

Romania's Electricity Market: Legal Framework, Infrastructure, and Strategic Perspectives

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Abstract. *Romania's energy market, molded by historical turns, regulatory shifts, and renewables' creeping ascent, cuts a restless path. This study probes the legal and institutional girders, National Regulatory Authority for Energy (ANRE) and Transelectrica, are the entities that prop the sector up. It tracks the conduits of electricity, gas, oil; their anchorage in European Union mandates. A SWOT lens lays bare Romania's fortes: a varied energy brew, a geography well-placed. The aging grids, policy hesitations still persist. Renewable strides and EU-funded ventures beckon as prospects; geopolitical churn and green compliance weights, though, bear down. Pointing to Romania's chance at regional energy clout, this work sketches routes to a durable, eco-minded future.*

Keywords: *Romania energy market framework, energy market regulator and transmission operators, energy mix.*

Introduction

In the nineteenth century, Romania forged the underpinnings of what would blossom into its modern energy domain, an enterprise launched by founding sites committed to oil extraction and processing. Strikingly, as accounts from that epoch reveal, Ploiești, in 1856, beheld the creation of the world's first commercial oil refinery, an accomplishment (modest though it seemed) that, by its very emergence, proclaimed Romania's debut in the global energy sphere.

As the 20th century unfolded, Romania emerged as an important force in oil production; holding sway both in Europe and on the global stage: this ascent not only cemented its important presence in the worldwide energy domain; but also markedly advanced its economic and industrial growth; casting light on the nation's expanding sway and input in international markets.

After World War II's close, Romania embarked on a new chapter beneath the communist regime's sway, launching an expansive nationalization drive that enveloped the energy sector alongside other vital industries. This step, integral to a grander design for consolidating dominion over national wealth, aligned with the state's ideological aims and developmental ambitions. In this epoch, Romania channeled substantial funds toward bolstering and broadening its energy framework; efforts, being manifold, unfolded thus: initially, a resolute thrust to amplify yields of conventional resources, oil and coal chief among them, their indispensability acknowledged for energy security and the burgeoning industrial sphere. Concurrently, the period heralded Romania's bold foray into nuclear energy, a calculated turn toward embracing varied, technologically sophisticated solutions. Such fervent investment and progress, though bound by the regime's rigid mandates, forged the bedrock for modernizing Romania's energy prowess.

As the 1980s broke, Romania plunged into a grim epoch of energy dearth and economic upheaval; teetering on the edge of a full-blown crisis: at its heart; the state's stringent financial maneuvers, chiefly a debt-clearing ploy hinging on exporting copious oil yields, lay bare. Crafted to curb the nation's burdensome foreign debts; accrued from myriad developmental pursuits; this approach wreaked havoc on domestic energy reserves; sparking widespread scarcity. Rationing

measures; though introduced to ease the strain; only underscored the crisis's severity: industries; crippled by inconsistent energy flows; descended into disarray; while citizens—facing meager supplies for heating; cooking; and necessities—bore acute privations. This period; thus; threw into sharp relief the vulnerabilities plaguing Romania's energy sphere; exposing the delicate interplay of fiscal policies; resource management; and societal well-being in the twilight of communist rule.

After communism regime was removed, Romania's energy sector remain exposed; its deep-seated flaws and hurdles laid bare: decades of centralized governance had left it marred by crumbling infrastructure and pervasive inefficiencies; a heritage that gravely undermined its efficacy and standing in competitive arenas.

In the dawn of the 1990s; Romania launched a formidable endeavor to recast its economic framework; pursuing advancement anchored in novel tenets: this era; marked by a daring shift from state-driven models; embraced market-focused principles. The state, acutely conscious of the pressing need for progress and for streamlined operations, initiated a broad drive of privatization of systemic restructuring. Aimed at dismantling the energy sector's monopolistic grip, these efforts sought to instill dynamic competition, to foster an environment primed for ingenuity in order to obtain enhanced efficiency. So, Romania toiled to revitalize its energy domain: sturdier; nimbler; ready to address the needs of an evolving economy.

The 2000s mark was a time of strategic realignment in Romania especially in the context of efforts to belong to the European Union. The period of early 2000's was characterized by a determined approach to reorient the Romanian energy sector to fit the standards and regulatory frameworks of the European Union. This was important not only for meeting the requirements for accession to the EU, but for anchoring Romania in the wider European energy market. The reform agenda at this time was both deep and broad and touched on critical areas of market liberalization, oversight of regulation and maintenance of fair competition. At the heart of these reforms, demolition of state controlled energy monopolies was the need which opened doors to a diversified and competitively structured market.

On the other hand, efforts to attract foreign investment have gained momentum, being considered essential to channel the necessary capital and expertise to the energy sector. The regulatory structure, completely overhauled, has been made more transparent, simplified and consumer-oriented. These far-reaching changes have significantly reshaped Romania's energy landscape, bringing it more in line with European standards and increasing its attractiveness for both local and international investors. As Romania has advanced towards integration into the European Union, these measures have underlined its commitment to economic modernization, sectoral competitiveness and sustainable progress within the European framework.

