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Renewable energy regulations

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Table of contents

Table of contents	I
I Renewable energy regulations	II
I.1 Introduction	1
I.2 Types of Regulations	3
I.3 Agreement and regulations relating to renewable energies in the European Union	3
I.3.1 United Nations Framework Convention	3
I.3.2 Kyoto Protocol.....	3
I.3.3 Paris Agreement.....	4
I.4 Universal Regulations	4
I.5 Algerian renewable energy regulations	6

Renewable energy regulations

Table of Contents

I.1	Introduction	1
I.2	Types of Regulations	3
I.3	Agreement and regulations relating to renewable energies in the European Union	3
I.3.1	United Nations Framework Convention	3
I.3.2	Kyoto Protocol.....	3
I.3.3	Paris Agreement.....	4
I.4	Universal Regulations	4
I.5	Algerian renewable energy regulations	6

I.1 Introduction

Regulations are authoritative rules or directives created and maintained by an authority, such as government agencies, to manage the behavior of industries, individuals, and organizations. They ensure the safety, efficiency, and fairness of various systems within society .

The components of the regulation

The regulations are composed of the following standards :

- The order
- The regulations
- Decree

Moreover, there are two kinds of regulations :

- The regulations implementing the laws
- Autonomous regulations .

What is regulation mean ?

To regulate: to control, especially by rules, administer, conduct, direct, govern, manage, monitor, order, organize, oversee, restrict, and supervise.

Regulation: rule, in accordance with rules or conventions, by law, commandment, decree, dictate, directive, edict, law order, requirement, restriction, rule, and statute.

Why regulation ?

Regulation in industries like energy aims to fix "market failures" to safeguard consumers, society, and the environment. It primarily ensures fair competition and prevents one dominant player from raising prices. In regulated markets, the level of control is a political decision tied to policy goals. While competition can reduce regulation, it doesn't eliminate the need entirely.

1. Ensure Fair Play: Prevents companies from abusing their market power, promoting competition.
2. Protect Consumers: Keeps prices reasonable and prevents exploitation.
3. Safeguard the Environment: Imposes rules to reduce harmful emissions like CO_2 .
4. Ensure Social Equity: Guarantees universal access to essential services.
5. Maintain Supply Security: Prevents disruptions to critical services like electricity.

In essence, regulation in competitive markets aims for economic efficiency, protects consumers, the environment, and promotes social justice by ensuring necessary goods and services

are provided reliably.

Who regulates ?

Regulating energy industries involves different models globally. The independent or semi-independent specialist regulator is common, especially post-privatization. However, in some cases, a central government department retains regulatory functions. Three common models include regulation through a government department, a ministerial agency, or a fully independent regulator.

In general, renewable energy regulation may involve:

- Central government departments: Setting overarching policies.
- Specialist utility or energy regulators: Focusing on industry-specific oversight, including renewables.
- Competition regulators: Ensuring fair practices in the energy market.
- Environmental regulators: Addressing environmental concerns related to energy production.
- Local authorities: Managing regional aspects of energy projects.
- Courts and tribunals: Resolving legal matters in the energy sector.

Regulation of **solar photovoltaic (PV) energy** and renewable energies, in general, is typically managed by multiple entities at various levels. Here are the key regulators:

International Level:

- **International Electrotechnical Commission (IEC):** Sets global standards for electrical and electronic technologies, including PV systems.

International Renewable Energy Agency (IRENA): Promotes the adoption and sustainable use of renewable energy worldwide.

Regional Level:

European Union (EU): The European Commission implements directives like the Renewable Energy Directive (RED) to set targets and policies for member states.

North American Electric Reliability Corporation (NERC): Ensures the reliability of the power grid in North America, including renewable energy integration.

National Level:

Government Ministries and Departments: Various countries have specific ministries or departments, such as the U.S. Department of Energy (DOE) or China's National Energy Administration (NEA), responsible for energy policy and regulation.

National Regulatory Authorities: Bodies like the Federal Energy Regulatory Commission (FERC) in the U.S. oversee electricity markets, including renewables.

Local Level:

State and Provincial Governments: In federal systems, individual states or provinces often have their own regulations and incentives for renewable energy.

