagasse for use as fuel
0055404	4	M	Corn oils for industrial purposes
0055405	4	M	Fish oils for industrial purposes
0055405	4	S	Fish oil for industrial purposes
0060366	4	M	Perilla oils for industrial purposes
0060367	4	M	Peanut oils for industrial purposes
0060368	4	M	Linseed oils for industrial purposes
0060369	4	M	Olive oils for industrial purposes
0060370	4	M	Sesame oil for industrial purposes
0060371	4	M	Soybean oil for industrial purposes
0077216	4	M	Biofuels
0077216	4	S	Biofuel
0077216	4	S	Biomass fuel
0077216	4	S	Fuels from biological sources
0012943	5	M	Air purifying preparations
0055445	5	M	Biological fungicides

reference	Nice	type	description
0055446	5	M	Biological herbicides
0065418	5	M	Microbicides for wastewater treatment
0065449	5	M	Domestic biopesticides
0065475	5	M	Agricultural biopesticides
0005178	6	M	Guttering of metal for the collection of rain-water
0015306	6	M	Rainwater hoppers of metal
0021155	6	M	Rainwater reservoirs of metal
0050708	6	M	Roofing of metal, incorporating photovoltaic cells
0050708	6	S	Roofing of metal, incorporating solar cells
0000491	7	M	Anti-pollution devices for motors and engines
0000491	7	S	Filters for engines
0000491	7	S	Filters for motors and engines
0002400	7	M	Machines for use in the processing of water
0003185	7	M	Waste compaction apparatus [machines]
0005765	7	M	Sound absorbers [silencers] being parts of vehicle exhaust systems
0008938	7	M	Waste baling presses [machines]
0009193	7	M	Electrical generators using solar cells
0011214	7	M	Mufflers [parts of machines]
0012051	7	M	Recycling crushing units [machines]
0012099	7	M	Liquid waste removal machines
0012923	7	M	Silencers as part of vehicle exhaust systems
0018559	7	M	Compressors for recovering and recycling refrigerant gases
0018574	7	M	Sewage treatment machines
0021651	7	M	Electric garbage disposal machines
0021818	7	M	Exhaust silencers
0021818	7	S	Silencers
0022625	7	M	Vacuum cleaners powered by rechargeable batteries
0023835	7	M	Silencers being parts of exhaust systems
0025449	7	M	Emission reduction units for motors and engines
0026566	7	M	Waste extraction machines
0028833	7	M	Sound absorbers [silencers] being parts of exhaust systems for machines

reference	Nice	type	description
0029252	7	M	Machines for separating recyclable materials
0031883	7	M	Turbine blades for power generation
0032007	7	M	Generators for wind turbines
0032056	7	M	Wind turbines
0032760	7	M	Electric propulsion mechanisms for water vehicles
0034911	7	M	Granulators for sprue recycling
0035153	7	M	Recycling machines
0035253	7	M	Fuel economisers for motors and engines
0036560	7	M	Waste material conveying machines
0037293	7	M	Exhaust gas treatment systems for diesel engines
0037362	7	M	Machine tools for removing waste material
0038054	7	M	Rubbish compactors [machines]
0038313	7	M	Rechargeable hedge cutters
0040211	7	M	Food waste disposal machines
0040211	7	S	Food waste disposals [garbage disposals]
0040801	7	M	Composting machines
0041646	7	M	Wind-powered electricity generators
0043616	7	M	Waste converters [machines]
0046817	7	M	Waste compacting machines
0046817	7	S	Compacting machines for trash
0046817	7	S	Compacting machines for waste
0046817	7	S	Garbage compacting machines
0046817	7	S	Garbage compactors
0046817	7	S	Machines for compressing garbage
0046817	7	S	Machines for the compacting of waste
0046817	7	S	Refuse compacting machines
0046817	7	S	Trash compacting machines
0046817	7	S	Trash compactors
0047709	7	M	Waste management and recycling machines
0050635	7	M	Waste and trash separator machines
0058290	7	M	Waste crushing machines

reference	Nice	type	description
0058290	7	S	Refuse crushing machines
0060474	7	M	Waste and trash conveying machines
0065540	7	M	Hydroelectric installations for generating electricity
0070878	7	M	Waste sorting machines
0072149	7	M	Solar power generators
0072546	7	M	Mufflers for motors and engines
0072546	7	S	Engine mufflers
0072546	7	S	Exhaust mufflers for motors
0072546	7	S	Exhaust silencers for engines
0072546	7	S	Motor mufflers
0072546	7	S	Mufflers for motors
0072546	7	S	Silencers for engines
0072546	7	S	Silencers for motors and engines
0074892	7	M	Electric power generators using geothermal power
0074901	7	M	Electric power generators using waste heat
0076519	7	M	Organic waste composting machines
0076758	7	M	Hydrogen dispensing pumps for service stations
0073794	8	M	Biodegradable spoons
0073795	8	M	Biodegradable forks
0073800	8	M	Biodegradable knives
0073801	8	M	Biodegradable cutlery
0001920	9	M	Electric batteries for powering electric vehicles
0007728	9	M	Portable solar panels for generating electricity
0008035	9	M	Lithium ion batteries
0010285	9	M	Solar powered radios
0010840	9	M	Photovoltaic solar modules
0011533	9	M	Photovoltaic cells
0014013	9	M	Solar batteries
0015958	9	M	Solar energy collectors for electricity generation
0020958	9	M	Solar battery chargers
0020958	9	S	Solar-powered battery chargers

reference	Nice	type	description
0022544	9	M	Solar batteries for domestic use
0023084	9	M	Photovoltaic inverters
0023084	9	S	Inverters used in solar power generation
0023300	9	M	Electronic carbon dioxide monitors [other than for medical purposes]
0023300	9	S	Electronic carbon dioxide monitors, other than for medical purposes
0023301	9	M	Electronic carbon dioxide recorders [other than for medical purposes]
0023701	9	M	Environmental test chamber (temperature simulation equipment)
0023709	9	M	Diesel oil emission testers
0025712	9	M	Solar cells
0027632	9	M	Solar panel arrays
0032292	9	M	Rechargeable cells
0032718	9	M	Rechargeable batteries
0032718	9	S	Chargeable batteries
0033401	9	M	Solar panels
0033401	9	S	Solar cell panels
0033401	9	S	Solar cell plates
0033401	9	S	Solar panels for electricity generation
0039203	9	M	Solar modules
0039204	9	M	Solar powered telephones
0040658	9	M	Pollutant sensors
0043077	9	M	Solar wafers
0043077	9	S	Wafers for solar cells
0044794	9	M	Solar cells for electricity generation
0045485	9	M	Solar batteries for industrial use
0047390	9	M	Batteries for electric vehicles
0047747	9	M	Apparatus and instruments for accumulating and storing electricity
0048096	9	M	Apparatus and instruments for accumulating electricity
0052064	9	M	Charging stations for electric vehicles
0055014	9	M	Charging appliances for rechargeable equipment
0058173	9	M	Battery chargers
0058173	9	S	Battery charge devices

reference	Nice	type	description
0058173	9	S	Battery charging equipment
0058173	9	S	Chargers for batteries
0058173	9	S	Electric battery chargers
0058174	9	M	Chargers for electric batteries
0058174	9	S	Chargers for electric accumulators
0058174	9	S	Chargers for electrical accumulators
0058174	9	S	Rechargers for electric accumulators
0058446	9	M	Batteries, electric, for vehicles
0058446	9	S	Accumulators, electric, for vehicles
0058446	9	S	Electric accumulators for vehicles
0058446	9	S	Electric batteries for vehicles
0060018	9	M	Solar panels for the production of electricity
0060018	9	S	Solar panels for production of electricity
0060524	9	M	Electric control devices for energy management
0060686	9	M	Photovoltaic apparatus and installations for generating solar electricity
0060795	9	M	Battery charging devices for motor vehicles
0065695	9	M	Photovoltaic installations for generating electricity [photovoltaic power plants]
0065702	9	M	Photovoltaic apparatus for converting solar radiation to electrical energy
0065749	9	M	Photovoltaic modules
0065749	9	S	Modules for photovoltaic power generation
0065812	9	M	Calibrated photovoltaic reference cells
0065991	9	M	Rechargeable electric batteries
0070581	9	M	Solar-powered rechargeable batteries
0070788	9	M	Atmospheric oxygen monitors
0070915	9	M	Electrical cells and batteries
0072102	9	M	Remote control apparatus for controlling lighting
0072102	9	S	Remote control apparatus for lighting apparatus and instruments
0072821	9	M	Accumulators, electric
0072821	9	S	Electric accumulators
0072821	9	S	Electric storage batteries
0072821	9	S	Electrical accumulators

reference	Nice	type	description
0072821	9	S	Electrical storage batteries
0072821	9	S	Storage cells [electric]
0072822	9	M	Batteries, electric
0072822	9	S	Electric batteries
0072822	9	S	Electrical batteries
0072968	9	M	Apparatus for measuring, monitoring and analyzing electricity consumption
0072970	9	M	Crystalline silicon solar power cells
0072970	9	S	Crystalline silicon solar cells
0072971	9	M	Accumulators for photovoltaic power
0072990	9	M	Air pollution measuring devices
0073919	9	M	Photovoltaic apparatus for generating electricity
0074479	9	M	Apparatus for monitoring electrical energy consumption
0074591	9	M	Computer hardware for the control of lighting
0074592	9	M	Computer software for the control of lighting
0074594	9	M	Programmable controls for lighting apparatus and instruments
0074595	9	M	Audio-sensitive controls for lighting apparatus and instruments
0075836	9	M	Apparatus for improving power efficiency
0076458	9	M	Development environment software
0076466	9	M	Environmental control software
0076467	9	M	Environmental monitoring software
0077408	9	M	Apparatus and instruments for accumulating the distribution of electricity
0077413	9	M	Apparatus and instruments for accumulating the use of electricity
0077767	9	M	Electric-car charger
0078367	9	M	Software for greenhouse gas accounting
0000090	11	M	Furnaces for recovering scrap metals
0000888	11	M	Purification installations for waste material
0001004	11	M	Cartridge filtration units [water treatment equipment]
0001005	11	M	Reverse osmosis filtration units [water treatment equipment]
0001160	11	M	Air purifying apparatus and machines
0001495	11	M	Industrial waste water purification plants
0003073	11	M	Filters for exhaust extractors [parts of household or industrial installations]