The article tries to offer a present glance on Romania energy market focusing on the current legal framework which overrules energy sector. Principal regulatory authorities are identified and their role in the market is presented.

Furthermore, the author focuses on transmission and distribution network for electricity and on Swot analyses on electricity sector. It is made a comparative analysis in Romania, Germany and Poland electricity sector pointing out the differences.

Literature review

The 2003 publication "*Electricity market development in Romania*" by Budulan P. and colleagues discusses the development of the electricity market in Romania, emphasizing two key objectives for energy policy: the liberalization of the electricity market and promotion of market mechanism on production and energy supply. The reform process, which began in 1998, has gone through

multiple restructuring phases, though it remains incomplete. The Romanian Government's medium-term strategy, established in 2001, outlines key steps for privatizing generation and distribution companies to foster a competitive electricity trading environment.

D. Kennedy's 2005 treatise, exploring the "*South-East Europe Regional Energy Market*", delves into Romania's position, its manifold challenges, within the Athens Memorandum's framework. Romania, long an energy exporter, sees its alignment with the memorandum's goals dissected. Noteworthy advances in energy reform emerge: escalated tariffs, bolstered payment discipline, autonomous regulators' inception, and the reordering of pertinent utilities. Yet obstacles persist, Kennedy notes; gas price adjustments remain imperative, payment adherence falters still. Inevitably, such reforms, though essential, risk precipitating affordability concerns, casting a shadow over Romania's energy transition within the broader European context.

Diaconu A et al in their 2009 study "Electricity reform in Romania", highlight Romania's role as a net electricity exporter within the South-East Europe region. This role is expected to gain significance having in view intended new nuclear generators and enhancements in international transmission capacity. Romania has committed to an electricity restructuring plan, which includes vertical separation, although the specifics of horizontal restructuring within the generation sector remain unclear. Key unresolved issues include the allocation of hydroelectric capacity and offers low costs and determining the number and assets of new thermal generation enterprises.

Onet's 2010 study, "*The Liberalization of Electricity Markets in Romania and the EU*", probes the measures adopted by the EU and Romania to forge competitive, market-oriented electricity pricing. Its opening segment traces the EU's historical endeavors; the subsequent part scrutinizes Romania's recent strides toward a cohesive national energy strategy, alongside policies for crisis mitigation. The roles of Romania's Energy Regulatory Authority (ANRE) and the European Agency for the Cooperation of Energy Regulators (ACER) are elucidated. Further, the study delineates Romania's electricity market structure, drawing on data from the Romanian Electricity and Gas Market Operator (OPCOM) concerning market modalities and 2021 financial performance. Romania's progress in market liberalization, though nascent, is evident, with requisite frameworks established. Legislative efforts, reflective of European norms, must nonetheless adapt continually to counter the pressures of global energy crises.

In their 2010 inquiry, "*Regulating District Heating in Romania: Legislative Challenges and Energy Efficiency Barriers*", Puputoaia D. and Bouzarovski S. explore the intricate heritage of district heating (DH) systems throughout Eastern and Central Europe. Constructed to serve communist-era Soviet ambitions, these sprawling networks—now faltering—face technical, fiscal, regulatory, environmental trials in the post-communist epoch, ceding prominence to rival heating approaches. Being so, attempts to revive DH, driven by ecological and energy security imperatives, lack sufficient research attuned to local nuances. Romania's legislative reforms governing DH come under scrutiny; governance quandaries bedeviling state authorities take center stage. Analyzing policy documents, decrees, statutes, the study lays bare tariff-setting intricacies and organizational burdens as paramount concerns. Proffering policy counsel, the authors delineate restructuring avenues, aiming to enhance energy efficiency within Romania's heating sector, ever mindful of broader regional currents.

Marta D'Angelo's 2020 study, "*Onshore Wind Energy Market Analysis: Sweden, Poland, and Romania*", discerns Romania's foremost hurdle: the pressing need for hefty grid expansion investments, entwined with critical political choices. Though the three pre-feasibility ventures already prove financially sound, their lucrateness—D'Angelo posits—might yet rise, should

technical investment burdens diminish and requisite political reforms, long overdue, take hold within the broader energy landscape.

Culita G.C. and Vaduva C.D., in their 2021 work, “*Technical and Commercial Quality of Electricity Distribution in Romania*”, laud electricity—humanity’s signal achievement—for its role in energizing infrastructure, simplifying daily labors. Romania’s energy sector, now thriving, now languishing (when fiscal priorities outstripped service betterment), has known vicissitudes. Central, nonetheless, stands the consumer’s import. Shaping its Energy Strategy, Romania—poised as a regional energy linchpin and crisis arbiter—must delineate firm aims, ensuring that consumers, above all, derive enduring benefits within the shifting currents of sectorial evolution.

