Renewable energies and sustainable development in the context of environmental security.
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Headline

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- Introduction.
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- sustainable development.
- Renewable energy.
- The role of renewable energy.
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- The role of verification systems in sustainable development.

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Abstract

- The solutions to the environmental problems we face today require long-term sustains action for sustainable development. Renewable energy is one of the most effective ways to achieve sustainable development.
- Today, there are many opportunities for renewable energy sources (RES), including nuclear technology that contributes to mitigation of climate change and the promotion of sustainable development (SD).
- There must be complementarity between the nuclear industry and sustainable development in the context of environmental security. In this context.

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Abstract

- The main scope of the current study is to highlight the role that alternative energies play in achieving sustainable development.
- In addition, we discuss the most important environmental and security challenges of nuclear plant and the importance of their peaceful use as a source of sustainable development and environmental security.
- It also makes a number of recommendations to support the Arab countries' tendency to introduce the option of nuclear energy into their national electricity generation programs.

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Introduction

- Sustainable development is the primary and ultimate goal of the world for all countries regional and international institutions. Energy is the main Engine and the active component of every growth and development and has an important role in the development process. Access to modern and sustainable energy services contributes to the eradication of poverty, Improve living standards and help meet basic human needs.
- The energy used worldwide is traditional and unsustainable, as it is polluting the environment as well as it causing harmful emissions. Since sustainable development is primarily concerned with the protection of the environment, ensuring optimal use and fair distribution of resources between the present generation and subsequent generations.

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Introduction

- Nuclear plants have the potential to mitigate negative environmental impacts with minimal cost in the energy supply sector, particularly electricity generation. Nuclear plant projects face major challenges, especially after the Chernobyl 1986 and Fukushima events of 2011, including fears of radioactive effects, nuclear waste management, nuclear proliferation issues and lack of public acceptance.
- Therefore, the Competent authorities working in the nuclear stations increase nuclear safety standards, review the safety of nuclear installations, strictly enforce laws, seek to prove economic competitiveness, maintain environmental security, help non-proliferation and gain public acceptance.
- All this has prompted us to search.

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Research problem

- The problem that revolves inside us research in the field of renewable energy and its role in achieving sustainable development is to increase the need for energy in reliance on fossil sources threatened by depletion, which did not allow sustainable development due to emissions harmful to the environment from its sustainability. This has led to the search for sources of renewable energies such as solar, wind, etc. to provide environmental security and achieve sustainable development.

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Importance of the study

- Highlighting the role and importance of renewable energy and the role of verification regimes for the CTBT. And to support the peaceful use of nuclear technology in achieving the goals of sustainable development.
- Increasing the demand for energy to achieve the development goals while reducing the use of traditional energy, without harming the environment is to provide environmental security to achieve sustainable development and this is what we seek.

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sustainable development

- Sustainable development is a comprehensive concept to meet the needs of people at the present time and to improve their living conditions without compromising the ability of future generations to achieve their goals. They have three interrelated pillars: economic development, social development and environmental protection.
- Sustainable development takes into consideration a set of goals it seeks to achieve. Most sustainable development objectives are focused on preserving the environment, making good use of existing resources, and providing opportunities for future generations to benefit from them to achieve a better life for the population.

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Renewable energy

- Renewable energies today are a fundamental means of achieving development, especially in our time, which is witnessing a deterioration in the environment due to traditional sources of energy and other negative factors that have led to the spread of pests and the destruction of nature. The use of such energies is necessary and effective to achieve the development goals and develop the economy and improve the energy services of citizens. As it will be critical to the success of development plans in various fields, considering that development has coherence and complementarity P renewable energies.
- Renewable energies are natural resources that are permanent, immortal and available in nature, whether limited or unlimited but constantly renewable. This is a clean energy that does not result in the use of environmental pollution or damage to either the environment or the human being. The most important sources are solar, water, , Organic heat and organic energy.

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The role of renewable energy

- Renewable energies play an important role in the achievement of sustainable development. The use of this type of energy is reflected in the three dimensions of sustainable development, namely, economic dimensions, social dimensions and environmental dimensions. The extent to which the use of renewable energies reflects this development is shown.

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The role of renewable energy

- Access to modern and sustainable energy services contributes to the eradication of poverty, saving lives, improving health, raising the standard of living and helping to meet basic human needs.
- Energy experts expect energy demand to increase in the 21st century, especially in developing countries, increasing demand for energy to increase greenhouse gas emissions and rising climate change on the planet. The rates of these gases are expected to double in the same period.
- There is a global consensus that in order to avoid the adverse effects of climate change in environmental, social and economic systems, greenhouse gas emissions should not rise.

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Environmental challenges of nuclear plants

- The nuclear plants in the world face a range of environmental challenges, some of these we will discuss, such as the health effects of radiation in normal operation and accident situations, as well as demonstrating their non-participation in greenhouse gases, climate change, safe storage of nuclear waste, .
- Nuclear plants are the only source of electricity whose environmental costs are included in the cost of kilowatt hours of electricity It is also subject to the approval of the nuclear and environmental regulatory authorities on the results of these reports, including:

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Environmental challenges of nuclear plants

❖ Health effects of radiation: -

- Nuclear plants bend to strict rules limiting their radiation effects on workers, the public and the environment.
- Nuclear plants operate under regulatory, monitoring, monitoring, verification, and inspection aspects to ensure safe performance.
- Nuclear plants have no radiological effects on the environment and do not exceed a radiation dose of 0.002 mSv / year compared to natural radiation doses of up to 2.4 mSv / year.