reference	Nice	type	description
0003074	11	M	Filters for gases [household or industrial installations]
0003201	11	M	Water filters
0005267	11	M	Combustion installations for waste fuels
0005784	11	M	Solar powered ventilation apparatus
0006799	11	M	Heating apparatus for use in the treatment of waste material
0008834	11	M	Rechargeable torches
0009424	11	M	Filters for waste gas purification
0009525	11	M	Evacuated heat pipe solar collectors [heat exchangers]
0010230	11	M	Industrial-water purifying apparatus
0010778	11	M	Sewage treatment [purification] installations
0011201	11	M	Flashlights utilising electric rechargeable devices
0014425	11	M	Water purifying apparatus and machines
0015295	11	M	Filters for water purifiers
0015295	11	S	Water purification filters
0015757	11	M	Supports adapted for use with solar heating tubes
0016052	11	M	Industrial air purifiers
0016366	11	M	Solar powered torches
0017638	11	M	Power filters for water purification [other than machines]
0019798	11	M	Filters for drinking water
0019798	11	S	Drinking water (Filters for -)
0019798	11	S	Drinking water filters
0020142	11	M	Membranes for the filtration of water
0020142	11	S	Membrane apparatus in the nature of filters for purifying water
0022462	11	M	Settler apparatus for waste
0023240	11	M	Furnaces for recovering metals
0024639	11	M	Ovens for the treatment of waste
0025483	11	M	Solar thermal collectors [heating]
0025483	11	S	Solar collectors for heating
0025483	11	S	Solar energy collectors for heating
0025483	11	S	Solar heat collection panels
0025483	11	S	Solar heating panels

reference	Nice	type	description
0025483	11	S	Solar panels for use in heating
0025797	11	M	Installations for water treatment under osmotic process
0026309	11	M	Appliances for water filtration [other than machines]
0027046	11	M	Biological reactors for clarifying industrial effluents
0027862	11	M	Thermal storage instruments [solar energy] for heating
0027862	11	S	Thermal storage apparatus [solar energy] for heating
0027932	11	M	Solar powered lamps
0028210	11	M	Screens for controlling light
0032279	11	M	Apparatus for filtering drinking water
0032985	11	M	Computer controlled lighting apparatus
0032985	11	S	Computer-controlled lighting apparatus
0032985	11	S	Computer-controlled lighting instruments
0032985	11	S	Computer controlled lighting instruments
0036002	11	M	Water filtering apparatus for industrial use
0037237	11	M	Solar energy powered heating installations
0037237	11	S	Solar energy powered heating apparatus
0037237	11	S	Solar heating apparatus
0037237	11	S	Solar heating installations
0037369	11	M	Fuel economisers
0037369	11	S	Economizers [Fuel -]
0037369	11	S	Fuel economizers
0042490	11	M	Solar water heaters
0044923	11	M	Apparatus for dehydrating food waste
0044923	11	S	Dehydrating (Apparatus for -) food waste
0055943	11	M	Electric water purifiers for household purposes
0055955	11	M	Garbage incinerators for household purposes
0055955	11	S	Waste incinerators for household purposes
0055956	11	M	Garbage incinerators for industrial purposes
0055956	11	S	Waste incinerators for industrial purposes
0057753	11	M	Purification installations for sewage
0057753	11	S	Purification installations (Sewage -)

reference	Nice	type	description
0057753	11	S	Sewage (Purification installations for -)
0057753	11	S	Sewage purification installations
0057754	11	M	Sewage purification apparatus
0057754	11	S	Apparatus for waste water purification
0057754	11	S	Purification apparatus (Sewage -)
0057754	11	S	Purification apparatus for sewage
0058457	11	M	Water purifying apparatus
0058457	11	S	Apparatus for purifying water
0058457	11	S	Apparatus for water purification
0058457	11	S	Water purification apparatus
0058457	11	S	Water purifiers
0058457	11	S	Water treatment apparatus for water purification
0058460	11	M	Water purification installations
0058460	11	S	Apparatus for the purification of liquids
0058460	11	S	Installations for purifying water
0058460	11	S	Installations for water purification
0058460	11	S	Purification installations (Water -)
0058460	11	S	Purification machines (Water -)
0058460	11	S	Water purification machines
0058460	11	S	Water purifying installations
0058461	11	M	Wastewater purification units
0058461	11	S	Waste water purification units
0058641	11	M	Air purifying apparatus
0058641	11	S	Air-purifying apparatus
0058641	11	S	Air purification apparatus
0058641	11	S	Air purification installations
0058641	11	S	Apparatus for purifying air
0058641	11	S	Purification apparatus (Air -)
0058641	11	S	Purification machines (Air -)
0058885	11	M	Water filtering apparatus
0058885	11	S	Apparatus for filtering water

reference	Nice	type	description
0058885	11	S	Apparatus for water filtering
0058885	11	S	Water filtration apparatus
0058886	11	M	Water filtering installations
0058886	11	S	Water filtration installations
0066262	11	M	Wastewater treatment tanks for industrial purposes
0066271	11	M	Air purifying units for commercial use
0066276	11	M	Bioreactors for use in the treatment of waste
0066277	11	M	Bioreactors for use in the treatment of wastewater
0066281	11	M	Water purifying units for producing potable water
0070213	11	M	Rainwater purification installations
0070981	11	M	Wastewater treatment installations
0070981	11	S	Waste water purification installations
0071664	11	M	Water filtration bottles sold empty
0071692	11	M	Water filtration jugs
0071693	11	M	Water purifiers for industrial use
0071693	11	S	Water purifiers for industry
0071694	11	M	Water treatment units for aerating and circulating water
0072138	11	M	Filters for air purifiers
0072139	11	M	Electric water purification filters for household purposes
0073818	11	M	Catalytic oxidizers for industrial air pollution control
0073819	11	M	Thermal oxidizers for industrial air pollution control
0074058	11	M	Water-saving toilets
0074059	11	M	Water-saving showerheads
0074060	11	M	Water-saving aerators for faucets
0074061	11	M	Water-saving faucets
0074795	11	M	Filters for wastewater
0075370	11	M	Ballast water treatment systems
0075723	11	M	Solar cell lighting apparatus
0003202	12	M	Geared electric motors for land vehicles
0003227	12	M	Electrically powered watercraft
0006521	12	M	Electric vehicles

reference	Nice	type	description
0006521	12	S	Electrically operated vehicles
0006521	12	S	Electrically powered vehicles
0006521	12	S	Vehicles (Electric -)
0007984	12	M	Wind powered vehicles
0015710	12	M	Electric trucks [vehicles]
0016665	12	M	Electric gear shifting apparatus for land vehicle motors
0020669	12	M	Electrically powered motor vehicles
0026323	12	M	Electrically powered land vehicles
0026323	12	S	Electric land vehicles
0028200	12	M	Electric motors for motor cars
0038791	12	M	Electric trains
0038792	12	M	Electrically powered aircraft
0040904	12	M	Motors, electric, for land vehicles
0040904	12	S	Electric drives for land vehicle motors
0040904	12	S	Electric drives for land vehicles
0040904	12	S	Electric drives for vehicles
0040904	12	S	Electric driving motors for land vehicles
0040904	12	S	Electric engines for land vehicles
0040904	12	S	Electric motors for land vehicles
0040904	12	S	Electric propulsion mechanisms for land vehicles
0040904	12	S	Electrical drives for land vehicles
0040904	12	S	Electrical motors for land vehicles
0042847	12	M	Self-propelled electric vehicle
0042847	12	S	Self-propelled electric vehicles
0043661	12	M	Electrically operated scooters
0043661	12	S	Electrically-powered motor scooters
0043661	12	S	Electrically powered scooters
0043661	12	S	Electrically powered scooters [vehicles]
0043662	12	M	Electrically powered trolleys
0044545	12	M	Electric tractors [vehicles]
0044546	12	M	Electric trolley buses

reference	Nice	type	description
0045463	12	M	Electric lift trucks
0045475	12	M	Electric cars
0045476	12	M	Electric railway cars
0056000	12	M	Electrically powered buses
0056006	12	M	Hybrid cars
0070308	12	M	Electric bicycles
0070385	12	M	Self-balancing electric unicycles
0070385	12	S	Self balancing unicycles
0070387	12	M	Electric unicycles
0070388	12	M	Electric one wheel scooters
0073637	12	M	Folding electric bicycles
0074744	12	M	Plug-in hybrid cars
0074745	12	M	Plug-in electric cars
0074746	12	M	Series hybrid cars
0074747	12	M	Fuel cell cars
0074748	12	M	Fuel cell electric cars
0074894	12	M	Hydrogen fueled cars
0074895	12	M	Hydrogen fueled trains
0075408	12	M	Electric motor cycles
0075460	12	M	Self-balancing one-wheeled electric scooters
0075530	12	M	Hybrid vehicles
0075770	12	M	Electric motors for two-wheeled vehicles
0000360	16	M	Packaging materials made from mineral-based paper substitutes
0034212	16	M	Recycled paper
0066443	16	M	Packaging materials made of recycled paper
0066451	16	M	Biodegradable paper pulp-based to-go containers for food
0066490	16	M	Packaging containers of regenerated cellulose
0071063	16	M	Recycled bond paper
0071567	16	M	Food waste bags of paper for household use
0077716	16	M	Bags for packaging made of biodegradable paper
0077717	16	M	Bags for packaging made of biodegradable plastic

reference	Nice	type	description
0004857	17	M	Recycled plastics
0004857	17	S	Recycled plastic materials for use in manufacture
0004858	17	M	Recycled rubber
0004858	17	S	Reclaimed rubber
0004859	17	M	Regenerated cellulose for use in manufacture
0007496	17	M	Pellets of recycled rubber
0010581	17	M	Recycled rubber mixed with plastic material
0027988	17	M	Barrier curtains in the nature of floating baffles or booms for the containment of pollutants
0033673	17	M	Recycled compound plastics
0033980	17	M	Sealing compounds for stopping leakage from oil tanks [other than chemicals]
0036144	17	M	Floating anti-pollution barriers
0036144	17	S	Anti-pollution barriers (Floating -)
0036144	17	S	Barriers (Floating anti-pollution -)
0043651	17	M	Foil of regenerated cellulose, other than for wrapping
0043651	17	S	Cellulose (Foil of regenerated -) other than for packing
0043651	17	S	Cellulose (Foil of regenerated -), other than for wrapping
0043651	17	S	Foil of regenerated cellulose, other than for packing
0043651	17	S	Sheets of reclaimed cellulose, other than for packing
0043651	17	S	Sheets of regenerated cellulose, other than for wrapping
0045219	17	M	Recycled compound plastics for use in manufacture
0056789	17	M	Regenerated fiber thread not for textile use
0074108	17	M	Biodegradable plastic film for agricultural use
0066712	18	M	Reusable shopping bags
0006396	19	M	Roofing, not of metal, incorporating photovoltaic cells
0006396	19	S	Roofing, not of metal, incorporating solar cells
0019668	19	M	Rainwater hoppers of non-metallic materials
0042703	19	M	Rainwater reservoirs (Non-metallic -)
0044264	19	M	Guttering (Non-metallic -) for the collection of rainwater
0056160	20	M	Non-metal recycling bins for commercial use
0021019	21	M	Reusable plastic water bottles sold empty