In their 2022 work, “An Overview of the Gas Market in Romania in the Context of the Liberalization Process”, Nedelcu C. and Busu M. herald Romania—preeminent in Central Europe’s natural gas trade, its industrial use pioneered—as a singular study. Peaking in the early 1980s, the market flourished under policies (shunning imports) that spurred domestic resource extraction, only to dwindle thereafter. Post-1989, Romania’s economy—recast through decentralized reforms—pursued enhanced service, efficiency. Its energy market, opening to competition, echoed the national economy’s liberalizing arc. Examining this shift, the authors parse Romania’s gas market, its trajectory woven into broader currents of policy transformation.

Ciobotea M. et al. (2024), in their investigation titled “*Data-driven analysis of Romania’s renewable energy landscape and investment uncertainties*,” explore the shifting terrain of Romania’s energy profile — not merely through aggregate production metrics, but via a layered reading of policy mechanisms, procurement behaviors, and the silent momentum behind renewable integration. Rather than framing the energy transition as a linear progression, the authors ground their analysis in raw, publicly accessible data: electricity generation figures, procurement documents (culled from the Electronic Public Procurement System), contextualized through modeling and targeted literature. Thermal power — long a mainstay — has, over time, receded, while solar and wind begin to assert presence, not uniformly, but through localized accelerations.

The changes are generated not only by environment and technical requirements but also by country’s energies policies, administrative measures and investment cycles in order to achieve the established aims.

Methodology

The study concentrates on Romanian law’s regarding electricity and energy in general in Romania and their compliance and alignment with EU Energy Policy. The most important regulatory authorities and their role in presented point out their role in this market.

Based on date available the article makes a short introduction on Transelectrica company, as national transmission system operator and the companies involves in electricity distribution.

The paper employs a **Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis** to evaluate Romania’s energy sector. Finally, it is made a parallel presentation of the key aspects of electricity market comparing the situation in Romania Germany and Denmark.

Legal framework for energy market

Romania’s energy sector, governed by a normative web, seeks not just to oversee distinct tasks—production, transmission, distribution, trade—but to operate as a unified system, molded alongside EU directives. Far from a cursory or rote alignment, this stems from dogged efforts to mesh national policy with the shifting currents of Europe’s energy vision; one that champions open markets while

weaving in tenets of ecological durability and system steadiness. What follows is a survey of the key legislative tools now guiding Romania's energy realm.

Electricity and Natural Gas Law No. 123/2012 – The law governs the electricity and natural gas sector in Romania. It establishes a legal framework for the organization and functioning of the energy market. It elaborates on the operational protocols for the electrical and natural gas systems, detailing the responsibilities and rights of both the operators within these sectors and the end consumers, alongside delineating the supervisory duties of the regulatory authorities over market conduct.

Central to this legislative strategy rests the aim to cultivate heightened transparency within the energy market; fostering a dynamic; competitive arena where consumers; far from being mere bystanders; emerge as active participants free to select from diverse service providers: the legal structure anticipates that such market openness will; in due course; yield fairer pricing models and enhanced service delivery—not as mere byproducts; but as core attributes of a diligently governed market. To tackle entrenched inefficiencies and forestall conflicts of interest that might skew competition; the law stipulates a distinct operational divide among the energy sector's key segments—production; transmission; distribution—thus enshrining structural autonomy as a cornerstone of sectorial soundness.

Anchored in enduring regulatory axioms, the legislation articulates with precision, not merely enumerating steps, the prerequisites and pathways for securing, and sustaining, licenses to engage in electricity and natural gas domains. Entry to energy networks – that pivotal national infrastructure – depends on doctrines ensuring equitable; regulated access, thus upholding market vitality whilst facilitating renewable energy integration, which, though ascendant, demands nuanced orchestration to prosper. Moreover, the law incorporates specific safeguards for consumer protection, including directives on billing transparency and the mandatory provision of clear information to consumers. It sets up frameworks for resolving disputes between energy providers and consumers, thereby bolstering consumer trust in the energy sector.

Energy Law No. 160/2012 – Replacing the previous Energy Law No. 13/2007, it provides the general framework for the functioning of the energy sector, including the promotion of renewable energy sources, energy efficiency, and consumer protection.

Romania's Energy Law No. 160/2012; a cornerstone edict; meticulously shapes the framework; governance; and regulatory weave of the nation's energy domain: beyond mere directives; it propels Romania to overhaul its energy infrastructure; bolster conservation efforts; and embed renewable sources within its strategic energy mosaic. Its primary aim—cultivating an energy system at once robust; sustainable; and aligned with European Union tenets—forges a vibrant; forward-leaning structure.

With measured exactness; Law No. 160/2012 delineates policies steering energy production; transmission; distribution; supply; and utilization: environmental stewardship holds primacy; its tenets advocating reduced carbon outputs; endorsing cleaner energy pathways; and promoting enhanced efficiency across economic sectors. Consumer protections—clear pricing; equitable service access; reliable quality—are further enshrined through deliberate provisions; intricately threaded into the law's core.

