

The clean technology mechanisms as a strategic option to achieve sustainable development-The experience of the Walt Disney Company and the Danish Lego company as a model-

آليات التكنولوجيا النظيفة كخيار استراتيجي لتحقيق التنمية المستدامة-تجربة شركة والت ديزني و شركة ليغو الدنماركية أنموذجا-

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Received: 31-01-2024

Accepted: 22-04-2024

Abstract:

This study aimed to know the mechanisms of clean technologies to achieve sustainable development, with reference to the two global experiences of the Walt Disney company and the Danish Lego company, clarifying the concept of clean technology and sustainable development, and the relationship between them, in addition to clarifying how to achieve sustainable development by investing in technological mechanisms. Clean technologies, based on the descriptive approach, and the study ended by presenting a set of results, the most important of which is that Clean technologies are considered one of the most important means that must be used to protect the environment and achieve sustainable development.

Keywords: sustainable development, clean technologies, clean technology mechanisms

ملخص:

هدفت هذه الدراسة الى معرفة آليات التكنولوجيا النظيفة لتحقيق التنمية المستدامة مع الإشارة للتجربتين العالميتين لشركة والت ديزني و شركة ليغو الدنماركية، من خلال توضيح مفهوم التكنولوجيا النظيفة والتنمية المستدامة، والعلاقة بينهما، الى جانب توضيح كيفية تحقيق التنمية المستدامة عن طريق الاستثمار في آليات التكنولوجيا النظيفة، وذلك بالاعتماد على المنهج الوصفي، ولقد انتهت الدراسة

بتقديم مجموعة من النتائج ومن أبرزها أن التكنولوجيا النظيفة تعتبر من أهم الوسائل التي يجب استخدامها لحماية البيئة، ولتحقيق التنمية المستدامة.

الكلمات المفتاحية: التنمية المستدامة، التكنولوجيا النظيفة، آليات التكنولوجيا النظيفة

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1. INTRODUCTION

Faced with the continued spread of epidemics, pollution and depletion of natural resources, it has become necessary for institutions that use technology to adopt modern environmental protection practices, since it constitutes the main cause environmental degradation taking into account the inadequacy of economic and legal procedures, and this by abandoning polluting technologies and replacing them with clean technologies. This has made clean technologies a topic of interest over the last millennium, especially in light of the development challenge that countries seek to address in various areas, seeking new resources capable of meeting the needs of current generations and future. the framework of what we call sustainable development, taking into account different economic, environmental and social aspects.

It is therefore necessary to seek new technologies and modern, environmentally friendly applications aimed at protecting the environment and achieving sustainable environmental development.

Based on the above, the characteristics of the problem of our study were crystallized as follows:

To what extent can clean technologies contribute to sustainable development by investing in their mechanisms?

Objectives of the studies:

- Define the importance of sustainable development.
- Identify the most important approaches and mechanisms to benefit from clean technologies in achieving sustainable development.
- Clarify the relationship between clean technologies and sustainable development.

- Highlight the role of clean technologies as a basic mechanism to achieve sustainable development.

Research methodology:

We relied on the inductive descriptive approach to review the different research axes, addressing the conceptual framework of sustainable development and clean technologies, while clarifying the relationships between them, in addition to addressing the most important mechanisms of clean technologies to benefit from them. to achieve sustainable development with Explain how to achieve sustainable development by investing in clean technologies.

2. The theoretical foundation of sustainable development

2.1 The definition of sustainable development:

The idea of sustainable development was officially ratified at the Earth Summit held in Rio de Janeiro in 1992, where it was defined as "the process of developing and improving the current situation without affecting capabilities and resources future generations." (Boughali.s, 2013, p. 56)

The United Nations World Council on Environment and Development defined it in its 1987 report as "the set of coordinated and harmonious actions and processes necessary to change resource exploitation, investment trends, technological development and institutional changes, so as to guarantee the satisfaction of current needs. and potential future human needs and activities. (Al-Rasul, 2007, p. 87)

Therefore, sustainable development is an approach to development that uses resources in a way that allows those resources to continue to exist. The concept of sustainable development is also linked to the organizing principle of achieving human development goals while preserving the capacity of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. From this angle, sustainable development aims for social progress, environmental balance and economic growth.