reference	Nice	type	description
0026665	21	M	Reusable stainless steel water bottles sold empty
0052118	21	M	Reusable ice cubes
0056220	21	M	Non-metal recycling bins for household use
0060662	21	M	Biodegradable plates
0060663	21	M	Biodegradable bowls
0060664	21	M	Biodegradable cups
0060665	21	M	Biodegradable trays
0060667	21	M	Compostable bowls
0060668	21	M	Compostable plates
0060669	21	M	Compostable trays
0066933	21	M	Reusable stainless steel water bottles
0066945	21	M	Compost containers for household use
0066988	21	M	Biodegradable paper pulp-based cups
0066989	21	M	Biodegradable paper pulp-based bowls
0066990	21	M	Biodegradable paper pulp-based plates
0067010	21	M	Biodegradable trays for domestic purposes
0067014	21	M	Compostable trays for domestic purposes
0067015	21	M	Compostable cups
0076851	21	M	Reusable silicone food covers
0077910	21	M	Biodegradable bottles
0077911	21	M	Reusable bottles
0077912	21	M	Biobased bottles
0039773	23	M	Regenerated fiber thread and yarn [for textile use]
0034541	24	M	Regenerated fiber yarn fabrics
0011752	31	M	Biodegradable mulching plates made of wood fibres
0051557	35	M	Advertising services to promote public awareness of environmental issues and initiatives
0075582	35	M	Advertising services to promote public awareness of environmental matters
0002682	36	M	Brokerage of carbon credits
0004013	36	M	Brokerage of carbon offsets
0009759	36	M	Provision of charitable fundraising services in relation to carbon offsetting

reference	Nice	type	description
0009511	37	M	Refilling of empty toner cartridges
0010826	37	M	Installation and maintenance of photovoltaic installations
0010827	37	M	Installation and maintenance of solar thermal installations
0013131	37	M	Rebuilding engines that have been worn or partially destroyed
0013776	37	M	Advisory services relating to the repair of environmental control systems
0015111	37	M	Repair or maintenance of waste crushing machines and apparatus
0015112	37	M	Repair or maintenance of water pollution control equipment
0016999	37	M	Soil erosion control services
0017461	37	M	Re-inking and refilling of toner cartridges
0017461	37	S	Refilling of toner cartridges
0017461	37	S	Toner cartridges (Refilling of -)
0019620	37	M	Advisory services relating to the maintenance of environmental control systems
0021764	37	M	Hydro-electric factory construction
0021764	37	S	Construction of hydroelectric factories
0021824	37	M	Installation of environmental engineering systems
0029960	37	M	Repair services for electric generators and wind turbines
0032362	37	M	Repair or maintenance of water purifying apparatus
0032362	37	S	Maintenance and repair of water purifying plants
0036255	37	M	Rebuilding machines that have been worn or partially destroyed
0036255	37	S	Reconditioning machines that are worn or partially destroyed
0038194	37	M	Repair or maintenance of waste compacting machines and apparatus
0039148	37	M	Installation of solar powered systems
0050038	37	M	Vehicle battery charging
0050038	37	S	Battery charging service for motor vehicles
0057940	37	M	Renovation of clothing
0068038	37	M	Repair of water purifying apparatus
0068081	37	M	Installation of energy-saving apparatus
0068094	37	M	Construction of wind power plants
0068095	37	M	Installation of photovoltaic cells and modules
0068110	37	M	Providing information relating to the repair or maintenance of water pollution control equipment

reference	Nice	type	description
0068127	37	M	Installation of clean room environmental control systems
0068128	37	M	Installation of environmental control systems
0068152	37	M	Maintenance of water purifying apparatus
0068159	37	M	Providing information relating to the repair or maintenance of waste crushing machines and apparatus
0068165	37	M	Maintenance, repair and reconditioning of photovoltaic apparatus and installations
0068209	37	M	Maintenance and repair of electric vehicles
0068209	37	S	Repair and maintenance of electric vehicles
0068211	37	M	Maintenance of water pollution control equipment
0068227	37	M	Installation of solar heating systems
0068235	37	M	Repair of biogas plants and machines
0068258	37	M	Maintenance and repair of wind power plants
0068258	37	S	Repair and maintenance of wind power plants
0068262	37	M	Repair of water pollution control equipment
0068332	37	M	Installation of environmental protection systems
0068352	37	M	Maintenance and repair of wave energy power plants
0068353	37	M	Construction of wave energy power plants
0068358	37	M	Repair of industrial waste treatment machines
0068376	37	M	Providing information relating to the repair or maintenance of water purifying apparatus
0068389	37	M	Repair of machines for treating organic waste
0068415	37	M	Installation of rainwater tanks
0068416	37	M	Installation of rainwater harvesting systems
0068418	37	M	Installation of rainwater collection systems
0068428	37	M	Providing information relating to the repair or maintenance of waste compacting machines and apparatus
0068432	37	M	Recharging of batteries and accumulators
0068446	37	M	Charging of electric vehicles
0068446	37	S	Recharging services for electric vehicles
0068447	37	M	Recharging of batteries
0074331	37	M	Fueling of hydrogen gas for vehicles
0075357	37	M	Hazardous waste clean-up services

reference	Nice	type	description
0076063	37	M	Maintenance and repair of solar power installations
0076064	37	M	Maintenance and repair of solar heating installations
0076065	37	M	Installation of residential solar panel power systems
0076066	37	M	Installation of non-residential solar panel power systems
0076067	37	M	Construction of utility solar installations
0076110	37	M	Maintenance and repair of solar thermal installations
0076133	37	M	Installation of geothermal installations
0076134	37	M	Construction of geothermal energy installations
0076134	37	S	Construction of geothermal power installations
0076134	37	S	Construction of geothermal power plants
0076135	37	M	Construction of geothermal heating installations
0076136	37	M	Construction of geothermal community heating installations
0076137	37	M	Maintenance and repair of geothermal installations
0076373	37	M	Installation of hydropower systems
0076374	37	M	Installation of wind power systems
0076896	37	M	Refilling of ink cartridges
0009117	39	M	Paper and cardboard collection for recycling
0068611	39	M	Carpooling services
0068611	39	S	Carpooling services
0070046	39	M	Collection of recyclable goods [transport]
0074016	39	M	Rental of electric cars
0074734	39	M	Rental of hydrogen cars
0076190	39	M	Rental of recycling containers
0000158	40	M	Treatment of chemical waste
0000330	40	M	Chemical decontamination of nuclear plant
0000340	40	M	Cooking oil and vegetable oil recycling services
0000931	40	M	Recycling of insulating gases from air conditioning plant
0000932	40	M	Recycling of organic solvents
0000933	40	M	Recycling of plastics
0000933	40	S	Recycling of plastic
0000934	40	M	Recycling of solvents

reference	Nice	type	description
0001073	40	M	Air purification
0001073	40	S	Purification of air
0001592	40	M	Oil-spill treatment
0001593	40	M	On-site water purification services
0001812	40	M	Treatment of toxic waste
0001812	40	S	Waste (Treatment of toxic -)
0003367	40	M	Waste management services [recycling]
0003550	40	M	Regeneration of water
0004325	40	M	Consultancy relating to the clearance of oil pollution
0004473	40	M	Recycling of chlorofluorocarbon (CFC) containing liquids
0004522	40	M	Decontamination of nuclear waste
0004917	40	M	Treatment [recycling] of hazardous products
0005457	40	M	Recycling of valuable materials
0006120	40	M	Chemical recycling of waste products
0006497	40	M	Treatment of hazardous liquids
0006708	40	M	Recycling of insulating gases from refrigerators
0008044	40	M	Radiation area decontamination services
0008322	40	M	Sorting of waste and recyclable material
0010162	40	M	Land decontamination
0010165	40	M	Recycling of chlorofluorocarbon (CFC) containing gases
0011295	40	M	Consultancy relating to the clearance of chemical pollution
0011711	40	M	Treatment [recycling] of waste
0011712	40	M	Waste water treatment
0011712	40	S	Services for the treatment of sewage
0011712	40	S	Sewage treatment services
0011712	40	S	Treatment of effluent
0011712	40	S	Treatment of waste water
0011712	40	S	Waste water reprocessing
0012506	40	M	Recycling of refrigerant fluids
0012507	40	M	Recycling of scrap
0013413	40	M	Processing of waste oil

reference	Nice	type	description
0013860	40	M	Nuclear waste treatment
0014714	40	M	Treatment of hazardous substances
0014714	40	S	Hazardous substances (Treatment of -)
0014714	40	S	Treatment of hazardous materials
0015858	40	M	Consultancy relating to the treatment of oil pollution
0015992	40	M	Recycling of aerosol propellants
0016076	40	M	Industrial toxic waste disposal
0016444	40	M	Treatment [recycling] of chemicals
0016965	40	M	Treatment of hazardous waste by encapsulation
0018323	40	M	Recycling of foam blowing agents
0018324	40	M	Recycling of metals
0018677	40	M	Waste and/or water treatment services
0018809	40	M	Sorting of waste and recyclable material [transformation]
0019215	40	M	Treatment of toxic material
0019232	40	M	Purification of industrial waste water
0019707	40	M	Nuclear fuel recycling
0020558	40	M	Decontamination of subsurface soil sites
0021755	40	M	Water purification
0022329	40	M	Treatment [recycling] of hazardous liquids
0023170	40	M	Detoxification of hazardous materials
0023525	40	M	Chemical treatment of waste products
0024112	40	M	Treatment and recycling of packaging
0024114	40	M	Recycling of minerals
0024115	40	M	Recycling of paper
0026258	40	M	Rental of air purification apparatus
0026258	40	S	Air purification apparatus (Rental of -)
0026662	40	M	Rental of water treatment equipment
0027591	40	M	Water treatment and purification
0027591	40	S	Treatment [purification] of water
0028494	40	M	Treatment of hazardous waste
0028494	40	S	Hazardous waste management