Prioritizing the shift to renewables; the statute pledges to increase the share of renewable sources in Romania's energy consumption mix: this resolves dovetails with overarching European directives; underscoring Romania's commitment to a more verdant economy. To spur renewable energy ventures; the law outlines fiscal incentives and enabling mechanisms for such initiatives.

The law weaves an intricate web for the energy market's workings, not just a rigid blueprint. It lays bare the duties and rights of producers, suppliers, distributors, and consumers, all knit into a unified structure. But, ensuring compliance, oversight mechanisms (aligned with national and EU standards) and licensing protocols stand meticulous. Whence arises the National Regulatory Authority for Energy (ANRE), charged with enforcement, market vigilance, and safeguarding consumers, anchoring this complex system.

Renewable Energy Law No. 220/2008 (updated with subsequent modifications) - Focuses on the promotion of energy production from renewable sources. It sets out support schemes for renewable energy projects, including green certificates and feed-in tariffs.

Law No. 220/2008, subsequently adjusted through multiple amendments, laid the initial groundwork for what would become Romania's sustained legislative engagement with renewable energy — not as an abstract objective, but as a structural imperative anchored in both national interest and supranational obligation. Rather than simply echoing the European Union's environmental directives, the law operates as a strategic lever, nudging the national energy portfolio toward deeper diversification by integrating sources such as solar radiation, aeolian flux, hydro systems, biomass processes, and subterranean heat. In doing so, it reframes energy production as a site of ecological responsibility, economic recalibration, and long-horizon planning, all converging under the premise that sustainability is no longer ancillary, but central.

Embedded within the legislative design are intricately structured support arrangements and fiscal inducements, deliberately constructed to magnetize long-term capital flows into the renewables arena. These provisions—ranging from tradable green certificates to fixed feed-in remuneration and other targeted financial instruments—function not merely as economic incentives but as mechanisms of directional influence within the market. Of particular significance is the green certificate scheme, which obliges energy providers to acquire a quota calibrated against their electricity turnover; a requirement that entwines regulatory compliance with the broader strategy of scaling up low-carbon generation through market-responsive obligations rather than prescriptive output targets.

The law, while ambitious in its environmental scope, refrains from abstract declarations; instead, it assigns measurable quotas for renewable integration into the national energy balance — not merely as guidance, but as binding orientation. Responsibilities are apportioned with precision: producers are pressed into proactive alignment, suppliers are not exempt from systemic recalibration, and regulators — central to this machinery — are tasked with ensuring that such green objectives are not deferred. The statute thus functions less as a directive and more as an operational matrix where compliance becomes embedded in the very logic of market participation.

Law No. 121/2014 – For energy efficiency, aiming to improve energy efficiency in Romania and to implement the EU Directive 2012/27/EU on energy efficiency. Romania's Law No. 121/2014: dubbed the Energy Efficiency Law: serves as a vital statute, thrusting the nation toward hefty energy savings, all while sowing seeds for sustainable habits across its realm. It entwines: deftly: with the European Union's grand aims—those set for 2020, and beyond—erecting a sturdy legal scaffold. This code—curbing waste; boosting conservation; spreading renewables far and wide—marks Romania's keen shift to an economy greener, thriftier in its energy ways.

Central to the law's approach, a rigorous clampdown on energy efficiency norms, spanning domains as varied as building construction and retrofits; industrial process streamlining; energy distribution upgrades. It decrees—pointedly—sweeping efficiency overhauls for public edifices,

nudging state entities to spearhead conservation efforts: thus laying down markers for private enterprises, householders alike.

To ignite broad embrace of energy-saving measures: Law No. 121/2014 unveils compelling fiscal lures—grants; tax relief; soft-loan deals—tailored to propel energy-efficient tech and habits, both across businesses and homes.

This statute's hallmark—its institution of a compulsory energy efficiency framework, which binds providers and distributors to attain designated yearly savings thresholds—stands out markedly. Being thus, it nurtures a forward-thinking stance on conservation within the sector, whilst subtly encouraging energy-prudent customs among consumers.

The National Regulatory Authority for Energy (ANRE)

The National Regulatory Authority for Energy is a primary regulatory body overseeing the energy sector, responsible for ensuring competition, transparency, and consumer protection in the energy market. ANRE issues licenses, monitor market behavior, and sets tariffs for regulated activities.

Emergency Ordinance No. 33/2007 on the organization and functioning of the Regulatory Authority for Energy (ANRE), detailing the powers and responsibilities of the regulatory body. This edict—articulating, with precision, ANRE's mandates, structural composition, and territorial purview—vests therein (notwithstanding its manifold duties) sweeping powers of regulation, scrutiny, and enforcement. Its remit embraces granting licences to sundry energy market operatives, steadfastly upholding conformity with national and European statutes, and instituting rectificatory measures to preserve market rectitude and consumer safeguards. Moreover, ANRE, tasked with fixing tariffs for regulated sectors, probes market aberrations and fosters just practices, thus securing equitable competition.

