



CHAPTER IV

ECO-FRIENDLY MATERIALS

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Biodegradable Plastics



4.1 CHAPTER IV HISTORY

The use of eco-friendly materials in Europe can be traced back to the 1960s and 1970s, when environmental consciousness began to emerge in response to issues such as air and water pollution, deforestation, and resource depletion.

In response to these concerns, alternative materials and processes were developed to reduce the impact on the environment, including recycled materials, biodegradable products, and non-toxic chemicals.

In the 1980s, the concept of sustainability and the impact of human activities on the environment gained more attention.

This led to the development of new eco-friendly materials, such as bamboo, cork, and organic cotton, and the introduction of stricter regulations on the use of harmful chemicals and substances in manufacturing.

In the 1990s and 2000s

as environmental awareness continued to grow, the demand for eco-friendly products increased. This led to the development of new technologies and the introduction of eco-labels and certification programmes to help consumers identify and choose environmentally friendly products.

In recent years, the trend towards sustainability has continued to grow, with more and more businesses and consumers becoming aware of the impact their actions have on the environment. As a result, the market for eco-friendly materials has continued to grow and evolve, with new products and technologies being developed to meet the demands of a more environmentally conscious society.

Today

eco-friendly materials are widely used in a range of industries, including the building and construction industry, the automotive industry, and the fashion and textiles industry. In the future, it is likely that the trend towards sustainability will continue to drive innovation and the development of new eco-friendly materials and technologies.

To what regards the graphic design industry, when choosing materials for your designs, opt for eco-friendly options. Eco-friendly materials in graphic design can include a variety of options such as recycled paper, biodegradable plastics, and natural fibers. These materials have a lower environmental impact compared to traditional materials, and using them can contribute to a more sustainable future.



4.2 CHAPTER IV RECYCLED PAPER

Paper is a fundamental material in graphic design, and its production has a significant impact on the environment.

However, there are many eco-friendly paper options available for designers to choose from, which can reduce the environmental impact of paper production. In this section, we will discuss

the different types of eco-friendly paper available and the benefits of using them in graphic design.

Recycled paper or ecologically sustainable paper can be produced from a variety of materials, including:

- **POST-CONSUMER WASTE**
This includes paper products that have been used by consumers and are then collected and processed for reuse.
- **PRE-CONSUMER WASTE**
This includes paper products that were not used for their intended purpose, such as trimmings from manufacturing processes or unused paper products.
- **AGRICULTURAL WASTE**
This includes crop residues, straw, and other plant materials that can be processed into paper products.
- **BAMBOO**
Bamboo is a fast-growing and sustainable resource that can be used to make paper products.
- **HEMP**
Hemp is a versatile and sustainable plant that can be used to make paper products.



These materials can be processed into various types of paper, including writing paper, printer paper, tissue paper, and packaging paper, among others. The use of these materials helps reduce the need for virgin fibers and minimizes the impact on the environment.

As mentioned above, recycled paper is made from post-consumer waste and is an important component of the **circular economy**, as it helps to conserve natural resources, reduce carbon footprint and waste, and promotes sustainable management of forests in the EU and worldwide. According to Eurostat, the use of recycled paper in Europe has been increasing over the past few decades.

In 2019, the total production of recycled paper in the European Union (EU) reached 23.3 million tonnes, which represented a significant increase from 17.2 million tonnes in 2009.

This growth can be attributed to the increasing focus on sustainable development and environmental protection, as well as the growing demand for recycled paper products.



HERE ARE SOME DATA POINTS RELATED TO the use of recycled paper in the European Union:

4.2 CHAPTER IV RECYCLED PAPER

76.1% RESOURCE CONSERVATION

According to Eurostat¹⁴, in 2019, the European Union recycled 76.1% of its paper waste, saving 17.5 million metric tons of raw materials. This helps to conserve natural resources by reducing the need to harvest new trees.

70% CARBON FOOTPRINT REDUCTION

According to the European Recycling Industries Confederation¹⁵, paper recycling saves up to 70% of the energy needed to produce paper from virgin fibers.



WATER CONSERVATION

According to the European Recycling Industries Confederation, recycling paper uses less water than producing paper from virgin fibers.

17.5 TREES CONSERVATION

According to the Confederation of European Paper Industries (CEPI), recycling one ton of paper saves around 17 trees. In 2019, the European Union recycled 76.1% of its paper waste, saving 17.5 million metric tons of raw materials.

It's important to note that these data points are approximate and may vary depending on the specific recycling methods and paper production processes used. The EU is continuously working on improving paper recycling rates and promoting sustainable paper production.

The European Union has certifications such as FSC and PEFC that guarantee that the paper is sourced from responsibly managed forests.