reference	Nice	type	description
0028494	40	S	Hazardous waste treatment services
0029233	40	M	Chemical treatment of exhaust gases from fossil fuel combustion
0029854	40	M	Recycling of toner
0030723	40	M	Purification of gases
0032237	40	M	Waste treatment by electrolysis
0032705	40	M	Disposal of waste water from industrial processes
0033300	40	M	Extraction of minerals contained in waste residues
0034287	40	M	Treatment of hazardous gases
0035646	40	M	Recycling of insulating gases from freezers
0035735	40	M	Leasing of water purification equipment
0035735	40	S	Rental of water purifying apparatus
0036107	40	M	Decontamination of hazardous materials
0036495	40	M	Treatment of toxic sludges
0038951	40	M	Consultancy relating to the treatment of chemical pollution
0039525	40	M	Treatment [reclamation] of industrial waste
0039525	40	S	Treatment of industrial waste
0039526	40	M	Treatment [reclamation] of material from hazardous products
0040482	40	M	Generation of electricity from solar energy
0041403	40	M	Water pollution control
0041404	40	M	Water treating
0041404	40	S	Treatment of water
0041404	40	S	Water treatment
0041404	40	S	Water treatment services
0042265	40	M	Treatment of waste water from generating operations
0042266	40	M	Treatment of waste water from industrial processes
0042788	40	M	Recycling of chemicals
0043556	40	M	Incineration of gases
0043796	40	M	Waste disposal [treatment of waste]
0043994	40	M	Rental of water filtration units for commercial use
0044278	40	M	Disposal of solid residues
0044829	40	M	Extraction of elements contained in waste residues

reference	Nice	type	description
0044830	40	M	Reclamation of material from waste
0045266	40	M	Treatment [reclamation] of material from waste
0045267	40	M	Treatment [recycling] of radioactive waste
0045268	40	M	Treatment [recycling] of toxic liquids
0045792	40	M	Recycling services
0045792	40	S	Recycling
0048063	40	M	Air and water conditioning and purification
0048064	40	M	Recycling and waste treatment
0056688	40	M	Rental of waste compacting machines
0056689	40	M	Rental of waste crushing machines
0057324	40	M	Waste treatment [transformation]
0057324	40	S	Treatment [transformation] of waste
0057324	40	S	Waste processing [transformation]
0057325	40	M	Treatment of waste materials
0057325	40	S	Waste treatment
0057326	40	M	Treatment of waste
0057326	40	S	Waste processing
0057974	40	M	Waste incineration
0057974	40	S	Incineration of waste
0057975	40	M	Incineration of waste and trash
0057975	40	S	Burning of refuse and waste
0057975	40	S	Incineration of trash
0057975	40	S	Trash (Incineration of -)
0057975	40	S	Trash incineration
0057975	40	S	Waste and trash (Incineration of -)
0058487	40	M	Destruction of waste and trash
0058487	40	S	Waste and trash (Destruction of -)
0058488	40	M	Destruction of waste
0058488	40	S	Waste destruction
0058489	40	M	Destruction of trash
0058737	40	M	Recycling of waste and trash

reference	Nice	type	description
0058737	40	S	Recycling of refuse and waste
0058737	40	S	Recycling of waste and rubbish
0058737	40	S	Waste and trash (Recycling of -)
0058738	40	M	Recycling of waste
0058738	40	S	Recycling of waste materials
0058738	40	S	Recycling of waste products
0058738	40	S	Trash (Recycling of -)
0058738	40	S	Waste recycling services
0060088	40	M	Upcycling [waste recycling]
0068795	40	M	Providing information relating to the rental of waste crushing machines and apparatus
0068796	40	M	Providing information relating to water treatment
0068801	40	M	Consultancy relating to the incineration of waste and trash
0068802	40	M	Consultancy relating to the destruction of waste and trash
0068803	40	M	Consultancy relating to the recycling of waste and trash
0068804	40	M	Information, advice and consultancy services relating to the recycling of waste and trash
0068805	40	M	Incineration and destruction of waste
0068808	40	M	Treatment of industrial waste to sequester carbon
0068813	40	M	Information and advisory services relating to the generation of electricity from wave energy
0068826	40	M	Rental of waste compacting machines and apparatus
0068827	40	M	Treatment and processing of clothing for recycling purposes
0068831	40	M	Generation of electricity from wind energy
0068851	40	M	Production of electrical power from renewable sources
0068854	40	M	Rental of waste crushing machines and apparatus
0068858	40	M	Generation of electricity from wave energy
0068867	40	M	Production of energy by power plants
0068874	40	M	Recycling of beverage bottles
0068875	40	M	Generation of electrical power using carbon sequestration
0068880	40	M	Production of hydroelectric power
0068881	40	M	Treatment of contaminated soil

reference	Nice	type	description
0068885	40	M	Providing information relating to the rental of water purifying apparatus
0068891	40	M	Recycling of clothing
0068896	40	M	Providing information relating to the rental of waste compacting machines and apparatus
0068897	40	M	Providing information relating to the recycling of waste
0068901	40	M	Recycling of clothing to obtain materials for making synthetic fibers
0068909	40	M	Recycling catalytic converters
0068911	40	M	Consultancy services relating to the generation of electrical power
0068917	40	M	Treatment of waste materials in the field of environmental pollution control
0068925	40	M	Rental of water and air purification equipment
0068937	40	M	Soil, waste or water treatment services [environmental remediation services]
0069957	40	M	Rental of batteries
0076160	40	M	Generation of electricity from geothermal energy
0078566	40	M	Recycling of PET bottles
0009716	41	M	Education services relating to water
0015976	41	M	Ecologically orientated aquatic instruction
0018531	41	M	Provision of educational services relating to ecological topics
0027055	41	M	Education services relating to water pollution
0036368	41	M	Adult education services relating to environmental issues
0044388	41	M	Education services relating to water management
0000112	42	M	Consultation in environment protection
0000112	42	S	Advisory services relating to environmental protection
0000676	42	M	Environmental consultancy services
0002007	42	M	Engineering services in the field of electrical power and natural gas production
0002709	42	M	Consultancy services relating to environmental planning
0005466	42	M	Design of controlled environmental buildings
0007311	42	M	Advisory services relating to pollution control
0007716	42	M	Evaluation and testing of real estate for the presence of hazardous material
0007730	42	M	Greenhouse gas emission measuring and analysis
0007811	42	M	Energy auditing
0008068	42	M	Provision of scientific information, advice and consultancy in relation to carbon offsetting

reference	Nice	type	description
0008068	42	S	Providing scientific information, advice and consultancy relating to carbon offsetting
0008597	42	M	Information services relating to the safety of chemicals used in horticulture
0009284	42	M	Collection of information relating to the environment
0009286	42	M	Compilation of information relating to environmental conditions
0009815	42	M	Information services relating to the safety of fertilisers used in forestry
0009815	42	S	Information services relating to the safety of manures used in forestry
0009816	42	M	Information services relating to the safety of fertilisers used in horticulture
0010287	42	M	Airborne remote sensing relating to environmental explorations
0012254	42	M	Environmental testing
0013382	42	M	Sampling for contamination
0014298	42	M	Technical advice relating to pollution damage
0015641	42	M	Provision of information, advice and consultancy in relation to carbon offsetting
0016006	42	M	Professional consultancy relating to energy efficiency in buildings
0017382	42	M	Technical consulting in the field of environmental engineering
0018061	42	M	Environmental monitoring of waste storage areas
0018963	42	M	Advisory services relating to energy efficiency
0020291	42	M	Information services relating to the safety of fertilisers used in agriculture
0020291	42	S	Information services relating to the safety of manures used in agriculture
0022147	42	M	Recording data relating to energy consumption in buildings
0023230	42	M	Technical consulting in the field of pollution detection
0023866	42	M	Environmental testing of vibration
0025164	42	M	Development of computer programs for analysis of exhaust gas emissions
0026428	42	M	Environmental testing and inspection services
0026636	42	M	Compilation of environmental information
0026663	42	M	Research in the field of energy
0027636	42	M	Airborne remote monitoring relating to environmental explorations
0029596	42	M	Environmental testing of exhaust emissions
0030535	42	M	Consultancy in the field of energy-saving
0030535	42	S	Energy-saving (Consultancy in the field of -)
0030697	42	M	Scientific research relating to ecology
0033403	42	M	Advisory services relating to the safety of the environment

reference	Nice	type	description
0035388	42	M	Environmental hazard assessment
0035389	42	M	Research in the field of environmental protection
0035389	42	S	Environmental protection (Research in the field of -)
0035389	42	S	Research in the area of environmental protection
0035389	42	S	Research relating to environmental protection
0035390	42	M	Environmental surveys
0036250	42	M	Advisory services relating to environmental pollution
0037559	42	M	Information services relating to the safety of chemicals used in agriculture
0037560	42	M	Information services relating to the safety of chemicals used in forestry
0038271	42	M	Research in the field of climate change
0038272	42	M	Research in the reduction of carbon emissions
0038283	42	M	Drafting and development of photovoltaic systems
0040507	42	M	Technical consultancy in the field of environmental science
0040508	42	M	Technological consulting services in the field of alternative energy generation
0041175	42	M	Environmental monitoring of waste treatment areas
0041176	42	M	Environmental testing of noise pollution
0050822	42	M	Certification services for the energy efficiency of buildings
0051399	42	M	Environmental testing services to detect contaminants in water
0051498	42	M	Research in the field of ecology
0051551	42	M	Technical research in the field of carbon offsetting
0051639	42	M	Providing scientific information in the fields of climate change and global warming
0051669	42	M	Providing technical advice relating to energy-saving measures
0056718	42	M	Providing technological information about environmentally-conscious and green innovations
0069139	42	M	Conducting sampling and analysis services to check for contamination
0069141	42	M	Provision of information concerning research and technical project studies relating to the use of natural energy
0069142	42	M	Conducting research and technical project studies relating to the use of natural energy
0069200	42	M	Technical project studies in the field of carbon offsetting
0069205	42	M	Engineering services in the field of environmental technology
0069215	42	M	Design and development of software for control, regulation and monitoring of solar energy systems

reference	Nice	type	description
0069252	42	M	Programming of energy management software
0069253	42	M	Design and development of energy management software
0069288	42	M	Technical advice in connection with energy-saving measures
0069340	42	M	Environmental monitoring services
0069399	42	M	Environmental assessment services
0069439	42	M	Design and development of regenerative energy generation systems
0069448	42	M	Consultancy services relating to research in the field of environmental protection
0069832	42	M	Providing scientific information in the field of global warming
0069833	42	M	Providing scientific information in the field of climate change
0071380	42	M	Research in the field of environmental conservation
0076995	42	M	Scientific and technological research in the field of natural disasters
0001399	44	M	Tree planting for carbon offsetting purposes
0001399	44	S	The planting of trees for carbon offsetting purposes
0007691	44	M	Agricultural services relating to environmental conservation
0069593	44	M	Advisory and consultancy services relating to the use of non-chemical treatments for sustainable agriculture and horticulture
0075085	44	M	Reintroduction and conservation of wildlife