Emergency Ordinance No. 33/2007—marked by its steadfast dedication to consumer well-being—imposes upon ANRE the duty to devise and uphold service quality benchmarks, institute streamlined and approachable avenues for resolving consumer complaints, and ensure the delivery of precise, lucid particulars concerning energy costs and services. Being thus, its focus on consumers proves essential in fostering confidence and openness within the energy sector.

This decree—its purport steadfastly fixed upon sustainable energy advancement—enjoins ANRE, with notable resolve, to kindle outlays in vital energy frameworks and pioneering contrivances, to uphold renewable sources' integration and to press conservation endeavours. By forging a regulatory sphere—propitious to ingenuity and growth—ANRE, thus charged, navigates the energy domain toward fortified stability, enduring soundness and fiscal rectitude.

As the principal regulatory entity, ANRE is tasked with a broad spectrum of critical duties designed to ensure the energy market's smooth, equitable, and progressive operation, aligning with Romania's strategic goals and compliance with the European Union's regulatory frameworks. Below are elaborated tasks of ANRE concerning the Romanian energy market:

- **Comprehensive Market Supervision and Regulation**
This authority—ANRE, steadfast in its charge to guide the energy market's workings—devises and enforces precepts that shape domains like electricity; natural gas; renewable sources. By cultivating an ethos—propitious to just rivalry, candour, rectitude—it resolutely forestalls inclinations toward monopolistic tendencies.
- **Issuance of Licenses and Operational Authorizations**
ANRE—its purview firmly tasked with overseeing the licensure of energy sector operatives—administers a process spanning manifold pursuits: generation; transmission; distribution; supply; vending of energy. By such exacting licensure, ANRE steadfastly

upholds, for entities within the energy domain, paramount standards of operational rectitude, safety and constancy.

➤ **Safeguarding Consumer Interests**

ANRE, unwavering in its charge to safeguard energy users—its purpose steadfast—instates a formidable framework: benchmarks of service distinction, equitable pricing, billing lucidity. By ordaining conduits, vigilantly overseen, for the expeditious resolution of consumer grievances, it resolutely preserves their prerogatives, contentment thereby secured.

➤ **Regulation of Pricing and Tariffs**

ANRE establish the tariffs for energy market segments looking to assure the balance between offer and demand, create the premises to obtain a fair price for customers and also to encourage the investment in this sector

➤ **Compliance Monitoring and Regulatory Enforcement**

Lest the energy sector's probity and stakeholders' responsibility falter, ANRE—through scrutiny (ever assiduous) deftly wielded—staunchly forestalls, uncovers, and chastises infractions, thus upholding strict observance of juridical and regulatory mandates.

➤ **Encouragement of Sustainable Energy Practices**

Promoting stewardship of nature and thrift in energy—ANRE, sagaciously, devises enticements; regulatory frameworks (fortifying renewable contrivances) align with Romania's oath to lessen its carbon trace: progress, though knotty, hastens toward sustainability.

➤ **Facilitation of European Market Integration**

To weave Romania's energy market into the European Union's broader tapestry, ANRE—its efforts deftly aligned—harmonizes national policies with EU edicts, fosters cross-border collaboration, and fortifies network ties with adjacent nations.

Ministry of Energy

The Ministry of Energy constitutes Romania's central energy governance institution, wielding primary authority over national energy policy design, regulatory implementation, and strategic coordination. Its operational mandate spans three interconnected spheres: economic development priorities through energy market structuring; environmental protection via sustainable resource management; and social welfare assurance by maintaining energy accessibility. This tripartite responsibility manifests through legislative drafting, regulatory oversight, and targeted sustainability initiatives—all directed toward coherent energy system development while balancing competing national objectives:

➤ ***Strategic Policy Development and Implementation***

To chart Romania's energy course, the Ministry, tasked with forging a national strategy, delineates priorities—energy autonomy, sustainable expansion, and seamless renewable integration—its vision hinging on meticulous scenario planning; thus, balancing supply against demand, it strives to curb import reliance, steering, as it does, toward a verdant economic horizon with resilient foresight.

➤ ***Legislative and Regulatory Framework Advancement***

While ANRE directly governs the energy market's regulatory facets, the Ministry fashions the bedrock legislative milieu, ardently championing and proposing acts to government and lawmakers, thus fostering, as it does, vibrant market vitality, safeguarded consumer privileges, competitive ethos, and ecological preservation with steadfast resolve.