Municipal Governments: Local governments may have additional regulations and incentives to promote the use of renewable energy within their jurisdictions.

I.2 Types of Regulations

1- Economic Regulations: Control prices, competition, and market entry within industries. Example: antitrust laws .

2- Social Regulations: Protect public welfare by setting standards for health, safety, and the environment. Example: environmental protection laws.

3- Administrative Regulations: Govern the internal procedures of organizations, particularly within the public sector. Example: procurement regulations.

I.3 Agreement and regulations relating to renewable energies in the European Union

I.3.1 United Nations Framework Convention

An international environmental treaty to combat "dangerous human interference with the climate system", in part by stabilizing atmospheric concentrations of greenhouse gases. It was signed by 154 countries at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, which was held in Rio de Janeiro from June 3 to 14, 1992. It has established a secretariat headquartered in Bonn and has entered into force. Implemented in March 1994. The Treaty called for continued scientific research, regular meetings, negotiations and future political agreements designed to allow ecosystems to adapt naturally to climate change .

I.3.2 Kyoto Protocol

The Kyoto Protocol is an international treaty linked to the United Nations Framework Convention on Climate Change (UNFCCC), adopted in Kyoto, Japan, in December 1997. It commits its Parties by setting internationally binding emission reduction targets.

The Protocol's main goal is to reduce greenhouse gas (GHG) emissions to mitigate climate change .

Relationship to Renewable Energy:

1- Promotion of Renewable Energy: The Kyoto Protocol encourages the use of renewable energy sources as a means to reduce GHG emissions. It includes mechanisms like the Clean Development Mechanism (CDM) that support projects using renewable energy technologies, such as solar and wind power.

2- Emission Reduction Targets: By setting binding targets for GHG emissions, the Protocol incentivizes countries to invest in renewable energy to meet these targets.

3- Sustainable Development: The Protocol promotes sustainable development, which includes the development and deployment of renewable energy technologies.

The Kyoto Protocol has played a significant role in advancing renewable energy by creating financial and regulatory incentives for countries to transition away from fossil fuels and towards cleaner energy sources.

I.3.3 Paris Agreement

The Paris Agreement is a landmark international treaty adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC). Its primary goal is to limit global warming to well below 2°C above pre-industrial levels, with efforts to limit the increase to 1.5°C. The Agreement works on a five-year cycle of increasingly ambitious climate action plans known as Nationally Determined Contributions (NDCs).

1- Relationship with Renewable Energy: Emission Reduction Targets: The Paris Agreement encourages countries to set ambitious targets for reducing greenhouse gas emissions. Renewable energy plays a crucial role in achieving these targets by replacing fossil fuels with cleaner energy sources.

2- NDCs and Renewable Energy: Many countries include renewable energy targets in their NDCs. For example, 134 out of 188 submitted NDCs mention renewable energy targets, with a significant focus on electricity generation.

3- Financial and Technical Support: The Agreement provides a framework for financial, technical, and capacity-building support to help countries transition to renewable energy.

4- Long-Term Strategies: Countries are encouraged to develop long-term low greenhouse gas emission development strategies (LT-LEDS) that include renewable energy as a key component.

By promoting the adoption of renewable energy, the Paris Agreement aims to reduce energy-related CO₂ emissions and contribute to global efforts to combat climate change.

I.4 Universal Regulations

1. Renewable Energy Targets: Many countries have set ambitious targets for renewable energy deployment, such as the EU's target of at least 40% renewable energy share by 2030. These targets often drive policy and regulation.

2. Feed-in Tariffs (FiTs): FiTs provide guaranteed payments per unit of renewable energy produced, encouraging investment and project development.

3. Renewable Portfolio Standards (RPS): RPS mandate electricity suppliers or utilities to

source a certain percentage of their energy from renewable sources.

4. Net Metering: Allows small-scale renewable energy producers to sell excess electricity back to the grid, offsetting their own consumption costs.

5. Permitting and Licensing: Streamlined permitting processes and clear licensing requirements are crucial for efficient project development.

6. Grid Integration: Regulations ensure efficient and reliable integration of variable renewable energy sources like solar and wind into the grid.