Annex 2. Green expressions, sorted by category and number of terms found (1996-2020)

Group	ID	Category	Ref	Expression	# terms
Energy Production	**11**	**Biofuels**	21	+biogas	3 109
Energy Production	11	Biofuels	29	+biomass	2 592
Energy Production	11	Biofuels	20	+biofuel	1 824
Energy Production	11	Biofuels	18	+biodiesel −fuel	310
Energy Production	11	Biofuels	120	+fuel +ethanol −pharmaceutical −topical −1	280
Energy Production	11	Biofuels	16	+biobased	231
Energy Production	11	Biofuels	160	+peat.fuel −oils −block	166
Energy Production	11	Biofuels	296	+bioethanol	151
Energy Production	11	Biofuels	180	+rape.oils +industrial.purpose	123
Energy Production	11	Biofuels	24	+biological +fuel	120
Energy Production	11	Biofuels	27	+biological +reactor	103
Energy Production	11	Biofuels	237	+sunflower.oils +industrial.purpose	91
Energy Production	11	Biofuels	256	+vegetable.wax	63
Energy Production	11	Biofuels	121	+fuel +inhibit +deposition	26
Energy Production	11	Biofuels	136	+hydrocarbon.fuels.derived +tar	18
Energy Production	11	Biofuels	181	+rapeseed.oil +industrial.purposes	16
Energy Production	11	Biofuels	157	+olive.oils.industrial.purpose	14
Energy Production	11	Biofuels	146	+linseed.oils +industrial.purpose	13
Energy Production	11	Biofuels	46	+colza.oils −food −lubricating	9
Energy Production	11	Biofuels	234	+soybean.oils +industrial.purpose	8
Energy Production	11	Biofuels	116	+fish.oils.industrial.purpose	6
Energy Production	11	Biofuels	233	+solid.oxygen.fuel	6
Energy Production	11	Biofuels	161	+perilla.oils +industrial.purpose	3
Energy Production	11	Biofuels	12	+bagasse +fuel	2
Energy Production	11	Biofuels	60	+corn.oils +industrial −food	2
Energy Production	11	Biofuels	159	+peanut.oils.industrial.purpose	2
Energy Production	11	Biofuels	216	+sesame.oils +industrial.purpose	2
Energy Production	**12**	**Solar Energy**	162	+photovoltaic	13 446
Energy Production	12	Solar Energy	223	+solar +collector	6 553
Energy Production	12	Solar Energy	221	+solar +battery	5 246
Energy Production	12	Solar Energy	224	+solar +energy	4 643
Energy Production	12	Solar Energy	222	+solar +cell	4 547

Group	ID	Category	Ref	Expression	# terms
Energy Production	12	Solar Energy	228	+solar +panel	3 729
Energy Production	12	Solar Energy	229	+solar +power	2 771
Energy Production	12	Solar Energy	226	+solar +installation	2 688
Energy Production	12	Solar Energy	225	+solar +heating	2 687
Energy Production	12	Solar Energy	227	+solar +module	1 127
Energy Production	12	Solar Energy	231	+solar +water	698
Energy Production	12	Solar Energy	232	+solarpow	587
Energy Production	12	Solar Energy	230	+solar +wafer	215
Energy Production	12	Solar Energy	361	+thermal +collector	23
Energy Production	12	Solar Energy	235	+storag.cell.electr	9
Energy Production	12	Solar Energy	371	+water +heat	
Energy Production	**13**	**Wind Energy**	290	+wind +power	3 741
Energy Production	13	Wind Energy	291	+wind +turbine	2 428
Energy Production	13	Wind Energy	292	+wind.energi	963
Energy Production	13	Wind Energy	293	+windpowered	441
Energy Production	13	Wind Energy	168	+power.generation +turbine +blade	115
Energy Production	**19**	**Other energy**	87	+energy.generation −leasing −maintenance	3 998
Energy Production	19	Other energy	77	+electric.power −payments −generators −tools −windlasses −units −dryers −load.banks −poles −posts −emergency.use −soldering.irons −winches −wheelchairs −9 −11	3 746
Energy Production	19	Other energy	200	+research +energy	3 150
Energy Production	19	Other energy	152	+natural +energy	2 696
Energy Production	19	Other energy	89	+energy.power −others −management.systems	1 511
Energy Production	19	Other energy	76	+electric.energy +renewable −nonrenewable.source −non.renewable.source −uninterruptible.power.supplies	808
Energy Production	19	Other energy	358	+renewable +source	774
Energy Production	19	Other energy	137	+hydroelectric	768
Energy Production	19	Other energy	128	+geothermal +energy	462
Energy Production	19	Other energy	129	+geothermal +installation	405
Energy Production	19	Other energy	244	+trash +incineration	385
Energy Production	19	Other energy	288	+wave +energy	315
Energy Production	19	Other energy	130	+geothermal +power	235
Energy Production	19	Other energy	142	+hydropower	219
Energy Production	19	Other energy	141	+hydrogen.fueled	150
Energy Production	19	Other energy	139	+hydrogen +pump	68
Energy Production	19	Other energy	324	+hydrogen.gas	57

Group	ID	Category	Ref	Expression	# terms
Energy Production	19	Other energy	308	+energy.alternative	45
Energy Production	19	Other energy	127	+generation +electrical.power +waste.heat	30
Energy Production	19	Other energy	365	+waste +burning	24
Energy Production	19	Other energy	364	+using.waste.heat	4
Transportation	**20**	**General transport**	73	+electric +vehicle −cigarette −door −horn −lock −sunroof −alternator −alarm −temperature −theft −antitheft −washers −7 −37	15 586
Transportation	20	General transport	81	+electricallypowered −payments −generators −tools −windlasses −units −dryers −load.banks −poles −posts −emergency.use −soldering.irons −winches −wheelchairs −9 −11	345
Transportation	**21**	**Electric car**	75	+electric.car −washers	1 161
Transportation	21	Electric car	82	+electriccar −washers	88
Transportation	**22**	**Electric moto**	71	+electric +scooters −washers −self.balancing −selfbalancing	2 248
Transportation	**23**	**Electric bike**	74	+electric.bicycle −lock −washers	3 698
Transportation	**24**	**Hybrid vehicle**	135	+hybrid +vehicle	360
Transportation	24	Hybrid vehicle	134	+hybrid +car	213
Transportation	**25**	**Hydrogen vehicle**	140	+hydrogen +vehicle	102
Transportation	25	Hydrogen vehicle	138	+hydrogen +car	60
Transportation	25	Hydrogen vehicle	122	+fuel.cell.cars	31
Transportation	**26**	**Electric engines**	70	+electric +motor −gear −wheelchairs −alternator −checking −washers −7 −11 −37	9 221
Transportation	**29**	**Other vehicles**	72	+electric +truck −washers −reach	528
Transportation	29	Other vehicles	69	+electric +buses −washers	492
Transportation	29	Other vehicles	80	+electric.unicycle −washers	290
Transportation	29	Other vehicles	215	+selfbalanc +onewheel +scooter	191
Transportation	29	Other vehicles	78	+electric.railway −washers	132
Transportation	29	Other vehicles	214	+self.balanc +unicycl	95
Transportation	29	Other vehicles	79	+electric.train −washers	53
Transportation	29	Other vehicles	307	+electric.tractor −washers	18
Energy conservation	**31**	**Energy saving**	90	+energysaving	4 162
Energy conservation	31	Energy saving	86	+energy.efficient	4 151
Energy conservation	31	Energy saving	309	+energy.saving	1 479
Energy conservation	31	Energy saving	118	+fuel +economiser	867
Energy conservation	31	Energy saving	34	+car.pool	266
Energy conservation	31	Energy saving	38	+carpool	230
Energy conservation	31	Energy saving	167	+power.efficient	223
Energy conservation	31	Energy saving	119	+fuel +economizer	162

Group	ID	Category	Ref	Expression	# terms
Energy conservation	31	Energy saving	123	+fuelsaving	161
Energy conservation	31	Energy saving	356	+reduction +electricity	160
Energy conservation	31	Energy saving	320	+fuel.saving	114
Energy conservation	31	Energy saving	47	+combust +promot	13
Energy conservation	**32**	**Storage of electricity**	1	+accumulator +electric	58 971
Energy conservation	32	Storage of electricity	15	+battery +electric −acidulated −telephone −computer −fire.extinguisher −game −cigarette −cutters −cell.phone −mobile.phone −smartphone −wireless	25 125
Energy conservation	32	Storage of electricity	183	+rechargeable −acidulated −telephone −computer −fire.extinguisher −refuelling −sweepers	8 979
Energy conservation	32	Storage of electricity	14	+battery +charging −acidulated −telephone −computer −fire.extinguisher −game −cigarette −cutters −cell.phone −mobile.phone −smartphone −wireless	4 559
Energy conservation	32	Storage of electricity	39	+charger.batteri	1 453
Energy conservation	32	Storage of electricity	147	+lithium +ion +batteries	634
Energy conservation	32	Storage of electricity	13	+battery +chargeable −acidulated −telephone −computer −fire.extinguisher −game −cigarette −cutters −cell.phone −mobile.phone −smartphone −wireless	293
Energy conservation	32	Storage of electricity	199	+rental +batteries	179
Energy conservation	**33**	**Low energy lighting**	57	+control +light +comput −softwar	1 322
Energy conservation	33	Low energy lighting	51	+comput.softwar +control.light	339
Energy conservation	33	Low energy lighting	58	+control +light +programm	244
Energy conservation	33	Low energy lighting	212	+screen.control.light	129
Energy conservation	33	Low energy lighting	52	+computercontrol.light	66
Energy conservation	33	Low energy lighting	10	+audiosensit.control.light	58
Energy conservation	**34**	**Energy management**	85	+energy.consumption −others −meters	3 665
Energy conservation	34	Energy management	88	+energy.management	3 333
Energy conservation	34	Energy management	84	+energy.audit	1 925
Energy conservation	34	Energy management	328	+measuring +electricity +consumption	317
Energy conservation	34	Energy management	53	+consultancy +generation +electrical.power	312
Energy conservation	34	Energy management	7	+analyzing +electricity +consumption	249
Energy conservation	34	Energy management	329	+monitoring +electricity +consumption	190
Reusable	**41**	**Recycling**	189	+recycle −cost.price −tyres −tires −animal −wrappin	21 492
Reusable	41	Recycling	300	+downcycle	
Reusable	**42**	**Reusable bags**	202	+reusable +bags	738
Reusable	**43**	**Reusable bottles**	203	+reusable +bottle	853
Reusable	43	Reusable bottles	338	+recovering +bottles	
Reusable	**44**	**Refilling cartridge**	191	+refilling +cartridges −cigarette −ink.pen −ballpoint	1 153
Reusable	44	Refilling cartridge	354	+recovering +toner	