- *Sectoral Oversight and Synchronization*
The Ministry—rather than acting as a singular directive force—operates through layered coordination, ensuring that the diverse arms of the energy sector move, if not in unison, then at least in deliberate alignment with both Romania’s national priorities and evolving EU mandates. It mediates, at times subtly, among regulatory bodies, policy units, and central market actors—its function less about command, more about sustaining a rhythm of implementation across institutional borders.
- *Investment Attraction and Facilitation*
This Ministry—its principal charge being the elicitation of energy sector funds—spurs, by astute stewardship and legislative honing, inflows of capital toward renewables; system optimization; aged infrastructure’s renewal. Through deftly wrought incentives and supports, it forges pathways for native and foreign coin—securing thereby not solely pecuniary streams, but the diffusion of novel stratagems and vanguard energy contraptions.
- *International Relations and Cooperation*
The Ministry—steadfast in upholding Romania’s aims on worldwide energy stages—partakes in global discourses, alliances, and cooperative ventures. Such engagement proves indispensable for shaping transnational energy bazaars; advancing cross-border infrastructural schemes; furthering endeavors that bolster energy constancy, sustainable mores.
- *Energy Security and Crisis Management*
This Ministry—its charge steadfastly fixed upon national energy stability—directs prescient orchestration for supply contingencies; adroit governance of reserves. By devising scrupulous plans, it thwarts hazards linked to import reliance: mechanisms for exigency redress, thus fortified.
- *Commitment to Environmental Integrity*
Pursuing environmental objectives within the energy policy framework, the Ministry actively works towards minimizing the energy sector’s carbon footprint. It champions initiatives that promote the adoption of renewable energy and energy efficiency, aligning Romania’s energy policies with global climate change mitigation efforts and EU environmental targets.

Transport and distribution system of the Electricity Sector

Transmission

Transelectrica is designated as the national transmission system operator, entrusted with a spectrum of critical responsibilities. Company's operational and organizational framework is governed by the comprehensive Electricity and Natural Gas Law No. 123/2012 in Romania.

This statute—delineating Transelectrica’s duties to uphold the national electricity transmission system’s constancy, dependability, efficacy—enjoins it to supervise daily operations; balance supply with demand; advance renewable sources’ incorporation. Further, it vests Transelectrica with authority to govern the nation’s electricity bazaar, securing equitable, impartial access to the transmission grid for all operatives, thus fostering rivalry, market vigor.

Charged with administering the nation’s electricity transmission grid, this state enterprise—its stewardship resolute—secures steadfast, efficacious conveyance of power from generating plants to distributive conduits and principal industrial patrons. Such endeavors, vital for upholding Romania’s electrical system’s rectitude and stability, prove instrumental in market functions; notably, the balancing of supply with patrons’ needs..

In addition, Transelectrica is at the front line of integrating renewable energy sources into the national electricity grid, a task that has become increasingly important as Romania moves towards a more sustainable energy future. This involves managing the complexities generated by variations in renewable energy production, to ensure a constant and reliable flow of electricity.

Subject to the vigilant oversight of the National Regulatory Authority for Energy (ANRE), Transelectrica—its adherence resolute—conforms to an exacting array of national and European Union precepts. These mandates, crafted to foster efficacy, constancy, and rivalry in Romania's electricity transmission, extend the company's duties to the upkeep and enhancement of transmission frameworks, thus ensuring their aptitude for present and forthcoming market exigencies.

Below in figure no.2. we present Transelectrica network:



Figure no.1. Transelectrica network

Source: Transelectrica.

According to information provided by Transelectrica, the company operates:

- 8.834,4 km of overhead electrical lines (3.1km of 750 kv, 4.915,2 km of 400kv and 3.875,6 km of 220kv) from which 486.2 km represent interconnection lines
- 81 electrical stations (1 of 750 kv, 38 of 400kv and 42 of 220kv)
- 216 transforming stations with 38.058 MVA

Distribution

Across Romania, sundry distribution system operators (DSOs) govern the electricity distribution lattice. These entities, steadfast in duty, secure the conveyance of electrical power from the high-voltage transmission web to patrons: households; enterprises; sundry end-users, via networks of middling and low voltage.

The main Romanian DSOs are:

1. **Distributie Energie Electrica Romania** lays over about 97.196 km² covering Cluj, Bihor, Satu Mare, Maramures, Bistrița-Năsăud, Sălaj, Alba, Brașov, Covasna, Harghita, Mureș, Sibiu, Prahova, Buzău, Galați, Brăila, Dâmbovița și Vrancea.
It has about 203.391km of electrical lines supping about 17.05 TWh annually to about 3.9 milin clients.
2. **Retele Electrice Banat, Retele Electrice Dobrogea and Retele Electrice Muntenia** (previously called E-Distributie Banat, E-Distributie Dobrogea and E-Distributie Muntenia when they under propriety of Enel), now under Public Power Corporation (PPC) group have as activity the distribution of electricity and covers about 133.000 km of aerian and undergrad electric lines, 286 transformer substations and 24,315 transformer substations (cumulating over 22,000 MVA) and supply about 15TWh yearly to over 3.1 million clients. **Retele Electrice Banat** operates as network operator in Arad, Caras-Severin, Hunedoara and Timis counties, **Retele Electrice Dobrogea** in Calarasi, Constanta, Ialomița and Tulcea counties while **Retele Electrice Muntenia** is a network operator in Bucharest, Giurgiu and Ilfov.
3. **Delgaz Grid (E. ON)** – This company provide services in **Bacau, Botosani, Iasi, Neamt, Suceava and Vaslui** . It operates an electricity network of over 83,000 km. They serve, in total, about 3 million customers (electricity and gas)
4. **Distributie Oltenia**, establish in 2007 as legal successor of Electrica Oltenia, ensures the supply of electricity to 1,449,939 customers from 7 counties in the Oltenia region: Dolj, Arges, Olt, Gorj, Valcea, Mehedinti and Teleorman. The company operates 66.650 km of aerian lines (44.109 low voltage, 19.180 medium voltage, 5.361 high -votage) and 19.075 km of underground lines (16.516 low- voltage, 2.521 medium- voltage, 38 high-voltage)