In fact, the **FSC (Forest Stewardship Council)** and **PEFC (Programme for the Endorsement of Forest Certification)** are two of the most widely recognized international certification schemes for sustainable forest management.

NOTE

14— <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211027-2>

15— <https://www.euric-aisbl.eu/branches/erpa>





4.2 CHAPTER IV TIPS AND TYPES FOR GRAPHIC DESIGN TEACHERS

Graphic design teachers can introduce the topic of electronic consumption and the impact that designs have online in the curriculum in a number of ways

MORE SPECIFICALLY:

- **FSC-CERTIFIED PAPER**
FSC (Forest Stewardship Council) certified paper is made from responsibly managed forests. The FSC certification is based on 10 principles that address issues such as the rights of indigenous people, conservation of biodiversity, and the protection of forests. FSC-certified products are verified through a rigorous third-party auditing process to ensure that they meet the standards set by the organization. Additionally, FSC-certified paper is often more affordable than traditional options.
- **PEFC-CERTIFICATED PAPER**
The PEFC certification is based on a similar set of principles, but with a greater focus on the sustainable management of forests, including the protection of water resources, soil, and wildlife habitats. PEFC-certified products are also subject to regular auditing to ensure that they continue to meet the standards set by the organization.

Both of these certifications play an important role in promoting the responsible management of forests, and by extension, promoting the use of eco-friendly and sustainable materials such as recycled paper in Europe.

When choosing eco-friendly paper options, it is important to consider the entire lifecycle of the paper, from production to disposal.

Additionally, it's important to check for the certifications, and recycled content, to ensure that the paper is produced sustainably. In fact, it's worth noting that the use of recycled paper can vary depending on the company and the specific product, and not all products labelled as "recycled" are made entirely of recycled paper.

By choosing eco-friendly paper options, graphic designers can reduce the environmental impact of paper production and contribute to a more sustainable future.

Additionally, by choosing eco-friendly options, designers can also create designs that are in line with the values of their clients and customers.



4.2 CHAPTER IV RECYCLED PAPER

ROMANIA RECYCLED PAPER IS BECOMING MORE POPULAR AND WIDELY USED IN ROMANIA

Recycled paper is becoming more popular and widely used in Romania, as it is an environmentally-friendly alternative to virgin paper. However, recycling rate in Romania is not as high as in other European countries, and there is still room for improvement. Here are a few examples of the use of recycled paper in Romania:

PAPER RECYCLING → According to Eurostat, in 2019, the paper recycling rate in Romania was **41.4%**, meaning that only 41.4% of paper waste was recycled. Nevertheless, this data suggests that paper recycling programs are being implemented in Romania and recycling rate is slowly increasing.

ITALY RECYCLED PAPER IS A POPULAR AND WIDELY-USED MATERIAL IN ITALY

Recycled paper is a popular and widely-used material in Italy, as it is an environmentally-friendly alternative to virgin paper. Here are a few examples of the use of recycled paper in Italy:

PAPER RECYCLING → According to Eurostat, in 2019, the paper recycling rate in Italy was **72.2%**, meaning that 72.2% of paper waste was recycled. This is an increase from 67.8% in 2010. This data suggests that paper recycling programs are effective in reducing waste and promoting sustainability in the graphic design industry.



4.3 CHAPTER IV BIODEGRADABLE PLASTICS

Biodegradable plastics are made from natural materials such as corn starch and can break down in the environment, reducing the amount of plastic waste that ends up in landfills and oceans.

They are considered a sustainable alternative to traditional plastics as they can reduce waste and the environmental impact of plastic production, use, and disposal and can be an important component of the circular economy, where materials are used, reused, and recycled to minimize waste and environmental impact.

The European Union has recognized the importance of biodegradable plastics in addressing plastic pollution and promoting sustainability. In fact, the EU has put in place a number of regulations to promote the use of biodegradable plastics and reduce the environmental impact of plastics. For example, it has set targets for member states to reduce the use of single-use plastics, and to increase the recycling and composting of plastics.

The [OK Compost certification](#) is a European certification for compostable products. It is granted by the [European Bioplastics Association](#) and is based on the European standard [EN 13432](#). The certification guarantees that a product meets the criteria for biodegradability and compostability, meaning that it can break down into natural substances within a specific time frame and not cause harm to the environment during the process. The OK Compost certification is recognized in many countries in Europe and is a widely accepted benchmark for environmentally friendly and sustainable products.

The use of biodegradable plastics in graphic design can have environmental benefits, as they can decompose naturally in the environment, reducing the amount of plastic waste in landfills and oceans.

However, their use is currently not well regulated or understood, and it is important to consider the limitations and the need for proper regulations and infrastructure to handle them.