Group	ID	Category	Ref	Expression	# terms
Reusable	**49**	**Other reusable**	194	+regenerated +cellulose	565
Reusable	49	Other reusable	359	+reusable +plastic	232
Reusable	49	Other reusable	204	+reusable +ice.cube	221
Reusable	49	Other reusable	195	+regenerated +fiber	193
Reusable	49	Other reusable	184	+reclaim +cellulos −wrap	164
Reusable	49	Other reusable	205	+reusable +silicone	151
Reusable	49	Other reusable	245	+trash +separator	66
Reusable	49	Other reusable	188	+recovering +metal	56
Reusable	49	Other reusable	187	+recovering +gases	46
Reusable	49	Other reusable	185	+reclaim.rubber	43
Reusable	49	Other reusable	255	+upcycling	29
Reusable	49	Other reusable	347	+recovering +organic	29
Reusable	49	Other reusable	340	+recovering +chemical	20
Reusable	49	Other reusable	355	+recovering +waste	17
Reusable	49	Other reusable	346	+recovering +material	16
Reusable	49	Other reusable	344	+recovering +fluid	14
Reusable	49	Other reusable	350	+recovering +plastic	5
Reusable	49	Other reusable	337	+recovering +agents	4
Reusable	49	Other reusable	348	+recovering +packaging	4
Reusable	49	Other reusable	351	+recovering +rubber	4
Reusable	49	Other reusable	339	+recovering +catalytic	3
Reusable	49	Other reusable	342	+recovering +clothing	3
Reusable	49	Other reusable	349	+recovering +paper	2
Reusable	49	Other reusable	343	+recovering +crushing	1
Reusable	49	Other reusable	353	+recovering +solvent	1
Reusable	49	Other reusable	336	+recovering +aerosol	
Reusable	49	Other reusable	341	+recovering +chlorofluorocarbon	
Reusable	49	Other reusable	352	+recovering +scrap	
Pollution control	**50**	**Pollution general**	176	+purification −swimming.pools −clean.air −proteins −minerals −refrigerant.fluids −alum −synthesis.gas −olefin −membrane −carbonaceous −osmosis −boxes −solvent −planning −substances −tanks −units −desalination −gas −portable −ambient −salt −chemical −gases −agent −preparation −machin	13 698
Pollution control	50	Pollution general	177	+purifying +apparatus −tapwater −aquarium −bathwater −cyclone −membrane −vehiclemounted −industrial.purposes −household	11 236

Group	ID	Category	Ref	Expression	# terms
Pollution control	50	Pollution general	61	+decontamination −showers −metal −portable −chambers −sterilization −11	2 362
Pollution control	50	Pollution general	218	+silencer −firearm −rifle −gun −shotgun −pistol	1 754
Pollution control	50	Pollution general	8	+antipollution −9	1 059
Pollution control	50	Pollution general	163	+pollution +control	804
Pollution control	50	Pollution general	166	+pollution +treatment	319
Pollution control	50	Pollution general	247	+treatment +contamination	290
Pollution control	50	Pollution general	211	+sampling +contamination	251
Pollution control	50	Pollution general	253	+treatment +toxic	240
Pollution control	50	Pollution general	174	+purifi +plant	200
Pollution control	50	Pollution general	164	+pollution +detection	178
Pollution control	50	Pollution general	207	+safety +chemicals.used	141
Pollution control	50	Pollution general	165	+pollution +sensor	124
Pollution control	50	Pollution general	239	+testing +hazardous.material	115
Pollution control	50	Pollution general	54	+containment +pollutants	106
Pollution control	50	Pollution general	331	+nontoxic −enamels	89
Pollution control	50	Pollution general	252	+treatment +radioactive	84
Pollution control	50	Pollution general	317	+environmental.pollution	82
Pollution control	50	Pollution general	62	+detoxification +hazardous.materials	76
Pollution control	50	Pollution general	59	+control +spillage	60
Pollution control	50	Pollution general	2	+advice +pollution.damage	59
Pollution control	50	Pollution general	169	+prevention +environmental +damage	54
Pollution control	50	Pollution general	197	+remove +organic.contaminant	54
Pollution control	50	Pollution general	156	+oilspill +treatment	30
Pollution control	50	Pollution general	213	+sealing +stopping +leakage +oil	27
Pollution control	50	Pollution general	43	+clearance +chemical +pollution	26
Pollution control	50	Pollution general	246	+treat +poison	23
Pollution control	50	Pollution general	332	+oil.spill +treatment	19
Pollution control	50	Pollution general	44	+clearance +oil +pollution	18
Pollution control	50	Pollution general	294	+anti.pollution −9	13
Pollution control	50	Pollution general	64	+dissolve.poison	3
Pollution control	50	Pollution general	298	+chemical.free	2
Pollution control	50	Pollution general	334	+pollution +alarm	2
Pollution control	**51**	**Water purification**	277	+water +filter −electrostatic −sanitary −supply −boxes −chemical.compounds −aquarium −spas −pump −media −devices −units −agricultural −paper −rental −industrial −household −treatment −domestic	9 740

Group	ID	Category	Ref	Expression	# terms
Pollution control	51	Water purification	282	+water +treatment −hot −chlorinating −gravimetric −ion −ionization −carbonate −phosphate −ultraviolet −swimming −spas −demineralising −softening −bilge −sterilization −tanks −medical −preparation −substance −agent −filter	6 471
Pollution control	51	Water purification	280	+water +process −transportable	2 146
Pollution control	51	Water purification	281	+water +treating −ion −cooling	1 647
Pollution control	51	Water purification	369	+waste +water −tanks −guttering −planning	1 450
Pollution control	51	Water purification	279	+water +filtration −electrostatic −sanitary −supply −boxes −chemical.compounds −aquarium −spas −pump −media −devices −units −agricultural −paper −rental	1 300
Pollution control	51	Water purification	178	+rainwat −dispers −plastic −nonmetal −drainag	1 099
Pollution control	51	Water purification	254	+treatment.water −apparatus	1 092
Pollution control	51	Water purification	275	+wastewater +treatment −tanks	650
Pollution control	51	Water purification	173	+purifi +chemic +water −swim	596
Pollution control	51	Water purification	68	+electr.water.purifi	565
Pollution control	51	Water purification	278	+water +filter +apparatus +industri	439
Pollution control	51	Water purification	283	+water.purifi +industri −mainten	409
Pollution control	51	Water purification	196	+regeneration +water	320
Pollution control	51	Water purification	285	+water.purifi.instal	320
Pollution control	51	Water purification	274	+wastewater +filter	304
Pollution control	51	Water purification	287	+watersav	266
Pollution control	51	Water purification	22	+biolog +water.treatment	252
Pollution control	51	Water purification	11	+bacteria +water.treatment	171
Pollution control	51	Water purification	179	+rainwat +nonmetal −dispers −trap	156
Pollution control	51	Water purification	276	+water +education.service −safety	141
Pollution control	51	Water purification	373	+water +save	123
Pollution control	51	Water purification	112	+filter +waste.gas	112
Pollution control	51	Water purification	145	+instal.purifi.water	105
Pollution control	51	Water purification	40	+chemic +purif.water −swim	75
Pollution control	51	Water purification	372	+water +clarification −chemical.compounds	37
Pollution control	51	Water purification	284	+water.purifi.agent	20
Pollution control	51	Water purification	236	+substanc.purifi.water	
Pollution control	51	Water purification	370	+water +clarification	
Pollution control	**52**	**Air purification**	5	+air.purifi.prepar −deodoris	2 480
Pollution control	52	Air purification	6	+airpurifying −wearable −stroller −cyclone −electric −vehiclemounted −automobile −deodorising −household	782
Pollution control	52	Air purification	3	+air.pollut	574
Pollution control	52	Air purification	113	+filter.air.purifi	559

Group	ID	Category	Ref	Expression	# terms
Pollution control	52	Air purification	249	+treatment +gases −thermal.treatment −object	557
Pollution control	52	Air purification	149	+mufflers +engine	472
Pollution control	52	Air purification	111	+filter +gases +industrial −part	271
Pollution control	52	Air purification	172	+purif.machin −gas −air	251
Pollution control	52	Air purification	248	+treatment +effluent −industrial	251
Pollution control	52	Air purification	115	+filter.motor −oil −air	250
Pollution control	52	Air purification	286	+waterpurifying −dispenser −swimming −spas −tanks −aquarium −alum −household	224
Pollution control	52	Air purification	110	+exhaust.gas.treatment	216
Pollution control	52	Air purification	219	+smokeless −cigarette −tobacco	185
Pollution control	52	Air purification	144	+industri.air.purifi	183
Pollution control	52	Air purification	114	+filter.engin −air −oil	174
Pollution control	52	Air purification	108	+exhaust.extractors −fans	154
Pollution control	52	Air purification	171	+purif.gase −1 −11	152
Pollution control	52	Air purification	48	+combust.enhanc	123
Pollution control	52	Air purification	175	+purifi +potabl.water	101
Pollution control	52	Air purification	4	+air.purifi +commerci.use	99
Pollution control	52	Air purification	151	+mufflers +motor	96
Pollution control	52	Air purification	41	+chemic.prepar +petroleum	85
Pollution control	52	Air purification	109	+exhaust.gas +analysis	80
Pollution control	52	Air purification	150	+mufflers +machine	79
Pollution control	52	Air purification	240	+toxic.gas	47
Pollution control	52	Air purification	9	+atmospheric.oxygen +monitors −11	33
Pollution control	52	Air purification	155	+oil.emission +testers	24
Pollution control	52	Air purification	42	+cleansing +gases	8
Pollution control	**53**	**Biodegradable**	17	+biodegradable −implants −prostheses	4 361
Waste Management	**61**	**Waste disposal**	258	+waste +compacting	1 270
Waste Management	61	Waste disposal	266	+waste +machine −shredding −gas −shredder −disposal	1 045
Waste Management	61	Waste disposal	158	+organic +waste	524
Waste Management	61	Waste disposal	260	+waste +crushing	435
Waste Management	61	Waste disposal	67	+electr +garbag.dispos	247
Waste Management	61	Waste disposal	272	+waste +trash	193
Waste Management	61	Waste disposal	63	+disposal +residues	175
Waste Management	61	Waste disposal	241	+trash +compacting −industrial	149
Waste Management	61	Waste disposal	368	+waste +residues	99