2.2 Goal of Sustainable Development

Sustainable development is the various of dimensions and the aims to achieve numerous objectives are including: (Samir, 2006, p. 450)

- **Achieve the well-being of the population:** Sustainable development aims

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to reconcile the two sides of the equation (population/resources) in order to ensure a balance between them.

- **Preserve the natural resource base and reduce pollution:** Sustainable development focuses on the relationship between people's activities and the environment by addressing environmental systems and their contents as the basis of human life.

-**Optimal use of natural resources and determination of the absorption capacity of ecosystems:** The environment has the capacity to absorb the changes that occur as a result of changes in human activity.

2.3 Dimensions of sustainable development

Sustainable development is based on the integration and interconnection that exist between three fundamental dimensions: (Siham Al-Ayeb, 2020, pp. 215-216)

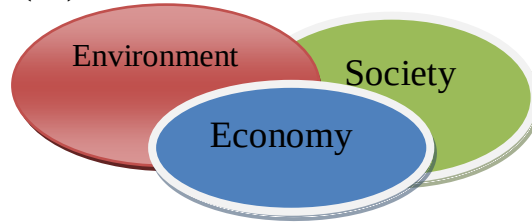
2.3.1 The economic dimension (economic sustainability): As part of this dimension, sustainable development works to achieve economic development, taking into account long-term environmental balances, the environment being considered as the basis of mechanisms and the basis of human, natural and plant life, and this dimension includes sustainable economic growth, capital efficiency, satisfaction of basic needs, economic justice.

2.3.2 The environmental dimension (environmental sustainability): It focuses on the preservation of natural resources and their optimal use with the aim of supporting them in the long term, and on the need for precaution and prevention based on the forecast of this that can happen to ecosystems. The environmental dimension of sustainable development revolves around several elements which are: ecosystems, energy, biodiversity, biological productivity, capacity for adaptation.

2.3.3 The social dimension (social sustainability): It represents the human dimension of sustainable development and indicates the need to choose equity between generations, because current generations must consider the importance and necessity of the equity process and justice by making choices for growth. in accordance with their desires and the desires of future generations, and the social dimension includes equality, in

distribution, popular participation, cultural diversity and institutional sustainability.

Figure n° (01): Dimensions of sustainable development



Source: (Al-Rasul, 2007, p. 89)

3. The relationship between clean technologies and the dimensions of sustainable development

3.1 Definition of clean technologies

The clean technology is defined as a product or process that helps reduce negative impacts on the environment. These are technologies that aim to mitigate the effects of climate change and attempt to adapt to it, through the optimal use of available energy and resources, and in a sustainable manner with waste Management. (others, 2019, p. 01)

The clean technologies represent various innovative processes and products used in a way that preserves natural resources and the environment, and which helps reduce the amount of waste and pollution resulting from production and consumption processes. In other words, it is technology that meets current needs without compromising the ability of future generations to meet their own needs. (Abadi, 2017, p. 938)

As you know, clean technologies are industrial production methods that take into account that they cause the minimum possible pollution and depend on the reduction of waste production, as well as greater efficiency in the process production, because the use of resources is rationalized, raw materials, water and energy to a certain extent. Care must be taken that this production process does not waste a lot of waste, and this also involves recovering some useful waste in the production process, instead of disposing of it (Al-Maloud, 2009, p. 49).

3.2 Objectives of Clean technology:

The main objectives of clean technologies are (Abdel Baqi Amira,

2019, p. 110):

- Develop production methods and introduce appropriate modifications in the product life chain, which includes the extraction and manufacturing of raw materials, transportation, storage and use of products, then their disposal by respectful means of the environment.
- Integrate health and environmental considerations into all production processes.
- Find the appropriate way to inform public opinion and the official bodies concerned of any information relating to health or environmental risks linked to operations carried out by economic institutions and recommend appropriate preventive measures.
- Prepare environmental studies in economic institutions, study the impact of production on the working environment and methods of reducing industrial pollution by economically and ecologically appropriate means.
- Reduce risks where the causes and consequences are unknown or where environmental and human resources are potentially threatened.
- Eliminate polluting technologies and resources with cleaner technologies.
- Develop products and services consistent with consumer behavior and desires.