7. Environmental Impact Assessment (EIA): EIAs assess the potential environmental impacts of renewable energy projects and guide mitigation measures.

8. Land Use Planning: Regulations ensure the responsible siting of renewable energy projects to minimize land-use conflicts and environmental impacts.

9. Social Impact Assessment (SIA): SIAs assess the social impacts of renewable energy projects on communities and guide community engagement and benefit-sharing strategies.

10. Community Engagement: Regulations encourage open communication and engagement with local communities affected by renewable energy projects.

11. Carbon Pricing: Mechanisms like carbon taxes or emissions trading schemes can incentivize the reduction of greenhouse gas emissions, indirectly supporting renewable energy development.

12. Energy Efficiency: Regulations promoting energy efficiency can reduce overall energy demand, making it easier to meet targets with renewable energy sources.

13. Research and Development (R&D): Investing in R&D for new and more efficient renewable energy technologies is crucial for long-term sustainability and cost reduction.

14. Technology Transfer and Capacity Building: Sharing knowledge and expertise with developing countries can accelerate their transition to renewable energy.

15. Intellectual Property (IP) Rights: Clear and fair IP regulations are essential to incentivize innovation and attract investment in renewable energy technologies.

16. Renewable Energy Certificates (RECs): Tradable certificates that represent the environmental attributes of one megawatt-hour of electricity generated from renewable sources.

17. Emission Standards: Regulations setting limits on the amount of pollutants that can be released from industrial processes and power plants.

18. International Climate Agreements: Agreements like the Paris Agreement that set global targets for reducing greenhouse gas emissions.

19. Smart Grid Standards: Technical standards for modernizing power systems to integrate renewable energy and improve efficiency.

I.5 Algerian renewable energy regulations

Influenced by the widespread interest in renewable energy in the world, Algeria has decided to develop a national policy to promote it by trying to establish a legal framework to regulate this sector as an alternative to traditional energy in order to achieve sustainable development. Below are the regulations and laws adopted by Algeria in the field of renewable energy:

Law No. 98-11 of August 22, 1998 :

Which includes the orientation law and the five-year program for scientific research and technological development, was one of the first laws to give concrete expression to the Algerian government's interest in renewable energies .

Law No. 99-09 on energy management was promulgated:

It aims to consolidate energy efficiency and promote the use of renewable energies. As part of environmental protection against greenhouse gases, this law also includes various measures and procedures taken with the aim of rationalizing energy and developing renewable energies .

Order No. 02-01 of 2002 relating to the distribution of electricity and gas by Canals:

This was the first legislative framework dealing with the marketing of electrical energy. The law also enabled the private sector to exploit energy from renewable sources, as well as allowing self-generation of energy from these sources .

Law No. 01-02 of 2002:

Has also adopted support policies represented by the conduct of calls for tenders for the development of large projects for the private sector, which guarantee the purchase of energy produced from renewable sources.

Law No. 04.09 of 2004 relating to the promotion of renewable energies in the context of sustainable development :

It aims to strike a balance between energy sources and the need to achieve sustainable development by preserving traditional energies and gradually replacing them with clean, sustainable energies.

La loi No. 04-09 :

The aforementioned stipulates the need to create a national renewable energy observatory to contribute to their development.

Executive Decrees No. 06-428, 06-429 of November 26, 2006 And Order of February 21, 2008:

On guaranteeing the connection of renewable energy plants to the grid.

Law No. 09-09 and Executive Decision No. 11423 of December 20, 2011:

which creates the (National Fund for Renewable Energy and Cogeneration).

Executive Decree No. - 13 - 218 of June 18, 2013:

Determines the conditions for granting bonuses to cover the costs of diversifying electricity production.

Executive Decree No. 17-98 of February 26, 2017 :

Determines the procedure for requesting tenders for the production of renewable energies from co-production and their integration into the electrical energy supply system.

The decision establishing the ministry in application of Executive Decree No. 20-322 of 11/22/2020:

Which defines the responsibilities of the Minister of Energy Transition and Renewable Energies. It aims to implement a national renewable energy development program focused on solar energy (3,000 hours of sunshine per year) and wind energy, with export prospects .



Figure I.1: National institute of Standards and Technology logo.