Group	ID	Category	Ref	Expression	# terms
Waste Management	61	Waste disposal	262	+waste +disposal +toxic −plastic.bags −vessels	64
Waste Management	61	Waste disposal	206	+rubbish +compactor	48
Waste Management	61	Waste disposal	242	+trash +compactor	45
Waste Management	61	Waste disposal	363	+trash +storage −transport	45
Waste Management	61	Waste disposal	257	+waste +binding	33
Waste Management	61	Waste disposal	192	+refuse +compacting +machines	32
Waste Management	61	Waste disposal	124	+garbage +compacting	30
Waste Management	61	Waste disposal	271	+waste +settler	22
Waste Management	61	Waste disposal	193	+refuse +crushing +machines	11
Waste Management	61	Waste disposal	125	+garbage +compactor	10
Waste Management	61	Waste disposal	50	+compress.garbag	4
Waste Management	61	Waste disposal	326	+junk +clearance	3
Waste Management	61	Waste disposal	360	+rubbish +track	
Waste Management	**62**	**Process waste**	170	+process +waste	4 807
Waste Management	62	Process waste	273	+waste +treatment −tanks −repair.animal.waste	3 920
Waste Management	62	Process waste	268	+waste +material −collection	2 479
Waste Management	62	Process waste	265	+waste +installation −sanitary	2 413
Waste Management	62	Process waste	251	+treatment +liquids −hydrocarbons −objects	1 315
Waste Management	62	Process waste	270	+waste +services −chute −transport −cleaning	1 261
Waste Management	62	Process waste	267	+waste +management	1 250
Waste Management	62	Process waste	217	+sewage +treatment −plants	1 080
Waste Management	62	Process waste	261	+waste +destruction	845
Waste Management	62	Process waste	117	+food.waste	783
Waste Management	62	Process waste	243	+trash +destruction	585
Waste Management	62	Process waste	264	+waste +incineration −disposal	511
Waste Management	62	Process waste	250	+treatment +hazardous	472
Waste Management	62	Process waste	263	+waste +extraction	264
Waste Management	62	Process waste	259	+waste +converter	138
Waste Management	62	Process waste	143	+incineration +gases	72
Waste Management	62	Process waste	33	+burning +refuse	70
Waste Management	62	Process waste	269	+waste +reprocessing	61
Waste Management	62	Process waste	107	+enzyme +waste −deodorising	44
Waste Management	62	Process waste	126	+garbage +incinerator +purpose	29
Agriculture	**71**	**Fertiliser alternatives**	154	+natural +manure	670
Agriculture	71	Fertiliser alternatives	153	+natural +fertilizer −chemical	577

Group	ID	Category	Ref	Expression	# terms
Agriculture	71	Fertiliser alternatives	31	+biostimulant	556
Agriculture	71	Fertiliser alternatives	19	+biofertilizer −nitrogen	351
Agriculture	71	Fertiliser alternatives	209	+safety +fertilisers.used	160
Agriculture	71	Fertiliser alternatives	49	+compost.fertil	47
Agriculture	71	Fertiliser alternatives	220	+soil.erosion +control	41
Agriculture	71	Fertiliser alternatives	210	+safety +manures −horticultur	30
Agriculture	**72**	**Pesticide alternatives**	25	+biological +fungicide	418
Agriculture	72	Pesticide alternatives	30	+biopesticide	371
Agriculture	72	Pesticide alternatives	26	+biological +herbicide	217
Agriculture	72	Pesticide alternatives	325	+integrated.pest +management	5
Agriculture	**79**	**Other agriculture**	28	+biological +vegetation	198
Agriculture	79	Other agriculture	295	+biodynamic	65
Agriculture	79	Other agriculture	357	+regenerative +agriculture	7
Environmental awareness	**81**	**Ecology**	65	+ecology	2 501
Environmental awareness	81	Ecology	92	+environment +protection	1 751
Environmental awareness	81	Ecology	45	+climate +change	1 134
Environmental awareness	81	Ecology	99	+environmental.conservation	500
Environmental awareness	81	Ecology	133	+greenhouse +gas	390
Environmental awareness	81	Ecology	314	+environmental.issues	331
Environmental awareness	81	Ecology	132	+green +innovation	324
Environmental awareness	81	Ecology	83	+emission.reduction	316
Environmental awareness	81	Ecology	148	+mineralbased	245
Environmental awareness	81	Ecology	305	+ecosystem	219
Environmental awareness	81	Ecology	313	+environmental.friendly	210
Environmental awareness	81	Ecology	289	+wildlife +conservation	170
Environmental awareness	81	Ecology	190	+reduction +carbon +emissions	108
Environmental awareness	81	Ecology	315	+environmental.matters	103
Environmental awareness	81	Ecology	322	+green +technology	89
Environmental awareness	81	Ecology	101	+environmental.exploration	69
Environmental awareness	81	Ecology	330	+natural +alternative	65
Environmental awareness	81	Ecology	318	+environmental.responsible	58
Environmental awareness	81	Ecology	304	+ecofriendly	49
Environmental awareness	81	Ecology	131	+global.warming	39
Environmental awareness	81	Ecology	201	+research +natural.disasters	25
Environmental awareness	81	Ecology	306	+ecotourism	12

Group	ID	Category	Ref	Expression	# terms
Environmental awareness	81	Ecology	312	+environmental.conscious	12
Environmental awareness	81	Ecology	374	+wildlife +reserve	9
Environmental awareness	81	Ecology	302	+ecobiology	2
Environmental awareness	81	Ecology	321	+green +initiative	1
Environmental awareness	81	Ecology	303	+ecochoice	
Environmental awareness	81	Ecology	323	+greener +choices	
Environmental awareness	81	Ecology	333	+planet +friendly	
Environmental awareness	81	Ecology	362	+toxin.free	
Environmental awareness	**82**	**Sustainability**	238	+sustainable	4 159
Environmental awareness	82	Sustainability	182	+rebuilding +destroyed	935
Environmental awareness	82	Sustainability	301	+durable	493
Environmental awareness	82	Sustainability	198	+renovation +clothing	289
Environmental awareness	82	Sustainability	23	+biological +detergent	267
Environmental awareness	82	Sustainability	186	+recondit.machin +destroy −engin	46
Environmental awareness	82	Sustainability	345	+recovering +machine	45
Environmental awareness	82	Sustainability	366	+waste +prevention	27
Environmental awareness	82	Sustainability	367	+waste +reducing	27
Environmental awareness	82	Sustainability	335	+rebuilding +worn	4
Environmental awareness	82	Sustainability	327	+low.impact	2
Environmental awareness	82	Sustainability	375	+zero.waste	
Climate change	**91**	**Environmental services**	97	+environmental +services	7 144
Climate change	91	Environmental services	103	+environmental.protection	5 138
Climate change	91	Environmental services	95	+environmental +control −access	2 766
Climate change	91	Environmental services	96	+environmental +information	2 584
Climate change	91	Environmental services	91	+environment +information	2 180
Climate change	91	Environmental services	94	+environmental +assessment	1 513
Climate change	91	Environmental services	98	+environmental +system −9	904
Climate change	91	Environmental services	106	+environmental.testing	865
Climate change	91	Environmental services	208	+safety +environment	644
Climate change	91	Environmental services	102	+environmental.monitoring	640
Climate change	91	Environmental services	100	+environmental.engineering	620
Climate change	91	Environmental services	319	+environmental.technology	495
Climate change	91	Environmental services	105	+environmental.surveys	475
Climate change	91	Environmental services	311	+environmental.condition	215
Climate change	91	Environmental services	104	+environmental.science	198

Group	ID	Category	Ref	Expression	# terms
Climate change	91	Environmental services	93	+environment.software	175
Climate change	91	Environmental services	316	+environmental.planning	89
Climate change	91	Environmental services	310	+environmental.building	1
Climate change	**92**	**Carbon monitor**	35	+carbon +monitor −10	283
Climate change	92	Carbon monitor	55	+control +carbon +dioxide	90
Climate change	92	Carbon monitor	37	+carbon +recorders −10	65
Climate change	92	Carbon monitor	297	+carbon +footprint	38
Climate change	92	Carbon monitor	299	+control +carbon +emission	20
Climate change	92	Carbon monitor	56	+control +hydrocarbon +emission	18
Climate change	**93**	**Carbon brokerage**	36	+carbon +offsetting	1 879
Climate change	93	Carbon brokerage	32	+brokerage.carbon.credit	528
Climate change	93	Carbon brokerage	66	+electr +carbon.sequestr	67

Annex 3. Nice Classification (11th edition)