These distribution system operators—linchpins in Romania’s electrical supply continuum—secure, with steadfast precision, the efficacious transit of power to patrons throughout the realm. Tasked further with the upkeep and enhancement of the distribution lattice; the establishment of novel linkages; the mending of outages, their endeavors fall under the vigilant purview of the National Regulatory Authority for Energy (ANRE), which upholds conformity with Romania’s energy market precepts.

Swot analysis on Romania energy market

Strengths	Opportunities
Diverse Energy Mix: Romania—its energy array notably manifold—reaps advantage from a broad compendium: hydroelectric; nuclear; coal; renewable sources, wind and solar among them, thereby fortifying its stability and security of supply.. Strategic Geographic Location: Sited at the confluence of Europe’s energy arteries—its position singular—Romania stands poised to assume a central role in regional energy conveyance; distribution, thus bolstering its prominence in continental energy constancy.	EU Funding and Support: Romania—its access to European Union coffers and technical succor for energy ventures—secures notable prospects: modernizing frameworks; advancing renewables; enhancing efficacy of energy use. Technological Advancements: The embrace of novel contrivances—smart grids; energy repositories; digital mechanisms—stands to fortify the steadfastness and efficiency of Romania’s energy provision; its distribution likewise refined.

Existing Infrastructure: Romania, endowed with a sturdy energy framework—its assets robust—commands refineries; a national transmission lattice; Black Sea port provisions, all apt to sustain domestic demands and, equally, export ventures. Renewable Energy Potential: Romania has a lot of chances to use renewable energy, especially from wind and solar, thanks to its good climate and because the European Union is giving extra support for this type of energy.	Energy Market Liberalization: Persisting in liberalizing Romania's energy bazaar - its course thus set—may kindle further capital inflows, heighten rivalry, temper costs and elevate service standards for patrons. The transition to a green reliable energy: The determination to pursue the change to a sustainable energy give to Romania the occasion to decrease the CO2 emissions and to enlarge its production mix according to EU demands.
Weaknesses Aging Infrastructure: Romania—though possessed of considerable infrastructure—contends with antiquated systems: power grids; heating networks, long past prime, demand substantial outlays for renewal, efficacy's enhancement. Political and regulatory instability: Continuous changes in energy rules and guidelines, which are modified very often, give a shadow of uncertainty over investment prospects, discouraging both local and foreign capital in Romania's energy sector. Energy Efficiency Struggles: Romania's sector, lagging among the EU's least efficient, grapples with hefty losses across production, transmission, distribution; improvements, sorely needed, remain a steep climb. Dependence of fuel coming from imports: Although country have resources, to assure domestic demand, Romania is forced to import certain quantities of natural gas and oil, which undermines its energy autonomy.	Threats Instability of world energy market: The frequent changes of world energy prices due to geopolitical situation have an important influence on the country's energy policy due to partial rely on natural gas and oil imports Environmental Regulations: Adherence to exacting EU ecological and climatic mandates—its rigor unyielding—demands considerable pecuniary outlays, perchance encumbering Romania's enterprises; its economy, thus strained. Technical and operational problems: The fit-in of important energy quantities produced by renewable generation sector oblige the the country to make important investment in national grid to assure system balance and smooth operation. Political and economic changes: The internal and regional economic and policy trends influences the internal investment and the development of the sector.