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Environmental challenges of nuclear plants

❖ Global Warming and Climate Change:-

- Nuclear plants are characterized by the fact that they do not emit carbon dioxide, the main cause of greenhouse effect, they do not produce nitrogen, sulfur dioxide or oxides that cause acid rain, nor do toxic metals such as lead, mercury, etc., so it is cleaner and non-polluting. Environment and is the best solution to the problem of global climate change

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Environmental challenges of nuclear plants

❖ Risks of nuclear waste:-

- The biggest obstacle facing the renaissance of nuclear plants is the problem of managing nuclear waste, especially high radiation and long life.
- In order to get rid of the safety of this type of waste stored in facilities created under appropriate geological conditions so that the conservation of radioactive waste and the protection of humans and the environment can be trusted against their risks for hundreds of thousands of years.
- There are sites in America, Russia, Sweden, France, Finland, China and Japan are being developed for the purpose of disposal of high-radiation nuclear waste as well as spent fuel

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Environmental challenges of nuclear plants

❖ Thermal pollution:-

- The cooling water discharged from the nuclear plants is subject to strict environmental restrictions that make it safe for fish and marine organisms in pure locations. These restrictions begin with the selection of the station site and then design and operation with continuous monitoring systems.
- Studies on the thermal effect of cooling water on the marine environment in Taiwan have shown that there is no effect of cooling water on the marine environment. A study on the Kiga station in Taiwan from the station confirmed the marine environment around it.

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Security challenges for nuclear plants

Existing nuclear plants under construction or planning face a range of security challenges, some of which will be discussed, such as energy security, site security, public acceptance, as well as nuclear proliferation issues.

❖ Energy security:-

- Energy security is a fundamental consideration in the selection of nuclear plants within a mix of electricity sources in a country. Nuclear plants have two advantages: first, the costs of generating nuclear power are much lower in terms of changes in fuel prices, as in fossil fuels, and secondly, uranium fuel is used in small quantities and is available in multiple producing countries with strategic assets.
- Energy security has prompted many countries that do not have nuclear plants to study nuclear option as well as renewable energy technologies to diversify energy mix.

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Security challenges for nuclear plants

❖ Security of the site and gain acceptance of the crowd: -

- Nuclear plant sites are strategic objectives that provide all the procedures and means of protection and security. After the events of September 11, 2011 increased fears of targeting the sites of nuclear stations for terrorist attacks, despite the engineering designs to turn the reactor.
- Terrorist operations aim not only at nuclear plants but also at nuclear facilities such as waste storage facilities, consumer fuel storage basins, and radioactive and nuclear transport facilities. Therefore, the assessment of nuclear threats and the strengthening of physical protection systems for nuclear installations and materials are of paramount importance. Physical protection systems rely on an effective set of Systems and procedures with a view to preventing the theft, misrepresentation or unauthorized transfer of nuclear material, as well as preventing the destruction or abuse of nuclear facilities by individuals or groups of terrorists.

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Security challenges for nuclear plants

- The establishment and operation of physical protection systems are great interest at the national and international levels and the State has full responsibility for the establishment and operation of physical protection systems for nuclear materials and installations.
- To combat nuclear terrorism and to support nuclear security in the country, including the accounting of nuclear materials, reviewing and monitoring exports and imports, as well as the monitoring of radioactive materials and the national regulatory body. Verification of this is nuclear security and the countries must work together to comply with the Convention on the Physical Protection of Nuclear Material and Facilities as well as the International Convention for the Suppression of Acts Nuclear terrorism and public acceptance are of paramount importance in maintaining the security of nuclear sites and installations and the two live nearby

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Security challenges for nuclear plants

❖ Non-proliferation issues:-

- Nuclear plants do not pose nuclear proliferation risks, which are related to the nuclear fuel cycle in the process of enriching uranium at first, or obtaining plutonium for the processing of consumer fuel at the end. The Safeguards System of the International Atomic Energy Agency (IAEA) and the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) are fundamental to preventing the diversion of peaceful uses of nuclear energy to military uses and the development of nuclear weapons.
- The best way to build the bases of mutual trust between nations is to take a comprehensive approach to combating nuclear weapons, weapons of mass destruction, arms control and strengthening non-proliferation policy, with the need to create a world in which the benefits of nuclear energy are peaceful and available to all States.

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The role of verification systems in sustainable development

- CTBT verification systems are designed to detect any nuclear explosion that occurs on Earth - underground, underwater or in the atmosphere.
- The purpose of the verification system is to monitor compliance by countries with the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which prohibits all nuclear explosions on the planet.
- This means that the verification systems play a role in protecting the environment from pollution by explosions and the results toxic gases and pollutants on the ground or underground affect the population or the remnants of underwater explosions affect the aquatic environment ... etc. and so we protect the planet as much as possible.

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