Class	Headings
1	Chemicals for use in industry, science and photography, as well as in agriculture, horticulture and forestry; unprocessed artificial resins, unprocessed plastics; fire extinguishing and fire prevention compositions; tempering and soldering preparations; substances for tanning animal skins and hides; adhesives for use in industry; putties and other paste fillers; compost, manures, fertilizers; biological preparations for use in industry and science.
2	Paints, varnishes, lacquers; preservatives against rust and against deterioration of wood; colorants, dyes; inks for printing, marking and engraving; raw natural resins; metals in foil and powder form for use in painting, decorating, printing and art.
3	Non-medicated cosmetics and toiletry preparations; non-medicated dentifrices; perfumery, essential oils; bleaching preparations and other substances for laundry use; cleaning, polishing, scouring and abrasive preparations.
4	Industrial oils and greases, wax; lubricants; dust absorbing, wetting and binding compositions; fuels and illuminants; candles and wicks for lighting.
5	Pharmaceuticals, medical and veterinary preparations; sanitary preparations for medical purposes; dietetic food and substances adapted for medical or veterinary use, food for babies; dietary supplements for human beings and animals; plasters, materials for dressings; material for stopping teeth, dental wax; disinfectants; preparations for destroying vermin; fungicides, herbicides.
6	Common metals and their alloys, ores; metal materials for building and construction; transportable buildings of metal; non-electric cables and wires of common metal; small items of metal hardware; metal containers for storage or transport; safes.
7	Machines, machine tools, power-operated tools; motors and engines, except for land vehicles; machine coupling and transmission components, except for land vehicles; agricultural implements, other than hand-operated hand tools; Incubators for eggs; automatic vending machines.
8	Hand tools and implements, hand-operated; cutlery; side arms, except firearms; razors.
9	scientific, research, navigation, surveying, photographic, cinematographic, audiovisual, optical, weighing, measuring, signalling, detecting, testing, inspecting, life-saving and teaching apparatus and instruments; apparatus and instruments for conducting, switching, transforming, accumulating, regulating or controlling the distribution or use of electricity; apparatus and instruments for recording, transmitting, reproducing or processing sound, images or data; recorded and downloadable media, computer software, blank digital or analogue recording and storage media; mechanisms for coin-operated apparatus; cash registers, calculating devices; computers and computer peripheral devices; diving suits, divers' masks, ear plugs for divers, nose clips for divers and swimmers, gloves for divers, breathing apparatus for underwater swimming; fire-extinguishing apparatus.
10	Surgical, medical, dental and veterinary apparatus and instruments; artificial limbs, eyes and teeth; 83rthopaedic articles; suture materials; therapeutic and assistive devices adapted for persons with disabilities; massage apparatus; apparatus, devices and articles for nursing infants; sexual activity apparatus, devices and articles.
11	Apparatus and installations for lighting, heating, cooling, steam generating, cooking, drying, ventilating, water supply and sanitary purposes.
12	Vehicles; apparatus for locomotion by land, air or water.
13	Firearms; ammunition and projectiles; explosives; fireworks.
14	Precious metals and their alloys; jewellery, precious and semi-precious stones; horological and chronometric instruments.
15	Musical instruments; music stands and stands for musical instruments; conductors' batons.
16	paper and cardboard; printed matter; bookbinding material; photographs; stationery and office requisites, except furniture; adhesives for stationery or household purposes; drawing materials and materials for artists; paintbrushes; instructional and teaching materials; plastic sheets, films and bags for wrapping and packaging; printers' type, printing blocks.
17	Unprocessed and semi-processed rubber, gutta-percha, gum, asbestos, mica and substitutes for all these materials; plastics and resins in extruded form for use in manufacture; packing, stopping and insulating materials; flexible pipes, tubes and hoses, not of metal.
18	Leather and imitations of leather; animal skins and hides; luggage and carrying bags; umbrellas and parasols; walking sticks; whips, harness and saddlery; collars, leashes and clothing for animals.

Class	Headings
19	Materials, not of metal, for building and construction; rigid pipes, not of metal, for building; asphalt, pitch, tar and bitumen; transportable buildings, not of metal; monuments, not of metal.
20	Furniture, mirrors, picture frames; containers, not of metal, for storage or transport; unworked or semi-worked bone, horn, whalebone or mother-of-pearl; shells; meerschaum; yellow amber.
21	Household or kitchen utensils and containers; cookware and tableware, except forks, knives and spoons; combs and sponges; brushes, except paintbrushes; brush-making materials; articles for cleaning purposes; unworked or semi-worked glass, except building glass; glassware, porcelain and earthenware.
22	Ropes and string; nets; tents and tarpaulins; awnings of textile or synthetic materials; sails; sacks for the transport and storage of materials in bulk; padding, cushioning and stuffing materials, except of paper, cardboard, rubber or plastics; raw fibrous textile materials and substitutes therefor.
23	Yarns and threads, for textile use.
24	Textiles and substitutes for textiles; household linen; curtains of textile or plastic.
25	Clothing, footwear, headwear.
26	Lace, braid and embroidery, and haberdashery ribbons and bows; buttons, hooks and eyes, pins and needles; artificial flowers; hair decorations; false hair.
27	Carpets, rugs, mats and matting, linoleum and other materials for covering existing floors; wall hangings, not of textile.
28	Games, toys and playthings; video game apparatus; gymnastic and sporting articles; decorations for Christmas trees.
29	Meat, fish, poultry and game; meat extracts; preserved, frozen, dried and cooked fruits and vegetables; jellies, jams, compotes; eggs; milk, cheese, butter, yogurt and other milk products; oils and fats for food.
30	Coffee, tea, cocoa and artificial coffee; rice, pasta and noodles; tapioca and sago; flour and preparations made from cereals; bread, pastries and confectionery; chocolate; ice cream, sorbets and other edible ices; sugar, honey, treacle; yeast, baking-powder; salt, seasonings, spices, preserved herbs; vinegar, sauces and other condiments; ice [frozen water].
31	Raw and unprocessed agricultural, aquacultural, horticultural and forestry products; raw and unprocessed grains and seeds; fresh fruits and vegetables, fresh herbs; natural plants and flowers; bulbs, seedlings and seeds for planting; live animals; foodstuffs and beverages for animals; malt.
32	Beers; non-alcoholic beverages; mineral and aerated waters; fruit beverages and fruit juices; syrups and other non-alcoholic preparations for making beverages.
33	Alcoholic beverages; alcoholic preparations for making beverages.
34	Tobacco and tobacco substitutes; cigarettes and cigars; electronic cigarettes and oral vaporizers for smokers; smokers' articles; matches.
35	Advertising; business management; business administration; office functions.
36	Insurance; financial affairs; monetary affairs; real estate affairs.
37	Construction services; installation and repair services; mining extraction, oil and gas drilling.
38	Telecommunications services.
39	Transport; packaging and storage of goods; travel arrangement.
40	Treatment of materials; recycling of waste and trash; air purification and treatement of water; printing services; food and drink preservation.
41	Education; providing of training; entertainment; sporting and cultural activities.
42	Scientific and technological services and research and design relating thereto; Industrial analysis, industrial research and industrial design services; quality control and authentication services; design and development of computer hardware and software.
43	Services for providing food and drink; temporary accommodation.
44	Medical services; veterinary services; hygienic and beauty care for human beings or animals; agriculture, aquaculture, horticulture and forestry services.
45	Legal services; security services for the physical protection of tangible property and individuals; personal and social services rendered by others to meet the needs of individuals.

References

Belderbos, R.A., Kazimierczak, M., Goedhuys, M. (2021), Patents, Trademarks and Appropriation Strategy of Incumbents: New Firm Formation in European Regions. *Regional Studies*, forthcoming.

Block, J., Fisch, C., Ikeuchi, K., Kato, M. (2021), Trademarks as an indicator of regional innovation: evidence from Japanese prefectures. *Regional Studies*, March 2021.

Castaldi, C. (2020), All the great things you can do with trademark data: Taking stock and looking ahead. *Strategic Organization*, 18(3).

Castaldi, C. and Mendonça, S. (2021), Regions and trademarks: Research opportunities and policy insights from leveraging trademarks in regional innovation studies. *Regional Studies*, forthcoming.

Davis, L.N. (2009), Leveraging trademarks to capture innovation returns. Paper presented at the Summer Conference, Copenhagen Business School, June 2009.

deGrazia, C.A.W., Myers, A., Toole, A. (2020), Innovation activities and business cycles: are trademarks a leading indicator? *Industry and Innovation*, 27(1-2).

Drivas, K. (2020), The role of technology and relatedness in regional trademark activity. *Regional Studies*, doi.org/10.1080/00343404.2020.1808883.

EUIPO (2020), Use of IPR bundles by EU firms 2014-2015. Accessible at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/reports/2020_IPR_Bundles/2020_Use_of_IPR_bundles_by_EU_firms_2014_2015_Full_EN.pdf.

EUIPO and EPO (2019), High-growth firms and intellectual property rights. Accessible at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/reports/2019_High-growth_firms_and_intellectual_property_rights/2019_High-growth_firms_and_intellectual_property_rights.pdf. May 2019.

EUIPO and EPO (2019a), IPR-intensive industries and economic performance in the European Union. Accessible at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/IPContributionStudy/IPR-intensive_industries_and_economicin_EU/WEB_IPR_intensive_Report_2019.pdf. September 2019.

EUIPO and EPO (2021), Intellectual property rights and firm performance in the European Union. Accessible at: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/reports/IPContributionStudy/IPR_firm_performance_in_EU/2021_IP_Rights_and_firm_performance_in_the_EU_en.pdf. February 2021.

European Commission (2020), Taxonomy: Final report of the Technical Expert Group on Sustainable Finance. Accessible at: https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf.

Eurostat (2009), Handbook on Environmental Goods and Services Sector. Accessible at: https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-ra-09-012.

Flikkema, M., Castaldi, C., de Man, A-P., Seip, M. (2019), Trademarks' relatedness to product and service innovation: A branding strategy approach. *Research Policy* 2019.01.018.

Flikkema, M., De Man, A. P., & Castaldi, C. (2014), Are trademark counts a valid indicator of innovation? Results of an in-depth study of new benelux trademarks filed by SMEs. *Industry and Innovation*, *21*(4).

Greenhalgh, C., Rogers, M. (2012), Trademarks and Performance in Services and Manufacturing Firms: Evidence of Schumpeterian Competition through Innovation. *Australian Economic Review* 45(1).

Malmberg, C. (2005), Trademark Statistics as Innovation Indicator? – A Micro Study. CIRCLE Lund University Working Paper 2005/17.

Mendonça, S., Pereira, T.S., Godinho, M.M. (2004), Trademarks as an indicator of innovation and industrial change. *Research Policy* (33), November 2004.

Sandner, P.G., Block, J. (2011), The market value of R&D, patents, and trademarks. *Research Policy* 40 (2011).

Schautschick, P., & Greenhalgh, C. (2016). Empirical studies of trade marks–the existing economic literature. *Economics of innovation and new technology*, 25(4), 358-390.

Schmoch, U. (2003), Service marks a novel innovation indicator. *Research Evaluation*, August 2003.

Schwiebacher, F. (2010), How companies use different forms of IPR protection—are patents and trademarks complements or substitutes? Paper presented at the DRUID-DIME Winder 2010 PhD Conference, January 2010.

Seip, M., Castaldi, C., Flikkema, M., de Man, A-P. (2018), The timing of trademark application in innovation processes. *Technovation* 2018.02.001.

Von Graevenitz, G., Graham, S.J.H., Myers, A.F: (2021), Distance (Still) Hampers Diffusion of Innovations. *Regional Studies*, doi.org/10.1080/00343404.2021.1918334.

Green EU trade marks

September 2021

© European Union Intellectual Property Office, 2021
Reproduction is authorised provided the source is acknowledged