It is therefore clear to us, through these clean technology objectives, that they contribute to reducing the factors that lead to environmental degradation, in addition to producing and exploiting clean energy, and use materials in a way that reduces environmental damage, in addition to designing clean and environmentally friendly products.

3.3 The relationship between clean technologies and the dimensions of sustainable development

Clean technologies are linked to sustainable development through three main dimensions, the most important of which is the environmental dimension, since it constitutes the main source of economic development and the fundamental condition for the continuation of economic activity and human survival through to free resources: water, air, soil, light and heat, because it is considered, together with renewable energies, the main engine for reducing emissions. Carbon dioxide is a greenhouse gas that negatively

affects the climate.

3.3.1 The environmental dimension:

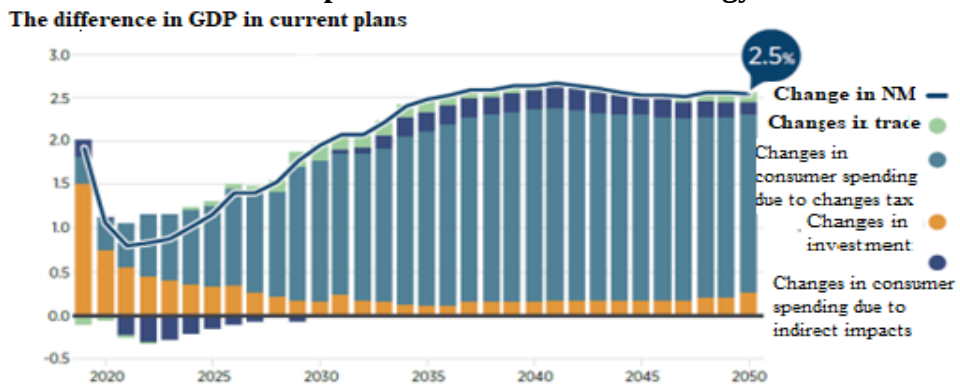
The historic climate agreement signed in Paris in 2015 aims to limit the rate of increase in global temperature so that it does not exceed two degrees Celsius during the current century compared to prehistoric levels, and clean energy constitutes the cornerstone for finding an effective solution. solution to the phenomenon of climate change.

Greenhouse gas emissions continue to rise despite scientific warnings and political commitments, having increased at a rate of 1.5% per year over the past decade and only stabilizing for a short period between 2014 and 2016, and total emissions reached a record level of 55.3 gigatons of greenhouse gases. carbon dioxide equivalent, year 2018 (UNEP, 2019, p. 8).

3.3.2 The economic dimension.

More intense greenhouse gas emissions into the atmosphere would further reduce levels of economic output and overall productivity, and studies indicate that levels of the latter will decline by 2030 at a rate of 4.2%. compared to what they are today, and at a rate of 2.7% in 2050 if the situation continues (Books, 2013, p. 8).

Figure 01: Global GDP, trade, differences in consumer spending and investments between current plans and the 2019-2050 energy transition.



Source:(Fates Nisreen, Yado Muhammad, 2022, p. 348).

At the level of the global economy, GDP will increase by 2050 in the baseline and transition scenarios, as the transformation of the global energy system stimulates economic activity in addition to the growth that can be expected under the of the business approach currently adopted, and the cumulative benefit resulting from the increase in GDP will reach 2050.

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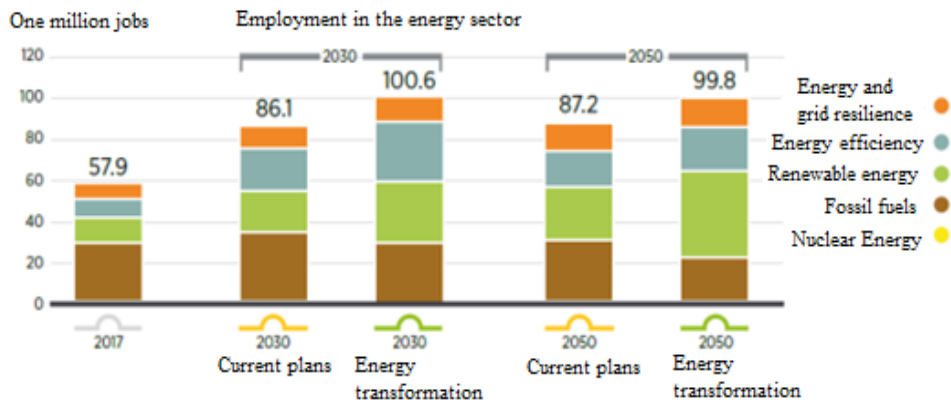
From 2017 to 2050, approximately 52 trillion dollars, in addition to increasing GDP per capita by more than double. Investment in clean technologies has a positive impact on domestic product in the short term. then fades. This impact is mainly due to the initial investment in renewable energy production capacity. Energy efficiency and resilience of the energy system to support the energy transition. The impact of trade on GDP was moderately positive over the whole period, reflecting the fact that trade must always be balanced in nominal terms.