In graphic design, biodegradable plastics can be used in various applications, such as packaging materials, marketing materials, and promotional items. For example, biodegradable plastic bags can be used for packaging products, such as books, clothing, or food. Biodegradable plastic films can be used for printing and promoting eco-friendly products, such as natural cosmetics or organic foods. Biodegradable plastic sheets can be used for making promotional materials, such as brochures, flyers, or business cards.

It is important to note that biodegradable plastics are not necessarily more environmentally-friendly than traditional plastics. The process of biodegradation is often slow and requires specific environmental conditions, such as high temperature, humidity, and the presence of microorganisms. As a result, biodegradable plastics can still contribute to environmental pollution if they are not disposed of properly.



4.3 CHAPTER IV BIODEGRADABLE PLASTICS

ROMANIA

- According to Eurostat, Romania had a consumption of biodegradable plastics of 2.5 kg per capita in 2019, which is lower than the European Union average of 5.5 kg per capita. **Romania had a recycling rate of biodegradable plastics of only 5% in 2019, compared to the EU average of 30%.**
- According to the National Environmental Guard of Romania, plastic waste is one of the most common forms of pollution in Romania, with an **estimated annual generation of 800,000 tons of plastic waste.** Furthermore, the majority of plastic waste ends up in landfills, where it can take hundreds of years to degrade and release harmful chemicals into the environment.

ITALY

- According to Eurostat, Italy had a consumption of biodegradable plastics of 5.5 kg per capita in 2019, which is on par with the European Union average of 5.5 kg per capita. **Furthermore, Italy had a recycling rate of biodegradable plastics of only 11% in 2019, compared to the EU average of 30%.**
- According to the Italian Environment Protection Agency (ISPRA), plastic waste is one of the most common forms of pollution in Italy, **with an estimated annual generation of 2.8 million tons of plastic waste.**



4.4 CHAPTER IV NATURAL FIBERS

The use of natural fibers in graphic design has been growing in popularity in Europe in recent years, as a response to the increased awareness of the impact of traditional synthetic materials on the environment.

Natural fibers, such as cotton, hemp, and flax, are renewable resources that are biodegradable and can be produced with less environmental impact than synthetic materials. These fibers are commonly used in the production of paper, textiles, and other materials for graphic design purposes. In addition, natural fibers are often preferred for their soft feel and unique textures, which can add character and interest to printed materials.

Some of the most commonly used natural fibers in graphic design include:

- **COTTON**
Cotton is a natural fiber that is widely used in the graphic design industry, particularly for printing and packaging applications. It is a durable, absorbent, and soft material that is easy to dye and print on.
- **HEMP**
Hemp is a strong and durable natural fiber that is also commonly used in graphic design, especially for creating eco-friendly packaging.
- **LINEN**
Linen is another natural fiber that is commonly used in graphic design, particularly for high-quality printing applications. It is known for its strength and durability, as well as its ability to hold fine detail.
- **JUTE**
Jute is a natural fiber that is often used in graphic design for its eco-friendly properties. It is a strong, flexible, and biodegradable material that is commonly used for creating packaging and other design materials.
- **BAMBOO**
Bamboo is a fast-growing plant that is becoming increasingly popular as a natural fiber for graphic design. It is known for its strength and sustainability, and it is often used for creating paper products and other design materials.

It's important to note that while these eco-friendly materials can have a lower environmental impact than traditional materials, the entire life cycle of the material should be taken into consideration, including the sourcing, production, and disposal. Additionally, it's important to consider the specific use case and the intended audience to determine which eco-friendly material is the best fit for a specific project.



Here are some tips and approaches for graphic design teachers to introduce the use of eco-friendly materials in the curriculum:

4.5 CHAPTER IV

TIPS AND TYPES FOR GRAPHIC DESIGN TEACHERS

- **START WITH THE BASICS**
Discuss the importance of sustainability in design and how it can positively impact the environment.
- **INCORPORATE REAL-WORLD EXAMPLES**
Show students practical examples of designers who are using eco-friendly materials and the positive impact it has on the environment and communities.
- **HANDS-ON LEARNING**
Provide opportunities for students to work with eco-friendly materials in their own design projects and reflect on their experiences.
- **PROMOTE RESEARCH AND DEVELOPMENT**
Encourage students to research and explore eco-friendly materials, their properties, and applications. This can also be an opportunity to introduce them to new materials they may not have encountered before.
- **FOSTER A CULTURE OF SUSTAINABILITY**
Emphasize the importance of sustainability in the design process and encourage students to adopt eco-friendly practices in their personal and professional lives.
- **UTILIZE TECHNOLOGY**
Use digital tools such as sustainability calculators or virtual simulations to demonstrate the environmental impact of different materials and their alternatives.
- **ENCOURAGE STUDENTS TO GET INVOLVED**
Encourage students to participate in sustainability initiatives, events, and campaigns that promote eco-friendly materials and practices in graphic design.