Parallel regarding electricity market in Romania, Germany and Poland

Aspect	Romania	Germany	Poland	Denmark
Energy Market Liberalization	Partial market liberalization with the state maintaining control over key sectors. Competition is emerging but remains limited.	The energy market is totally deregulated and integrates multiple public and private suppliers generating real competition.	Gradual market reforms in progress; state still holds influence over some key energy assets.	Competitive and developed market which promotes customers' interest
Regulatory Stability	Frequent regulatory changes create uncertainty, discouraging investor confidence.	The regulatory laws are well defined and in line with EU requirements, creating an encouraging framework for investors	The regulatory environment is moving in the right direction, but it is still some influences from the authorities, inclusive in tariffs regulations	Ther regulations are very clear and stable, according to long-term policies of the government which give certainty to the market investors
Grid Modernization	Outdated infrastructure with slow progress in modernization. Limited development of smart grid technology.	Highly advanced grid with digital integration, well-equipped to accommodate renewable energy.	The grid is continuously improved by important investment made by the state and privates.	State-of-the-art grid infrastructure fully assure the feed-in of renewable energy and equipped with advanced smart grid capabilities.
Energy Efficiency	Low energy efficiency and important transmission losses.	Strict regulations ensure high energy efficiency standards, reduce losses, and promote advanced storage solutions.	Moderate energy efficiency, supported by a improving grid and policies to cut coal dependence.	Exceptional energy efficiency through digitalized networks and smart energy management.
Investment Confidence	Investors are hesitant due to frequent legislative changes and an unstable regulatory environment.	Important investments, transparent regulations and financial incentives, attract international investors.	High investor confidence due to structured government incentives. There are still concerns over past policy inconsistencies.	Highly attractive due to clear and stable policies and strong support for energy sector innovation

Aspect	Romania	Germany	Poland	Denmark
Market Competitiveness	Market competition is limited, with monopolistic structures still present in the distribution sector. The retail market is not fully developed.	A competitive wholesale market and retail energy market, where trading hubs enhance efficiency.	Growing competition in the energy market, although pricing remains shaped by government subsidies.	Total deregulated market offers consumers flexible energy contracts paired with competitive prices.
Electricity Pricing	Prices have an important variation due the uncertainty of the regulations. While some subsidies persist, ongoing reforms seek to better match prices with market conditions.	Electricity prices is among Europe's highest, driven in large part by renewable surcharges and green energy subsidies	Electricity prices remain moderate, though upward pressure mounts amid tightening environmental rules and the ongoing shift toward cleaner energy sources.	In certain regions, electricity costs run high — yet this is partly offset by strong renewable generation and supportive state incentives.

Conclusions

At present, Romania's energy sector stands at a critical juncture; reflecting the sweeping shifts seen across global and European energy arenas: this defining phase hinges on the nation's endeavor to balance pressing energy needs; sustainability imperatives; economic considerations; and the intricate geopolitical terrain. The trajectory of Romania's energy market, shaped by a constellation of pivotal elements; is poised to steer the course of its energy strategies and market dynamics in the years ahead.

Romania's energy sector, long sustained by a mixed array—fossil fuels carrying weight, hydroelectric infrastructure standing robust, nuclear strengths in tow—has thrived on variety. Alongside this, the land holds rich promise for renewables: wind, solar, biomass, each ripe for harvest. Policy's taking a turn now, leaning toward wider energy options, greater self-dependence, a greener economy. This stems, in part, from Romania's own aims; yet, alignment with European Union calls for ecological duty and renewable uptake presses just as hard.

Among Romania's energy sector possibilities, few hold as much promise—or intricacy—as merging renewable sources with the national grid: the nation's terrain and climate; ideally positioned for tapping wind and solar energy; have spurred a clear upsurge in investments, propelled by state incentives and reinforced by European Union funds. Yet, the erratic flow of these energies—paired with an urgent demand for considerable sums to modernize grid frameworks and devise storage mechanisms—stands as a weighty barrier to completely harnessing this renewable capacity.

Within Southeast Europe's energy landscape, Romania's advantageous location and rich natural resources position it as a prospective linchpin for bolstering regional energy security: its Black Sea gas fields, if explored and developed; hold the potential to transform the nation into a pivotal energy nexus, particularly when leveraged alongside established oil and gas networks. Initiatives to extend gas linkages with adjacent countries and enhance storage capacities stand poised to strengthen Romania's energy autonomy; while simultaneously advancing the broader regional security framework. Yet, the journey toward a varied, enduring, and robust energy market

remains strewn with obstacles: substantial funding for infrastructure is essential; as is the pace of regulatory adjustments and the alignment of national policies with overarching EU environmental and energy mandates. Further complexities arise from the global drive for decarbonization; compounded by ongoing geopolitical frictions that challenge Romania's strategic energy foresight.

The study relies predominantly on qualitative assessments, not focusing on statistical data. In this article the author does not incorporate the perspective regarding the electricity market from market actors like government regulators, industry leaders, sectors investors or consumers. Also, the article do not aim to propose a road map for Romanian electricity market in order to improve its efficiency and development.

In sum, Romania's energy sector navigates a dynamic era marked by vast potential for expansion, prospects for diversification, and a strengthened position in regional energy security: by leveraging its renewable assets; bolstering its role in stabilizing the region's energy landscape; and dedicating itself to ecological sustainability, the nation stands poised to carve out a resilient, forward-looking energy path. Realizing this ambition demands calculated investments; adaptive regulatory frameworks; and an unwavering focus on innovation alongside cooperative endeavors across national and regional spheres. The course ahead for Romania's energy market signals profound change; driven by the worldwide pivot to sustainable, secure energy systems.

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