The transition of the global energy system brings significant economic benefits. It is true that the additional costs of transitioning the global energy system over the long term could reach \$1.8 trillion per year in 2050, but the savings from lower rates of air pollution will improve. Levels of public health and reduction of environmental damage will exceed These costs are much higher, and reports from the International Energy Agency indicate that savings in these three aspects alone will reach an average of \$6 trillion by 2050. Furthermore, this transformation process would significantly improve the economic footprint of the global energy system compared to the commercial approach currently taken.

3.3.3 Social dimension

Transforming the energy system can significantly increase employment rates in the energy sector, and overall, the transition to clean energy sources will create more energy sector jobs than it will not lose any in the fossil fuel sector. The Renewable Energy Roadmap report predicts that the transformation of the energy system will result in the loss of 7.4 million fossil fuel jobs by 2050, but in return will create 19 million new jobs in the areas of renewable energy, energy efficiency, grid improvement and energy flexibility, which ultimately means gaining 11.6 million jobs.

Figure 02: Global employment in the energy and renewable energy sector 2017, 2030-2050



Source: Fates Nisreen, previous reference, p. 349

The number figure (02) represents global employment in the clean energy sector under the mitigation and current scenarios, as jobs in the renewable energy and energy efficiency sectors increase by 14% in the mitigation scenario up to 'in 2050 compared to current scenarios, while employment in the clean energy sector. The fossil fuel sector is declining, and this decline is thought to be much less than the employment increases associated with energy conversion.

The transition to a sustainable and more environmentally friendly economy offers significant opportunities for social development: creating more jobs, improving the quality of a wide range of jobs and widespread social inclusion.

4. Clean technology mechanisms to achieve sustainable environmental development.

Clean technologies include a group of modern technologies that aim to produce and harness clean energy and use materials in ways that reduce environmental damage, in addition to designing clean and environmentally friendly products. Among the most important of these mechanisms are: energy, green buildings, green chemistry and nanotechnology (Hasina, 2020, pp. 12-15)

4.1 Green energy

The United States Energy Information Administration defines it as resources whose flow in nature is renewable and inexhaustible, but can be limited. These include biomass, water, solar, geothermal energy, wind,

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oceans, wave action and tides. The Intergovernmental Panel on Climate Change has defined it as energy that is renewed in nature at a rate equal to or greater than its use and which can be converted into energy through the use of various technological methods, which enables the provision of energy services such as fuel. and electricity.

Green energy sources are characterized by being continually renewable and not depleted, meaning they are sustainable, unlike some other energy sources like coal, oil and gas. They also have many environmental benefits because they are clean and produce few greenhouse gases. or net carbon emissions, and so they don't. It depletes natural resources and has a slight negative impact on the environment without wasting carbon dioxide and other toxic materials. Additionally, renewable energy is economically considered cheaper and safer than other sources, but this is highly dependent on the weather, which affects. The ability to produce it in large quantities requires capital and the availability of large areas.

4.2 Green buildings (sustainable buildings).

Green buildings are also called sustainable construction. These are buildings that use renewable materials in their construction while taking advantage of renewable energy strategies to make the building comfortable for their residents, using methods that do not harm the environment. The term green buildings refer to the construction method that relies on environmentally friendly design techniques. These buildings are designed to respect the environment and take into account the reduction of energy consumption, materials and resources, as well as the mitigation of the effects of construction and use. on the environment, while being in harmony with the environment. Their design method aims to reduce environmental impacts. Negative aspects are achieved by improving the efficiency of material and energy use. Green or sustainable buildings seek to ensure the application of sustainability standards in a way that helps preserve the environment and guarantees the right of future generations to obtain their fair share of energy and resources. Green buildings also include various practices aimed at using environmentally friendly and resource-efficient elements throughout the life of the building, starting with design,

construction, maintenance, renovation and dismantling.

The main objective of green or sustainable buildings is to enable environmentally friendly construction practices, which contribute to saving energy, water and raw materials, in addition to reducing excess water, greenhouse gas emissions, consumption, reuse and recycling of materials in order to provide comfortable spaces, clean, safe and productive homes. The term building refers to Green also refers to a sustainable building or u

4.3 Green nanotechnology.

Nanotechnology includes various technical research and developments at the atomic and molecular levels in order to explain and understand nanoscale phenomena and materials that create and utilize unique compositions due to their small size.

The United Nations has paid great attention to nanotechnology due to the remarkable development in this field and has sought to use it in many fields to benefit from its advantages, such as medical field, industry, energy, agriculture, but also the environment, since this technology has proven its ability to solve many problems, including environmental pollution and the mitigation of its effects, in addition to its use in the development of supply methods and water treatment and air pollution detection, which contributes to the development of strategies to protect the environment against pollution, producing clean energy sources and solving various environmental problems.

5. Sustainable development and investment in clean technologies

5.1 Sustainable development through green chemistry.

Green chemistry can contribute to achieving the Sustainable Development Goals, by providing citizens with life-saving medicines, clean energy or more sustainable materials. It is part of the United Nations Sustainable Development Goals to reduce poverty and can provide the basis for economic growth.

Ensuring that green chemistry is at the heart of new chemical processes and products will also benefit human lives by reducing resource use. The Sustainable Development Goals linked to quality education and gender equality are key points on the agenda of the International Union of Pure and Applied Chemistry. Green chemistry can also contribute to

healthier and happier societies while reducing inequality and spreading justice and peace.

5.2 Sustainable development through green nanotechnologies.

Nanomaterials can be functionalized with different chemical groups to increase their affinity toward a specific compound, including solutes and gases, and can also be functionalized with chemical groups that selectively target key biochemical components and metabolic networks.

Nanomaterials also provide unprecedented opportunities to develop functional materials with superior electronic, optical, catalytic, and magnetic properties. These novel functional materials can also be processed into various forms, including supramolecular hosts, molecules, fibers, and water-soluble membranes. Significant progress has been made in the use of nanotechnology to address global challenges, including in the areas of water technology, clean energy technologies, greenhouse gas management, supply and use of materials, manufacturing and green chemistry (Diallo, 2013).

5.3 Sustainable development through green buildings.

Some basics are needed to classify every city as sustainable, namely (OXFAM):

- Access to public resources;
- Urban renewal measures;
- Reduce gas emissions;
- Rational and ethical consumption;
- Recycling and responsible consumption.

5.4 Sustainable development through green information technologies.

The question of sustainability raises the need for green computing. With green computing, it is possible to create hardware products and software applications that consume fewer resources. The challenge of growing demand for computers can be solved through the product continuity concept of green computing. Recycling IT equipment and not disposing of it will limit the production of harmful substances such as lead and mercury. Recycling will reduce the need to create new devices and will also reduce energy and resource consumption (Fatima Hafeez, 2021, p. 1093).

5.5 Sustainable development through green energy.

Renewable energy is environmentally safe and economically sustainable compared to fossil energy sources for many considerations (Salvarli, 2020):

- Use of hydroelectric energy for water supply and irrigation in agriculture.
- The geothermal power plant is sustainable and produces low emissions compared to traditional fossil fuel power plants.
- The environmental impact of wind energy, compared to that of fossil fuels, is relatively low.
- The use of solar energy is increasing rapidly around the world.
- Bioenergy is produced from biomass and is a clean energy source with regard to the type of biomass and the conversion technology used.

6. The role of clean technologies in promoting sustainable development

Modern technology and innovations play a leading role in advancing sustainable development, as development goals can be achieved by applying clean technological innovation, for example in energy production, agriculture, renewable resource systems, to energy storage, as solutions for sustainability can be found. in these areas by exploiting technological progress without negative repercussions on the environment. When it comes to electricity generation, traditionally, fossil fuel sources have been used as a means of energy production, but fossil fuel sources have also created significant amounts of pollution for the ecosystem. at all stages of this process, from exploration to the combustion process to obtain energy, which is not in line with the sustainable development goals (Mustafa Seckin Salvarli, 2020).

It was therefore necessary to develop new and alternative forms of energy production while reducing and limiting emissions of polluting gases. Among these forms we find so-called alternative energies as well as clean technologies, which are renewable and clean energies aimed at stopping the impact of climate change on future generations.

6.1 The role of clean technologies in environmental sustainability

The objective of clean technologies is to modernize and replace traditional practices and methods responsible for the deterioration and

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depletion of natural resources with more efficient and sustainable methods, through the use of renewable energy, it is that is, energy generated from sources that renew themselves naturally and on a human time scale, such as wind turbines, solar panels, geothermal energy and hydroelectricity. And tidal energy to conserve natural resources, instead of using fossil fuels which emit greenhouse gases and thus cause environmental pollution. Other applications of clean technologies include (G.U. Fayomia, 2020):

- Use of green buildings, also called sustainable buildings. These buildings contain resource-efficient structures, such as habitable wind turbines in the Netherlands, as well as self-sufficient buildings and cities.

- Smart Agriculture Smart agriculture is a game changer when it comes to reducing carbon emissions. The agricultural industry has huge implications for our planet: the livestock sector alone contributes 44% of human-caused methane emissions, and hydroponics is only a small aspect of the agriculture sector. smart agriculture. Therefore, the use of technology in areas such as precision agriculture and artificial intelligence can lead to a breakthrough in the agricultural sector (W. Kates, 2016).

Water quality Often neglected; water quality constitutes a major environmental issue. Many companies are working to reduce their water consumption and provide clean drinking water to underdeveloped areas. Some of the ways clean technologies can be applied to water are through water treatment and wastewater treatment.

6.2 The role of clean technologies in achieving sustainable development from an economic perspective

Technological advances and green technologies can be applied in all areas of the economy, health, transportation, business and industries to reduce environmental impacts. Through best practices to reduce industrial waste, it is necessary to reduce the amount of waste we send to landfills. can link clean technologies to all efforts to reduce waste production, or at least recycle it (V. Strezov, 2017).

The effective and efficient use of resources, particularly in the use of hybrid and electric cars, has had a radical impact in helping to reduce and reduce carbon emissions, as well as creating employment and employment

opportunities. new paths of innovation and development. The use of modern scientific advancements has also made it possible to manufacture advanced medicines to ensure the health and vitality of people, and neurosurgery has become possible thanks to continued technological advancements. By creating green cities as small businesses that use local products and participate in recycling processes, these businesses have a positive environmental impact in addition to making financial gains, which helps reduce our environmental footprint and conserve resources, because almost all industries can participate in own projects. technology, even startups and small businesses can make an impact by applying clean technologies, as the green technology market was worth US\$11.2 billion in 2020 and is expected to reach US\$36.6 billion by 2025, as we see a growing awareness of the importance of technology. subject. Sustainability may be due to a generational change in our societies. Today's younger generations are more environmentally conscious and more inclined to make sustainable choices. Reports have shown that 73% of Gen Z are willing to pay more for products if they are sustainable. Gen Z is more likely to purchase goods based on values. The company's environmental principles and younger generations showing keen interest in preserving the Earth indicate that we can expect more from clean technologies in the future (T. Pukšec, 2018).

In other areas of food security, the use of green technologies in sustainable agriculture and fishing has eliminated the need for harmful pesticides and antibiotics, leading to the development of products that will not affect our long-term health. term and which, at the same time, also allowed us to conserve our natural resources (Harris, 2000).

6.3 The role of clean technologies in achieving sustainable development from a social perspective

The perceived impact of emerging technologies on the development of societies is felt in various parts and areas, and the proper application of these technologies requires taking into account the environmental, economic, political, cultural and social contexts and their impacts, in the extent to which technology is used to improve people's general standard of living; In addition to the analysis aimed at better allocation of resources,

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there are other technological applications aimed at ensuring sustainable development, such as the use of efficient methods of partial cogeneration, multigeneration and load sharing, as well as in the power generation, the use of concentrated solar and hybrid power generation systems, and in the development of improved control strategies for storage applications. Energy, aging processes of battery packaging, as well as supercapacitors.

7. International Experiences of green practices:

7.1 Walt Disney International Company:

The Walt Disney Foundation was established in 1923 and is a leading American institution in entertainment, media, motion pictures and tourism, as well as gaming and apparel. In recent years, the Foundation has seen remarkable progress in the rankings of the High Reputation Institute, as it occupied second, third and second places respectively during the years 2018, 2019 and the middle of the first of 2020 (Schmidt, 2023).

A-Disney and its green practices:

To integrate environmental sustainability into the Walt Disney Resort's daily operations, energy-efficient lighting fixtures have been installed throughout the property. Walt Disney World Resort also maintains a Florida Green Loading rating for all 24 resort hotels, and more than 92,000 tons have been recycled. of materials in 2010, making recycling a large part of Walt Disney World Resort's waste management operations, meeting 80 percent of its irrigation needs with reclaimed water. Unique waste from Disney's Animal Kingdom is also sent to the composting facility. In 2010, it supplied more than 4680 tons of natural fertilizer, more than 9000 tons of organic fertilizer throughout the year (Bouafia Aliyah, April 2021, p. 184).

In 2019, net greenhouse gas emissions were reduced by 47% compared to 2012 levels. This reduction was achieved through a combination of investments in sustainable design innovations, energy efficiency, low-carbon fuel sources, renewable electricity and natural climate solutions. operational waste from landfills (University, 2023).

Disney has received Green Seal Awards for its sustainable production practices across numerous Disney film and television productions from the Environmental Media Association, a global symbol confirming that a

product or service meets the highest standards in health and environmental leadership.

Disney is determined to please the companies that made it a giant by implementing net-zero greenhouse gas emissions policies across all of its facilities. It strives to reduce indirect greenhouse gas emissions by reducing electricity consumption. Disney also has a zero waste policy, meaning nothing ends up in landfills. Waste, the entertainment giant is also using water-saving technologies and working to reduce the manufacturing and distribution footprint of its products. This is linked to the company's ecological management and its policy of having a positive net balance sheet impact, which has made Disney a leader in social responsibility (Merskin, 2020).

7.2 the Danish international company “LEGO”:

The Lego company was founded in 1932 and its name is taken from the Danish word *leg godt*, which means (play well). It is one of the leading international companies in the toy industry. She has been ranked in the top ten for nine consecutive years, most recently ranked first in the middle, first in 2020 and second in 2019 (<https://www.strategicplay.com/>, 2023).

LEGO Green (Sustainable) Practices:

The company relies on environmentally friendly energies (renewable energies) such as solar energy and investments in offshore wind power. In 2019, the group installed 3,570 solar panels in one of its branches, in addition to partially exploiting solar energy in factories abroad. production from investments in energy sources outdated Renewable energy: 340 gigawatt hours of energy used in Lego factories. It also strives to completely eliminate the environmental impact of its manufacturing by 2030 without compromising quality and safety, relying on sustainable sources. Currently, the group manufactures 80 different types from sustainable sources, where 185 sustainable plant elements in the production process, in addition to recycling the organization's waste and ensuring that it is not completely landfilled by 2025. Currently, the organization recycles 93% of total waste and 100% of plastic waste (Christensen, 2023).

8. Conclusion

In light of the green trend, clean technologies have become a

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requirement to find the alternatives needed to preserve the environment and economic growth. This is based on a set of preventive rather than curative technological applications to avoid pollution and the depletion of natural resources. This contributes to the preservation of natural resources and their optimal use. This benefits the economy, society and the environment, because these mechanisms or applications allow the possibility of sustaining resources and ensuring the ability of future generations to meet their needs while meeting the needs of current generations, which is the primary objective of sustainable development.

8.1 Results

The results of the study showed that clean technology mechanisms have the capacity to find solutions to various environmental problems, in addition to their significant contribution to maintaining the sustainability of natural resources in the long term and not depleting them through their effective use, which contributes to maintaining environmental balance and achieving sustainable development.

Clean technologies offer many ways to protect the environment, the most important of which are: “prediction, detection, response, containment and recovery”.

Clean technologies have several objectives and strategies to rely on to achieve effective economic leadership

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